



Exploring the Role of Guarantee Products in Supporting Local Currency Financing of Sustainable Off-Grid Energy Projects in Africa

The African Development Bank

November 2020



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Foreword



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Growth Complex

African Development Bank

The African Development Bank's New Deal on Energy for Africa (NDEA) seeks to increase public and private sector investment into the African energy sector. Between 2016 and 2019, the Bank approved \$6.5 billion in financing for energy projects across Africa, directly mobilizing \$850 million from the Bank's own funds, and further leveraging \$9.3 billion from its private and public sector partners. Nevertheless, the current level of investment into energy infrastructure projects is insufficient to deliver on the NDEA target of universal access to energy by 2025. In addition to foreign direct investment, accessing capital from local capital and financial markets is vital to effectively close the financing gap.

Mobilizing local capital into Africa's energy sector is especially important for developers deploying off-grid solutions. Unlike larger on-grid generation projects that are often regulated by power purchase agreements denominated in hard currency, off-grid solutions normally generate revenue in local currency. While hard currency provides much-needed scale-up capital, it also exposes developers to a considerable currency mismatch and forex risks.

The African Development Bank is leading on a number of initiatives and projects aimed at increasing the pool of local currency financing for off-grid energy projects across the continent. The off-grid window of the Facility for Energy Inclusion (FEI), a US\$500 million debt platform anchored by the Bank for small- to medium-scale clean energy projects which became operational in early 2019, has already extended local currency financing to developers deploying off-grid solar solutions. The On-Grid Window of FEI has closed in 2019, availing debt, including in local currency, to mini-grid, captive, and small- to medium-scale IPP projects across the continent.

Local financial and capital markets participation in Africa's off-grid sector is still extremely limited. The challenges limiting their participation can be addressed, to a certain extent, with financial instruments. For example, the Bank is deploying a Partial Credit Guarantees (PCGs) to mobilize a West African Francs (CFA) denominated receivables-backed facility from two Ivorian banks to support the deployment of more than 100,000 solar home systems in Cote d'Ivoire. Seeking to replicate this model across Sub-Saharan Africa, the Bank and the European Union are collaborating under the Distributed Energy Service Companies (DESCOs) financing programme to provide PCGs to de-risk facilities extended to off-grid solar companies. The programme is expected to crowd in the local currency equivalent of €185 million across 5-6 transactions.

Information asymmetry also hinders local currency investment at scale in the off-grid sector. To address this, the Bank, and the Sustainable Energy Fund for Africa (SEFA) commissioned this report, produced following a thorough analysis of market trends, and consultations with over 150 stakeholders to provide an in-depth overview of off-grid opportunities, as well as obstacles hindering local currency financing.

We believe the information and insights from this report will be beneficial for all market players, and hope that the findings contained herein spark market action that will enhance the Bank's efforts, as well as those of other stakeholders who share our ambitions for the Continent's off-grid sector.

Sustainable Energy Fund for Africa

The Sustainable Energy Fund for Africa (SEFA) is a multi-donor fund hosted and managed by the African Development Bank (AfDB or the Bank), housed in the Renewable Energy and Energy Efficiency Department (PERN) under the Power, Energy, Climate, and Green Growth (PEVP) complex. SEFA was established in 2011 in partnership with the Government of Denmark and has since received contributions from the Governments of Italy, Norway, Spain, Sweden, the United Kingdom and the United States.

SEFA's overarching objective is to contribute to universal access to affordable, reliable, sustainable, and modern energy services for all in Africa, in line with the United Nations' Sustainable Development Goal 7 (SDG 7). SEFA achieves this objective by availing a range of concessional and catalytic financing instruments to de-risk investments in renewable energy and energy efficiency solutions. SEFA's resources serve to remove market barriers, demonstrate the viability of pioneering approaches, enhance the bankability of investments, and crowd-in commercial finance.

SEFA avails technical assistance and concessional finance instruments to remove market barriers, build a more robust pipeline of projects and improve the risk-return profile of individual investments by supporting interventions across three strategic priorities:

- **Green Baseload (GBL):** increasing the penetration of renewable energy in power systems, with a strong focus on power system stability, and delivering alternatives to fossil-fuel baseload generation options.
- **Green Mini-Grids (GMG):** accelerating electricity access to underserved populations through clean energy mini-grid solutions.
- **Energy Efficiency (EE):** improving the efficiency of energy services delivered through a variety of technologies and business models, also including clean cooking and pico-solar technologies.

Acknowledgements

In 2018, the African Development Bank (AfDB) and the Sustainable Energy Fund for Africa (SEFA) commissioned a consortium led by Cambridge Economic Policy Associates LLP (CEPA) to assess the availability of local currency finance for sustainable energy projects in Africa and the obstacles developers face in tapping into local financial and capital markets. CEPA was further tasked with assessing the extent to which credit enhancement in the form of guarantees and similar monoline insurance instruments could contribute to crowding in local banks and other financial intermediaries into the African sustainable energy sector. Following a year of in-depth market analysis and stakeholder consultations, we are therefore pleased to publish and present the results and findings on the off-grid component of this study.

Exploring the Role of Guarantee Products in Supporting Local Currency Financing of Sustainable Off-Grid Energy Projects in Africa (the “Report”) was prepared under the overall leadership of Wale Shonibare, Director of the Energy Financial Solutions, Policy & Regulations Department of the Power, Energy, Climate and Green Growth Complex, with strategic advice and guidance from the senior management team. Energy Policy, Regulation and Statistics Division Manager Callixte Kambanda and Energy Partnerships Manager Joao Cunha Duarte provided overall supervision of the preparation of the Report.

Chief Energy Sector Regulations Specialist, Rhoda Mshana, and Local Currency Financing Consultant, Nicolas Miyares, led the core team working on the Report. This team comprised CEPA and its fellow consortium partners (MDY legal and LixCap Advisory), who conducted the relevant research, consulted and interviewed sector stakeholders (including in-country), and distilled and compiled their findings into the Report. A joint AfDB-SEFA team peer reviewed the Report, providing CEPA with additional technical input and strategic direction. This team included Kwasi Asare-Bekoe, Fatma Ben Abda, Abel Brook, Jalel Chabchoub, Victor Chando, Brendan Coleman, Umang Goswami, Djamali Ibrahime, Albin Kakou, Charles Oyewole Lawuyi, Solomon Sarpong, Jason Seung-Soo Jin, Carlos Mollinedo, Peter Onyango and Yves Withofs.

The AfDB and SEFA gratefully acknowledge the input provided by all stakeholders that were consulted and interviewed by CEPA throughout the preparation phase of the Report. The insights that were shared will help inform the nature and scope of the interventions to be undertaken by the AfDB and SEFA in the sustainable energy space in the years to come.

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Abbreviations

ABMI

Asian Bond Markets Initiative

ADB

Asian Development Bank

AECF

African Enterprise
Challenge Fund

AEGF

Africa Energy
Guarantee Facility

AFD

French Development Agency

AfDB

African Development Bank

AGF

Africa Guarantee Fund

AGI

Association of
Ghana Industries

AI

Alternative Investments

ALCB

African Local Currency
Bond Fund

AMDA

Africa Mini-grid
Developers Association

APRI

Aboitiz Power's Geothermal
Energy Vehicle

ARM

Asset and Resource
Management Company
Infrastructure Fund

ASEAN

Association of Southeast
Asian Nations

AssetCo

DESCO Asset Company

ATI

African Trade
Insurance Agency

AUM

Assets Under Management

BCBS

Tunisia Bank for
International Settlements

BCT

Central Bank of Tunisia

BoG

Bank of Ghana

BoI

Bank of Industry

C&I

Commercial and Industrial

CBA

Commercial Bank
of Africa

CBG

Consolidated Bank Ghana

CBK

Central Bank of Kenya

CBN

Central Bank of Nigeria

CDC

Caisse des Dépôts
et Consignations

CDO

Collateralized Debt Obligation

CGIF

Credit Guarantee and
Investment Facility

CHP

Combined Heat
and Power

CP

Commercial Paper

DCA

Development Credit Authority

DESCO

Distributed Energy
Service Companies

DFC

US International Development
Finance Corporation

DFI

Development Finance
Institution

DFID

UK Department for
International Development

DISCO

Nigerian Distribution
Companies

EBRD

European Bank for
Reconstruction and
Development

ECG

Electricity Company of Ghana

EEGM

Energy Efficiency Guarantee
Mechanism

EFSD

European Fund for
Sustainable Development

EIB

European Investment Bank

EPC

Engineering, Procurement
and Construction

ERC

Energy Regulatory
Commission

ESCO

Energy Service Company

ESMAP

Energy Sector Management
Assistance Programme

ETI

Economically Targeted
Investments

EU

European Union

FGEE

Fonds de Garantie de
l'Efficacité Energétique

FGN

Federal Government
of Nigeria

FGPME

Fonds de Garantie des Petites
et Moyennes Entreprise

FMO

Netherlands Development
Finance Company

FX

Foreign Exchange

GAT

Ghana Amalgamated
Trust Limited

GCF

Green Climate Fund

GCSA

Government Commitment and
Support Agreements

GEDAP

Ghana Energy Development
and Access Project

GENCO

Nigerian Generation
Companies

GGF

Green Guarantee Facility

GIZ

German Corporation for
International Cooperation

GVE

Green Village Energy

GW

Gigawatt

IDA

International Development
Association

IDB

Inter-American
Development Bank

IEA

International Energy Agency

IFC

International Finance
Corporation

IFRS

International Financial
Reporting Standards

IMF

International Monetary Fund

IPP

Independent Power Producer

IRENA

International Renewable
Energy Agency

IRR

Internal Rate of Return

KFW

German State-Owned
Development Bank

KOSAP

Kenya Off-Grid Solar
Access Projects

KPLC

Kenya Power and
Lighting Company

KUSSCO

Kenya Union of Savings and
Credit Cooperatives

KwH

Kilowatt Hour

L/C

Letter of Credit

LIBOR

London Interbank Offered Rate

MCC

Millennium Challenge
Corporation

MEC

Microenergy Credits

MEII

Middle East Investment Initiative

MEIT

Italian Ministry for the
Environment, Land and Sea

MENA

Middle East and North Africa

MFI

Microfinance Institution

MIGA

Multilateral Investment
Guarantee Agency

MSME

Micro, Small &
Medium Enterprises

MW

Megawatt

MYTO

Multi-Year Tariff Order

NDEA

New Deal on Energy for Africa

NDF

Nordic Development Fund

NEP

Nigeria Electrification Project

NERC

Nigerian Electricity Regulatory
Commission

NES

National Electrification Strategy

NGO

Non-Governmental Organization

NHIL

National Health Insurance Levy

NIDF

Nigeria Infrastructure Debt Fund

NPL

Non-Performing Loans

NPRAGhana National Pensions
Regulatory Authority**NSIA**Nigerian Sovereign
Investment Authority**OCDE**Organisation for Economic
Co-operation and
Development**O&M**

Operations & Maintenance

OpCo

DESCO Operating Company

PAYGO

Pay-as-you-go

PBG

Policy Based Guarantee

PCG

Partial Credit Guarantee

PCOA

Put-Call Option Arrangements

PDS

Power Distribution Systems

PenComNigerian National Pension
Committee**PIDG**Private Infrastructure
Development Group**PPA**

Power Purchase Agreement

PPP

Private Public Partnership

PRG

Partial Risk Guarantee

PRI

Political Risk Insurance

PROSOL

Tunisian Solar Programme

PSRPPower Sector Recovery
Implementation Programme**PURC**Ghana Public Utilities
Regulatory Commission**PV**

Photovoltaic

REANigeria's Rural
Electrification Agency**RBA**

Retirement Benefits Authority

RBF

Results Based Finance

RLSFRegional Liquidity
Support Facility**SACCO**Savings and Credit
Cooperative Societies**SASRA**SACCO Societies
Regulatory Authority**SDG**Sustainable Development
Goals**SEC**Ghana Securities
Exchange Commission**SECO**Swiss State Secretariat for
Economic Affairs**SEforAll**

Sustainable Energy for All

SEFASustainable Energy Fund
for Africa

SHS

Solar Household System

Sida

Swedish International
Development Cooperation
Agency

SME

Small and medium-sized
enterprise

SOTUGAR

Tunisian Guarantee Company

SPV

Special Purpose Vehicle

SREP

Scaling Up Renewable
Energy Programme

SSA

Sub-Saharan Africa

SSNIT

Ghanaian Social Security and
National Insurance Trust

STEG

Tunisian State-Owned
Utility Company

SWF

Sovereign Wealth Fund

TCX

Currency Exchange Fund

TPFA

Temporary Pension
Fund Account

UBA

United Bank for Africa

UGEAP

Universal Green Energy
Access Programme

UK CDC

CDC Group, the UK's
Development Finance
Institution

UNDP

United Nations
Development Programme

UNEP

United Nations
Environment Programme

USADF

United States Africa
Development Foundation

USAID

United States Agency for
International Development

VAT

Value Added Tax

VRA

Volta River Authority

Executive summary

Universal and sustainable energy provision is a key priority across Africa. Countries are facing the dual objective of increasing the availability of energy to households and businesses while also decreasing the dependency on fossil fuels by adopting renewable and /or low carbon technologies.

In addition to relying on imported fossil fuels, most African countries are also reliant on hard currency debt for the financing of energy infrastructure. This creates significant exchange rate risks that are difficult to hedge and which can have profound implications for energy costs.

There is a strong case for developing the capacity and capabilities of local financial intermediaries to provide competitively priced local currency term credit to reduce reliance on hard currency financing. In the off-grid sector, this is particularly relevant for local commercial banks and institutional investors (where sizeable opportunities exist).

One approach to stimulating local currency lending is through credit enhancement products that provide risk mitigation for local currency lenders and institutional investors. Credit guarantees aim to help improve the credit profile of borrowers and by doing so, enhance the financing terms on offer from lenders and investors. In turn, this can improve the current lack of competitiveness of local currency debt financing against other forms of financing, including equity and hard currency financing, thereby increasing its uptake.

The aim of this report is to assess this hypothesis by exploring the supply of and demand for local currency finance for off-grid renewable energy projects in Africa. Grid-connected renewable energy projects are also discussed, but only in the context of applying credit enhancement solutions in these markets. The research includes in-depth examination of the markets in Ghana, Kenya, Nigeria, and Tunisia. It also explores the obstacles that developers and businesses face in tapping into local currency credit and capital markets and analyses the extent to which credit enhancement in the form of competitively priced guarantees – of multiple forms – could entice local banks and other financial intermediaries to provide local currency debt finance to the off-grid sector.

The research is based on an extensive desk-based review of publications on the off-grid energy and local currency financing space, as well as documents related to solar household systems (SHS), commercial and industrial (C&I) and mini-grid sectors in four countries. In addition to this, consultations have been carried out with 163 organizations working in the field. The intended outputs of this report are to provide information, analysis, and insights on local currency opportunities for off-grid energy businesses and projects, with the objective of stimulating private sector initiatives in the off-grid space.

Demand for local currency finance

SHS

The SHS market in Africa has grown substantially in recent years and has led to the emergence of established players in the market. These businesses are reaching a scale where local currency debt financing is the preferred route for funding the next phase of their growth. These companies are looking to leverage the value of their consumer receivable assets – the bundle of loans that they have given to their customers so that they can purchase their products.

While there are examples of companies able to access finance, there are concerns about the sustainability of the market in its current form. Market observers have noted that some SHS companies have received equity finance from impact investors with return targets based on unobtainable growth projections, given the underlying affordability constraints across different markets in Africa. Another concern is whether companies can achieve the high levels of market penetration experienced in East Africa, without the extensive use of mobile money in other countries.

Historically, SHS companies have tried to make use of guarantees, but have found that banks were unwilling to provide any improvement to credit terms. Banks see the role of credit guarantees as being limited to a collateral substitute or supplement as part of the security package rather than something that has an impact on the price of the loan.

Consultees suggested that there could be a role for funded local currency solutions for primary (or greenfield) financings, so long as these are priced competitively.

If securitisation structures are adopted to leverage receivables, guarantees could be used to make the risk profiles of different tranches attractive to different types of institutional investor. However, these transactions would have to be of a minimum scale to justify the high transactions costs.

C&I

The C&I market for off-grid energy has similarly achieved sustained growth, primarily driven by businesses currently not connected to the national grid wanting power, but also by the falling costs of solar technology relative to national tariff rates which creates opportunities for energy cost savings, with short pay-back periods that businesses are seeking to exploit.

Most of the transactions in this space have involved businesses making outright purchases of equipment; however, the use of solar-as-a-service business models has been growing. This model is relatively well-established in South Africa, but beyond this, the market is still relatively new, with Kenya and other East African countries, Nigeria and Ghana seeing some activity, supported by both local and international developers.

Many of these businesses are new market entrants and have therefore struggled to access finance from commercial banks to roll-out their offering. Whilst local financing institutions should be well placed to analyse the credit risk of local C&I companies, a combination of regulatory uncertainty, a limited understanding of solar projects and solar-as-a-service business models and more expensive loans, mean that they have, to date, played a limited role in financing smaller projects, with banks most likely to support clients with whom they have an established relationship. Leasing models could provide an alternative means to providing credit to new market entrants.

With the emergence of leasing and solar-as-a-service providers, there appears to be a need for credit enhancement products. However, local currency finance providers have limited appetite for investing in the C&I sector, other than through traditional on-balance sheet corporate lending to established players. This should improve, as these business models become more established and the leasing portfolios grow and demonstrate performance, but innovative use of credit enhancement products may accelerate uptake of local currency finance in these emerging business models.

Mini-grids

While mini-grids have an important role to play in expanding access to energy across the continent, given the transmission line coverage constraints on the continent, the business models are unproven and significant challenges face the sector. These include: i) gaps in policy and regulatory frameworks; ii) lack of proven business model(s); iii) lack of market data and linkages; iv) lack of capacity of key stakeholder groups (public institutions, developers and financial institutions); and v) limited access to finance.

Across almost all countries of study, mini-grid developers noted that the interest rates on debt that they would require to run a sustainable business are far below what is currently being offered to them by commercial lenders. Mini-grid developers, without exception, emphasised the continued need for grants covering from 30% to 50% of their costs. While they expressed a demand for local currency, it was always caveated as competitively priced local currency. Such rates and tenors (often as much as ten years) are unlikely to be offered by local currency lenders; even if the provider fully reflected the risk reduction, a credit enhancement product can bring to their pricing.

Supply of local currency finance

The main providers of finance reviewed for this research are commercial banks, leasing companies, and institutional investors.

- In most African countries, commercial banks might be expected to be the most active finance providers in these markets. From consultations with market participants, however, the consensus is that to date,

banks have had a generally limited appetite given the availability of alternative investments, especially government securities, except where they already have well established banking relationships. However, there is some evidence that the network banks (i.e. the banks with operations in several countries and reasonable access to foreign exchange) in Sub-Saharan Africa (SSA) have shown an interest in discussing in more detail products that could help to unlock more local finance for the renewables sector.

- **Leasing companies**, which are new market entrants solely focused on this sector, struggle to obtain finance (which they would then extend to customers to finance purchases). Credit guarantees of their capital raising could represent the most catalytic entry point for channelling credit into the sector.
- In the context of off-grid energy projects, **institutional investor** demands for long-term, low-risk, liquid assets of sufficient scale are almost non-existent. Notwithstanding these constraints, opportunities are most likely to arise through investments in securitisation vehicles of underlying debt assets (including consumer receivables) with a track record of performance, which even then may need to be structured to meet the requirements of different investor classes.

In addition to funded finance providers, there is also existing credit enhancement support to the renewables sector in Africa through GuarantCo, InfraCredit, the Africa Guarantee Fund (AGF), amongst others. The AfDB is also establishing a Distributed Energy Service Companies (DESCOs) financing programme supported by the European Union (EU). This programme has a focus on the SHS market and leveraging the value of consumer receivables.

Conclusions

There are potential advantages in using local currency debt financing for off-grid renewables projects and businesses, to mitigate foreign exchange (FX) risks, but its greater use is not straightforward. Notwithstanding a range of institutional and regulatory issues, there is a two-fold challenge of financing economics. On the **demand side**, borrowers need to be incentivized to use local currency debt finance in lieu of equity or hard currency debt (which can be difficult when local currency debt costs are more expensive); while on the **supply side** lenders need to be encouraged to invest in renewables businesses and projects, which fact involves mitigating credit risks through credit enhancement.

Lenders consulted in several countries confirmed that they continue to require liquidity to provide finance to the off-grid sectors on suitable terms. To address this, banks require long term debt finance of their own or a means by which to exit from long-term lending to meet liquidity needs.

Even where sufficient liquidity is available or has been created, the single greatest impediment to term local currency debt finance is for lenders to take the protection of the guarantee into account in their pricing. Many noted that guarantees can help to reduce collateral requirements, as part of a security package, but there would only be limited, if any, pricing benefits to the borrower. As a result, with the provision of credit guarantees, borrowers would still face high local currency borrowing costs due to a combination of high wholesale rates and lending margins. Margins on local currency finance have often remained persistently high, so where hard currency is available, this will be preferred due to lower wholesale rates, while local currency lending is only attractive with subsidized wholesale rates. **For these reasons, banks may not be the most promising entry point for credit guarantee interventions.**

Given this, it is possible that guarantees are best targeted at capital market issues or in support of intermediaries raising capital who then provided funded local currency debt. This could, for instance, include leasing companies and structured capital market funds, such as securitisations; first of these involving credit or capital markets, the latter being focused on capital markets. Any capital market opportunities targeted at institutional investors will need to be of an asset composition, scale and structure which take these factors into account.

From a sub-sector perspective, the greatest immediate opportunities appear to be in primary and secondary local currency financings of SHS pay-as-you-go (PAYGO) models, together with the C&I segment, especially where the focus of the business itself is on the domestic market and not exporting. Emerging leasing business models in this space could provide an important entry point. In comparison, the mini-grid market faces a significant affordability challenge.

Across all market segments, the best way to approach the challenge is to ensure that the complexities associated with borrowing in local currency finance are minimised. This includes ensuring that borrowers face reducing costs while also improving ease of investment for financial providers. This could entail reducing transaction costs (for instance, when structuring securitisation vehicles). A key focus of supply side interventions is ensuring risks are better understood as well as structuring opportunities in ways that make them attractive to target finance providers, while still ensuring that providers learn how to evaluate credit risks and neither rely on excessive levels of collateralization nor guarantee protection.

There are existing guarantee providers operating in the African infrastructure space, and to ensure that these organizations can offer products that are appropriate for the off-grid market, innovative solutions will be needed to ensure that they meet the diverging needs of borrowers as well as providers of finance.

Chapter 1

Introduction

Countries in Africa are seeking to increase energy supply to facilitate economic and social development, while simultaneously reducing the continent's dependency on fossil fuels by adopting renewable and / or low carbon technology. This applies equally to large scale generation projects as well as power solutions in the off-grid space targeted at businesses and households.

In addition to relying heavily on imported fossil fuels, most African countries are also reliant on hard currency debt for the financing of energy infrastructure, typically creating significant exchange rate risks that are difficult to hedge and which can have profound implication for energy costs if they crystallise. There is therefore a strong case for developing the capacity and capabilities of local financial intermediaries to provide competitively priced term credit products. In the off-grid sector, this is particularly relevant for local commercial banks and, where sizable opportunities are available, institutional investors.

To help meet the demand for finance from the renewables sector with the supply of finance from local credit and capital markets, the aim of guarantees is to simultaneously improve the credit profile of borrowers and in doing so, improve the financing terms on offer from lenders and investors. In turn, this can make local currency debt financing more competitive versus other forms of financing, including equity and hard currency debt, thereby increasing its uptake.

The aim of this research is to test this hypothesis by exploring the supply of and demand for local currency finance for off-grid renewable energy projects in Africa, with in-depth examination of the markets in Ghana, Kenya, Nigeria, and Tunisia. It also explores the obstacles that developers and businesses face in tapping into local currency credit and capital markets and analyses the extent to which credit enhancement in the form of competitively priced guarantees – of multiple forms – could entice local banks and other financial intermediaries to provide local currency debt finance to the off-grid sector.

This report was adapted from a study undertaken for the African Development Bank (AfDB) to assess credit enhancement focused interventions that could be deployed to address the gap in local currency available for renewable energy projects and businesses. The information contained in this document is based on the content of four country specific market diagnostics and a pan-African market diagnostic developed over the period from September 2018 to November 2018. The intended outputs of this report are to provide information, analysis and insights on local currency opportunities for off-grid energy businesses and projects with the objective of stimulating private sector initiatives in the off-grid space.

This introductory section defines the concepts and terminology used in the remainder of the report and explains in further detail the importance of local currency

financing for off-grid renewable energy projects in Africa and the exchange rate risks and currency mismatches that it can help mitigate. Following this introduction, the report is structured as follows:

- Section three provides a Pan-African overview of the demand for and supply of local currency finance for the renewable energy sector.
- Sections four through seven present the country diagnostics for Ghana, Kenya, Nigeria, and Tunisia where in addition to looking at the demand and supply dynamics in each market, an illustrative estimate of the market size for guarantees is provided.

1.1. Defining the off-grid energy sector

The off-grid energy sector, broadly defined as energy generation, distribution and supply that do not involve a country's centralized national grid, has experienced considerable growth in recent years. Key sub-sectors reviewed for this report include:

- **the solar household systems (SHS) market:** small-scale (or "pico") photovoltaic (PV) systems to meet basic electricity needs through larger systems capable of powering household appliances with high energy requirements;
- **the commercial and industrial (C&I) market:** off-grid energy services provided to businesses of all sizes across different sectors of the economy; and
- **the mini-grid sector:** standalone grid systems that serve a geographic area that is either poorly connected or not connected to the national grid.

While the principal focus of this report is on the off-grid market, there is also some discussion of large renewable energy independent power producer (IPP) projects that are

project financed to provide further context to the findings and issues. These large projects are mostly on-grid via public off-take; however, this does not rule out private power purchase agreements (PPAs) in off-grid contexts (although their scale will be typically much smaller than on-grid, project financed counterparts).

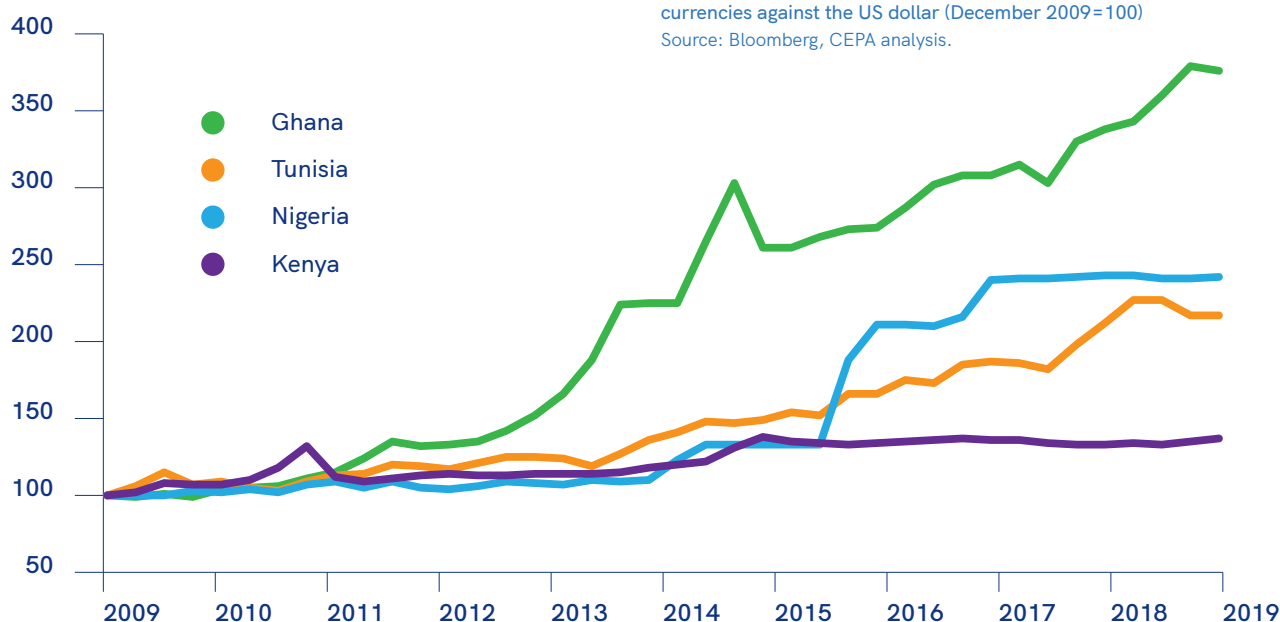
1.2. The public policy case for local currency financing

The public policy case for greater local currency financing is in part based on mitigating foreign exchange (FX) rate risks, but also in terms of developing local financial markets.

1.2.1. FX risks

FX risk occurs because the main forms of finance for renewable projects and businesses are provided in hard currencies, whereas with the notable exception of export orientated businesses, the African consumers who ultimately fund them are providing revenue in local currencies. This is an acute problem because most African domestic currencies – to varying degrees – have systematically fallen in value against hard currencies such as the US dollar over an extended length of time. In addition, some African currencies have been prone to significant volatility, which can be difficult to manage from a treasury perspective. This is particularly the case in countries which rely on export of a single commodity as their primary means of generating foreign exchange. Figure 1-1 illustrates how the exchange rates of the Ghanaian, Kenyan, Nigerian, and Tunisian currencies have moved against the US dollar since 2010; it shows that all of the currencies have experienced a significant loss in value, particularly the Ghanaian cedi which lost 73% of its value in 2010.

Figure 1-1:
Exchange rate movements of selected African currencies against the US dollar (December 2009=100)
Source: Bloomberg, CEPA analysis.



This is problematic because the tariffs for the provision of renewable energy services financed in hard currencies have to be adjusted to reflect the fall in revenue received from customers in local currencies.¹ If the local currency keeps falling in value, then the tariff has to keep increasing, which limits the affordability of the service to local consumers and ultimately the sustainability of the project or business. Where the local currency experiences an extreme fall in value it can be politically impossible to increase the tariff to the required levels. For instance, the Nigerian naira lost 50% of its value in only a few months in 2016 when Nigeria removed its peg to the US Dollar in favour of a flexible interbank exchange rate market.

1.2.2. Why do businesses continue to rely on hard currency finance?

Off-grid businesses have struggled to attract commercial local currency finance, and instead rely on foreign currency finance, particularly US dollars or euros. If the local currency depreciates – or is devalued in the case of fixed / managed FX regimes – the businesses either must raise tariffs to end users or bear the risk itself to account for the effective fall in the revenue that it receives relative to its costs, with the latter often rendering a project or business unbankable. These risks demonstrate the benefits and growing need of local currency solutions for businesses.

The evidence shows that exchange rate risk is material in most cases.² Why then, do businesses continue to seek finance, in many cases exclusively, in hard currencies given the extent of the risk that is faced?

In theory, a business has a choice between sourcing finance in hard currency or local currency (or a mix) and will make a choice based on the extent to which the price and tenor available matches the needs of the renewable business or project being implemented.

Presently, hard currencies such as the US dollar and euro are available from development finance institutions (DFIs), generally at more competitive rates than commercial banks, for tenors up to 15 years (in some cases even longer). In contrast, local currency debt finance is often difficult to source beyond seven years. Similarly, the pricing is often expensive, sometimes with rates similar to rates of return on equity with a volatility driven by limited ability to fix rates. So local currency finance is not an option where long term

finance is required at the lumpier or less scalable end of business or project financing requirements.

In addition to the pricing and tenor, there are further issues on the supply-side that limit the ability to secure local currency finance in renewable energy transactions. These include:

- The high *nominal* interest rate for local, relative to hard currency debt means that the headline costs to customers will be higher, at least initially (although real rates may be more aligned). The interest rate comprises the wholesale rate (i.e. the banks' borrowing rate), plus a *risk adjusted margin*. In theory the *project risk* should be largely independent of the currency in which it is financed, but in reality wholesale rates between FX, such as the London Interbank Offered Rate (LIBOR), and local rates (set by central banks) can vary considerably, as these are heavily influenced by national monetary policies.³ For companies deploying SHS and other types of individual use products, higher costs of financing are borne by the customers in terms of more expensive products.
- Local currency finance is often only provided with floating rather than fixed interest rates, with the exception of some middle-income countries. This means that monetary policy tightening could result in rates increasing, which in turn will likely lead to costs to businesses and/or customers also increasing. Businesses and developers are therefore simply trading interest rate risk for FX risk, when choosing between the available options.
- Although it is not the main focus of this analysis, it is worth noting that larger infrastructure transactions take a considerable time to develop and reach financial close. This is especially true in Africa where project preparation lead times are particularly long. Incorporating local currency financing into transactions can be a long process that often requires working with institutions that have limited experience of appraising such investments. Therefore, these institutions depend on additional outsourced legal and technical advisory services that can considerably increase the time and cost to complete these transactions. This is the most relevant challenge to larger project financed renewables generation projects in the off-grid sector.

Whilst others may exist, for these above-mentioned reasons, project sponsors often do not explore local currency financing.

1 Generally, the state-owned utility finds it politically impossible to increase the tariff by the required amount, so the tariffs that are applied are no longer cost reflective. The off-taker for the IPP can become insolvent because of the inability to apply cost-reflective-tariffs and the project that it is operating then requires long-term subsidy and/or expenditure on maintaining the project to the required standards.

2 The Kenyan shilling has performed well compared with other African currencies and while it has been devalued against the dollar, the fluctuations have been more moderate.

3 While less relevant to the off-grid sector, in the case of IPP projects, it can be very difficult politically to set higher tariffs in order to apply local currency finance, when cheaper hard currency finance is available, even though the currency risk is known.

Across the different market segments and technologies, renewable infrastructure businesses and projects incur different proportions of their costs in hard currency. For instance, hydro projects incur relatively higher costs in local currency because one of the main inputs required to implement the project is cement which is available locally, whereas other infrastructure projects incur considerable costs in US dollars because the inputs must be imported (for instance in the case of SHS). Where a significant proportion of costs are in US dollars, it will make sense for the project to have a similar proportion of finance in US dollars to limit the risk faced (although the extent of this issue depends on how easy it is to access US dollar finance; i.e., the extent of the currency transfer and convertibility risks).

Overall, whilst businesses are in theory able to make a simple choice on whether to apply local currency, the market realities make it a more complicated issue. Some evidence suggests that after taking account of the various costs and benefits, there are advantages in supporting the provision of local currency financing, at least for small IPP projects.⁴ The extent of FX risk faced by renewables projects means that there is at a **minimum** a policy rationale for exploring options to increase local currency finance as a contribution to the overall debt financing component of a transaction (recognising that this proportion may differ between borrowers).

1.2.3. Developing Africa's local capital markets

Currently across the different market segments in the renewables sector, the level of participation by local commercial banks and institutional investors is very limited.

In the case of IPPs, apart from countries with deeper financial markets, such as South Africa, DFI project finance is the main model used to take projects to financial close. Over the past decade, Chinese financing institutions such as the China Export Import Bank (EXIM), have also become an important source of finance for renewable projects, although this is generally focused on larger projects, above 20 - 50MW. Conversely, the off-grid sector has relied on its own equity, impact investors, and DFIs to provide finance to facilitate the development of the sector.

Hard Currency financing dominates across all modes of renewables finance. The EXIM bank approach, widely used by the Chinese for example, provides low cost debt typically in US dollars, in exchange for a specified level of Chinese inputs or content. However, it also usually requires that the host governments take on most of the project risk through a sovereign guarantee. The DFI approach on the other hand, does provide for the possibility to take on more project risks without necessarily requiring a sovereign guarantee,

however the hard currency project-finance method creates limited opportunities for local currency-based institutional financing. The fact that debt is held to term has the effect of preventing local institutional investment that may prefer operational and local currency denominated assets to match with long term local currency-denominated liabilities (such as pensions).

There are important benefits from involving more African financing institutions in the provision of finance for African infrastructure projects, which could be supported by the introduction of local currency guarantees. These include:

- **To increase investment options.** At present the investment of local financial institutions in Africa are concentrated in relatively few assets, predominately government securities. Increasing the range of investments available to African institutions can help them to benefit from increased diversification of their portfolios and potentially achieve a higher long-term return on their investments.
- **To promote alternative sources of finance for renewable projects.** Although current market conditions suggest that the main barrier to implementing renewable projects is a lack of bankable project opportunities rather than a lack of finance; increasing the supply of local finance will increase the range of options for projects, enabling them to improve their efficiency and potentially reduce costs to consumers. Furthermore, whilst international sources of finance are currently available, the experience of the last financial crisis shows that they may not always be so.
- **To facilitate greater involvement of local developers.** Local developers can find it more difficult to access finance from international sources relative to international developers. Therefore, increasing the availability of finance from local institutions could help to stimulate more investment from local developers, which also makes use of local financial advisors and lawyers and therefore could help to reduce the costs involved in renewables projects.
- **To help credit and capital markets mature.** There are also significant spill-over benefits to African economies of having wider, deeper, and therefore more efficient, longer term credit and especially capital markets. Utilizing the demand from renewable energy infrastructure is potentially a way of accelerating such development.

The potential to use local capital markets for financing of renewables in Africa will, however, depend upon both the sub-sector in question and the potential for secondary or re-financings as opposed to greenfield or primary financings.

4 GuarantCo commissioned a detailed study of the issue for the Kenyan IPP market - Local currency-denominated for Kenyan Power Purchase Agreements, Dalberg (2018).

1.3. The role of guarantees in credit and Capital market finance

At a high level, types of finance available to renewables businesses and projects can be split into the credit and capital market finance. Credit market finance corresponds to the activities of the financial intermediation actors (mainly the banking sector, leasing companies and factoring companies, amongst others) and involves the provision of loans or other forms of credit. Capital market finance includes the money market for short-term debt instruments such as commercial paper (CP) and the longer-term capital markets for bonds and the issuance of shares and special purpose vehicles (SPVs). Institutional investors such as pension and insurance funds, banks, as well as individuals can invest in the latter. It is also useful to distinguish between primary financings, typically involving the debt finance of greenfield assets, and secondary financings which often involve the refinancing of initial repayment obligations, typically associated with assets that are already generating cash-flows.

Guarantees work by transferring either a full or portion of a single or range of risks from the credit provider to the provider of the guarantee. The aim is two-fold. First, through the transfer of the risk, it can make credit providers more willing to lend than they otherwise would be, essentially transforming what would have otherwise been an unbankable opportunity into one to which credit can be extended. Second, because the risk is reduced to the credit provider, the provider can lend on more favourable terms, making such finance more attractive to businesses and projects.

As regards the supply of finance, any credit enhancement through a guarantee cannot take place in isolation, it needs to be in support of a particular form of financing. The opportunities are segmented into three forms of finance:

- short-term **working capital** provision;
- **term credit** provision through banks and non-banking credit providers (such as leasing companies) or specialist funds; and
- **capital market** term finance through bonds, notes, and other paper instruments, including securitisation vehicles.

Each of these is discussed below.

1.3.1. Working capital

Working capital is necessary to finance advisory services, imports of either components or equipment and installation. It supports all activities until payment has been received from the customer, in instances where there is an outright purchase of the product by the customer. This excludes the funding of any credit that might be extended to the customer by the supplier, which is likely to require longer term funding.

Working capital products can include:

- bank overdrafts;
- letters of credit (L/Cs) – used especially in trade finance

to enable import and supply of equipment; and

- invoice factoring – financing is advanced to the supplier by a bank or specialist factoring company, secured on receivables.

This type of financing is needed by local manufacturers of equipment, which will typically involve material and component imports, as well as importers and installers of equipment.

Import of equipment is typically financed in hard currency whereas invoice factoring can be in local currency or hard currency, depending on the needs of the customer who may, for instance, prefer hard currency where its revenues are largely in hard currency (due to exports for example) or local currency where its customer base is largely domestic.

1.3.2. Term finance

Term finance can be provided to households, businesses or single projects and is essentially financed beyond working capital requirements; it reduces the need to pay for items upfront, enabling costs to be spread over time.

The major providers of term finance are banks; however, it can also be provided by suppliers of a product or service and by leasing companies. Unlike banks, leasing companies are non-deposit takers and likely to be subject to fewer regulations than banks. Where an asset is taken back at the end of the lease period, they can also better understand the value of an asset at a particular point in time (although the complexities of adequately pricing residual values in a sector such as solar where there is significant technological change should not be underestimated). On balance, therefore, a leasing approach could be particularly useful in the context of renewables generation (including and especially in the captive power space) or energy efficiency equipment.

In extending credit, such intermediaries need to be able to finance themselves. Unlike banks and micro-finance institutions (MFIs), non-deposit takers cannot rely on their deposits to advance credit; they raise finance themselves, either from credit or capital markets.

1.3.3. Capital market finance

Capital market finance covers primary issues of Commercial Paper (up to one year) and bonds, direct financings, share issue, to re-financings, for instance, through SPV securitisation vehicles (although not widely used). SPVs which securitise a company's receivables should allow for greater access to finance, but this sort of transaction requires a good (at least three years, and possibly even five years) track record of predictable payment and returns.

This is the main form of finance that institutional investors such as pension funds are active in. Banks are also significant institutional investors.

1.3.4. Guarantee products

In understanding how guarantees can alter market dynamics it is useful to understand the types of guarantees that could be utilised to do so. Different forms of guarantees can be used to cover particular risks with some being more appropriate to particular types of debt finance providers:

- **Payment guarantees** involve cover for either payment delays or non-payment. These are often used in the context of supporting the payment obligations by off-takers under a PPA, especially involving state-owned entities. Most multilateral development banks support this, typically through partial risk guarantees (PRG) or financial guarantees, which are usually counter-guaranteed by host governments. This is typically less relevant to the off-grid market, although they can similarly be utilised to support payments to off-grid energy service providers, where host governments wish to promote this model.
- **Partial credit guarantees (PCG)** cover a portion of default on scheduled payments of an obligation. PCGs could serve as a credit enhancement or tenor extension. They are often non-accelerable and a default is triggered when a payment becomes due. PCGs can be structured to provide protection either on individual loans/projects or a portfolio of multiple projects. Guarantees typically can be structured using various risk sharing structures:
 - *pro-rata*: where the loss is shared in line with the coverage ratio between the guarantor and the guaranteed.
 - *first-loss*: where the obligation of the guarantor is triggered as soon as there is a default. If the first loss coverage is more than the default, then the guaranteed is fully covered for that loss.

- *second-loss*: the guarantee coverage comes after the depletion of a first loss tranche. The Guarantor will typically reimburse the originator for a fixed percentage of the incurred losses that exceed a predefined threshold for the loss.
- **On-demand guarantees** involve the passing of the credit risk to the guarantee provider as soon as there is a default on a financing covenant triggering an immediate pay-out under the guarantee, typically interest payments, but not exclusively so – in this sense they are accelerable (in a way that most PCGs are not).
- **Refinancing guarantees** or take-out financing arrangements are commitments to take over a credit at a particular point in time. They are essentially a put option on the part of the holder of the debt: they are more liquidity instruments than credit protection instruments, in that the credit transferred should not be impaired. A standby loan facility that can be drawn at a certain point in time to replace a portion of the debt is a similar instrument.

In credit markets the guarantee fee forms a part of the credit margin, with the lender typically responsible for paying the guarantee fee. In the case of a mono-line credit wrap (i.e. a 100% guarantee to cover interest and principal payments) on a bond, the guarantor is typically paid by the issuer of the instrument as a separate transaction, either upfront or over the life of the guarantee, rather than by the entity receiving the protection of the guarantee.

The different types of finance and guarantees are presented in the matrix on Figure 1-2.

Figure 1-2:
Financing modalities and types of guarantee
Source: CEPA analysis

	Credit markets		Capital markets
	L/C & working capital	Term loan	Issuance
Description	Guarantee backs up L/C & working capital facilities offered by banks.	Partial credit cover provided on bank loans to provide extra security.	Credit wrap for institutional investors looking to invest in issued paper.
Nature of guarantee	First-loss guarantees, up to specified loss amount.	Partial credit guarantees, providing up to 75% coverage.	Full wrap on rated bonds.
Tenor	Less than one year.	From three years.	Two to three-year borrowing, as well as long-term issuance.
Transaction types supported	Manufacturers & importers in key sectors.	Leasing companies, on-lending funds.	Green bonds, corporate issuances for refinancing and securitisation purposes.

1.4. The country diagnostics

The country diagnostics are detailed assessments of the market readiness and demand for local currency credit enhancement for renewable energy projects across four countries – Ghana, Kenya, Nigeria, and Tunisia. The main objectives of the diagnostics are:

- to demonstrate the need for credit enhancement by identifying the nature and scale of the observed market gap; and
- to explore the extent to which this gap is not being adequately addressed by the market or existing interventions in the renewable energy and local currency finance space.

Based on the findings of this research, an initial view is provided on what type of intervention would be most appropriate, if any in the specific markets.

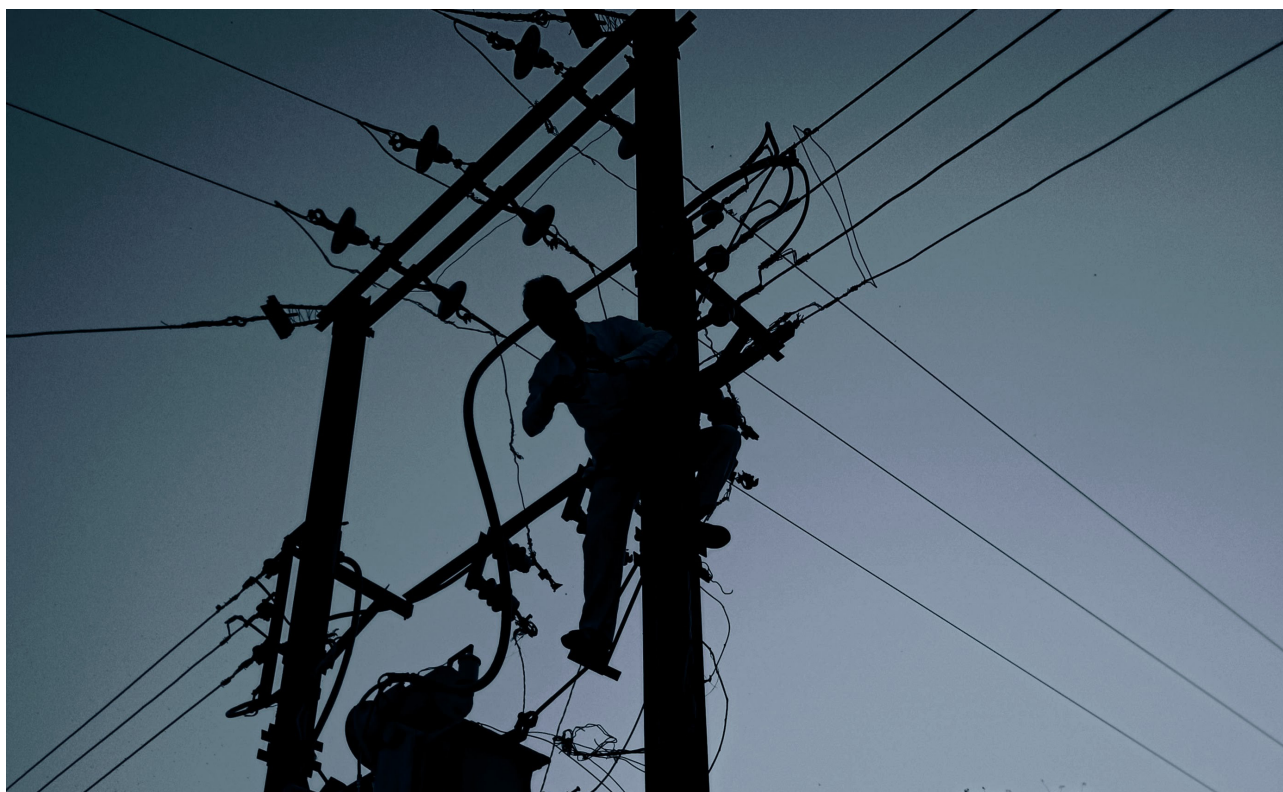
1.4.1. Methodology

To gather evidence on the market opportunity, semi-structured interviews were undertaken in each country with market participants. These in-country consultations were supplemented with telephone discussions held prior to the visit, as well as follow-up meetings/calls with additional stakeholders. In Ghana, 36 different institutions and 48 individuals were consulted. In Kenya, 37 different institutions and 53 individuals were consulted. In Nigeria, 39 different institutions and 50 individuals were consulted and in Tunisia, 16 different institutions and 24 individuals were consulted.

Consultations included businesses operating across the SHS, mini-grid, C&I and to a lesser extent utility-scale development segments of each country's renewable energy market, as well as developers involved in energy efficiency. The aim of these discussions was to further understand the nature of their local currency financing requirements, and more generally, the current challenges faced by developers and businesses in this space.

Interviews were also conducted with suppliers of local currency finance including commercial banks, pension funds, fund managers and sector regulators. These discussions gave an indication of their level of interest in providing local currency finance to the different sectors and the extent to which credit enhancement might be a catalyst to improve their ability to provide local currency finance to the market. The consultations were supplemented by extensive desk-research.

The findings enclosed in this report may contain predictions based on current data and historical trends. Any such predictions are subject to inherent risks and uncertainties. Furthermore, it is noted that the presented market sizes and demand figures do not factor in potential negative impact due to the Covid-19 pandemic.



Chapter 2

Pan-African Overview

This section explores the issues affecting currency mismatch between demand for, and supply of, local currency financing for off-grid renewables projects across Africa, breaking down the analysis by SHS, C&I, and mini-grid subsectors as well as by financing sources. It also provides examples of guarantees and other mechanisms that have crowded in local currency financing into energy businesses and projects in other emerging markets and explores different types of credit enhancement that could theoretically be made available and their potential effectiveness in attracting local currency finance into the African off-grid sector.

2.1. Demand for finance

To explore the specifics of the wide-ranging nature of the demand for financing, the overall off-grid renewables sector has been further segmented into three sub-sectors: the household sector, largely driven by SHS; the C&I sector in which the energy users are businesses rather than households; and the mini-grid sector – often comprising isolated grids, separate from the main national grid(s). These all have different financing requirements, for instance in terms of scale, working and investment capital, tenor or term; and represent different risk profiles from a debt provider perspective. The potential for using local currency guarantees also differs considerably.

2.1.1. SHS

The SHS⁵ market has experienced considerable growth since 2012; the level of investment in the sector has increased from just US\$21 million to more than US\$350 million in 2018.⁶ In Sub-Saharan Africa (SSA), between 2016 and 2018, more than 3.7 million SHS kits were sold on average, with nearly 11.3 million sold in total.⁷ This is significantly higher than the one million sold in 2012.⁸ East Africa accounts for the majority of market activity with 74% of the sales over this period.⁹

5 In the context of this report, the SHS market is defined as products that enable users to have, as a minimum, Tier 1 access to electricity. Tier 1 access refers to a service that provides a basic service level, such as sufficient power to support a small number of lights and cell phone charging for a limited period of time (for example, four hours). The SHS market for the purposes of this report also includes other Tiers of access up to Tier 5, which refers to full electricity access that is sufficient to power high-energy using appliances such as refrigerators, televisions, washing machines and other household goods. For further details of definitions please see ESMAP & SE4All (2015), *Beyond Connections: Energy Access Redefined*.

6 GOGLA (2019), *Investing in the off-grid solar sector: What you need to know*.

7 GOGLA (2019), *Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data: July-December 2018*.

8 Catalyst (2018), *Achieving SDG 7: The need to disrupt off-grid electricity financing in Africa*.

9 GOGLA (2019), *Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data: July-December 2018*.

Local currency finance transactions in the SHS market

The growth in the SHS market has led to the emergence of established players who have been able to attract debt financing, some of which have been denominated in local currency.

The SHS model, particularly in East Africa, is operated on a PAYGO basis, in which customers who typically pay in local currency are provided with a period of credit, rather than paying upfront for the equipment. In turn, the SHS provider pays for imported equipment – often from China – either in hard currency or by converting local currency receipts into foreign exchange. Letters of credit are often used to facilitate this type of operations.

Companies such as M-KOPA, BBOX and Zola EDF are all active and operating at a scale where they need access to local currency finance to support the sustainable growth of their organisations, rather than just raising more equity. In particular, these companies are looking to leverage the value of their consumer receivable assets – the bundle of loans that they have given to their customers to buy their products.¹⁰ They can either do this by borrowing on-balance sheet using the value of the receivables as collateral, or by applying an off-balance sheet securitisation approach involving the creation of an SPV. Some examples of the few transactions that have been completed are presented in Box 2-1. Further details of some of these transactions can be found in the individual country diagnostics in Sections 4 through 7.

Size of the demand for local currency finance

Although the SHS market has grown rapidly since 2012, it is still a relatively new sector, which is dominated by eight to ten companies many of which have not yet been able to demonstrate a track-record of profitability. Whilst the companies are still growing and planning to expand into new markets, there are also concerns about the sustainability of the sector in its current form. For example, Mobisol, one of the market leaders in the SHS market, filed for insolvency in April 2019, with some sources citing troubles with the commercial viability of its operations.¹¹ Mobisol was subsequently bought by ENGIE in September 2019, which is also looking to build on its experience from other ventures to capitalise on Mobisol's position in the market. Market observers noted that on the primary finance side, some SHS companies have received investment from impact investors in the form of equity with return targets which

Box 2-1: Examples of consumer receivables transactions in the SHS sector

The following SHS companies have been able to raise local currency finance by utilizing the cash-flows of their consumer receivables.

M-KOPA. In 2017, M-KOPA agreed a local currency facility with Stanbic Bank with investment from the Commonwealth Development Corporation, the UK's DFI (UK CDC), Norfund and the Netherlands Development Finance Company (FMO) for approximately US\$55 million local currency equivalent in Kenyan (US\$40 million) and Uganda shillings (US\$15 million). At the time, M-KOPA could not rely on a guarantee to provide any improvement to the terms of the loan, so it was not a viable option. It is possible that in subsequent financing rounds, M-KOPA may have more flexibility to negotiate/ make use of credit enhancement products to obtain debt on improved terms.

BBOX. In 2017, BBOX agreed a US\$2 million equivalent debt facility with Banque Populaire du Rwanda by securitising its consumer receivables portfolio. The loan had a tenor of 36 months.

ZOLA EDF. AfDB approved a proposal to support Zola EDF (an SPV 50:50 owned by Off-Grid Electric and EDF) with a PRG to mobilize a local currency loan worth approximately €24 million equivalent arranged by Société Générale de Banque, Credit Agricole Corporate and Investment Bank.

PEG Africa. In 2019, PEG Africa raised US\$25 million equivalent in a multi-currency transaction (including US dollars, Ghanaian cedis and CFA francs) led by UK CDC. This includes a US\$15 million-equivalent receivables-backed facility.

¹⁰ It is worth noting that some of the impact investors have not imposed a discipline of return of capital/ ROI, so that the SHS operators do not see a cost of capital and that makes debt financing less attractive. The desire for local financing by M-KOPA, BBOX, etc. is more to insulate the business from forex risk and introduce gearing.

¹¹ For example, see Financial Times (2019), Mobisol: A cautionary tale for impact investors [online]. Available at: <https://www.ft.com/content/8832bffc-f319-36fa-a720-fadaaf86e4f4>.

are based on unobtainable growth projections given the underlying affordability constraints across different markets in Africa.¹² The credit worthiness of the customer base of SHS companies should not be ignored as a limiting factor to the growth potential of the sector. Linked to the above is also a fundamental concern about the ability of the SHS sector to scale in countries (outside of East Africa) where the mobile money penetration rate is lower/ unproven.

Despite these risks, if the sector is to grow it has significant financing requirements. The 2018 Off-Grid Solar Market Trends Report estimates that globally, the sector will need between US\$2.6 billion and US\$2.85 billion of external debt financing between 2017 and 2022. The 2018 Catalyst Report estimates that the existing large companies operating in the sector will need over US\$10 billion of investment (of which US\$7 billion will be in debt) to meet demand in East Africa and grow into developing markets across Africa. Local currency denominated receivables financing could potentially play a significant role in supporting this growth.

Would guarantees alone help to unlock more local currency finance?

The analysis presented in this section demonstrates that the SHS sector; that is, the demand side, has a demonstrable need for local currency finance. As the sector continues to mature, the bigger companies will need to apply the consumer receivables financing model to free up the working capital to support expansion into additional markets.

In theory, credit enhancement products could play a role in supporting the SHS companies to raise local currency finance with local/ regional banks and possibly also with institutional investors. In practice, the evidence suggests that most of the SHS companies do not have the track-record required to enable them to attract finance from local currency debt providers. Where credit has been extended by commercial banks, it has been on the basis of either implicit or explicit guarantees provided by parent companies. The former is a type of “name lending” where the borrower’s reputation rather than the quality of the credit has a greater weighting in the credit decision. This could and should, however, be an issue that is addressed over the next few years as the more successful companies continue to grow and become desirable clients for local banks.

Therefore, from historical experience it is not clear that the provision of guarantee products alone will be sufficient, at least in the short-term to stimulate the provision of local

currency debt at affordable interest rates. Two leading SHS companies tried to make use of guarantees while working on their respective local currency deals, but found that the banks were unwilling to provide any improvement in the credit terms to reflect the guarantee that was on offer. This would appear to stem from the fact that banks view the guarantee as part of the security package, as a substitute for cash, land or property collateral, rather than as something that has a pricing impact over and above this, as would be the case in more sophisticated credit markets. As such its role is strictly limited to achieving the bankability threshold. The reluctance of commercial banks to lower interest rates with the provision of a guarantee was highlighted during multiple consultations with banks (see the individual country diagnostic reports for further details).

To address some of these issues, AfDB has recently launched the Distributed Energy Service Companies (DESCO) Financing Programme in Sub-Saharan Africa. Details of this are provided in Box 2-2.

Whilst this may improve over time as some companies build up a track-record in designing guarantee solutions, it will be important to find ways of making both primary and secondary financings more attractive in the sector. The former refers to greenfield finance involving either the credit or capital market financing of new assets where there are no existing cash-flows. The latter to operational financings, when assets are generating revenues and there is a refinancing of existing commitments or the financing of consumer receivables.

