Baker McKenzie.

OPPORTUNITIES FOR CORPORATE PROCUREMENT OF POWER IN SUB-SAHARAN AFRICA

This report explores the ways in which businesses can take a more active approach in managing their power supply in several sub-Saharan African power markets

IN PARTNERSHIP WITH:

Contents

1 INTRODUCTION

Purpose of this report

While there has been a remarkable growth globally in the number of corporates electing to procure their power directly from generators in recent years, usually through the use of power purchase agreements (**corporate PPAs**), this trend has been more stagnant in most parts of sub-Saharan Africa. In a recent study by the Business Renewables Centre in the United States, the following features were common across all reported corporate PPAs:

- they are utility-scale—from 5 to 315 megawatts (**MW**); and
- they are all off-site—they are not panels on a factory roof, but rather large wind and solar farms developed to feed the grid.[1]

Although some sub-Saharan African countries are seeing reasonable growth in small scale, commercial and industrial (C&I) solar projects (e.g. South Africa, Kenya, Nigeria and Ghana), the structure of power markets in most countries (being vertically integrated) makes the implementation of projects with the above characteristics considerably more difficult. The regulatory frameworks in many countries restrict the sale of energy without a licence, creating barriers to entry for the adoption of corporate PPAs. Additionally, there remains a lack of knowledge and understanding on the part of many corporate customers as to how they can structure, price and implement a corporate PPA.

This being said, the dramatic fall in costs of certain renewable energy technologies (such as solar PV and wind) are starting to turn the economics in favour of corporate PPAs. In addition, there are signals from several markets indicating that power utilities and regulators are considering options around restructuring their respective power markets as they embrace the energy transition.

Some of these developments may begin opening up markets to the types of corporate PPAs that are common in more developed regions and should be monitored closely. In light of this, this report has been prepared for both developers and corporates and aims to unpack the opportunities and possible structures for corporate PPAs in the following countries:

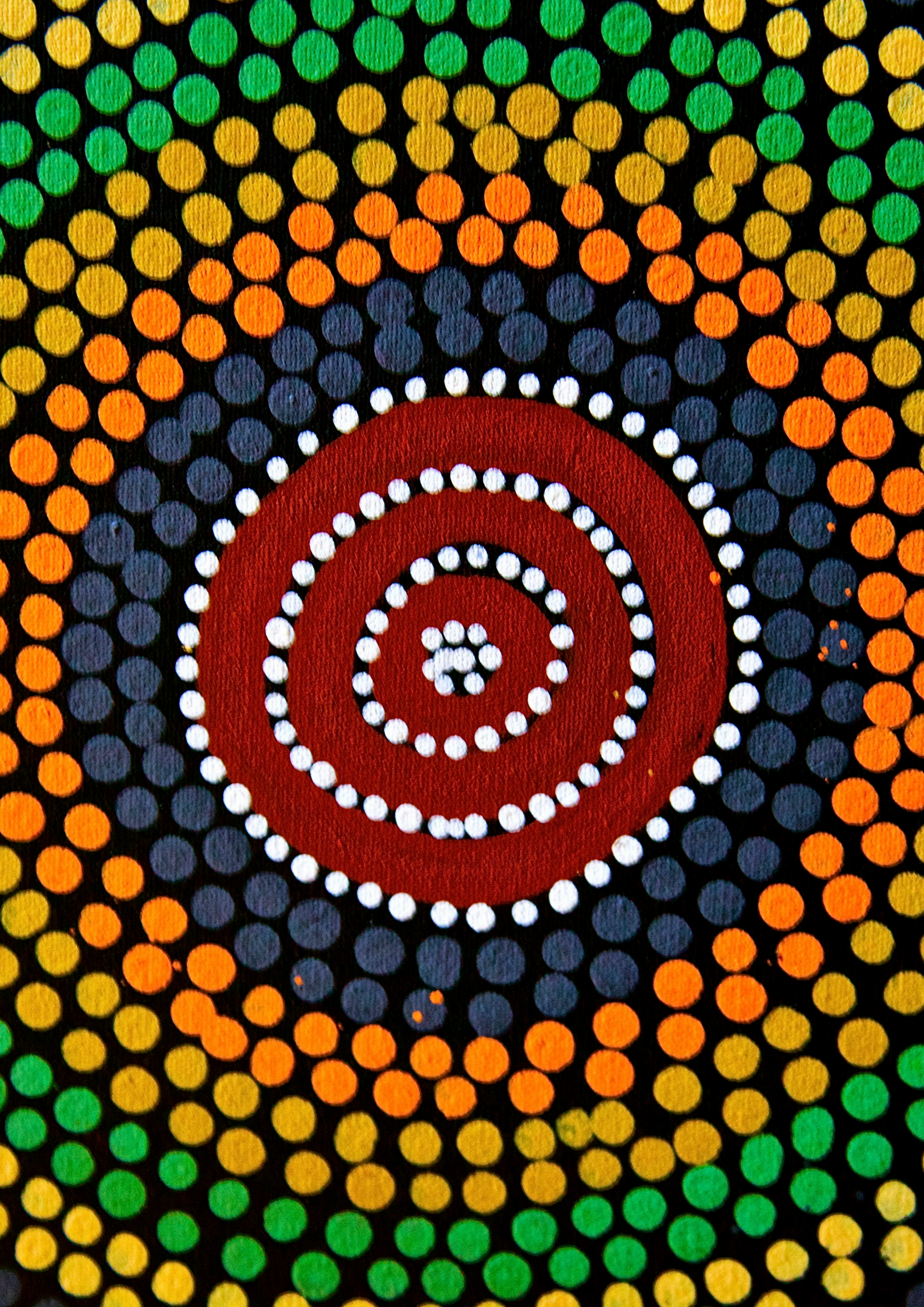
1. Ethiopia (*Tadesse Kiros Law Office*);
2. Ghana (*Kimathi & Partners*);
3. Kenya (*Kaplan & Stratton*);
4. Namibia (*Engling, Stritter and Partners*);
5. Nigeria (*Banwo & Ighodalo*);
6. South Africa (*Baker McKenzie*);
7. Tanzania (*FB Attorneys*);
8. Zambia (*Corpus Legal Practitioners*); and
9. Zimbabwe (*Atherstone & Cook*).

Participating Countries

Baker McKenzie authored this report along with input from the firms mentioned above that operate in each of the participating countries. Each firm's input was provided through responses to a questionnaire that was prepared by Baker McKenzie.

We hope that this report will serve as a tool that will facilitate the expansion of corporate PPAs in the participating countries.

1 Rocky Mountain Institute – https://www.rmi.org/the-power-of-agreement/



2 OVERVIEW OF CORPORATE PPAs

What is a corporate PPA?

A PPA is a contract between a buyer and generator of electricity to purchase electricity (whether physically or notionally) at a pre-agreed price for a pre-agreed period.

A corporate can choose to take control over its electricity procurement by contracting either directly or indirectly with a generator. This is a "corporate PPA", that is, a PPA between a generator and the end corporate customer (either directly or indirectly). For various reasons, discussed below, corporates tend to procure their power from renewable energy generators. Given the abundance of solar resources on the continent, this is the most common energy source for corporate PPAs in Africa.

In jurisdictions such as the United States and Europe, where electricity is sold and bought across regional power pools, corporate PPAs are often structured as pure financial derivatives that allow corporates to hedge against volatile and increasing wholesale power prices. Where power pools are not available corporate PPAs involve a physical transfer of power to the customer (whether wheeled across a transmission line or supplied directly).

Due to the requirement to obtain a licence for the sale of power in several sub-Saharan African countries, parties may elect to structure a corporate PPA in various ways, including in the form of a hire-purchase agreement or equipment lease, with the underlying price being linked to the energy produced by the applicable system.

As an alternative to entering into a PPA with a renewable generator, some corporates may choose to build a renewable energy plant on-site e.g. on the rooftop of, or alongside, a factory or office. In this case, the corporate will either need to fund the installation itself or take out a loan.

For the purposes of this report, references to a corporate PPA will include either of the above structures. The report will address the advantages and disadvantages of each structure where applicable.

What are the key drivers?

There are primarily three key drivers for entering into a corporate PPA in Africa:

- **Economics:** due to significant reductions in the cost of solar PV and wind technologies, coupled with increases in grid tariffs across most countries, the cost of renewable energy has become more competitive than grid supplied electricity in many jurisdictions. Bloomberg New Energy Finance (NEF)[2] recently reported that solar PV can compete with grid tariffs for both commercial and industrial customers in Ghana, Senegal and Kenya and can compete with grid tariffs for commercial customers (which are usually higher than industrial tariffs) in Ghana, Senegal, Rwanda and Kenya. As grid tariffs steadily increase (to become cost reflective), this situation is likely to play out in many other jurisdictions. Corporate PPAs allow customers to secure long term electricity price certainty and, potentially, to save money.
- **Power Supply:** grid reliability is a constant business risk across most countries in sub-Saharan Africa. Power outages, known as "load shedding" in South Africa, result in many businesses having to revert to expensive diesel power back-up generators. According to Bloomberg NEF, Nigerian businesses face more than one outage a day.
- **Sustainability Targets:** following major global developments in the fight against climate change, such as the Paris Agreement of 2015, there is growing pressure on the private sector to actively ensure the sustainability of their business operations. One of the key focuses in this regard is the transition towards decarbonising several sectors including electricity, transport and heating. Large companies around the world are committing to reducing their carbon footprint, some going as far as committing to being supplied by 100% of renewable energy (for example, approximately 145 companies have signed up to the RE100 initiative). Major investors, such as private equity infrastructure and pension funds and wealth managers, are also applying significant pressure on their portfolio companies to i) disclose their current carbon emissions and ii) commit to reducing these emissions. Corporate PPAs utilising renewable energy support the corporate to meet its emission reduction or renewable energy commitments cost-effectively, report on its activities easily and secure a reputation as a good corporate citizen.