For primary financing solutions, evidence from stakeholder consultations suggests there could be a role for funded local currency solutions in primary transactions in this market segment. Such loans could either be paid back over the life of the loan or potentially accelerated through refinancing once a portfolio of receivables has been created. Secondary securitisation structures could then be guaranteed as appropriate, depending upon different appetites for different levels of risk in a collateralised debt obligation (CDO) waterfall structure. Those investors with the greatest risk appetite would be attracted to more junior ranking tranches with the highest interest rates, whereas the most risk averse could be the focus of a guarantee wrap on the most senior tranches.

¹² Equity would generally be converted into the bookkeeping currency (i.e. local currency) of the investee company (unless coupled with a pre-agreed minimum return in hard currency terms – e.g. put option with a floor IRR in hard currency terms).

Box 2-2: DESCO Programmeme

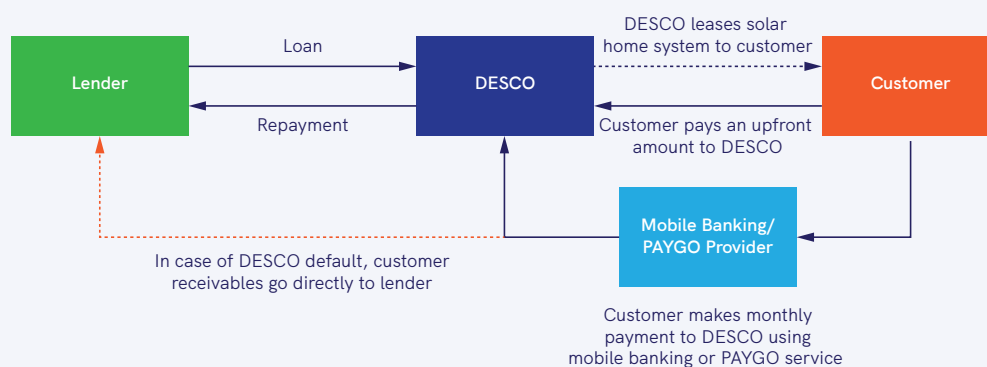
For DESCOs selling SHS in Sub-Saharan Africa, the traditional collateral requirements of local banks are one of the main obstacles precluding their access to local currency finance. These companies may not have sufficient liquid or physical assets to pledge and are often considered by local banks to be risky investments despite the fact that some companies in the sector, particularly in East Africa, have well-established track records.

With the objective of increasing the pool of available finance in the off-grid solar sector in Sub-Saharan Africa, the African Development Bank, with support from the European Union, launched the **DESCOs Financing Programmeme** in July 2018. Under the auspices of the DESCOs Financing Programme, the AfDB will work with local financial intermediaries (such as commercial banks and debt funds, amongst others) and DESCOs deploying solar home systems to structure, de-risk, and execute receivables-backed transactions that provide DESCOs with the local currency capital they require to sustainably scale-up their operations.

Understanding Receivables-Backed Financing in the Context of Off-Grid Solar

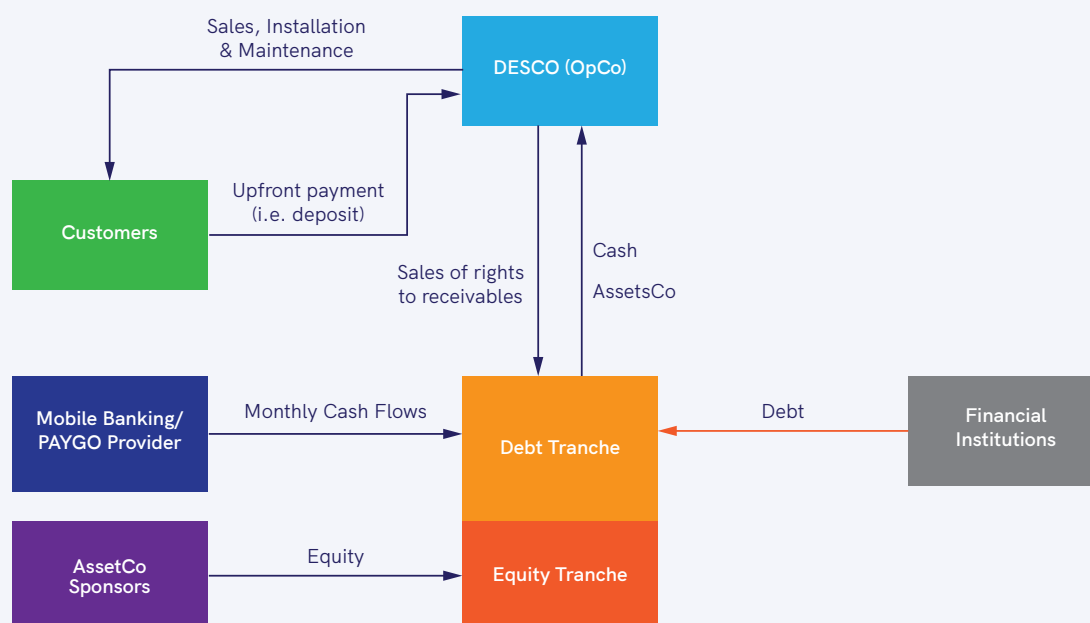
When a DESCO leases a solar home system to a customer (see Figure 2-1), the credit extended to the customer becomes an asset on its balance sheet. In general terms, this future cash receivable is equal to the value of the product (which the customer will pay for over a period of several months) minus the upfront payment the customer pays when initially acquiring the relevant system. The portfolio of bundled solar home system contracts becomes a granular portfolio with predictable and generally steady cash flows. Bundles of receivables can then be leveraged as collateral to access debt. Should the DESCO default, the right to receivables it pledged would go to the lender.

Figure 2-1:
Example DESCO transaction structure



However, the aforementioned arrangement may not assuage lender concerns regarding the operator's financial viability. DESCOs deploying leasable solar home systems import these systems or their constituent parts (usually on short-term credit) and then lease them to customers, who pay for them over a prolonged period of time. While DESCOs may build up a sizeable number of future receivables, they may nevertheless face current cash flow issues that could impact their ability to service their debt. One way to resolve this issue is to bifurcate the business lines of the DESCO into two separate legal entities: (i) an operating company (the "OpCo") that imports/assembles, sells, and maintains the solar home systems; and (ii) an asset company (the "AssetCo") that purchases the right to receivables of the OpCo with a combination of debt raised from financial institutions and equity from its investors. The AssetCo obtains debt from financial institutions by pledging the right to receivables it purchased from the OpCo as collateral. In this setup, the OpCo sells – generally at a discount – to the AssetCo its right to the receivables from the contracts entered into with customers at the beginning of their respective leases. In exchange, the OpCo receives immediate cash from the AssetCo whereas it would otherwise have had to wait for customers to pay off their systems. In this arrangement, the OpCo may also sign an agreement with the AssetCo to maintain, service, and repossess (in cases of customer default) the systems, the receivables of which are now assigned to the AssetCo.

Figure 2-2:
DESCO OptCo and AssetCo arrangements



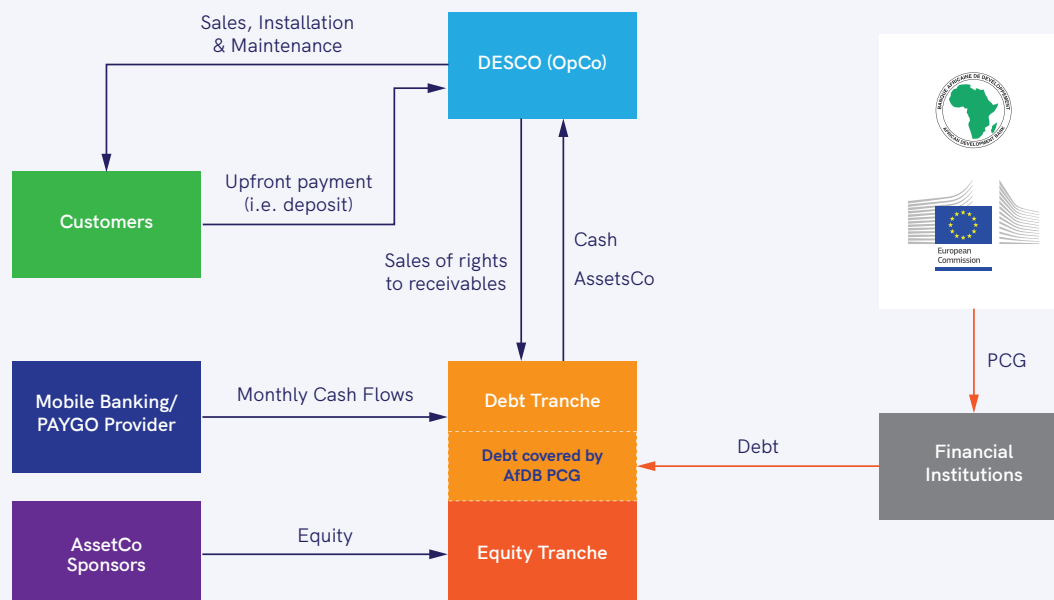
As noted earlier and demonstrated in Figure 2-2 above, the AssetCo purchases the rights to the OpCo's receivables with a blend of debt raised from banks or other financial institutions and paid-in equity from its shareholders and/or retained earnings. The amount required from AssetCo shareholders will depend on the advance rate determined by the lender. An advance rate is the maximum percentage of the value of the pledged collateral (in this case, the right to customer receivables) that a lender will extend a loan. For example, for OpCo receivables valued at the local currency equivalent of US\$1 million, a lender may extend to the AssetCo a loan of the local currency equivalent of US\$700,000, or 70% of the collateral's face value, with the remaining US\$300,000 (local currency equivalent), or 30% provided by AssetCo shareholders. This overcollateralization – i.e. the amount of credit provided is less than the value of the collateral pledged – is a form of credit enhancement that protects the lender from any future decrease in the value of the pledged receivables.

How the AfDB and EU Get Involved

The arrangement described above and presented in Figure 2-2 can provide lenders with both (i) sufficient collateral in the form of predictable and steady cash flows from OpCo receivables (assigned to the AssetCo), and (ii) a considerable degree of distance from OpCo risks. If, for any reason, the OpCo becomes insolvent, cash flows from customer receivables will continue flowing to the AssetCo.

Despite its benefits, there is little precedent in Africa in employing this transaction structure in the off-grid solar sector. Moreover, the credit risk of DESCOS and their underlying customer bases are still considered by most local financial institutions to be high. While DESCOS may be able to tap into local financial markets, the tenors and pricing offered may still be unsustainable. In order to further de-risk these transactions, as well as improve pricing and tenor terms, the AfDB, with the support of the EU, is in a position under the DESCOS Financing Programme to provide PCGs to the debt extended to AssetCos by lenders. In this scenario, the AfDB's PCG could absorb up to one-third of the losses attributable to the debt tranche in the case of AssetCo default before lenders start experiencing losses themselves or on a pari-passu basis wherein losses are shared with lenders. Figure 2-3 provides a representation of how this would look in practice.

Figure 2-3:
AfDB and EU support for DESCOs



The AfDB and the EU believe that a transaction structure that both (i) isolates lenders from operator risk and (ii) generates predictable cash flows that can be collateralised, coupled with a de-risking mechanism such as a PCG can unlock local currency solutions for DESCOs operating in Sub-Saharan Africa.

Ways of making primary and secondary financings more attractive include:

- **Find ways of improving the risk profile of the underlying assets, such as through securitisation structures** involving a broad-based portfolio of assets, particularly if it is possible to provide different tranches of risk such as in the case of a CDO. Tradeable instruments will also improve attractiveness. An implication of this is that it may make sense to treat commercial banks more as institutional investors, targeting their involvement in secondary financings. It is notable that Stanbic participated with US\$9 million equivalent in the US\$55 million equivalent financing facility for M-KOPA.
- **Educating the providers of finance on the companies' business models and on credit risk assessment**, as InfraCredit in Nigeria has sought to do.

Developing interest in the receivables market will require a broad-based effort if potential is to be realised.

2.1.2. C&I

The market for renewable energy off-grid supply of electricity to C&I customers has been developing in recent years, driven by falling costs of wind and particularly solar PV technology, in some countries resulting in generation costs that are lower than those offered by the grid. This sub-section provides an overview of this market, focusing on the key trends. It then examines how these solutions have been financed to date and such needs moving forward. This also highlights the need for local currency financing and the extent to which guarantees might be used to catalyse this finance.

The market, location and main companies

On-site C&I has emerged as a key market for solar and hybrid solutions, combining solar PV, diesel generators and the grid. Most developers have concentrated on on-grid for retail, hospitality, fast-moving consumer goods, agriculture and large industrial enterprises and off-grid solutions for remote camps, mines and oil and gas facilities. These projects are typically a combination of roof-top and ground mounted solar PV, combined with diesel or, increasingly, battery storage.

Research undertaken by Bloomberg NEF found that the most common model for this was outright purchase by business.¹³ Private PPA arrangements appear most common with larger projects in the mining sector. Whilst the absence of a grid connection can be the primary rationale for these arrangements in some contexts, in others it is the lower cost differential with grid power, enabling relatively short investment pay-back of sometimes over four to five years.

In some countries the market has developed into solar-as-a-service business models, with shorter-term off-take contracts or leasing solutions. This model is also being extended into the renewable heat and chilling space. There are many new market entrants across Africa pursuing this model. In South Africa, the market is well established, predominantly financed by local banks. Beyond South Africa, the market is still relatively new, focused on Kenya and other East African countries, as well as Nigeria and Ghana, with a combination of local and international developers.

Table 2-1:
Selected African countries with C&I Solar projects (2019)
Source: BloombergNEF (2019)

Country	C&I capacity
Nigeria	20MW
Kenya	15MW
Burkina Faso	15MW
Eritrea	7.5MW
Ghana	7MW
Namibia	7MW
Senegal	0.8MW
Tanzania	0.7MW
South Sudan	0.5MW
Zimbabwe	0.5MW
Gambia	0.2MW
Democratic Republic of Congo	0.05MW

The C&I market is in the early stages of development, with developers and financiers evolving their business models to meet the needs of customers. Accordingly, there is limited

analysis available on the potential size of this market. However, the significant reduction in the costs of solar, weak local grids and a desire to mitigate exposure to diesel fuel costs and higher on-grid electricity tariffs provide this market with opportunities to grow.

C&I projects generally range from around 50kW up to 2MW, with project costs ranging from US\$100,000 up to US\$3 million. PPAs in this segment are rare; provision has been through outright purchase, although leasing models offer potential. Many of these new entrants, however, have struggled to obtain finance from commercial banks to roll-out their business models. They are often too small for traditional investors in on-grid power generation projects, such as DFIs and international banks, with local commercial banks limiting their exposure to known, creditworthy customers.

The bankability of the C&I projects is directly linked to the credit quality of the C&I off-taker. This means that projects with larger local or foreign enterprises, and often those generating export revenues, can secure on-balance sheet finance from local banks.

However, whilst local financing institutions should be well placed to analyse the credit risk of local C&I companies, a combination of regulatory uncertainty, a limited understanding of solar projects and solar-as-a-service business models and more expensive loans, mean that they have, to date, played a limited role in financing smaller projects. Several of these smaller projects have been financed through a combination of foreign currency leasing and crowdfunding.

Such leasing companies are much less liquid than banks, but arguably can play a much more significant role at the smaller end of the C&I segment, where there may be less interest from banks (although the approach can work for larger entities too). Part of this relates to the fact that such businesses are seeking to drive profitability through the services that they provide, including maintenance, rather than through financing which, to them, is more of a necessary facilitator. However, the fact that they have a greater interest in and understanding of different aspects of renewable energy, including the value of assets at different points in the life cycle and greater ability to recycle them where there has been a default, than the average bank, can mean that they could be more informed and less conservative providers of credit than the latter.

In both the household and C&I market segments, there is therefore a need for both working capital and term finance, the former to cover the import and installation of equipment and the latter to fund credit provision to customers.

Financing solutions and needs of the sector

The financing needs of the sector can be broken down into the following, although who bears them will depend on the model employed to deliver them (such as outright purchase, leasing models etc.):

- **Capital costs.** Financing the purchase of solar panels and solar-hybrid plants (containerised) and associated electrical equipment, the majority of which are imported or paid for in hard currency, mainly US dollars. Financing is either raised up-front or by way of an annual leasing or solar-as-a-service fee; in the case of the latter, the leasing company will require working capital and term finance to finance imports.
- **Customer receivables.** Leasing or solar-as-a-service providers also require funding to support the development of their financing solutions, both in foreign and local currency.
- **Construction costs.** Projects use a range of locally manufactured items, such as steel frames for mounting solar panels, cabling, foundations, and ground works. Construction and project commissioning incur costs both in hard and local currency (for local labour).
- **Operating capital.** To pay for ongoing operations and maintenance (O&M) costs, which are typically a mix of local and hard currency related costs.

Table 2-2 provides some recent transactions that have taken place in the C&I market, although it should be noted that these examples have all been financed with hard currency to date.

Potential scale of total finance and local currency financing needs

As noted above, the C&I market is in the early stages of development, with a limited number of projects in markets outside of South Africa and East Africa. Therefore, the potential size of the market is relatively uncertain, although there are strong drivers, such as cost reduction and security of supply, behind the development of the market. The evolution of leasing and solar-as-a-service business models is adapting the market to the needs of C&I customers.

Interviews with stakeholders suggested that banks in East Africa are becoming active in the market, through support from Sunref (*Agence Française de Développement's* green finance label) and similar credit-enhanced, on-lending support provided by donor agencies. This model has been key to building an understanding of the project structures and financing risks and encouraging local banks to support C&I projects.

Table 2-2:
Examples of C&I activity in selected African countries

Crossboundary – Ghana
Financing, operating and maintaining 1.11MWp solar plant supporting a regional bottling plant located in Accra as part of a 15-year service agreement. ¹⁴
Ecoligo – Kenya
Partnered with Arriya Leasing in Kenya, providing €250k for projects with Kenyan horticulture companies. Ecoligo has directly financed a number of other projects in Kenya and Ghana.
Daystar Power – Nigeria
Formed in 2017, Daystar offers multiple financing solutions as part of its business model, including a 'power as a service' and 'solar as a service' business model. In 2019 Daystar raised US\$10m of equity from Verod Capital Management and Persistent Energy capital to finance C&I businesses. To date, it has supported projects ranging from 20kWp to 5MWp. Customers have included banks and other retail businesses. ¹⁵ Daystar is also operating in Ghana.
GAMCO Power – Tunisia
Installed nearly 223KWp of solar power across eight sites, ranging from fish farms, technology companies to guest houses.

¹⁴ Crossboundary website [online]. <<https://www.crossboundary.com/energy/projects/>>

¹⁵ (Weetracker, March 2019). Persistent Energy and Verod Capital invests US\$10 million in West African solar solutions firm Daystar Power. [online]. <<https://weetracker.com/2019/03/21/persistent-energy-and-verod-capital-invests-usd-10-mn-in-west-african-solar-solutions-firm-daystar-power/>>

C&I projects have relatively shorter paybacks, three to five years but the assets have a useful life of 15 to 20 years, and so there appears to be an opportunity to refinance initial foreign currency financing with local currency.

Role for credit enhancement products to enable local currency finance raising

With the emergence of leasing and solar-as-a-service providers, there appears to be a need for credit enhancement products to support these providers to raise local currency financing from local/ regional banks and to manage portfolio risk of leasing deals across several currencies.

However, as noted earlier, it appears that local currency finance providers have very limited appetite for investing in the C&I sector, other than through traditional on-balance sheet corporate lending to established players, due to a lack of understanding of the market, including the role of receivables as collateral and other new emerging (leasing) business models. This should improve, as these business models become more established and the leasing portfolios grow and demonstrate performance.

More work will need to be done to build up local lenders understanding of the markets.

2.1.3. Mini-grids¹⁶

Relative to grid connections, mini-grids are acknowledged to be the lowest cost solution for remote communities far from existing grids with relatively high population densities, while off-grid solutions like SHS tend to be more cost effective for areas with low population densities.¹⁷

The mini-grid sector in SSA has received over US\$250 million in committed public debt, which aims to mobilise over US\$4 billion in total investment, with the bulk of the investment coming from programmes supported by the Green Climate Fund (GCF) and the AfDB. For example, in 2016 Deutsche Bank launched the Universal Energy Access Programme to mobilise US\$3.5 billion in debt finance by 2030, by combining capital from the GCF with private sector investments to finance renewable electricity access for African households and small and medium enterprises (SMEs) in cooperation with local banks.¹⁸

The AfDB's own support has included funding rounds and partnerships totalling over US\$160 million committed to mini-grids, through a number of programmes with targeted finance and technical assistance including: the Sustainable Energy Fund for Africa (SEFA), and the Green Mini-Grid Market Development Programme, and the Facility for Energy Inclusion's On-Grid Window which lends to developers of mini-grids.

Despite these large headline figures, it is difficult to assess how they translate into actual demand in the market. For mini-grids to be commercially viable to a developer, the power demand from households and businesses has to provide an acceptable return on investment. Stakeholders estimated that a single household connection typically costs approximately US\$500 to US\$800 and household consumers typically purchased US\$2.50 to US\$5.00 worth of kWh per month, at least initially, although this can grow over time. Large numbers of commercial or small-scale industrial customers can, however, alter the commercial potential considerably.

While mini-grids have an important role to play in expanding access to energy across the continent the business models are unproven and significant challenges face the sector. See Box 2-3 for a summary of some of the main obstacles to growth of the sector.

Mini-grid business models

A 2016 study of the mini-grid market in Africa looked at how the business models differ by ownership, size, and customer strategy.¹⁹ It examined four common ownership models; public, community, private, and public-private partnership (PPP), with the latter being identified as the one with the greatest potential.

The **public utility model** is one where a utility owns and manages the mini-grid; frequently these are run on diesel and not renewables. They are financed by public funds and charge the national tariff which is not cost reflective and is therefore cross subsidised by customers connected to the main grid. In general, these are being deprioritised by utilities.²⁰

The **community model** is one where a community or a local non-governmental organisation (NGO) owns and manages

16 Green mini-grids refer to isolated grids not connected to the national electricity network and rely on renewable energy sources for power. References to mini-grids within the report refer to green mini-grids.

17 International Energy Agency (2017) Energy Access Outlook 2017: From Poverty to Prosperity; and Tilleard, Davies & Shaw (2018) Minigrids Are the Cheapest Way to Bring Electricity to 100 Million Africans Today.

18 Attia and Guay (2018) 4 Ways the Mini-Grid Market Can Avoid the Cleantech Sector's Early Failures [online]. <<https://www.greentechmedia.com/articles/read/mini-grid-market-avoid-the-pitfalls-of-cleantech#gs.F1CJB3I>> [Accessed 22 November 2018].

19 Green Mini-Grids in Sub-Saharan Africa: Analysis of Barriers to Growth and the Potential Role of the African Development Bank in Supporting the Sector, GMG MDP Document Series: n°1, December 2016.

20 Ibid.

Box 2-3: Challenges facing the private mini-grid sector

Four main challenges facing the private mini-grid sector are listed below:

1. Gaps in policy and regulatory framework

Tariffs: Private mini-grids require cost reflective tariffs and most African countries have a uniform national tariff which is applied regardless of the cost of provision. Electricity generated from mini-grids is usually more expensive than grid power, and while state-owned grids are cross-subsidised, private ones are less likely to be. Even where 100 % capex grants are provided to mini-grid projects, uniform national tariffs are often not high enough to cover opex costs in SSA, meaning that mini-grids are still unsustainable even with significant grants.

Licenses: Countries with specific regulations for private mini-grid operators (such as Kenya and Tanzania) frequently have lengthy, licensing processes. To bypass the process, developers may choose smaller mini-grids (less than 100kWp) as they are typically exempt from the regulatory regime.

Takeover by national grid: Private investors are concerned with the 'stranding' or expropriation risk of a mini-grid being taken over by an expanding national grid as most African countries do not provide information on grid expansion plans. In addition, clear rules on how the mini-grids would be integrated into the national grid are often lacking, including information around how compensation would be determined under such circumstances.

2. The lack of market data and linkages

There is a lack of data to support mini-grids at a number of levels. Nationally and regionally, grid expansion plans, policy and regulation are often unclear. Locally, demand information and income levels are difficult to determine with seasonal migration of workers further obscuring the picture. At the technology level, historical data on renewable resources may not be readily available for hydro, wind and biomass.

3. The lack of capacity of key stakeholders

While not specific to the sector, there is a lack of the skills and experience from public institutions, developers, financial institutions and project staff required to successfully manage mini-grid development.

4. The lack of access to finance

Currently, mini-grids are mainly financed through grants and concessional finance (the subsidy element often being 30 % plus), commercial equity, and infrequently through some loans. The grants, while necessary and welcomed by the sector, can also be inflexible, carry high transaction costs, and experience disbursement delays all which impact developers' cash flows hindering their ability to build pilot projects.

Source: Green Mini-Grids in Sub-Saharan Africa: Analysis of Barriers to Growth and the Potential Role of the African Development Bank in Supporting the Sector, GMG MDP Document Series: n°1, December 2016.

the mini-grid; they are typically financed by grants and small in-kind contributions such as land, labour and materials.²¹ Tariffs are typically set to cover operation and maintenance costs, with a small retention for replacement parts. This ownership model leaves minimal opportunity to scale.²²

The **private model** is one where an investor builds, owns and operates the mini-grid. The financing is often a mix of grants and private finance. The grants are typically used to cover development costs, and the cost of the distribution

network.²³ In some cases the tariffs are cost reflective where customers are able and willing to pay, and the regulatory regime allows it, else a subsidy is sought. The most successful mini-grid developers focus on anchor clients, designing and building a distribution network to service and provide them with power. Other commercial businesses are secondary and residential customers follow when housing density is sufficient. In other words, high usage C&I customers drive the economics of the mini-grid.

²¹ Ibid.

²² Ibid.

²³ Ibid.

The **PPP model** is one that combines features from the other models described above, however different parties build, own, and operate the distribution and generation of assets. This model is best suited to larger mini-grids.²⁴ There are three types of PPP mini-grid models:

- Built and owned by a public partner, operated by a private partner under a long-term O&M agreement.
- Owned by the public partner who undertakes procurement. Built by the private sector for no charge and then operates and maintains the system under a concession to recoup its investment via tariffs.
- Distribution and support infrastructure owned and built by the public partner, generation assets are owned and installed by the private sector, which is also responsible for O&M and sales of electricity.

The size of the market

The current size of the mini-grid market in Africa is small relative to other regions, but the current pipeline suggests that it is expected to grow exponentially. For example, a recent study by World Bank's Energy Sector Management Assistance Programme (ESMAP) estimated that there are currently 1,465 installed mini-grids in Africa, compared to more than 6,900 in East Asia and the Pacific and more than 9,300 in South Asia.²⁵ However, 4,061 mini-grids are planned on the continent, accounting for 54% of globally planned investments.²⁶ The two largest markets for future growth are expected to be Nigeria and Senegal, accounting for 50% of Africa's future planned investment.²⁷ Efforts to size the potential mini-grid market in African countries have focused on the potential areas for the sector to grow, through sizing unserved areas where mini-grids are a cost-effective way of providing electricity, compared with national grid expansion and other off-grid solutions. These estimates are also often subject to significant assumptions on cost efficiencies being achieved in the short- to medium-term to improve the affordability to households and businesses they would serve. They are not, however, estimating actual real effective demand.

One 2017 study focused on Kenya, Senegal, Tanzania, and Uganda assessed the total addressable market for mini-grids by looking at the size of the market without current access to electricity and the portion of that market with the ability to pay for mini-grid access.²⁸ The countries were chosen because of their favourable regulatory environments and existing track record of mini-grid development. They estimated the total annual revenue across the four countries

at US\$750 million (doubling if mini-grid costs were reduced by 50%).²⁹ In Kenya, the government has been working with the World Bank's ESMAP to develop a National Electrification Strategy (NES) to meet a target of universal electrification by 2022, with mini-grids playing an important part in reaching this target. The national utility Kenya Power and Lighting Company (KPLC) is looking to build on its experience of developing and operating 27 mini-grids through its plans to develop 23 additional mini-grids at a cost of US\$6.7 million.³⁰ But private sector provision is also expected to play an important role, building on the private sector operators currently operating 21 mini-grids as of 2017.³¹ To support the growth of the mini-grid market, the World Bank has launched the Kenya Off-Grid Solar Access Projects for underserved counties (KOSAP), where as part of an overall US\$150 million of lending, US\$40 million will be dedicated to supporting mini-grids for rural populations.³²

According to market reports and stakeholders, Nigeria is expected to be one of the countries in SSA with the greatest mini-grid potential. Box 2-4 specifically looks at the pipeline for mini-grids in Nigeria.

Demand for local currency finance

Both developers and investors indicated that local currency finance would be welcomed to finance ongoing operating costs and to purchase equipment which is procured locally.

Mini-grid developers, without exception, emphasised the continued need for grants covering from 30 to 50% of their costs. While they expressed a demand for local currency, it was always caveated as competitively priced local currency. The rates they indicated they needed for 10-year tenors are unlikely to be achievable even if the provider reflected fully a credit enhancement product in their pricing (and evidence suggests that this is often not the case).

The evidence from the specific country diagnostic studies include:

- Demand for finance in **Ghana** is limited given that only an isolated number of developers are operating at any scale, and for those that are, future growth could be limited by the extent to which the government is committed to expanding the private provision of mini-grids. Even with a government commitment, commercial lending rates (26 - 30%) and tenors (maximum three years) are not close to being at the levels needed to make private sector

24 Ibid.

25 ESMAP (2019), *Mini Grids for Half a Billion People: Market Outlook and Handbook for Decision Makers*.

26 Ibid.

27 Ibid.

28 Rocky Mountain Institute (2017) *Energy Within Reach: Growing the Minigrid Market in Sub-Saharan Africa*.

29 Ibid.

30 Micro Grid Knowledge (2019), *Kenya Continues Rollout of Off-Grid Minigrids* [online]. Accessed at: <https://microgridknowledge.com/kenya-off-grid-minigrids/>

31 World Bank (2017). *Mini Grids in Kenya: A Case Study of a Market at a Turning Point*.

32 World Bank (2017). *Off-grid Solar Access Project for Underserved Counties: Project Appraisal Document*.

Box 2-4: The mini-grid pipeline in Nigeria

Several Nigerian developers have business plans that suggest they are expecting strong growth in the number and size of the mini-grid programmes being rolling out over the next five years. However, according to the available research it seems that the market will continue to be driven by subsidy/ donor programmes. One of the main drivers of mini-grid programmes, is the 'Off-grid opportunity in Nigeria' report published by the Nigerian Rural Electrification Agency (REA), which suggests that there is a potential demand to establish 10,000 mini-grids of up to 100kW each by 2023 and still only meet 30 % of the total demand in Nigeria.

The Nigeria Electrification Project (NEP) is a Federal Government initiative that seeks to provide electricity access to households, micro, small and medium enterprises in off grid communities across the country through mini grid and standalone solar systems. NEP is being implemented by the Rural Electrification Agency (REA) in collaboration with the World Bank, AfDB and other partners. The World Bank and AfDB have approved financing of US\$350 million and US\$200 million to the Project, respectively, of which over 40% of the funds will provide grant funding to private sector mini grid developers. The mini grid components include roll out of a minimum subsidy tender to electrify selected communities that have high economic growth potential, and a performance-based grant programme that developers may use to electrify the communities of their choice. Mini-grids developed under the programme are expected to serve a minimum of 105,000 households and 24,000 local businesses¹.

1 AFDB financed Nigeria Electrification Project expected results

provision commercially viable, which would need to be around 14% in local currency terms with tenors of five to seven years. Notwithstanding this, a key developer in the market indicated that if it were able to obtain finance on reasonable terms, it would be able to expand its network with 200 additional mini-grids costing US\$15 million equivalent over the next two years.

- In **Kenya**, as with other countries, business models are currently nascent, limiting the willingness of banks

to lend, with one stakeholder indicating that there are only two or three mini-grid developers operating with positive cash flows in Kenya. Mini-grid developers in Kenya will also need grants if they are to compete with grid-connected tariffs in future, given KPLC intentions to reduce its retail prices by as much as 50%.

- Based on consultations with seven mini-grid developers in **Nigeria**, access to local currency debt finance was highlighted as the main constraint to growth, yet commercial bank rates in the country at the time of writing ranged from 22% to 28%, far above what developers need to obtain internal rates of returns of around 15 to 17%, which would require interest rates of around 10%. If developers are able to access these rates, the sector is more likely to be able to meet its expected private investment needs, which is estimated at c.US\$220 million according to recent studies.³³

Impact investors and DFIs indicated that they are starting to explore the mini-grid market. They acknowledged the development case for mini-grids, however, the prevailing (albeit nascent) view was that the sector presented a number of significant challenges and the business model remained unproven on a commercial basis.

2.2. Supply of finance

An analysis of the supply of finance illustrates the largely hard currency nature of debt financing across market segments and the relatively limited role of local currency finance, although there are instances of the latter which potentially can be built on, through a mix of appropriate investment structuring and credit enhancement. Overall, the importance of DFIs and impact investors in financing can be seen.

2.2.1. Commercial banks

In most African countries commercial banks might be expected to be the most active finance providers in these markets. From consultations with market participants, however, the consensus is that to date, banks have had a generally limited appetite given the availability of alternative investments, especially government securities, except where they have well established banking relationships with participants within the sector. To a degree, though, there is some evidence that some of the network banks in SSA (i.e. the banks with operations in several countries and reasonable access to foreign exchange) have shown an interest and could be worked with to understand in more detail what products could help to unlock more local finance for the renewables sector.³⁴

33 GIZ (2019). Accelerating mini-grid development in Nigeria.

34 The term "national" bank refers to banks that have only limited international operations, particularly outside of Africa.

Commercial banks' ability to provide local currency finance

Across Africa commercial banks often face hard macroeconomic and regulatory constraints that limit their ability to provide term local currency finance. In particular, the absence of long-term savings makes it difficult for the banks to source long-term capital in local currency (and hard currency for some of the national banks). The banks would face a liability mismatch if they tried to provide long-term debt. Therefore, even the network banks find it difficult to offer tenors in excess of seven years in local currency in African markets. For instance, in the case of IPP projects that need tenors of up to 15 years, it becomes difficult for banks to participate. From a regulatory perspective, more stringent capital adequacy requirements prescribed by the Basel Committee on Banking Supervision (BCBS), the Basel III requirements, are currently being adopted by local and network banks on the continent. These include two new minimum standards for funding liquidity, the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR), which are expected to constrain local commercial banks' capacity in offering long tenor debt financing.

An additional issue is that the local currency provided by commercial banks struggles to compete with the hard currency provided by DFIs. Commercial banks must charge high interest rates in part due to the inflation experienced in their countries, which in turn increases wholesale rates driven by tight monetary policies; they also typically have to apply variable interest rates (because of the absence of hedging markets) whereas DFIs can provide fixed-rate hard currency debt products. In current market conditions, DFIs are able to source debt relatively cheaply; even if a local currency finance option is available, the hard currency option is generally cheaper (not taking account of the issues around FX risk previously discussed).

In addition to these 'hard' constraints, the banks also have limited capacity to provide local currency finance to the sector:

- Generally, the banks (apart from a few network banks) have limited experience executing these types of deals, making it time consuming and difficult to complete transactions involving them.
- It is not clear that they understand certain segments of the market, particularly the SHS companies. Interviewees suggested that the banks are not yet able to appraise the nature of the credit risk posed by the companies' consumer receivables. Though some thought that this understanding will naturally develop as the SHS market becomes more mature.

Commercial banks' appetite to provide local currency finance

Findings from the consultations were clear that commercial banks have demonstrated limited appetite for providing local currency finance in the renewables sector.

The general observation on the banking sector is that except for some of the network banks, in many African countries the industry is primarily focused on the purchase of high yielding, short term government treasuries and lacks the sophistication to assess more complex and long-term credit risks. Where credit is provided this is for well-established clients and / or those with significant amounts of collateral, especially property and cash. For instance, in Kenya interviewees indicated that the national banks are requiring 100% collateral to provide loans, and that even where donors have created specialist lending facilities the banks have not been disbursing to clients other than those with whom there are existing banking relationships.

Government debt is particularly attractive for commercial banks because it is supposedly risk-free and in some African countries, interest earned is tax-exempt as well as being treated advantageously in the calculation of capital to adequacy ratios.³⁵

A key finding from the consultations was that if guarantees were applied, banks would only make minimal, if any, reduction to the interest rate charged. As a result, unless the guarantee fee was subsidised, the all-in cost to the borrower would be greater than the interest rate initially offered had the bank already been willing to lend (which it may have been willing to do so, where adequate collateral existed). This is an important issue as first it reduces the interest and ability of local projects and businesses to borrow in local currency. Second, it creates major challenges to guarantee providers in being able to price the credit on a risk reflective basis, which undermines the ability to operate a guarantee business on a commercial basis (particularly where there are subsidized guarantees available). The experience of developers and SHS companies thus far that have tried to make use of guarantees to access local currency finance suggests that the market is therefore not quite yet ready. However, recent initiatives such as the DESCOs Financing Programme, sponsored by the AfDB and EU mentioned previously are seeking to deploy competitively priced guarantees to crowd local commercial banks into the off-grid space.

Across the different market segments reviewed, there are **a few examples of local currency finance being provided outside of the South African market in SSA**. As described in Box 2-1 in the SHS market there have been a handful

35 Berensmann, Dafe, Volz (2015). Developing local currency bond markets for long-term development financing in SSA.

of local currency transactions that involved participation from network banks, these have included both primary and secondary (consumer receivable) financing and targeted at the few large and established companies operating in the segment. Both the C&I and mini-grid segments are not receiving local currency finance from banks on a systematic basis. For IPP transactions, the African network banks have been involved in providing hard currency debt to IPP transactions, typically alongside a DFI and for projects that are effectively in receipt of some form of sovereign guarantee. However, because of the DFI dominated market, instances of local currency finance from the banks are rare.

2.2.2. Leasing companies

Given the mismatch between the financing solutions commercial banks are able to provide to the renewables sector and the sector's financing needs, from a policy perspective this could point to supporting leasing companies in the renewables sector seeking to provide credit to customers. Where these are new market entrants solely focused on this sector, these entities can struggle to obtain finance. Credit guarantees on their capital raising could play a significant role in channelling credit into the sector.

2.2.3. Institutional investors

A potential source of finance for infrastructure more generally is investment by local institutional investors (defined for the purposes of this report as pension funds; insurance and other intermediated funds; commercial banks; wealthy individuals, and national sovereign wealth funds) capable of investing in the local currency denominated debt issues in renewable projects. Where the credit quality is sufficiently robust, institutional investors represent a good fit for both borrowers and investors due to the general characteristics of traditional long-life infrastructure assets such as IPPs: long-term steady yield with limited correlation with other asset classes are a fit with the long-term liabilities that pension funds face. In addition, infrastructure assets whose revenues are uplifted by inflation can assist pension funds to hedge the inflation risks that they face in terms of their liabilities. **The extent to which these characteristics apply to the nascent off-grid sector is, however, much more debatable. Sufficient scale and a lack of liquid instruments are also problematic.** Where some potential may arise, is through investments in securitisations of underlying debt assets with a track record of performance, which even then may need to be highly structured to meet the requirements of different investor classes.

The desk research and stakeholder interviews indicate that, for a multitude of reasons, there is presently **limited ability**

and appetite for local institutional investors to invest in even highly creditworthy large-scale renewable infrastructure projects.

Institutional investors limited ability to invest

The current size of the institutional investment market in Africa is very small. Overall, the level of assets held by institutional investors across the whole continent is lower than the assets held by the Netherlands. According to the available data, just nine countries³⁶ have over US\$10 billion of assets under management (AUM) by institutional investors.³⁷ On average, around 3% of the assets held by funds are invested in infrastructure by institutional investors in countries of the Organisation for Economic Cooperation and Development (OECD); this would imply that even in the African countries with a relatively large level of institutional investor assets, only around US\$300 million would be available to invest in all infrastructure sectors (let alone off-grid projects).

The amount that institutional investors could invest in the renewables sector could of course grow over time as economies in Africa continue to develop and more savings are directed to pension funds. However, as of 2018, there are also limits on the proportion of investments that can be directed to infrastructure assets in many African countries: in Nigeria, 5% of pension fund assets can be allocated to infrastructure funds (or directly into infrastructure related projects) and up to 15% in infrastructure bonds; in Kenya, up to 5% can be invested in infrastructure, though it has yet to be designated as a specific asset class.

A review of the IPP transactions completed in the renewables sector over the past ten years found limited evidence of local institutional investors investing directly in renewable projects unless they are operational. Across most countries in SSA institutional investors continue to concentrate their investments in government debt: In Nigeria, 70% of pension fund assets are currently invested in Federal Government of Nigeria (FGN) securities; in Kenya around two-thirds of investment is in government securities.

Even if attractive yields could be achieved by investing in renewable projects, institutional investors are cautious over taking on risks that they do not fully understand, particularly construction risk. Given the limited pipeline of renewable projects that are reaching financial close in the African market, there is limited incentive for institutional investors to deploy the resources needed to develop the skills required to assess the risks associated with greenfield renewable projects.

36 South Africa, Nigeria, Kenya, Morocco, Botswana, Namibia, Egypt, Morocco and Libya.

37 Ashiagbor (2014). Pension Funds and Private Equity: Unlocking Africa's Potential; PwC (2017), Nigeria Pensions Commission for data on Insurance companies and pension funds; and Diallo et al. (2016) Sovereign Wealth Funds and Long-Term Investments in Sub-Saharan Africa.

Operational assets with a track record of performance would be the more obvious entry point for such investors. However, the current dominance of the US dollar-based, debt project financing model of DFIs and commercial banks in the IPP market does not readily facilitate such investment by local institutional investors.

There is also no evidence that institutional investors have shown an appetite for investing in either the mini-grid, C&I or SHS segments of the renewable market. These business models are not mature enough to be able to attract institutional investors; the information provided by SHS companies suggests that pension funds simply do not understand the market at present.

2.2.4. The roles of other credit providers

More widely, given the limited role of local and international commercial banks, as well as institutional investors, in Africa in financing these market segments, both hard currency and to a lesser extent, local currency credit is mainly being provided by other entities.

DFIs

DFIs have played an important role in providing hard currency debt to greenfield renewable IPPs using the PPA secured, project finance model. Once these projects become operational and are producing a steady and proven cash-flow, they become much more attractive to local institutional investors. This is because the operational assets offer long-term steady yield with limited correlation with other asset classes, making them a good fit with the long-term liabilities that institutional investors face.

DFIs could in theory help to create demand from local institutional investors by recycling their operational renewable assets. This would involve them divesting the performing renewable loans on their balance sheet. The brownfield loans could be put together in a securitisation vehicle and sold as local currency bonds to local institutional investors including local national/ network banks. This approach would free up DFI's capacity to support more greenfield projects whilst introducing a local currency tranche to renewables projects.³⁸

However, the available evidence suggests that DFIs are not willing and/ or able to recycle their operational assets in the renewables sector, as there are very few instances where DFIs opened up their transactions to create a product that

would enable the introduction of a local currency tranche to the financing package.

There are a few examples of transactions that have involved refinancing:

- In 2018, the AfDB, the International Finance Corporation (IFC) and some other DFIs approved an c.US\$400 million refinancing package for the Bujagali hydro project in Uganda.
- In 2017, FMO and the Belgian Investment Company for Developing Countries agreed a €24 million refinancing package for the Bokhol solar plant in Senegal.

In neither of these instances did the refinancing transaction lead to the introduction of local currency debt provided by local institutions. In the case of Bujagali, the deal was agreed to extend the tenor of the senior and subordinated loans, in order to reduce the annual debt service payments; while in the case of Bokhol, the debt was to refinance a bridge loan that had been provided by Green Africa Power (a former PIDG company).^{39,40}

This is an issue that needs to be considered in more detail, but there are constraints that limit the ability of DFIs to recycle their performing assets. For instance, when the DFIs originally provide the debt, they price it based on the assumption that it will be held to term; they might find it challenging to be able to sell the bonds at market rates without affecting their own position. Furthermore, the ability to recycle the assets requires the existence of active capital markets, which are only present in a few African countries. There are also some practical concerns around the cost and time taken to arrange the refinancing transactions; the Bujagali deal took around two years to arrange. Therefore, a more complicated deal involving the introduction of local currency investors could imply disproportionate transaction costs.

If there was a desire to incorporate a DFI-local currency tranche in a project financing which would be attractive to local institutional investors, this could be facilitated by the initial DFI investment being refinanced out, once the project was operational. As such, this would involve the project's financing being designed up front for local currency financing, as this is difficult to achieve after the event, not least given that the PPA would be denominated solely in hard currency. Given the differential in pricing between hard currency and local currency, the primary financing could be

38 See for instance, Collier and Mayer (2014) *Unlocking Private Finance for African Infrastructure*.

39 AfDB (2018) Consortium Delivers Bujagali Refinancing to Reduce Ugandan Electricity Costs. [Online] <<https://www.afdb.org/en/news-and-events/consortium-delivers-bujagali-refinancing-to-reduce-ugandan-electricity-costs-18361/>> [Accessed 23 November 2018]

40 BIO (n.d.) SynergySenergy 2. [Online] <<http://www.bio-invest.be/en/portfolio/details/252.html?mn=8>> [Accessed 23 November 2018]

through a mezzanine instrument. Once operational there would be less need for as much risk capital, which could be replaced by local currency denominated senior notes, with a credit wrap. The replacement of a hard currency mezzanine finance tranche with local currency denominated senior debt was recently achieved by a GuarantCo backed project in the Philippines.⁴¹ As previously noted however, presently these types of transactions are almost exclusively on-grid.

Other DFI financing solutions include dedicated off-grid specific financing vehicles. For example, the African Development Bank had launched the Facility for Energy Inclusion (FEI) in 2018, a US\$500 million debt fund focusing on providing senior and mezzanine debt financing to small-scale renewable energy projects. The fund has two autonomous windows, one of which is the pan-African US\$100-150 million Off-Grid Energy Access Fund (OGEF) which will support off-grid energy access companies through local currency corporate loans, secured loans and securitises receivables transactions as well as technical assistance. OGEF has reached final equity close as of November 2019 with contributions from the AfDB, the Global Environment Facility (GEF), the European Commission, KfW, the Nordic Development Fund and private institutional investors. FEI OGEF is managed by Lion's Head Global Partners, an investment bank.

Impact investors and crowd funders

Impact investors play a significant role in the off-grid primary finance market, with crowd funding investment platforms playing a growing albeit nascent role in the sector. Both impact investors and crowd funders indicated that while their focus has been on SHS, they are starting to look more at mini-grid opportunities. However, they all noted concerns around the present business models and track record in Africa and thought the longer tenor requirements of developers did not necessarily align well with their own business models.

Few impact investors offer local currency at present. One example of a company offering local currency is Oikocredit, which is primarily a microfinance investor and renewable energy makes up only a small part of its portfolio. Oikocredit use the Currency Exchange (TCX) to hedge in some cases or takes the currency risk themselves and reflects that in their terms. The impact investors consulted indicated that local currency would be helpful for the SHS companies they have been investing in, but they would pass on the cost of a guarantee to the borrowers and they felt that the additional cost could potentially make it unattractive for them. They noted that even their US dollar offers were in some instances being turned down because companies were able to attract very low cost DFI finance.

Box 2-5: Examples of impact investors supporting the SHS market with primary finance

Two notable impact investors working in the renewable energy space include:

SunFunder. Between the start of operations in 2012 to the end of Q3 2019, SunFunder closed US\$82 million worth of loans to 46 solar borrowers in emerging economies to meet their inventory, working capital and construction requirements. The company has unlocked US\$135 million from investors across three funds and KOSAP. The most active markets are East Africa followed by West Africa, with most of the loans being used for working capital and inventory. Borrowers are typically SHS companies and, increasingly, C&I, mini-grid and other productive use solar projects. Through its due diligence process, the company offers speed and flexibility alongside tailored structuring, which it sees as a complementary value add that will ultimately support the entry of local financial institutions. SunFunder's largest fund investors are DFIs with the U.S. International Development Finance Corporation (DFC) having invested US\$40 million, alongside impact and other private investors. Its blended finance structures also support the entry of increasingly commercial investors into the sector.

Oikocredit. Established in 1975 in the Netherlands, Oikocredit is a social impact investor and worldwide cooperative. It offers loans/ investment capital for microfinance institutions, cooperatives and SMEs in developing countries with a focus on the agriculture and renewable energy sectors and has developed 639 partnerships in 70 countries. Around half of their investing is done in local currency, making use of TCX to hedge exposure which is expensive. Oikocredit also provides capacity building programmes to allow its partners to operate more efficiently and effectively. Its financial resources primarily derive from private investments that have been receiving stable gross dividends since 2000. Recently it created a unit to provide debt and equity investments up to US\$10 million in renewable energy projects, mostly focused on PAYGO and they are currently looking into mini-grids.

41 Sindicatum Renewable Energy Company II. [Online] < <https://guarantco.com/portfolio/sindicatum-renewable-energy-company-ii-2/> > [Accessed 05 November 2019]

See Box 2-5 for brief profiles of two impact investors in the SHS market in Africa.

There are also a number of crowdfunding/ investment platforms that have entered in the renewable energy finance space. See Boxes 2-6 and 2-7 which describes

two companies in this area, Trine (crowdfunding) and Lendable (investment platform). Trine currently use a guarantee facility provided by the Swedish International Development Cooperation Agency (Sida) but for euro denominated transactions. They currently do not offer local currency finance.

Box 2-6: Trine – A crowd funding digital investment platform

Trine is a digital investment platform committed to procuring financing to local solar entrepreneurs in African countries, with the overall aim of providing at least 66 million people with access to clean energy by 2022. The relatively new business model uses crowd investing to enable people from across the world to support solar energy projects, currently these projects are focusing on off-grid solar. Since the Scandinavian start-up launched its first loan in 2015, the investment platform has expanded to c.10, 000 registered investors, consisting of individuals, families, offices and institutions across Europe, who have collectively financed almost €28.8 million into off-grid solar energy, as at the end of 2019.

Trine's business model: With its profit for purpose business model, all stakeholders are aligned in their risk and profit-driven motivations. The crowd investors fund the initial cost for installing the solar system, which is then repaid over time by the value of electricity produced from the solar system itself. Each financial transaction is supported by, on average, 1,000 to 1,200 people. In the meantime, successful projects deliver a return to investors, whilst alleviating energy scarcity and improving living standards.⁴²

Before April 2018, Trine was raising €250,000 to €300,000 per month. Following partnership with the United Nations' Development Programme (UNDP)⁴³ which provided an impact certificate as recognition of Trine's work in of moving towards Sustainable Development Goal (SDG) 7 on affordable and clean energy, as well as support from Sida, Trine began raising €1.5 million per month from May 2018. Sida's guarantee instrument provides financial compensation to the financier if the borrower is not able to pay back; it is a risk sharing tool.⁴⁴ For Trine, Sida covers 60% of the principal. However, Trine can distribute the guarantee from 30% to 90% between investor types.

Between June 2017 and August 2018, Trine secured €7.4 million in funding. The company itself generates profits in two different ways. When a campaign becomes fully funded through the digital platform, the solar partner pays Trine an arranger fee of approximately 5% of the total loan. Trine splits the total interest on loans equally with the crowd, meaning if the investor earns 5% annually on the investment, Trine also earns 5% on the loan. Due to the online platform, there are very few administration costs.

A look into the future: The immediate financial needs seem substantial with West Africa being a promising new market. Trine is specifically targeting growth in Ghana, the Ivory Coast, Nigeria, and Zambia over the next two to three years. Despite discussions with TCX to develop synthetic local currency loans, as at the end of 2018 Trine did not use local currency due to the inherent risks. As the company founder, Christoffer Falsen, explains:

"The complexity of using local currency makes our business model more expensive and complex, which is why we are currently focusing on investments from private individuals and institutions in euros. Imagine – we have 1,200 investors on a single transaction in Rwanda, we need to keep this as simple as possible. However, we recognise the demand and importance of local currency... we have pushed this into an ambition for the future and are discussing piloting with support from KfW".

42 TRINE (n.d.) Changes coming with the new Loan Note Instrument.

43 TRINE (2018) UNDP and TRINE partner to scale-up private investment in high-impact energy projects. [Online] <<https://www.jointrine.com/article/partnership-to-scale-up-private-investment-in-high-impact-energy-projects--undp>> [Accessed 22 November 2018].

44 Sida (2016) Sida's Guarantee Instrument.

Box 2-7: Lendable – Securing debt finance for SHS companies by leveraging consumer receivables

Lendable is a finance company that enables digital lenders to secure debt financing from offshore investors against their portfolio cash-flows. It has built a technology platform and financial products to bring finance to 100 million borrowers across Africa. The business has created the first debt platform designed specifically for African alternative lenders. The platform uses a risk engine to analyse the quality of diversified receivables portfolios. The lenders include non-banking, asset backed finance providers operating in microfinance, asset financing, asset leasing and a range of pay-as-you-go services.⁴⁵ Ultimately, Lendable's mandate is to make credit accessible to those that need it most, making African consumer and SME credit a competitive asset class.

By October 2017, Lendable had completed five transactions, raising US\$2.83 million for East African alternative lenders. Typically, Lendable transactions are a purchase of consumer or SME borrowing contracts secured by productive assets. A portion of the alternative lenders' loan book is purchased, which frees up capital for lenders to make more loans and grow. To date, most contracts have been secured by SHS companies, which have typically been held back by the lack of well-priced debt.

For example, in May 2017, Lendable secured the debt financing for Raj Ushanga House (RUH), the Kenyan distributor for Azuri Technologies, which is a provider of PAYGO solar energy solutions. Under this initiative, capital is secured by future customer revenues form a high-quality portfolio of over 7,000 RUH PAYGO solar customer contracts. The Chief Executive of RUH said, "We will also be able to significantly expand the availability and variety of Azuri solar home systems in Kenya."⁴⁶

Lendable has built an asset-backed finance software platform, Maestro, to assess alternative lender financials, customer collections, and customer payment histories. It uses payment patterns and secondary data to predict future payments and to automatically price and monitor the financing facility. This enables Lendable to predict payment behaviour of SME entrepreneurs, many of whom may not have access to affordable credit.

Lendable promotes a responsible investment philosophy by conducting thorough risk assessments during due diligence, promoting the responsible use of data, and lending only based on customer' repayment capacity. In June 2018 the company joined the alliance of over 50 fintech investors and digital finance investors in launching the Global Guidelines in Amsterdam. The Guidelines are aimed at spreading the benefits of the fintech revolution more widely.

Daniel Goldfarb, CEO and co-founder of Lendable says, "We believe that responsible lending is good business. If you provide an irresponsible lending product to borrowers, over time they will respond by not repaying. As such, we invest in helping our alternative lenders improve their systems and practices to meet global standards of responsible investing."⁴⁷

2.2.5. Available credit enhancement products in the market

The currently available relevant credit enhancement products in both the African market and in Asia and Latin America are discussed below.

Box 2-8 focuses on selected providers of local currency guarantees in Africa. There are relatively few facilities that focus on providing local currency credit guarantees in the renewables sector in Africa and where they do, there are challenges to operating on a fully commercial basis.

45 ICT Practice of the World Bank Group, Lendable and Global Off-Grid Lighting Association (2018) Data Playbook for the Off-Grid Pay-As-You-Go Sector. [Online] <[http://lendablemarketplace.com/static/publications/Playbook_Draft_011818_V14\(Interactive\).pdf](http://lendablemarketplace.com/static/publications/Playbook_Draft_011818_V14(Interactive).pdf)> [Accessed 22 November 2018]

46 Mwiti (2017). Rural solar energy initiative gets Sh56.6 million financial boost. [Online] <<https://www.standardmedia.co.ke/business/article/2001239140/rural-solar-energy-initiative-gets-sh56-6-million-financing-boost>> [accessed 22 November 2018].

47 Lendable (2018) Press release [Online]. <<http://lendablemarketplace.com/blog/2018/06/18/lendable-signatory-responsible-lending/>> [accessed 22 November 2018].

Box 2-8: Existing local currency guarantee providers

Selected examples of providers of local currency credit guarantees in Africa are:

GuarantCo. GuarantCo generally provides PCGs in local (and hard currencies) to support investment in infrastructure. It has received concessional financing primarily from the UK Department for International Development (DFID), the Swiss State Secretariat for Economic Affairs (SECO), FMO, Sida and the Australian Department of Foreign Affairs and Trade (DFAT). GuarantCo operates mainly across South Asia and SSA. Most of its transactions (by US\$ value) have been in India and Pakistan; in Africa it has been most active in Ghana, Nigeria and Cameroon. GuarantCo has been involved in only a few renewable transactions in Africa: it provided a US\$2.7 million guarantee to the Akuo Kita Solar project in Mali and the Kalangala Renewables project in Uganda. GuarantCo seeks to operate on a commercial basis, resulting in higher guarantee fees than more subsidised alternative providers.

InfraCredit. GuarantCo, working together with the Nigerian Sovereign Investment Authority (NSIA) sponsored the creation of InfraCredit. InfraCredit is focused on providing guarantees to support investment across the Nigerian infrastructure sector. Alongside the provision of US\$25 million paid-in capital by NSIA and US\$50 million callable capital by GuarantCo, the Africa Finance Corporation has provided US\$25 million in equity investment in the initiative. In addition, KfW recently committed to investing the dollar equivalent of €31 million in the form of subordinated capital and in April 2019, AfDB approved a US\$15 million investment package. InfraCredit can provide guarantees up to 100%; they are irrevocable and unconditional, but not accelerable. It has completed two transactions to date. Because of the issues faced in the market it has had to focus much of its efforts in carrying out technical assistance to build the capacity of banks and pension funds to understand how to appraise infrastructure opportunities as well as how to price-in the value of the guarantees that InfraCredit provides. InfraCredit is interesting both because it is focused on institutional investors, particularly pension funds and the fact that its unit of account is Nigerian naira, rather than US dollars. As such it can invest its treasury resources in naira without facing exchange rate risk, as a result benefiting from higher yields.