On the supply side, the corporate PPA market is critical to facilitating the development of new renewable energy facilities in Africa (as part of or additional to any legislated renewable energy resource allocation) by providing or underwriting longer-term PPAs with renewable energy developers. Developers face constant challenges in securing grid supplied renewable energy projects including "unbankable" PPAs, administrative delays, policy uncertainty and difficulties in negotiating with incumbent utilities. Corporate PPAs allow developers the opportunity to negotiate directly with the customer, by-passing some of these challenges.

2 Solar for Business in sub-Saharan African; January 2019

3 CHALLENGES AND DEVELOPMENTS

Regulation

The regulatory frameworks in many sub-Saharan African countries are outdated and need to be amended to take account of the changing nature of the power sector.

The key issue that obstructs the use of corporate PPAs in most markets is that a licence is required to either operate a power asset or sell power, or both. Most markets have a threshold where a licence is required, usually ranging between 100kW and 1000kW. Where projects exceed these thresholds, the PPA will often be structured in alternative ways, including as a hire-purchase agreement or lease to avoid the application of the licence requirement to comply with any available exemptions. However, in addition to triggering unfavourable tax consequences (where the PPA becomes a contingent liability on the corporate's books), these solutions carry enforceability risk and may not pass a lender's bankability requirements.

It's worth noting that there are no licence requirements in Senegal and Mozambique and the threshold in Uganda for a licence is 2000 kW.[3]

In addition to licence requirements, some jurisdictions require approval from the local distribution network operator to install an on-site power plant (e.g. rooftop solar PV). This approval can be difficult to obtain and is often delayed.

Power Market Reform

Net metering, where plants are able to supply unused power into the grid in return for a feed-in tariff, is not available in most countries and where it is available, such as in parts of South Africa, the tariff is often too low to enhance the economics of the project. This is a key reform that is required in these power markets to unlock opportunities of corporate PPAs.

As the energy transition (a move to decarbonised, decentralised and democratised power markets) slowly makes its way into sub-Saharan Africa, some utilities and regulators are showing signs of key market reforms that will enable more opportunities for corporate PPAs. For example, Namibia is close to finalising a new energy policy that will allow the bilateral trading of power between generators and customers. In a small power market such as Namibia, the opportunities may be more limited. However, it is expected that neighbouring countries, such as Zambia, may well follow Namibia in this reform.

3 Solar for Business in sub-Saharan African; January 2019

Mini-grid Opportunities

Due to strong resources, as well as poorly maintained and limited grid networks, sub-Saharan Africa has seen an increase in the roll out of mini-grid. In addition, the rapid technological development and operational efficiencies have made mini-grids a practical, cost effective and viable solution to electrify rural areas.

In Africa, it is estimated that over 2,000 mini-grids have been identified, with solar projects accounting for 40%. It is however expected that the number of mini-grids may rapidly increase to 16,000 by 2023.

The International Energy Agency estimates that at least 40% of new power connections in sub-Saharan Africa during the next decade will be provided by mini-grids. For example, Rwanda plans to provide over 90% of its electricity supply through mini-grids by 2024.

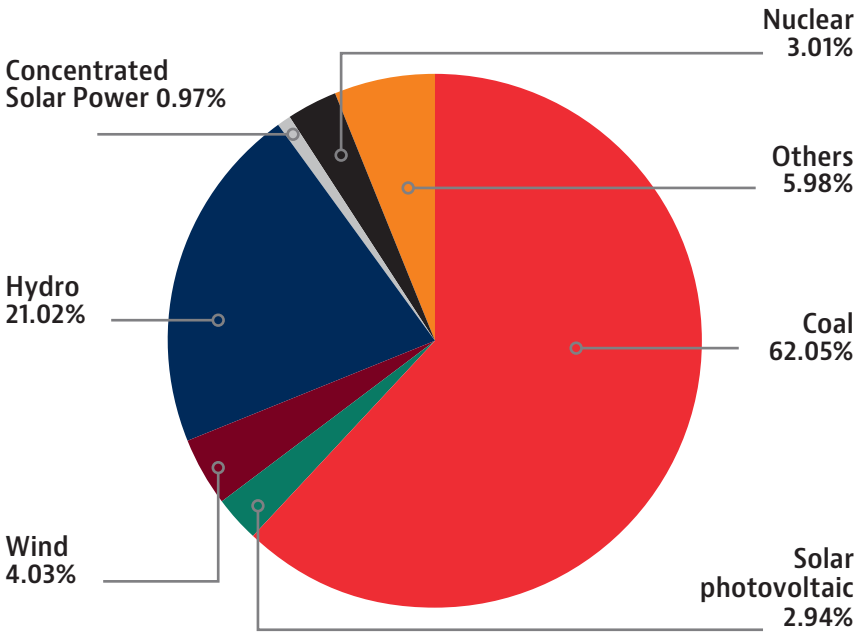
The regulatory environment can be quite different depending on the country. Tanzania has fairly clear policies and regulations that favour mini-grids. Nigeria has issued regulation detailing the framework for the establishment of mini-grids. Uganda is currently developing a mini-grid framework with the support of various donor programmes. Similarly, Rwanda has been in consultation with private mini-grid companies in the development of their mini-grid framework.

Southern African Power Pool

The Southern Africa Power Pool (**SAPP**) has been operating for over 10 years. While the trading activity has usually been considered to be too low for commercial opportunities, the number of trades over the last 18 months has increased significantly, potentially indicating that this market is maturing and that opportunities may begin materialising (although Eskom's dominance in SAPP still poses a restriction to this).

SAPP has installed 22 606 MW of generation capacity in the last 13 years, resulting in an annual average of 1,739 MW of new generation capacity.

The SAPP currently serves more than 300 million people and has an available generation capacity of 67.19 GW. A total of 2,124 GWh was traded on the SAPP market during 2018, resulting in USD 106.6 million being exchanged on SAPP's competitive market.



SAPP by technology types

Current operating members of SAPP include Botswana, Democratic Republic of Congo, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe.

A key development to watch is Namibia's move to allow bilateral trading, which is expected to extend into the use of the SAPP.

Key Countries to Watch

According to Bloomberg NEF, Nigeria, Ghana and Kenya are key sub-Saharan Africa countries to watch for corporate PPA opportunities, based on positive economics and relatively accommodating regulatory systems.

Senegal, Uganda and Rwanda, with increasing grid tariffs and reasonable momentum in renewable energy adoption, also offer opportunities. However, due to the small nature of the commercial and industrial power demand, the scalability of project portfolios appears to be limited.

South Africa, being the most industrialised economy in Africa, is often considered a good starting point for corporate PPA development. Regulatory and policy uncertainty have been the main reasons why adoption is relatively low. However, continued increases in Eskom supplied grid electricity tariffs has resulted in a notable increase in corporate PPAs over the last 18 months. This is expected to grow further once the Integrated Resource Plan is finalised and regulations are aligned.

Part 4 of this report provides a summary of the regulatory landscape applicable to corporate PPAs in the participating countries and comments on any reforms or changes which should be monitored.

4 COUNTRY FOCUS

This section considers the ways in which a corporate PPA may be implemented in the participating countries. The types of corporate PPA structures and power markets referred to in this section are set out in further detail in Annexure A.

SOUTH AFRICA

The roll out of corporate PPAs in South Africa has slowly been increasing in recent years.

Renewable energy has the highest allocation in the country's draft Integrated Resource Plan for the period up to 2030. Of this allocation, 500 MW per annum has been allocated to "embedded generation". Although this increase is encouraging for the corporate PPA market (which can be considered to be "embedded generation"), regulatory challenges continue to inhibit the roll out of large scale corporate PPAs. The Integrated Resource Plan (**IRP**) has not been finalised, which is adding more uncertainty and creating further delays in the sector.

Given these challenges, which are discussed below, the most active segment of the market in South Africa currently involves projects that are less than 1 MW.

Corporate PPA structures in South Africa:

MARKET STRUCTURE	
Model 1 Vertically integrated monopoly (with some qualifications)	Eskom sells electricity to various customers and municipalities, which municipalities, in turn, sell electricity to the end-user.
BEHIND THE METER PPA	
Available in South Africa	Yes
Licence required	No licence is required up to 1 MW, but generating systems must be registered with NERSA.[4] A licence is required above 1 MW. It is expected that an amendment will be made to the Electricity Regulation Act (ERA) in terms of which a licence, as well as Ministerial approval for deviation from IRP of the Department of Energy, is required for systems above 10 MW.
Other practical difficulties or things to consider	Developers in some regions will experience challenges in connecting to the grid, as the local network provider's approval is usually required. Developers also face "stranded asset risk" in the event the off-taker goes insolvent or moves premises. Developers are addressing this risk through wheeling arrangements.

4 The registration process is yet to be finalised by NERSA.

SLEEVED PPA	
Available in South Africa	Yes, but subject to wheeling challenges.
License required	Same as above. In addition, a connection agreement with the local network provider and/or Eskom is required. This connection agreement will include the wheeling arrangement and wheeling approval required from the National Energy Regulator of South Africa.
Other practical difficulties or things to consider	Eskom's current wheeling policy is prohibitive as the customers' electricity bill is not credited at the same value that it pays under the PPA. This makes pricing under the PPAs difficult and usually renders the projects commercially unfeasible. Eskom's wheeling arrangements are not clear and transparent, creating uncertainty for developers and investors. Eskom does offer an "energy banking scheme" where unused energy is able to be "banked" with Eskom for use (i.e. credit) in due course, but not longer than 12 months.
VIRTUAL PPA	
Available in South Africa	No, there is no pool market in South Africa.

Specific regulations or policies in South Africa that are applicable to mini-grid or other solutions

There are no specific regulations for mini-grids. The existing regulations applicable to generation, distribution and trading must be applied to a mini-grid project.

Subsidy or incentive programmes for the generation of renewable or clean energy in South Africa

Other than the indirect subsidies introduced through the REIPPPP, there are no incentives imposed at the utility level.

However, generators of electricity using non-renewable (fossil) fuels and environmentally hazardous (nuclear) sources are subjected to the payment of an environmental levy in South Africa, which is passed through to the customer.

Section 12B of the Income Tax Act No. 58 of 1962, as amended, provides for a capital allowance for movable assets used in the production of renewable energy.

Carbon tax or other carbon pricing mechanisms

The Carbon Tax Act became effective on 1 June 2019. Accompanying the Carbon Tax Act is a set of carbon-offset regulations.

Expected changes to regulations

There is growing speculation amongst market commentators that Eskom may be restructured in such a way that opens up competition in both the generation and retail sections of the market.

GHANA

Ghana is a country that aspires to industrialise, modernise its agricultural sector, and to provide economic opportunities for its growing population. A key constraint to this vision is the country's unreliable and costly supply of electricity. Ghana has over 4 000 MW of installed generation capacity, though actual availability rarely exceeds 2 400 MW due to changing hydrological conditions, inadequate fuel supplies and derelict power infrastructure.

Ghana is endowed with an abundant supply of renewable energy resources, particularly solar energy. Despite this, renewable energy currently only contributes approximately 22.5 MW to Ghana's electricity supply. In an attempt to increase investment in the renewable energy sector, the Ghanaian government has promulgated the Renewable Energy Act which aims to increase the use of renewable energy by 10% in 2030.

Bloomberg NEF reports that C&I solar currently costs $0.11/kWh, approximately 53% lower than commercial grid tariffs and 25% lower than industrial grid tariffs.

Corporate PPA structures in Ghana:

MARKET STRUCTURE	
Model 2 Unbundled monopoly	The energy market in Ghana is split up into three divisions, namely generation, transmission and distribution. The Volta Region Authority (**VRA**) is the main electricity generator in Ghana and is wholly owned by the Ghanaian government. The Ghana Grid Company (**GridCo**) owns and operates the transmission network in Ghana. Electricity in Ghana is distributed by the Electricity Company of Ghana (**ECG**) and the Northern Electricity Department Company (**NedCo**). Gridco, ECG and NedCo are wholly owned by the Ghanaian government. As of 1 March 2019, a company known as Power Distribution Services Ghana Limited (**PDS**) has taken over operations from ECG for a period of 20 years in terms of a concession arrangement.
BEHIND THE METER PPA	
Available in Ghana	Yes
Licence required	Yes, any entity who intends to engage in commercial activity under renewable energy generation may not do so without a wholesale licence Commercial activities include the production, transportation, storage, distribution, sale and marketing, importation, exportation and re-exportation of renewable energy as well as the installation and maintenance thereof. A wholesale licence permits the holder to manufacture and assemble renewable energy products. It also permits the holder to install, generate, and supply electrical energy. Wholesale licences are mainly intended for generators who wish to make use of the national grid to supply electricity to licenced distribution utilities or bulk customers.[5]
SLEEVED PPA	
Available in Ghana	Yes
Licence required	Same as above. Approval of the feed-in-tariff must be obtained from the Public Utilities Regulatory Commission (**PURC**). The PURC functions as the economic regulator and is mandated, amongst other things, to protect the interest of consumers and utility providers. In addition, an electrical connection agreement or a transmission services agreement must be entered into with GridCo.
VIRTUAL PPA	
Available in Ghana	No

5 A bulk customer is defined as a consumer of electricity with a maximum demand of at least 500 KvA consistently for a consecutive period of 3 months or a minimum annual energy consumption of 1 million kilowatt-hours.

Specific regulations or policies in Ghana that are applicable to mini-grid or other solutions

The Ghanaian Energy Commission has published draft mini-grid regulations. These regulations are yet to be enacted and are still under development.

Subsidy or incentive programmes for the generation of renewable or clean energy in Ghana

Ghana does not currently have any renewable energy subsidies or incentive programmes.

Previously the National Solar Rooftop Programme granted exemptions on solar panels. A capital subsidy was given to beneficiaries either by way of a cash payment or through the provision of solar panels to beneficiaries who have purchased and installed the requisite inverters, batteries or charge controllers. The programme is currently under review and is not in force.

Carbon tax or other carbon pricing mechanisms

No. There is currently no carbon tax levied in Ghana.

NIGERIA

About 20% of the grid-connected electricity generation in Nigeria is from large hydro projects built prior to the unbundling of the market. The remainder of the energy mix is largely dominated by gas-fired capacity.

However, Nigeria has a great abundance of renewable energy resources yet untapped. These include hydro, biomass, wind, biogas, solar and geothermal resources. There are a few utility-scale solar and wind power projects in their very early phases of development. The Nigerian Bulk Electricity Trading Plc. (**NBET**) is seeking to procure electricity from fourteen utility-scale solar projects in Nigeria and has executed PPAs in connection with these projects. There are also some non-utility scale distributed solar power projects in operation.

The Nigerian government has introduced a range of policies and regulations, including feed-in-tariffs, which are aimed at achieving a targeted renewable energy generation capacity of 2,000 MW by 2020.

In addition, the government recently issued the Sustainable Energy for All Action Agenda (**SEforAll**) targets. The SEforAll aims to achieve a 20% and 19% contribution of solar energy (PV and Solar thermal) to Nigeria's electricity generation mix by 2020 and 2030 respectively. Other similar action plans and agendas aim to increase the amount of electricity generated by renewable energy.

The renewable energy market is therefore likely to increase in the medium to long term once broader sector-related hurdles are surmounted.

MARKET STRUCTURE	
Hybrid model of Model 2 (Unbundled monopoly) and Model 3 (Unbundled, limited competition)	Competition exists amongst generators, the majority of whom are now privately owned. However, the entire transmission network is owned and operated by the Nigerian government through the Transmission Company of Nigeria (**TCN**). TCN also currently acts as the market and system operator for Nigeria's transmission network. Competition exists, to a limited extent, in the wholesale market, as generators can contract directly with: ▪ Nigeria Bulk Electricity Trading Plc (**NBET**), a government-owned bulk purchaser; ▪ any electricity retailer or distribution company (**Discos**); or ▪ directly with certain eligible customers (**Eligible Customers**). NBET generally executes PPAs with generators for the purchase of electricity which it, in turn, resells to the Discos under vesting contracts. The Discos thereafter supply electricity to their consumers. There is very limited competition in the retail electricity market as each Disco is effectively a monopoly provider within its franchise area, save where the generator supplies power directly to Eligible Customers.
BEHIND THE METER PPA	
Available in Nigeria	Yes
Licence required	Yes, two licensing options are available. **1. Offsite** Where the generation capacity is above 1 MW, the seller must obtain a generation licence from the Nigerian Electricity Regulatory Commission (**NERC**). The corporate customer must be approved by NERC as an Eligible Customer and must consume more than 2 MWh/h over the course of each month. In addition, the corporate PPA must be approved by NERC. The corporate customer must enter into a bilateral agreement with the relevant distribution licencee such as the holder of an independent electricity distribution network licence, for construction, installation and operation of the distribution system used to connect the customer to the generation facility, subject to NERC's approval. **2. Onsite** Where the power plant will generate over 1 MW for the purpose of consumption by the generator, and not sold to a third-party, the Corporate customer can obtain a captive power permit from the NERC. A service provider will construct and install the power plant on behalf of the corporate customer within the corporate customer's premises and will provide operation and maintenance services to the corporate customer.

SLEEVED PPA	
Available in Nigeria	Yes
License required	Yes This would entail that the seller supplying electricity to the corporate customer using the Grid or the Disco's infrastructure. The seller must obtain a generation licence from NERC where the generation capacity is above 1 MW. The corporate customer must be approved as an Eligible Customer by NERC and must have a consumption above 2 MWh/h over the course of each month and connected to a metered 33 KV delivery point on the retailer's distribution network.[6] In addition, the corporate PPA must be approved by NERC. The customer must execute a transmission use of system agreement with TCN and a distribution use of system agreement with the seller and the relevant Disco.
Other practical difficulties or things to consider	The seller and customer must consider transmission network challenges and the likely need to build a transmission line or distribution infrastructure to deliver electricity to the Customer. Where an intending corporate customer does not meet the consumption requirement of 2 MWh/h per month, it may aggregate its site with other customers to apply for eligibility status, as a group. The group of corporate customers would be required to establish a special purpose vehicle through which the corporate customers would undertake the purchase of the electricity.
VIRTUAL PPA	
Available in Nigeria	No

Specific regulations or policies in Nigeria that are applicable to mini-grid or other solutions

In 2017, NERC issued the Mini Grid Regulations which applies to any mini-grids connected to a generation capacity of up to 1 MW. Mini-grids may be interconnected (i.e. connected to a distribution network) or isolated (i.e. not connected to a distribution network).

Subsidy or incentive programmes for the generation of renewable or clean energy in Nigeria

Certain renewable energy projects benefit from the renewable energy feed-in-tariff (**REFIT**) which guarantees a fixed tariff providing investors with an adequate return on their investment. The REFIT only applies to projects not exceeding the following capacities: Solar (5 MW), Wind (10 MW), Biomass (10 MW) and Small Hydro (30 MW).

Carbon tax or other carbon pricing mechanisms

There are currently no carbon tax or other carbon pricing mechanisms in force in Nigeria. However, corporate entities have to comply with environmental legislation on air emissions and environmental pollution.

6 It will also apply to a 11 KV delivery point, when NERC flags off phase II of Eligible Customers.

TANZANIA

Tanzania has recently embarked on initiatives that are designed to increase investment in renewable energy. While renewable energy supplies more than 50% of all energy production in Tanzania, this production has been predominantly hydroelectricity and thermal energy. Following the enactment of recent policies and legislation, the role of solar and wind energy projects is expected to increase.