Africa Guarantee Fund (AGF). AGF, was set up in 2011 to support SMEs in Africa. It typically provides conditional portfolio guarantees in the currency of the underlying financing. The fund is incorporated in Mauritius and has registered offices in both Kenya and Togo. AGF received initial funding from the governments of both Denmark (US\$20 million), Spain (US\$20 million) as well as from the AfDB (US\$10 million). It has subsequently raised additional investment to strengthen its capital base from the French Development Agency (AFD), and the Nordic Development Fund (NDF). AGF's 2018 Annual Report states that it has developed a portfolio of US\$515 million across 40 countries in Africa. Through these guarantees it reports that it has facilitated 20,500 SMEs to access loans from AGF's partner financial institutions. The average tenor of an AGF guarantee is five years. Approximately 70% or more of AGF's capital is first loss and very patient, essentially earning a sub-market rate of return that is important in enabling its economics to work.

Development Credit Authority (DCA). The DCA is run by the United States Agency for International Development (USAID). The guarantees are backed by the US Treasury and typically provided as a 50% pari passu guarantee on loan principal (not on interest or any fees) with concessional pricing. The guarantee can support both local and hard currency and be applied to individual projects, loan portfolios, bonds and portable guarantees (where the borrower can effectively shop for financing from multiple lenders using the guarantee to try to get better terms). In operation since 1999, DCA has a reported portfolio of US\$5.5 billion across 80 countries. It operates across sectors, however only 2% of the transactions have been focused on the infrastructure sector.

There are some examples of successful credit enhancement platforms outside of Africa and some of these are discussed below. It is worth noting however, that these are in countries with more developed financial markets and where there is a stronger pipeline of bankable projects.

These platforms require fewer subsidies and operate on a more commercial basis than how a comparable platform could expect to engage in the countries examined for this study. One example is the Credit Guarantee & Investment Facility (CGIF) in Asia. Details of this initiative are provided in Box 2-9.

Box 2-9: The Credit Guarantee & Investment Facility (CGIF)

CGIF is a multi-donor trust fund housed in the Asian Development Bank (ADB) to develop and strengthen local currency and regional bond markets in the Association of South East Nations (ASEAN), and forms a core component of the Asian Bond Markets Initiative (ABMI). CGIF was established in 2010 and commenced operations in 2012, after receiving an initial paid in capital of US\$700 million with funding from China (US\$200 million), the Japan Bank for International Cooperation (US\$200 million), ADB (US\$130 million), the Republic of Korea (US\$100 million) and US\$70 million from ASEAN members including Malaysia, the Philippines, Singapore, Thailand, Brunei Darussalam, Vietnam, Myanmar, Cambodia and Lao PDR.

CGIF can guarantee up to US\$140 million equivalent in a single issuance up to ten years to corporates across a number of sectors, including infrastructure. For example, in 2016 CGIF supported a Php. 10.7 billion (US\$224 million equivalent) bond issuance for Aboitiz Power's geothermal energy vehicle (APRI), the proceeds of which are to be used to expand the company's renewable energy portfolio. CGIF guaranteed the issue in collaboration with ADB. CGIF also launched its Construction Period Guarantee in 2016, which provides support to investors who are unwilling to take construction risk on greenfield infrastructure projects.

CGIF has a global long-term AA rating from Standard and Poor's (June 2017). It was ranked third (to the World Bank Group and AfDB) in the amounts mobilised by multilateral guarantees over the period 2012 – 2015. As at the end of 2017 it had issued 14 guarantees, insuring between 75% to 100% of the issue size. It has supported projects across Thailand, Indonesia, Singapore, Vietnam and the Philippines.

available local currency financing solutions, including credit enhancement options.

- **Supply side.** Lenders need to be encouraged to provide debt to renewables businesses and projects; in most instances, this involves mitigating credit risks and addressing any liquidity risks that providers of credit face.

In theory, different forms of credit guarantees should reduce credit risk to lenders, who in turn should be able to reduce their pricing to reflect the reduced risk, making the pricing more competitive to borrowers and leading to a greater uptake of local currency debt finance. For this theory to operate in practice however two key conditions must be met:

- First, the role of the credit guarantee in reducing risk must be recognised in terms of lower underlying debt pricing on the part of the credit providers.
- Second, the credit provider must have access to enough liquidity in order to be able to provide the required debt tenor or term.

The research has confirmed that liquidity remains an issue within many African banking systems, with lenders in several of the countries considered lacking the required liquidity the long-term finance necessary for off-grid renewable projects to be viable. A way to address this has been to provide banks with either long term debt finance of their own or to allow a means to exit from long term lending in the event of a need for liquidity.

Even where enough liquidity is available or where it has been created, the single greatest impediment to term local currency debt finance is the willingness of lenders to take the protection of a credit guarantee into account in their pricing. So, whilst a guarantee can compensate to varying degrees for an absence of collateral, as part of a security package, there are only limited, if any, pricing benefits to the borrower, who continues to face high borrowing costs due to a combination of high wholesale rates and lending margins. A guarantee, of course, is targeted on the latter; the only way the former can be addressed is if the providers of liquidity to banks do so at concessional rates (which some programmes have sought to do). In fact, as regards the margin, irrespective of whether the lending is local currency or hard currency, lending margins have remained stubbornly high. As a result, where hard currency is available, this will be preferred due to lower wholesale rates; local currency is only attractive where the wholesale rates can be subsidised.

2.3. Conclusions

There are potential advantages to using local currency debt financing for the financing of off-grid renewables projects and businesses to mitigate FX risks, but its greater use is not straightforward. Notwithstanding the existence of a range of institutional and regulatory issues there is a two-fold challenge of financing economics:

- **Demand side.** Borrowers are expected to make the most economically optimal decision based on costs and availability. Therefore, ideally, they should be encouraged to be aware of the entire spectrum of

The implications of this are that traditional lenders may not be the most promising entry point for credit guarantee interventions. Banks often have much better credit opportunities open to them than many renewables projects and nascent businesses offer.

Capital markets do not have the same degree of liquidity challenges as banks, but larger ticket items are required to address the high transaction costs. Institutional investor purchasers of capital market issues also prefer operational

as opposed to greenfield assets. Any capital market opportunities targeted at institutional investors will therefore need to be of an asset composition, scale and structure which takes these factors into account.

In many markets there are, however, new market entrants who provide both finance and renewables equipment, typically through leasing arrangements. In many instances, financing is essentially a secondary or ancillary service with them focusing most on the renewables service provision. They can also look to the renewables equipment as being their collateral when providing credit. As such, they can be both less conservative lenders than the banks and more competitive in their pricing. Unfortunately, they are often new entrants to markets, without either collateral or long-term credit history; therefore, they are unlikely to be attractive clients to traditional lenders.

Given the above, it is useful to draw out implications for the potential for guarantees to help mobilise local currency financing in the segments considered. However, there are two inter-related issues that need to be considered from a policy perspective:

- First, whether it makes sense to provide guarantees where there is no pricing benefit; or put another way, whether it makes more sense to prioritise the provision of guarantees in contexts where there are pricing benefits.
- Second, where there are no pricing benefits, it is likely that the guarantee pricing will need to be subsidized in some way, either directly in the pricing or indirectly through a sub-market return on equity invested in any guarantee vehicle – and in these instances whether existing “subsidised” platforms should be built on or new ones created.

In the case of the first point, as GuarantCo has experienced, there may be few situations in which it is possible to find a debt provider that will price taking into account the benefit of a guarantee and a business or project that can accommodate the local currency cost. These situations will typically involve very experienced credit providers or else a credit rating that institutional investors can respond to. Given this, it is possible that guarantees are best targeted at capital market issues (with a likely minimum ticket size of, say US\$20 million) or in support of intermediaries raising capital who then provide funded local currency debt. This could, for instance, include leasing companies and structured capital market funds, such as securitisations; first of these involving credit or capital markets, the latter being focused on capital markets.

As regards the second point, the policy case for supporting donor-led interventions that require a degree of subsidy needs to be largely justified on the basis of preparing the ground for future more widespread commercial uptake, once markets have developed to the point where risk can be priced more efficiently. The related question to this is whether new entities should be created or whether existing platforms should be broadened and deepened.

Taking the above into account, it is useful to return to the different market segments in question and the opportunities for using guarantees to mobilise local currency finance. Overall, the greatest immediate opportunities appear to be in primary and secondary local currency financings of SHS PAYGO models, together with the C&I segment, especially where the focus is on domestic markets. Emerging leasing business models in this space could provide an important entry point. In comparison, the mini-grid market faces the greatest affordability challenge, whereas re-financings of IPP project financings should create the largest scale opportunities, the crowding out of local currency by hard currency in primary transactions makes this extremely challenging, given that PPAs have been contracted on a hard currency basis, as it will be costly to incorporate local currency financing requirements after the initial financing.

In the case of project financings, the best way to create opportunities for secondary financings which will be most attractive to institutional investors is to prepare the ground for them in a local currency primary financing. The research undertaken, however, uncovered no public financial intervention seeking to create such opportunities. This is because most of the focus of interventions is about the creation of assets; there is less consideration of how financings occur. By championing local currency solutions in support of renewable energy, rather than just supporting renewable energy, particular interventions can be transformative. This is an area which DFIs could potentially pilot.

Unless there is sufficient liquidity in credit markets, capital markets are likely to offer the greatest opportunities for credit guarantees to support local currency finance, subject to minimum scale considerations. Where there is insufficient liquidity in credit markets any guarantees policies will need to take account of the need to create liquidity, for instance through parallel provision of long-term finance or take out financing arrangements to mitigate such risks. Again, working with leasing companies as opposed to just banks may be an appropriate strategy.

Overall, many of the opportunities for supply of local currency finance will be through secondary financings where there is an operational track record, greater ability to structure opportunities as well as the potential for improved liquidity. Taken together, these bound and / or reduce risk, making them more attractive to local currency finance providers. Support to green bond issues with **credit enhancement products** are a possibility worth considering in this space.

More generally across the market segments, the best way to approach the challenges in each is to focus, as appropriate, on making a local currency financing as simple as possible by reducing costs to borrowers and improving ease of investment for finance providers. An important way of reducing costs is to mitigate transaction costs, especially

those which add to the costs of local financing, for instance in terms of structuring securitisation vehicles. A key focus of supply side interventions is to ensure risks are better understood, as well as structuring opportunities in ways that make them attractive to target finance providers.

The interventions required to achieve more opportunities for local currency financing across the market segments are therefore varied and wide-ranging but arguably involve significant innovation in designing solutions rather than creating new financing vehicles with all their attendant structuring and intermediation costs (especially where transactions are likely to be – at least initially – on something of a pilot basis). Moreover, there are existing guarantee platforms, many facing their own limited deal-flow.

Chapter 3

Ghana Country Diagnostic

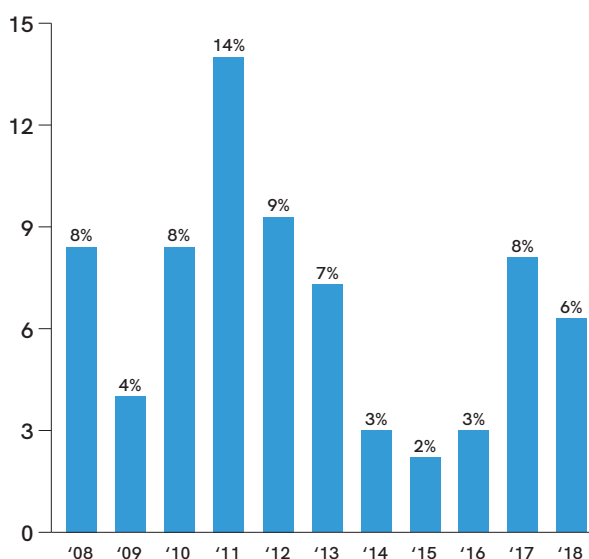


Figure 3-1:
Ghana real GDP growth 2008 to 2018 (constant prices)
Source: Ghana Statistics Service.

3.1. Macroeconomic overview

This section focuses on the key macroeconomic policy issues that could affect the viability of introducing a local currency credit guarantee product in the market: foreign exchange policies and interest rates.

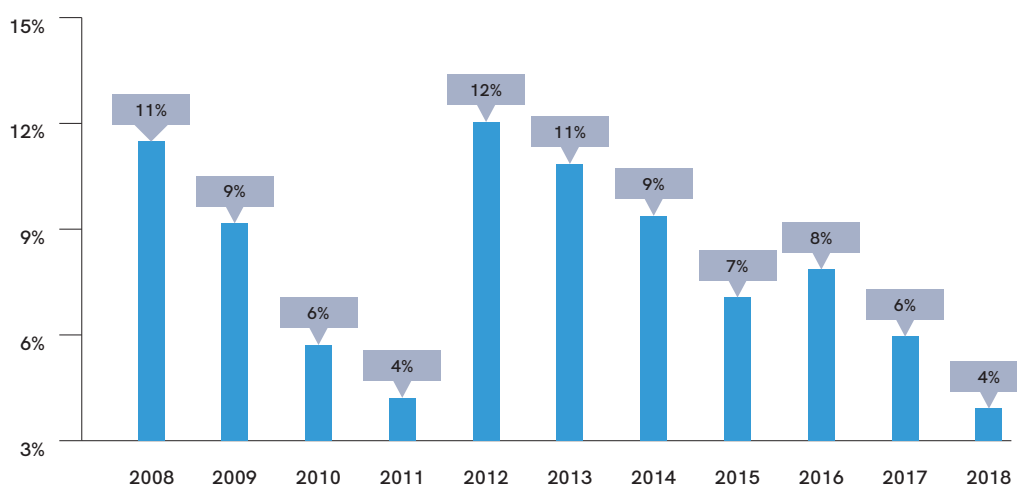
Ghana is a lower-middle income country whose economic performance has been mixed over the past decade. This is summarised in Figure 3-1 below, which shows the economy's real GDP growth over the past ten years.

It achieved its lower-middle income status following the commencement of oil production in 2011, when GDP grew at 14%, as the above figure shows. In 2018, crude oil accounted for 31% of total merchandise exports by value, up from 23% in 2017. This was the second largest contributor to exports, with gold accounting for 37% in 2018 and 42% in 2017 respectively, while cocoa has also been an important commodity export for Ghana for several years, accounting for 9% of exports in 2018 and 14% in 2017.

After 2011, the economy suffered because of reductions in international commodity prices (particularly oil and gold). In addition, the government failed to tackle challenges facing the energy sector, which had significant knock-on effects to other areas of the economy, particularly over the 2014-15 period. As shown in the Figure 3-2 below, the government budget deficit rose significantly prior to the 2014-15 crisis, averaging 11% of GDP between 2012 and 2014.

The high deficits led to the government adopting a stabilisation plan with support from the International Monetary Fund (IMF) and the World Bank in 2015. This included a three-year, US\$918 million Extended Credit Facility that was provided by the IMF to support the medium-term economic reform programme, which specifically focused on reducing

Figure 3-2:
Ghana government budget deficits as a %age of GDP (nominal)
Source: Bank of Ghana. *Note that data for Q4 2009 was not available, and therefore has been estimated using a quarterly average for the other quarters in 2009.



fiscal deficits and subsequently Ghana's debt burden. Ghana also introduced strict controls on hard currency to limit outflows, although these were widely seen as being ineffective and were revised only a few months later.

Following this period, economic growth stabilised, with growth rates of 8.1% in 2017, 6.3% in 2018 (the latter was above IMF expectations), and a growth rate of 7.6% for 2019 is expected, according to the World Bank. In addition, as the figure above shows, fiscal deficits have also reduced in recent years, reaching 4% in 2018, the lowest level since 2011 when Ghana experienced its high economic growth rate.

Exchange rates

As Ghana is an import-dependent country, domestic economic growth causes demand for imports to increase. If this is not coupled with corresponding increases in export revenues (which is often the case given that its export revenues from oil, gold, coffee and cocoa are highly dependent on international commodity prices), the cedi will depreciate as demand for hard currency outstrips earnings from exports. This hence points to key structural issues in the economy that Ghana has yet to resolve.

Currency fluctuations have tended to follow Ghana's wider macroeconomic conditions. Following the rebasing of the Ghanaian cedi in July 2007, where four zeros were removed from the currency, it has gone through periods of stable as well as significant depreciation against the US dollar.

As shown in Figure 3-3 below, the cedi has depreciated relatively consistently over time, but a significant drop against the dollar was experienced between 2013 and 2015, when the country experienced lower export revenues, energy rationing and a slowdown in key industrial sectors that weighed heavily on economic activity. The upward trend has continued since then, although it has been more volatile around this trend. As of late October 2019, the cedi was trading at 5.46 against the dollar, up from 0.92 in 2007, representing an 83% reduction in the value of the cedi.

A relatively large devaluation of the cedi also took place in February and March of 2019, making it one of the worst performing currencies in 2019 against 140 currencies tracked by Bloomberg. According to government sources, the underlying cause of the depreciation was financial market speculation. There was false reporting about the Bank of Ghana (BoG) spending its reserves to avoid further depreciation of the cedi. Such action would be in breach of conditions made as part of its IMF bailout that prevents BoG from intervening in the market by selling currency reserves to prop up the cedi. In response to this, the government negotiated a US\$750 million bridge loan with Standard Chartered and Standard Bank to increase liquidity in the local forex market and refinanced this with a US\$3 billion Eurobond in March 2019.

Interests rates and financial markets

Ghana has experienced periods of high inflation over the past two decades. Since 2007, BoG has put in place an

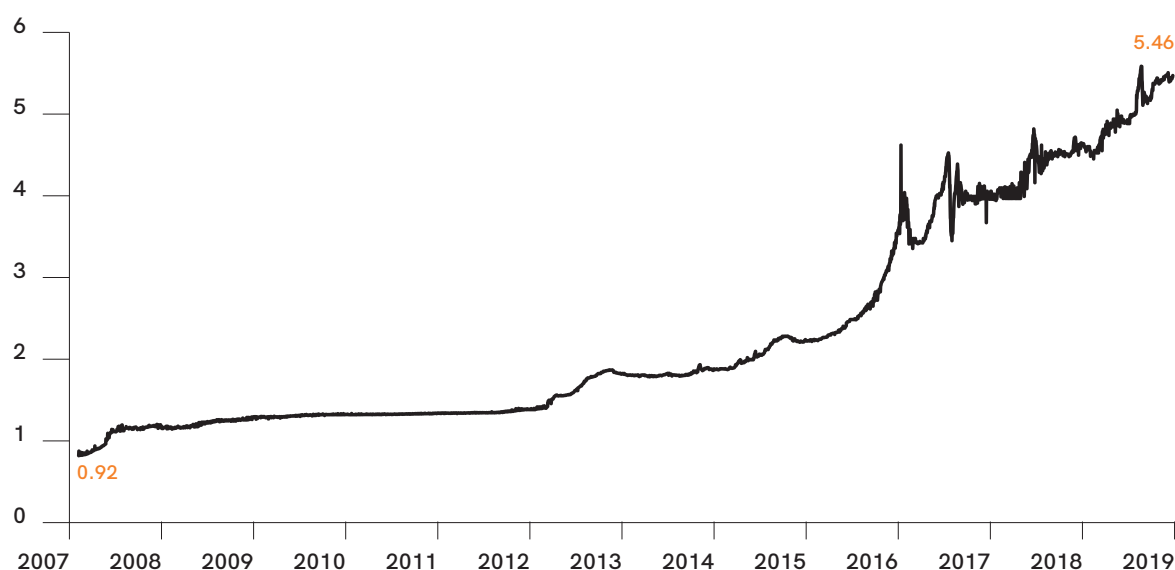


Figure 3-3:
Exchange rate 2007 – 2019 (cedi to 1 US dollar)
Source: Bloomberg

official inflation target, which has varied over time.⁴⁸ Since 2015, this target has remained at 8% +/- 2%. During the initial periods of high inflation, the central bank was unable to meet its target, and above target inflation was also experienced during the difficult economic period of 2014 to 2016. In more recent years, inflation has been relatively controlled, falling within the target range consistently since 2018. Central bank interest rates have tended to move along similar trends to inflation to try and meet inflation targets, and as of September 2019 policy rates had fallen to 16%. In recent years, the governor of the BoG has also suggested lowering the central bank target in order to help stabilize inflation further and improve the country's competitiveness.

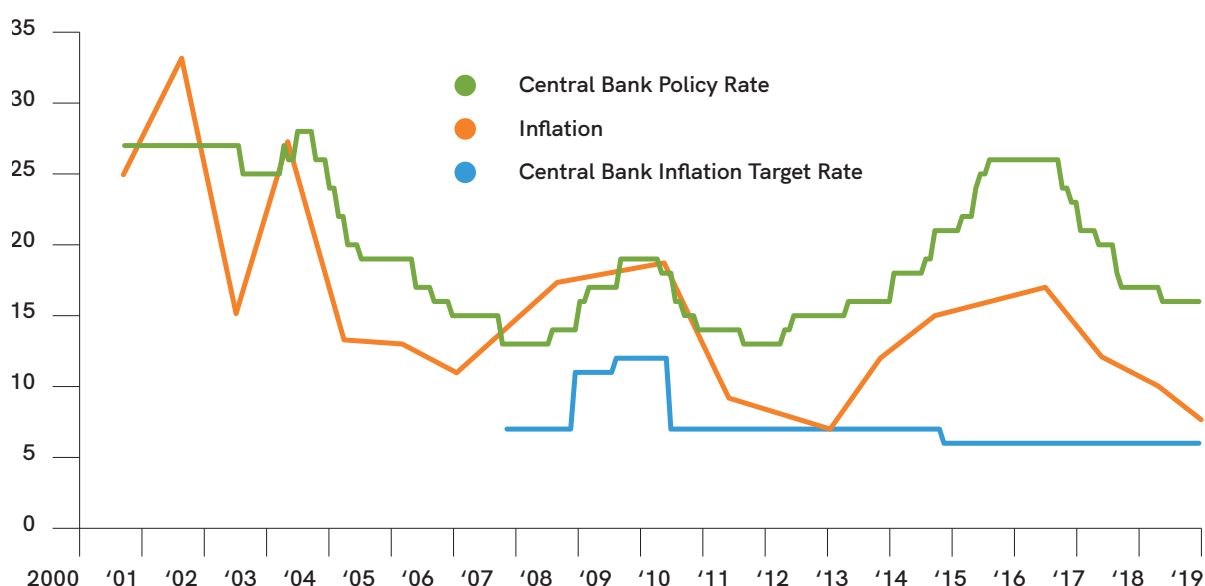
Interviewees suggested that a high proportion of institutional investor capital has been invested in government securities, particularly at the shorter end of the market. For example, most private pension stakeholders noted that funds are up to their limit of 60% of assets allocated to central government securities. As shown by the yield curve below, yields are currently between 14.5% and 18%, and issuances beyond seven-year tenors have been limited.

More generally, the financial market in Ghana is heavily dependent on government issuances and the secondary market for government paper, with corporate debt issuances being very limited. Many lenders also seem cautious about lending to corporate borrowers because of instabilities in the system, recent high default rates and a cleaning of the banking system that have made many lenders even more cautious about extending credit to the private sector. This partly explains why corporate lending rates are currently averaging in the mid to high 20%.

3.2. Power sector overview

The Ministry of Energy in Ghana is responsible for formulating and implementing energy policy, in addition to coordinating the activities of the agencies within Ghana's Energy Sector. The Energy Commission, set up in 1997, acts as an advisor to the government on energy-related matters, in addition to regulating, licensing, managing and developing indigenous energy resources. The Public Utilities Regulatory Commission (PURC) regulates the provision of utility services. Energy is generated by both private and public companies and transmitted by the publicly owned Ghana Grid Company to distribution companies. The Electricity Company of Ghana (ECG) is the main electricity distributor.

Figure 3-4:
BoG policy interest rate, inflation, and inflation target⁴⁹
Source: IMF; Bank of Ghana. Policy rates based on monthly data, while inflation is based on annual data.



⁴⁸ An unofficial target has been in place since 2002.

⁴⁹ The target ranges are included from 2007, when BoG first adopted an official inflation target. Ranges vary over time to reflect changes to the targets made by BoG.

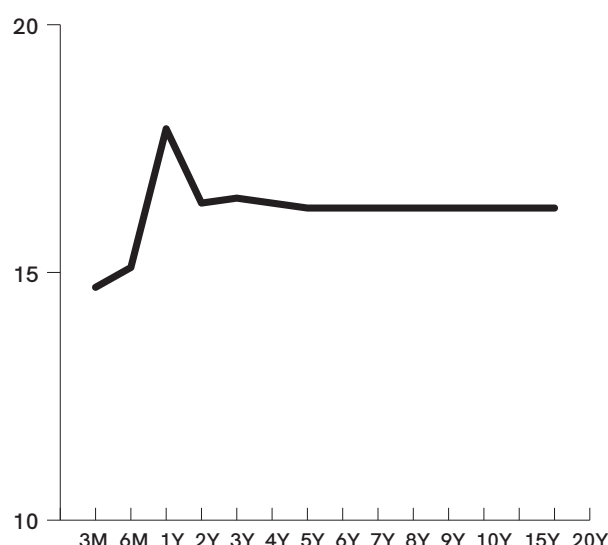


Figure 3-5:
Government of Ghana yield curve (implied as of October 2019).
Source: Bloomberg

Ghana has been able to significantly increase access to the grid in recent years, with the proportion of people with access to electricity increasing from 45% to 84% between 2000 and 2018, which makes its electricity penetration among the highest in SSA.⁵⁰ Under the government's National Electrification Scheme, which has been running since 1989, it had been aiming to attain universal access by 2020. However, given the relatively low coverage rates in rural areas, particularly in the Northern (74%), Upper East (70%) and Western (73%) regions, this is unlikely to be achieved.⁵¹ In addition, many stakeholders noted that while these rates may appear high, the true connection figures are actually much lower as they include areas that have distribution lines but where final connections to households have not yet been made.

Despite the growth in access rates, Ghana's energy sector has faced several challenges. Historically Ghana has relied on hydropower for a high proportion of its energy, which is provided by the government-owned Volta River Authority (VRA). Generating capacity can vary significantly depending on levels of rainfall and droughts have led to energy shortages in the past. As of 2018, total grid-connected generation capacity was 4,889MW, comprising of 32% hydro, 67% thermal and just 1% renewables⁵², derived from

three grid-connected solar plants and a small biogas plant.⁵³ Compared with the 2,525MW of peak demand there appears to be a significant over-capacity on the system.⁵⁴

Following the challenges faced during 2014-15 with limited generating capacity, the government installed a range of emergency power plants. To pay for this power and address wider solvency concerns, tariffs were increased significantly. Ghana has also fast-tracked private power plants, with 43 PPAs signed during 2014-17, mostly procured and negotiated on a non-competitive basis. This caused an overcapacity on the grid, which led to the cancellation and restructuring of several PPAs for projects that have yet to begin construction in order to avoid payment of capacity charges for idle plants. The government is currently making excess capacity payments on installed capacity, estimated at an approximate US\$500 million per year in 2019⁵⁵.

In addition, ECG has faced a range of operational challenges, including solvency issues related to not receiving payments for electricity provision from government entities estimated to be US\$1 billion by 2018, revenue collection rates averaging 91% since 2013 (in 2016 and 2017 it was only slightly above 80%) and distribution losses averaging over 25% since 2008.^{56,57,58} To address some of these challenges, the government with support from the Millennium Challenge Corporation (MCC), granted in March 2019 the concession of bulk power distribution from ECG to Power Distribution Systems (PDS), a private consortium composed of Ghanaian and international sponsors. However, by October 2019 this contract had been cancelled by the government due to alleged breaches in demand guarantees by PDS.

According to the World Bank, average tariffs in Ghana were US\$0.18/kWh at the end of 2016. Rates for C&I customers are among the highest in SSA, currently standing at US\$0.25/kWh for commercial and US\$0.16/kWh for industrial users. These are higher than tariffs for other countries in West Africa, with Cote d'Ivoire rates being US\$0.14/kWh and US\$0.09 for commercial and industrial users respectively.⁵⁹ They are also higher than rates in some developed markets, with rates in the UK standing at US\$0.16/kWh (in 2018) and US\$0.13/kWh (in 2017) for each customer segment.⁶⁰ This is despite the PURC reducing C&I tariffs by 30% for

50 Energy Commission (2019), National Energy Statistics 2009-2018.

51 Energy Commission (2018), 2018 Ghana Energy Statistics Handbook.

52 Excludes large hydro power plants.

53 Energy Commission (2019), National Energy Statistics 2009-2018.

54 Ibid.

55 International Monetary Fund (2019), 2019 Article IV Consultation. Accessed here: <https://www.imf.org/en/Publications/CR/Issues/2019/12/18/Ghana-2019-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-Executive-48883>

56 Ibid.

57 Energy Commission (2018), Ghana Energy Statistics Handbook.

58 Electricity Company of Ghana (2017), Proposal for Review of Distribution Service Charge (DSC).

59 BloombergNEF (2019) Solar for Businesses in Sub-Saharan Africa.

60 UK Department of Business Energy and Industrial Strategy (2018), Electricity Sector Tariffs for Non-Domestic consumers.

commercial customers in 2018. Although this was expected to increase demand, this did not materialise and as a result the sector continues to suffer from solvency issues.

3.3. Demand for finance

3.3.1. SHS

Market size and recent activity

According to recent reports, nearly 423,000 off-grid solar devices were sold in Ghana between 2014 and 2018, with average annual growth standing at 49%.⁶¹ In the first half of 2019, just 13,700 units were sold in the country, far less than in Nigeria (c. 135,000) and Kenya (c. 975,000), demonstrating this is currently a much smaller market.⁶² While this is somewhat small compared to figures reported for East African countries, the enabling environment for off-grid solar in Ghana is seen as highly supportive, ranking joint highest across a number of countries in Africa and South and South-East Asia for having a supportive electrification framework, fiscal and public financing support, quality standard and

certification and consumer awareness programmes.⁶³ On paper, Ghana also does not charge import duties or VAT on solar panels, and when solar kits are pre-packaged, import duties are not added to other components of the system (batteries, inverters and others accessories), but are added to these components if imported separately, which is required for larger equipment. Inverters are charged a lower import duty of 5% compared to the general duty of 20% and are not charged VAT or the National Health Insurance Levy (NHIL) of 2.5%, while for batteries import duty, VAT and NHIL are payable.

The SHS market includes a few established PAYGO companies that have also been active in other countries in the region and elsewhere in SSA. Companies vary from those providing very small-scale SHS (or “pico”) systems with up to 11Wp of capacity, which is sufficient to power a number of lights and charge phones, to larger systems that can power a household using multiple appliances replacing grid-connected power. Financing plans are provided in a variety of forms. For example, companies offering pico

Table 3-1:
Key SHS providers in Ghana (2019)
Source: CEPA analysis.

Company	Description
PEG Africa	Started operating in Ghana in 2012, and as of September 2019 was serving some 400,000 people across Ghana, Cote d'Ivoire and Senegal, mainly through sales of its pico kits (comprising small-scale solar panels, lights, phone chargers and less commonly TVs). The company has focused on providing asset financing for smaller devices, and has mainly targeted lower income households.
Zola/Off-grid Electric	SHS provider which has sold over 150,000 devices across SSA, including c.3,000 devices in Ghana since January 2018. In 2018, the company raised US\$55 million in Series D equity, which was used to support its entry into the Ghanaian market.
Azuri Technologies	SHS supplier that has been active in several countries across Africa. Launched a partnership with Oasis African Resources in 2015 to bring 100,000 off-grid home systems to Ghana. Azuri Technologies will provide the products, while Oasis African Resources will act as the local distribution company and PAYGO provider.
Translight	Licensed installer of the Ghana Energy Commission, currently providing 5MW of capacity to a range of customers, primarily middle-class households, small businesses, schools and hospitals. As of April 2019, it was looking to raise a total of US\$30 million over the next few years to implement a partnership model with local banks, focusing on larger installations.

61 World Bank Group (2018c) Off-grid solar market trends report 2018. Additional sales data was also obtained from biannual reports.

62 GOGILA (2019), Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data: January-June 2019.

63 World Bank Group (2018c) Off-grid solar market trends report 2018. Additional sales data was also obtained from biannual reports.

systems offer similar financing and payment arrangements to their East African counterparts. Specifically, customers are provided with PAYGO systems and pay for services and financing via mobile payments. However, despite mobile phone penetration rates of 130% by 2019, mobile money is less widespread than in countries such as Kenya.⁶⁴ Users also tend to load money onto payment platforms when required, rather than having excess amounts in their accounts as in Kenya where mobile money is used for a wider range of payments. This can make payment more challenging, especially in rural areas where they do not access facilities to add mobile money regularly. Companies supplying pico kits mainly target low-income households not previously connected to the grid, while those supplying larger systems are targeting both middle-income households as well as small-scale businesses. For middle-class households, financing plans can be agreed as part of the package provided by the SHS provider or distribution company, with payments being more formalised, given these customers are more likely to have a bank account.

Details of these organizations are provided in Table 3-1.

PEG Africa operates a similar business model to SHS providers in East Africa, namely that it is primarily an asset finance business offering pico solutions that, to date, have mainly benefited low-income households. For example, according to its website 50% of its customers earn less than US\$3 per day, and 89% have no access to the electricity grid. Because of the focus on these lower income households, the company has operated at a loss. This has also limited its ability to partner with telecoms companies, since these organisations are looking to promote products targeting higher income households. Financing terms are very favourable to its customers, offering local currency finance on packages ranging from GHS3,800 (c.US\$697) to GHS5,000 (c.US\$918).⁶⁵

Aside from the companies mentioned in Table 4-1 above, some smaller companies also operate in the sector and are looking at aggressive expansion. For example, Plug the Sun, which provides small devices of 150W as well as much larger devices, has been able to sell devices extensively in Latin America (including 20,000 devices in Peru as of April 2019) and established itself in Ghana in 2019. This company has the backing of Maccaferri Industrial Group, a large Italian manufacturing company that it sources a lot of its key equipment from directly. It is also looking at partnering with telecoms companies such as MTN, who will be able to sell the products as part of packages that included new internet routers, and banks who could provide credit to bank employees and customers to finance the purchase of the solar kits.

The government and donors have also sponsored programmes that are looking to support the expansion of off-grid solar to households. For example:

- As part of the **National Rooftop Solar PV Programme**, the Ministry of Energy, through the Energy Commission is aiming to facilitate the installation of 200,000 solar PV systems for residential, public, and C&I customers. Through this programme, the government will provide a capital subsidy for solar panels up to a maximum capacity of 500Wp. Customers will then be required to purchase balance of system components such as inverters, batteries, charge controllers, changeover switches, and wires etc.
- From 2007 until January 2019 the World Bank supported the government with improving access to electricity through the **Ghana Energy Development and Access Project (GEDAP)**, though it should be noted the primary focus of this has been improving the operational performance of ECG. Through this project, the government has been able to distribute 17,000 SHS to rural communities.
- In 2017, AfDB and other partners launched a US\$230 million **Scaling Up Renewable Energy Programme (SREP)**, which aimed to support the government's objectives of scaling up energy from renewable sources. One of the components of SREP includes scaling up the use of mini-grids and SHS, of which US\$83 million has been allocated, and will support the provision of 33,000 SHS.
- More recently, the World Bank has been putting forward plans to implement the **Regional Off-grid Electrification Project**, to support electricity access in 15 countries of the Economic Community of West Africa States, including Ghana, and four other countries in Central Africa. This US\$200 million project will include a work stream that focuses on mitigating barriers to access to finance, in which regional development banks will be supported by the World Bank to provide lines of credit that can be accessed by commercial banks, MFIs and other financial institutions to on-lend to improve access to SHS.

These programmes suggest there is government intention and commitment to promote off-grid, but stakeholders noted that the market has largely been private-sector driven, and that some programmes, particularly the government's National Rooftop Solar PV Programme, have shown little signs of activity. The National Rooftop Programme was launched during the power crisis to provide power for lighting and communication to support education and other vital services. With the excess generation capacity which is available to the connected 84% of the population, the focus of the rooftop programme has shifted to island

⁶⁴ Jumia (2019), Ghana Mobile Report 2019.

⁶⁵ We have used an exchange rate of GHS1 = US\$0.18 throughout the report.

communities not reachable by the grid. Despite the lack of activity, a number of stakeholders noted that as part of the government's commitment to attain universal access, it sees the SHS sector as providing a viable alternative to grid connection, especially for those without access to the grid, and therefore are supportive of the sector in these instances. On the other hand, many noted that if higher-income households start coming off the grid at a noticeable scale, this could cause a number of challenges for government given that the state utility will lose some of its best customers, which in turn would impact its financial sustainability, and increase the already surplus capacity situation in the country. A similar argument was also made for C&I customers, and details of this are provided below.

Demand for local currency finance

PEG Africa's experience of raising finance is a clear example that there are firms in the SHS market that can raise local currency. As part of a Series C funding round, PEG raised

US\$25 million equivalent (including dollars, cedis and CFA francs) as part of its strategy to reach 200,000 more households over the next four years. While the specifics of the financing are not certain nor public knowledge, stakeholders have suggested that US\$15 million of the facility is a receivables-backed multi-currency loan, of which US\$12.5 million was provided by UK CDC and US\$2.5 million was provided by SunFunder. US\$5 million was provided as a subordinated loan by ElectriFi, an investment facility backed by a number of DFIs and US\$5 million was equity provided by existing shareholders. The financing from UK CDC was provided as part of the 2X Challenge initiative launched by several DFIs from G7 countries that are looking to provide finance to companies promoting women in business. This initiative includes the use of blended finance, and as a result it is likely that the debt finance has some element of subsidy in it, rather than being fully commercial as is the case with standard DFI financing.

Box 3-1: Translight Solar and future financing arrangements

Established in December 2014, Translight is a Ghanaian SHS provider offering larger systems to more affluent customers, and to date has installed 5MW of SHS. Pricing for Translight packages average at around US\$3,000, while other providers offer packages as small as US\$200 equivalent. Given the size of its systems, Translight also targets C&I customers. Translight provides an integrated service package, and its centralised control system allows it to collect extensive data on consumer usage, as well as control the system in the event of non-payment. In 2017, the company was named the most innovative energy company at the Ghana Energy Awards. In the same year, Translight competed among 160 green companies in the 3rd West African PFAN projects competition and came out in the top five companies. After winning a place for incubation in the Ghana Climate Innovation Center programme in 2017, Translight graduated as the company with the highest potential to scale.

As part of its growth strategy, Translight was aiming to raise US\$8 million equivalent, comprising half US dollars and half Ghana cedis, which is the first phase of a US\$20 million financing programme over the 2019-2021 period. Translight will use some of these funds as collateral to provide the security needed to allow financial institutions to on-lend to businesses (60 % of customers), households (30 %) and schools (10 %) looking to install their solar technology. These customers will enter financing arrangements with the banks. In its business model, a customer who wants solar energy from Translight applies to a collaborating bank. After approval, Translight provides the solar system to the customer and is paid upfront by the bank after installation. The customer makes monthly payments to the bank. Translight guarantees the performance of the solar systems and remotely manages the installation to ensure payments and ongoing services to customers but will not be taking customer credit risk. Their plans are for the banks to assume the credit risk, supported by portfolio guarantees from AGF, although it appears that no firm arrangements are in place for the AGF guarantees as of 2019. Translight currently has financial advisors looking at different funding sources for this capital, which it is hoping to be a mix of DFI debt as well as equity. Translight has already completed the due diligence process from the Ghana Climate Venture Facility (Wangara Green Ventures), a World Bank-backed investment facility looking to support clean energy. If approved by the Wangara's Investment Committee, Translight should receive its initial equity investment before the end of 2019.

As regards the AGF support, Translight notes that many banks are still not interested, mainly because they will need a collateralised solution in place to assume the credit risk, which the Translight arrangement may be able to provide them should they be able to raise sufficient funds. However, without the collateralised element, Translight notes that this arrangement is unlikely to take off.

Source: Translight; CEPA analysis.

Between 2016 and 2017, PEG Africa benefited from a US\$1 million, one-year loan facility from Oikocredit, an impact investor that has supported renewable energy transactions across a few markets. This loan used a 50% PCG from AGF's Green Guarantee Facility (GGF), offering some precedent for how guarantees could potentially be structured for this market segment.

Beyond PEG, other SHS providers are also looking to raise local currency to finance future activities. For example, Zola is currently discussing the possibility of raising local currency with different banks using receivables-based financing. Translight Solar are also looking to raise money to scale, and plan to use a structure in order to enable banks provide credit to consumers to purchase Translight's solar equipment. Details are provided in the Box 3-1.

Translight's proposition is similar to arrangements being considered by other SHS companies, albeit on differing scales, in that companies are looking at partnering with banks to provide consumer-based finance to bank customers and/or employees, and could be an approach that credit enhancement products support. Through these arrangements, a portfolio guarantee (i.e. a credit guarantee on a portfolio of loans) would be provided to the financial institutions to on-lend to households who were able to meet pre-defined lending criteria. Some SHS companies such as Plug the Sun are currently looking at such arrangements with some of the key banks in Ghana, but talks are preliminary, and the total scale of the partnerships are likely to be below US\$250,000 equivalent.

While the SHS market in Ghana is less active than Kenya, the outlook for the sector seems promising. This includes customers not connected to the grid, which may be larger than that suggested by official figures, as well as customers who are looking for a more reliable solution to their energy needs than what the current grid offers and that costs less than diesel generation. The commercial lending in this sector may be limited by the high rates and relatively limited tenors of financing currently available. For example, many solar companies noted that for financing to work they would require debt with tenors of three to five years. Key areas of demand for local currency financing, and in turn potential transactions for credit enhancement products to support include:

- **Receivables financing** of SHS companies who are looking to raise finance directly from banks, and in turn offer financing packages to their customers.
- **Consumer finance arrangements**, which could cover either larger systems for customers who Translight and others are targeting, or smaller systems offered by Plug the Sun, Zola, and others, with credit enhancement products providing portfolio guarantees to the financial institutions.

For consumer financing arrangements, some SHS companies are assuming 30% interest rates, but in reality, the uptake of this is likely to be limited unless financing

packages are small, and customers are able to make significant savings over a short time horizon. Because of this, interest rates will need to either reduce significantly, or banks will require access to cheaper credit lines in order to pass on lower financing costs to customers.

3.3.2. Mini-grids

Market size and recent activity

Electricity provision via mini-grids in Ghana has been undertaken by both public and private sector partners. On the public sector side, the World Bank has supported the provision of five mini-grid networks through GEDAP, whereby US\$101 million of a total project funding of US\$339 million was provided to support renewable energy and electricity access. Within this, a pilot mini-grid scheme was launched to serve 10,000 people in five areas, with a total installed capacity of 1.7MW. Four of these mini-grids were built and initially operated by private contractors, before being transferred to VRA for operation, while one was transferred to ECG. The transfer of mini-grid assets and operations to state utilities was done to ensure equal electricity prices to the rural communities who are more vulnerable than the 84% who have access to cheaper grid electricity in accordance with Ghana's Energy Policy which provides for equal electricity prices in the country irrespective of geographical location. According to multiple consultees, while these mini-grids include high quality equipment and have good capacity, the cost of these projects was unsustainably high for mini-grids to really address current access needs. In addition, many felt that many more grids should have been delivered since 2010, when the project was first initiated.

Private sector provision of mini-grids has been delivered mainly by Black Star Energy, a subsidiary of Energicity, a US-based energy company. Black Star has commissioned 15 mini-grids across the Ashanti region, reaching 6,000 people (an average of 400 per grid) in total over a four-year period. The capacity of the grids ranges from 5-20kW, and costs around US\$100,000 on average. Electricity has been provided at prices that are 12% higher than grid-connected prices, but according to various stakeholders' customers have been very satisfied with the service provided, given that reliability has been over 99%, which is much better than what they could have hoped for through a grid connection. The systems themselves are slightly more basic than those provided through the World Bank programme.

To date, Black Star have been operating under a pilot license, and the prices that it can charge are negotiated and approved by the PURC. However, attempts to extend its license have been met with challenges with the government, and as a result they have not been able to expand further. Consultees noted that Ghana does not have a clear policy for mini-grids, and the regulatory environment is also unclear. As with other sectors mentioned in the report, lack of government commitment appears to be a significant and real challenge to private sector provision in the mini-grid space,

and given the option, government will always opt for public sector provision due to the belief that electricity should be provided by the state. Political risk remains the single biggest challenge for the sector expanding, so much so that Black Star have been looking at other markets, namely Sierra Leone, where policies and regulations for mini-grids are much more accepting of private sector participation. Given the current challenges around government commitment, many do not see a private sector mini-grid market evolving in the near-term, and changing the government's stance is likely to require a concerted effort from different partners for it to develop.

Demand for local currency finance

In addition to challenges with a lack of government commitment, stakeholders also noted that for commercial banks to be interested, transactions will need to be packaged together so that they are of a scale to garner interest. There is also limited understanding of the mini-grid sector in commercial banks at present, which is not helped by the need for tenors longer than the three years currently available, since mini-grid finance requires five to seven years for it to be attractive to sponsors.

Even if these issues are overcome, rates are currently too high for services to be delivered at a cost acceptable to customers. In the case of Black Star, the company has been financed by equity from impact investors to date, and the introduction of commercial loans at current rates is likely to make it difficult to maintain prices at a 12% mark-up on ECG rates and make a sustainable return. According to Black Star's internal analysis, debt would need to be offered at about 14% in cedi terms, with tenors of five to seven years, to enable tariffs to be charged at an estimated c. GHS1/kWh (or US\$0.21/kWh), based on market conditions. This is half the interest rates currently offered and is only likely to be achievable if banks have access to lower cost funds. If these tenors and rates could be offered, a credit guarantee could be applied to debt finance provided to the sector.

Regarding the pipeline, Black Star noted that accessing finance at the rates outlined above could enable them to build 200 mini-grids over a two-year period at a cost of c.US\$15 million equivalent. But such growth projections depend on whether the challenges with government commitment outlined above are overcome, as well as persuading banks to take an interest in the mini-grid sector, which is one of the more difficult sectors to generate interest for from banks. More widely, Black Star estimates the US\$500 million will be needed to serve c.6 million people via mini-grids, coming from both public and private sources. Such estimates

appear high when considering current access rates, but as noted actual access is expected to be much lower than official figures. It is also highly unlikely that such funding will be allocated to the sector in the short to medium-term.

3.3.3. Captive C&I

Market size and recent activity

The C&I sector in Ghana covers a range of industries in the economy, including small-scale SMEs, supermarkets, malls, petrol stations, hotels, restaurants, banks, pharmaceutical companies, agri-business, telecoms, manufacturing and processing plants, and heavy industry including mining and other extractive sectors, etc.

Ghana is a leading example of how businesses could significantly reduce their energy costs by switching from a grid-connection to off-grid solar, usually the grid interactive type which can be operated in synchronism with grid electricity supply at the consumers' facility. On-grid tariffs for industrial users in Ghana are estimated to be US\$0.16/kWh, while tariffs for commercial users are much higher at US\$0.25/kWh.⁶⁶ Despite recent reductions in tariffs, these rates remain among the highest in SSA, and for many customers it has been economical to switch from grid-connected tariffs to diesel generators. In comparison, the benchmark electricity costs for C&I users using off-grid solar ranges from US\$0.10/kWh to US\$0.14/kWh, suggesting that businesses could make significant ongoing cost savings by switching away from the national grid.⁶⁷ Savings on a monthly basis will be much higher once companies have fully paid for the solar equipment, especially if they are able to rely almost solely on solar installations for their power.

Aside from the cost savings, C&I customers could also benefit from more reliable power by switching to off-grid. As previously mentioned, the national utility has faced major issues in delivering a reliable service and this has posed a challenge for several businesses. While outages are less of an issue compared to the energy crisis in 2014 and 2015 (and arguably more reliable than in countries such as Nigeria), consultees noted that they are still occurring and confidence in the system is low, providing further incentives for businesses to switch to off-grid.

The estimated size of the C&I market as of 2018 was only around 7MW, although the majority of this was installed in 2017 and 2018, as highlighted in the figure below. This compares to 20MW of installed capacity in Nigeria and 15MW in Kenya.⁶⁸

⁶⁶ BloombergNEF (2019) Solar for Businesses in Sub-Saharan Africa.

⁶⁷ Ibid.

⁶⁸ Please note that due to the limited tracking of off-grid solar installations these figures may not be fully accurate. Instead, they should be interpreted as an indication of activity across these markets.

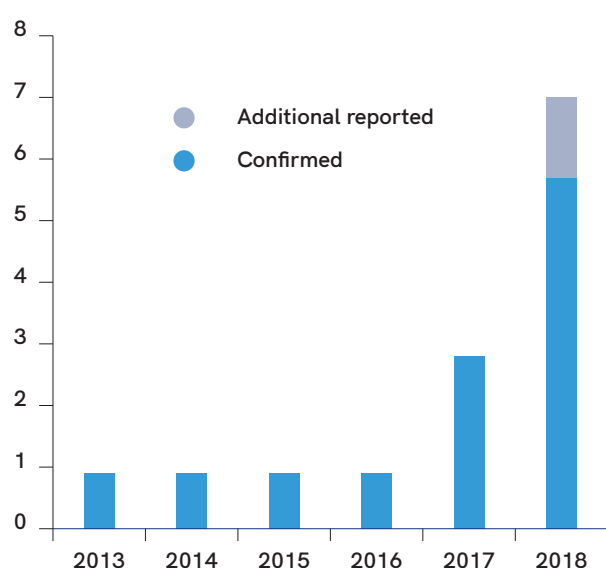


Figure 3-6:
Ghana C&I installed capacity

Source: BloombergNEF (2019). The dark blue is cumulative installed capacity of projects larger than 30kW identified in the BloombergNEF study, while the red is the gap between the tracked projects and the total installed capacity that developers reported, the commissioning year of which is unknown.

Key participants in Ghana's C&I market are highlighted in Table 3-2 below, and include developers, financiers, and installers of solar equipment in the sector. Figures in the table are based on company websites and interviews with market participants. Note that these include C&I customers but also public sector clients, partly explaining why the total installed capacity is higher than that which is reported in the headline figures above.

Table 3-2:

Key C&I companies in Ghana (2019)

Source: CEPA analysis and company websites.

Company	C&I capacity
TINO Solutions	7.5MW
Sunpower Innovations	c.3.7MW
Dutch & Co	1.4MW
Translight Solar	600kWp
Yingli Namene	c.600kWp
Franerix	590kWp
Daystar Power	227KWp

Most current installed capacity is located near industrial and mining facilities that already have a well-functioning grid connection, suggesting that cost savings are the primary drivers of projects. Most of these projects have been undertaken through direct purchases, although several companies offer rental and lease-to-own financing arrangements to customers. For example, Redavia is a German based company that leases both on-grid and off-grid containerised solar solutions to businesses and communities. In addition to its Ghana operations, Redavia also operates in Kenya and Tanzania and has received financing from InfraCo Africa, ResponsAbility and Electrifi. The Ghana-based firm, Yingli Namene, also leases solar solutions; their experience is discussed in the box below. Developers themselves understandably prefer to undertake projects through direct purchase arrangements in order to minimise the payment risk. These arrangements tend to involve partial payment pre-installation, then on completion customers pay the cost in full (some companies allow up to three months to complete payment).

There currently seems limited awareness of utilising off-grid solar as a potential power source for C&I customers, although developers believe that this is rising, with particularly strong growth expected for industrial sector clients with plants larger than 500kW. While Ghana has a large mining industry, with gold being one of the country's leading exports, several key mines have direct PPAs with VRA, and although the agreed tariffs are not reported, many assume they are very low, meaning that the economic arguments outlined above are not likely to apply.

Several multinational organisations use Ghana as a regional hub, and some of these have clean energy targets as part of their corporate social responsibility activities. This includes Cargill, who in 2017 installed a 565KWp solar facility on their cocoa and chocolate site in Tema, as part of its target to have 18% of its power consumption provided by renewable sources. Other larger projects in the sector include a 1.33MWp solar facility to provide power to Coca Cola's bottling plant located in Accra. The plant is being financed, operated and maintained by CrossBoundary, who have signed a 15-year service agreement with Coca Cola to provide electricity to the plant. In addition, while not specifically a C&I customer, stakeholders noted that several government ministries and buildings are looking to install solar equipment on their premises, including Jubilee House, the official residence of the president. These projects aim to alleviate the issues faced by government for not paying outstanding energy bills to the state utility, with revenue collection (both from government and customers more widely) being a major challenge that has faced ECG. A few projects are also being considered with the catholic diocese in Ghana with support from Power Africa, which will look to

Box 3-2: Yingli Namene financing arrangements for C&I installations

Headquartered in Accra, Yingli Namene Solar focuses on the development, financial structuring, installation and operation of utility scale and C&I solar PV projects throughout the Europe, Middle East and Africa region.

Yingli Namene is a 50/50 joint venture between the UK's Namene Energy International and China's Yingli Green Energy Holding Co., intending to develop 100MW of utility scale solar and 50MW of commercial rooftop solar in Ghana. Its projects to date include a 66kWp installation at a health center and a 40kWp project for Stanbic Bank that has been developed in partnership with Ecoligo under a leasing model. Yingli Namene also recently completed a 400kWp solar PV project at the Kasapreko bottling facility under the first commercial PPA in Ghana. This project was financed by Crossboundary Energy, with an agreement that allows Kasapreko to avoid the initial upfront installation cost. This is a vital structure to develop the C&I market in Ghana, as the upfront cost, coupled with the high cost of finance, often deters customers from installing such large systems.

Yingli Namene intends to continue to provide C&I solar installations under financing arrangements like that at Kasapreko. To do so, Yingli Namene or its partners in development (e.g. Crossboundary) will need to raise capital in order to cover the cost of financing these projects. It was reported that the company intends to explore potential financing options from financial institutions in order to support project construction.

In addition to large scale installations, Yingli Namene also produces and distributes pico-solar lights. It has yet to develop any utility-scale solar.

Source: Yingli Namene

install a total of 4-6MW of power across 310 schools, 28 health facilities and 500 other buildings.⁶⁹

Key challenges that most stakeholders highlighted included government commitment to expanding the off-grid sector for C&I customers and access to finance, specifically:

- **Government commitment:** Although many stakeholders noted the government has committed to increasing the use of renewables, its immediate priority is to ensure the financial sustainability of the sector, particularly of ECG. Therefore, a strong growth of the off-grid C&I sector might have an adverse effect on the financial sustainability of the sector as this could mean it will lose some of its best-paying customers potentially fuelling the existing overcapacity and increasing the government's payments of capacity charges for idle capacity as well as stranded gas under existing PPAs and Gas Agreements. Some stakeholders noted that net metering was piloted in Ghana, and that demand for solar significantly increased as a result of this, to such an extent that ECG became concerned about the impact it would have on reducing its C&I customer base. Stakeholders believe that this was one of the key reasons why the scheme was stopped and are not expecting the government will be rolling out net metering more widely because of this. In addition, the government cancelled third party PPAs in December 2018, meaning that only state-owned utility companies can sign PPAs with power producers, which makes it more difficult for C&I companies to distribute their power to private providers. There may be some further directive in this direction if the overcapacity situation persists. Unless these commitment barriers are addressed, the potential growth in the C&I sector will remain limited.
- **Access to finance:** Companies noted that interest rates for corporates and SMEs were currently between 24 and 30% despite the recent falls in central bank policy rates, and tenors were often limited to two to three years. These rates are simply too high for companies to consider undertaking projects. As with SHS companies, C&I providers do not believe banks understand the solar sector. Some interviewees also noted that companies are far more likely to be accepted for credit when looking to invest in their main business line, as opposed to investing in solar equipment. Of those projects that have gone ahead, many of the companies are export companies that have been able to do transactions in US dollars, which has meant lower interest rates. A few transactions

⁶⁹ Further details of this initiative can be found here: <https://ustda.gov/news/press-releases/2019/ustda-supports-new-us-company-partnership-bring-solar-systems-ghana>

have also been completed following outright equipment purchases without the need to raise finance. For finance to be viable, many consultees noted that interest rates would need to fall below 20% to even be considered, and in many cases, it would need to fall even further than this to be viable.

Other constraints on growth in the C&I sector that have been highlighted include:

- **Barriers to market entry to foreign entities:** Local Content and Local Participation Regulations (LI 2354) for the electricity supply industry stipulate that companies operating in the sector must include a minimum of 15% of local ownership in the company. This share will increase to 51% in ten years, although companies active in the market prior to 2017 will be exempt from the requirements. The regulation also stipulates that certain materials (including 50% of the value of solar panels, 50% of the value of inverters and 100% of the value of cables) must be sourced locally, with a target of 80 to 100% of local content by 2025. However, given that most materials cannot currently be sourced locally, it may not be feasible to undertake such projects going forward. There may be ad-hoc waivers provided by the Local Content Committee in situations where the required materials cannot be obtained from the local market, but this will add to the complexity and predictability of projects going ahead.
- **Complexity obtaining licenses:** Three licenses are required from the Energy Commission for each project in sequence (a provisional license, construction permit and authorisation to operate), each requiring a maximum of 60 days to approve (by law). In the experience of some stakeholders consulted for this report, this process for approval can take longer than the period advised. In addition, a captive generation license is required for projects larger than 1MW, which some stakeholders consider to be difficult to obtain and time consuming.
- **Cost of licensing for small producers:** Some stakeholders noted that the cost of a license is the same for a small-scale solar plant as it is for a utility scale project, meaning the cost on a per watt basis is high and prohibitive for the C&I sector.
- **Inconsistency in applying tax exemptions:** While solar modules are exempt from import tax and VAT, these exemptions have historically been noted to have been applied inconsistently in practice between various projects.