While there have been a limited number of corporate PPAs, dominated by the mining sector, the main area of growth in Tanzania has been in off-grid solutions for commercial and industrial customers (i.e. mini-grids and behind the meter installations).

Corporate PPA structures in Tanzania:

MARKET STRUCTURE	
Model 3 Unbundled (limited competition)	There are multiple competitors in the electricity-generating sector. These include the Independent Power Tanzania Limited, Aggreko, and Songas Limited. Tanzania Electric Supply Company Limited (**TANESCO**) is a Government-owned electricity utility company that owns the entire transmission network and distribution networks in the country. TANESCO supplies electricity from the generation plants or purchases electricity from generators.
BEHIND THE METER PPA	
Available in Tanzania	Yes
Licence required	**For projects ≤ 100 kW:** no requirement for an environmental impact assessment (EIA), an electricity generation licence or a tariff approval by the Regulatory authority EWURA. **For projects ≤ 1 MW:** do not require an electricity generation licence, but a simple registration with the regulatory authority EWURA is sufficient. **For off-takers with a peak load ≥ 250 kVA:** if an SPP developer reaches an agreement with an 'eligible customer', defined as having a peak load of 250 kVA or higher, to sell electricity to that entity under a PPA, such agreement is exempted from the requirement of tariff approval by EWURA.
SLEEVED PPA	
Available in Tanzania	Yes
Licence required	Same as above. A sleeved PPA will require negotiations and agreement with the local energy provider, the supplier (TANESCO) and the Ministry of Energy. Eskom does offer an "energy banking scheme" where unused energy is able to be "banked" with Eskom for use (i.e. credit) in due course but not longer than 12 months.
VIRTUAL PPA	
Available in Tanzania	No

Specific regulations or policies in Tanzania that are applicable to mini-grid or other solutions

The Tanzanian government established a Small Power Projects (**SPP**) framework in 2009, including a standardized PPA and non-technology specific feed-in tariff, as well as provisions for direct sale to retail customers through a privately owned mini-grid.

In addition, section 17 of the Energy and Water Utilities Regulatory Authority Act, 2001 and the Electricity (Procurement of Approval of Power Purchase Agreement) Rules provide for the regulation of power projects.

Subsidy or incentive programmes for the generation of renewable or clean energy in Tanzania

There is currently no subsidies or incentive programmes in Tanzania.

Carbon tax or other carbon pricing mechanisms

Currently there is no carbon tax levied in Tanzania. However, power producers are required to pay a fee to the National Environmental Management Council.

ETHIOPIA

While Behind the Meter PPAs are not prohibited under the existing law, no corporate PPA has been implemented yet. However, since Ethiopia has adopted the Climate Resilient Green Economy Strategy that promotes green and sustainable growth, it is believed that the government will consider new renewable energy initiatives such as corporate PPAs.

The projects involving IPPs in Ethiopia have been procured through Ethiopian Electric Power (**EEP**) – a PPA was signed with an IPP and a further one has been identified to be procured through an international competitive bidding process. The government has introduced new public private partnership legislation in 2018 and approved to procure 14 IPP projects. The tendering process for eight scaling solar projects (1000MWac) is in now underway. The request for proposal for the procurement of two scaling solar projects (250 MWac) and the request for quotation for six scaling solar projects (750MWac) have been released in May 2019.

More than 96% of Ethiopia's electricity supply is from hydropower, wind and geothermal. Energy demand is increasing due to rapid economic growth. The demand is expected to rise by the rate of 10 to 14% per year until 2037.

Corporate PPA structures in Ethiopia:

MARKET STRUCTURE	
Model 1 Vertically integrated monopoly	The EEP and Ethiopian Electric Utility (**EEU**) are Government-owned enterprises established to carry out electricity generation and supply activities. The transmission and distribution of electricity through integrated national grid systems are reserved for the Government. The private sector can generate and engage in off-grid electricity operations. EEP undertakes electricity generation, transmission, substation activities. It sells bulk power to EEU and exports power to neighbouring countries from its own generation plants.
BEHIND THE METER PPA	
Available in Ethiopia	Yes
Licence required	A licence must be obtained from the Ethiopian Energy Authority (**EEA**). Moreover, the PPA has to be approved by the EEA. However, the law does provide detailed rules regulating PPAs between a corporate buyer and a private generator.
SLEEVED PPA	
Available in Ethiopia	No
VIRTUAL PPA	
Available in Ethiopia	No

Specific regulations or policies in Ethiopia that are applicable to mini-grid or other solutions

There are no specific regulations that govern mini-grids in Ethiopia. The general laws regulating the electricity sector must be applied.

Subsidy or incentive programmes for the generation of renewable or clean energy in Ethiopia

There are no subsidies in place that are specific to renewable energy.

However, there are incentives that are designed to encourage investments in electricity generation and geothermal energy generation in general. Ethiopian tax legislation provides an income tax exemption for electricity generation, transmission and distribution for up to nine years, depending on the location of the project.

Furthermore, the geothermal resources laws provide customs duty and tax incentives for projects that generate electricity from geothermal resources. The exemption applies with respect to the importation of consumables, equipment, machinery and vehicles required for operation in accordance with the approved work program by the EEA.

Carbon tax or other carbon pricing mechanisms

There is currently no carbon tax levied in Ethiopia. However the government of Ethiopia is considering introducing a carbon tax policy.

ZIMBABWE

The electricity market in Zimbabwe remains largely monopolised by ZESA Holdings (Pvt) Ltd (**ZESA**), notwithstanding the 2012 National Energy Policy, which proposed to unbundle the transmission and distribution business in order to create a bulk-supply market. An amendment to the Electricity Act, which proposed to remove the restriction on the privatisation of the transmission and distribution businesses of ZESA, has also not been implemented to date.

PPAs with IPPs are not very common in Zimbabwe, although there has been a slight increase in the number of PPAs entered into. In 2017, the Zimbabwe Energy Regulatory Authority (**ZERA**) approved eight PPAs and a Special Pricing Agreement between Zimbabwe Electricity Transmission and Distribution Company (**ZETDC**) and ferrochrome producers.

Renewable energy sources contribute significantly to the national grid. However, there is potential for further growth in this area. The Zimbabwean government supported the development of renewable energy in its 2012 National Energy Policy. There has been considerable development in this area and the role of renewable energy is expected to increase in the short to medium term.

A Renewable Energy Policy was developed in 2017 and the Zimbabwe Energy Regulatory Authority (**ZERA**) developed a REFIT scheme in 2013. The REFIT is still awaiting government approval. The REFIT would authorise power utilities operating on the national grid to purchase electricity from renewable energy sources at a pre-determined price with a view to promoting investment in the sector.

Corporate PPA structures in Zimbabwe:

MARKET STRUCTURE	
Model 1 Vertically integrated monopoly	There is only one power utility company in Zimbabwe, being ZESA. ZESA is a state-owned enterprise mandated to generate, transmit and distribute electricity. ZESA provides electricity through its subsidiaries, namely the Zimbabwe Power Company (**ZPC**), which operates and maintains power generation stations and the ZETDC, which distributes and sells electricity. Zimbabwe also imports electricity from other countries and purchases electricity from IPPs within Zimbabwe.
BEHIND THE METER PPA	
Available in Zimbabwe	Yes
Licence required	No licence is required for electricity generation, transmission, distribution, or the supply of electricity less than 100 kW. No licence is required if the electricity generated is above 100 kW, however, the generating entity would need the approval of the Zimbabwe Energy Regulatory Authority.
SLEEVED PPA	
Available in Zimbabwe	Yes, but subject to challenges. Zimbabwe has one electricity distribution company and consumers do not have a choice as to what source of electricity they wish to purchase. ZPC and ZETDC's operations are separate and an agreement between the two entities and the customer would be required to cater for such an arrangement. The renewable energy project may therefore not perform as expected, affecting the retailer's obligations towards the corporate.
Licence required	N/A
Other practical difficulties or things to consider	Zimbabwe has been facing major foreign currency shortages for some time now and investments may be affected if Zimbabwe changes its currency.
VIRTUAL PPA	
Available in Zimbabwe	No This is not possible since the electricity tariffs and prices are regulated by ZERA. ZERA is guided by the need for a licencee to recover the full costs of its business activities, including a reasonable return and the need to protect consumers while keeping them informed about the cost of their consumption.

Specific regulations or policies in Zimbabwe that are applicable to mini-grid or other solutions

ZERA developed technical guidelines for the construction of mini-grids in 2017. These guidelines were to be finalised in 2018. However, as these have not been finalised, the existing regulations on generation and distribution of electricity apply to mini-grid solutions.

Subsidy or incentive programmes for the generation of renewable or clean energy in Zimbabwe

An industrial, commercial or residential customer who generates electricity from renewable energy sources and supplies that to the distribution network (the **Participant**) can obtain a reduction in their electricity bill in terms of the Electricity (Net Metering) Regulations Statutory Instrument 86/ 2018. The Participant's reduction is in the form of a credit of 0.9 kWh in each billing period for every kWh that the Participant exported to the grid. A Participant is not entitled to claim monetary compensation from the distribution licencee for energy (kWh) that has been exported to the Licensee. Furthermore, the reconciliation procedures and conditions for perpetual roll-over of excess generation or net exports are to be done on a monthly basis allowing the licencee to roll over net exports from previous monthly billing periods and use these to offset any future consumption bills of the Participant.

In addition, a licencee is obligated to provide electricity services to a Participant at non-discriminatory rates that are identical to the rates that a Participant would be charged if not a Participant, including a choice of retail tariff schedules.