Despite these concerns, many see the C&I sector as having significant growth potential. According to the Association of Ghana Industries (AGI), companies are growing more aware of the potential benefits associated with solar. For them to make the investment, companies need to see

the business case for them doing so in terms of potential cost savings and reliability improvements, which could be helped by more awareness raising or marketing on the part of C&I companies, government and/or development partners. Some capacity building efforts were being launched as of April 2019 by the German Corporation for International Cooperation (GIZ) in association with AGI, which will involve establishing a register of reputable providers and offering companies advice on the selection of companies and technologies to explore as part of their installations. This initiative will be implemented with GIZ support over a two-year period, after which AGI will run and fund this independent of external support. Initiatives such as this will be important to raising awareness of quality products in the market, and provided that the economics for installing solar remain favourable for C&I customers, further growth is likely, albeit limited if government policies are not supportive.

Demand for local currency finance

The consultations highlighted that the most promising area for local currency finance is from companies looking to install C&I facilities. Several developers noted that they have an extensive pipeline and are assuming high growth over the coming years, but such growth could be higher still should companies be able to access more affordable finance. Should they be able to access debt on reasonable terms, they would utilise this to finance their installations as opposed to either i) relying solely on equity; or ii) not going ahead with installations.

According to recent reports⁷⁰, key developers were expected to build some 32MW of additional capacity for C&I clients in 2019, with several multi-MW projects in advanced stages of development, and several consultees were expecting more growth over the 2020-2024 period. Estimating a conservatively stable pipeline of 30MW per year would result in a 150MW pipeline over the coming five years. Assuming an average capex cost used in the BloombergNEF study of US\$1/W, this equates to US\$150 million of required financing over the 2020-2024 period. While not all the projects in the pipeline require financing, a significant proportion is likely to be more feasible should financing be available. But given the current situation of high rates, relatively short tenors and a lack of appetite from banks to lend, a number of steps will need to be taken in order for financing to flow to the sector.

Many noted that guarantees would be helpful in facilitating the access to finance but pointed out that guarantees alone will not overcome the high interest rate costs currently faced for sufficient scale to be reached. To address the financing constraints, some organisations are looking to support banks in order to unlock further financing.

70 BloombergNEF (2019) Solar for Businesses in Sub-Saharan Africa.

For example, **KfW has undertaken pre-feasibility work in order to establish a green credit line potentially worth €20 million.** The green credit line aims to provide up to three banks with preferentially priced funding to on-lend to micro, small and medium enterprises (MSMEs) and individuals in the C&I sector, providing medium-term loan tenures and affordable interest rates. The participating banks would also benefit from technical support in developing the new product offering and their lending pipeline. Details regarding the credit line are still to be confirmed.

3.4. Supply of finance

3.4.1. Commercial banks

According to the BoG Banking Sector Report for July 2019, total assets in the banking sector grew by 12.4% year-on-year to GHS112.84 billion (US\$20.7 billion) in October 2018. Banks' investment in bills and securities increased to GHS43.52 billion at end-of-June 2019 (US\$8 billion, 21.5% year-on-year growth) from GHS35.82 billion (US\$6.58 billion) in June 2018, constituting the largest component of total assets. According to BoG, banks prefer long-term, high-yielding securities and resolution bonds. This explains the increase in long-term securities of 69.8% to GHS27.21 billion (US\$6.58 billion), while short-term bills contracted by 18% to GHS15.89 billion (US\$2.92 billion). This growth was partly due to the government issuing bonds to finance the outstanding liabilities of the two defunct banks discussed above. The industry's gross advances stood at GHS38.66 billion (US\$7.1 billion) in June 2019, which was like the levels in previous years. As of 2018, the three largest banks in Ghana in terms of operating assets were Ghana Commercial Bank (GHS9.7bn, or US\$1.7bn), Ecobank Ghana (GHS9.7bn, or US\$1.7bn) and Barclays Bank of Ghana (GHS8.8bn, or US\$1.6bn).

Distress in the banking sector, marked by high NPLs and non-compliance with capital adequacy requirements led the BoG to undertake a comprehensive reform agenda from 2017 onwards. The objective was to increase resilience through consolidation and the strengthening of the regulatory and supervisory framework. Some of the reforms were:

- Revocation of banking licenses for seven insolvent banks.
- Banks needing to increase their capital to at least GHS400 million by December 2018.
- Six banks being merged to become three.
- Some private pension funds in Ghana have injected

fresh equity capital in five indigenous banks through a special purpose holding company named Ghana Amalgamated Trust Limited (GAT). Resources from GAT will be used to recapitalize two state-owned banks (Agricultural Development Bank and National Investment Bank) and three other banks.⁷¹

- In August 2018, BoG acted to revoke five banks' licenses and merged their assets into a new wholly state-owned entity, the Consolidated Bank Ghana Ltd (CBG). The governor of BoG confirmed that CBG had been recapitalised through a taxpayer-funded bailout in an amount of GHS450 million (US\$83 million) and a sovereign-guaranteed GHS5.76 billion bond (US\$1.06 billion) to absorb the financial losses.⁷²

This resulted in the number of banks in Ghana having reduced to 23 by the end of 2018, compared to 34 one year earlier.

According to local banks, (and some customers) the impact of this restructuring is still being felt in the market in several ways:

- Banks are very risk averse in their lending decisions, particularly regarding their collateral requirements, which range from 125% to 200%, based on information provided during consultations. This seems to be in reaction to BoG guidance when the restructuring was launched that all banks should incorporate "stronger corporate governance structures and risk management systems and practices."⁷³
- Given that some banks lost licenses, and were merged, it seems banks are ensuring that this does not happen to them.
- There is less competition in the lending market given the fewer number of banks.
- Banks need to continue to retain higher capital ratios, and so are taking the opportunity of seeking to boost profits by increasing lending margins. Several interviewees noted that despite the bank rate declining in recent months (to c.16%), most banks have retained their end lending rates to customers at the previous levels of mid to high 20s. i.e. banks are seeking to increase margins rather than pass on the lower cost of financing. Weaker competition is helping this. These high rates mean that even if the cost of finance were reduced to reflect credit enhancement, the overall rates would still be high by any reasonable measure.
- Banks' pricing models remain relatively unsophisticated at present, with several indicating that they would not reduce their margins on any guaranteed portion of any loan provided.

71 Ibid.

72 World Economic Forum (2018), How Ghana is working to improve the banking sector. Accessed here: <https://www.weforum.org/agenda/2018/12/ghana-working-to-improve-bank-regulation/>

73 Bank of Ghana (2019), Update on Banking Sector Reforms. Accessed here:

- Government paper is still being issued at relatively high rates of interest (c.17%), and so it is easy for banks to invest their depositors' funds into this relatively high "risk free" rate, rather than lending to customers with the corresponding higher credit risk.⁷⁴ Several banks noted that they may not be that interested in a product such as a guarantee as the "opportunity cost" of seeking to analyse and understand the underlying projects' risk (solar and mini grid transactions are also relatively new and little understood), the credit enhancement structure etc. would be too high compared to investing in government paper.⁷⁵ Ghana seems to be an almost classic case of public sector borrowing "crowding out" private sector borrowing in the "real economy."

Tenor of loans is also a challenge for banks, with many stating that they could lend up to a maximum of five years, but that even that was rare, with most of their loans having tenors of up to two years. This is clearly a disadvantage for any kind of capital investment projects, as they would need to have payback periods of less than two years to make this worthwhile. Several solar companies indicated that their pay back periods were three to five years, while mini-grids require five to seven years. Almost all banks stated that they would not increase their tenor, even if the credit enhancement was for a long period. This seemed to be because of their very conservative asset-liability matching policies. Almost all suggested that to lend for five years or so they would need a directly matching deposit for five years – and these hardly exist in Ghana at present (and are expensive). While almost all banks said that they would not extend their tenor with a guarantee, they would extend the tenor, and pass on cost savings, if a funded solution were provided. However, even this would not be certain. For example, under the World Bank's GEDAP project, Global Environment Facility funds were provided to help local banks lend. While this worked well in Sri Lanka and Bangladesh, local banks in Ghana did not lend, even when encouraged by the Ministry of Finance, as banks had no means of assessing the quality of the equipment being used by the solar companies, as there were no standards or testing centres in the country at the time, and consequently thought the risks of lending were too high.

Foreign banks are more sophisticated regarding asset-liability management, but for them to be interested in such a structure in the renewables sector, the facilities need to be

of a larger size (say minimum US\$20 million equivalent) to make it worthwhile. There are very few, if any, projects of this size.

Extent to which guarantees can address these issues for commercial banks

In summary, given that the effects of the recent restructuring of the Ghanaian banking sector are still being felt, in general terms it is unlikely that the provision of a guarantee is, on its own, sufficient to catalyse banks to provide additional lending to renewables projects at affordable pricing, and with an appropriate tenor in any meaningful volume. With one or two exceptions, the banking sector remains risk averse, and relatively uncompetitive, with very little motivation to consider new markets that will take time to understand, when the alternative is to invest in relatively high yielding "risk free" government paper. With the relatively limited reflective pricing capabilities of the Banks, it also seems unlikely that any credit enhancement would reduce pricing to a level low enough to encourage more renewables given the current high interest rate environment in Ghana.

Some banks suggested that a form of funded solution may help as it would address one of the key restrictions of banks, which is to obtain deposits with a longer tenor (say five years and above) to enable them to provide longer term loans, which generally are required by renewable energy projects and businesses. However, evidence from a current (confidential) project suggests that even in this case, the demand may not be there at present.

Alternatively, refinancing guarantees may to some extent help with reducing the issues associated with liquidity mentioned above, but most banks currently have limited motivation to lend to the sector, and it is unclear the extent to which these products would help overcome this, as well as reduce the price of the debt to a level acceptable to borrowers in this segment of this market. If refinancing guarantees are to be considered, banks will need to have confidence in the quality of the guarantor. In addition, a guarantee would need to be simple to implement if banks are to use it.

⁷⁴ Banks' cost of funding varied, depending upon their reliance on deposits from customers, or the interbank market. However, one bank noted that their cost of funding was as low as 4% given the high level of their deposits.

⁷⁵ Several banks noted that they did not understand the solar sector, particularly regarding the value of solar systems as collateral. This meant that while they would provide consumer finance for vehicle purchases etc., in which the collateral value is well understood, but they would not consider such finance for solar systems.

3.4.2. Capital markets and institutional investment

Figure 3-7 below depicts the growth in Ghana's pension sector between 2012 and 2018. As the figure shows, in recent years Ghana's pension market has witnessed unprecedented growth. As of 2018, the Ghanaian pension market had GHS22.3 billion (US\$4.1 billion) of AUM, or 7.4% of GDP, up from GHS5 billion (US\$920 million, or 6.75% of GDP) in 2012.⁷⁶

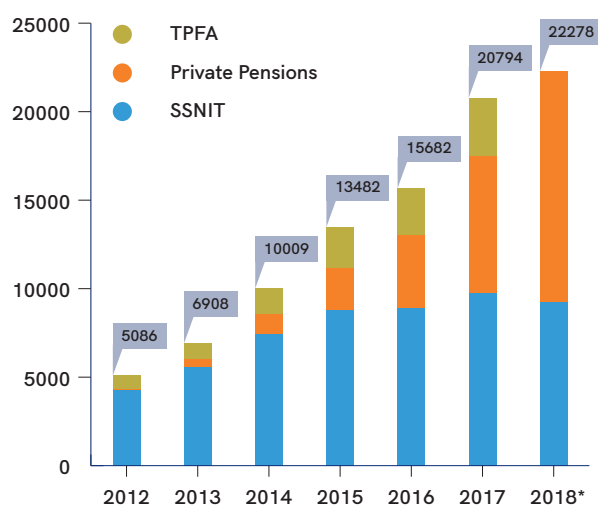


Figure 3-7:

Ghana pension funds by AUM (millions GHS)

Source: National Pensions Regulatory Authority. SSNIT denotes the publicly provided pension funds. TPFA denotes the Temporary Pension Fund Account, details of which are provided below. *For 2018 data, a disaggregation of private pension funds and TPFA data was not provided.

The total AUM is still significantly lower than the average proportion of assets to GDP across some high and middle-income countries of 67%, although this is a higher proportion than Nigeria, China and India.⁷⁷ On the other hand, the life insurance market is somewhat smaller, with GHS2.9 billion (US\$530 million), offered by 22 insurers as of December 2017.⁷⁸

Prior to 2008, the Social Security and National Insurance Trust (SSNIT) managed all pensions in the country, and regulation of this was limited. Following issues of risk management, governance and funding, reforms were initiated to modernise the system.

SSNIT is the key government agency administering the national pension scheme in the country and the largest non-bank financial institution in Ghana, accounting for GHS9.2 billion (US\$1.7 billion), or 41% of total AUM of the pensions sector in 2018.⁷⁹ As of June 2018, 1.47 million Ghanaians were members of SSNIT.⁸⁰

Private schemes on the other hand accounted for GHS13.04 billion (US\$1.5 billion), or 59% of AUM across 31 trusts, meaning that more pension funds are now held by private trusts as opposed to SSNIT. This change has happened rapidly, since before 2017 SSNIT accounted for the larger proportion of AUM and demonstrates the unprecedented growth of Ghana's private pensions sector. Prior to 2018, GHS3.3 billion (US\$610 million) was held in a central bank account known as the Temporary Pension Fund Account (TPFA).⁸¹ This was set up originally to hold private pension funds while fund managers and other relevant institutions were established. These institutions were established back in 2012-13, and according to the National Pensions Regulatory Authority (NPRA) these have now been transferred to private pension funds.⁸² As of 2016, there were nearly 1.4 million corporate trustees in Ghana, with more than a quarter being part of the Pensions Alliance Trust and another quarter being with Enterprise Trustees.⁸³ As Figure 3-8 below shows, Enterprise Trustees dominates the market in terms of total AUM, while Petra Trust, Axis Pension Trust and GLICO Pensions Trust also hold relatively large market shares.

The current structure of the Ghanaian pension system was established after the National Pensions Act 2008, which aligned the system more with ones found in OECD countries. The primary objective of these reforms was to encourage domestic capital market development.

For assets under SSNIT management, the defined benefit structure as well as the asset classes allows it to have some relative flexibility. In addition, SSNIT has an investment mandate that has a clear socio-economic component,

76 National Pensions Regulatory Authority (2017), Growth of funds under the 3-tier pension scheme from 2012-2017 (GDP analysis).

77 Willis Towers Watson (2018), Global pension assets study 2018 [online]. Available at: <https://www.willistowerswatson.com/-/media/WTW/Images/Press/2018/01/Global-Pension-Asset-Study-2018-Japan.pdf>

78 National Insurance Commission (2017), 2017 Annual Report & Financial Statements.

79 National Pensions Regulatory Authority (2018), Growth of funds under the 3-tier pension scheme from 2013-2018 (GDP analysis).

80 SSNIT website. Accessed here: <https://www.ssnit.org.gh/about-us/>

81 National Pensions Regulatory Authority (2018), Growth of funds under the 3-tier pension scheme from 2013-2018 (GDP analysis).

82 NPRA (2019), GHS3.1bn Pension cash transferred to labour unions [online]. Available at: <http://npa.gov.gh/index.php/news-public-notice/news/item/608-gh-3-1bn-pension-cash-transferred-to-labour-unions>

83 Business World Ghana (2017), Private pension funds up by 45.39% [online]. Available at: <http://www.businessworldghana.com/private-pension-funds-45-39/>

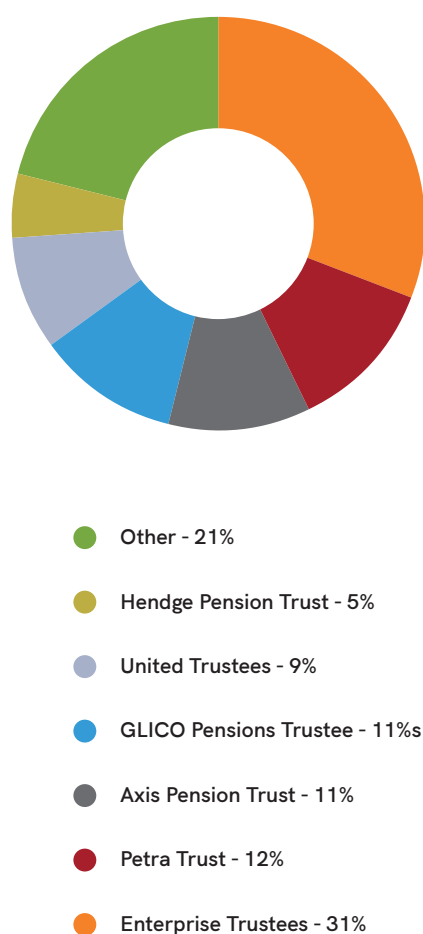


Figure 3-8:
Market share of private pension trusts 2018 by AUM
Source: NPRA.

meaning investments can be more targeted to sectors where the government has a strategic concern. Its four listed asset classes are: i) equity; ii) fixed income; iii) real estate; and iv) economically targeted investments (ETI). Infrastructure investments are included under this latter category, and SSNIT has an ETI target of 5% of the asset mix.⁸⁴ However, actual investments in these sectors have tended to fluctuate between zero and 2%. For example, in 2017 ETIs accounted for 1.8% of total investments, or GHS166.46 million (US\$32 million), which covers a range of sectors and therefore it is unlikely to act as a significant source of income for projects receiving support from guarantees.⁸⁵ SSNIT has full ownership of CENIT Energy

Limited, an IPP that owns a 126MW thermal power plant in the country. SSNIT established CENIT in 2012 to take over the construction and operation of this plant, located in Tema. The SPV for this project was originally called Tema-Osonor Plant Limited and reached financial close in 2009 at a cost of US\$140 million. When it took over the project, SSNIT fully financed the project with a debt/equity ratio of 82/18, with the debt being provided in local currency over a 10-year period at a rate equivalent to 2-year government bonds plus 500 basis points (bps).⁸⁶

Private pensions that are part of defined contribution schemes have stricter regulations on what their funds can be invested in. For example, according to NPRA investment guidelines for tier 2 and 3 pension funds, these schemes have the following limits on different asset classes:⁸⁷

- Government of Ghana securities – 60%
- Local Government and Statutory Agency Securities – 15%
- Corporate debt securities – 35%
- Bank and other money market securities – 35%
- Ordinary listed shares and preference shares – 20%
- Collective Investment Schemes, including Unit Trusts, Mutual Funds and Exchange Traded Funds – 15% (with a sub limit of not more than 5% in any one corporate entity.)
- Alternative Investments (AIs), covering real estate, private equity funds and external investments in securities – 15% (with a sub limit of not more than 10% shall be invested in any AI sub-asset class, except external investment which shall be a maximum of 5%).

What these limits mean is that funds can invest in central government securities, local government securities and money market securities only and remain within the prescribed limits – there would be no need to invest in the “real” economy of equities, corporate debt, AIs, etc. Interviewees suggested that most fund managers invest significantly below the available limits in corporate debt, equities, and AIs.⁸⁸

Generally, institutional investors are risk averse, and can earn returns of 15-25% by investing in “risk free” government paper. The government has recently issued bonds that are earmarked for infrastructure. For example, in January 2019 it re-opened a 2-year bond worth GHS486 million (US\$89 million) with a 16.5% coupon rate which is primarily to support public sector infrastructure projects.⁸⁹ However, institutional investors are still taking government, rather than corporate risk on these transactions, making them no different from standard government

⁸⁴ Global Economic Governance Africa (2018), Infrastructure as an asset class in Africa.

⁸⁵ Ibid.

⁸⁶ CEPA (2015), Mobilising Finance for Infrastructure – Ghana Case Study.

⁸⁷ NPRA (2016), Guidelines on investment of pension scheme funds.

⁸⁸ One interviewee suggested this could be as low as 3%.

⁸⁹ Ghana Web (2019), Government raises GHC485.9m bond to finance infrastructure. Accessed here: <https://www.ghanaweb.com/GhanaHomePage/business/Government-raises-GHC485-9m-bond-to-finance-infrastructure-718020>



bond issuances. There have been some corporate debt issuances recently, mainly from financial institutions such as payday lenders, at spreads of c.2 to 6% over Treasuries, but the volumes have been low. Interviewees suggest that this is because of the following:

- The market is still relatively young (the first corporate bond was issued in 2015 by Izwe Loans, a payday lender). Issuances have mostly been from companies in the financial sector, including payday lenders and real estate companies. Some of the initial issues are having some difficulty in meeting their payments when due. This has made investors even more conservative such that any issue needs to be well secured, based on a track record of existing cash flow, in a mature, well understood sector etc.
- While funds are “looking for yield,” the opportunity cost to them in terms of the time and effort to understand non-standard products needs to be low if they are to diversify away from the relatively high yielding government paper. So, for example, a well-established corporate with a five-year track record may meet this criterion, whereas a structured renewable energy product probably would not.
- There are no local credit rating providers in Ghana, and the concept of credit ratings is not well understood.⁹⁰

This means that any issue needs to have full due diligence undertaken on it by the Ghana Securities Exchange Commission (SEC, before it is issued), and then each individual fund manager. This is a time-consuming process, requiring a lot of education of each individual fund manager. Some issuers think that to achieve rates of c.22% in the local market, this just is not worth the commitment.

This is almost a textbook case of public borrowing “crowding out” private sector, “real economy” borrowing. However, several interviewees noted that they see the supply of government paper gradually diminishing and that with the continuing and accelerating growth of pension funds’ resources, institutional investors will need to increase their efforts to seek yield by looking at opportunities in the non-government sector over the coming years, i.e. the opportunity cost of looking at alternatives will come down.

While not in the off-grid sector, an example of successfully crowding in of institutional investors is the Quantum Terminals transaction that was closed in 2018, which benefited from a 75% PCG from GuarantCo. This followed previous support that GuarantCo had provided to the business on a corporate lending transaction.

⁹⁰ It was also suggested by one interviewee that the SEC may not “approve” an international credit rating agency as they wouldn’t be able to have any kind of recourse to them should something go wrong.

Details of this experience are provided in the Box 3-3.

Quantum Terminals' experience demonstrates that it is possible to arrange long term infrastructure local currency facilities. However, it should be stressed that at the time of writing, this facility is unique, had existing cash flow from a mature sector, and was robustly structured. There appear to be no other facilities in the pipeline, and certainly there are limited, if any, potential projects in the renewable energy market that would be able to demonstrate the attributes necessary to place a bond at the current time.

To what extent guarantees can address these issues for institutional investors?

Compared to commercial banks, institutional investors are the more "natural" lenders to longer term off-grid projects. The sources of funding and liability profiles of institutional investors are more suited to the longer tenor debt that is generally required of the sector. The Quantum Terminals transaction (albeit general infrastructure, not renewables) demonstrates this. However, institutions remain risk averse, and the capacity to assess and understand the risk-reward dynamics of such projects remains limited.

The relative lack of sophistication of many of the investors, and the lack of an easily understood rating from a local credit rating agency means that a lot of work is required by any issuer to educate the market and the regulators. For example, the SEC has still not issued rules for asset-backed securities, so any securitisation of consumer solar receivables with credit enhancement would face significant challenges. This means that any issue must be of a reasonable size to justify the time and cost involved – the Quantum Terminals transaction took two years to achieve close and many off-grid projects would not be of sufficient size to justify this.

Furthermore, at present there are no opportunities in the renewables sector that institutional investors could target. However, in theory, should an acceptable market be developed with the support of credit enhancement products, then the potential, with a lot of effort and education (including helping to develop the capital markets through policy dialogue and perhaps technical assistance), to attract institutional investors is reasonable, but only in the medium to long term as the capital markets and renewables markets mature.

Box 3-3: Quantum Terminals experience raising institutional finance

While the use of guarantees in the infrastructure sector in Ghana has been extremely limited, GuarantCo has (opportunistically) been involved in two transactions; the second transaction was a refinancing of the first.

In 2013, Quantum Terminals approached Standard Chartered Bank for a loan to enable it to invest in their fuel storage business. Standard Chartered has a reasonably close relationship with GuarantCo and tends to approach it for support on an ad hoc basis, e.g. if it is at, or close to counterparty limits. On this transaction, Quantum did not know that GuarantCo existed, and certainly not the opportunity to borrow in local currency for a tenor of five years – which was important for its infrastructure business. The final structure was that Standard Chartered Bank provided a five-year dual currency loan of US\$6 million- and US\$6 million-cedi equivalent of which GuarantCo provided a 100 % guarantee to Standard Chartered on the cedi tranche. The dollar tranche was priced at c.7 %, while the cedi equivalent facility was priced at 28.5 %. Quantum were willing to borrow at this rate because it believed the cedi would depreciate on such a scale to make this competitive to borrowing at a lower rate in dollars. Had local currency not been available, the borrower would have had significantly higher debt service payments if financed solely in dollars. In fact, within approximately two years, the cost of servicing the dollar tranche exceeded the cost of servicing the cedi tranche.

In late 2018, this facility was refinanced, and new money advanced, by issuing a ten-year, amortising (after a two-year grace period) GHS45 million (US\$10 million) fixed rate bond on both the Ghana and London Stock exchanges. This was the first corporate bond issuance in Ghana's fixed income market by a non-financial institution. The bond is callable by Quantum after two years. This benefited from a 75 % GuarantCo credit guarantee (GuarantCo had begun developing a relationship with the London Stock Exchange for African issuers, and this was one of the first transactions). The interest rate was 22.5 % (2.25 % over government benchmark). GuarantCo and Quantum spent two years preparing for this facility and spent a lot of time explaining and educating potential institutional investors. Fairly early in the process, Stanlib advised Quantum that it could arrange the entire facility, which it did, placing the facility with 50 of the funds that it manages. The guarantee is structured as an on-demand facility, but in line with the original amortisation structure i.e. should the borrower not pay, then the lenders can claim for (75 % of) the outstanding payment (principal and interest) due, but this would be paid by GuarantCo in line with the original amortization profile.

Source: Quantum Terminals; CEPA analysis

3.4.3. Existing credit enhancement solutions in the market

Political risk and partial credit guarantees

These products are usually provided on a commercial, risk-reflective basis. This includes products that provided political risk insurance (PRI), such as that provided by the World Bank's MIGA, as well as export credit cover that can also cover political and certain commercial risks faced by overseas lenders and investors. PCGs provided by DFIs and specialized institutions such as AGF and GuarantCo also fall under this category. Examples of scenarios where these have been provided include:

- **MIGA PRI cover:** MIGA has provided support on several transactions in Ghana. Type of support has included:
 - **Traditional political risk cover.** Insurance against war, expropriation, civil disobedience, transfer restrictions, etc. This type of support was provided on the Takoradi Renewable Energy project in 2012, the cover worth US\$9.2 million is for a period of ten years. The project produces biomass from rubber trees for export to European markets to be used in biomass power generation.
 - **Non-honouring of a sovereign financial obligation.** This support covers risks associated with the financial obligations of sovereign governments, or state-owned enterprises not meeting payment obligations to foreign commercial companies and provides similar cover to that provided as part of multilateral PRGs but is priced on a commercial basis. Compensation is based on the insured outstanding principal and any accrued and unpaid interest. This support was provided to the investors in the Takoradi 3 power project in 2012; the cover worth US\$88.4 million is for a period of 15 years.
- **Export credit insurance:** Export credit provides both political and commercial risk insurance for businesses and financial institutions investing in foreign entities and countries. In the case of Ghana, South African banks' lending (hard currency) to the Cenpower IPP project benefited from political (100% cover) and commercial risk (85% cover) insurance from the Export Credit Insurance Corporation of South Africa on US\$447 million of commercial debt. The political insurance provides similar cover to that provided by MIGA, while the commercial insurance covered insolvency and payment default of the SPV to which the banks were lending.
- **PCGs:** Entities that have supported transactions with commercially priced PCGs include:
 - **AGF**, which provided Oikocredit with a 50% PCG for its US\$1 million loan to PEG Africa in 2016.
 - **GuarantCo**, which has supported Quantum Terminals guarantees to raise local currency finance – first a 100% local currency credit guarantee to raise US\$6 million equivalent from Standard Chartered; and more recently a 75% PCG to raise US\$9 million equivalent from institutional investors.

Guarantees provided on a non-risk reflective basis

These include the various sovereign guarantees provided by the Government of Ghana, as well as concessional PCG and PRGs provided by multilateral institutions such as the AfDB and World Bank utilising their concessional resources. Bilateral development banks such as KfW can provide the same, where a government counter guarantee is in place; SIDA and USAID do not have this requirement. The key difference between these and the above guarantees are that these are not usually priced on a risk-reflective basis, making them more attractive to developers and lenders from a cost perspective, although they can be difficult and time-consuming to obtain. Key examples include:

- **Government Commitment and Support Agreements (GCSAs)**, these have been provided on a few IPPs in Ghana, including the Takoradi 2 and Cenpower projects. This support provides developers with indemnity against all political and commercial risks that could accrue from a project.⁹¹
- **Put-Call Option Arrangements (PCOAs)**, PCOA essentially allows the government (through a call option) to buy or investors (through a put option) to sell the SPV in the event of termination of the PPA, with liabilities of the government capped at outstanding debt obligations. This cover has been used more recently on the Early Power Bridge project, and consultees indicated that lenders see PCOAs as a minimum requirement for entering PPAs in Ghana on on-grid projects, given the issues that have been faced by the state utility.
- **USAID**, historically, USAID has offered PCG guarantees on a concessional basis to commercial banks in order to promote lending to the renewables sector.
- **World Bank guarantees**, these include:
 - **The more standard International Development Association (IDA) PRGs**, which was used in 2015 as part of covering government payments (US\$500 million worth of cover) on the Sankofa Gas project; and
 - More recently, the World Bank has utilised its **Policy Based Guarantee (PBG)** product in Ghana. This US\$400 million guarantee supported a US\$1 billion Eurobond issuance in 2015 to refinance Ghana's short-term debt obligations and lower its financing costs. The bond had a 15-year tenor and a coupon of 10.75% and was estimated to reduce required yields by 150-200bps. This was provided as part

⁹¹ Under a GCSA, the government indemnifies investors and lenders against all political and commercial risks that could accrue from a project. GCSA also require off-takers (in the case of Ghana ECG or VRA) to provide support via either a letter of credit (L/C) or cash escrow account to cover non-payment in the short-term. In both cases, protection is provided to private parties in the event of contract termination, but a PCOA is generally favoured by the government as this limits government contingent liabilities and the specific terms in which government will be required to purchase the assets (termination of the PPA), compared to the situation under a GCSA in which the government is required to make payments in the event of a range of risk factors.



of the joint IMF-World Bank support mentioned previously, where the World Bank had issued an IDA credit of US\$150 million to support Ghana's budgetary reforms, and this was the first bond issuance supported by a PBG in 14 years.⁹²

3.5. Estimated demand for guarantee products⁹³

The size of a given market in terms of transactions completed and finance provided will depend on where demand intersects with supply. There is some evidence on the global demand for finance – comprising its different types in terms of currency denomination, tenor, debt / equity etc. But where the market for local currency finance clears will depend on factors affecting its supply, for example price, wholesale market liquidity, risk perceptions and appetite etc. As set out, the demand for local currency guarantees will also depend on the relative attractiveness of competing products and how the availability of different types of guarantee could alter such dynamics.

Demand for finance per segment

Table 3-3 provides an indication of the extent of demand for finance within different market segments. This is the starting point in assessing the potential demand for local currency guarantees to stimulate the provision of local credit and/or capital market finance – the table is colour coded using different shades of blue to illustrate where there is most opportunity. The darker the shading, the stronger the relative opportunity.

The research indicates that the most likely opportunities for credit enhancement products for local currency in the short term are in the **SHS and C&I sectors, with the market more likely to be able to benefit from guarantees to support credit transactions**. This is a derived demand driven by the level of activity in these market segments for debt finance to support growth. Whilst there is a desire for local currency debt finance from local institutions, the extent to which demand will intersect with supply will depend on what price such debt will be offered at. Where this is high in absolute terms and/or there are cheaper alternatives (such as equity or hard currency debt from, say DFIs), the market for local currency finance will only clear at very low volumes. This is what has been experienced in Ghana to date, where despite increases in activity of local developers the supply-side financing constraints have meant that companies have relied on their own equity, impact investors and (to a lesser extent) DFI financing, while local bank involvement has been limited.

The size of the C&I segment will depend on a number of factors, particularly the extent of government commitment to scaling up off-grid renewables (which will drive demand) in the face of looming excess generation capacity of grid electricity, the extent to which banks can access cheaper finance and whether these lower costs will be passed on to customers (the cost of supply).

Cost of supply in terms of the cedi interest rate is clearly a major constraint in Ghana. The high level is driven by high bank funding costs (that is, high base rate) plus high margins that reflect the alternative opportunities that

⁹² World Bank (2018c), Financial Solutions Brief – Ghana Policy-Based Guarantee.

⁹³ The figures presented in this sub-section are purely illustrative and should be interpreted as such. Furthermore, the mentioned figures do not consider the negative impact resulting from the COVID-19 epidemic, which took place after the market assessment had been concluded.

Table 3-3:

Indication of the relative attractiveness of the market segments (figures in US\$).

Segment	Demand for finance	Scope to use guarantees for credit market	Scope to use guarantees for capital market
SHS	Total demand for finance potentially being in excess of US\$130 million-US\$200 million based on development plans of some of the leading SHS companies, of which US\$65 million-US\$90 million being for local currency finance .	<ul style="list-style-type: none"> Portfolio guarantees of consumer finance options may be an option, and approaches to doing this are being considered, but discussions are preliminary at present. Some companies already in discussions with banks on obtaining finance, and banks acknowledge that guarantees would help address collateral and other security requirements. Many SHS companies looking to raise local currency finance, but issues around pricing are apparent. Unlikely that a guarantee alone will result in reductions needed to enable many to take up finance (i.e. pricing in 15 to 19 percent region). Size of sector still relatively small in Ghana, so number of opportunities still likely to be limited. 	<ul style="list-style-type: none"> Possibility that institutional investors will be interested in securitization opportunities that arise, if they are structured appropriately. But the market is very immature and consequently regulators and investors will need a lot of assurances if these options are considered. Fewer opportunities for banks and other institutions to issue bonds to finance opportunities in these sectors, as even with guarantees cost of funds still likely to be high.
C&I	Total demand for finance in the region of US\$180 million-US\$250 million over the next five years based on reported pipeline of at least 32MW over 2019 and assumed future growth in the sector. Of this, approximately US\$80 million - US\$110 million is expected to be local currency .	<ul style="list-style-type: none"> Portfolio guarantees to banks could help unlock financing for a few companies looking to install solar, but cost of finance would need to fall significantly. C&I developers could also benefit from finance backed by guarantees, but current cost of finance remains an issue. Government commitment would enable significant growth in sector, but unclear whether this will be realized. Some companies noted a need for working capital facilities, but demand does not appear to be extensive. 	<ul style="list-style-type: none"> Unclear where opportunities for institutional investments likely to arise in this space at present, given the financing requirements in the market and size of companies that are operating.
Mini-grids	Estimated to be around US\$15 million , based on Black Star's potential pipeline of opportunities. This could either be local currency or US dollars, depending on terms offered.	<ul style="list-style-type: none"> Level of government support for future private sector mini-grid development is unclear at present. Provided government commitment and sector regulatory issues are addressed, the main company operating in this space may be in a position to raise finance with guarantees, but beyond this opportunities are more limited. 	<ul style="list-style-type: none"> Opportunities in the capital market appear even more limited than in the credit market, given the maturity of the sector and challenges it currently faces.

Legend

- Strongest relative opportunity
- Weakest relative opportunity

lenders face as well as the challenge of understanding the credit risk of new sectors. Banks also do not have access to a deep pool of long-term funds because of the lack of sophistication in the long-term capital markets and the low levels of long-term savings rates. Given this, the banks are asking for very high levels of collateral to protect them in a downside scenario. The only aspects of this that guarantee instruments could possibly assist with is to reduce collateral requirements and lending margins due to the protection offered and possibly liquidity risks, where there is a tenor mismatch (through take out guarantees – essentially a guarantee of liquidity). The guarantee cannot assist in lowering the central bank rate.

Working with partners who can address bank funding cost issues and tenor mismatch risks will increase the competitiveness of supply of local currency through lower pricing, increasing the potential for debt both to be offered and at a price at which there will be a higher level of take-up by borrowers. As such, key to the potential for opportunities to be realised in these segments, will be the extent to which DFIs can partner with other institutions who can address these other constraints. In terms of examples of partnership opportunities, there is KfW in which the Green Credit Line has the potential to reduce banks' funding costs significantly as well as reducing liquidity risks. KfW and other DFIs can also fund technical assistance. Indeed, more widely, partners providing technical support to ensure banks and other stakeholders have the capacity to identify and appraise any opportunities that arise, such as GIZ, the World Bank, the AfDB and USAID will also likely be crucial to success. Without these other interventions, the extent to which a guarantee on its own will be able to shift the demand for and supply of local currency finance in renewables' markets to enable more transactions to happen is not likely to be significant.

The story differs for institutional investors, who unlike banks do have access to long-term liquidity. But given the availability of relatively high yields on government securities, which they are far more comfortable investing in, their propensity to invest in new sectors at this stage is limited. That said, many were enthusiastic about diversifying their portfolio into other sectors, but appropriate capital market opportunities for institutional investors are not extensive in Ghana's pipeline. Consequently, in the case of capital market opportunities demand for finance is a relatively more pressing constraint than supply.

Beyond the household and C&I segments, the opportunities for local currency guarantees to support transactions in the other subsectors seem limited. For example, in mini-

grids, both the size of the sector and recent developments suggest a sufficient scale is unlikely to be reached that would involve debt financing. Should government be more open to future private sector development some opportunities may arise.

Approach to developing the illustrative guarantee demand estimates

To illustrate the potential derived demand for credit guarantees for local currency denominated debt over the next three to five years, inter-related market factors need to be considered in seizing the opportunity⁹⁴:

- **Potential demand for finance.** The indicative demand for investment in each segment over the next three to five years. This period is flexible to reflect the fact that timescales over which the estimated value of transactions is realised can differ, depending for instance, on the time required to raise finance, with the total amount either being raised in relatively shorter timescales (three years), or longer (five years). This range is driven by overall demand for finance identified in each market segment.
- **Proportion of finance in debt versus equity.** Some financing needs will be met through equity solutions rather than debt. Equity finance will not be able to make use of credit guarantee products. The proportion of debt finance will differ from segment to segment but is likely to be in the range of 50 to 70% for most market segments.
- **Potential demand for local currency debt finance.** This considers the proportion of the demand for debt finance that could potentially be satisfied with local currency finance. The proportion of local currency debt will differ according to the specifics of the financing arrangement in question, but an assumption is made around what would be optimal given the requirements of each segment, for instance in terms of hard currency import requirements.
- **Illustrative estimate of demand for local currency credit guarantees.** This refers to the local currency equivalent US dollar value of demand, which in theory has the potential to be supported by guarantees. The extent to which this potential can be realised will depend upon the competitiveness of local currency debt finance, (as regards pricing and tenor etc.) and whether the availability of guarantees is able to increase local currency debt financing. To account for the considerable uncertainty in the potential uptake of new guarantee products, scenarios are presented to illustrate low, medium, and high uptake, depending on the specificities of each segment.

94 Demand for credit guarantees of hard currency debt is not explicitly covered in this analysis.

Table 3-4:

Rationale, assumptions and sources of evidence behind indicative estimates

Source: CEPA analysis

	Key considerations	Sources/assumptions
Potential demand for finance	<ul style="list-style-type: none"> Assessment of the investment needs for the sector over the next three to five years to meet demand for the different segments of the market. 	<ul style="list-style-type: none"> SHS: World Bank (2018c) Off-grid solar market trends report 2018, and feedback from market participants. Mini-Grids: Feedback from market participants. C&I: BloombergNEF (2019). Solar for businesses in Sub Saharan Africa, and feedback from market participants. Commercial banks: Feedback on potential sources of lower cost finance to support RE/EE sectors.
Proportion of finance in debt vs. equity	<ul style="list-style-type: none"> Consideration of the optimal financing mix taking account of the cost and availability of debt and equity and the financing needs of the different segments. Some of the developers, particularly international developers will be looking for additional investment and will already have significant equity retained within the business so it may be that all their additional investment need is in the form of debt. 	<ul style="list-style-type: none"> Assumptions on debt-equity ratios are based on feedback from market participants on targeted ratios.
Potential demand for local currency finance	<ul style="list-style-type: none"> Consideration of the optimal split between local and foreign currency financing given costs and revenues for developers. Consideration of the demand for and supply of both foreign and local currency in the market, which will be determined by a range of factors e.g. relative costs. 	<ul style="list-style-type: none"> Feedback from market participants on local currency financing needs.
Indicative split between credit and capital markets	<ul style="list-style-type: none"> Need to take account of the relative cost and availability of the two options and the financing needs of the individual developers. 	<ul style="list-style-type: none"> Based on feedback from market participants.

Table 3-4 below summarises the key considerations and assumptions made to arrive at the illustrative indication of the potential demand for guarantees in Ghana.

Illustrative estimates of demand for guarantees by segment

Using the approach and assumptions outlined in the sub-section above, illustrative estimates of the demand by segment in low, medium and high scenarios are presented, first from the perspective of providers of finance, and second looking at it from the perspective of borrowers. The two are different perspectives and therefore not necessarily additive.

Tables 3-5 and 3-6 below suggest that there is greatest relative opportunity for guarantees to support commercial banks, either through portfolio guarantees (not shown on the table) or (to a lesser extent) on individual transactions to support activities in the SHS or C&I space. This is followed by financing activities of solar C&I companies and companies providing household products. It is, however, important to note that these tables do not represent consolidated demand. Many of these segments may overlap and would therefore be double counted if these estimates were to be summed. Rather, these indicative values represent the relative opportunity under each segment and provide an indication of the areas in which

Table 3-5:

Illustrative demand for guarantees by segment for providers of finance (US\$ local currency equivalent over three to five years)

Source: CEPA analysis

Providers of finance		
Market segment		Capital markets
Potential demand for finance		Up to US\$30m
Proportion of finance in debt vs. equity or grants		N/A
Potential demand for local currency debt		Up to US\$30m
Illustrative demand for local currency credit guarantees	Low	15% - US\$5m
	Medium	25% - US\$8m
	High	50% - US\$15m
Rationale		Based on pipeline of transactions where capital market investments could be feasible but note that alternative sources of finance may be pursued.

Table 3-6:

Illustrative demand for credit guarantees by segment (US\$ local currency equivalent over three to five years)

Source: CEPA analysis

Users of finance				
Market segment		SHS	C&I	Mini-grids
Potential demand for finance		US\$130m-US\$200m	US\$180m-US\$250m	Up to US\$15m
Proportion of finance in debt vs. equity		Up to US\$115m	Up to US\$150m	US\$10m
Potential demand for local currency finance		Up to US\$60m	Up to US\$75m	US\$5m
Illustrative demand for local currency credit guarantees	Low	5% - US\$3m	5% - US\$4m	5% - less than US\$1m
	Medium	15% - US\$9m	15% - US\$11m	15% - US\$1m
	High	30% - US\$17m	30% - US\$23m	30% - US\$2m
Rationale		Most finance will be raised in the credit market, competing with competitively priced DFI debt. Commercial banks have limited willingness to lower interest rates to levels that borrowers are looking to obtain, and are unlikely to reflect the benefit of a guarantee in their pricing. On the other hand, collateral requirements could be reduced through the use of guarantees.		

local currency guarantees would be best poised to enable the provision of local currency finance in the renewable energy sectors.

3.6. Conclusions

3.6.1. Demand for finance

Based on the market diagnostic, demand for local currency finance across the different sub-sectors is most prevalent in the SHS and C&I sectors. Within this:

- There are examples of companies raising or looking to raise local currency debt finance on a receivable's basis, be this either through an on-balance sheet financing arrangement or through securitising assets using an SPV structure.
- Initial discussions appear to be taking place for banks to offer consumer-based finance either to customers or household clients.
- For C&I, the costs and reliability of electricity in Ghana is posing challenges for businesses, and there has been some uptake in recent years. These transactions have mostly been made on a direct purchase basis, and many stakeholders noted that if financing were available on more affordable terms and government policies were more favourable towards off-grid, the number of firms switching would likely increase. To address this, portfolio guarantees on bank lending to the sector appear to be the most relevant products that local currency guarantees could offer.

Outside of these sectors, opportunities appear significantly more limited in the medium-term. For example, the current scale of the mini-grid market in Ghana is relatively small, and government commitment to increasing private sector participation is currently unclear.

3.6.2. Supply of finance

Although the diagnostic suggests that on the demand side, there has been significant activity and there could be prospects for the SHS and C&I sector to grow if the policy environment were favourable, there are considerable issues on the supply-side of finance that have meant to date the market for local currency finance in these segments has been clearing at a low level.

Fundamental challenges exist in Ghana's financial sector which means attracting local currency commercial finance is challenging.

For institutional investors, current regulations on capital allocation mean that they are essentially able to invest in a mixture of central government, sub-sovereign and money market securities and little else, and if alternative

assets do not provide the additional yield, they can obtain on government securities they are less inclined to invest. A number of participants were enthusiastic about investing in such opportunities if they were to arise, and the recent Quantum Terminals transaction shows that institutional investors in Ghana will invest in corporate debt instruments backed by guarantees, but it is unclear whether opportunities in the renewables sector will arise in the medium-term.

For commercial banks, their approach to managing asset-liability mismatches means that they are unable to lend at tenors of five years or more. Recent pricing on corporate debt is very high (24-29%), which is caused by a number of factors including opportunity cost of funds (i.e. ability to invest in high-yielding public sector instruments), aversion to lending to corporates and the recent banking crisis that has significantly reduced confidence in the sector. Almost all banks noted that lending to renewables has been limited and only Ecobank appears to be actively seeking opportunities in the sector. Regarding what benefit a guarantee would bring, many noted that it would help reduce collateral requirements needed under International Financial Reporting Standard 9 (IFRS9), and some noted that it may help reduce pricing, although given the current high rates this still would not be to levels suitable for borrowers.

As for other banks, the appetite for lending to the solar sector is mixed, and all noted that they would require access to lower cost funds on reasonable tenors for lending to take place. In addition to this, these banks are likely to require some form of capacity building in order to allow them to appropriately assess risks in the sector and develop their own pipeline of transactions.

Chapter 4

Kenya Country Diagnostic

4.1. Macroeconomic overview

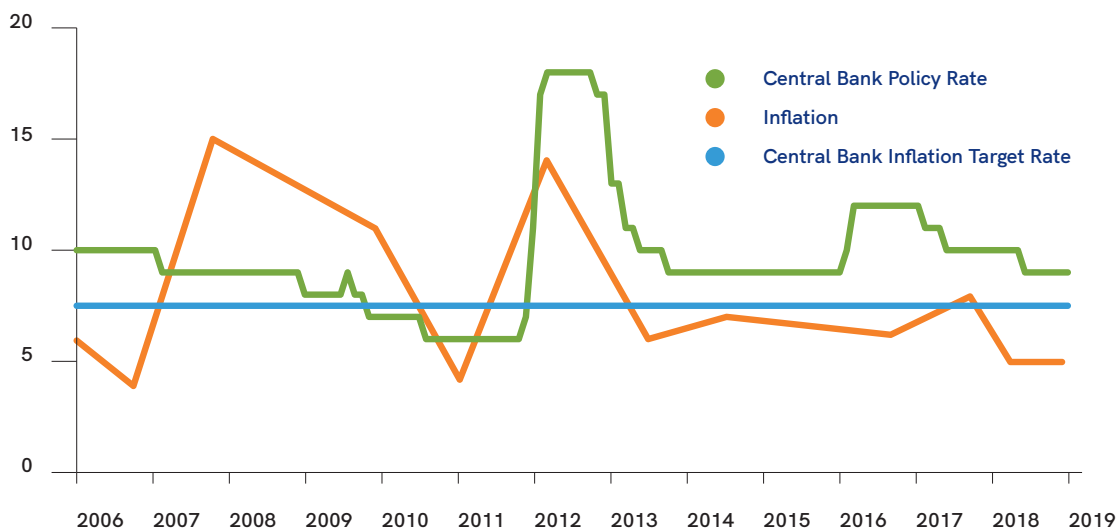
This section focuses on the key macroeconomic policy issues that could affect the viability of introducing a local currency credit guarantee product in the market: interest rates and foreign exchange policies.

Kenya is a lower-middle income country with the largest and most dynamic economy in East Africa. Growth in recent years has been relatively stable, averaging at close to 6% since 2010, with 2017 having a relatively low growth rate due to a drought and the lower levels of private sector investment resulting from uncertainties surrounding the presidential elections. This sustained growth is the result of a stable macroeconomic environment, low oil prices, improvements in supply-side constraints and growth in household incomes, all of which contribute to Kenya's long-term plan of becoming an upper-middle income country by 2030.

Interest rates

Between 2008 and 2012, Kenya suffered from volatile and high inflation rates, driven by external shocks including high food and fuel prices, as well as the eurozone crisis, which impacted export revenues while imports remained high and increased in cost. The eurozone crisis also had impacts on the real economy in terms of remittances and foreign aid. Despite these issues, Kenya's inflation rate has remained relatively stable since 2013, averaging at 6.7%, and is expected to reduce to around 5% in the coming years, as shown in Figure 4-1 below. This is well within the government's target rates of $5\% \pm 2.5\%$. Central bank policy rates have tended to follow trends in inflation. These were particularly high around 2011-12 to help calm inflationary pressures, and since then have tended to fluctuate between 8 and 12%, with the current rate at 9%, with real interest rates being in the region of 4 to 5%.

Figure 4-1:
Kenya central bank policy rate and inflation rate
Source: Central Bank of Kenya, IMF



In September 2016, the government introduced a cap on the interest rates that banks could lend to businesses and individuals, in response to public concerns of the high cost of credit faced by SMEs in particular. The cap set the maximum lending margin at no more than 400bps above the central bank base rate. For the average commercial bank, the cap reduced lending rates from 18.5% to 13.7% between June and December 2016,⁹⁵ but had no real impact on tenors, which for commercial loans were typically three to five years. The cap led to a relative convergence in lending rates between shillings and dollars, as shilling lending rates reduced. The provision also included a floor on deposit rates of 70% of the base rate, but this was abolished in 2018.

The cap resulted in a shift away from bank lending to smaller clients, and towards larger companies and government securities. For example, banks increased their holdings of government securities by 51% between the end of 2016 and September 2018, while growth in loan books was only 8.4%.⁹⁶ According to the Central Bank of Kenya (CBK), the decrease in SME lending resulted in 2017 growth being 0.4 percentage points lower than it would have been, had the cap not been in place.⁹⁷ Banks also changed their business model to one that relied increasingly on fees associated with the provision of loans as opposed to just interest income. Smaller banks also struggled as a result of the cap due to their inability to charge risk-reflective lending rates to clients.

In March 2019, a High Court ruling declared Sections 33B (1) and (2) of the Banking Act that introduced the controls on the cost of loans as unconstitutional, effectively nullifying the law and giving Parliament twelve months to amend the clauses within the law. However, in September 2019 Parliament rejected requests to remove the interest rate cap, which has been backed by the Ministry of Finance due to the impacts it was having on credit provision in the economy.⁹⁸ In October 2019 President Kenyatta refused to sign the next budget unless the cap was removed, highlighting that the cap had become a central issue in Kenyan politics.⁹⁹ Banks had increased their lending to government since the introduction of the cap, the removal of

which would require government to rely on more expensive borrowing from the local market, thus escalating the public debt.¹⁰⁰ Ultimately, in November 2019, President Kenyatta signed the law that removed the interest rate cap, which had stalled lending to businesses.¹⁰¹

Notwithstanding issues associated with the interest rate cap, Kenya has one of the most sophisticated financial markets in Sub-Saharan Africa, built on a relatively long-term yield curve. The current yield curve for government debt, to which any bond issue is tied, is shown in Figure 4-2.

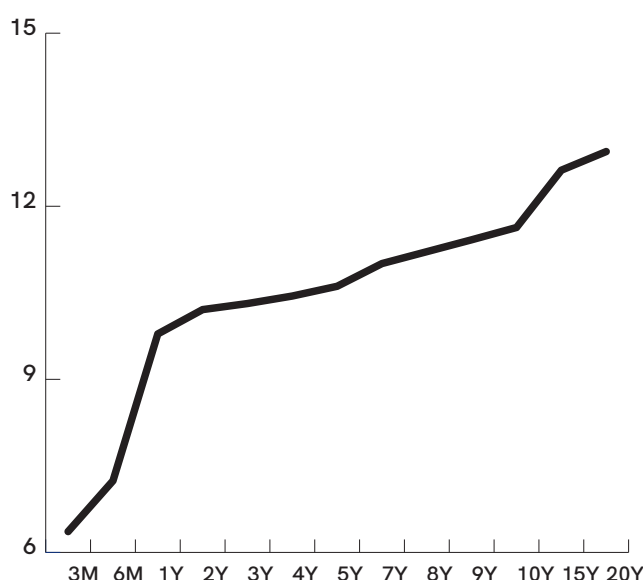


Figure 4-2:
Yield curve on Kenyan government debt (as of October 2019)
Source: Bloomberg

As of November 2018, over 40% of outstanding domestic government debt has a tenor of greater than ten years, and 25% is over 15 years, suggesting that there is a considerable market for relatively long-term shilling issues.¹⁰²

⁹⁵ Central Bank of Kenya (2016) Monetary Policy Statement

⁹⁶ Business Daily (2019), End of rate cap signals return to expensive loans [online]. Accessed at: <https://www.businessdailyafrica.com/economy/End-of-rate-cap-signals-return-to-expensive-loans/3946234-5026434-6a9knqz/index.html>

⁹⁷ Central Bank of Kenya (2018), Impact of interest rate capping on the Kenyan Economy.

⁹⁸ Reuters (2019), Update 1-Kenya parliament rejects request to remove interest rate caps [online]. Accessed at: <https://www.reuters.com/article/kenya-banking-lawmaking/update-1-kenya-parliament-rejects-request-to-remove-interest-rate-caps-idUSL5N26G5IG>

⁹⁹ Reuters (2019), Kenya's president refuses to sign the budget over rate cap [online]. Accessed at: <https://af.reuters.com/article/investingNews/idAFKBN1WW0PE-OZABS>

¹⁰⁰ The East Africa (2019) Will listing of 'unlawful' rate cap give a leg up to Kenya's private sector? [online]. Accessed at: <https://www.theeastafrican.co.ke/business/Will-lifting-rate-cap-give-a-leg-up-to-Kenya-private-sector/2560-5028198-6wtqdn/index.html>

¹⁰¹ Reuters (2019), Kenya's president finalises removal of rate cap for banks [online]. Accessed at: <https://www.reuters.com/article/kenya-banking/update-2-kenyas-president-finalises-removal-of-rate-cap-for-banks-idUSL8N27N4C5>

¹⁰² Central Bank of Kenya (2018), Kenya Quarterly Economic Review, Oct-Dec 2018.

Foreign exchange policy and volatility

Kenya operates a fully flexible market-determined exchange rate system. There are no exchange control restrictions (except for large amounts, see below), but only authorised banks and foreign exchange bureaus licensed by CBK can deal in foreign currency. They set their own rates, which are held to reasonable levels of variance and margins due to competition in the market.

Trade in foreign currency between US\$10,000 - US\$499,999 requires documentation to show the purpose of the transaction. CBK must be notified of any payment above US\$500,000 and retains the right to impose restrictions on remittances from Kenya to enable the government to meet its obligations under any international treaty.¹⁰³

Figure 4-3 below presents the FX volatility Kenya has experienced over the last two decades. Kenya's struggles with political, economic, and financial crises have resulted in currency depreciation since 2008, with particularly large depreciations in 2012 and 2015. Since 2016, however, the exchange rate has remained stable against the US dollar.

Figure 4-3:
Exchange rate 2000 - 2019 (shilling to US\$1)
Source: Bloomberg



The importance of hard currency in the renewable energy sector

The Energy Act of 2006 established the Energy Regulatory Commission (ERC) as the single agency responsible for economic and technical regulation of the energy sector. As is the case in much of SSA outside of South Africa, most power production projects in Kenya are financed with hard currency. The electricity distributor, KPLC, has foreign currency-denominated fixed tariff PPAs with electricity producers; KPLC then sells electricity to households and businesses that pay their bills in Kenyan shillings.

In the absence of cost-effective currency hedging instruments, additional costs incurred by KPLC through FX rate fluctuations are passed on to the consumer through an FX adjustment on energy bills. However, aside from short, sharp fluctuations shown in Figure 4-3, depreciation rates have been relatively low. As such, the overall tariffs between 2002 and 2016 were 5% lower with IPP projects financed in hard currency than they would have been if financed in local currency due to the high interest rates on shillings, although bills would have been significantly less volatile.¹⁰⁴ The exposure to FX rate fluctuations means energy customers are vulnerable to increasing tariffs, which can further fuel inflation. This is a concern in an economy like Kenya where inflation is already high and electricity payments account for a significant proportion of household income.

¹⁰³ Thomson Reuters Practical Law (2017) Doing Business in Kenya [online]. Accessed at: [https://uk.practicallaw.thomsonreuters.com/w-007-2231?transitionType=Default&contextData=\(sc.Default\)&firstPage=true&comp=pluk&bhcp=1](https://uk.practicallaw.thomsonreuters.com/w-007-2231?transitionType=Default&contextData=(sc.Default)&firstPage=true&comp=pluk&bhcp=1)

¹⁰⁴ Dalberg Advisors (2018), Local Currency-Denominated Tariffs for Kenyan Power Purchase Agreements.

4.2. Power sector overview

The power sector in Kenya is relatively well-established with a long track record of independent power generation and a relatively favourable regulatory environment for renewable energy. KPLC has hitherto established a reputation for paying its bills. Kenya is well endowed with renewable resources, particularly from geothermal and hydropower; in 2017 renewable energy accounted for 78% of total electricity generation, with the vast majority consisting of geothermal (43%) and hydro (33%).¹⁰⁵ Grid-connected solar power has been relatively limited in Kenya, but wind power in the country has been increasing; Lake Turkana, a 310MW wind farm financed by the private sector, started supplying the grid in March 2019.