The Minister of Environment and Tourism may also determine fiscal, economic or social incentives for using clean energy in promoting the protection of the environment and the conservation and sustainable utilisation of natural resources.

Carbon tax or other carbon pricing mechanisms

Zimbabwe's carbon tax legislation is restrictive. Carbon tax is payable on every litre of diesel or petrol imported in Zimbabwe. In addition, owners or operators of any establishment are prohibited from emitting a substance or energy that causes or is likely to cause air pollution without an emission licence issued by the Environmental Management Authority.

The Minister of Finance may exempt any licenced power generation project that commenced on or after 1 January 2018 from carbon tax liability for a fixed or indefinite period.

KENYA

Kenya has a more liberalised power market than most of the other countries surveyed in this report. While Kenya Electricity Generating Company (**KenGen**) is the single largest generator of electrical energy in the country, producing about 72% of electricity capacity, the IPP sector is growing at a steady pace. They are involved in generation either at a large scale or in renewable energy projects under the feed-in-tariff policy. Collectively, they account for about 28% of the country's installed capacity.

Renewable energy is one of the key energy sub-sectors that significantly contributes to the overall energy mix in Kenya. In Africa, Kenya offers one of the fastest growing and dynamic markets for renewable energy with significant investments in geothermal, solar and wind power generation projects. Kenya's feed-in-tariffs policy is aimed at promoting the generation of electricity from renewable energy sources.

In addition, President Kenyatta's ambitious plan to install an additional 5,000 MW capacity to the national grid by 2017 together with the Least-Cost Power Development Plan 2017-2037, which envisages 100% connectivity for Kenyans by 2020, provides a significant opportunity for investment in renewable energy. As of 2017, Kenya's installed capacity to the national grid was at approximately 2339.9 MW.

It is important to note, however, that recent developments have seen Kenya Power, the national electricity distributor issue a moratorium on the signing of any new PPAs indefinitely, citing financial constraints and excess capacity. Discussions on this are still ongoing. Further developments have also seen the passing of the new Energy Act, 2019, which came into effect on 28 March 2019 (the **2019 Energy Act)**. Under the 2019 Energy Act, Kenya Power & Lighting Company Limited's (**Kenya Power**) monopoly of the electricity retail and distribution sector in Kenya has been curtailed with the authorisation of the licensing authority to license other distributors and retailers of electricity. The moratorium placed on the signing of new PPAs may therefore not hold for too long.

There is also a proposal to amend the Feed–in-tariffs Policy to provide for an auction system in order to achieve reduced tariff offers by IPPs.

Corporate PPA structures in Kenya:

MARKET STRUCTURE	
Model 4 Unbundled, full competition	KenGen, a public company majority owned by the Kenyan Government, along with various IPPs, conducts power generation in Kenya. Until recently, these generators would sell the power in bulk to the Kenya Power which was solely responsible for the distribution and retail of electricity throughout Kenya. However, with the enactment of the 2019 Energy Act, the licensing authority is now authorised to licence other distributors and retailers of electricity. This effectively reduces Kenya Power's monopoly of the retail and distribution sector in Kenya. An investor in energy in Kenya can therefore sell energy to any licenced distributor or retailer, including Kenya Power and the few off-grids, which have recently been licenced by the Energy and Petroleum Regulatory Authority (**EPRA**), formerly the Energy Regulatory Commission (**ERC**).
BEHIND THE METER PPA	
Available in Kenya	Yes The 2019 Energy Act provides for the licensing of other distributors and retailers of electricity and allows for bulk supplies directly from electricity generators to the suppliers and distributors. This has the potential to encourage the establishment of private network connections between distributors, retailers and customers. It should, however, be noted that the 2019 Energy Act is a new piece of legislation and the regulations intended to give effect to some of its provisions have not been passed yet.
SLEEVED PPA	
Available in Kenya	Yes However, Kenya Power is no longer the only off-taker in the power market. This is due to the fact that the 2019 Energy Act provides for the licensing of other distributors and retailers of electricity. It is anticipated that the licenced distributors and retailers will purchase power from all power generators based on negotiated PPAs and distribute and retail electricity to consumers through the national grid or other transmission system. Therefore, an investor in the energy sector can only sell power to licenced distributors and retailers under the PPA arrangement and not directly to a corporate customer.
Licence required	The corporate customer may purchase the required load from Kenya Power, being the only operator with a nationwide retail or distribution network of electrical energy in Kenya or any other licenced distributor or retailer.

Other practical difficulties or things to consider	The corporate customer will be required to enter into a supply contract with Kenya Power or any other licenced distributor or supplier of electricity. The fees chargeable for electricity connection depends on the distance from existing power connection, power requirements, the number of meters required and such other factors as may be prescribed in the relevant regulations, which are yet to be made.
VIRTUAL PPA	
Available in Kenya	No

Specific regulations or policies in Kenya that are applicable to mini-grid or other solutions

No. There are no specific regulations for mini-grids and only a few mini-grids have been licenced by the EPRA under existing energy regulations.

Subsidy or incentive programmes for the generation of renewable or clean energy in Kenya

Other than the feed-in tariff, there are no other subsidies in respect of clean or renewable energy. There are, however, various tax incentives, including:

a) exemption from stamp duty of instruments executed in respect of loans from foreign sources received by investors in the infrastructure development sector, including the energy sector;

b) exemption from income tax of payments made to non-residents for services rendered under a **PPA**. This exemption is aimed at attracting more investments in the energy sector and lowering the cost of energy;

c) exemption from income tax of interest to be paid on loans from foreign sources for investing in the energy sector;

d) certain exemptions from the payment of VAT on taxable supplies, imported or purchased, for the direct and exclusive use in the construction of a power generating plant; and

e) a VAT exemption on specialised solar equipment and accessories, including solar water heaters and deep-cycle, sealed batteries This exemption also applies to raw materials supplied to solar equipment manufacturers for the manufacturing of solar equipment and deep-cycle batteries.

Carbon tax or other carbon pricing mechanisms

No. There is currently no carbon tax or carbon pricing mechanisms in Kenya. However, corporate entities have to comply with environmental legislation on air emissions.

NAMIBIA

During 2015 an interim Namibian REFIT Programme was adopted by the Ministry of Mines and Energy and implemented by the Electricity Control Board and the Namibia Power Corporation (NamPower).

In 2016, the President of the Republic of Namibia released the Harambee Prosperity Plan that spells out Namibia's short-term development priorities, including specific short-term targets for the energy industry. In addition, Namibia ratified its contributions to the Paris Climate Agreement, as codified in the Intended Nationally Determined Contributions (**INDCs**) to the United Nations Framework Convention on Climate Change. Namibia's INDCs commit the country to increase the share of renewables in electricity production to 70%.[7]

It was reported that eleven of the fourteen projects that qualified for participation in Namibia's interim REFIT Programme, were commissioned in October 2018 and currently contribute to Namibia's electricity supplies. These fourteen power plants, together with four further (Non-REFIT) solar PV power plant projects and one off-grid project produce in aggregate approximately 116.5 MW of electricity, which makes up approximately 20% of the total installed electricity generation capacity of 557 MW[8] and 18% of the maximum demand of 652 MW.[9]

7 Ministry of Mines and Energy, Republic of Namibia – National Energy Policy – July 2017, paragraph 1.2.

8 Total installed capacity amounted to approximately 516.5 MW in 2016 – ECB 2017 Annual Report pg. 53.

9 Maximum recorded electricity demand in Namibia was 667 MW during the year 2016 – ECB 2017 Annual Report.

Corporate PPA structures in Namibia:

MARKET STRUCTURE	
Model 1 Vertically integrated monopoly (with qualifications)	**NamPower** is the government-owned electricity utility that owns most of the generation capacity, all of the transmission network and some of the distribution network. Certain municipalities own certain parts of the distribution network. NamPower supplies electricity from its own generation plants or purchases electricity from IPPs. This electricity is in turn sold by NamPower to customers, municipalities and Regional Electricity Distributors (**REDs**). The government has also initiated the Electricity Distribution Industry reform process and three REDs were established. NamPower currently fulfils the role of the single buyer of electricity and is also the country's system and market operator, with a few exceptions which include some embedded generators connected to distribution licencees, self or captive generation and off-grid mini-grids. There are only a few instances where regional electricity distributors and local authorities buy electricity directly from IPPs. The current single-buyer model has been reviewed and during April 2019, the Minister of Mines and Energy approved a new market platform for the electricity supply industry for Namibia, "The Modified Single Buyer (MSB) Market Model". During June 2019, the "Namibia Detailed Electricity Market Framework", was made available by the ECB which provides for the MSB. The modified single-buyer model ("**MSB**") will allow certain customers to buy a portion of their energy requirements directly from IPPs. A phased approach will be followed to increase the number of customers to be allowed to participate in the MSB as well as the percentage of purchases allowed to buy. It is intended that as from September 2019, NamPower transmission connected customers ("**Contestable Customers**") will be allowed to purchase up to 30% of their consumption from "eligible sellers" (IPPs who comply with ECB licensing requirements and the MSB market rules which are intended to be finalised during July 2019 which would become part of the grid code) (Phase 1a). As from July 2021 (Phase 1b), distribution customers for 1MVA and above, and from July 2026 (Phase 2) further customers, will be added as Contestable Customers. Phase 1a and 1b, will allow bilateral wheeling, exports and trading of electricity. Phase 2 will allow imports (other than via NamPower) only once Namibia has reached ~80% self-sufficiency of supply.
BEHIND THE METER PPA	
Available in Namibia	Yes

Licence required	**For generation ≤ 500 kVA:** no licence is required, subject to the generation of electricity i) being supplied exclusively for own consumption; and ii) by the person in control of the plant and on premises owned or occupied by that person. **For distribution ≤ 500 kVA:** no licence is required, subject to the distribution network being used exclusively for private consumption on premises owned or occupied by that person.
Metering requirements	All renewable energy technologies are eligible for net metering, and all distribution consumers are allowed to install net metered facilities subject to the Electricity Act, 2007. The on-site generation capacity of each net metered facility must not exceed the lower of the main electricity supply circuit breaker current rating converted to the kVA of the facility which may not exceed 500 kVA. A distribution licencee must connect net metering consumers in its distribution licence area on a first-come-first-serve basis until the limits, which are imposed by the stability requirements of the distribution network, are reached. A distribution licencee must provide non-discriminatory rates to its customer-generators that are identical, with respect to i) rate structure; ii) retail rate components; and iii) any monthly charges, to the rates that a customer-generator would be charged if not a customer-generator. Physical monetary compensation by distribution licencees to customer-generators for exports and capacity, if applicable, is not allowed. A customer-generator is liable to pay the i) interconnection costs; and ii) shallow connection charges associated with the installation of their generating facilities. Since 14 November 2018, but subject to the approval of the Electricity Control Board, one is allowed to i) implement third-party ownership of net metered installations; or ii) aggregate multiple electricity accounts to one or more net metered installations.
SLEEVED PPA	
Available in Namibia	No (this will change if the Namibian Electricity Policy is implemented)
VIRTUAL PPA	
Available in Namibia	No

Specific regulations or policies in Namibia that are applicable to mini-grid or other solutions

There are no specific regulations for mini-grids and the existing regulations applicable to the generation, distribution and trading of electricity should be applied.