Kenya's strong economic growth has resulted in demand for electricity rising at approximately 5% per year over the last decade.¹⁰⁶ As of 2018, Kenya had c.2, 300MW of installed capacity, c.500MW that have reached financial close and an additional c.3, 200MW in the pipeline for 2030. The total installed capacity is expected to rise to 9,932MW by 2037, while demand is forecasted between 6,638MW and 9,790MW.¹⁰⁷ The majority of this new capacity will come from renewable IPP projects.¹⁰⁸ The Kenyan government is relying on the private sector to deliver a substantial portion of the required electricity infrastructure, which has to date consisted only of generation capacity. Previously, there have been brownouts and power rationing during times of drought due to an overreliance on hydro, but since the commissioning of additional geothermal, wind and solar power projects, this is no longer the case. In fact, in the short term, there is currently overcapacity on the grid relative to demand.

By SSA standards, Kenya has a reported relatively high access rate of 75% in 2018, and plans to achieve universal access by 2022 as part of the Kenya NES.¹⁰⁹ Those lacking access typically reside in sparsely populated areas in the north of the country, where grid extension is extremely expensive. Grid-connected distribution and supply is provided by KPLC, which is 51% owned by the Government of Kenya and minority-owned by the private sector. KPLC operates on a commercial basis and has developed a relatively sound reputation for ensuring

reliable access while also managing to pay its liabilities. However, in recent years its liabilities have significantly increased; newly installed generation capacity has meant higher PPA payments for KPLC. To fund this, Kenya's electricity price has increased by 21% from 2016 to 2018 (in local currency).¹¹⁰ There have been reports of recent issues with bill collections and high debt affecting KPLC's ability to meet its existing PPA obligations.¹¹¹ Collection rates have not been reported, however, the bad debt provisions from electricity receivables in KPLC's 2018 Annual Report nearly doubled, increasing by KES4.4 billion (US\$42.5 million).¹¹² KPLC also has mounting debt, evident from the profit warning issued to shareholders at the end of 2018, causing concern regarding its financial stability.

While grid-connected power is expected to account for 90% of electricity access in Kenya, off-grid connections could play an important role.¹¹³ Further, tariffs for C&I customers stood at approximately US\$0.17kWh, which is high by continental standards. Should they remain the same or increase further, off-grid connections through solar PV (or potentially natural gas in the future) will become more economically attractive for C&I customers as the prices of renewables fall over time.

To date, in the absence of net metering policies, renewable energy projects in Kenya have been designed to ensure the customer can make the most use of the generated energy. This limited the attraction of renewable energy installations to those customers with demand that matches generation patterns (e.g. high daytime loads for solar) seven days a week. However, in early 2019 the Kenyan president signed the Energy Bill 2017¹¹⁴ into law, introducing net metering policies for installations under 1MW. This should increase the attraction of renewable energy installations for smaller C&I as well as residential customers.

4.3. Demand for finance

4.3.1. SHS

Market size and recent activity

Kenya has one of the most developed SHS markets on the continent and is the birthplace of business models that are being rolled out across Africa. Provided that

105 World Bank (2017), KenGen Guarantee Project – Appraisal Document.

106 Energy Regulatory Commission (2018) Least cost power development plan 2017-2037.

107 Updated Least Cost Power Development Plan Study Period: 2017 – 2037 [online]. Accessed at: <http://gak.co.ke/wp-content/uploads/2019/02/Updated-Least-Cost-Power-Development-Plan-2017-2022-min.pdf>

108 Updated Least Cost Power Development Plan Study Period: 2017 – 2037 [online]. Accessed at: <http://gak.co.ke/wp-content/uploads/2019/02/Updated-Least-Cost-Power-Development-Plan-2017-2022-min.pdf>

109 World Bank (2018), Kenya Charts Path to Achieving Universal Access to Electricity [online]. Accessed at: <https://www.worldbank.org/en/news/feature/2018/12/06/kenya-charts-path-to-achieving-universal-access-to-electricity>

110 BloombergNEF (2019) Solar for Businesses in Sub-Saharan Africa.

111 Bryan Cave Leighton Paisner (2017) Power to Africa Volume 3: Kenya – Part 2.

112 We have used an exchange rate of US\$1 = KES103.50 throughout the report.

113 ESMAP (2017) Mini Grid in Kenya: A Case Study of a Market at a Turning Point.

114 The Energy Bill, 2017, National Assembly Bills No.50.

customers are creditworthy, SHS offers households an ability to switch kerosene lighting and other inefficient and polluting energy sources for solar, which can reduce household energy costs as well as positively impact the environment. SHS also allows customers to access electricity much quicker than waiting for a grid connection, which in Kenya can be a long process that requires a high upfront connection charge, particularly for those in more remote areas. Additionally, grid tariffs can be more costly than SHS, especially once customers take ownership of the system. This is particularly true in Kenya, where, as of 2018/19, household tariffs were US\$0.12/kWh for lifeline consumption up to 10kWh/month and US\$0.16/kWh for consumption above 11kWh, excluding fuel and FX-related costs, and additional taxes and levies.¹¹⁵

As of 2018, ten million people had basic access to electricity through quality-verified off-grid solar products.¹¹⁶ In the first half of 2019, Kenya sold nearly 975,000 off-grid solar products, accounting for 43% of all sales in SSA.¹¹⁷ In total, 1.27 million units were sold in Kenya in 2018, up from nearly 915,000 in 2017 and similar to levels sold in 2016. A key factor in this success is the high mobile penetration rates in Kenya, standing at 106.2% as of December 2018,¹¹⁸ coupled with the success of the M-Pesa mobile money platform, which is used as the basis for many of the PAYGO business models used by the sector. Initially introduced in 2007 to include rural Kenyans in financial services, M-Pesa has now evolved into a mobile banking service that enables customers to store money and make payments through their mobile devices.

Kenya was also selected as one of the first countries to benefit from the Lighting Africa programme, a World Bank initiative that involves providing technical assistance to companies and extensive awareness-raising campaigns in order to educate consumers of the benefits of off-grid lighting systems. There was extensive up-take during the initial years of the Lighting Africa programme, with solar lighting reaching 8% by 2013, and the solar lantern market growing by 200%.¹¹⁹ In order to meet the growing demand, a multitude of SHS companies entered the Kenyan market, increasing the level of competition. The growth in the off-grid market outpaced grid connections achieved by the Rural Electrification Authority and national utility companies.

Nowadays, the market is characterised by several established companies offering PAYGO rooftop solar systems as part of a service package to households that also includes household goods and lighting. The PAYGO systems mostly rely on payments via mobile money, accounting for 86% of cumulative sales between 2013 and 2017. Table 4-1 below summarizes some of the companies in the SHS market in Kenya.

In addition to the main players, according to some sources there are nearly 70 SHS providers operating locally. These have either been operating for some time but have yet to scale up operations, or are new enterprises looking to scale up rapidly on a PAYGO platform.¹²⁰

After several years of sales, Kenya has experienced a number of structural market changes, including the saturation of relatively easy-access markets and the inability to penetrate untapped ones, particularly for customers based in remote areas.¹²¹ Default rates vary widely across the industry, but there is concern that they may increase as companies try to increase customer acquisition in a relatively saturated market.¹²² Sector analysts have noted this as part of the reason for Mobisol filing for insolvency in April 2019, with many businesses operating at a loss in order to gain market share. Following Mobisol's insolvency, the company was acquired by French energy company ENGIE in September 2019, which follows other major energy players such as EDF and Total entering the off-grid market through investments in major SHS companies.

Aside from the main SHS providers, companies also operate along the supply chain, including equipment manufacturers for the products sold by the SHS service providers. For example, Solinc is a key local manufacturer for M-KOPA and has provided the company with over 100,000 PV panels up to 2018.¹²³

In addition, it should be noted that growth in the sector may not necessarily be just based on provision of power. Even now some business models are based on providing services such as TV of which power is an integral part. Once these distribution channels are established, the credit provision model can be applied to products and

115 Electricity Regulatory Commission (2018), Approved Charge Rates for 2018/19. Rates were converted from Kenyan shillings to US dollars based on current exchange rates as of 19th March 2019.

116 Lighting Africa (2018), Kenya country factsheet [online]. Accessed at: <https://www.lightingafrica.org/country/kenya/>

117 GOGA (2019), Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data: January-June 2019.

118 Communications Authority Kenya (2018) Second Quarter Sector Statistics Report for the Financial Year 2018/2019

119 Ibid.

120 The ENF Solar Directory of solar manufacturers can be accessed here: https://www.enfsolar.com/directory/installer/Africa?country=112&installation_size=s

121 REN21 (2018), Renewables 2018: Global Status Report.

122 Lighting Global (2018), Off-grid solar market trends.

123 M-KOPA (2018), 'Made in Kenya' Success in Solar Press Release [online]. Accessed at: <http://solar.m-kopa.com/wp-content/uploads/sites/4/2015/02/20180111-Made-in-Kenya-Release-Final.pdf>

Table 4-1:

Key SHS providers in Kenya (2019)

Source: CEPA analysis based on company websites and consultations as of June 2019.

Company	Description	Number of customers
Greenlight Planet	Founded in 2009, Greenlight Planet is a global company that designs, distributes and finances solar home energy. Products range from small solar lights, mobile chargers, to large rooftop panels and TVs.	27 million customers in more than 60 countries.
d.light	Founded in 2006, d.light is a global leader in providing solar products to households as well as other SHS providers who sell on their products. Kenya acts as one of d.light's global hubs for its products.	20 million solar light and power products sold across 65 countries. In 2017 d.light reported that an average of 800 Kenyan households a day were signing up for their D30 PAYGO SHS.
M-KOPA	Founded in 2011, M-KOPA is a market leader in SHS offering a range of products. These range from basic solar panels with some charging ports and lights, up to comprehensive packages that include flat screen digital TVs. M-KOPA also offers customers other consumer goods (phones, cook stoves and bicycles), as well as loans to pay for school fees.	600,000 households as of January 2018 (East Africa).
BBOXX	Established in 2010, BBOXX designs, manufactures, distributes and finances innovative plug & play solar systems to improve access to energy across Africa and other emerging markets. In addition to its power boxes and 50W or 300W solar panels, BBOXX offers customers lights, fans, TVs, refrigerators and radios, as well as equipment for distributed generation.	Sold more than 150,000 products across 35 countries, mainly in Kenya and East Africa more widely.
Azuri Technologies	Established in 2012, Azuri has delivered SHS on a commercial basis to customers in twelve SSA countries. Azuri works with local companies as well as larger organizations to offer products in partnership with others (e.g. Unilever) and to reach customers in the most remote areas (e.g. with Mobicom). Packages include (i) the Quad, a more basic package that includes a 10W panel, lamps, charging points, a radio and batteries; and (ii) Azuri TV, which includes a 50W panel and a TV, as well as the items included in the Quad package.	More than 150,000 systems sold in twelve SSA countries.
Mobisol (Insolvent, acquired by ENGIE)	Initially established in 2011, Mobisol has since expanded into twelve countries offering solar packages that include panels ranging from 40W to 200W, with basic packages including lighting while more comprehensive packages including a range of household goods. Mobisol first started in Kenya in 2012, and in 2016 significantly expanded its commercial operations.	600,000 customers reached across twelve countries.

services which may not even involve power. As such, they have considerable potential within the consumer products and services market.

One stakeholder saw this as a being a key attraction for impact investors in a market segment where other interviewees believed that there was a need for

consolidation due to a lack of profitability in part due to high product distribution costs (as well as centralised costs such as call centres). In other words, over time the channelling of new products and services through these business models will drive improved profitability (albeit not without a degree of consolidation and most likely some failures).

Demand for finance

Companies have been able to access finance from equity and impact investors, but have also had some experience raising debt, including in local currency. For example, M-KOPA secured a total of US\$80 million in debt financing in 2017, making it the largest solar deal in Africa that year. This included a US\$55 million equivalent local currency tranche in Kenyan and Ugandan shillings from Stanbic, UK CDC, Norfund and FMO. Although M-KOPA tried to use a guarantee at the time, it was unable to and had to rely on other forms of credit support.

Aside from M-KOPA, BBOXX issued US\$500,000 local currency equivalent of securitized receivables to Oikocredit, a social impact investor, at the end of 2015 for part of its Kenyan activities. It has also been able to secure a US\$2m equivalent local currency facility for its operations in Rwanda with Banque Populaire de Rwanda by securitizing its consumer receivables.

On the wider debt side, companies have been able to raise finance in Kenya, but this has often been in hard currency. For example:

- **Azuri technologies** launched a US\$20 million off-balance-sheet working capital debt financing programme at the end of 2018 to expand its services in East Africa. ElectriFI – a facility managed by the European Association of DFIs – lent US\$1.5 million to the facility, alongside the impact investment platform Trine.
- As part of one of its funding rounds, **BBOXX** was able to secure US\$5.3 million of debt from a range of financiers, mainly consisting of impact investors that had previously supported the company. Last year BBOXX entered a partnership with the crowd funder Trine, and recently completed six €1 million fundraising campaigns to support the deployment of 46,000 solar household systems in developing countries.

Beyond this, companies have largely been financed through their retained earnings as well as from impact investors. They have also received grant funding from various foundations and donors, largely provided in hard currencies.

Going forward, estimates of the demand for finance in the public domain suggest that companies will require between **US\$45 - US\$50 million** of debt finance between 2020 and 2022.¹²⁴ Due to the high level of finance raising activities of the top SHS companies and the responses received to the consultations with SHS providers, this is likely to be

a relatively conservative estimate of demand for finance. During consultations, several companies noted that they are likely to need local currency to finance their scale-up and future operations.

Issues and challenges

Access to debt finance was raised as an issue by several participants within and observers of the supply chain (importers, distributors, dealers and users); specifically, where there are new entrants without an established banking relationship and/ or limited traditional forms of collateral (cash, land and buildings). At present, a number of SHS companies do not feel that local banks are willing to lend to them on reasonable terms due to their lack of understanding of the business model, the perceived credit risk of SHS providers, and the banks' inability to charge risk-reflective rates due to the interest rate cap, prior to the law being rescinded in November 2019. To a degree, the lack of a widespread profitable track record in the market segment supports the banks' position. In any event, local currency finance can be expensive because of the relatively high base rate (CBK rate is 9%)¹²⁵ to which a margin is then applied.

On the capital market side, securitising receivables would be a way of providing additional finance to such companies. However, apart from in the case of the largest companies, this is likely to require the creation of a special purpose securitisation vehicle with paper issued by it – possibly on a tranche basis – backed by the receivables of a range of different entities. It is possible that a guarantee could compensate for a lack of a track record of successful repayments.

4.3.2. Mini-grids

Market size and activity

The Kenyan government plans to use mini-grids to electrify rural populations where grid extension is too costly. It has been working with ESMAP to develop the NES, published in 2018, to meet the 2022 universal electrification target. The government needs about US\$2.5 billion for additional investment to meet its targets.

Projects smaller than 1MW that do not sell power to the grid do not require a generation permit or license from ERC. Projects with a capacity of 1-3MW require a generation permit from the ERC. While projects with more than 3MW require a generation license from the ERC. The difference between a permit and a license is only the capacity and the application fee, which is free for a permit

¹²⁴ These figures are based on global estimates of demand for debt finance between the years 2020 and 2022 (US\$2.1 billion-US\$2.3 billion) in the SHS market taken from GOGLA (2018), Off-Grid Solar Trends Report. The figures from Kenya are based on Kenya's assumed share (2%) of total future demand. The figures do not factor in potential negative impact on demand due to the Covid-19 pandemic.

¹²⁵ Central Bank of Kenya, Central Bank Rate.

and 10,000 Kenyan shillings for a license. Both require the same application process, grant the same rights, and come with the same obligations. The process to obtain a license or permit is relatively easy and transparent to navigate. Several private sector players hold generation licenses, but only two have been granted distribution licenses – Powerhive and Talek Power Company as at 2020.¹²⁶

As of October 2019, KPLC operated 27 publicly owned and developed mini-grids, which dominate the sector. KPLC took over maintenance and operation once the REA developed the grid and built the generation and distribution assets. These mini-grid tariffs are set equal to the main-grid, and thus loss-making due to high O&M costs. The shortfall is recovered through cross-subsidies paid by KPLC's main-grid customers. At the time of writing, KPLC had published plans to develop a further 23 mini grids at a cost of US\$6.7 million.¹²⁷

The KOSAP projects, a World Bank project, is providing a loan of US\$150 million as part of the NES, with US\$40 million dedicated to developing mini-grids for rural populations.¹²⁸ These funds will be used to finance construction costs of the distribution network, while

technical assistance will be provided for site selection and procurement. The government plans to establish 120 mini-grids under a PPP model using the KOSAP support. Private companies will build the generation and distribution network and operate and maintain those assets over seven to ten years. They will receive monthly payments from KPLC for generation service provided under the PPA. KPLC is to maintain sole responsibility for tariffs, distribution, revenue collection and customer relations. While selling through a PPA guards private mini-grid developers against the risk of grid extension, the arrangement also precludes them from selling value-add products and services such as internet or televisions which, for some developers, could represent their largest revenue stream.

In 2011, the SREP programme planned for 27 new public sector mini-grids and the hybridisation of twelve existing diesel-fuelled mini-grid sites. The programme sought private sector participation in developing the existing sites, with an opportunity to implement 3MW of renewable hybrid systems in existing sites under feed-in tariffs. The project was approved as part of a country investment plan in 2014, but the private sector has not developed a full project proposal as the feed-in tariffs were too low.

Table 4-2:

Select solar mini-grid private companies

Source: World Bank (2017) Mini Grids in Kenya: A Case Study of a Market at a Turning Point

Company	Number of sites	Capacity	People served	Details
Powerhive	4	80kW	300	Developer of village-scale renewable mini grids, using solar with battery storage. First company after KPLC to be formally licensed by ERC for 25-year generation and distribution.
Talek Power Company	1	40MWp solar/ 10MWp diesel backup MG	200	SPV owned by the county government of Narok. Talek is the second mini-grid (after KPLC and Powerhive) to receive a distribution license.
PowerGen	15	>35kW	>500	Investor and operator of mini-grids. Some systems operated together with SteamaCo, a systems provider. Supply cluster model/ stand-alone systems.
RVE.Sol	1	7.5MW	47 small businesses and homes	Containerized technology, includes renewable energy generation, mini-grid distribution, remote monitoring, PAYGO service access, and potable water production.

¹²⁶ BloombergNEF (2019) Solar for Businesses in Sub-Saharan Africa

¹²⁷ Micro Grid Knowledge (2019), Kenya Continues Rollout of Off-Grid Minigrids [online]. Accessed at: <https://microgridknowledge.com/kenya-off-grid-minigrids/>

¹²⁸ World Bank (2017), Off-grid Solar Access Project for Underserved Counties: Project Appraisal Document.

There are at least 21 private sector mini-grids, developing at a slower pace than other areas of the sector. Four known companies operate these: Powerhive, Talek, PowerGen, and RVE.Sol. Table 4-2 provides an overview of their activities, all of which use solar technology.

According to a World Bank study in 2017, grid charges range between US\$0.02/kWh - US\$0.20/kWh, (depending on the level of monthly consumption), while mini-grid tariffs are more expensive at US\$0.56/kWh and can be as high as four times the grid price. Despite the low KPLC tariff, the initial connection to the national grid is costly at

US\$1,000. Depending on subsidies, as well as the size and technology of the mini-grid, these connection costs can range from c.US\$150 - US\$1,000.

Licensed mini-grid companies can set their own tariffs at cost-reflective levels, but these must be submitted to ERC for approval in order to obtain a license, as well as agreed with the community in question. This often requires the inclusion of some form of subsidy. As of 2017, these private companies had a collective installed capacity of around 500kW.

Box 4-1: Powerhive

Founded in 2012, Powerhive is a microgrid developer and solutions provider operating in Kenya, and recently West Africa and Asia Pacific. Its technology platform and business model enable the development, financing and management of bankable solar microgrids, while supporting economic development. With initial financial and technical backing from First Solar, in 2013 Powerhive completed a successful 80kW PAYGO pilot project in four villages within Kisii county using mobile money. The electricity supplied in three of these villages was able to support the needs of small businesses such as carpenters and welders. Customers paid a connection fee and a usage fee, which varied depending on overall capacity, allowing demand to be managed efficiently.

To improve the bankability of its future portfolio, Powerhive sought concessions for additional microgrids. In early 2015 it was granted a distribution license by the ERC, breaking the long-held KPLC monopoly. This achievement enabled Powerhive to raise US\$32 million in equity funding over 2015 and 2016 to support additional projects in Kenya as well as an expansion to West Africa and Asia Pacific.¹²⁹ In addition to equity finance, Powerhive also received:

- a US\$3 million results-based loan with a convertible option from the Renewable Energy Performance Platform;
- a US\$500,000 grant from the USAID's Development Innovation Ventures programme;
- US\$6.8m in debt finance from DFC; and
- US\$23m through a partnership with the Sun Exchange, a marketplace where members can purchase and lease solar cells.

A portion of these funds are being used to support Powerhive's plan to deploy 100 microgrids totalling 1MW, with much of the finance coming from Enel Green Power's US\$11 million equity investment. These grids will support 20,000 households, small businesses, schools, and health clinics in 100 Kenyan villages. Residents are trained to construct, operate and maintain the grids. As of mid-2018, Powerhive had 20 microgrids up and running, with each additional site taking a few months to construct.

In addition to the generation and provision of energy, Powerhive has also recently been licensed as an internet service provider. Wi-Fi hotspots and cyber cafes are being developed to provide customers with access to low-cost internet, powered by electricity generated through the microgrid.¹³⁰

¹²⁹ World Resources Institute (2016) Stimulating Pay-As-You-Go Energy Access in Kenya and Tanzania: The Role of Development Finance.

¹³⁰ PowerHive (2018) What Should be the Role of a Utility Company in Africa? [Online] Accessed at: <http://www.powerhive.com/what-should-be-the-role-of-a-utility-company-in-africa/>

There are many unregulated private mini-grid operators also supplying power to customers using a supply cluster model. These solutions are small (<50kW) modular and mobile and use a small diesel generator or solar PV systems where there is no grid connection. Typically, the tariffs are cost reflective and quite high as the companies are operating without a license. Additionally, there are a number of communities in Kenya who own their mini-grids, operating and maintaining the whole system from generation to distribution to collection of payments. These typically have an installed capacity below 100kW.

Demand for finance

Projects are financed mostly through grants from development partners due to the high costs and challenge in charging cost-reflective tariffs to the areas being served. For example, PowerGen and Powerhive received

grants from USAID's Development Innovation Ventures programme. One interviewee reported that mini-grid developers are waiting for the deployment of KOSAP before searching for commercial finance.

The varied subsidies available to mini-grid developers in Kenya are provided by institutions such as the World Bank, GIZ, DFID, SEFA, etc., and are outlined in Table 4-3.

Issues and challenges

Despite the potential for mini-grids to help in meeting access targets, the commercial viability of these projects is questioned in Kenya and other African countries. One stakeholder indicated that there are only two or three mini-grid developers with positive cash flows operating in Kenya. The business model is still nascent and has yet to be proven, limiting the willingness of banks to lend.

Table 4-3:
Overview of available mini-grid subsidies
Source: World Bank

Project stage	Implicit subsidies	Explicit subsidies	Provider(s)
Design	-	Technical assistance for feasibility studies, environmental impact assessment, market assessment and development, etc.	DFID GIZ AFD
Finance	Credit lines	Technical assistance for business and financial planning	DFID GIZ AFD
Construction	Capital grants Construction Progress Incentive (results-based financing, or RBF) Power Plant Commissioning Incentive (RBF)	Technical assistance, capacity building for solar technicians	DFID EnDev GIZ KfW Barclays Bank of Kenya (implementer)
Operation	Output-based grants Connection Incentive (RBF) Energy Production Incentive (RBF)	Technical assistance, capacity building for solar technicians	DFID EnDev GIZ Barclays Bank of Kenya (implementer) KfW AFD

The portfolios of mini-grid companies are not developed enough to consider raising funds from the capital market, particularly as many are operating without a license. As it stands, projects remain reliant on grant and equity finance.

The success of mini-grid projects relies greatly on having a conducive regulatory environment. In addition to the hurdles in the licensing process, it is currently unknown if tariffs for mini-grids in the upcoming ERC regulations will be uniform or cost-reflective. The price for grid electricity ranges between US\$0.15 - US\$0.20/kWh, and the government has declared its intention to lower this by as much as 50%. Mini-grid operators will have to continue relying on grants if they are to compete with KPLC's retail prices. These issues make it difficult to identify opportunities in the current environment for commercial transactions to which guarantees could be applied.

4.3.3. Captive C&I

Size of market and recent activity

As of 2018, the C&I solar market in Kenya was estimated to have a total installed capacity of 15MW, second only to Nigeria in SSA, excluding South Africa.¹³¹ The majority of these systems are in the manufacturing, agricultural and horticultural sectors. There are no installations greater than 3MW, and five between 1-3MW. These include Williamson Tea, Krystalline Salt, the International Centre of Insect Physiology and Iconology, and Two Rivers Development.

The main arrangements for the provision of C&I in Kenya are:

- **PPA-type structures**, whereby developers and/or manufacturers source and install the solar power plants on the site of an off-taker, who buys the power and in return pays the provider of the power through a service charge.
- **Leasing structures**, which involve off-takers renting equipment from developers and paying a leasing charge for this provision. These tend to be structured more as finance leases so that the asset sits on the customer's balance sheet, allowing it to benefit from investment tax allowances.
- **Outright purchases**, where off takers pay outright for the equipment and installation and are likely to contract a service provider for O&M services.

Key developers in the Kenyan C&I market include SolarCentury, Ofgen, Astonfield, Ecoligo and Harmonic Systems. Some local Engineering, Procurement and Construction (EPC) companies are also looking to build their C&I portfolio. They are collectively referred to as "developers".

BloombergNEF reported the average cost of C&I solar at US\$0.14/kWh in 2019. While this is like grid-connected tariffs once VAT, fuel charges and other additional costs are considered, the cost of C&I is expected to decline to \$0.07/kWh by 2030. This suggests that unless grid-connected tariffs fall significantly, C&I presents an opportunity for Kenyan businesses to significantly reduce their energy costs going forward, creating favourable pay-back opportunities and whole-life benefits.¹³²

Imported solar and wind products for the generation of renewable energy also benefit from exemption on import duties and VAT, and customers that install solar technology are eligible for tax credits, namely:¹³³

- an investment deduction on the capital expenditure for buildings and machinery used in manufacturing and certain hotels; and
- an investment deduction of 150% of capital expenditure for the direct purchase and installation of a solar system costing US\$1.96 million or more outside Nairobi, Mombasa and Kisumu, or 100% within said areas.

Any installation of up to 1MW for self-consumption does not require approval from the regulator or utility company. A generation permit is required for systems generating 1-3MW, and a license for anything above 3MW. Taken together these tend to militate against PPA structures, except in mining where the average scale of the power requirement is many times larger than in manufacturing or horticulture.

Kenyan developers have indicated that the licensing process, done through the ERC, is fairly transparent and straightforward, and only takes approximately two months.¹³⁴ Those who generate over 1MW and want to sell power also require a power supply license from the ERC. To date, none of these have been granted in the C&I space, given preferences for leasing structures or outright purchases.

Going forward, BloombergNEF has estimated an additional 26MW of C&I solar capacity could have been installed by the end of 2019, which could amount to a total value of approximately US\$26 million, given the average installation size of c.1MW.¹³⁵ In addition, by 2018 there were approximately 3,700 large power consumers in

¹³² Ibid.

¹³³ PKF (2016) Kenya Tax Guide 2016/17

¹³⁴ BloombergNEF (2019) Solar for Businesses in Sub-Saharan Africa.

¹³⁵ This information is based on data from five developers, collected and analysed by BloombergNEF. They reported that the installed C&I solar capacity in Kenya was 15MW as of October 2018, with an additional 26MW expected by the end of 2019. These installations have mainly been focused on manufacturing and horticultural sectors to date. The latter often have operations running 24/7, making the price of solar particularly attractive relative to the grid.

Kenya with a total average load of 650MW.¹³⁶ While not all of these consumers will switch to off-grid solar, it does provide an indication of the significant opportunity for C&I, assuming the economics of it remain favourable. One leasing company estimated a pipeline of approximately US\$53 million within the next three years. It is important to note that a significant reduction in the KPLC tariff would increase pay-back periods for off-grid solutions and therefore reduce incentives for them. This would, however, be less pronounced in the case of add on energy efficiency solutions in heating and cooling processes.

Demand for finance

Several companies highlighted the importance of access to working capital facilities, in addition to their equity funding, to expanding their activities and the challenges that some of them face in accessing these. This is a particular constraint for EPC companies, whereas leasing companies also need medium to longer term finance to fund the life cycle of the leased equipment. Whilst local currency finance may be appropriate in some instances, for many C&I developers and manufacturers, hard currency finance is more attractive given that components and / or equipment is imported. Moreover, whilst local currency can be relatively easily exchanged for hard currency, the hard currency interest rate is lower making the latter more attractive. More generally, according to BloombergNEF, most C&I transactions in Kenya have not involved the provision of finance by leasing companies, but rather direct purchases in which customers have either financed these themselves or else raised finance from their banks to do so, where this has been desirable and possible.¹³⁷

BloombergNEF estimate a pipeline worth 26MW for 2019. Assuming capex costs of US\$1/W, the central estimate of costs reported in the study, and similar pipeline figures over the five-year period gives a total pipeline of around US\$137 million over the five-year period.

Issues and challenges

Access to debt finance is noted as a main constraint to expanding operations by C&I developers and EPC companies, especially new entrants looking to provide credit to customers.¹³⁸

Several new entrants to the C&I market lack a strong track record and collateral due to the nascence of the

sector, meaning that if they are offered loan finance, the interest rates are likely to be closer to the top end of the cap. The tenors are typically only 2-3 years, which is adequate for working capital finance, but not for where the intent is to provide credit to customers in longer-term leasing transactions. There are also initiatives, such as the Sustainable Use of Natural Resources and Energy Finance (Sunref) led by AFD to provide longer term finance to commercial banks to support solar projects in Kenya; although it should be noted that most banks have considerable liquidity in local currency.

At present, several developers and EPC contractors note that the collateral requirements of banks are high, making it either difficult or unattractive for them to raise finance themselves, with several seeking to arrange debt finance for customers who take on the payment obligation. In addition, depending on the scale of the customer's cash flows, projects can be relatively small and therefore financing requirements are not as necessary. The small size can also make it difficult to raise finance as it is too small to get anyone interested as a stand-alone transaction. Although some leasing companies in the space prefer for clients to raise their own finance, others are interested in raising capital to fund their business models.

4.4. Supply of finance

4.4.1. Commercial banks

By the end of 2017, the total net assets of the Kenyan banking sector reached approximately US\$40 billion.¹³⁹ At this point there were 42 commercial banks, of which 40 were privately owned and 25 locally owned. Of the 15 foreign-owned banks, eleven were local subsidiaries and four were bank branches of foreign banks. Six of these foreign-owned banks were African banks, including Bank of Africa, Ecobank, Guaranty Trust Bank, SBM Bank Kenya, Standard Bank (operating locally as Stanbic) and United Bank for Africa. Until the removal of the interest cap which was introduced in 2016, commercial bank assets had increasingly been allocated to government securities, which reached more than KES1.2 trillion (US\$11.6billion) by the end of November 2018, or 27% of all commercial bank assets.¹⁴⁰ Net loans and advances accounted for 53% of total assets and in recent years have shown signs of subduing.¹⁴¹

¹³⁶ BloombergNEF (2019) Solar for Businesses in Sub-Saharan Africa.

¹³⁷ Ibid.

¹³⁸ According to the Bloomberg report, where it has been possible to raise finance, the lowest nominal interest rates provided to C&I installers by local banks is around 11% on shillings, implying a margin of around 200bps. However, these rates were not supported by the consultations conducted for this diagnostic, and are more likely to refer to rates offered on dollar loans in the C&I market to support import/export activities.

¹³⁹ Central Bank of Kenya (2017) Bank Supervision Annual Report 2017

¹⁴⁰ Central Bank of Kenya (2019), Kenya Quarterly Economic Review October-December 2018.

¹⁴¹ Ibid.

The Kenya banking sector is heavily driven by relationships between banks and clients. Many banks have shown reluctance to lend to potentially credible businesses if the company does not have a previous relationship, for instance, deposit taking and payment services. In such cases, the banks require significant collateral (from land, buildings, and cash) or personal guarantees from borrowers (in the form of collateral from personal assets) or a parent company guarantee to provide loans. More generally, banks often ask for 100% collateral on transactions before lending. Aside from the relationship-driven nature of the industry, the recent interest rate cap has had a noticeable impact on lending to smaller businesses, with government and large corporate lending increasing significantly since its implementation.

As regards specific sectors:

- Despite significant growth in the **SHS market** in Kenya, companies have found it difficult to obtain finance from local commercial banks, relying instead on DFIs for debt finance. This is primarily a result of the banks' perception of their businesses, as well as a lack of a track record of profitability, the underlying credit risk associated with their customer base, and new market entrants lacking local relationships with banks. SHS providers interviewed noted that local banks do not have the experience of assessing credit risk associated with the SHS business, which has meant lenders are reluctant to support them. That said, Stanbic supported a local currency facility provided to M-KOPA, demonstrating that commercial banks are starting to lend to these businesses. In addition, even more sophisticated debt providers have concerns regarding the competence of many, especially new, EPC companies.
- Established **C&I companies** have obtained L/Cs from banks to facilitate imports of equipment, which they then provide to clients who often finance purchases themselves. However, new entrants seeking to operate leasing models have found it hard to obtain finance from local banks because of their high collateral requirements. Instead, they have had to rely on impact investors, crowd funding and DFIs for provision of working capital and to fund the provision of credit to clients, which can constrain their ability to meet market demand.
- Most of the stakeholders consulted in the banking sector are waiting to see what happens in the **mini-grid** sector once the World Bank's KOSAP project takes off before considering commercial lending.

Generally speaking, the capacity to engage in the sectors of interest does not vary between foreign and local banks,

although foreign banks that are larger and have some experience in the sector may be more willing to engage than the local, smaller institutions with less experience of lending to these sectors.

To help increase interest in lending to the sector and the ability of banks to lend for longer tenors, AFD launched Sunref. Details are provided in Box 4-2.

Some key points have been raised regarding the use of guarantees to mobilise finance from local Kenyan banks. In particular:

- Banks generally see the role of guarantees as being limited to the security package enabling a loan and are unwilling to lower their margins even with them in place.
- Despite this, guarantees may be useful when banks are less familiar with the borrower, and as such, may expand the potential business of banks as opposed to enable reductions on interest rates offered.
- Understandably, banks prefer on-demand guarantees, which essentially pass the full risk and responsibility for recovery to the guarantee provider as soon as there is a default on a financing covenant. However, most guarantees currently available in the market are PCGs with a (shared loss), either 50/50 "pari-passu" or a majority loss on the part of the provider. These guarantees are typically only fully paid out only when the extent of the loss has been established (although AGF pays out half of its cover on calling) and are therefore non-accelerable, making the process of calling a guarantee much more involved relative to an on-demand one.
- As banks will not significantly reduce their own margins to take account of a guarantee, the cost of the guarantee is in addition to the cost of the loan, which limits the ability to fully price a guarantee where interest rates are already high. Whereas GuarantCo seeks risk reflective returns for its guarantee, banks are often looking for guarantees in the 75-150bps range, which can only be achieved where the provider is not targeting a risk reflective return, as in the case of AGF, USAID and Sida.¹⁴²

Another important point to raise in the Kenyan context is that banks do have access to sufficient dollars to finance smaller transactions, and as a result hard currency guarantees could also be an important instrument to mobilize local financial institutions to support projects in the sectors examined, especially given the need to import equipment.

In terms of pricing, it was reported that lenders in local currency were charging up to the interest rate cap. This would typically translate into a margin of 400bps, resulting

¹⁴² In theory, a guarantee fee could be charged separately, rather than being part of a loan, thereby circumventing the cap, the borrower would still need to be willing to pay the additional costs.

in a rate of approximately 13%.¹⁴³ This margin would be higher if a given bank's own funding costs were lower than the CBK rate, or if the bank was able to structure additional fees. As this is a relatively low margin, only the most creditworthy clients can access this.

In part, due to the rationing resulting from this, but also from a convenience and margin perspective, borrowers are drawn to dollars, where twelve month LIBOR is currently less than 3% rather than the 9% CBK rate, resulting in reported lending rates of nine to 11% and likely

Box 4-2: Sunref

Sunref is an AFD-led initiative to catalyse bank lending to green projects. In addition to providing technical assistance and capacity building to banks on green lending, the initiative involves lending to local banks (USD, euros and local currencies) which are then used to on-lend to renewable energy and energy efficiency projects. The choice of currency is based on the banks' internal needs assessment. The initiative has been running in East Africa since 2011, and is currently in its second phase, which began in 2014 and will end in 2019. After this, funds will be managed by Proparco, having received additional funding from GCF to widen scope and cover additional regions in Eastern Africa.

In the long-term, AFD hopes that banks become more comfortable lending to these sectors and will begin to lend their own resources.

Currently, the debt is channelled through partner banks in each country. In Uganda, the partner bank is Diamond Trust Bank. In Tanzania, the partner bank is Bank of Africa. In Kenya, the partner banks are Cooperative Bank of Kenya, Diamond Trust Bank and Commercial Bank of Africa (CBA). The Co-operative Bank of Kenya was the only bank present in the first phase. Chase Bank was a partner bank in the second phase of SUNREF until its receivership. Each of these banks has been given a US\$10m lending envelope. There are also additional funds (covering Kenya, Tanzania and Uganda in the form of a common pool) that are available for banks to access if they generate higher amounts of green business on a first come first serve basis.

To date, SUNREF has supported 39 projects covering hydropower, solar, energy efficiency, ESCO, biomass and biogas. During the first phase (2011-14), US\$38m was disbursed solely through the Co-operative Bank of Kenya, while to date the second phase has disbursed US\$34m. As part of the second phase of Sunref (from 2014 to 2019), 28 projects have been supported in Kenya. These have been captive projects or on-grid projects with PPAs, with an average commitment of US\$1m per project.

AFD caps the lending rates of banks to clients to ensure concessionality is passed on to project sponsors. What AFD lends to the banks at is determined bilaterally.

Despite the number of transactions being supported, some consultees noted that the Sunref programme has faced difficulties disbursing funds, especially during the initial years of the initiative. One of the biggest challenges for AFD has been the collateral requirements of banks, which has limited the number of transactions that can take place (as the credit risk resides with the participating banks, not AFD). One issue is when an existing bank has a lien on assets, which can complicate the partner bank's security arrangements.

SUNREF has a partial risk guarantee - ARIZ guarantee - that can help partner banks de-risk projects from a financial angle. The guarantee comes at an additional cost.

In Kenya, SUNREF has undertaken numerous trainings, engaged with the credit teams in banks on a case-by-case basis, delivered talks at seminars and conferences, and published studies (e.g. on green buildings and green transport) with the objective of encouraging the financial sector to undertake more green lending.

Source: AFD (2017), CEPA analysis.

143 What they would ideally lend at is more difficult to assess, but equivalent historical reported capital market transactions were in the region of 15-16% for less 'blue chip' issuers.

cheaper, where financing is provided by DFIs.¹⁴⁴ In other words, borrowers understandably will seek the lowest cost financing where they are able to access this.

4.4.2. Microfinance Institutions

As of December 2017, there were 13 licensed MFIs operating in Kenya, eleven of which had nationwide licenses while two had community licenses, with a total of KES75 billion (c.US\$743m) in total assets.¹⁴⁵ Two MFIs, Kenya Women MFB (44%) and Faulu MFB (38.4%) accounted for 82.4% of total market share by gross assets, showing that the sector is essentially dominated by these two entities.¹⁴⁶

MFIs are a main source of finance for low income households and have been key to ensuring that families have access to credit to purchase clean energy products when they are unable to afford the upfront cost. In many senses, MFIs are at least as well placed as PAYGO lenders to finance household solar, given that they have better access to local currency through their deposit-taking activities, as well as having an existing customer base and distribution network to reach clients (as set out, it was reported by some market observers that the distribution and call-centre costs were undermining the economics of the PAYGO model – importantly they also have considerable insights into likely default rates).

Savings and Credit Cooperative Societies (SACCO) are also an important source of local currency loans in Kenya; as of late 2017, they collectively held KES442 billion (US\$4.7 billion) in assets. The majority of loans provided through SACCOS are for the purchase of land and housing, as well as education, agriculture and business lending.¹⁴⁷ Only a select few, such as Moto Hope and Kenya Union of Savings and Credit Cooperatives (KUSSCO), offer green loans, although Lighting Africa, SNV and GVEP have used SACCOS for SHS focused projects.¹⁴⁸ The SACCO Societies Regulatory Authority (SASRA) has recently expressed concern at the consistency at which some SACCOS are operating on restricted licenses due to compliance issues. The media has also reported on issues of fraud and potential future issues from the recent doubling of taxation of dividends.¹⁴⁹

As of March 2019, there were 174 licensed deposit-taking SACCOS operating in Kenya.¹⁵⁰

In addition to deposits, MFIs active in this space such as Musoni have sought to raise additional finance in capital and credit markets. It was reported in the press that Musoni was seeking to issue a KES2 billion (US\$19.32 million) bond; however, ultimately it was able to raise bank finance with the support of a USAID guarantee of KES940 million (US\$9 million). This represents one way in which a guarantee could assist MFIs raise term wholesale resources.

It is less clear how a portfolio guarantee could work effectively. Unlike in the case of pure collateral-based lending, in which there is less focus on credit appraisal than in unsecured lending and in which a guarantee provider is providing a guarantee based on its ability to understand the credit risk better than the collateral-reliant lender, the same does not apply with micro-credit. It is difficult to see how a guarantor could understand individual household risks better than an MFI. A portfolio guarantee that might work on a risk-sharing basis, however, would be one that only kicked in above a certain anticipated loss rate on a portfolio (that the MFI provider would be pricing in) – essentially a second loss guarantee, with the MFI taking the first loss, but having a partial protection above this. One bank/ MFI expressed interest in this product but would require the cover to kick in at approximately 6% of portfolio losses.

4.4.3. Leasing companies

Leasing companies are firms that provide assets through a rental (or operating leases) or on a lease-to-own basis (finance leases). A key advantage of these organisations over banks and other suppliers of finance is their understanding of the asset life of the equipment they are providing, and as such can offer efficient financing terms based on this.

In terms of financing leases, two models have been used in Kenya:

- The first approach involves customers wishing to install equipment borrowing from a bank in which there is a full sale agreement with the leasing company, but with significant rights being assigned to the bank, creating a “tripartite” agreement. A bank will provide most of the finance, while a leasing company will provide the remainder. In the event of default, a bank will have first claim on the assets, but over the life of the arrangement the interest the bank earns decreases, while that of the leasing company increases.

¹⁴⁴ A DFI-backed financing intermediary reported that its all-in lending pricing was about 10%. Sunref’s participating banks can charge a maximum rate of 7%.

¹⁴⁵ Central Bank of Kenya (2018), Banking Supervision Annual Report 2017.

¹⁴⁶ Ibid.

¹⁴⁷ SASRA (2018) The SACCO Supervision Annual Report 2017.

¹⁴⁸ SACCOS were not included in the initial market sizing as they currently have limited engagement in the renewable energy and energy efficiency sector relative to MFIs. However, they may be considered further at the feasibility stage.

¹⁴⁹ Kirunga (2019) Kenyan savers hit by stumbling Sacco sector. [Online] Accessed at: <https://www.theafricareport.com/10479/kenyan-savers-hit-by-stumbling-sacco-sector/>

¹⁵⁰ SASRA (2019) List of Sacco societies licensed to undertake deposit-taking Sacco business in Kenya.

- The second approach involves leasing companies borrowing from a bank on its balance sheet and using this to provide finance to its customers to purchase the assets.

One leasing company interviewed preferred the first of these approaches as it allows it to focus on understanding the assets themselves, leaving the assessment of credit quality to banks. But particularly in the case of solar equipment, leasing companies are likely to be better placed than banks to understand the quality of these assets in terms of their asset life and collateral value (although challenges associated with technological change on values need to be recognised).

A further benefit of the leasing arrangement in the renewables / energy efficiency space is that the costs associated with installation, which are not recoverable, are normally covered by an upfront payment of 25-30% made by the customer. Moreover, one leasing company in this space suggested that its financing terms could be very competitive as it was making most of its margin on the supply and installation of equipment.

4.4.4. Intermediary funders

Intermediary funders refer to institutions providing finance, sourced from financing institutions, DFIs, donors and impact investors, which they then on-lend to companies working across the sectors of interest. In Kenya, these organisations have been a key source of financing across the SHS and C&I sectors. Taking the C&I sector as an example, these include:

- **SunFunder**, provided a US\$1.2m working capital debt facility to Questworks, a Kenya EPC company looking to expand its C&I business across the country.
- **CrossBoundary**, supported the financing of a 619KWp facility being developed by SolarCentury which will be covered by a solar services agreement with Unilever on a tea farm in Kericho, western Kenya.
- **Solarise Africa** financed a 1MW flower farm as well as an 850kW edible oil factory on a finance lease basis.
- **Ecoligo**, a crowdfunding platform for energy projects, supported the financing of C&I solar plants on Kenya flower farms. This was made possible through €1m of crowdfunding.

These institutions are specialist financing companies working in the solar space, and could provide the opportunity for local currency guarantees during their funding rounds. For example, one of the organisations mentioned that it would like to use a guarantee to fund a US\$13.25 million junior tranche in a fund it is currently looking to set up, although it should be noted that this guarantee is likely to be required in hard currency and there would likely be pricing challenges.

4.4.5. Capital markets and institutional investment

The alternative to raising debt finance from banks is to do so from institutional investors, utilising Kenya's capital markets. Institutional investors include pension funds, insurance funds, banks, and wealthy individuals. Altogether, there are some 15 fund managers in the Kenyan market.

There are also a number of active brokers and investment banks active in assisting companies to issue debt, including Dry Associates, which is very active in the CP market and NIC Investment Bank, one of the largest financial advisors (which will only look at the largest issues).¹⁵¹

Capital markets

Kenya's debt capital markets comprise short term CP issues – typically up to a year – as well as bonds. They are better placed than banks to provide long term local currency resources in large volumes. The long-term government yield curve has the potential to accurately price long term issues. Indeed, Kenya's bond market infrastructure is well-developed relative to other African countries with outstanding bonds greater than US\$10 billion and tenors of up to 30 years. As of June 2019, corporate bonds make up 23 of 186 outstanding issuances, or approximately 4% of the value of all outstanding bond issues; 4% of the local currency bonds and 9% of those issued in US dollars.¹⁵²

Prior to recent defaults by issuers (see below), the market was previously described as being 'quasi-stable', with a good level of capability in terms of structuring and issuing bonds. Kenya currently has the fifth largest bond market in Africa¹⁵³, with the investor base consisting of commercial banks, pension funds, insurance companies,

¹⁵¹ Dry Associates has been an arranger and placement agent for over 20 companies in diverse sectors including microfinance, hotels, retail, mining and banking, while NIC Investment Bank works with large publicly held corporations, multinational corporations, government institutions and development fund institutions.

¹⁵² Cbonds (2019) Kenya: bonds. [Online] Accessed 3 June 2019 at: <http://cbonds.com/countries/Kenya-bond>

¹⁵³ AFMI (2017) The African Bond Market Development Index: 2017 Annual country Rankings and Scores Report.

parastatals and retail investors.¹⁵⁴ In addition to Lesotho, Kenya also has specific requirements related to the issuance of asset-backed securities, under which many receivables-based financing by SHS companies could fall.¹⁵⁸

parastatals and retail investors.¹⁵⁴ In addition to Lesotho, Kenya also has specific requirements related to the issuance of asset-backed securities, under which many receivables-based financing by SHS companies could fall.¹⁵⁸

Companies wishing to issue bonds in Kenya will need to obtain approval from the Capital Markets Authority (CMA) (which the Authority must provide within 14 days of the application if all appropriate documentation and evidence are sent). Bonds can be publicly traded or placed privately. In addition to requirements concerning incorporation in Kenya, the integrity of company directors and submission of relevant documentation, companies looking to issue must meet the following requirements:^{156,157}

- **Minimum share capital and net assets:** Issuers require a minimum share capital of KES50 million (US\$500,000) and net assets of KES100 million (US\$1 million).
- **Minimum issuance:** Issues must be a minimum size of KES50 million (US\$500,000), with a minimum lot size of KES100,000 (US\$1,000).
- **Profitability:** Companies must have declared positive profits after tax attributable to shareholders in at least two of the last three financial periods preceding the application for the issue.
- **Debt ratios:** A company's total indebtedness, including the new issue of fixed income securities, shall not exceed 400% of a company's net worth as at the latest balance sheet. In addition, funds from operations to total debt for the three trading periods preceding the issue shall be maintained at a weighted average of 40% or more. These conditions need to be maintained while the issue is outstanding.
- **Legal opinion:** Issuers must provide copies of a legal opinion from a licensed law firm in Kenya confirming that all documentation is accurate and that collateral and other requirements are sufficiently met.
- **Guarantee requirements:** If an issuer does not satisfy the requirements, or does not wish to be subjected to the disclosure requirements, it may obtain a guarantee from an institution acceptable to the Authority, and a copy of the guarantee document must be sent and approved by the Authority.

The requirements set out above, plus the need for issuers to obtain financial advisory and other support, can make issuing a long and involved process, meaning that for many, the benefits of issuing in terms of access to longer term debt at a comparably lower cost are only realised if issuances are of a sufficient size, with consultees noting this to be c.US\$20 million equivalent.

Banks have historically been the most frequent issuers of bonds, but their activity was limited when the interest rate cap was introduced in 2016. They have been able to raise finance through bonds at rates between 12.5% and 13% for medium term issuances (typically five to seven years), a 200-300bps spread over government securities. However, because of the cap on interest rates, using issuances to on-lend to customers was less suitable because the margins that banks can make were so small, although bonds could still be used to finance acquisitions, capex and increasing banks' Tier 1 capital.¹⁵⁹ Chase Bank and Imperial Bank, who had both raised money through bonds, were placed into receivership in 2016, holding up lenders' funds. In 2018 there were reportedly defaults by five firms that had issued bonds, fuelling the widespread perception of a risky market.¹⁶⁰ There has been only one corporate bond issuance between 2015 and 2018, and the secondary market is seeing little activity as investors are unable to sell their private sector bonds.¹⁶¹ One interviewee noted that higher margins could be achieved by banks relying on their deposits, where there is a high degree of liquidity.

But there are definite benefits to corporates utilising the capital markets. Given the difficulties that banks face in lending long term, one market observer noted that it is better to list where the required tenor is greater than five years. Moreover, when the interest rate cap was in place, it only applied to lending, not to other forms of finance. The spread on a bond is relative to the same maturity government security; price is set by testing what will clear the market, with larger issues require higher pricing / spreads – it is therefore better to issue bonds in tranches.

154 BIS (n.d.) Government debt issuance and central banks – Kenya's experience. [Online] Accessed at: <https://www.bis.org/publ/bppdf/bispap76g.pdf>

155 ALCB Fund (2018) Benchmarking Report- African Corporate Bond Issuance.

156 Capital Markets Authority (2002), The Capital Markets (Securities) (Public Offers, Listing and Disclosures) Regulations, 2002.

157 Capital Markets Authority (2017), The Capital Markets (Securities Lending, Borrowing and Short-Selling) Regulations, 2017.

158 Details of these requirements can be found in, Capital Markets Authority (2017), Policy Guidance Note on Issue of Asset Backed Securities.

159 Guguyu (2016) Bonds issuing banks face thin margins [online] Accessed at: <https://www.businessdailyafrica.com/markets/Bonds-issuing-banks-face-thin-margins/539552-3388796-a49pfjz/index.html>

160 Mwaniki (2017) Little corporate bond market activity after Chase, Imperial crash. [Online] Accessed at: <https://www.businessdailyafrica.com/markets/marketnews/Little-corporate-bond-market-activity-after-Chase/3815534-4244490-3s5ypgz/index.html>

161 Guguyu (2018) NSE investors in no mood to buy corporate bonds [online]. Accessed at: <https://www.standardmedia.co.ke/business/article/2001300154/nse-investors-in-no-mood-to-buy-corporate-bonds>

Even today, CP six months to one year is an active market as are bonds (<two years). Prior to recent developments clients could be persuaded to move from these products into five-year bonds. Previously a BBB rated five-year bond had been priced at 15%, which was 150bps over the equivalent government bond, with pricing keying off the government yield curve. On shorter dated paper there is still a market for a 100bps spread.

Market observers noted that it is important to sell to institutional investors, although it has been noted that institutional investors are more comfortable investing in certain areas once they have seen other institutional investors do so. A key takeaway is that pension funds are the main investor and they either require a public bond (rated BBB or higher) or one that has been guaranteed. Encouragingly, there is some movement towards looking at ratings and pricing accordingly rather than just chasing yield, although this needs to go much further.

One of the biggest pending issues for the bond market liquidity is KenGen, because there is a limit to what can be raised – the announced KenGen KES40 billion issue is relatively large and might not be completely absorbed by the local market alone. Therefore, pension funds are critical to any larger issue (hence the bond must be public or guaranteed).

BBOXX is reportedly looking to issue locally and is seeking a bank guarantee. In 2017, a geothermal project was looking to issue but was ultimately financed by the Chinese. Smaller issues could be funded locally if the pension funds were involved. A bond does not have to be fully wrapped to attract pension funds – 50-75% cover seems sufficient.

Some established hire purchase and leasing companies have used the capital markets effectively. They are effectively charging 30% and even higher interest rates to clients: Synergy, Alios and ASL Credit are examples; the latter having BBB- ratings and therefore being acknowledged as creditworthy. ASL Credit currently has outstanding KES 800 million commercial paper (CP) and KES 1 billion in 2-year notes. Alios has a KES 400 million CP programme outstanding. Synergy issued a CP programme some time ago but has retired the programme. The ASL Credit's multicurrency 2-year notes carry a coupon of 13.5% for Kenya shillings, 7% for USD and 6% for Sterling. Their CP pays 13% in Kenya shillings.

Sometimes companies are prepared to use the capital markets even though this can be expensive; neither Synergy nor Alios was every credit rated but wanted to issue CP as an alternative to bank finance. Alios's CP programme pays 12.75% for shillings and 5% for USD. Even if these leasing companies were able to utilise a guarantee to reduce this pricing, a market observer noted that they would be unlikely to pass on any pricing benefits to customers, although they could do more business.

Green bonds

The Kenya Green Bond Programme was launched in 2017 in partnership with the Kenya Bankers Association, Nairobi Security Exchange, Climate Bonds Initiative, FMO, CBK and the Treasury. It provides technical assistance to both issuers and investors to develop the market for green bonds, focused on assisting new issuers to market. Since its launch, it has established tax exemptions and rules for green bond listings with the CMA.

Most green bond issuances are expected in local currency and the programme has mainly engaged with domestic investors to date. For example, it has held workshops with the Retirement Benefits Authority and the Kenya Association of Stockbrokers and Investments Banks. However, there is interest in attracting foreign investors as well, particularly for local currency issuances as this meets the financing needs of most issuers while aiding CBK's management of FX risk and stability. The type of investors will ultimately depend upon the issuer, size, and other factors at the time of issuance. The programme is expecting impact investors to take an interest in green corporate bonds as the investment size is likely to be too small to attract the mainstream pension funds and asset managers.

In 2019, Kenya became the first country in the East and Central Africa region to successfully issue a green bond. The bond, worth 4.3 billion shillings (\$42.5 million), was issued by Nairobi-based property developer Acorn Holdings in 2019 to build student accommodation.¹⁶² Depending on the success of the programme and the receptiveness of the market, there could be between KES20 – 45 billion worth of issuances in the next three years.¹⁶³ A market participant noted there were rumours that three financial institutions were interested in issuing, but the identity of these was not known.

¹⁶² Reuters (2019) Kenya's first green bond starts trading on the bourse Accessed at: <https://www.reuters.com/article/us-kenya-bonds-green/kenyas-first-green-bond-starts-trading-on-the-bourse-idUSKBN1ZF1WH>

¹⁶³ Kenya Green Bonds Programme (n/d). Annual Report 2017 - 2019

Pension funds

By the end of 2017, the OECD reported that total Kenyan pension fund assets were nearing US\$10.5 billion.¹⁶⁴ The largest pension funds are the state-owned National Social Security Fund (KES209.26 billion) and Sanlam Investments East Africa (KES201.93 billion), followed by GENA Africa, Stanlib Kenya, Old Mutual and Britam.¹⁶⁵ Regulations are in place regarding the proportion of funds that can be invested in certain areas, although fund managers do have some discretion over their specific investments. The 2018 OECD Pensions Survey states that alongside investment in government securities (up to a maximum of 90%), Kenyan pension funds can invest up to 20% in corporate assets that are approved by the CMA, 10% in corporate bonds that are not listed but have an investment grade credit rating, and 15% in foreign markets (outside of the East African Community) but this is limited to bank deposits, government securities, listed equities and rated corporate bonds. They can also invest up to 10% of their assets into 'other' assets that are approved by the regulator – the Retirement Benefits Authority (RBA).¹⁶⁶

Like other countries in Africa, Kenyan pension funds have made limited investments in infrastructure-related assets. Though according to the PwC Africa Asset Management report, Kenyan pension funds invest in a more diversified range of assets than is the case in most other African countries – as of December 2017, less than 37% of investment was in government securities (compared to around 70% in both Nigeria and Egypt);¹⁶⁷ whilst around 21% was allocated to property and 20% in listed equity.¹⁶⁸ Listed corporate debt remained limited on the other hand, accounting for less than 4% of total asset allocations.¹⁶⁹ One active market participant noted, however, that pension funds are currently heavily invested in Treasury Bills, given the current lack of trust in CP and bonds issued by banks and corporates. This suggests that the relative diversification of the pension funds observed in 2017 may no longer hold. Another noted that for an issue to be successful, it is imperative that the pension funds participate as they are the largest buyers of such instruments. A recent issue by a housing association that was going to be in three tranches was over-subscribed and fully funded in the second tranche because of pension fund involvement.