Subsidy or incentive programmes for the generation of renewable or clean energy in Namibia

Indirect subsidies exist through the Interim REFIT Programme, which provides an incentive imposed at the utility level. In addition, Namibian income tax legislation provides certain capital allowances, although this is not specific to renewable energy. Other general allowances include building and leasehold improvement allowances.

Importers may apply for a "single tariff ruling" allowing the importer to process the import of equipment free from customs duties, i.e. solar panels, which are duty-free.

In addition, the Ministry of Mines and Energy administers the Solar Revolving Fund (**SRF**). The SRF is a credit facility established by the Ministry of Mines and Energy to stimulate demand for the utilization of renewable energy technologies in rural areas. Individuals are able to obtain loans from the SFR to purchase renewable energy products. These loans are however restricted to a maximum amount of i) N$ 50,000 for Solar Water Pumps; ii) N$ 6,000 - N$ 35,000 for Solar Home Systems; and iii) N$ 30,000 for Solar Water Heaters.

The SRF is an element of Namibia's Off-Grid Energisation Master Plan, with the objective are to provide access to appropriate energy technologies to rural areas.

Carbon tax or other carbon pricing mechanisms

Currently there is no carbon tax or carbon pricing mechanisms in Namibia. However, corporate entities have to comply with environmental duties payable on certain products.

Expected changes to regulations

The most recent National Energy Policy for 2017 emphasises the review of the present electricity market model.

As stated above, the current single-buyer model is being reviewed and it has been decided to implement a modified model. This new model would allow IPPs to sell electricity directly to off-takers other than single buyers.

In addition, the Electricity Bill of 2016 introduces various improvements to the legal framework for the electricity industry and aims to lay down the groundwork for an updated market model. This model may include the possibility of wheeling power generated by third parties across the national grid.

In terms of the Namibia Energy Regulatory Authority Bill of 2016, it is the legislator's intention to establish a single sectoral regulator, the Namibian Energy Regulatory Authority, to regulate the energy sector.

ZAMBIA

The energy generation in Zambia is predominantly hydropower, which accounts for approximately 83% of the country's total installed capacity, while solar accounts for less than 0.1%.

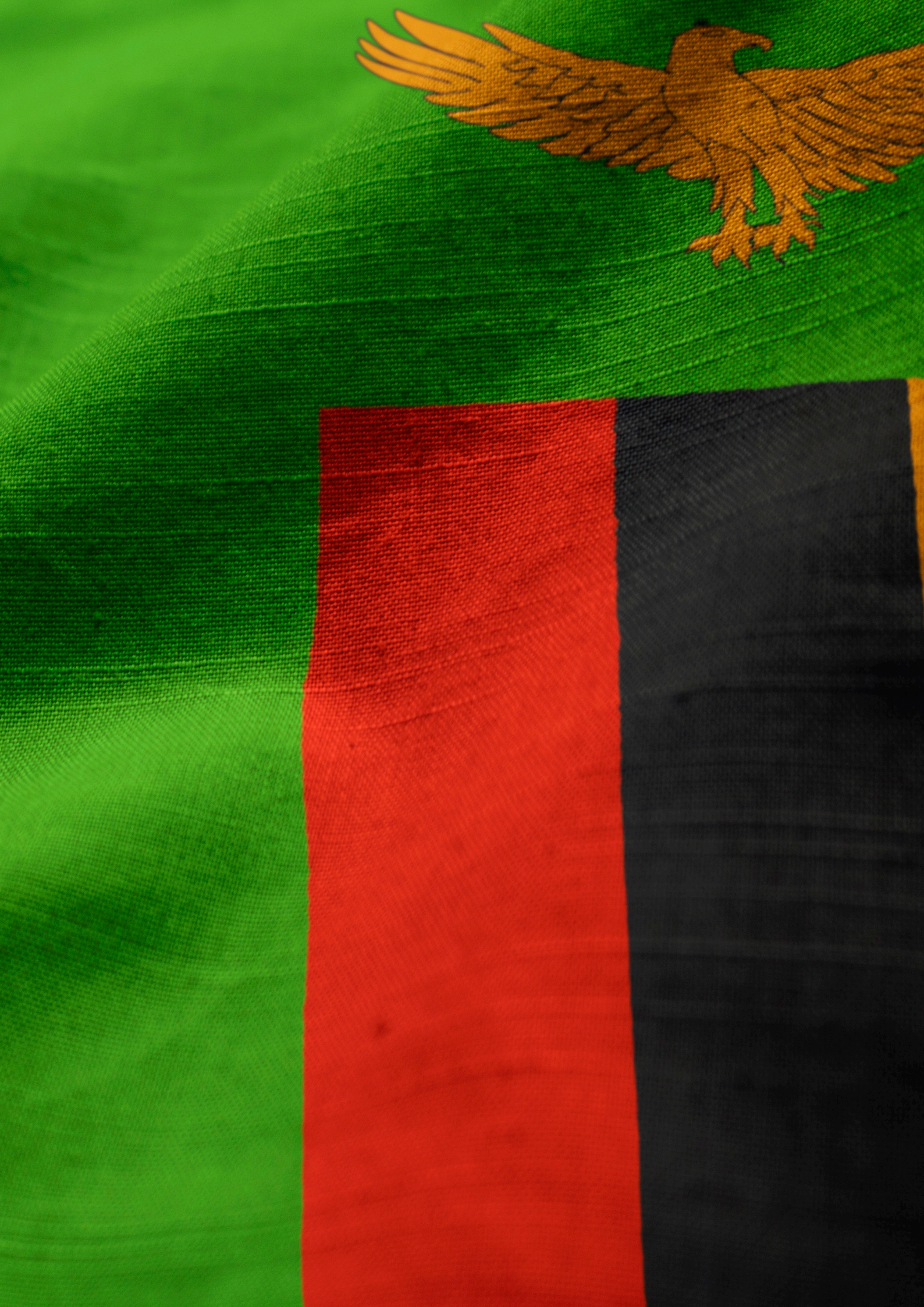
The role of renewable energy is expected to increase and over the past three years, Zambia has completed two rounds of procurement of solar energy through the World Bank Scaling Solar Programme and one round of procurement of mixed renewable energy through the Global Energy Transfer Feed-in-Tariff (**GET-FiT**) programme. The GET-Fit Programme is being used to implement the REFIT Strategy, formulated by the government to promote increased private investment in renewables.

Preliminary feasibility studies are currently underway to assess the viability of wind-generated energy.

Corporate PPA structures in Zambia:

MARKET STRUCTURE	
Model 1 Vertically integrated monopoly (with qualifications)	ZESCO Limited (**ZESCO**) is the wholly owned government electricity utility that owns most of the generation capacity, distribution and transmission assets. ZESCO supplies electricity to all grid-connected consumers from its own generation plants or purchases electricity from IPPs. Following the liberalization of the energy sector in 1995 through the Energy Regulation Act, IPPs make up approximately 20% of the total generation capacity.[10] In relation to distribution and transmission, the Copperbelt Energy Corporation Plc (**CEC**) is a net transmitter of electricity purchased from ZESCO at high voltage and distributed electricity to the mining industry based on the Copperbelt region of Zambia. While the sector is dominated by ZESCO, an IPP is permitted to generate and supply power to any third party.
BEHIND THE METER PPA	
Available in Zambia	Yes
Licence required	No generation licence is required for generation up to 100 kW. In addition, the tariff will have to be approved by the Regulator.
Other practical difficulties or things to consider	For the exportation of excess electricity to the grid, a connection agreement with the distribution network service provider (such as ZESCO or CEC) will be required. In addition, the generating plan should comply with all the technical and quality requirements such as voltage variations, frequency variations, reactive power and voltage control under the Distribution Code.

10 http://www.erb.org.zm/downloads/reports/esr2017.pdf



SLEEVED PPA	
Available in Zambia	Yes
Licence required	No generation licence is required for generation up to 100 kW.
Other practical difficulties or things to consider	A connection agreement with the distribution network service provider (such as ZESCO or CEC) will be required. In addition, the generating plan should comply with all the technical and quality requirements such as voltage variations, frequency variations, reactive power and voltage control under the Distribution Code. In addition, the tariff will have to be approved by the Regulator. The Zambian Grid Code requires that access to the grid should be provided on agreed standard terms to all the parties wishing to connect or use the grid. The retailer may, therefore, have challenges accessing the grid as ZESCO may impose wheeling fees which may affect the viability of the project.
VIRTUAL PPA	
Available in Zambia	No

Specific regulations or policies in Zambia that are applicable to mini-grid or other solutions

There are no specific regulations for mini-grids and the existing regulations applicable to the generation, distribution and transmission of electricity should be applied.