According to stakeholders, the Kenyan pension funds previously drew on local credit ratings agencies when deciding on investments, but the recent defaults in the market have impacted the trust in these institutions, and has resulted in many fund managers carrying out their own, more detailed due diligence.

Contributing to the lack of infrastructure investment is the ability of individuals to access half of their pension every time they move jobs. The long-term nature of pension funds typically suits them to investments in assets such as infrastructure. However, the regular access to pension funds and the resulting mentality in Kenya leads to a preference for shorter-term investments that potentially offer higher yields.¹⁷⁰

To help provide an additional source of capital for public infrastructure projects, the government has issued KES-denominated infrastructure-related bonds with maturities of eight to twenty years; pension funds have been some of the main investors into these bonds. The returns on these are tax exempt so they generate significant interest in the market.¹⁷¹ The RBA submitted some suggested changes to asset classes to the National Treasury, including the creation of a PPP asset class. In the 2018/19 budget the government requested that PPPs be considered a distinct asset class by institutional investors in order to facilitate investment and reduce FX risk.¹⁷² There are reportedly 67 projects in the pipeline which pension funds can participate in.¹⁷³

In terms of new developments in the market, a group of twelve pension funds in Kenya have joined to form the Kenya Pension Fund Investment Consortium. They intend to invest in local infrastructure, private equity and real estate deals which have been structured to potentially include direct investment by international asset owners and managers.^{174, 175} This has been motivated by the understanding that individually, pension funds are too small to provide investments of sufficient size for infrastructure projects or manage the costs of doing so, such as assessing different infrastructure-related opportunities. This type of alignment can also be seen in developed markets, such as the Pensions Infrastructure Platform in the UK, which provides members with greater access to infrastructure

¹⁶⁴ OECD (2018) Pension Funds in Figures.

¹⁶⁵ Retirement Benefits Authority (2018) Retirement Benefits Industry Report for December 2018

¹⁶⁶ OECD (2018) OECD survey of investment regulation of pension funds.

¹⁶⁷ PwC (2015) Africa Asset Management 2020.

¹⁶⁸ Financial Sector Regulators Forum (2018), Kenya Financial Sector Stability Report.

¹⁶⁹ Ibid.

¹⁷⁰ CEPA (2015) Mobilising Finance for Infrastructure: Kenya Country Study

¹⁷¹ Central Bank of Kenya (n.d.) Treasury Bonds. [Online] Accessed at: <https://www.centralbank.go.ke/securities/treasury-bonds/>

¹⁷² The National Treasury and Planning (2018) Budget Statement FY 2018/19.

¹⁷³ RBA (April – September 2018) The Pensioner.

¹⁷⁴ Jacobius (2018) Kenyan pension funds band together for infrastructure investment. [Online] Accessed at: <https://www.pionline.com/ARTICLE/20180917/PRINT/180919869/KENYAN-PENSION-FUNDS-BAND-TOGETHER-FOR-INFRASTRUCTURE-INVESTMENT>

¹⁷⁵ Muchira (2018) Kenyan pension schemes form pool to win big projects. [Online] Accessed at: <https://www.theeastafrican.co.ke/business/Kenyan-pension-schemes-form-pool-to-win-big-projects/2560-4776096-98aieuz/index.html>

as an asset class. Fund Investment Consortium. They intend to invest in local infrastructure, private equity and real estate deals which have been structured to potentially include direct investment by international asset owners and managers.^{176, 177} This has been motivated by the understanding that individually, pension funds are too small to provide investments of sufficient size for infrastructure projects or manage the costs of doing so, such as assessing different infrastructure-related opportunities. This type of alignment can also be seen in developed markets, such as the Pensions Infrastructure Platform in the UK, which provides members with greater access to infrastructure as an asset class.

Insurance funds

According to the available data, the Kenyan insurance funds have around US\$4 billion of AUM, which is just over half the size of the assets held in pension funds. The insurance funds are regulated by the Insurance Regulatory Authority, with limitations on investment categories like pension funds. Additionally, there is a limit of 10% for investments in any one corporate, commodity or group of related corporations. Infrastructure has not been designated as a specific asset class and therefore it is not clear whether funds can currently invest directly into infrastructure projects.¹⁷⁸

Like pension funds, the insurance funds have invested their assets mainly in government securities (around 40%); 16% in property and 15% in equities. There is limited evidence of direct investment in infrastructure related assets.¹⁷⁹ Insurance companies indicated that companies are generally not looking to invest in greenfield assets unless there are substantial security packages in place. However, they would be willing to invest in funds or corporates, and would look for a one to 2% margin over government bonds on debt. Some companies with a regional presence are willing to lend or invest in US dollars as well as local currency as a means of diversifying assets and mitigating against currency depreciation.

Ratings agencies

The CMA has licensed four ratings agencies; Metropolis Corporation Limited, Augusto and Company Limited, Care

Ratings Africa Private Limited and Global Credit Rating.¹⁸⁰ According to interviewees, the latter is currently the most respected and its ratings hold for one year. Fitch and S&P have not yet been licensed locally.

Institutional investors require a rating for their investments, for example, pension funds are limited to investments that have obtained a rating of BBB or above. While, obtaining a rating for either the company or a specific issue will be cheaper than a guarantee, it clearly does not offer the same degree of protection to investors. The recent instability has resulted in a market preference for the guarantee.

Role for credit enhancement

Investor appetite for corporate bonds is currently low in Kenya. It should also be cautioned, that raising local currency finance through a costly bond issuance process in which there is a high degree of investor caution is a challenging proposition, especially when competing with cheaper sources of hard currency DFI funding.

Whilst sentiment has been badly shaken by recent problems in the capital markets, at least a couple of market participants interviewed believed that interest in issues will increase at some point and a guarantee could assist with this. Indeed, guarantees have the potential to help (re)build investor confidence in the bond market. Until recently, there has not been significant uptake of DFI and other guarantees such as those provided by GuarantCo in Kenyan capital markets, though it should be noted that in October 2019 GuarantCo supported the first bond issued as part of the Green Bonds Programme with a guarantee.¹⁸¹

These interviews suggested that the required cover would be 50 to 75%. One market observer opined that most issuers are looking for a spread of 250bps over the relevant government benchmark, which could absorb a guarantee fee of 1.5%.

In most cases, companies in the sectors of interest are currently unlikely to meet all the issuing requirements, and as such guarantees may enable companies to issue when they otherwise would not have. Consultees noted that pensions funds will require issuers to have investment-

176 Jacobius (2018) Kenyan pension funds band together for infrastructure investment. [Online] Accessed at: <https://www.pionline.com/ARTICLE/20180917/PRINT/180919869/KENYAN-PENSION-FUNDS-BAND-TOGETHER-FOR-INFRASTRUCTURE-INVESTMENT>

177 Muchira (2018) Kenyan pension schemes form pool to win big projects. [Online] Accessed at: <https://www.theeastafrican.co.ke/business/Kenyan-pension-schemes-form-pool-to-win-big-projects/2560-4776096-98aiuez/index.html>

178 Kenya Insurance Regulation Authority (2015) Guidelines to the Insurance Industry on Management of Investment

179 PwC (2015) Africa Asset Management 2020.

180 Capital Markets Authority (2019) List of licensees & approved institutions - May 9, 2019.

181 GuarantCo (2019), GuarantCo provides partial credit guarantee to investors in Acorn's KES 5 billion note programme to fund the construction of accommodation for 5,000 students in Nairobi [online]. Accessed at: <https://guarantco.com/2019/guarantco-provides-partial-credit-guarantee-to-investors-in-acorns-kes-5-billion-note-programme-to-fund-the-construction-of-accommodation-for-5000-students-in-nairobi/>

grade credit ratings (i.e. BBB or higher) before they are able to invest, and guarantee products may be able to enable issuances to achieve this if structured appropriately. Even if companies do not meet all the requirements set out above, it will be important for any guarantee support to be provided only to credible companies, and establishing who these are will mean the guarantee provider undertake their own due diligence on these issues.

4.4.6. Existing solutions in the market

Turning to the guarantees that are currently available, several organisations have provided, or are looking to provide, guarantee products in Kenya. These are offered by different entities and comprise of different approaches, products and pricing. Excluding tied export credit guarantees and commercial investment insurance provided through for instance, Lloyd's insurance market, they can be usefully grouped into:

PCGs and PRGs provided by multilateral institutions, DFIs and specialist vehicles such as GuarantCo on a market priced basis.

PRGs and PCGs priced on a non-risk reflective basis by bilateral development agencies such as SIDA and USAID.

Political risk and partial credit guarantees

These can either provide protection against sovereign or quasi-sovereign performance risk, such as in the case of MIGA (which has a non-honouring of a sovereign obligation product), or else PCGs provided by DFIs and specialist vehicles. These products are priced on a risk rather than concessional basis:

The African Trade Insurance Agency (ATI) provided ten-year standby revolving and on-demand insurance cover for the Kipeto wind project, a 100MW power plant situated southwest of Nairobi. The cover protects against payment delay risk on behalf of KPLC. This support follows ATI's establishment of the Regional Liquidity Support Facility (RLSF), which provides L/C-based cover for payment delays on renewable energy projects of up to 50MW. ATI, the European Investment Bank (EIB) and Munich Re launched the Africa Energy Guarantee Facility (AEGF)

in 2018, which offers dedicated guarantees to support reinsurers in the provision of investment and trade insurance services for eligible energy projects. These guarantees cover against sovereign or sub-sovereign non-payment under PPAs, expropriation and break of contract, currency inconvertibility, war, civil unrest and arbitration award default. To date, no guarantees appear to have been issued in Kenya for this facility. ATI has signed a memorandum of understanding with USAID for the implementation of these facilities, which commits both organisations to increasing the bankability of power transactions and expanding the development of power sectors across SSA, including Kenya.

KenGen has redeemed its ten-year, 25-billion-shilling bond in 2019 (which was heavily subscribed at the time of issuance in 2009) and intends to issue a green bond in the near future.¹⁸² This finance raised through the capital market will be earmarked for developing wind and geothermal generation resources.

GuarantCo has provided guarantees to bond investors and commercial banks on infrastructure transactions. In addition to the PCG provided to support the Green Bonds Programme as previously mentioned, in Kenya it has provided support for transactions in manufacturing, water and digital communication infrastructure. Additionally, GuarantCo has partnered with AGF through the provision of a US\$74 million re-guarantee to support infrastructure-focused SMEs in accessing finance. GuarantCo's interest in future renewables transactions is highlighted by the recent study it sponsored that analysed the feasibility of local currency PPAs in Kenya.

Since its establishment in 2011, AGF has focused on providing credit guarantees to financial institutions to partially cover their exposure on loans (both hard currency and local currency denominated) extended to African SMEs for investments in various productive sectors. To date, it has signed deals in 38 African countries with over 100 financial institutions. AGF recently launched the GGF to focus on SME investments in climate-friendly projects. More details on the GGF are provided in Box 4-3.

¹⁸² Miriri (2019) KenGen to raise funds from the market this year, eyes green bond [online]. Accessed at: <https://uk.reuters.com/article/us-kenya-kengen/kenyas-kengen-to-raise-funds-from-the-market-this-year-eyes-green-bond-idUKKCN1Q31B8>

Box 4-3: AGF

AGF provides guarantees to address a range of financing needs, for example guarantees on equity, loans, and portfolios of receivables. The price of the guarantee ranges from one and a half to 4% (including facility and utilisation fees), providing a 50% partial cover of the principal amount, thus encouraging the financial institution to recover and value as much of a loss as possible. Once called, AGF pays out 50% of the cover (i.e. 25% of the loss) immediately, while the remaining amount is paid upon receipt of evidence that the bank has initiated a procedure to recover the default.

Demand for guarantees by banks is driven by the new accounting standards (IFRS9, introduced in 2018), which impose stricter rules on loss provisions for impairments (reduction in an asset's value), and force banks to set aside capital as credit loss provisions upfront rather than when evidence of losses emerges. Banks have had to reduce SME lending as a result of the new capital requirements, with significant effects on the green sector due to its nascence. Under these new standards, the rating of a guarantee provider has become increasingly important as banks assess the strength and added value of a guarantee; hence AGF's Insurer Financial Strength AA- rating by Fitch is crucial to its success.

AGF prices its guarantees solely to cover losses rather than to make a return on the activity. It aims to make a return on its investment portfolio, once operating costs have been deducted. To support this approach, class C capital, currently accounting for over 70% of total reserves, is patient first loss capital provided by development agencies, whereas Class B is provided on a commercial basis, including by AfDB, AFD and the Investment Fund for Developing Countries (IFU). AFD came in as a shareholder through AGF's acquisition of the GARI fund (which was established by AFD). The acquisition was done through a share swap.

AGF is considering leveraging its seed capital to obtain class A shares, which would allow for access to funds from the GCF. However, this change in structure would require AGF to increase profitability, presenting it with a challenging decision of either increasing its guarantee fees, feasibly difficult, or increasing its gearing ratio which could negatively affect AGF's rating. With the inclusion of operating costs, it took up to 2015 for AGF to become profitable, three years after being founded in 2012 (it was also provided with an initial grant to help with start-up costs).

AGF's unit of account is in US dollars, but guarantees can be written in hard currency or local currency. Most of its investment portfolio is in hard currencies, with only a limited amount in CFA (which in any event is pegged to the euro).

GGF

With additional resourcing from the NDF, AGF launched the GGF in 2016, covering four pilot countries, which in addition to Kenya include Cote d'Ivoire, Ghana and Zambia. At the end of July 2017, the GGF had provided guarantees covering US\$19.2 million of investment, with US\$7.7m of this in Kenya. It had also identified a pipeline of nearly US\$12 million in green projects to support in Kenya alone. Nearly half of the total guarantee products provided to date have been loan portfolio guarantees, followed by individual loans and bank fund-raising, the latter of which is only offered to tier 1 and 2 financial institutions to facilitate their access to additional capacity.¹⁸³

As part of the GGF, NDF has provided €6 million in class C equity capital (in addition to €1.6 million in grant finance for capacity building) to support it. This makes up part of AGF's first-loss equity pool, thereby supporting both AGF's overall portfolio of standard guarantees and GGF guarantees without differentiation. NDF's equity is expected to be fully committed in the first three years of GGF's operation, unlocking up to US\$40 million in private commercial capital for green growth and achieving a 6:1 leverage ratio.¹⁸⁴

¹⁸³ AGF (2017), Green Guarantee Facility.

¹⁸⁴ NDF (2016) African Guarantee Fund Green Guarantee Facility [online]. Accessed at: <https://ndf.fi/project/african-guarantee-fund-green-guarantee-facility-ndf-c88>

Table 4-4:
Examples of guarantee product terms and their transactions in Kenya
Source: AGF, ATI, GuarantCo

Guarantee Fund	Product	Price	Detail	Example transactions to date
ATI	PRI	2%-4%	Protects investments in African energy from business interruptions or losses arising from government action or political events	
	Trade Credit Insurance	2%-4%	Covers corporate and bank transactions against payment default	
	Regional Liquidity Support Facility	2%-4%	Provides short term liquidity to IPPs up to 50MW in the event of an off-taker default	Providing ten-year support to OPIC and Actis for the 100MW Kipeto wind IPP
	Breach of Contract Insurance	2%-4%	Covers investments in energy projects against risk of public utility not honoring its obligations	
AEGF	Reinsurance of political risk		Supports the provision of investment and trade insurance services for eligible energy projects	
GGF	Loan guarantee	1.5%-4%	Guarantees a portfolio of loans for a maximum of ten years, 50 percent coverage up to US\$1m	
	Equity guarantee	1.5%-4%	Reduces risk for equity investors for a maximum of ten years, 50 percent coverage up to US\$1m	
	Bank fundraising guarantee	1.5%-4%	Enables banks to raise long term resources for on-lending for a maximum of ten years, 50 percent coverage up to US\$20m	A US\$5m, three-year guarantee was provided to Social Investment Managers and Advisors to enable them to raise finance for on-lending to green companies
GuarantCo	Payment guarantees		GuarantCo's products are deliberately flexible, but are often focused on local currency enhancement in capital markets	Provided a PCG to enhance Cetel's first KES750m bond issuance

Table 4-4 provides an illustrative example of the terms of some of the guarantees currently available in Kenya.¹⁸⁵

4.5. Estimated demand for guarantee products

This section provides indicative estimates of the potential demand for guarantees to support the off-grid sector in Kenya. From a basic economics standpoint, the size of a given market segment (such as SHS or C&I) in terms of transactions completed and finance provided will depend on where demand for finance intersects with the supply of it.

Demand for finance per segment

There is some evidence on the global demand for finance – comprising its different types in terms of currency denomination, tenor, debt / equity etc. but where the market for local currency finance clears will depend on factors affecting its supply, for example debt pricing, wholesale market liquidity, risk perceptions and appetite etc. As set out, the demand for local currency guarantees will also depend on the relative attractiveness of competing products such as hard currency debt and how the availability of different types of guarantee could alter such dynamics, such that the market clears at a higher volume.

Table 4-5 provides an indication of the extent to which the different market segments provide opportunities for guarantees to stimulate the provision of local credit and or capital market finance – the table is colour coded using different shades of blue to illustrate where there is most opportunity. The darker the shading, the stronger the relative opportunity.

The estimates of the size of the local currency financing needs over the next three to five years are taken from a combination of the evidence in published reports and the feedback provided by market participants. It should be noted that in a few cases, assumptions have been made to estimate the total size of the market, and consequently the total numbers reported for each market segment should not be considered as definitive sizes of the guarantee demand for companies working in this space. In addition, as companies often work across different segments of the market (e.g. some solar companies provide installations to both households and corporate customers), and the Green Bonds Programme is likely to finance activities in the other market segments, the figures below should not be summed together to produce a whole market figure.

The evidence indicates that the most likely opportunities for local currency guarantees in the short term are in the SHS and C&I sectors, with the market more likely to be able

to benefit from guarantees to support credit transactions. Within these segments, opportunities are likely to vary from short-term, working capital support to term loans. Within term loans, guarantees could support individual transactions, including traditional debt products as well as receivables-based financing arrangements. Portfolio guarantees to financial intermediaries may also be an area where guarantee opportunities arise.

There are likely to be fewer capital market opportunities in the short term than opportunities in the credit market, but they are likely to be of greater scale, in local currency, and potentially of interest to institutional investors. This includes opportunities to guarantee green bonds, where discussions with the Green Bonds Programme suggested that between KES20 billion-KES45 billion (US\$200 million-US\$450 million) could be in the pipeline over the next three years.

The mini-grid model has yet to demonstrate its commercial viability, making it challenging to identify guarantee opportunities around which to base an approach. In the future, should a critical mass of commercial mini-grids be developed which could be aggregated, there may be capital market opportunities for receivables to be securitised. It should be noted that such an approach would likely require a scale of at least US\$20 million, given the transaction costs involved. Based on the analysis set out above, the main demand

As set out, the demand for local currency guarantees will also depend on the relative attractiveness of competing products such as hard currency debt and how the availability of different types of guarantee could alter such dynamics, such that the market clears at a higher volume.

185 This list is not exhaustive.

Table 4-5:

Indication of the relative attractiveness of the market segments for local currency guarantees

Segment	Demand for finance	Scope to use guarantees for credit market	Scope to use guarantees for capital market
SHS	Based on feedback from SHS companies and the GOGLA Off-Grid Solar Trends report, pipeline over the next five years is expected to be US\$125 million – US\$300 million , with up to US\$45 million estimated to be the local currency debt requirement.	Opportunities to support working capital facilities to manufacturers, importers or suppliers of SHS, by backstopping including L/Cs from banks and invoice factoring. Some opportunities could also arise from term credits, including bank loans and receivables-based financing to suppliers. Possible opportunities to support intermediary funders to raise capital.	Most promising areas appear to be receivables securitization and possible bond issuances by corporates (including green bonds) as well as MFIs. Opportunities for other capital market involvement are likely to be more limited than credit market opportunities due to the minimum ticket sizes needed to attract institutional investors.
C&I	Total required finance is estimated to be US\$250 million – US\$300 million over the next five years , based on a reported pipeline of 26MW in 2019 and similar installation sizes over the period. Up to US\$60 million of this is expected to be local currency.	Similar financing opportunities are likely to arise in C&I as SHS (i.e. working capital and term credit guarantees), but companies in C&I could be more attractive to financial institutions given greater creditworthiness of ultimate payees (companies and SMEs). Guarantees could either be provided for working capital for installers/importers, or on corporate loans to companies looking to benefit from solar and combined heat and power (CHP) technologies. Possible opportunities to support intermediary funders to raise capital.	Receivables financing of leasing companies could be a market entry point, provided that sufficient scale is reached. Bond issuances of corporate borrowers or financial intermediaries aimed at funding activities in the target segments, particularly green bonds, is another potential entry point.
Mini-grids	Local currency demand likely to be limited.	Unproven business model and regulatory uncertainty suggest that private financing opportunities in this segment are likely to be limited.	Market entry point for institutional investors in this segment is unclear.
Green bonds (Multi-sectoral)	The current pipeline of Kenya's Green Bonds Program is estimated to be US\$200 million – US\$450 million , with the majority of issuances (US\$170 million – US\$380 million) in local currency.	Not applicable to this segment	Full or partial credit wraps could be used to support issuances under this program.

Legend

- Strongest relative opportunity
- Weakest relative opportunity

for finance and hence the potential opportunities for guarantees fall in the following areas:

- **(Payment) guarantees for working capital facilities**, to leasing companies in the C&I sector or SHS providers, particularly for import activities. These could potentially be structured as a backstop to a working capital facility, such as a L/C, provided by a bank to a client, on a basis that best reflected the lender's requirements (first or second loss, *pari passu* etc.). As these would be client specific products, they would have to be of a reasonable size.
- **PCGs on term credit provided to the SHS and C&I segments**, with loans being backed by the receivables. These could be structured either as:
 - *portfolio guarantees*, on the collection of individual credits / loans comprising the said portfolio (for instance on a second loss basis over and above the anticipated loss rate assumed within the portfolio and priced for); or
 - *finance-raising guarantees* structured to protect the providers of finance to the SHS or C&I company providing the credit to its customers.
- **PCGs on commercial loans to financial intermediaries** that cover SHS and the C&I market, specifically MFIs, again with the choice being between portfolio and finance-raising structures.
- **Credit wraps** on either **green-bonds** or else tranches within a **securitisation vehicle**, comprised of SHS and / or C&I receivables, targeted at institutional investors. Discussions with financial advisors suggest that such wraps do not need to provide 100% cover, but they do need to be readily understood.

An important difference between Kenya and other markets examined is that the banking sector lends relatively extensively in dollars, and companies often require dollars for importing goods. This means *foreign currency guarantees are also likely to be needed to mobilise finance*. Note that spot and forward contracts are available and allow companies to borrow in local currency and convert this into dollars when required to make payments for imports, but generally dollar loans are more preferable for borrowers, since rates on foreign currency loans (even when accounting for depreciation in shillings) are more favourable. In addition, because of the relatively stable hard currency rates in Kenya and lower dollar borrowing costs, there are fewer benefits in companies refinancing dollars into local currency.

For other areas, opportunities may arise in future, and the option to provide products to these segments should

remain open, but current market conditions mean that in the near-term opportunities are less likely. For example:

On-grid IPP transactions may be limited in the near term; given that current power capacity is sufficient, thus reducing the need for new IPPs. Larger transactions could benefit from guarantees to lenders in principle, which would be in hard currency, while local currency transactions could take place in future if the government adopts recommendations from the recent GuarantCo study, which suggest that PPAs below 10MW should be denominated in local currency and hybrid tariffs should be used for larger projects. This approach has yet to be confirmed by the Kenyan government, but Gigawatt Global is exploring the potential for two of their solar IPP projects to take part in a local currency PPA pilot.¹⁸⁶

For the most part the **mini-grid market lacks a reasonable track record of commercial viability**, meaning that banks and other commercial institutions are unlikely to lend to this segment unless the level of subsidy provided is sufficient to achieve such viability. The reliability of payments of this subsidy will be critical in achieving creditworthiness.

Approach to developing the illustrative estimates

To illustrate the potential derived demand for credit guarantees for local currency denominated debt over the next three to five years, inter-related market factors need to be considered in sizing the opportunity¹⁸⁷:

- **Potential demand for finance.** The indicative demand for investment in each segment over the next three to five years. This period is flexible to reflect the fact that timescales over which the estimated value of transactions is realised can differ, depending for instance, on the time required to raise finance, with the total amount either being raised in relatively shorter timescales (three years), or longer (five years). This range is driven by overall demand for finance identified in each market segment.
- **Proportion of finance in debt versus equity.** Some financing needs will be met through equity solutions rather than debt. Equity finance will not be able to make use of credit guarantee products. The proportion of debt finance will differ from segment to segment but is likely to be in the range of 50 to 70% for most market segments.
- **Potential demand for local currency debt finance.** This considers the proportion of the demand for debt finance that could potentially be satisfied with local currency finance. This may be satisfied through either the capital or credit market, both of which may benefit from guarantees, although it is unlikely that there will be any term capital market issues below US\$20 million

¹⁸⁶ InfraCo Africa (2019) Backing Kenya's Solar Potential [online]. Accessed at: <http://www.infracoafrica.com/backing-kenyas-solar-potential/>

¹⁸⁷ Demand for credit guarantees of hard currency debt is not explicitly covered in this analysis.

(shilling equivalent). The proportion of local currency debt will differ according to the specifics of the financing arrangement in question, but an assumption is made around what would be optimal given the requirements of each segment, for instance in terms of hard currency import requirements (the assumption is that hard currency is widely available in Kenya).

- Illustrative estimate of demand for local currency credit guarantees. Which refers to the local currency equivalent US dollar value of demand that in theory has the potential to be supported by guarantees.

Table 4-6:
Rationale, assumptions and sources of
evidence behind indicative estimates

	Key considerations	Sources/assumptions
Potential demand for finance	<ul style="list-style-type: none"> • Assessment of the investment needs for the sector over the next three to five years to meet demand for the different segments of the market. 	<ul style="list-style-type: none"> • SHS: based on market feedback from leading developers and GOGLA (2018), Off-Grid Solar Trends Report. • MFI: based on market feedback extrapolated; and a 75% assumption on capital raising. • C&I: based on BloombergNEF (2019). Solar for businesses in Sub Saharan Africa. • Capital market: based on Kenya Green Bonds Program pipeline.
Proportion of finance in debt vs. equity	<ul style="list-style-type: none"> • Consideration of the optimal financing mix, taking account of the cost and availability of debt and equity and the financing needs of the different segments. • Some of the developers, particularly international developers, will be looking for additional investment and will already have significant equity retained within the business so it may be that all their additional investment needs are in the form of debt. 	<ul style="list-style-type: none"> • CMA requires a debt: equity ratio of no more than 4:1 in order to issue a public offering. • The Accelerating Energy Access report by Acumen indicates the current mix of capital for SHS include 60% and 50% debt, respectively. The former assumption is used for C&I.
Potential demand for local currency finance	<ul style="list-style-type: none"> • Consideration of the optimal split between local and foreign currency financing given costs and revenues for developers. 	<ul style="list-style-type: none"> • Market feedback and studies on the renewable sector • Most green bond issuances will be local currency, assuming 85%. • SHS developers need a mix of currencies. Based on experiences of M-KOPA and BBOX, an assumption of 25% local currency is used for the SHS segment.¹⁸⁸ • 90% of upfront costs for C&I developers are imports, with developers preferring hard currency. The remaining installation, operations and receivables financing require local currency. Assuming a debt requirement of 60% local currency.
Indicative estimate of demand for guarantees	<ul style="list-style-type: none"> • Will depend on the cost of the guarantee, level of coverage and the terms upon which the guarantee can be called. • The extent to which the guarantee enables the lender to invest when they would have been unable to otherwise is key; as is the extent to which lenders are willing/ able to reduce the interest rates to reflect the value of the guarantee. 	<ul style="list-style-type: none"> • Based on market feedback from developers on their potential appetite for using a guarantee and the level of interest from credit and capital market actors. • Ecomoto, M-KOPA and BBOX considering the use of guarantees gives a useful guide of potential demand. • Low, medium and high uptake scenarios given to illustrate a range of possible outcomes.

188 Local currency finance makes up approximately 13% for BBOX and 34% for M-KOPA of total finance raised to date. These have been averaged to arrive at the 25% assumption.

- The extent to which this potential can be realised will depend upon the competitiveness of local currency debt finance, (as regards pricing and tenor etc.) and whether the availability of guarantees is able to increase local currency debt financing. To account for the considerable uncertainty in the potential uptake of new guarantee products, scenarios are presented to illustrate low, medium and high uptake, depending on the specificities of each segment, noting the difficulty for local currency debt to compete with hard currency, which is widely available in Kenya.

Table 4-6 summarises the key considerations and assumptions made to arrive at the illustrative potential demand for local currency guarantees in Kenya.

Illustrative estimates of demand for guarantees by segment

Using the approach and assumptions outlined in the subsection above, illustrative estimates of the demand by segment in low, medium and high scenarios are presented, first from the perspective of providers/ suppliers (including the capital market through green bonds), and second looking at it from the perspective of borrowers. The two are different perspectives and therefore not necessarily additive.

Tables 4-7 and 4-8 below suggest that there is greatest relative opportunity for guarantees in the Green Bonds Programme – which covers a range of sectors and potentially capital raising by banks – followed by C&I and household segments, including MFIs, consistent with the

Table 4-7:

Illustrative demand for guarantees by segment for providers of finance (US\$ local currency equivalent over three to five years)

Source: CEPA analysis

Providers of finance			
Market segment		MFIs	Green Bonds (capital markets)
Potential demand for finance		US\$50m – US\$60m	US\$200m – US\$450m
Proportion of finance in debt vs. equity or grants		N/A	N/A
Potential demand for local currency debt		Up to US\$60m	Up to US\$380m
Illustrative demand for local currency credit guarantees	Low	5% – US\$3m	15% – US\$55m
	Medium	10% – US\$6m	30% – US\$110m
	High	15% – US\$9m	45% – US\$165m
Rationale		It would be difficult to price a partial portfolio guarantee that only kicked in above a certain anticipated loss rate low enough to make it competitive with the value of the shared loss to the MFI.	The Green Bonds Programme has an identified pipeline and is providing the technical assistance to issue bonds. The risk-aversion of investors in the market increases the appetite/ necessity for credit guarantees.

Table 4-8:

Illustrative demand for guarantees by segment for users of finance (US\$ local currency equivalent over three to five years)

Source: CEPA analysis

Users of finance				
Mark segment		SHS	C&I	MFI
Potential demand for finance		US\$125m - US\$300m	US\$250m - US\$300m	US\$40m - US\$45m
Proportion of finance in debt vs. equity or grants		US\$70m - US\$180m in debt	US\$150m - US\$180m	Up to US\$45m in debt
Potential demand for local currency debt		Up to US\$45m	Up to US\$100m	Up to US\$45m
Illustrative demand for credit guarantees	Low	10% - US\$4.5m	10% - US\$10m	25% - US\$11m
	Medium	20% - US\$9m	20% - US\$20m	50% - US\$22m
	High	30% - US\$13.5m	30% - US\$30m	75% - US\$33m
Rationale		Most finance will be raised in the credit market, competing with cheaply priced DFI debt. Commercial banks have limited capacity to lower interest rates to reflect margin and struggle with the complexity of partial, non-accelerable guarantees. Credit guarantees may be used to replace collateral requirement.		

analysis presented in Table 4-5. It is, however, important to note that this table does not represent consolidated demand. Many of these segments may overlap; for example, the finance required for C&I may be raised through green bonds and would therefore be double counted if these estimates were to be summed. Rather, these indicative values represent the relative opportunity under each segment, and provide an indication of the areas in which local currency guarantees would be best poised to enable the provision of local currency finance in the renewable energy sector.

4.6. Conclusions

The conclusions are set out as they relate to the different market segments identified. These suggest that the most immediate credit market opportunities for guarantees lie in the SHS and C&I space, whereas potential capital market opportunities are based around green bonds and innovative securitisation of household and other receivables.

Options therefore exist regarding whether credit enhancement products should focus on just one of these

areas – and if so which one – or both. The former will consist of a larger number but smaller transactions, most likely in hard currency and local currency, whereas the latter will be lumpier yet more local currency focused.

As many of the credit market opportunities effectively involve displacement of grid-based renewable power and the potential undermining of KPLC's economics, an important policy consideration is the extent to which such activities should be supported.

4.6.1. Mini-grids

The key difference in the mini-grid model is whether payments are made by KPLC, or whether the provider is fully exposed to household and business payment risks. The emerging mini-grid models in Kenya would appear to focus more on the former.

There is much that militates against a meaningful role for guarantees in the Kenyan mini-grids sector, which is largely based in the north. The sector is heavily supported either through direct subsidies or else through indirect cross subsidies paid through KPLC.

The scale of mini-grids in Kenya are relatively small and household-driven, in which demand for power is low, except where there are commercial or industrial anchor customers (for instance, in the case of a mine) – although such arrangements are likely to be much more private sector driven.

Because of the economics and uncertainty over future funding arrangements, it is difficult to confirm a large pipeline of guarantee opportunities around which to base an approach. Limited exceptions to this may emerge on an ad hoc basis, most likely involving guarantees to support provision of longer-term credit to creditworthy mini-grid developers.

4.6.2. SHS and C&I

Kenya has had significant off-grid activity in the SHS and C&I market segments. Unlike traditional public sector off-take through PPAs with KPLC, the commercial viability of these sectors depends upon the relative cost of off-grid energy and the spending power of households and businesses that are purchasing such products and services. They are therefore much more private sector in nature.

In Kenya, demand is driven either by limited access to, or the poor quality of grid provided services, or more typically by the significant differential between grid per kWh prices and the levelized cost of electricity delivered through solar solutions. In the case of the latter, payback periods are currently as low as four to five years in some contexts. In addition, new CHP energy efficiency technologies are entering the market, increasing demand in the C&I heating and cooling space.

Although many businesses and households purchase equipment outright, new innovative business models, which are different from traditional bank lending and even microcredit, have emerged to exploit these opportunities. In the household sector, mobile-based PAYGO systems have facilitated ‘payment by use’ and ‘payment by instalment’ business models. In the C&I space, different variations on leasing companies have become common, with equipment supply, maintenance and finance often bundled into contractual arrangements. An important key difference with traditional lenders is that many of the better companies in these segments understand the varied risks associated with providing credit, such as household default rates, asset values across their useful lives, as well as the ability to recycle moveable assets in a default scenario. This has, however, been expensive learning given that anecdotal evidence suggests it is taking time for these companies to achieve profitability. These qualities make them less risk averse than traditional lenders who typically require established relationships as well as considerable collateral in the form of cash, land and property (in which asset values play much less of a role).

In the household segment, new manufacturers have emerged producing innovative new products, which have payback periods of less than six months, making them attractive to even poorer households.

Both because the business models are unfamiliar to traditional lenders and market players are often unknown, new entrants, the credit required for both working capital (import, manufacture and / or distribution) as well as to fund customer credit has often been difficult to obtain, with many companies relying on impact investors and / or grants and development finance. The currencies required can vary, depending often on a combination of ultimate customer access to hard currency and differences in rates, but with hard currency typically required for import and then a mix of local currency for short- and longer-term receivables.

Whilst companies rather than banks supply the necessary credit within household and C&I market segments, they themselves also need credit to fund their own credit operations; equity is an expensive way of providing this. A further significant constraint can therefore be the willingness of traditional lenders to provide this and whether a form of guarantee, could play a role in unlocking such finance.

Apart from the potential issue associated with displacing KPLC – which will be less of an issue in the event that grid demand once again grows more strongly than grid capacity – there is a strong rationale for supporting the financing of these innovative areas, that is driving up energy access and energy efficiency in a way that traditional IPP generation alone does not. There is a need to supplement equity from impact advisors and DFI debt with that from the commercial sector. For the most part the guarantee interface will be with the credit markets – either through different forms of guarantees on the provision of credits to ultimate customers, and / or through the raising of finance in credit markets. There will be, however, continued challenges with the interest cap if it is not removed within good time. There are also challenges in terms of the attractiveness of hard currency and the fact that the market is still not mature enough to take account of the protection of a guarantee in the pricing of debt. Although there is an understandable desire for a reduced complexity of credit guarantees, this complexity is there for good reason, and credit providers can learn how to use such products effectively.

4.6.3. Capital markets and green bonds

Although unable to provide information on potential issuers, the Kenya Green Bond Programme suggests that there could be a pipeline in shilling equivalent between US\$200 million to US\$450 million. Whilst Kenya’s capital markets are some of the largest in SSA, the corporate failures of a couple of banks including Chase, has badly

impacted market confidence. Arguably, the availability of a guarantee, combined with the removal of the cap, could open opportunities for new banking issues, particularly green bonds.

The provision of long-term local currency finance at scale, is exactly where Kenyan capital markets should be able to provide a transformative role in the Kenyan economy. As MFIs, SHS and C&I segments develop, they should also be turning to the capital markets as a way of efficiently financing growth (recognising that the minimum efficient issue is approximately US\$20 million equivalent). There is a rationale, and arguably a Kenya specific gap to support these activities, like the model pursued by InfraCredit in Nigeria.

Chapter 5

Nigeria Country Diagnostic

5.1. Macroeconomic overview

This section focuses on the key macroeconomic policy issues that could affect the viability of introducing a local currency credit guarantee product in the market: Nigeria's foreign exchange policies and interest rates.

Foreign exchange volatility

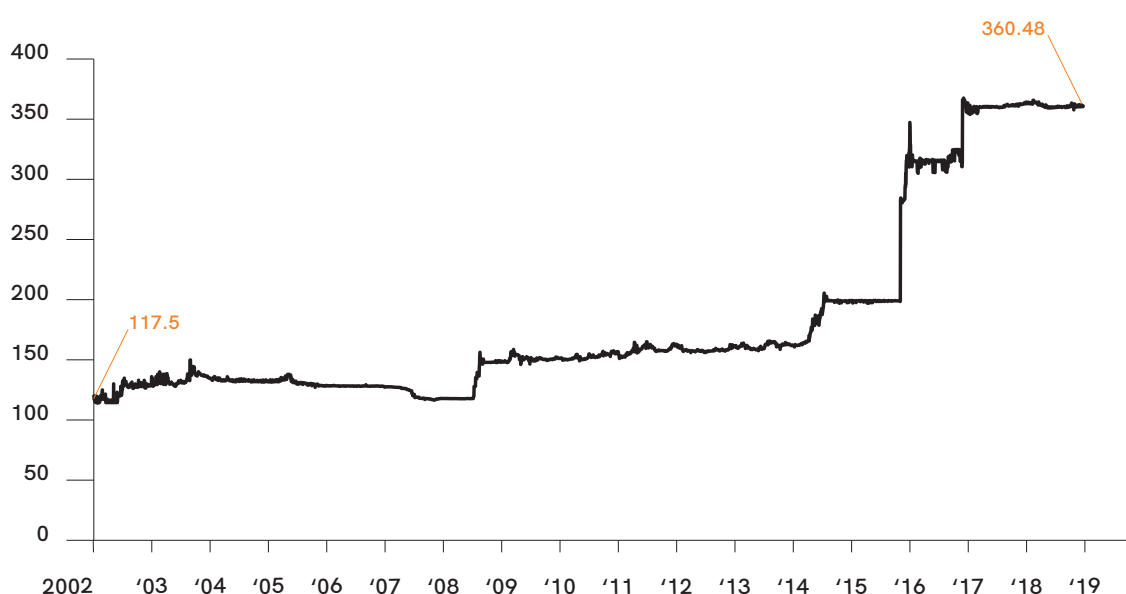
Nigeria has a long history of facing considerable challenges related to exchange rate management. Figure 6-1 illustrates how the economy has experienced prolonged periods of relative exchange rate stability, which are then followed by significant depreciations. The most notable instance occurred when the Central Bank of Nigeria's (CBN) official Naira rate depreciated by 42% in June 2016. It then fell further following the introduction of a more market-driven exchange rate system in the same year. This had been put in place to address problems with Nigeria's FX reserves that had built up through attempts to keep the Naira at a fixed rate following the decline in oil prices experienced in 2014 and 2015. A more recent depreciation of the exchange rate took place in August 2017 which, according to some sources was caused by CBN allowing banks to start quoting FX at a rate that differed from the official rate (the NAFEX rate). This resulted in the main interbank rate being set at almost the same level.¹⁸⁹

The underlying problem for Nigeria's currency has been the reliance on oil revenues (which still account for the majority of foreign exchange earnings and two-thirds of exchange rate earnings), combined with general instability

Figure 6-1:

Naira exchange rate 2002 – 2018 (Naira to 1 US dollar)

Source: Bloomberg



189 ECA International (2017), August currency review: Nigeria's sly devaluation.

in global oil prices.¹⁹⁰ The level of exchange rate instability is clearly a problem for any investor exposed to FX risk undertaking long-term investment in Nigeria.

FX policy in Nigeria

FX policies have been in a constant state of flux in Nigeria for 40 years. It is useful to try to understand what policies are in place now to determine the impact on the renewable energy sector.

As at 2019, Nigeria retained, in various guises, a system of multiple exchange rates, with one exchange rate for official government transactions and other rates for other transactions. As at the time of this report, the following exchange rate windows were in operation:¹⁹¹

- The CBN official window which has a rate of around 305 Naira to 1 US\$. This rate is used mainly for petroleum imports and government expenditure;
- A retail/ wholesale window with around 325 – 330 Naira to 1 US\$ which accounts for about 30% of non-official transactions; and
- The invisible FX window which has a rate of around 360 Naira to 1 US\$ and accounts for 70% of non-official transactions.

The continued existence of multiple exchange rates has created room for arbitrage and corruption and made it more difficult to manage the FX instability created by oil price volatility. According to the IMF, the different FX windows have been converging and the CBN has a stated policy of moving to a unified dollar exchange rate over time.

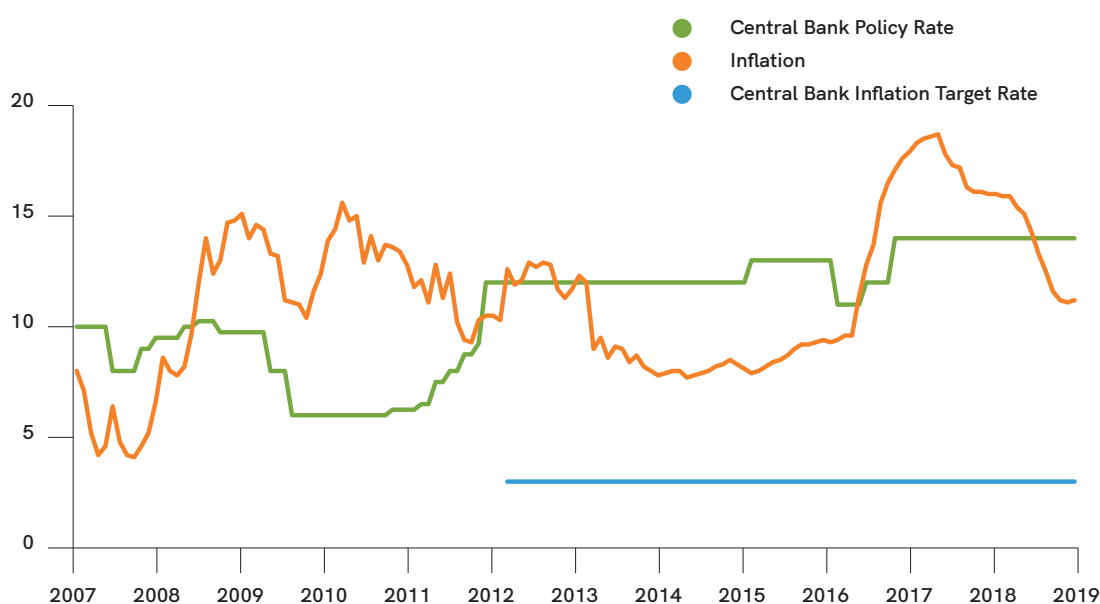
Following the sharp depreciation experienced in 2016, the CBN introduced capital controls to try to reduce the pressure on the Naira. These controls have included restrictions on the ability of 40 sectors of the economy to access FX, as well as capital flow management measures such as the repatriation requirements on export proceeds. These restrictions have made it very difficult for local firms to access inputs, leading the affected sectors to reduce production, resulting in lower employment and investment.

Interest rates and macroeconomic instability

Macroeconomic instability in Nigeria is one of the key factors that has limited the potential for private investment in the renewables sectors. Nigeria has suffered high and volatile levels of inflation for years, driven by high food and energy prices. Inflation rates have averaged over 12% per annum since 2000, reaching as high as 18% in 2016.

Figure 5-2 illustrates the policy interest rate, the inflation rate and the inflation target introduced by the CBN in 2012. Stated government policy is to use monetary policy to

Figure 5-2:
CBN policy interest rate, inflation and inflation target (2006 – 2019)
Source: CBN



¹⁹⁰ World Bank (2018) Project appraisal document on a proposed credit in the amount of SDR 87 Million to the Federal Republic of Nigeria for a Fiscal Governance and Institutions Project.

¹⁹¹ IMF (2018) 2018 Article IV Consultation—press release; staff report; and statement by the executive director for Nigeria.

manage inflation i.e. the CBN has the power to set the benchmark interest rate, which it can vary in order to try to control inflation. The CBN communicates an inflation target of 6 to 9%; as seen in the figure above, it has not achieved this rate since 2016.

The problem is that the CBN has, in practice, used monetary policy to try to manage the exchange rate while using open market operations to try to limit the inflation rate.^{192, 193} The government's continued difficulty in managing its fiscal position - both its inability to control spending and limitations in its revenue generation capabilities - has meant that it runs structural fiscal deficits which need to be financed to limit the impact on inflation.¹⁹⁴ To continue to attract demand for government debt, the Treasury-Bill rates have been priced to remain highly attractive to investors; in February 2019 the 181-day rate was 13.4%.¹⁹⁵ Moreover, if the CBN has to effectively borrow at a high rate of interest, it then has to lend to banks at a proportional rate. As a result, the benchmark monetary policy rate has remained at 14% since 2016.

There are two key constraints for Nigeria's renewable sector that follow-on from this:

- Institutional investors have the option to invest in relatively safe high-yielding government securities (and government bonds), which naturally limits the attractiveness of potential investments in the renewables sector; this is one of the reasons why the supply of local finance for projects remains small.
- As commercial banks must borrow Naira from the CBN at around 14%, when a risk-adjusted margin is added, the rates that can be offered to developers are naturally high. The prime lending rate in December 2018 was 16.17%. When it is considered that the renewable energy sector is comprised of companies that are generally new with a limited track-record, the interest rates that can be offered by banks to the sector are much higher.

To provide an indication of the current yields available on government securities, the yield curve on government securities is depicted in Figure 5-3.

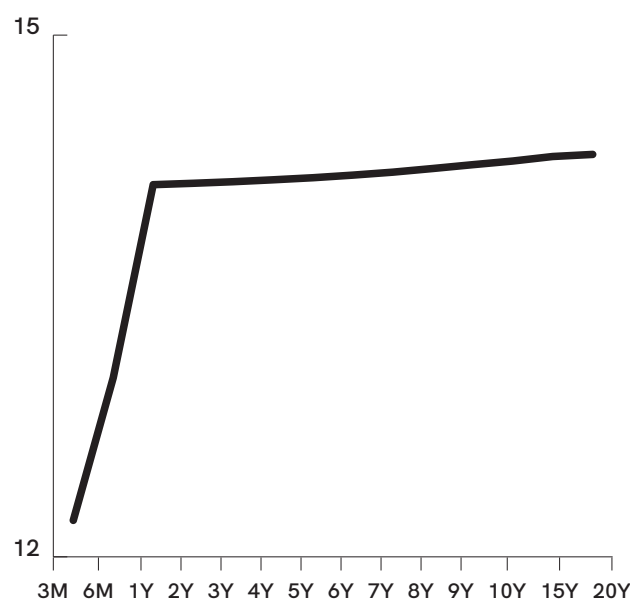


Figure 5-3:
Yield curve on Nigerian government debt (as of October 2019)
Source: Bloomberg.

5.2. Power sector overview

According to the World Bank database, approximately 60% of Nigerians do not have access to electricity provided by the national grid.¹⁹⁶ Daily generation provided by the grid is estimated to be under four GW per day, with installed capacity around 13.4 GW. This is set against Nigeria's minimum average daily power demand, estimated to be over nine GW, highlighting the significant shortfall in generation supply in the country.¹⁹⁷

Approximately 80% of existing generation capacity comes from gas-fired power plants. Poor infrastructure limits the amount of on-grid power produced and distributed by the grid. Common issues include low gas production, deficiencies in gas transportation infrastructure, transmission constraints, and stranded generation capacity.¹⁹⁸

¹⁹² IMF (2018). Nigeria: 2018 Article IV Consultation—Press Release; Staff Report; And Statement by the Executive Director for Nigeria.

¹⁹³ Open Market Operations involve the CBN selling government securities in order to mop up excess liquidity in the system.

¹⁹⁴ It could do this by printing additional money, but this would be inflationary and affect further currency stability.

¹⁹⁵ Central Bank of Nigeria data.

¹⁹⁶ <https://data.worldbank.org/indicator/eg.elc.accs.zs>

¹⁹⁷ PWC (2016). Powering Nigeria for the Future.

¹⁹⁸ Federal Republic of Nigeria (2018). Power Sector Recovery Programme 2017 - 2021.

According to the terms of Nigerian PPAs, the payments to the Nigerian generation companies (GENCOs) are denominated in dollars with the Nigerian distribution companies (DISCOs) receiving payment in Naira. As a result, the energy system is faced with a considerable FX risk, which in theory is borne mainly by consumers.

Tariff policies are set by the Nigerian Electricity Regulatory Commission (NERC). As part of the Nigerian energy privatisation process, NERC has implemented the Multi-Year Tariff Order (MYTO) under which energy prices are set based on a number of principles designed to reflect efficient and realistic cost levels and a fair rate of return for the Nigerian generation, transmission and distribution sectors.

In principle the MYTO provides a fifteen-year price path for energy tariffs, but in practice is set for a five-year period with scope for an annual review to account for changes in the inflation rate, gas price and foreign exchange rate assumptions. There is also scope for a more fundamental interim review in the event of any material changes to the private companies' business environment.

The MYTO was intended to provide investors with some protection from macroeconomic risks given Nigeria's exchange rate instability. However, it has not been possible for NERC to implement the required increases in the tariff to help the sector manage the impact of the depreciation of the Naira that has occurred since 2014. For instance, in 2015 NERC published an updated MYTO that would have increased retail tariffs by up to 80%, which led to petitions by various consumer groups. Subsequently NERC revised its MYTO; instead of increasing tariffs, they were reduced by 25%. Furthermore, no adjustment to the tariff was made following the 50+% depreciation that occurred in 2016.

The combination of the inability of NERC to implement cost reflective tariffs, the ongoing difficulty faced by DISCOs in collecting bills from customers (collection rates are below 50% in some States), in addition to various other challenges have effectively placed the Nigerian energy sector in a state of crisis. According to some estimates the shortfall in tariff collection faced by the industry amounts to around US\$1.5 billion.¹⁹⁹

The problems further downstream have meant that the Nigerian Bulk Energy Trader, which is responsible for paying the generation invoices as per the PPAs, has been repeatedly unable to pay the GENCOs. As a result, many of the GENCOs are facing insolvency and have been reducing generation, and investor confidence in Nigeria's energy sector has collapsed.

The response to the crisis has been the introduction of the Power Sector Recovery Implementation Programme (PSRP) in 2017 by the Nigerian government together with the World Bank. The PSRP places an emphasis on the need for investment in mini-grids and off-grid solutions to help increase access to electricity in the short to medium-term given the continued difficulties in attracting the investment needed to extend the reach of the grid. Nigeria's REA has developed the Off-Grid Electrification Strategy as part of the PSRP. Presumably this should lead to more investment in the sector (though much of this is in the form of grants and subsidies) and a greater need for local currency credit enhancement products.

In addition to low quantity, Nigeria suffers from problems with the quality of power produced. Factors ranging from vandalism of distribution lines, constraints at transmission interfaces, and issues with the governance and financial viability of distribution companies have meant that the power supply in Nigeria is subject to frequent and unpredictable power outages – businesses are estimated to experience an average of 239 hours of power outages each month.²⁰⁰ Overall, the Nigerian government estimates that the deficiencies in the power sector cost the economy US\$25 billion per annum. Over 80% of Nigerian businesses report that their challenges in accessing energy are the most significant constraints to doing business.²⁰¹

As a result of the inadequate supply, households, companies, and industries have resorted to purchasing self-generation technologies. This is predominantly in the form of small-scale diesel and petrol generating sets. It is estimated that 14 GW of self-generation capacity has been purchased on which consumers spend around US\$14 billion to US\$30 billion each year.^{202,203}

199 Federal Republic of Nigeria (2018). Power Sector Recovery Programme 2017 – 2021.

200 World Bank (2017). Program-for-Results Information Document Concept Stage.

201 Ibid.

202 Rural Electrification Agency (2017). The Off-Grid opportunity in Nigeria.

203 SEforAll Africa Hub, AfDB (2018). Mini-Grid market opportunity assessment: Nigeria.

The diesel/ petrol generators pollute the environment with both sound and fumes and are expensive to operate; it is estimated that they cost between US\$0.60 to US\$0.71 per kWh.²⁰⁴ This compares to the costs of solar with battery storage of around US\$0.20 per kWh, while the grid generated power is around US\$0.12 – US\$0.20 per kWh.²⁰⁵

The deficiencies in the supply of power from current gas generating plants, combined with the size of the existing self-generation market and high cost of diesel/ petrol self-generation options means that Nigeria has considerable potential to develop its renewable and climate impact infrastructure sectors. With stakeholders of the belief that there is little scope for the grid to develop further in the medium-term, there is a need to channel increased investment to the clean off-grid sector.²⁰⁶

5.3. Demand for finance

5.3.1. SHS

Market size and recent activity

The SHS market in Nigeria is not as large or as well established as it is in East Africa, with the lack of an established mobile payment platform highlighted as an issue. According to the H1 2019 Off-Grid Trends report, total sales of SHS products in Nigeria were just over 135,000 units. This compares to nearly 975,000 units sold in Kenya over the same period.²⁰⁷

However, some of the leading international companies, including Lumos, Azuri, D.Light and Greenlight Planet are present in the market, no doubt attracted by the sheer size of the opportunity relative to other countries in SSA. There are also many small local companies operating in this market segment. These local companies either import the solar equipment themselves or purchase it from companies such as Eastman that import solar equipment to sell on to local SHS companies.

According to the 2018 Off-Grid Solar Market Trends report, the Nigerian SHS market has grown by over 30% per annum from 2014 to 2016. The report states that the companies have been able to increase sales due to a combination of effective distribution partnerships and the number of customers that have existing generators and are therefore used to having high-powered energy systems

at home (given that diesel generators are typically more expensive than the SHS alternatives).

The evidence on the ground suggests that while the market is growing, it is not growing quite as quickly as some reports suggest, or that businesses had originally expected in their business plans. For instance, Lumos Global is currently the largest provider in the market with 100,000 customers, while the next largest, Green Light Planet, has below 20,000. Lumos had expected to reach a considerably larger number of customers by now, but has been held back by a range of factors; in particular the currency crisis, alongside the recession that has impacted the economy in the last few years.

Across all stakeholders, the main challenge that companies have experienced is the difficulty in managing their import costs given the considerable foreign exchange volatility described earlier.²⁰⁸ In addition, stakeholders indicated that there is a greater need to control the standard of the SHS products. Some providers operating at the cheaper end of the market are reportedly importing sub-standard products which is then reducing consumer confidence in the market. Certain stakeholders also identified the need for government to provide a more supportive environment for the uptake of SHS by consumers; for instance, introducing tax breaks or other incentives.

In terms of the affordability of SHS products, the market view is that there is a sizable population of Nigerian households – potentially as many as 15 to 20 million customers – that can pay for different size SHS given their current cost of energy. Lumos indicated that around 94% of their customers were currently paying on time. The main issue faced is in providing repayment packages that limit the up-front costs to customers, whilst also not exposing the companies to too much repayment risk. One of the local SHS companies consulted tried to get around these difficulties by offering an option of zero upfront cost with repayment over 36-months for the purchase of their SHS. They reported that they experienced only limited levels of default and had been able to recover their equipment in such cases.

Box 5-1 provides three case studies detailing how organisations involved in the SHS space in Nigeria have used strategic partnerships to address the issues around

204 Rocky Mountain Institute (2018) Mini-Grid Investment Report: Scaling the Nigeria Market.

205 SEforAll Africa Hub, AfDB (2018). Mini-Grid market opportunity assessment: Nigeria.

206 BloombergNEF (2019) Solar for businesses in Sub Saharan Africa.

207 GOGLA (2019), Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data: January-June 2019.

208 Lighting Global Program (2018). Off-grid Solar Market Trends Report 2018.

Box 5-1: Case studies on SHS partnerships

Lumos & MTN: Lumos is currently the largest SHS provider operating in Nigeria with over 100,000 paying customers and the aim to expand to three and a half to four million over the next five years. It began operations in Nigeria in 2015, and by the end of 2016 had sold around 25,000 systems.

Since then it has been in a strategic partnership with MTN, the largest mobile provider in the country, which has helped it to scale-up significantly. MTN customers can purchase Lumos systems through their local MTN store and pay through their pre-paid airtime credit based on a pay-as-you-go flexible subscription plan.

This partnership has been vital to enable Lumos to expand and provide smaller, more affordable systems in rural areas. Lumos benefits from MTN's nationwide logistics, customer service and brand reputability. As the mobile money market in Nigeria is still limited relative to East Africa, the development of an alternative digital payment option (airtime credit) has enabled customers to access SHS products more easily.

Azuri & First Bank: In early 2019, Azuri announced that it would be partnering with First Bank to provide SHS in the Nigerian market. Thirty % of the population in Nigeria do not hold bank accounts and the mobile money market is still relatively underdeveloped. This partnership will allow customers to make payments for their Azuri SHS through First Bank's rural and semi-urban FirstMonie agents. The network has around 16,000 branches and provides basic financial services to surrounding communities.

This partnership was not only developed to provide a payment method, but also to develop the trust of consumers, who have been suffering due to the sub-standard products available in the market. By co-branding and co-marketing with a trusted financial entity such as First Bank, Azuri can increase consumer confidence in its products.

D.LIGHT & LAPO: Through its Clean Energy Lending Programme, LAPO Microfinance Bank has partnered with several reputable small solar product suppliers in order to on-sell the products to their customers – mainly solar lanterns and other small appliances. D.LIGHT is its largest provider of solar lanterns. LAPO purchases these products directly based on consumer demand and allows customers to pay them off over eight weeks. These products are targeted at low-income individuals who would be unable to purchase the product without the provision of a small loan.

As of 2018, LAPO has sold nearly 160,000 products totalling approximately US\$4 million in loans (local currency equivalent). D.LIGHT accounts for 111,000 of the products sold. LAPO is currently considering expanding its product offering to include larger solar household products.

the lack of a mobile payment platform and also to help give their products better brand recognition/ a defined consumer base.

Demand for local currency finance

Some of the companies operating in the market have already had some success in raising finance to facilitate the further development of the SHS market. For instance, in December 2016 Lumos Global received a US\$50 million debt investment from DFC and US\$40 million equity investment from a consortium led by Pembani Remgro Infrastructure Fund, which remains the largest reported investment in the SHS market in Nigeria.

The SHS market is like the mini-grid market in that it is also in part reliant on the provision of subsidies/ grants from government and/or donors. For instance, the World Bank's NEP includes US\$15 million allocated to the provision of accelerator grants to the biggest SHS providers. The grants

will be provided up-front to the companies with the most scope to rapidly scale-up their capabilities. The aim is to crowd-in additional large-scale investment and provide liquidity for working capital. Alongside the accelerator grants, the NEP has US\$60 million for the provision of output-based grants to enable companies in the SHS market to invest in recurrent operational costs, and costs required to scale. The grants will be set at 15-20% of the nominal retail price and paid in tranches when the company verifies product installations.

In terms of future demand for local currency finance, all three specialist SHS companies consulted are actively looking for local currency finance. All expressed an interest in trying to adopt the consumer receivables financing model that was used by M-KOPA to raise local currency finance in East Africa, though there was no evidence that commercial banks in Nigeria have any appetite for such

transactions.²⁰⁹ Based on the projected financing needs of one of the companies, over the next five years there could conservatively be demand for in excess of US\$100 million in local currency equivalent to facilitate required investment.

5.3.2. Mini-grids

Size of markets and recent activity

Several mini-grid projects have already been completed in Nigeria. This includes projects that have benefited from 100% government funding through the REA, while others have involved private developers raising capital to support additional projects. In total, it is estimated that there are over 30 mini-grid projects in place in Nigeria, 19 of which

Table 5-1:
Examples of private mini-grid projects in Nigeria (2019)
Source: World Bank (2017), CEPA analysis.

Location	Year operational	Type of technology	People served	kW	Owner - project costs
Abuja FCT	2017	Biogas	500	20	Waste-2-Watt
Anambra State	2016	Solar PV	1,600	40	GVE \$220,000
Bauchi State	2018	Solar PV	N/A	10	ACOB Lighting Technologies
Bauchi State	2017	Solar PV	N/A	7.5	ACOB Lighting Technologies
Edo State	2016	Solar PV	1,180	38	Arnergy
Gombe State	2015	Solar PV	1,600	34	GVE \$220,000
Kaduna State	2017	Solar PV	443	16	ACOB Lighting Technologies
Kigbe - Abuja FCT	2017	Solar PV	1,200 (5 businesses)	20	Havenhill US\$117,000
Kurdula, Sokoto State	2015/2018	Solar PV	292 (142 businesses)	80	GoSolar
Kwaku - Abuja FCT		Solar PV	N/A	30	Havenhill
Niger State	2017	Solar PV	230 households	41	GVE \$250,000
Niger State	2016	Solar PV	1,600	34	GVE \$220,000
Niger State	2015	Solar SV	200 households	38	GVE \$250,000
Niger State	n/a	Solar PV	765, (100 businesses)	100	Nayo Tropical Technology
Ogun State	2018	Solar PV	c.1,600	85	Rubitech – supported by USAID, GIZ
Osun State	2015	Solar PV	1,180	24	Arnergy
Rivers State	2017	Solar PV	636	16	ACOB Lighting Technologies
Rivers State	2015	Solar PV	720	9	GVE \$60,000
Rivers State	2015	Solar PV	720	9	GVE \$60,000
Rivers State	2013	Solar PV	480	6	Green Village Energy (GVE) \$75,000
Umon Island	2018	Solar PV	5000	50	CREDC

209 SHS companies operating at scale need to leverage the value of their consumer receivable assets (the bundle of loans that they have given to their customers to get access to their products) to free up working capital. They can either do this by borrowing an on-balance sheet using the value of the receivables as collateral, or else an off-balance sheet securitisation approach involving the creation of an SPV. To date we understand that M-KOPA, BBOX and Zola EDF are the only companies to use this model in Africa; all three transactions have effectively used the former model.

are purely public projects and the remainder having more private involvement. Table 5-1 below provides examples of the latter.

In total, the existing projects are estimated to serve an approximate minimum of 20,000 customers. According to available information, all projects that have been completed to date are at or below the 100kW threshold, meaning that they benefit from the regulatory arrangements but also suggesting that the market has been reticent to test the extent to which the regulations in place for larger mini-grids will prove to be effective.

The costs incurred by mini-grid developers vary significantly based on the technology type, consumption and location. The World Bank released a study in 2017 that analysed the costs of hybrid and solar PV mini-grids in both Africa and Asia, noting that there are yet to be accurate cost benchmarks due to the nascence of the sector and cost differentials within and between markets. It found that batteries, PV panels, inverters and distribution cabling had the largest impact on cost; however, these costs had a large range. For example, the price of PV panels varied from US\$180 to US\$1060/kWp. Collectively, generation, storage and distribution make up an average of 60% of overall capital expenditure (capex) at 23%, 20% and 17%, respectively.²¹⁰ The connection cost of one Nigerian mini-grid developer was listed as US\$783.^{211, 212}

Companies that build multiple mini-grids face lower costs. The World Bank study reported that capex per kW could decrease by as much as 70% with the promotion of multi-mini grid programmes. Nayo Tropical Technologies, for instance, is developing a cluster of ten new mini-grids around their initial site in Niger State. The proximity of these projects is expected to drop the overall cost by up to 40%.²¹³

Currently in Nigeria, total costs of mini-grids are estimated at US\$0.60/kWh and have the potential to drop by two thirds through decreasing hardware costs, better programme design and increased efficiency of the service delivery, among others.²¹⁴ For GVE in Nigeria, the average capex is US\$7,000/kW while operating expenditure (opex) is US\$140/kW/year.^{215, 216} Capex is also dependent on

the level of electricity supply; per customer, capex can increase tenfold or more between supplying customers at 8kWh/month (US\$400/customer) to 110kWh/month (US\$4,375/customer).

There are approximately ten companies operating in the mini-grid sector, which are organised into an association under the Africa Mini-Grid Developers Association (AMDA). GVE is the largest company. The case study below discusses their experience with raising capital in Nigeria.

Size and nature of the financing need

The experience of GVE described in Box 5-2 is interesting because it details the experience that the leading mini-grid developer has had in trying to access finance in Nigeria. Despite its track record in attracting funds from a range of organisations, and of completing operational projects, GVE has yet to access finance from commercial sources, which could ultimately limit its ability to implement the projects that it has in its pipeline.

For the seven developers consulted who are involved in the mini-grid segment, access to local currency debt finance was highlighted as the main constraint that is limiting the growth of their companies. Some of the developers had secured an agreement from REA to access a grant to cover a proportion of the costs but had yet to secure the funds/finance required to start the construction of the project. Excluding GVE, the consulted developers suggested that they need up to US\$2.5 million of local currency debt finance within the next year for projects that they are actively developing.

Mini-grid developers are also in need of hard currency finance in order to pay for their equipment imports. Those who are licensed and have received grants from the government do not have issues converting into hard currency. In such a case, obtaining local currency debt and converting it to hard currency as required, helps to shield developers from FX risk. One of the developers consulted indicated that approximately 40% of its costs were in foreign currency and the remainder in Naira. While this ratio is accurate for a single Nigerian developer, it may not be representative of the industry as a whole.

Reports by the International Renewable Energy Agency (IRENA) and the World Bank have analysed the proportion of cost components faced by mini-grid developers.²¹⁷ Based on these numbers and assumptions on imported materials, it is likely that developers will require hard

210 World Bank (2017) Benchmarking Study of Solar PV Mini Grids Investment Costs

211 World Bank (2017) Mini Grids in Nigeria: A Case Study of a Promising Market

212 Connection cost defined as the distribution cost to the developer of connecting one new customer.

213 Rocky Mountain Institute (2018) Mini Grids in the Money

214 Rural Electrification Agency (2017) Nigeria Minigrid Investment Brief

215 ECREE (2017) Mapping & Assessment of Existing Clean Energy Mini-Grid Experiences in West Africa

216 It should be noted that these costs are based on some of the initial mini-grid projects completed in Nigeria. It is possible that more recent mini-grid projects have been carried out at lower costs.

217 IRENA (2016) Solar PV in Africa: Costs and Markets; World Bank (2017) Benchmarking Study of Solar Mini Grids Investment Costs: Preliminary Results

Box 5-2: Case study on Green Village Energy

GVE, founded in 2012, is the largest and most experienced local mini-grid developer operating in Nigeria. In total it has completed twelve projects with an installed capacity of 0.5MW.

Its operating model involves selling power to communities through a network of vendors who purchase the electricity in bulk and resell it to local consumers. Residential customers pay an up-front connection fee of US\$20, which pays for a prepaid meter and a load limiter which monitors consumption. Additional payments are based on consumption levels.

GVE has obtained funds/ finance from a range of sources:

- Angel investors, family and friends provided funds for its first round of investment.
- Following on from this initial investment, it was able to access grants from the REA and the Institute of Electrical Engineers, which provided US\$300,000 to fund completion of one of GVE's pilot projects. GVE also received a US\$100,000 grant from the United States Africa Development Foundation (USADF). Additionally, it received transaction advisory support from USAID's Power Africa programme and a US\$100,000 seed grant for its second and third projects.
- GVE obtained a US\$1.7 million (local currency equivalent) loan from the Bank of Industry (BoI) from one of the Special Intervention Funds. BoI are now shareholders in the organization and are represented on the Board. All-On, a locally based impact investor has also invested in the company.
- It has also received support from the government, benefiting from a five-year tax holiday because of its 'pioneer status' based on the innovative nature of its activity.

However, GVE has not yet been able to access credit from local commercial banks. It has been in discussions with several banks but have to date been unable to get an offer which matches its requirements: it was looking for tenors of between seven to ten years with indicative interest rates of 13 to 15 %.

GVE is currently in the process of developing another set of mini-grid projects that have received some funding from REA, which it estimates will double its installed capacity to 1MW. Beyond the programmes under development, it reportedly has a long pipeline of projects that it would like to develop, which if completed, would take total installed capacity to 22MW. In all it estimates that it needs to raise approximately US\$95 million of capital, of which around US\$70 million might be in the form of debt. This would also include some projects that it has planned for the C&I segment. It is yet to identify the source of finance for these investment needs.

currency for approximately 50% of their up-front costs.²¹⁸ However, there is still significant variation in costs making industry-wide assumptions challenging.

Overall, across the mini-grid segment there are different estimates of the extent of the local currency financing needs over the next four to five years. For instance, a recent GIZ study forecasts that the total capital value of completed mini-grid projects will reach over US\$400 million, with approximately US\$220 million of private investment needed.²¹⁹ The REA provides more of a top-down estimate of the investment needs, but its analysis suggests that there is potential for the mini-grid sector in Nigeria to scale rapidly to over 10,000 sites by 2023, creating an investment need of nearly US\$20 billion.²²⁰

Whatever the size of the local currency financing needs, the evidence from the consultations and existing reports suggests that Nigerian banks and institutional investors are not involved in supplying finance to the sector. Consultations with stakeholders suggest that the finance offered by the banks is not viable for the sector, with interest rates generally available at between 22 to 28% with short tenors. At an inflation rate of eleven to 12%, this represents an extremely high real interest rate.

To put that into context, according to existing models, mini-grids expect to make a nominal return of around 15 to 17%, which therefore cannot be achieved with interest rates at this level.²²¹ Moreover, given that most of the

²¹⁸ Assuming generation, conversion and approximately half distribution assets require importation and therefore hard currency.

²¹⁹ GIZ (2019). Accelerating mini-grid development in Nigeria.

²²⁰ Rural Electrification Agency (2017). The Off-Grid opportunity in Nigeria.

²²¹ GVE model estimates up to a 17% to 21% IRR but this is based on the assumption that it could raise interest rates at 14%; whilst the REA's analysis shows an IRR of 15% but this assumes that the project obtains debt finance at 10%.

projects are quite new, there is no evidence that existing mini-grid developments are currently achieving a 15% level of return. The prevailing market view is that the sector needs single digit interest rates to be viable.

The mismatch between the interest rates available from commercial banks and what is required by developers is large and suggests that subsidised finance alongside guarantee products is required to stimulate the increase in financ that is desperately needed to support additional mini-grid developments.

5.3.3. Captive C&I

Market size and recent activity

The Nigerian C&I market is estimated in reports to be the biggest in SSA and the market with the most potential for further investment in the sector. This is due to a combination of factors:

- The poor reliability of the grid and the difficulties faced in securing the required investment to expand grid connections/ improve grid reliability.
- The huge self-generation market, currently dominated by diesel generators, with spending by consumers estimated at around US\$14 billion per annum.²²²
- The emergence of solar technologies, which are cheaper than the diesel generators. According to the Rocky Mountain Institute, diesel gen sets produce power at a cost of US\$0.60 to US\$0.71 per kWh.²²³ This compares to the costs of solar with battery storage of around \$0.20 per kWh, though the grid generated power is around US\$0.12 to US\$0.20 per kWh. Therefore, consumers and businesses demand for these products is driven by the potential to significantly cut their energy costs.

At present, Nigeria has a reasonably conducive policy and regulatory environment for increased investment in the C&I sector, largely because the projects can take place without involving government institutions. The main challenge on this front is the difficulty faced in importing solar equipment and batteries into the country, which is due to the general deficiencies in Nigeria's import procedures rather than issues specific to the renewables sector. Solar equipment typically attracts a 5% import duty and the batteries required for storage attract a 20% duty and 5% VAT. The government could consider reducing these duties to stimulate further growth of the market.

A recent report by BloombergNEF suggests that C&I installed capacity has grown rapidly in recent years. The projects have increased in capacity from under 5MW to around 9MW between 2017 and 2018. Total renewable energy installed capacity as at 2019 is estimated to be at least

20MW, with developers working on a pipeline of projects of 49MW to 55MW, scheduled for completion by the end of 2019.²²⁴ Some of the feedback from the consultations suggests that the size of the C&I market is considerably higher than is presented in the BloombergNEF report, with one stakeholder suggesting that there is already at least 100MW of C&I developments installed.

There is no accepted database that has measured the size of the industry. Part of the problem is that several developments have been self-financed by corporates, so no central records exist apart from potentially at the customs office.

The C&I sector in Nigeria does include some large projects focused on industrial off-takers; however, renewable energy options are not always feasible for some of the larger industrial off-takers. Additionally, in some cases where gas solutions are available, renewable supply may not be the most economically efficient choice.²²⁵ The largest reported C&I renewable projects in development/ completed include the 2.35MW Tulip Cocoa processing plant developed by Alfen BV; the 1.2MW Usuma Dam solar power plant that was built by the Japan International Cooperation Agency; and a 1MW project built by Enerwhere for Bayero University in Kano.

There is much more activity at the smaller end of the market. According to BloombergNEF's report, C&I sites over 30kW are estimated to make up less than half of the current capacity. Developers are very confident that this is a large market and presents a significant opportunity for growth, highlighting the potential to serve a range of commercial off-takers including economic clusters of SMEs (shopping centres, computer villages, etc.), agribusinesses, smaller factories, bank branches, breweries and hospitals. Box 5-3 below provides a case study for Daystar power, which is involved in several ongoing developments.

Demand for finance

Like the mini-grid space, companies operating in the C&I market were clear that access to finance in general, and local currency debt finance specifically, is the main issue that they face. In contrast to the mini-grid segment, there is potentially more of a track-record of profitability amongst the established C&I companies, noting that some developers report achieving IRRs of up to 20% in Naira terms. Despite this, both the feedback from the developers consulted and the existing research (particularly the recent BloombergNEF study) suggest that local banks are not providing finance for the C&I segment.

222 Rural Electrification Agency (2017). *The Off-Grid opportunity in Nigeria*.

223 Rocky Mountain Institute (2018) *Mini-Grid Investment Report: Scaling the Nigeria Market*.

224 BloombergNEF (2019) *Solar for businesses in Sub Saharan Africa*.

225 Over the long-term however a hybrid solution is likely more cost efficient.

Box 5-3: Case study on Daystar power

Daystar power was formed in 2017. It is a developer that operates across West Africa which was founded by a venture capital financier Sunray Ventures with an initial US\$1 million capital injection. It also received a loan of just under US\$600,000 from the German Investment Corporation - DEG. It recently signed a US\$10 million private equity investment deal with Verod Capital Management and Persistent Energy Capital LLC to expand C&I operations.

Daystar can install systems of between 20kW and 5MW, serving a range of C&I customers. Though to date developments have ranged from 20kW projects that cost around US\$50,000 to 2MW projects that are around US\$2 million to US\$3 million. The smaller projects are usually for bank branches at which point they might do, for example, ten projects all together.

Daystar operates two main business models:

- A 'power as a service' model in which it provides a client with all their power needs against a fixed service fee.
- A 'solar as a service' model in which the solar generated for the client is charged at a per kWh price with a guaranteed offtake level agreed.

Across both models its publications suggest that it can achieve an internal rate of return (IRR) of around 25 % in US dollars. To put that into context, the BloombergNEF paper suggests that developers in the sector have achieved IRRs in the range of five % for old projects to 20 % for their newer projects in Naira terms.

The company has won the right to supply several banks with solar power. It is in the process of installing solar power systems at the Nigerian Bank of Agriculture's 158 branches and has also reached agreement with Unity Bank to transform the power supply for its branches from diesel generators to more efficient solar solutions across its 240 business branches.

A case study of one of their systems based on a bank branch in Lagos, which consumes around 2,850 kWh per month, shows that its hybrid systems have cut the branch's energy costs by over 20 % per month (US\$960 to US\$760), whilst also reducing diesel use by around 200 litres per month and reducing CO2 emission by 600kg, with no up-front costs.

Daystar alone have a pipeline of projects in excess of 20MW, the challenges to delivering on that pipeline include getting sufficient access to local currency to enable them to finance their business model and the challenge of coordinating/ managing their business without becoming over-exposed/ ramping up too quickly when they don't have sufficient capacity.

The C&I developers consulted had been quoted interest rates well above 20% from local banks with only short-term tenors. Similarly, the BloombergNEF study suggests that developers have been offered rates over 25% for tenors of up to two years.²²⁶ There are no real estimates of the total size of the financing need of the sector. The BloombergNEF report suggests that there is at least another 55MW of projects that are already under development that should be commissioned by end of 2019. These developments will be of different sizes/ costs. Given the growth opportunities in the market, a

conservative estimate of 55MW of C&I projects completed each year for the next four to five years was calculated. This implies that investment will be required for at least an additional 275MW of projects.

Investments would need to be in a diverse range of systems with very different costs depending on their size and specific requirements of the off-takers, but a rough estimate of finance needs could be up to US\$500 million over the next three to five years with a significant proportion ideally coming in the form of local currency finance.²²⁷

226 BloombergNEF (2019) Solar for businesses in Sub Saharan Africa.

227 According to the Bloomberg report capex costs for C&I projects typically range between US\$1.1 per Watt to US\$1.6 without storage, though this can increase to around US\$3 per W when the highest quality lithium-ion batteries are used.

5.4. Supply of finance

5.4.1. Commercial banks

According to the CBN there are 21 registered commercial (money deposit) banks in operation in Nigeria.²²⁸

Across all of the banks, a total of around US\$45 billion of credit was allocated to the private sector in 2017, of which around 4.5% (approx. US\$2 billion) is directed towards the power and energy sector.²²⁹

The sub-section below presents an overview of some of the issues that have limited the ability of the banking sector to provide intermediation services to the renewable sector.

Factors limiting lending

According to stakeholders, the biggest issue facing the banks is their cost of funds, which has a knock-on effect on the interest rates that the banks can offer. The CBN benchmark rate for the Naira is 14%. This rate must then be adjusted to cover the costs and required risk-reflective margin of the banks. Given that many of renewables sector developers do not have an established track record, nor the required collateral, it is clear why most banks are only willing to offer interest rates of over 20%; that is a margin of 6% plus.

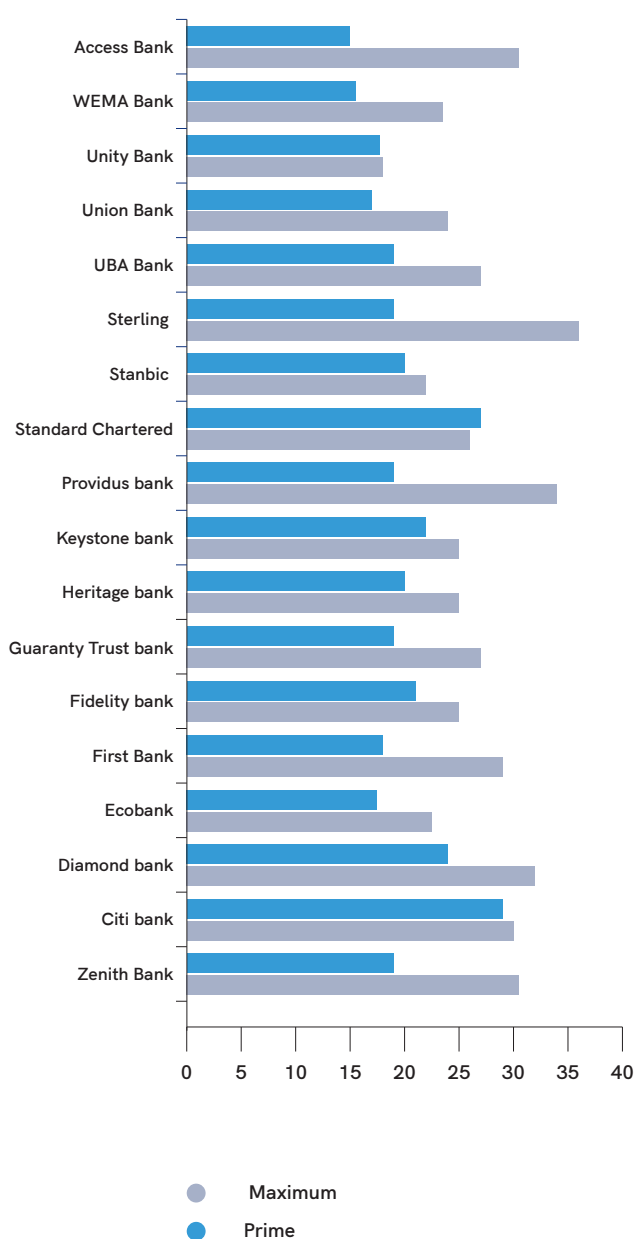
The figure below illustrates the prime and maximum lending rates that are available for the power and energy sector according to the CBN. In practice, this varies on a case by case basis depending on the specific circumstance of the company trying to access credit. It shows that the lowest prime lending rate available is 15% from Access Bank, but also that some banks are offering prime rates over 20%. The average prime rate is 20% and the average maximum rate is 27%. Conversely, the prevailing view of the market (particularly mini-grid developers) is that single digit interest rates at long tenors are required; it is easy to see why they have in general been unable to access credit from banks.

The cost of funds available to banks, along with the small size and short-term nature of bank deposits make it challenging for banks to offer terms that are viable for developers.²³⁰

The few instances identified where local banks have been involved in providing finance to developers, the bank had been able to obtain funds from a concessional source of finance – typically one of the government's special intervention funds or from a DFI. Access Bank and the United Bank for Africa (UBA) both have access to a line of credit on favourable terms from AFD and the

EU, as part of a US\$74 million intervention through the SunRef programme. However, these banks have been reluctant to use the funds to provide additional loans to the renewables sector, because they have to apply an interest rate cap when using the funds which makes it unattractive (from the banks' reported perspective) to provide additional loans to developers.

Figure 5-4:
Maximum and prime lending rates available for the power and energy sector in Nigeria (%)
Source: CBN (2019)



²²⁸ CBN, List of Financial Institutions: Commercial Banks. [Accessed 19 March 2019] <https://www.CBN.gov.ng/Supervision/Inst-DM.asp>

²²⁹ CBN (2018) Financial Stability Report. June 2017.

²³⁰ The interest rates on short term deposits range between 9.15% (for one month) to 10.23% (for 12 months) - March 2019.

Nigerian banking regulation requires that all banks have policies in place to address sector concentration within their portfolio.²³¹ Nigerian banks tend to group renewable energy organisations in with large scale non-renewable IPPs, despite their different risk, business models and financing needs, among others. With loans to the oil and gas sector making up approximately 30% of total lending, Nigerian commercial banks have suffered significantly from the oil price slump since 2014, and the associated defaults of energy firms.²³² Some of the consultations indicated that banks may consider investing in any form of energy generation to be high-risk, overexposing them to the energy market, and thus reducing their willingness to lend to the renewable energy sector.

Regulations/ bank requirements and appetite for the renewables sector

In addition to the underlying macroeconomic constraints, the following factors also limit the banks' appetite to lend to the renewables sector:

- Existing regulations;
- The availability of relatively safe government securities; and
- Nigerian banks' general conservative approach to banking in addition to their limited capacity to assess and provide credit based on a companies' current and expected future cashflows.

These factors are explored in detail below.

Bank regulations

Some elements of the existing banking regulations make it difficult for the banks play the required intermediation role in the renewables sector.

The banks have collateral requirements as high as 120% for any loan that they provide. Moreover, the form of collateral is limited to assets such as property, machinery (e.g. cars), and stocks/ bonds. To date, none of the banks have been willing/ able to accept solar equipment as a form of collateral. Though one of the banks – Sterling Bank – has been exploring the potential to develop a secondary market in solar equipment in order to more confidently attach a value to it, and therefore use it as an asset. Many of the developers consulted noted that their inability to meet the collateral requirements made it impossible for them to access credit from banks. This includes Bol which applies the same collateral requirements as the banks.

In addition to the issues around the collateral requirements, it is reported that the Basel III requirements will make it even more difficult for the banks to provide longer-term tenors. The new regulations will enforce more stringent requirements around the way in which the short-term asset liability mismatch faced by Nigerian banks is managed. Furthermore, the IFRS9 has introduced new rules around the treatment of bad loans, which has an impact on the capital requirements of local banks and will again make it more difficult for them to provide loans to developers in the renewables sector.

Opportunity cost and interest in the renewables sector

As noted throughout this report, one of the underlying issues facing Nigeria is the macroeconomic instability that leads to the government securities trading at around 14%. From a bank's perspective, these opportunities significantly reduce the incentive to take on additional risk for a similar return by investing in the renewables sector.

Only a handful of banks were seen by stakeholders as being progressive or having a real interest in exploring other opportunities. Sterling Bank was highlighted by several developers and other stakeholders as the main bank that is actively trying to develop products that it can offer to the renewables sector. In addition to its work to establish a secondary market for solar assets, it has an ambitious target of providing up to US\$300 million of local currency loans to the sector over the coming years. In addition to Sterling Bank, both First Bank and Standard Chartered were also considered to have interest in the renewables sector.

Extent to which guarantees can address these issues

Given the fundamental nature of the issues facing the banking sector combined with the fact that the vast majority of developers that are looking for debt in the renewables sector have been in operation for under three years and have no track-record of completing operational (and commercially sustainable) projects, it is uncertain whether the provision of a guarantee is, on its own, sufficient to stimulate banks to provide additional lending to renewables projects and businesses.

The leading banks in the sector, all recognised that a guarantee would effectively remove (in the case of 100% guarantee) the risks that they face, but they were less sanguine about the extent to which it would enable them to provide credit to developers on terms that are viable. Only one of the banks reported that the provision

231 CBN (2010) Prudential Guidelines for Deposit Money Banks in Nigeria

232 Chaudry, Smith (2018) Burned by energy losses, Nigeria banks look to broaden risk exposure [online]. Accessed at: <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/46550308>

of a guarantee would enable them to offer a (100bps) reduction in the headline rate; the others were doubtful that the guarantee would enable them to offer any pricing advantage or extended tenor. Clearly, this appears somewhat illogical in the context of minimum margins of 600bps.

Overall, however, the evidence suggests that presently a guarantee would not enable a bank to offer the interest rates at the level needed to unlock more opportunities in the renewables sector, particularly in the mini-grid segment of the market. For the commercial banks to be more involved, the guarantee would need to be provided alongside some concessional funds that would enable them to offer lower interest rates and longer tenors. However, it is possible that for some of the developers (e.g. those operating in the C&I and SHS spaces), the provision of a guarantee could enable them to access loans from banks in cases where they might otherwise be unable/ unwilling to meet the collateral requirements that are required by banks (i.e. the guarantee would substitute for part of the collateral requirements).

5.4.2. Microfinance Institutions

As at end June 2017, there were around 1,000 registered MFIs in Nigeria, with over US\$1 billion in assets, as.²³³ The CBN introduced new regulations in late 2018, including increasing the minimum capital requirements and publishing a new Code of Corporate Governance (that will come into force as of April 1st, 2019), to improve the solvency and overall performance of MFIs.²³⁴

There are three categories of MFI in Nigeria: Unit MFIs which are able to operate in one location and are required to have paid-in capital of at least US\$55,000 (local currency equivalent); State MFIs which can open multiple branches within a single State and are required to have a minimum paid-in capital of approximately US\$2.75 million; and National Banks which can operate across States and need paid-in capital of at least US\$13.9 million.

MFI involvement in renewables and energy efficiency

The IFC established the Lighting Africa Program that seeks to expand access to solar products by the poorest consumers. Lighting Africa has partnered with several MFIs to provide them with capacity building, for instance, training on how to identify which solar products meet the required standards. Following on from this, a few MFIs in Nigeria have developed programmes (in some cases these were in existence before the IFC programme began) to help increase access to small-scale SHS products such as solar lanterns. Two of

these MFIs: LAPO Microfinance Bank and Grooming Centre are interested in expanding their programmes.²³⁵

LAPO Microfinance Bank

LAPO Microfinance Bank, Nigeria's largest MFI with a presence across 35 of Nigeria's 36 States and over 400 branches, sells solar systems (mainly lanterns) directly through its branches. They purchase the solar products from three registered suppliers (d.light, Sun-King and Solarway) and then sell the products to their registered customers who then repay the loans within three months – the average loan size is around US\$20. Customers have a one-week grace period and can repay within three months. In total they have sold around 162,000 units and have provided loans in the region of US\$4 million as of 2019. They described their default rate as being 'minimal' because they largely provide loans to existing customers who they know well and have environmental and social risk assessment procedures in place.

LAPO are interested in expanding their model and potentially branching out to higher value SHS products, but face constraints in their ability to access enough capital to do so.

Grooming Centre MFI

Grooming Centre is present across 23 States and Abuja; it has 581 branches, over 680,000 active borrowers and over 720,000 active savers.²³⁶

In the solar sector, Grooming Centre has a similar model to LAPO. To date they have disbursed loans to their customers worth around US\$200,000 to enable them to access small-scale SHS products (worth up to approximately US\$55). Grooming Centre's loans are repaid over three months and attract a 7.5% service charge with repayments made over twelve instalments. Grooming Centre works with suppliers such as Consistent Energy and Solar Way.

Grooming Centre is interested in expanding their solar programme and has conducted research which found that around 80% of their customers were interested in purchasing solar products, of which 20% were looking for higher capacity solar systems. At present, their lending under their 'solar loan' programme makes up around just 0.01% of their total portfolio, with an intention to increase this to around 1% over the coming years. In addition to potential capital constraints, they also identified the difficulty in managing logistics if their programme were to become significantly larger.

233 CBN, List of Financial Institutions: Commercial Banks. [Accessed 19 March 2019] <https://www.CBN.gov.ng/Supervision/Inst-DM.asp>

234 CBN (2018). Code of corporate governance for microfinance banks in Nigeria.

235 Additional MFIs involved include: Olive MFI, Susu MFI, Forward MFI and Ilishan MFI.

236 Grooming Centre (2019) Grooming at a Glance. [Accessed 20 March 2019] from <http://groomingcentre.org/index.php/performance/at-a-glance>

Is there scope to use guarantees?

Grooming Centre was able to make use of a guarantee from the AGF to guarantee its portfolio of loans under a programme designed to sell fertilizer to its customers using a model like that applied in the solar sector. It might be possible to work with MFIs such as Grooming Centre and LAPO (and others, focusing initially on those that had been part of the Lighting Africa programme) to explore the possibility of guaranteeing their portfolios, which could enhance their ability to expand their programmes. The guarantee would provide cover only for defaults over and above the MFIs' expected losses on its portfolio. Alternatively, a guarantee could be used to help MFIs raise capital to on-lend.

Local currency finance needs

Another area that could be explored with the larger MFIs is the extent to which they need to raise additional local currency. For instance, LAPO's local credit rating report notes that the bank is actively trying to reduce its exposure to foreign exchange risk by accessing the domestic debt market.²³⁷

LAPO reportedly has a desire to raise around US\$55 million in local currency debt by issuing bonds in the period to end 2020. In 2018, it became the first Nigerian MFI to raise capital through a bond, raising over US\$8.5 million through a 17.75% five-year, fixed rate unsecured bond. For comparison, a government four-year bond has a yield of 14.6% and a seven-year bond has a yield of 14.47% (note that Nigeria currently has a flat/ inverted yield curve which is attributed to a combination of factors including the open-market operations carried out by the CBN, the recession and the political uncertainty that had been caused by recent Presidential and State-level elections).

LAPO worked with the AfDB backed African Local Currency Bond Fund (ALCB) to help issue the bonds and considered using an AGF guarantee to improve the attractiveness of the investment to local pension funds/ institutional investors.²³⁸

Whilst LAPO was able to raise capital, the bond was undersubscribed. It is possible that LAPO and other large and solvent MFIs that are involved in the renewables market could be a target for local currency guarantees with the aim being to reduce their exposure to exchange rate risk and therefore improve their ability to provide loans to consumers in the sector. Given the potential issues with the use of the AGF guarantee (payment procedure following a call under the guarantee), for this to work it is important that the guarantee is designed to address the requirements of Nigerian institutional investors.

5.4.3. Capital markets and institutional investment

This sub-section reviews the potential supply of local currency finance for the renewables sector from institutional investors in Nigeria. It is worth noting that alongside pension and insurance funds, Nigeria is one of the few countries in Africa that has a sovereign wealth fund – the NSIA, which provided first-loss capital to InfraCredit.

Pension funds in Nigeria

In 2010 the National Pension Committee (Pencom) revised its regulations that govern the investment of pension fund assets. As a result of these reforms, Nigerian pension funds can allocate up to 10% of their assets to infrastructure funds (or directly into infrastructure related projects) and up to 25% in infrastructure bonds. Both limits have increased (from 5% and 15% respectively) in the recently revised regulations.²³⁹

Given that total pension fund assets are currently estimated to be US\$24 billion (local currency equivalent), conceivably a maximum of US\$8 billion is available from institutional investors for the financing of infrastructure in Nigeria under existing regulations.

However, at present, pension fund investment remains focused on government securities. According to the most recently available report from Pencom, 73% of pension fund assets are still invested in FGN securities. The regulated allocation limit for government securities has recently been reduced from 80% to 60%, so it is expected that additional investment will be targeted on alternative assets in the coming years.²⁴⁰

In contrast, just 0.38% of assets are currently invested in infrastructure (let alone focused on renewable energy): 0.21% to infrastructure funds, 0.09% to corporate infrastructure bonds (the Viathan transaction guaranteed by InfraCredit) and 0.08% to green bonds.

In addition to the changes to the target asset allocations, Pencom is adjusting regulations to improve the ability of pension funds to invest in infrastructure/ alternative assets. For instance, in July 2018, Pencom introduced regulations to enable the establishment of multi-fund structure pension funds (i.e. it enables the funds to hold the assets of those close to retirement in a different pot from those just entering the workforce). This, in theory, will create a tranche of pension fund assets that are better suited to accepting greater risk in the portfolio, and provide a source of longer-term funding. The eventual

237 Agusto&Co (2018). LAPO Microfinance Bank Limited. Final Rating Report.

238 ALCB, Portfolio. [Accessed 20 March 2019]. <http://www.alcbfund.com/portfolio/>

239 Pencom (2019) Regulation of investment of pension fund assets.

240 Pencom (2019) December 2018 Monthly report.

aim is to get pension funds to build their experience of investing in different asset classes and their understanding of the different risks versus rewards.

According to Pencom, investment by pension funds in infrastructure is starting to increase, though in practice this has been driven by a small number of transactions.

Examples of investments include:

- The Asset and Resource Management Company Ltd (ARM) Infrastructure fund, the first fund in Nigeria to secure investment from the pension sector, raised US\$91 million at first close, with US\$20 million coming from the AfDB and the remainder from Nigerian pension funds and other private partners.
- Nineteen pension funds in Nigeria have invested in the Nigeria Infrastructure Debt Fund (NIDF). The NIDF has around US\$55 million (in local currency equivalent) of AUM. It was established to provide the pension funds and other investors with a regular and stable income by making primarily debt investments in infrastructure projects located in Nigeria. The Fund's investment portfolio of infrastructure loans and other securities targets a gross return of three to 4.5% above the comparable FGN bond yields. Renewable energy is one of NIDF's main target areas; around half of their investments in the sector have targeted C&I developers. NIDF raised the option of local currency guarantees, which could make way for NIDF to invest in more renewable projects.
- Twelve pension funds and two insurance companies invested in the bond issued by Viathan Group; the first corporate bond guaranteed by InfraCredit. Eleven pension funds invested in the 15-year corporate bond issued by North South Power, InfraCredit's second transaction.

InfraCredit and NIDF were consulted to explain how they have been able to secure investment from pension funds. Both emphasised the importance of the work they undertook to build the capacity of the pension funds to understand the guarantee process, and more generally how to assess the credit quality of infrastructure-related assets. In addition, they emphasised the need to spend a lot of time and resource building relationships. NIDF indicated that they had to complete over 400 meetings to get pension funds on board but believe that the combination of their up-front effort to establish a working relationship and the performance of the fund may make future attempts to raise capital from pension funds less resource intensive.

At present, pension funds do not have the capacity to independently assess the credit worthiness of individual transactions. One stakeholder from the sector informed us

that the pension funds that have invested in infrastructure related transactions have relied on InfraCredit/ the infrastructure funds due diligence capabilities almost entirely. In the case of the InfraCredit projects, the pension funds are not involved in monitoring actively the performance of the investment - they are effectively relying on InfraCredit to step in and ensure any payments are made on time to the extent that the pension funds 'wouldn't even know if there was a problem with the issuer, they would just expect InfraCredit to step in and resolve the problems in advance'.

Pension funds currently require 100% guarantees. Though there is a view that this could change over time as they gain more experience of working with institutions such as InfraCredit and begin to develop their appetite for PCGs.

What type of assets can pension funds invest in?

Based on consultations and a review of Pencom's regulations, pension funds can invest in renewable infrastructure through the following channels:²⁴¹

- Pension funds can only invest in bonds that are listed on the Nigerian stock exchange; and specialist infrastructure funds that are registered with the Nigerian Securities Exchange Commission.
- Any bonds in which pension funds invest must have a minimum A rating from at least two rating agencies, one of which must be registered in the local market.
- Investment in infrastructure bonds is subject to a minimum investment size of approximately US\$14 million.
- There is a requirement for an appropriate credit enhancement to be in place, including guarantees from government or a recognized agency (backed by a sovereign or a DFI).

Is there scope for pension funds to invest in the renewable sector?

Overall, Nigerian pension funds are showing increasing (albeit from a very small base) appetite and ability to invest in infrastructure, and therefore opportunities in the renewables sector. InfraCredit has already carried out a considerable amount of work to develop the capacity of pension funds to invest in infrastructure projects. However, pension funds can - for understandable reasons - only invest in a certain type of infrastructure assets (e.g. tradeable, investment grade rated, operational assets). Furthermore, the investments are, according to the regulations, restricted to larger project sizes that are not typically found with individual transactions in the renewables sector.

²⁴¹ Pencom (2019) Regulation of investment of pension fund assets.

In practice, there are a limited number of opportunities in the renewables sector that pension funds could target. Given the relatively small pipeline of investments, it is not clear that pension funds should incur the overhead/transaction costs involved in establishing the teams needed for them to invest in individual transactions. At this stage, it may be more optimal for them to focus primarily on investing through infrastructure funds or with InfraCredit who can carry out the due diligence etc. on their behalf more efficiently.

Nigerian insurance funds

Insurance funds in Nigeria are regulated by the Securities and Exchange Commission. The 2007 Investment and Securities Act of 2007 sets out the regulations that govern the investments that they can make. According to provision 171 of the 2007 Act, the insurance schemes can invest in a range of assets including infrastructure related assets.

Specific data on the investments carried out by insurance funds is more limited, but as noted above, two funds invested in the Viathan Group bond issued in 2017.

NSIA

The NSIA is Nigeria's sovereign wealth fund, it was established with US\$1 billion of seed capital, though has now grown to US\$1.5 billion. NSIA owns the Nigerian Infrastructure Fund, which is a US\$400 million fund mandated to invest across all the economic infrastructure sectors; it is required to achieve a commercial return on its investments and invest in projects of a minimum size of US\$5 million. NSIA provided US\$25 million of first-loss capital to support the establishment of InfraCredit.

5.4.4. Existing solutions in the market

Based on the consultations and research, the most active/relevant guarantee products in the market are offered by InfraCredit and the USAID's DCA guarantee. In addition, the AGF is reportedly considering launching a product for the Nigerian market. Each are profiled below.

InfraCredit

GuarantCo worked with the NSIA to sponsor the creation of InfraCredit in 2017. InfraCredit is focused on providing guarantees to support investment across the Nigerian infrastructure sector. Alongside the provision of US\$25 million paid-in capital by the NSIA, the Africa Finance Corporation also recently made a US\$25 million equity investment to become a shareholder of InfraCredit. In terms of callable capital, GuarantCo provided US\$50 million to help establish InfraCredit. KfW has recently committed to investing the dollar equivalent of €31 million in the form of subordinated capital, and in April 2019, AfDB approved a US\$15 million investment package.

Transactions completed by InfraCredit

InfraCredit can provide guarantees up to 100%; they are irrevocable and unconditional, but not accelerable. It has successfully completed two transactions to date. The first was a guarantee to support Viathan, a captive and embedded power developer, in the successful issuance of a ten-year bond priced at 82bps over the benchmark. In total the guarantee helped raise c.US\$27 million and attracted investment from twelve pension funds, two insurance companies, a commercial bank and a trustee. The bond issuance was oversubscribed.

InfraCredit's second transaction supported North South Power to issue the first 15-year corporate bond in Nigeria. The bond is priced at 15.6%, which is 70bps above the CBN benchmark rate. North South Power is the operator of the 30-year concession on the 600MW Shiroro Hydroelectric Power Plant which has been in operation since 1990 (North South Power obtained the concession in 2013). The bond was 60% oversubscribed, attracting interest from local pension funds and other institutional investors.

Funds raised from the bond will be used to overhaul a 150MW hydropower turbine, as well as fund the replacement of the company's current short term (Naira and dollar denominated) bank facilities with long term local currency debt, thereby eliminating the currency and tenor mismatch.

InfraCredit is AAA rated by a local ratings agency, but this was not the primary driver of its completed transactions. More than the credit rating/ strength of its balance sheet, InfraCredit emphasised the considerable work that it has done to build the capacity of pension funds, banks, regulators and developers to start the process of building a sustainable pipeline of projects for them to guarantee.

Both InfraCredit and other stakeholders have emphasised the importance of the relationships that they have built in enabling them to complete their two transactions. One indication of their success in getting pension funds to better understand the value of the guarantees is that they achieved a lower spread on their second transaction despite it being for a much longer tenor (though there may have been differences in the underlying credit quality of the two issuers that had an impact as well).

New products being developed by InfraCredit

Despite the work that InfraCredit has done to build capacity, it has completed only two transactions in around two years. It has reportedly been carrying out some additional market scoping to identify new guarantee products that would enable them to reach different areas of the market. InfraCredit are considering/ close to launching the following:

- **Refinancing guarantees.** InfraCredit plan to develop a new product to provide contingent refinancing guarantees to support the increased provision of finance during the construction phase based on conditional take-out financing from the debt capital markets.
- **The solar C&I/ mini-grid space.** Most of the opportunities that InfraCredit has seen in the sector have been too small for it to support, which has led it to work with development partners to establish an aggregation vehicle. It has already developed a business plan and is in preliminary discussions with the Nigerian Securities Commission and plans to introduce the new product this financial year.
- **Bol partnership.** InfraCredit intends to work with Bol to provide a blended finance solution which would provide borrowers with greater access to capital relative to what would otherwise be available to them through the more limited Bol funds. The InfraCredit guarantee would enable the borrower to leverage Bol lower cost funds by accessing investment from pension funds at longer tenors and comparably cheaper rates than those available from commercial banks. Bol is planning to put approximately US\$27 million, in local currency equivalent, into this partnership.
- **Corporate bond raising.** InfraCredit is also trying to look at ways to make the process of issuing corporate bonds and project finance bonds more accessible to a wider range of infrastructure developers.

USAID DCA guarantees

In 2012, USAID signed a US\$5 million loan portfolio guarantee with EcoBank. The aim of the guarantee was to catalyse increased lending to SMEs operating in the renewable energy and energy efficiency sectors in Nigeria. The guarantee offered partial coverage (typically around 50%).

The guarantee has reportedly been supportive in enabling the bank to provide US\$2 million of credit to seven companies in the renewables sector. For instance, Solynta (a SHS company) was able to access a loan from Ecobank.²⁴² However, EcoBank also had to access a cheaper source of funds through a Special Intervention Fund that is designed to provide cheaper credit to MSMEs. The Fund is operated by the CBN / Bol.²⁴³

The Fund enabled EcoBank to provide the loans at 9% interest rates to the developers. Without access to the cheaper source of funds, it would not have been able to complete transactions in the renewables space – even with

the guarantee; rates would have been around 25%. As the guarantee only offered partial cover, the bank considered the credit risk to remain the same. As such, several stakeholders were of the view that the market needs 100% guarantees if the provision of guarantees is to have the intended impact.

The guarantee was a factor in enabling EcoBank to provide credit to the renewable energy sector. However, it is not clear that the guarantee, on its own, would have enabled the bank to provide loans. The bank's access to a cheaper source of funds through the Special Intervention Fund was more important in opening a pipeline in the renewable sector.

Additional market feedback on the use of the guarantee suggested that USAID had to work with EcoBank to build its capacity on how the guarantee operated and how to assess the prevailing credit risks in the renewable sector. Furthermore, the bank's renewable energy team reportedly faced significant internal challenges in carrying out investment in the renewables sector because it was classified as additional lending to the energy sector; the bank was already heavily exposed to the energy sector following the privatisation process that occurred earlier in the decade.

African Guarantee Fund guarantees

AGF has been active in the West Africa region, and has completed transactions with four institutions that have reportedly helped banks and MFIs provide more credit to SMEs. This has included the provision of loan portfolio guarantees of US\$12.5 million to both Ecobank and Diamond Bank in 2013, which aimed to facilitate up to US\$25 million of credit facilities to SMEs in West Africa. It has also issued a US\$18 million portfolio guarantee to Oikocredit, which it has used to issue US\$3 million of loans to SMEs in Nigeria.²⁴⁴ It also reportedly issued a resource mobilizing guarantee to Fortis Microfinance bank to enable it to raise US\$3 million, though Fortis has recently had its license revoked.²⁴⁵

In addition, the AGF has tried to work with LAPO microfinance bank to support its fundraising efforts. The ALCB worked with LAPO to support it in raising approximately US\$8.5 million in local currency equivalent through the issuance of the first bond by a micro-finance institution in Nigeria.

242 USAID DCA (n.d) Nigeria: Financing Innovative Energy Solutions. [Accessed 19 March 2019] <https://usaid-credit.exposure.co/nigeria-financing-innovative-energy-solutions>

243 Bank of Industry (2015) Guidelines for the CBN Intervention Fund for Manufacturing Re-Financing and Restructuring Facilities of Banks' Loans.

244 Kolawole (2018) We've Facilitated Loans for 2,400 SMEs in Nigeria – Felix Bikpo [online]. Accessed at: <https://www.vanguardngr.com/2018/03/weve-facilitated-loans-2400-smes-nigeria-ceo-african-guarantee-fund/>

245 NIDC (2019) Notice to Depositors of Closed Fortis Microfinance Bank [online]. Accessed at: <https://ndic.gov.ng/notice-to-depositors-of-closed-fortis-microfinance-bank/>

This process took several years to complete, in part because of the currency crisis that occurred in Nigeria in 2016, but also because of the various challenges faced in operating in the Nigerian market and in generating appropriate interest. The ALCB and LAPO considered using a guarantee from AGF to support their capital raising efforts, however there were two main issues with this:

- In this case the market wanted the guarantee to offer 100% coverage, rather than the approximate 50 to 80% range usually provided by AGF guarantees.
- Consultees also suggested that market participants did not understand nor accept AGF's process for providing payment in the event of default. AGF's guarantee works by providing an advance payment of 50% when a claim is presented, followed by the balance once procedures, which are clearly outlined in the guarantee agreement, have been adhered to. Stakeholders were of the view that any guarantee product operating in the Nigerian market needs to be very simple.

Future AGF activity in Nigeria

AGF are also currently working together with Vetiva Capital Management Ltd and Climate Finance Advisory Ltd to support the proposed implementation of a US\$100 million credit fund programme (Green Energy Fund Programme), which seeks to leverage low-cost domestic intervention funds through the CBN, Bol and the Development Bank of Nigeria. It is targeting renewable hybrid projects in the C&I, mini-grid and home system space, as well as energy efficiency projects for industry and SMEs, in particular because these are areas where government involvement is more limited.²⁴⁶

The fund is targeted at the smaller end of the market, with projects restricted to a maximum generation capacity of 2MW or cost of US\$5 million, while the eligible transaction models are power-as-a-service (PAYGO or monthly tariffs) or lease-to-own.

AGF has signed a MoU with Vetiva and Climate Finance Advisory Ltd with the intention to provide PCGs of up to totally US\$50 million under the programme, covering 50% of mobilised public and private sector credit funds. This would enable green energy project developers to access up to US\$100 million of long-term local currency loans on concessional terms. AGF will be supporting the Green Energy Fund programme through its GGF, which was launched in 2016 with support of the NDF.

A recent report by AGF identifies a total pipeline of projects in Nigeria that are under review at US\$11.2 million (in local currency equivalent). US\$10 million of the pipeline is for AGF's Loan Individual Guarantees: which are single loans made by one of AGF's partner financial institutions to a single borrower whose identity is known to AGF. In addition, the Nigeria pipeline includes US\$1.2 million for equity guarantees: where the guarantee is provided to a known equity investor or venture capital fund.

5.5. Estimated demand for guarantee products²⁴⁷

This section provides indicative estimates of the potential demand for guarantees to support the off-grid sector in Nigeria. From a basic economics standpoint, the size of a given market segment (such as SHS or C&I) in terms of transactions completed and finance provided will depend on where demand for finance intersects with the supply of it.

Demand for finance per segment

There is some evidence on the global demand for finance – comprising its different types in terms of currency denomination, tenor, debt / equity etc. but where the market for local currency finance clears will depend on factors affecting its supply, for example debt pricing, market liquidity and risk perceptions etc. As set out, the demand for local currency guarantees will also depend on the relative attractiveness of competing products such as hard currency debt and how the availability of different types of guarantee could alter such dynamics.

Table 5-2 provides an indication of the extent to which the different market segments provide opportunities for guarantees to stimulate the provision of local credit and or capital market finance – the table is colour coded using different shades of blue to illustrate where there is most opportunity. The darker the shading, the stronger the relative opportunity. The table also provides some examples of the developers/ organisations operating in the different market segments.

Approach to developing the illustrative estimates

To illustrate the potential derived demand for credit guarantees for local currency denominated debt over the next three to five years, inter-related market factors need to be considered in seizing the opportunity²⁴⁸:

²⁴⁶ Information accessed from African Guarantee Fund website.

²⁴⁷ The figures presented in this sub-section are purely illustrative and should be interpreted as such. Furthermore, the mentioned figures do not take into account negative impact resulting from the COVID-19 epidemic, which took place after the market assessment had been concluded.

²⁴⁸ Demand for credit guarantees of hard currency debt is not explicitly covered in this analysis.

- **Potential demand for finance.** The indicative demand for investment in each segment over the next three to five years (presented in Table 5-2. This period is flexible to reflect the fact that timescales over which the estimated value of transactions is realised can differ, depending for instance, on the time required to raise finance, with the total amount either being raised in relatively shorter timescales (three years), or longer (five years). This range is driven by overall demand for finance identified in each market segment.
- **Proportion of finance in debt versus equity.** Some financing needs will be met through equity solutions rather than debt. Equity finance will not be able to make use of credit guarantee products. The proportion of debt finance will differ from segment to segment but is likely to be in the range of 50 to 70% for most market segments.
- **Potential demand for local currency finance.** The proportion of the demand for finance that will need to be satisfied with local currency finance.

Table 5-2:

Indication of the relative attractiveness of the market segments for local currency guarantees (figures in US\$).

Segment	Demand for finance	Scope to use guarantees for credit market	Scope to use guarantees for capital market
SHS	Potentially in excess of US\$100 million based on development plans of some of the leading SHS companies.	<p>Opportunity to issue portfolio guarantees to MFIs active in the solar space to cover defaults above their expected losses. Though only a handful of MFIs are currently operating in the space.</p> <p>As SHS companies grow there is an opportunity to issue guarantees to enable them to obtain loans from banks using their consumer receivables as collateral in order to free up working capital. But unclear that banks are willing/ able to engage in such transactions at this stage.</p> <p>Mixed feedback on the interest rates that the sector can bear, with figures ranging from single digit to around 15 percent.</p> <p>At present only one large firm, Lumos Global, has achieved scale in the market, the other international SHS developers are in the process of establishing themselves in Nigeria.</p> <p>Overall opportunities will emerge, but currently limitations around the number of viable organizations to partner with.</p>	<p>Opportunity to explore providing fundraising guarantees primarily to MFIs (e.g. institutions such as LAPO) to enable them to issue bonds that allow them to on-lend to households.</p> <p>Limited opportunity to use guarantees to support the consumer receivables securitization model at this stage given overall development of the market and capacity of institutional investors to engage in such transactions.</p>
Mini-grids	Estimated to be around \$220 million in GIZ study.	<p>Considerable demand for local currency finance from developers, but few, if any, examples of operating projects that are performing on a sustainable basis to give them a credible opportunity to obtain credit from banks.</p> <p>Developers need single-digit interest rates with long-term tenors that are unavailable in the Nigerian market.</p> <p>Overall, the pricing of local currency debt limits the potential role for guarantees at this stage, but the market could develop over time.</p>	Not probable to provide a pipeline of viable opportunities at present given level of maturity of mini-grid segment.

Segment	Demand for finance	Scope to use guarantees for credit market	Scope to use guarantees for capital market
C&I	Around US\$500 million over the next three to five years based on extrapolating a reported pipeline of at least 55MW for 2019 over the next five years.	<p>Opportunity to support importers/manufacturers to access credit. Limited potential to provide guarantees to corporates seeking to purchase solar equipment. Feedback received is that given the cost of debt, corporates are choosing to self-finance solar equipment.</p> <p>Considerable demand from developers for local currency finance. Opportunities for using guarantees more viable than in mini-grid sector because there are currently more established C&I companies in operation, and they are operating on a more commercial basis.</p> <p>Also, opportunity to provide guarantees to infrastructure funds such as NIDF, which are targeting the C&I space (but also other segments of the renewable market).</p> <p>Overall pricing of local currency will constrain the potential role for guarantees, but given underlying demand and growth, it is possible that a pipeline of opportunities for local currency guarantees to support both working capital and term loans.</p>	Unclear that developers in the C&I segment have reached the level to enable them to issue bonds. Scope for refinancing also limited at this stage, though could be potential to explore securitizing the portfolios of C&I developers that are effectively operating different forms of leasing businesses.

Legend

- Strongest relative opportunity
- Weakest relative opportunity

- **Potential demand for local currency debt finance.** This considers the proportion of the demand for debt finance that could potentially be satisfied with local currency finance. The proportion of local currency debt will differ according to the specifics of the financing arrangement in question, but an assumption is made around what would be optimal given the requirements of each segment, for instance in terms of hard currency import requirements.
- **Illustrative estimate of demand for local currency credit guarantees.** Which refers to the local currency equivalent US dollar value of demand that in theory has the potential to be supported by guarantees. The extent to which this potential can be realised will depend upon the competitiveness of local currency debt finance, (as regards pricing and tenor etc.) and whether the availability of guarantees is able to increase local currency debt financing. To account for the considerable uncertainty in the potential uptake of new guarantee products, scenarios are presented to illustrate low,

medium, and high uptake, depending on the specificities of each segment. The scenarios shown are:

- **Low take-up:** 5% of transaction volume
- **Medium take-up:** 15% of transaction volume
- **High take-up:** 30% of transaction volume

The Table 5-3 summarises the key considerations and assumptions made to arrive at the illustrative indication of the potential demand for local currency guarantees in Nigeria.