Subsidy or incentive programmes for the generation of renewable or clean energy in Zambia

There are currently no subsidies on renewable energy projects in Zambia.

Carbon tax or other carbon pricing mechanisms

Apart from carbon emissions tax on motor vehicles, there are currently no regulations regarding carbon pricing mechanism which would impose liability of corporates in the energy sector.

Expected changes to regulations

Proposed legislation, known as the Electricity (Open Access) Regulations, is currently under consideration. The proposed regulations will essentially guarantee the availability of spare transmission capacity to a qualifying participant on non-discriminatory terms and conditions.

The energy Regulator is currently conducting an Electricity Cost of Service Study and Determination of Cost Reflective Tariffs (the **Study**) in order to ensure that the Government has a sound basis for adjusting electricity tariffs in the future. The recommendations and the outcomes of the Study may therefore have an impact on operators of corporate PPAs and other participants of the electricity sector in Zambia as they will be used by the ERB as a guide or standard to be used when reviewing proposed electricity tariffs.

5 PRACTICAL CONSIDERATIONS

Providing Scale: Aggregated corporate PPAs

Corporates with limited space for an onsite solar rooftop installation will need to consider a sleeved or wheeled PPA. However, if the corporate has a relatively small load, it will find it difficult to receive favourable pricing from projects and will not have much bargaining power in the negotiations of a corporate PPA.

These corporates may therefore begin looking at setting up consortiums with other corporate buyers to provide the scaling required to secure more competitive pricing. This would:

- create more flexibility for a corporate to contract a smaller portion of their consumption and create more flexibility in matching the project's generation profile with their load profiles; and
- provide scaling opportunities for developers to build portfolios of aggregated offtake arrangements and grow the sector.

However, corporates need to be mindful of:

a) default risk of one off-taker triggering a default of the aggregated PPA. Corporates may be able to negotiate the PPA on a several basis (i.e. where their respective liability is on an individual basis and not shared) where the portfolio of corporates has an appealing credit rating;

b) project financing requirements, including security requirements such as the need to have a direct agreement with each off-taker. This could be managed by nominating an agent on behalf of the group of buyers to enter into a single PPA and direct agreement; and

c) cartel conduct prohibitions under competition laws when forming alliances with other corporates.

Bankability Requirements

Where a corporate PPA will underwrite a new build project, which will be financed off a third party's balance sheet, such financiers, are likely to require the following:

a) **offtake (i.e. PPA) linked to debt requirements:** typical commercial lenders will require revenues to be locked in for a certain period of their loan to sufficiently de-risk the project. Ten years is usually considered a minimum PPA term. This however may be viewed by some corporates as a long time for a commitment to be made and may have pricing implications in negotiations;

b) **credit support:** lenders will be taking a long term view on the corporate's credit strength and will require additional payment support (usually in the form of a parent company guarantee or letter of credit) where the credit strength is not sufficient. Such payment guarantees may be in breach of the parent company's own debt covenants and may require consent from its own lenders;

c) **lender direct agreements:** the corporate will need to enter into a separate tripartite agreement with the project and its lenders to provide the lenders with suitable step in rights in the event that the project defaults under the PPA. If an aggregated model is used by multiple corporates, it is likely that lenders will require a direct agreement with each corporate or a nominated agent of the corporates (as discussed above); and

d) **single asset risk:** where a project is being contracted for a specific asset (for example, a behind-the-meter structure used at a mining site), lenders will also need to take a view on the projected lifecycle of the specific asset and may require additional credit support.

Building Internal and External Support

PwC reported[11] that 71% of respondents cited "building internal support" as the biggest hurdle in the renewable energy procurement process. Energy procurement officers will need to illustrate the financial benefits that a corporate PPA offers the corporate's balance sheet in order to secure support from the finance team.

A pragmatic and phased approach to renewable energy procurement internally will involve:

- defining the internal mandate, objectives and parameters (what are the key outcomes, how will this be achieved and timing for achievement, what we can and can not do);
- running the procurement processes to determine market pricing and supply terms and selecting the most suitable approach and structure;
- making a final investment decision (clearly presenting a refined solution for board approval); and
- implementing the project (final negotiations of corporate PPA and ancillary agreements, authorisation applications and the commencement of operations).

Managing Electricity Price Movements with Load Flexibility

A corporate needs to take a view on the electricity price for the period of the contract and, where possible, ensure that its contract price does not become higher than the prevailing electricity cost in its area. Ultimately, the benefits that a corporate PPA offers need to outweigh the downside risk of a turn in prices.

The nature of a corporate's operations and the flexibility of its load will influence its ability to take a long term view on its own electricity consumption requirements. This will, in turn, determine the optimal offtake obligations and tenor of a PPA. Businesses that place a value on having operational flexibility will find it more difficult to predict how long they require a fixed energy procurement arrangement, whereas businesses that own fixed assets for which electricity consumption is more certain are in a better position to evaluate their requirements. Any mismatch between a corporate's load and the generation profile of a project may be mitigated in time through the inclusion of battery storage to manage load discrepancies.

Administrative and Transaction Costs

Electricity procurement can be a complicated task. Corporates will either need to have in-house support (technical, legal and commercial) or will need to outsource these services.

Given the early stage of this market, all deals are being carried out on a bespoke and granular basis. This has been identified as a key issue for all parties involved and a major hurdle to overcome. The development of standardised documentation and processes will ultimately drive costs down and open up this market.

These costs can however be offset by the advantages of being an early mover in the market.

11 PwC "Corporate renewable energy procurement survey insights".

Regulatory Issues

As indicated above, there are various regulatory requirements that need to be considered when structuring a PPA process. The applicable regulatory requirements will vary according to the particular circumstances. However, the following are common regulatory issues that need to be considered:

- generation licence requirements and the ease of obtaining these;
- network service provider authorisations and the associated wheeling agreement; and
- changes in law. There are several examples of power markets in Africa that may be materially restructured in the next few years. PPAs will need to deal with the implications of these changes on the contracting parties.

Tax and Accounting Treatment

The accounting treatment of a PPA will depend on the accounting standards by which the corporate is governed.

The introduction of a revised reporting standard (IFRS 16) creates a risk that a Corporate PPA might be treated as a lease and be brought onto the corporate's balance sheet. The key consideration of whether a Corporate PPA will be treated as a lease is whether the corporate controls the use of the relevant asset (i.e. obtains substantial economic benefit and directs its use).

Corporates considering entering into PPAs should consult their accounting and tax teams at the outset to understand what it can and cannot do.

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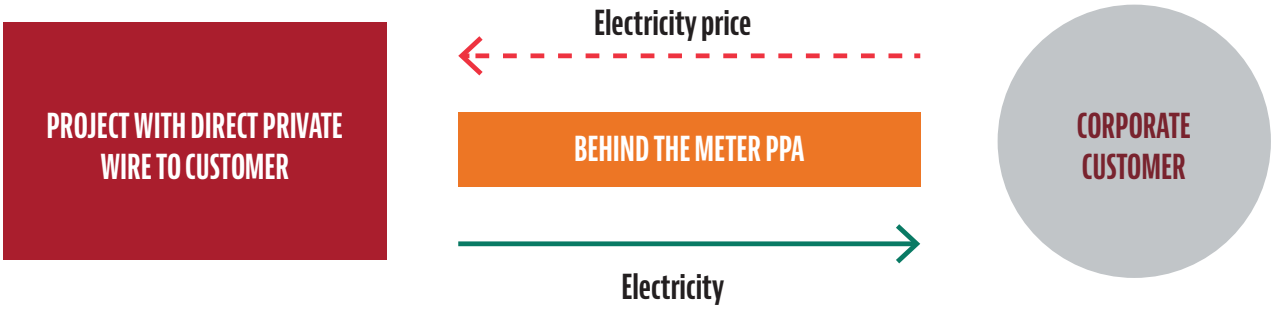
ANNEXURE A:

SUMMARY OF CORPORATE PPA STRUCTURES

STRUCTURE 1: BEHIND THE METER GENERATION	STRUCTURE 2: SLEEVED GENERATION	STRUCTURE 3: VIRTUAL GENERATION
Renewable energy projects installed onsite at a corporate's premises or near-site. The corporate agrees to purchase all or a portion of the electricity generated by the project. Any demand unmet by the onsite project is serviced via a separate electricity supply contract.	The corporate buys electricity from a specific renewable energy project via an electricity supplier under a long-term contract for the specified load. Electricity supplier either: ▪ simply wheels the electricity from the project to the corporate and charges a wheeling fee; or ▪ hedges the corporate's load with the renewable energy project for the same contract term as the corporate's retail contract (back to back). No electricity is purchased by the Corporate directly from the renewable energy project.	The corporate buys all electricity from the grid via a short-term contract with a retailer against a fixed price. The electricity generated from the renewable energy project is exported directly to the grid. No electricity is purchased directly from the renewable energy project. The corporate and the renewable energy project enter into a direct PPA in terms of which they agree a strike price of electricity. If the wholesale component of the price paid by the corporate under its short term supply contract is less than the strike price, the corporate pays the project the difference. If the wholesale component of the price paid by the corporate is above the strike price, the project pays the corporate the difference. This assumes that the project receives the wholesale price for exporting electricity to the grid.

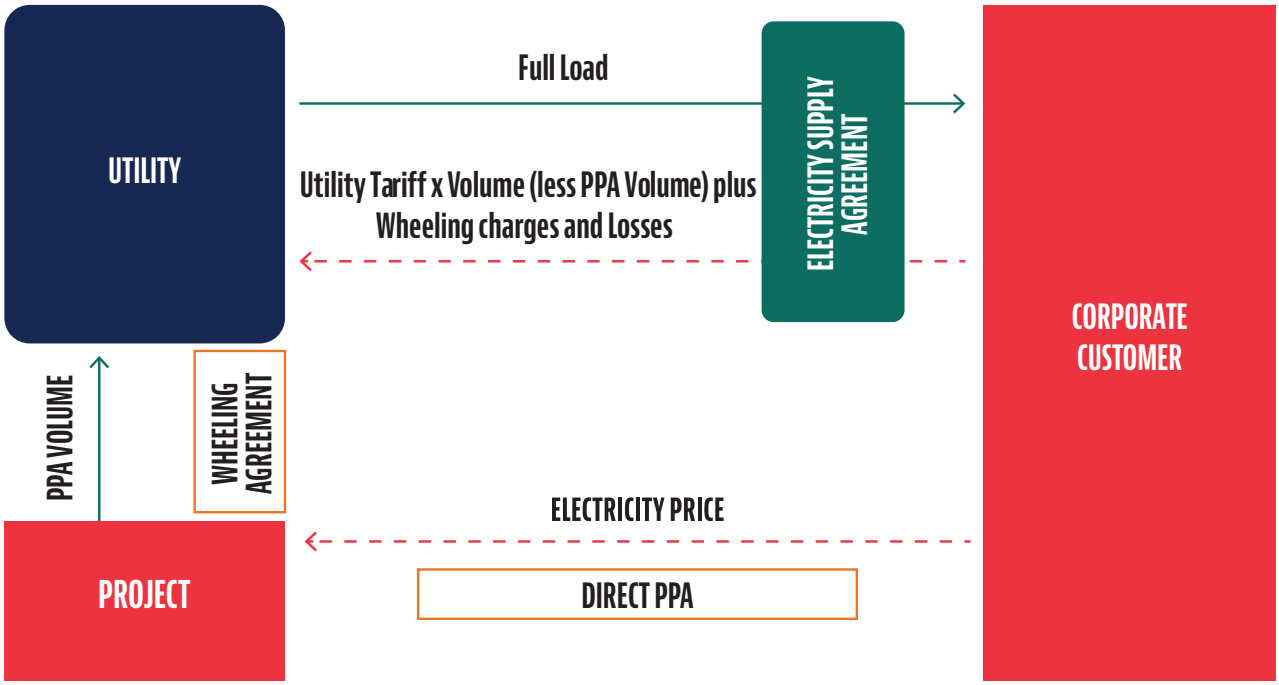
STRUCTURE 1: BEHIND THE METER GENERATION



The corporate customer can invest directly (or not) in the generation asset or outsource the construction/ operation of the asset to a third party.

ADVANTAGES	CHALLENGES
Avoidance of the complexity of having an electricity supplier (utility or distributor) involved.	Corporates generally do not have sufficient onsite space to support a project at locations with large load requirements.
Avoidance of expensive network charges.	Feed-in-tariffs for excess energy are often significantly lower than the wholesale costs.
Corporates receive long term certainty on the costs of such a project.	Many corporates are tenants in their buildings, meaning they may require landlord approval, which creates an extra layer of complication.
Marketability and traceability (i.e. being able to easily identify the generation plant and say "this is powering our factory") are easier under this structure.	A number of landlords have shown a reluctance to agree to these deals as they are trying to monetise their roof space themselves.

STRUCTURE 2: SLEEVED GENERATION



Off-site generation can avoid site constraints (e.g. land size, available resource etc) and allow larger projects. Although network charges may be incurred for being connected to and using the grid, it also allows for revenue to not depend on the one corporate customer.

This structure could involve two potential sub-structures:

a) the distributor/electricity supplier wheels the electricity across its network on behalf of the renewable energy project and charges a wheeling fee. This is becoming more common in vertically integrated markets as it allows the incumbent electricity companies to recover some of their lost revenue through the wheeling charges; and

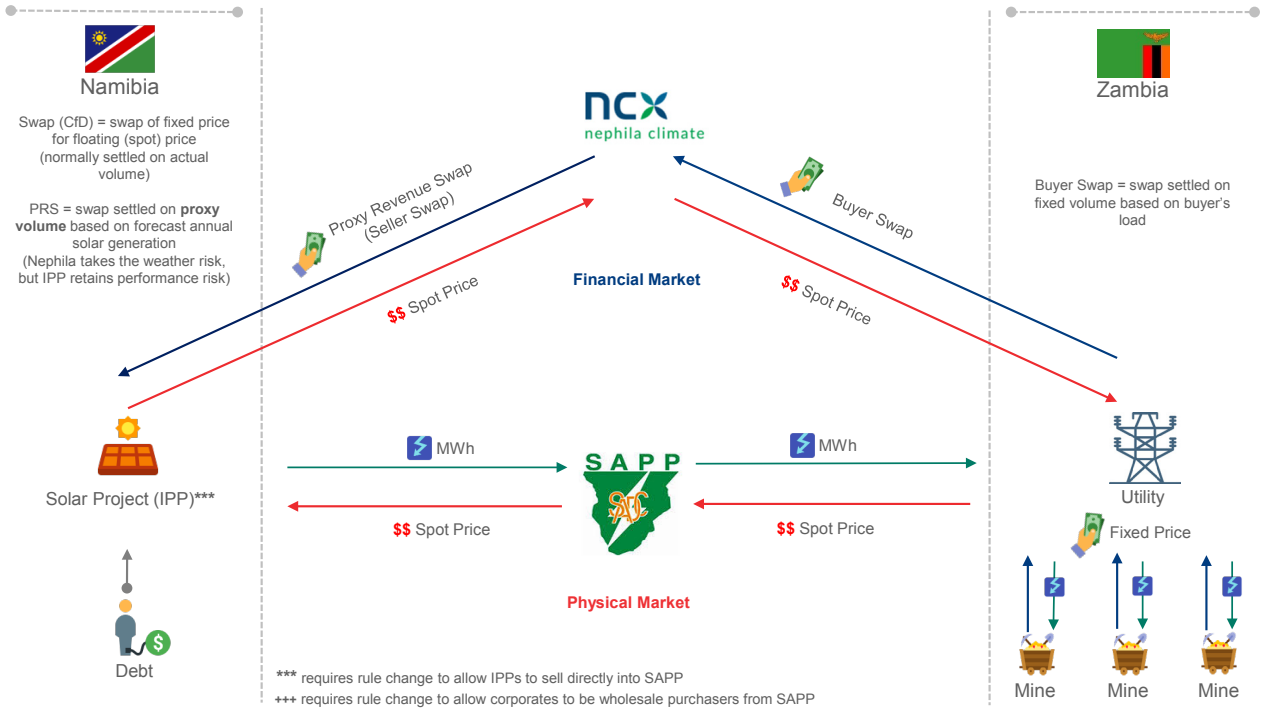
b) the customer and renewable energy project negotiate a PPA directly and present the PPA to the distributor/ electricity supplier. The distributor/ electricity supplier then i) as the buyer, enters into the PPA with the renewable energy project (seller) and ii) as the seller, enters into the same PPA with the customer (buyer) but with a mark-up on the price to cover its costs.

ADVANTAGES	CHALLENGES
The corporate's electricity costs should decrease to reflect the long tenor of the retail contract (and potential savings using cheaper renewable energy).	The distributor/electricity supplier will charge the corporate a fee for entering into the corporate PPA arrangement.
Does not require land at or near the customer's site to build the project.	Corporates may have to provide a payment guarantee to the project for the retailer's payment obligations under the bundled PPA.
Option for multiple corporates to pool together in respect of offtake of energy for the project.	

STRUCTURE 3: VIRTUAL PPA

This is a financial contract in the form of a CfD (contract for difference), where the project owner and the corporate agree to swap a fixed price or strike price (paid by the corporate to the project) with the prevailing grid tariff (which is received by the project from an intermediary customer and paid onto the corporate) in respect of a certain volume of output that is contracted under the PPA (PPA Output). The corporate continues to procure all of its electricity through its existing electricity supply agreement.

The below example is based on a potential SAPP based virtual PPA, where an intermediary financial institution facilitates the spot price swap between an IPP and a corporate, in this case illustrated through a product offered by Nephilia climate change and currently being tested for application in SAPP.



SUMMARY OF MARKET STRUCTURES

Model 1 Vertically Integrated Monopoly	Generation, transmission, distribution, wholesale and retail energy supply and services are vertically integrated, owned and controlled by one entity (which is typically government-owned or controlled). There is no or limited competition at any level within this model and consequently, customers have no choice of energy supplier.
Model 2 Unbundled Monopoly	Competition exists only amongst generators, where generation assets can be privately or publicly owned. A central wholesale purchasing agent acquires electricity on behalf of the electricity suppliers. The central wholesale purchasing agent may be directed or controlled by the Government, which means the Government may be able to direct the agent to limit power purchases from certain generation sources. There is no competition within the rest of the energy market, with a single monopoly transmission business and monopoly franchises for distribution and retailing of electricity. Customers must purchase energy from the retailer operating in their region. The number of distribution and retail 'franchises' depends on each market. Retail businesses may be jointly owned and operated with distribution businesses within a geographical area.
Model 3 Unbundled, Limited Competition	The same as Model 2, however, there is a competitive wholesale market where generators can contract directly with many buyers, rather than a central wholesale purchasing agent. The trading of electricity may be conducted through a central 'pool' system. Customers must purchase energy from the retailer operating in their region.
Model 4 Unbundled, Full Competition	The same as Model 2, however, there is a competitive wholesale market where generators can contract directly with many buyers, rather than a central wholesale purchasing agent. The trading of electricity may be conducted through a central 'pool' system. Customers may choose to purchase energy from several retailers operating in their region.

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