Illustrative estimates of demand for guarantees by segment

Using the approach and assumptions outlined in the sub-section above, illustrative estimates of the demand by segment are presented. The table suggests that there is most opportunity in the C&I segment, which is consistent with the qualitative analysis presented in Table 5-2. However, the quantitative approach indicates that there is more potential for transactions in the mini-grid segment than found through the qualitative assessment.

Table 5-3:
Rationale, assumptions, and sources of evidence behind indicative estimates

	Key considerations	Sources/assumptions
Potential demand for finance	<ul style="list-style-type: none"> Assessment of the investment needs for the sector over the next three to five years to meet demand for the different segments of the market. 	<ul style="list-style-type: none"> SHS: Based on market feedback from leading developers. Mini-Grids: GLZ (2019). Accelerating mini-grid development in Nigeria. C&I: BloombergNEF (2019). Solar for businesses in Sub Saharan Africa.
Proportion of finance in debt vs. equity	<ul style="list-style-type: none"> Consideration of the optimal financing mix taking account of the cost and availability of debt and equity and the financing needs of the different segments. Some of the developers, particularly international developers will be looking for additional investment and will already have significant equity retained within the business so it may be that all their additional investment needs are in the form of debt. 	<ul style="list-style-type: none"> The Bol requires developers to have at least 20 percent equity before they will provide a loan. German Solar Association (2018). Enabling PV Nigeria, suggests that typical equity contribution in the sector is 30 percent - this is used as a base assumption across market segments.
Potential demand for local currency debt finance	<ul style="list-style-type: none"> Consideration of the optimal split between local and foreign currency financing given costs and revenues for developers. Consideration of the demand for and supply of both foreign and local currency in the market, which will be determined by a range of factors e.g. relative costs. Important to note that: in Nigeria, local developers can't access foreign currency finance, but is more of an option for international developers. 	<ul style="list-style-type: none"> Market feedback and studies on the renewables sector. Figure given for the SHS segment during market feedback referred specifically to local currency finance. Mini-grid developers in Nigeria are currently primarily local developers, so their ability to access FX finance is restricted. A range is presented to account for uncertainty. C&I: BloombergNEF and market feedback implies that import costs are around 80 to 90 percent of capex, so possible that foreign currency financing needs could be significant. Assumption is it can range from 20 to 80 percent.
Indicative split between credit and capital markets	<ul style="list-style-type: none"> Need to take account of the relative cost and availability of the two options and the financing needs of the individual developers. 	<ul style="list-style-type: none"> Based on the feedback from stakeholder consultations the scope for capital market financing options for all three segments is currently very limited. Therefore, it is assumed that there will be no activity in securing capital market debt for the three segments.
Indicative estimate of demand for local currency guarantees	<ul style="list-style-type: none"> Will depend on the cost of the guarantee, level of coverage and the terms upon which the guarantee can be called. The extent to which the guarantee enables the lender to invest when they would have been unable to otherwise is key; as is the extent to which lenders are willing/ able to reduce the interest rates to reflect the value of the guarantee. The amount of resource dedicated to marketing and developing pipeline will be an important factor. Will also depend on the alternative guarantee products and other risk mitigation products available to developers 	<ul style="list-style-type: none"> Based on the market feedback from developers on their potential appetite for using a guarantee and commercial banks level of interest. Low, medium and high uptake scenarios given to offer a range of scenarios, depending on the nature of the segment in question.

Table 5-4:

Illustrative demand for credit guarantees by segment (US\$ local currency equivalent over three to five years)

Market segment		SHS	Mini-Grids	C&I
Potential demand for finance		US\$100m	US\$220m	US\$500m
Proportion of finance in debt vs. equity		Up to US\$70m in debt	Up to US\$154m in debt	Up to US\$280m in debt
Potential demand for local currency finance		Up to US\$70m	US\$70m to US\$154m	US\$55m to US\$225m
Illustrative demand for credit guarantees	Low	US\$3.5m	US\$7.7m	US\$11m
	Medium	US\$10.5m	US\$23.1m	US\$34m
	High	US\$21m	US\$46.2m	US\$67.5m

5.6. Conclusions

5.6.1. Demand for local currency finance

The analysis presented in this diagnostic provides strong evidence that there is considerable unmet demand for local currency finance for renewable energy projects and businesses in Nigeria. There was strong and consistent feedback from stakeholders that the number one constraint that they face is a lack of access to finance in general, and affordable local currency finance in particular.

This unmet demand for local currency debt finance is observed most in the case of smaller projects in the C&I sector. Because of the unaffordability of local currency debt finance, businesses are heavily reliant on equity finance, which has created an opportunity for impact investors. However, there are also opportunities to incorporate local currency finance in mini-grid and SHS.

5.6.2. Supply of finance - commercial banks

The most challenging question is the extent to which there is a sufficient supply of local currency finance to meet the demand. At present the type of opportunities available in the C&I segment are not conducive for investment from local institutional investors. The most natural source of local currency finance for these projects is from the commercial banks. Whilst in theory the banks can lend to projects in the renewables sector, the feedback from developers is that banks have shown very limited interest to date. With a few exceptions, (e.g. Sterling Bank), limited evidence was found that banks have invested any resources in creating specialist teams focused on the renewables sector, nor have they taken any steps to develop products suitable to the sector.

The banks' limited appetite for the renewables sector is ascribed in part to their continued preference for investing in government securities instead of lending to corporates, and the fact that the renewables sector is still quite new and has a limited track-record in Nigeria. There is a gap for a local institution that is willing to take credit risk in the renewables space, particularly at the smaller end of the market.

Alongside limits to the willingness of banks to provide local currency finance, the market diagnostic suggests there are more fundamental issues hindering their ability to do so. The banks face real constraints in their ability to offer tenor and pricing that is of the term required and affordable to most borrowers. This is because of their own cost of funds and the short-term nature of their own deposit bases, which creates liquidity risks. Banks are in general only willing or able to offer rates more than 20% with very short tenors (in some cases only a year). Given the return expectations of developers, local currency financing options on these terms are not viable, as they appear to offer little if any pricing benefit over equity finance. Essentially, because of this, despite high levels of interest in local currency debt financing, the degree of overlap between demand for, and supply of, local currency debt financing, is very limited.

In principle a guarantee provided by a highly creditworthy entity should reduce lender risks through both the ability of the provider to undertake a more informed credit appraisal and to compensate for any lack of collateral. Depending on who is providing the guarantee, regulatory provisioning costs to the lender can also be reduced (that is, reducing the costs of the loan). In return, not only should the lender be more prepared to extend credit and at longer tenors, but also to reduce its pricing to reflect this improved risk profile,

both in terms of the potential for default (due to the credit providers more informed due diligence) and any losses in the event of default (due to the insurance provided by the guarantor), as well as any reduced regulatory provisioning cost benefits.

The feedback received, however, is that any pricing benefit would be marginal at best (one quoted a 100bps benefit). In some cases, the banks informed us that they would be unwilling to offer any pricing benefit at all. This is a feature of many banking markets in SSA where there is an extremely binary credit decision taken; where there is no track record and insufficient collateral the bank will simply not lend, but where lending requirements are met, the institution does not wish to give up much, or even any, of its margin. Essentially, the extent of any credit pricing is extremely limited.

If the cost of a guarantee product offered on a commercial basis is added - which might translate to an additional 2 to 4% on top of the bank's interest rate - the overall costs will become too high for most borrowers operating in the renewables sector.

The most viable way forward for local currency guarantees in Nigeria might be to target support at the existing subsidised funds that are offering interest rates that are viable to developers in the renewables sector to help expand their reach. For instance, the Bol's Solar Energy

Fund, is offering headline interest rates at 9%, but to date partly because of the collateral requirements the solar fund has only provided loans to two developers. The provision of guarantees could help to unlock more of the capital in the fund. In addition to the government's Special Intervention Funds, some commercial banks already have access to subsidised funds e.g. Sunref's investment in Access Bank and UBA, which might also be targeted. However, the issue with this approach is that the size of these subsidised funds is quite limited. The Solar Energy Fund for example is only around US\$16 million.

Both AGF and InfraCredit are already currently in the process of developing interventions to target these funds in order to provide guarantees to the smaller end of the renewable market.

5.6.3. Supply of finance – capital markets

There are also opportunities for local currency guarantees to support increased investment from institutional investors in the renewables space. This could include providing guarantees to support MFIs to raise funds, with the aim of facilitating increased lending to households to purchase solar equipment. There may also be opportunity to work in partnership with infrastructure funds such as NIDF and ARM Pension Fund. This would involve guaranteeing a sub-set of the funds' portfolios in order to help free up their balance sheet to facilitate more investment and/ or enable them to raise additional funds from pension funds.



Chapter 6

Tunisia Country Diagnostic

Figure 6-1:
Tunisia GDP growth rates 2008-18 (constant prices)
Source: IMF. *2018 is an estimated figure.

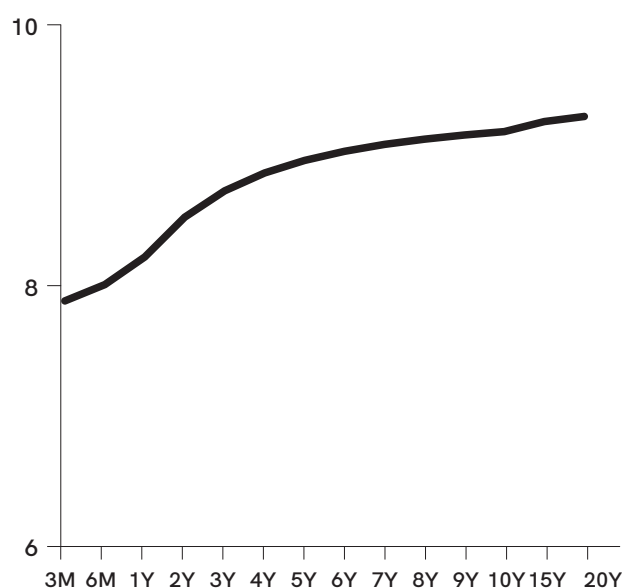
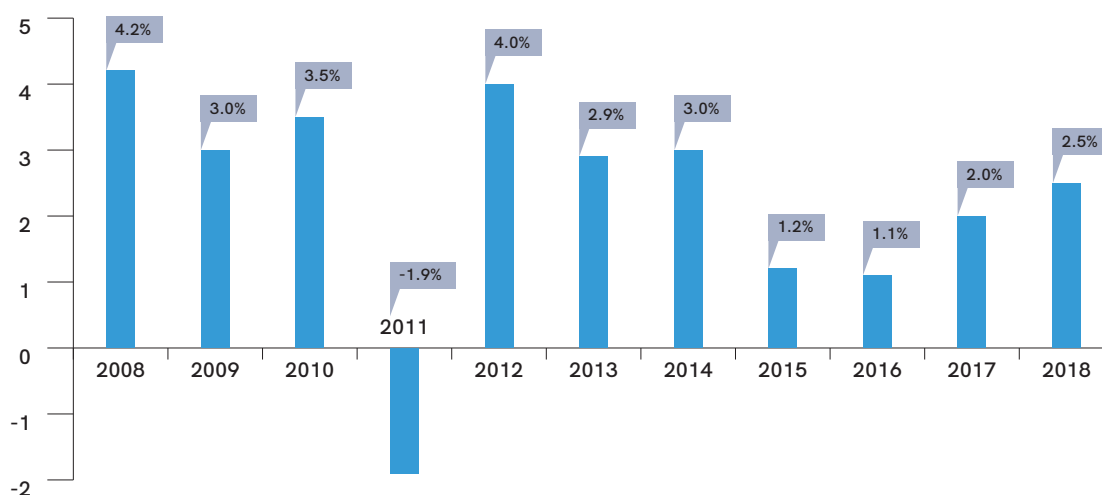


Figure 6-2:
Yield curve on Tunisian government debt (as of October 2019)

6.1. Macroeconomic overview

This section focuses on the key macroeconomic policy issues that could affect the viability of introducing a local currency credit guarantee product in the market: interest rates and foreign exchange.

Considered a lower-middle income country, Tunisia has been pursuing economic liberalisation policies since the 1980s. In more recent times, growth has been low compared to the other countries being studied, averaging at 2% over the ten-year period. Annual GDP growth rates are depicted in the Figure 6-1 below. As this shows, rates have been lowering over the past four years, while in 2011 rates were negative following the political uncertainty created by the Arab Spring

Interest rates

Relative to other countries analysed, yields on Tunisian government bonds are comparatively low, as shown in Figure 6-2 below.

Following from the Arab Spring, a new constitution was adopted in 2014 and the first post-revolution presidential and parliamentary elections took place in 2014. The economy is export oriented. While petroleum has historically accounted for a significant proportion of GDP (approximately 4% of oil rents between 2002 and 2014), in recent years this has declined (1.5% of GDP in 2017), and Tunisia is now a net importer of oil.²⁴⁹ Despite the economic transition and ongoing modest growth, the country continues to struggle with high unemployment estimated to have reached c.15.5% in 2018.²⁵⁰

²⁴⁹ World Bank (2017), World Development Indicators.

²⁵⁰ World Bank (2018). [online] <<https://data.worldbank.org/indicator/SU.UEM.TOTL.ZS?locations=TN>>. Accessed 16 July 2019.

Foreign exchange

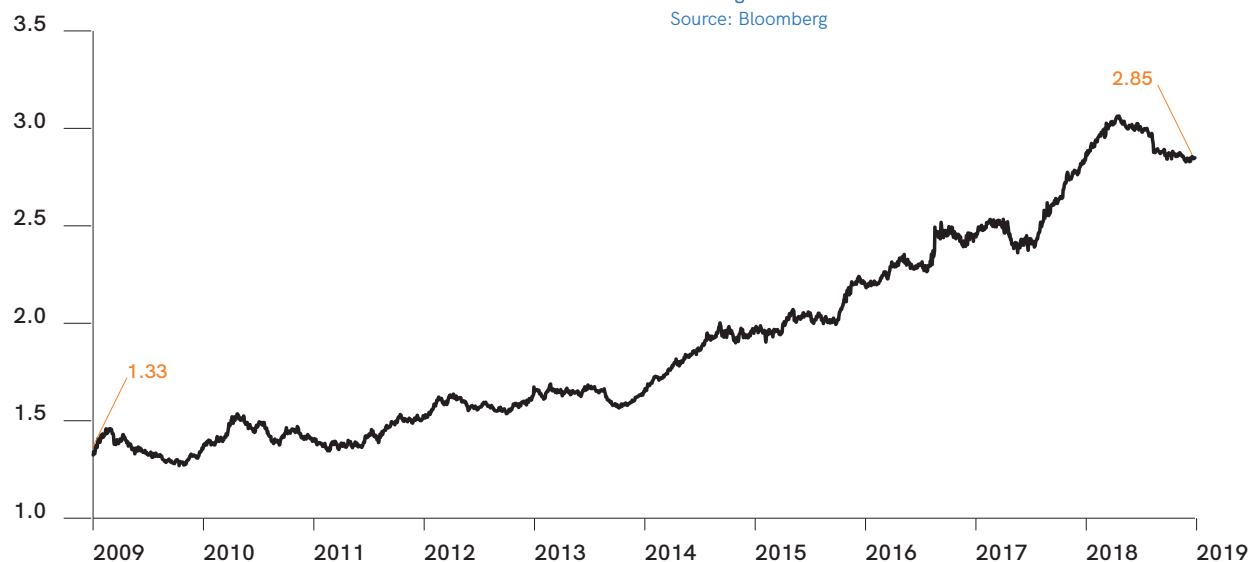
The Tunisian dinar is the country's national currency, pegged to a basket of currencies comprised of Tunisia's key trading partners. It operates as a crawling peg; periodic adjustments are made to the currency within a set band to keep the real effective exchange rate relatively constant. Many observers, including the IMF, regard the dinar as highly overvalued which has had knock-on effects on the current account deficit and foreign reserves. As such, the Central Bank has increased its exchange flexibility and allowed the dinar to depreciate increasingly against the dollar since 2014, as shown in Figure 6-3 below.

The decline in 2018 may be linked mostly to the overall strengthening of the dollar given that economic growth and a range of other indicators were positive in Tunisia during this period.

In 2018, inflation reached its highest level in 30 years at 7.8%, although the Banque Centrale de Tunisie (BCT) has achieved some reductions through two policy rate changes.²⁵¹ The trade deficit reached a record level of 15.5 billion dinars, and foreign exchange reserves fell to just 70 days' worth of imports in August 2019.²⁵² This led to the second downgrade of Tunisia's credit rating by Moody's in just seven months to five levels below investment grade.²⁵³

The dinar is not traded outside Tunisia but is convertible for trade and investment operations. Foreign investors can repatriate funds and assets, although certain transfers are subject to authorisation by the BCT depending on the type of transaction and/ or the percentage of foreign ownership.²⁵⁴ These are transfers often conducted without difficulty but may be subject to long lead times. Some restrictions still limit operations carried out by Tunisian residents. Private companies have indicated that in practice the capital controls are a significant constraint to trade. At face value, the relevant laws seem to allow for easy repatriation of capital. However, in practice the BCT and Customs – the two guardians of the dinar – are expected to maximise possible currency conversion limitations within the regulatory framework. For example, the European Bank for Reconstruction and Development (EBRD) has stated that capital controls and restricted access to hard currency have constrained companies investing in Tunisia, and impacted the internationalisation of Tunisian companies.²⁵⁵

Figure 6-3:
Exchange rate 2009 – 2018 (Tunisian dinar to 1 US dollar)
Source: Bloomberg



251 Reuters (2018) Tunisia's inflation stable at 7.4 pct in November. [online] <<https://af.reuters.com/article/investingNews/idAFK BN1O40Z7-OZABS>> Accessed 4 July 2019

252 MEMO (2018) Experts: Tunisia's foreign exchange reserves are at 'critical' levels. [online] <<https://www.middleeastmonitor.com/20180305-experts-tunisias-foreign-exchange-reserves-are-at-critical-levels/>> 4 July 2019

253 Bloomberg (2018) Tunisia's dinar Must Weaken Further to Boost Economy, IMF Says. [online] <<https://www.bloomberg.com/news/articles/2018-04-04/tunisia-s-dinar-must-weaken-further-to-boost-economy-imf-says>> Accessed 4 July 2019

254 Export.gov (2019) Tunisia – Electrical Power Systems and Renewable Energy. [online] <<https://www.export.gov/apex/article2?id=Tunisia-Electrical-Power-Systems-and-Renewable-Energy>> Accessed 4 July 2019

255 EBRD (2018), Tunisia Country Strategy 2018-2023.

6.2. Power sector overview

Tunisia has followed a utility model, with the Tunisian State-Owned Utility Company (STEG), responsible for a large proportion of electricity generation and holding a monopoly over transmission and distribution.

The entire Tunisian population has had access to electricity since 2016, but the demand for energy has been outstripping domestic supply in recent years. In July 2019, Tunisia consumed 4.25GWh of electricity which was an all-time high.²⁵⁶ The 5% annual growth in power consumption has made Tunisia susceptible to brownouts and required the importation of oil and gas.²⁵⁷ This dependence on imports makes the country vulnerable to international price fluctuations. It also depletes foreign reserves; the energy deficit accounted for a third of the country's trade deficit, with the deficit totalling more than TND19 billion (US\$6.6 billion) in 2018.²⁵⁸

STEG's performance is suffering. In 2017, the energy losses in the electricity network reached 18%.²⁵⁹ High levels of subsidies (i.e. low energy tariffs, which were US\$0.07kWh in 2018) and low bill collection rates (76% in 2016 although increasing to 92% in 2018) have affected commercial performance.²⁶⁰ STEG has been loss-making since 2010, with net losses rising to TND1.8 billion (US\$735 million) in 2017.²⁶¹ On STEG, stakeholders noted that STEG:

- Has about four million customers; reportedly, only about half of them pay their electricity bill;
- Accounts for about a quarter of the total losses of Tunisia's state-owned enterprises; and
- Is owed an approximate TND 1.5 billion (US\$520 million), mainly by the public sector (municipalities).

To rectify the situation, the Ministry of Industry, Energy and Small and Medium-Sized Enterprises is working, with the support of the World Bank, to implement a commercial action plan for STEG to reduce losses, phase out electricity subsidies, increase tariff rates and improve

bill collection, among other measures.^{262,263,264} This is done to both improve financial performance and enhance STEG's credibility as a buyer of electricity, particularly as PPAs are not backed by sovereign guarantees.

Stakeholders have also raised concerns about the market power of STEG. In relation to renewable energy, these concerns include the limitation on project size for the private sector (not applicable to STEG); STEG's ability to exert influence over public policy through its monopoly position; and the absence of an independent regulator for fair arbitrage between STEG and investors.²⁶⁵ The 2015 law and 2016 decree created an authority headed by a judge to rule in renewable energy SPVs and issues related to STEG. Moreover, under the current PPAs, litigations are settled through international arbitration. The designated place of arbitration for PPAs is Geneva using International Chamber of Commerce procedures under Tunisian law. The current regulatory framework acts as a barrier to entry to the electricity sector for private actors.²⁶⁶

Renewable energy sources are considered key to reducing Tunisia's reliance on fossil fuels. The government has supported the deployment of solar PV to residential and C&I customers but is now focused on developing utility-scale solar and wind energy. As of 2016, the total installed capacity of renewable energy was estimated to be 312MW, comprising of 245MW wind, 62MW hydropower and 25MW of solar PV. Collectively, this represents just 6% of total capacity.²⁶⁷ STEG currently operates the bulk of Tunisia's renewable energy, with other actors largely focused on smaller-scale, off-grid generators.

256 Huffington Post (July 2019). Un pic record de consommation d'électricité atteint affirme la STEG. [online] <https://www.huffpostmaghreb.com/entry/un-pic-record-de-consommation-delectricite-atteint-affirme-la-steg-mg_5d25ce68e4b0cfb595fe8229>

257 Export.gov (2019) Tunisia - Electrical Power Systems and Renewable Energy. [online] <<https://www.export.gov/apex/article2?id=Tunisia-Electrical-Power-Systems-and-Renewable-Energy>> Accessed 4 July 2019..

258 allAfrica (2019) TunisiaL Energy Deficit Accounts for 1/3 of Overall Volume of Country's Trade Deficit. [online] <<https://allafrica.com/stories/201901140511.html>> Accessed 4 July 2019

259 World Bank (2019), Energy Sector Improvement Project: Project Appraisal Document.

260 Ibid.

261 Ibid.

262 World Bank (2018) Investment, Competitiveness and Inclusion Development Policy Financing Project, Program Document [Online] <<http://documents.worldbank.org/curated/en/408781530329592442/pdf/PD-Tunisia-ICI-DPF-Board-Package-052518-fin-06052018.pdf>> Accessed 16 January 2019.

263 In terms of bill collection, STEG management has implemented a series of measures, such as disconnecting the public and private companies who do not pay their bills. STEG has also implemented a national programme to raise awareness, educate and introduce payment facilities for late-paying clients before their power is cut. Meanwhile, the government has been reviewing electricity tariffs to allow STEG to gradually apply tariffs that become close to the cost of the service of electricity. The first reform was adopted in 2014, which consisted of a review of the tariff structure and increase in electricity prices, while the government continued to subsidise small consumers. A second revision to the tariffs came into effect in January 2017 with an overall increase of 5% per kWh, which is not applied to small consumers whose consumption does not exceed 100 kWh / month and to small businesses. The latest adjustment in July 2019 was an increase of 10% of electricity tariffs applicable only to high electricity consumers that represent around 6% of STEG customers.

264 World Bank (2019) Tunisia - STEG Energy Sector Improvement Project

265 UNDP (2018) Tunisia: Derisking Renewable Energy Investment 2018.

266 MENA Select (2018) Energy for the Future: Energy pathways for sustainable development in the MENA region.

267 Bureau des statistiques, Ministère de l'Industrie, [online] <https://energypedia.info/wiki/Tunisia_Energy_Situation#cite_note-Bureau_des_statistiques.2C_Minist.C3.A8re_de_l.E2.80.98Industrie.-2> Accessed 16 January 2019

- Two large wind parks currently operate in Tunisia, both owned by the state utility STEG; one in the Bizerte region with a capacity of 190MW has been operational since 2012, while the other in the Sidi Daoud region with a capacity of 55MW operational since 2009.
- The first large-scale solar power plant is a 10MW plant in Tozeur to be operated by STEG and will be supported with a loan of €12.5m from KfW and €1.5m of additional grant financing from the EU Neighbourhood Investment Facility. The total cost of the project is €16m and is expected to be in operation by 2020.²⁶⁸ Local stakeholders noted that there are issues regarding the financial viability of this plant, especially because of the wider, existing financial strain being placed on STEG.
- There are at least three solar PV installations with a capacity greater than 100kW: a 149kWp installation in Sfax, 100kWp in Korba, and a 211kWp installation by Tunisia's water utility.²⁶⁹

Given the high rate of electrification achieved through the utility model, mini-grid systems are not prevalent in Tunisia. Private, small scale installations account for just 0.4% of all energy production (including conventional and renewable sources), a tiny proportion compared to the 81% and 18% that STEG and grid connected IPPs provide.

In 2017, the Ministry of Industry, Energy and Small and Medium-Sized Enterprises launched tenders for 210MW of electricity generation capacity through wind and solar projects. The Council of Ministers then adopted an action plan to further scale up implementation of the Tunisian Solar Plan (TSP), followed by a call for proposals from the Ministry of Industry, Energy and Small and Medium-Sized Enterprises in May 2018 for 1,000MW of renewable energy capacity. This consists of 500MW for five solar projects, 300MW for two wind projects, and an additional 200MW of wind with locations to be proposed by developers. The winning bidders will be awarded long-term PPAs with STEG as the off taker.

6.2.1. Overview of the renewable energy market

The Tunisian government is supportive of a range of renewable energy options to combat the foreign reserve issues arising from growing demand and the dependence on oil and gas imports. Subsidies have been and continue to be provided through several renewable energy and energy efficiency programmes.

Electricity production in Tunisia was first liberalised in 1996 under law-96-27. In 2015, the Renewable Energy Law for Electricity Production was passed, enabling renewable electricity production by private actors for both own consumption and for sale to STEG, subject to a maximum of 30%.

Tunisia provides tax breaks for products that contribute to energy efficiency, namely:²⁷⁰

- VAT exemption on locally purchased raw materials, semi-finished goods and equipment; and
- VAT suspension and payment of customs duties at the minimum rate of 10% for imported goods and equipment that have no locally manufactured equivalent.

Renewable energy currently represents only about 10% of Tunisia's total primary energy supply. Investing in renewable energy will help Tunisia meet its green targets, international climate commitments, and the increasing demand for electricity, while reducing the country's dependence on imported fossil fuels. A reduction in fossil fuel imports can help reduce the trade deficit and free up government funds presently spent on fuel subsidies.

In 2015, Tunisia submitted its intended Nationally Determined Contribution (NDC) to the UNFCCC, which includes the following objectives:²⁷¹

- A 41% reduction in carbon intensity by 2030 compared to 2010 levels. 13% of this is unconditional, while 28% can be achieved with support from international financing, capacity building, and technology transfer.
- Specific sector targets, including reducing carbon intensity in the energy sector by 46% through energy efficiency and the adoption of renewable energies. The energy sector is the focus of the NDC, requiring 85% of the required funding to be mobilised.

The TSP aims at increasing the share of renewable energy of total electricity generation to 30% by 2030, totalling 3,815MW. This includes 1,755MW of wind, 1,610MW of solar photovoltaic (PV) and 450MW for concentrated solar power (CSP). Two-thirds of the renewable energy capacity is to be developed through the private sector. The additional renewable energy capacity will be implemented in two phases, with 1GW of installed capacity by 2020 and an additional 1.25GW during the 2021-25 period.²⁷²

268 IJ Global, Tozeur I PV Power Plant (2018) [online] <<https://ijglobal.com/data/transaction/41654/tozeur-i-pv-solar-plant-10mw>> Accessed 16 January 2019.

269 Energypedia (n.d.) Tunisia Energy Situation. [online] <https://energypedia.info/wiki/Tunisia_Energy_Situation> Accessed 4 July 2019.

270 GIZ (2012) Renewable Energy and Energy Efficiency in Tunisia. [online] <https://energypedia.info/images/8/85/EN_Renewable_energy_and_energy_efficiency_in_Tunisia_GIZ_2012.pdf> Accessed 16 January 2019

271 IISD (2015) Tunisia Submits NDC. [online] <<http://sdg.iisd.org/news/tunisia-submits-indc/>> Accessed 4 July 2019

272 World Bank (2018) Investment, Competitiveness and Inclusion Development Policy Financing Project, Programme/Program Document [Online] <<http://documents.worldbank.org/curated/en/408781530329592442/pdf/PD-Tunisia-ICI-DPF-Board-Package-052518-fin-06052018.pdf>> Accessed 16 January 2019

To support the development and implementation of the TSP, the Government has adopted several regulations. The Renewable Energy Law of 2015 sets out the legislative framework for the promotion of renewable energy. The Government has also taken measures to improve the regulatory and institutional framework, such as making the model PPA more bankable and simplifying procedures for approving projects.²⁷³ The EU is providing support towards establishing an independent regulatory authority for the renewables sector.

The achievement of Tunisia's sustainable energy goals will require significant involvement of the private sector, with local financial institutions as important intermediaries. Tunisia's Renewable Energy Law of 2015 envisages three different 'regimes' for renewable energy projects that are implemented by the private sector:

- Concession regime – for large projects selling their output to STEG based on a PPA;
- Authorisation regime – for small and medium-sized projects, also selling their output to STEG based on a PPA; and
- Self-generation regime – where there is a direct industry end-user (captive generation), allowing for sales of excess power to STEG.

The law in this form only permits sales to STEG²⁷⁴ (i.e. sales to third parties are not allowed). There are no explicit government guarantees for the payment obligations of the national power off-taker (STEG). Given the current installed capacity and pipeline, TSP targets are unlikely to be met. However, the government has been actively tendering renewable energy projects.

Self-generation regime

The cost of electricity supply via the national grid has substantially increased in recent months, making industrial companies keen to consider auto-generation/solar PV options. Due to STEG's tight pricing policy for buying power, off-grid investments in renewable energy are generally more profitable, with shorter pay-back periods, than on-grid investments.

The self-generation scheme allows individual production of electricity from renewable energy for self-consumption, which could be for a public or private organisation, operating in industry, agriculture or tertiary sectors. The producer has the right to transport the electricity through the national power grid to its consumption points²⁷⁵, and the right to sell the surplus exclusively to STEG within the limits of a maximum amount (i.e. up to 30% of the energy produced), under a standard contract as approved by the Ministry of Industry, Energy and Small and Medium-Sized Enterprises.

The recent progressive increases of electricity prices by STEG (57% for medium and high voltage customers since 2010), which are expected to continue, have boosted the viability of the C&I self-generation sector. STEG's tariff for medium voltage electricity was increased by 12% in 2018, up from previous annual increases of about 8%.²⁷⁶ Investments in this segment now feature payback periods in the range of six to seven years, due to the growing gap between STEG tariffs and auto-production PV electricity costs.²⁷⁷

However, the low electricity tariff paid by STEG to independent producers with PV electricity to sell, does not allow sufficient returns, requiring pay-back periods generally exceeding twelve years.²⁷⁸ In view of this, the main incentive for a company to install own PV generation facilities is the considerable cost saving that can be achieved by avoiding the purchase of power from the STEG grid. To companies that export, in particular, the avoidance of brownouts and the subsequent impact it has on their production is another key reason to consider self-generation.

In an attempt to open the market for decentralised renewable energy, the government has promulgated in May 2019 the cross-cutting law 2019-47 for improving business climate. The recent 2020-105 decree provides guidance on how IPP projects for self-consumption purposes can be structured. For example, it allows financial investors to participate in a company that sells electricity to its shareholders.

273 World Bank (2018) Investment, Competitiveness and Inclusion Development Policy Financing Project, Programme Document [Online] <<http://documents.worldbank.org/curated/en/408781530329592442/pdf/PD-Tunisia-ICI-DPF-Board-Package-052518-fin-06052018.pdf>> Accessed 16 January 2019

274 Except perhaps for the "Export Regime" where the operational aspects are still unclear. The IPP might export directly or via STEG.

275 Private generators are allowed to distribute energy only to consumption points within the same company,; for such cases STEG charges a transport fee.

276 For consumption below 100 kWh/month, non-residential customers are charged TND0.10 (US\$0.036)/kWh, while above the price range is TND0.199-TND0.391 (US\$0.069-US\$0.14)/kWh, depending on usage (with higher prices being charged for consumption above 500kWh/month).

277 As tariffs increase, and the cost of PV drops the payback period for investments in autogeneration decreases and it becomes more attractive.

278 The payback periods are based on consultations with stakeholders.

6.3. Demand for finance

6.3.1. SHS

Market size and recent activity

The solar programme PROSOL (2005 – 2015) supported the distribution of residential solar water heaters. This was a joint initiative by the National Agency for Energy Management (ANME), STEG, the United Nations Environment Programme (UNEP) and the Italian Ministry for the Environment, Land and Sea (MEIT). Customers paid a 10% deposit for the system and received a 30% subsidy, with the remainder of the cost paid off through electricity bills to STEG over five years. STEG assumed default risks and would withhold services in the event of non-payment. Banks were willing to provide financing totalling TND210 (US\$71 million), and at lower interest rates (e.g. 5 to 6 percentage points below 12 to 13% average rates at the programme start), due to the decreased risk of non-payment. The subsidy was provided by MEIT. The programme is considered a success with over 270,000 systems installed.²⁷⁹

This was followed by PROSOL Elec (2010 – 2016). The PROSOL Elec programme²⁸⁰ offers financial incentives to residential customers of STEG, who intend to invest in PV solar installations to help meet their electrical energy needs.²⁸¹ The incentives consist of:

- A subsidy from the National Fund for Energy Conservation (FNME)²⁸², representing 30% of the cost of the investment of the PV installation, capped at TND3,000 per kWp;
- An additional subsidy of 10% of the cost of the investment granted by the Italian MEIT through the Mediterranean Renewable Energy Centre.
- A five-year credit of up to TND3,000 per kWp, provided by Attijari Bank and repayable via the electricity bill from STEG; and
- A reduction of the interest rate on the loan, equivalent to a grant of 5% of the investment cost, paid by MEIT.

The objective of the project is to support 1,000 solar buildings (roof top installations) with a total PV capacity of 1,500 kW.

Eligible beneficiaries are any residential client that meets the following conditions:

- Be the owner of the premises where the PV equipment will be installed, with sufficient surface area available for the installation.
- Have a low voltage electricity subscription from STEG; and
- Have an annual electrical energy consumption of at least 1,800 kWh for 1 kW solar installations, or an annual consumption of at least 3,600 kWh for 2kW installations.

The subsidies are funded by the Energy Transformation Fund (see below).

Thirty-two megawatts had been installed by September 2016. Subsidies of up to 50% were provided to increase uptake. Both PROSOL programmes are intended to continue until 2030.²⁸³

Customers bought these systems to reduce their long-term energy bills. The systems are paid off through bills to STEG, which acts as a loan guarantor for the banks. In theory, a credit guarantee could be used to protect STEG from customer default, but this would increase the cost to consumers, which may not be desirable given that the roll out of these systems is heavily subsidised and promoted by the government as part of their energy strategy.

Demand for local currency finance

The government's PROSOL programme has provided considerable amounts of subsidy to households to support solar installation, while it has also been possible for consumers to make other repayments through their STEG bills as opposed to having to undertake separate repayment arrangements. Since the programme is expected to continue until 2030, there is unlikely to be a significant demand for local currency consumer finance in this area.²⁸⁴

That said, companies supplying the various programmes in the country could benefit from both working capital and term finance to support their operations, but at present are limited by the amount of financing they can access because of liquidity constraints in the banking sector, which has reduced the appetite of banks to lend. Interest rate caps have also been put in place for decades in Tunisia, which creates challenges for companies when looking to obtain finance, especially SMEs. The current

²⁷⁹ Innovation for Sustainable Development Network (2019) PROSOL: Financing Solar Water Heating in Tunisia. [online] <<http://new.inno4sd.net/prosol-financing-solar-water-heating-in-tunisia-454>>.

²⁸⁰ STEG (n.d.) Procédure d'Acquisition. [online] <http://www.steg.com.tn/fr/prosol_elec/presentation.html> Accessed 4 July 2019.

²⁸¹ The Prosol Elec programme operations manual can be found here: https://www.steg.com.tn/dwl/prosol/Manuel_de_procedures_IPV_Ver1.1_Nov_2015_p.pdf

²⁸² To be replaced by the FTE Fund.

²⁸³ RES4MED (2016) Country Profile: Tunisia.

²⁸⁴ Consumer finance in Tunisia is exclusively in dinars. Individuals are not normally able to borrow in hard currency for purchases of consumer goods.

interest rate cap (*taux d'intérêt excessifs*) is set at 1.2 times the average lending rate observed in the previous half-year for individuals and SMEs (there are different caps for different credit categories; the caps are set for fixed six-months periods).

6.3.2. Captive C&I

Market size and recent activity

Under law no. 2015-12, any entity that is active in the industrial sector (local government, public or private institution) may generate electricity for self-consumption and sell its generation surpluses (capped at 30% of production) to STEG in compliance with a pre-defined purchase agreement.²⁸⁵ Renewable electricity producers cover the cost of connection to the grid.²⁸⁶ In low voltage, capacities in the commercial sector are between ten and 30kW. In medium voltage, capacities in the commercial sector range between 25 and 100kW. Also, the 2019 competition law (see section 6.2.1) is expected to have positive effects on the business climate.

The government has three subsidy programmes available to C&I users: the *Bâtiment Solaire* programme with a subsidy of 30% of investment costs, and two types of self-generation mechanisms, one for installations connected to the low voltage grid and the other to the medium/high voltage grid, both receiving a 20% subsidy of investment costs.²⁸⁷ Customers are required to pay the cost to the installer up front and use conventional methods of financing if required.²⁸⁸ Suppliers therefore face limited FX risk for any imported parts. Some C&I companies face challenges in obtaining finance for self-generation; the June 2019 business climate law attempts to improve companies' ability to raise finance by allowing self-generators to create an SPV under the build-own-operate system.

Solar installations are becoming more attractive to C&I customers given the brownouts²⁸⁹ and expected reduction in tariff subsidies (with all subsidies expected to be eliminated by 2022). There are a few Tunisian solar PV providers that have installed systems for C&I customers (e.g. SaterSolar, Volta PV, Shams Energy Access, Sunway).

GAMCO Energy has installed solar PV for commercial properties listed in Table 6-1 below. Details regarding installations are limited, but they seem to range from fish farms, to technology companies and guest houses.²⁹⁰

Table 6-1:

Commercial installations by GAMCO Energy (2019)

Source: GAMCO Energy website.

Client	Peak power	Address
Othmen Bouzid	99.96 kWp	Korba, Nabeul
Anouar Company	39.78 kWp	Hammamet
Ali Meftah	24.18 kWp	Cité Manar Kairouan
Société Nour	18.46 kWp	Hammamet
STE FLEXCON	17.76 kWp	Nabeul, Dar Chaabane El Fehri
Société S.C.C.BAT	15.08 kWp	Baraket Essahel
STE AquaSpir Spiruline du cap bon	4.16 kWp	La Rtiba Takelsa, Nabeul
Ayed Mounira	2.6 kWp	Nabeul

In 2015, the German Solar Industry conducted case studies on solar thermal opportunities in the industrial and tertiary sectors in Tunisia. In the latter, they found the biggest opportunities to be in hotels, hospitals, covered pools and public buildings. In the former, they focused on textiles, brick factories and agribusiness.²⁹¹ Cement companies have also been noted as potential targets for self-generation because of their high energy consumption.

The largest C&I customer for onsite solar in Tunisia was found to be the manufacturing sector, followed by public buildings and offices.²⁹² Tunisia has the sixth largest manufacturing sector on the continent and therefore may have significant potential for the installation of solar PV systems. This is further reinforced by the experience of MorSEFF - the EBRD

285 RES4MED (2018) Tunisian case study: Mechanisms and main factors of a RES auction.

286 IEA (2009) Decrees on rules of selling renewable electricity to the Tunisian Company of Electricity and Gas (STEG). [online] <<https://www.iea.org/policiesandmeasures/pams/tunisia/name-36492-en.php>> Accessed 4 July 2019.

287 GIZ, BSW (2014) Enabling PV in the MENA Region: The emerging PV market in Tunisia.

288 C&I companies are eligible for the 20% FTE subsidy of the investment cost, if they fall under the classification 'industrial, service, or agricultural companies that are registered with a tax code'.

289 According to the World Bank's Doing Business indicators for 2019, Tunisia reported a SAIDI (measuring duration of outages) of 3.4 hours and a SAIFI (frequency of outages) of 2.5 times a year. World Bank (2019) Doing Business Indicators [online] <https://www.doingbusiness.org/en/data/exploreconomies/tunisia#DB_ge>. Accessed 31st July 2019.

290 Sotuver, a glass company is an example of a manufacturer that undertook a self-generation project described here: https://www.ilboursa.com/marches/sotuver-aurait-realise-un-benefice-net-de-7-5-millions-de-dinars-en-2016_11093.

291 BSW, GIZ, ANME (2016) Opportunities for solar thermal systems in the tertiary and industrial sectors in Tunisia.

292 BloombergNEF (2019) Solar for Businesses in Sub-Saharan Africa.

energy efficiency programme in Morocco – where demand for the programme is driven by manufacturers followed by energy intensive local industries like brick makers.

Peak electricity demand increased at around 5% per year between 2010 and 2019 despite the weaker economic growth.²⁹³ The country has been addressing the demand increase mainly through additional natural gas fuelled generation units.²⁹⁴ As a result, overall dependency on energy imports increased significantly and the country's energy security reduced, making Tunisia very vulnerable to supply interruptions.²⁹⁵ This may increase the attractiveness of solar PV. Additionally, the Tunisian government intends to continue to raise energy tariffs to improve the commercial performance of STEG. By installing solar systems, C&I customers can fix their energy tariff and hedge against uncertain future energy prices. These systems are made even more attractive by government subsidies and STEG purchase agreements, allowing C&I customers to generate income from unused energy (although the latter is likely to be marginal). Companies which have undergone mandatory energy audits may also use solar PV to meet suggested targets.

The market potential for self-generation in the C&I space remains positive, with notable opportunities for companies operating in the pharmaceutical, food, plastic, and waste treatment sectors companies in the pharmaceutical, food, plastic, and waste treatment sectors.²⁹⁶

Demand for local currency finance

The benefits to C&I customers of installing solar PV for their energy needs are increasing due to a combination of brownouts, anticipated tariff rises, government subsidies and regulatory frameworks to support the sale of additional electricity to STEG.

The available information on current C&I installations indicates sole use by the installer. Without off-taker agreements, there is no scope for a guarantee to cover payment stream risk for C&I generators.

It was not immediately possible to find evidence of finance providers for solar installations in Tunisia. Based on supplier websites and further research, it seems that systems are paid for up front by the customer, in which case credit guarantees could be useful for customers that require bank loans to

finance their systems. SMEs in Tunisia have problems obtaining finance due to high collateral requirements and complex procedures. For example, during consultations some companies looking to raise finance noted instances where banks were asking for collateral corresponding to almost five times the value of loans, while processing times for loan can be very long and cumbersome. The provision of guarantees alleviates the credit risk to financial institutions and may incentivise them to offer loans to customers to support renewable energy or energy efficiency projects. Likely, this would also require technical assistance to ensure banks were able to effectively conduct due diligence.

6.4. Supply of finance

6.4.1. Commercial banks

Tunisia hosts 30 banks, of which 23 are onshore and seven are offshore. Onshore banks include three Islamic banks, two microcredit and SME financing banks, and 18 commercial universal banks. Among the largest banks are the three state-owned banks, which include *Société Tunisienne de Banque*, Banque National Agricole, and Banque de l'Habitat, collectively representing 40% of banking sector assets and 34% of banking sector deposits.²⁹⁷ The largest private sector banks include *Banque Internationale Arabe de Tunisie* (TND13.5 billion or US\$4.7 billion of assets in 2017), Amen Bank (TND8.6 billion or US\$3 billion in assets) and Attijari Bank (TND7.8 billion or US\$2.7 billion in assets).²⁹⁸ Banks offer essentially identical services targeting the same segment of Tunisia's larger corporations. SMEs and individuals often have difficulty accessing bank finance due to high collateral requirements, but they remain the country's primary lending market.

In 2017 the AfDB reported the collective assets of the banking sector at 115% of GDP, which equates to approximately US\$46.3 billion.²⁹⁹ The market is highly fragmented and dominated by a relatively small number of large private sector banks and state-owned banks. According to the BCT banking supervision report, nonperforming loans were at 15.6% in 2016, mostly in the industrial (27.6%) and tourism (19.1%) sectors.³⁰⁰ As of March 2018, IMF Article IV cites "roughly 15%" NPLs still ongoing with only 65% provisioning. Tunisia also has the highest collateral to loan value in the MENA region.³⁰¹

293 World Bank (2019) – Tunisia STEG Energy Sector Improvement Project Appraisal Report

294 Ibid.

295 Ibid.

296 Lixcap market research

297 Export.gov (2019), Tunisia – Banking Systems. [online] <<https://www.export.gov/article?id=Tunisia-Banking-Systems>> Accessed 31st July 2019.

298 A full list of banks and details of their assets and liabilities can be found at: <https://www.apbt.org.tn/wp-content/uploads/2019/02/Rapport-annuel-APTBEF-2017.pdf>

299 AfDB (n.d.) Tunisia Country Strategy Paper 2017 – 2021

300 Central Bank of Tunisia (2017) Annual Report on Banking Supervision

301 AfDB (n.d.) Tunisia Country Strategy Paper 2017 – 2021

The authorities have strengthened the banking system in recent years, with the recapitalisation of three big state banks, legislation to guarantee central bank independence and a law to improve bank governance (Law n°2016_48).³⁰² However, the sector remains fragile, due to the country's weak economy and the legal obstacles to public banks selling, restructuring or liquidating collateral; NPLs stood at 15% in September 2017 (i.e. only a marginal improvement over 2016).³⁰³

The banking sector faces several liquidity challenges, and there is a lack of confidence in the banks among the general public. The large informal cash-based sector in Tunisia reduces the volume of deposits and, as a result, banks' liquidity (causing the banks to run high loan-to-deposit ratios). New banking regulation has been introduced which requires banks to contribute to a newly created guarantee fund - article 149 of the law 2016-41 (the bank law). As of 2018 banks contribute to 0.3% of their deposits and must comply with the new definition for capital adequacy related to solvency, risk division and concentration (circular 2018-06 of BCT). Banks must have a loan to deposit ratio of 120% maximum (circular 2018-10). The purpose of the BCT is to manage inflation. The Ministry of Finance is also getting tougher on banks; banks and financial institutions have additional budgets constraints including: they have to pay a tax of 4 to 5% on their profit to the state (budget law of 2018, article 52) and 1% of their profits to the social security funds (article 53 of the budget law of 2018).

The financial sector regulation puts a cap on interest rates on overdrafts, term loans and leasing products, which can impede adequate risk pricing and may hinder economic growth.³⁰⁴ The current interest rate cap (excessive interest rates) is set at 1.2 times the average lending rate observed in the previous half-year for individuals and SMEs (there are different caps for different credit categories; the caps are set for fixed six-months periods). There are ongoing discussions about raising it to 1.33 for SMEs.³⁰⁵

To date, renewable and energy efficiency projects have mainly been paid upfront and with various forms of

subsidy support. In the limited cases where projects have looked to obtain commercial finance, this has come with often exceedingly stringent collateralisation requirements, with some stakeholders noting collateral requirements of five times the value of loans.³⁰⁶ Banks tend to apply 'name lending'. Attijari bank states that it differs from other banks in this respect, as it looks at the borrowers' fundamentals and business plan to make a proper credit assessment. Attijari Bank also points out that it is so far the only Tunisian bank that has set up a specialised unit for credit evaluation of renewable and energy efficiency projects. Most local banks do not yet have the capacity to evaluate the risk profile of renewable energy projects. Some lack liquidity, and given their collective small size, are ill-equipped to provide finance to multiple large infrastructure projects.³⁰⁷

The BCT only partially applies Basel II regulation.³⁰⁸

Because of this, Tunisian banks do not fully apply a risk-weighted capital approach yet, which means that the potential benefit of a guarantee with high credit worthiness, in terms of allowing the banks to set aside less capital for provisioning, thus increasing the return on their capital, is not likely to be fully recognised. Otherwise, this would be an argument for the lending bank to reduce its margin, in recognition of the risk-weight reduction made possible by the guarantee, thereby (partly) neutralizing the cost of the guarantee fee.³⁰⁹

The high inflation rates, record trade deficits and the attendant volatility of the dinar make for high currency risks in projects that have revenues in local currency and liabilities in hard currency. Tunisian banks have access to a government-backed 'FX balancing fund' (*fonds de paréquation de change*), managed by TunisRe, to hedge FX currency risk. The government introduced this facility due to the lack of market mechanisms for hedging FX risk. The cost of this insurance was reported in 2015 to be 4% , which was below the price that any commercially run entity could offer (and led to losses for the FX balancing fund).³¹⁰ As a result of the dinar depreciation, the fund had to stop issuing hedges for a short period. It was recently reactivated and provides FX hedges at a minimum cost of 650bps (significantly higher than previously), which stakeholders have indicated is too high to be taken up by banks.³¹¹

302 Economist Intelligence Unit: Tunisia – Risk Assessment (Overview): Banking sector risk.

303 World Bank (2018) Investment, Competitiveness and Inclusion Development Policy Financing Project, Program Document [Online] <http://documents.worldbank.org/curated/en/408781530329592442/pdf/PD-Tunisia-ICI-DPF-Board-Package-052518-fin-06052018.pdf> Accessed 16 January 2019

304 AfDB Country Strategy Paper 2017 – 2021, p. 25.

305 IMF (2018), Tunisia - Third Review Under the Extended Fund Facility, and Request for Waiver of Applicability and Modification of Performance Criteria.

306 This is due in part to interest rate caps which don't allow for risk reflective pricing.

307 World Bank (2018) Investment, Competitiveness and Inclusion Development Policy Financing Project, Program Document [Online] <http://documents.worldbank.org/curated/en/408781530329592442/pdf/PD-Tunisia-ICI-DPF-Board-Package-052518-fin-06052018.pdf> Accessed 16 January 2019

308 Tunisia is currently not a member of the Basel Committee on Banking Supervision.

309 The cost of the guarantee fee is ordinarily passed on to the borrower via the interest rate on the loan.

310 EIB (2015) Tunisia: Neighbourhood SME financing. Page 23

311 EBRD consultation and <https://www.realites.com.tn/2018/12/vers-la-refonte-de-la-reglementation-de-changes/>

Desk-based research and consultations have highlighted that there is a gap in the availability of long-term credit, and the SME sector is underserved also with short- and medium-term credit. Young and innovative SMEs especially have problems in accessing external financing sources even if their business model is sound, due to a lack of available (in particular real estate) collateral.³¹²

6.4.2. Leasing companies

The leasing sector in Tunisia is well-developed compared to other markets considered during this work, but there is scope for increasing its product range, and the leasing companies need improved access to long term external funding.³¹³

This is particularly an issue for leasing companies not affiliated with a commercial bank.

Leasing products are becoming increasingly important for Tunisian MSMEs to finance renewable energy and energy efficiency-related investments in new, or upgrading of existing, equipment and machinery. Leasing is attractive to MSMEs that do not have a long credit history or lack collateral to obtain a bank loan.³¹⁴

Leasing companies can be more flexible than banks with regards to collateral, and they generally have shorter processing times than banks. However, the leasing companies in Tunisia have a liquidity problem, and are squeezed by the cap on interest rates imposed by the government. They also have structurally high funding costs, particularly independent companies not affiliated with banks. Recent (2019) bond issuances by leasing companies have had interest rates of 10% to 11.5%.³¹⁵ Leasing companies are lobbying the government to access a monetary market window for central bank refinancing, but it is unlikely they will gain access to that in the short term. Another important obstacle for leasing finance is the absence in Tunisia of a secondary market for PV equipment, which would allow leasing operators to recover their receivables by the resale of equipment in the case of non-payment by clients. This is due to current regulation which requires PV companies to install only new equipment in order to carry out PV projects, obtain subsidies, and connect to the grid. This impedes the development of a secondary market for PV equipment.³¹⁶

This may be resolved by the June 2019 change to the law which allows for the set-up of an SPV under the self-generation regime.

The Green for Growth Fund provided a €6m loan to Attijari Leasing to fund its offer of leasing finance to Tunisian MSMEs. The purpose is to support energy efficiency measures such as replacing existing vehicles with more fuel-efficient alternatives. The leasing products can also be used by client MSMEs to finance the installation of energy efficient processing equipment and machinery.³¹⁷

6.4.3 Intermediary funders

Intermediary funders refer to institutions providing finance, sourced from financing institutions, DFIs, donors and impact investors, which they on-lend to companies working across the sectors of interest.

The Green for Growth Fund was created by the EIB and KfW in 2009 to promote energy efficiency around the MENA region by broadening the finance base through loans to financial institutions and investments in non-financial institutions. In early 2019, the Green for Growth Fund provided Attijari Leasing with a US\$7 million loan to on-lend to MSMEs for energy efficient equipment, machinery, and vehicles. Attijari is the fifth largest leasing company in Tunisia, able to serve rural areas of the country through the branches of its parent, Attijari Bank.³¹⁸

6.4.4. Capital markets and institutional investment

Mutual funds

The *Bourse des Valeurs Mobilières de Tunis*, the Tunisian stock exchange, was established in 1969 and includes over 80 listed companies trading stocks, bonds, and funds. As of the first quarter of 2019, total market capitalisation was TND23 trillion (US\$8 billion).³¹⁹

PwC found Tunisia's asset management industry to be "nascent" in 2014, with the financial sector mostly dominated by banks. The market is continuing to recover

312 Ibid. p. 24.

313 EIB (2015) Tunisia: Neighbourhood SME financing. Page 24.

314 Ibid. p. 20.

315 An example of an issue includes Attijari Leasing's issue of a TND20 million (US\$7 million), 5-year bond in March 2019 at a fixed coupon rate of 11%. Category B of the bond issue offers, as alternative to the fixed rate of the Category A notes, a variable rate of the Tunisian interbank rate TMM + 2,75%.

316 GIZ, ANME (2018) Garanties et Refinancement dans le Cadre du Financement des Projets Photovoltaïques par le Leasing en Tunisie. The study recommends that a certification scheme for second-hand PV equipment be set up, which would allow PV projects to make use of second-hand equipment, as certified by a body approved by the State.

317 Green for Growth Fund (2019) Press Release: GGF Partners with Attijari Leasing to Promote Energy Efficiency in Tunisian MSME Sector. [online] <https://www.ggf.lu/pressnews/detail/ggf-partners-with-attijari-leasing-to-promote-energy-efficiency-in-tunisian-msme-sector-invests-eur/> Accessed 4 July 2019

318 Green for Growth Fund (2019) GGF Partners with Attijari Leasing to Promote Energy Efficiency in Tunisian MSME Sector, Investor EUR 6 Million. [online] <https://www.ggf.lu/pressnews/detail/ggf-partners-with-attijari-leasing-to-promote-energy-efficiency-in-tunisian-msme-sector-invests-eur/> Accessed 3 May 2019

319 Kapitalis (2019) La Bourse de Tunis enregistre une perte de 5.64% au 1er trimestre 2019. [online] <http://kapitalis.com/tunisie/2019/04/02/la-bourse-de-tunis-enregistre-une-perte-de-564-au-1er-trimestre-2019/> Accessed 4 July 2019

from the Arab Spring, with transactions increasing from 30,000 in 2013 to 40,000 in 2014. There is a good level of sector diversity among the 81 listed companies, although the majority belong to the financial sector.

As of 2014, there were 27 active Tunisian fund managers of listed mutual funds, most of which were banks. Foreign funds are not allowed to be marketed in Tunisia and individuals are not allowed to access hard currency without government authorisation.³²⁰

Total AUM of these mutual funds are estimated to be US\$2.5 billion. Most investments by mutual funds were in government bonds (40.8%), especially treasury bonds, and corporate bonds (29.4%), with only 6.6% of investments allocated to equities.³²¹ To date, it appears that such funds have not invested directly in renewable energy.

Pension funds

Tunisia's pension and social security system is handled by three national funds.³²²

- The National Pension and Welfare Fund (*Caisse Nationale de Retraite et de Prévoyance Sociale*), which manages pensions, disability and death benefits for public sector employees.
- The National Social Security System (*Caisse Nationale de Sécurité Sociale*), which manages pensions, disability and death benefits for private sector employees.
- The National Health Insurance Fund (*Caisse Nationale d'Assurance Maladie*), which manages the health insurance system, work accidents and occupational diseases.

These national funds exist alongside private life insurance and pension arrangements for retirement savers that are marketed by banks and insurance companies.

There were at the time of the market sounding no specialised asset managers operating in Tunisia that invest a pool of collective pension contributions in securities; *Caisse des Dépôts et Consignations* (CDC) is the closest equivalent to a fund manager in this respect, in that they are the government's asset manager. There is, however, a limited number of private life insurance and pension schemes for individuals.

Insurance funds

The insurance market in Tunisia is relatively under-developed, with most insurers being state-owned and the sector dominated by non-life insurers. Only local insurance companies are currently allowed to operate in Tunisia. As of 2014, total AUM for the insurance industry was estimated at US\$2 billion.

Life insurance products are mostly sold by insurance companies, but banks now also offer such products to promote the sector.³²³

It is the fastest expanding insurance line, with a total of 18 companies, including five dedicated life insurers. The top-four firms in the segment by premiums were all dedicated life insurance providers: Attijari Assurances at 15.8%; Maghreb Vie; Hayett; and Carte Vie.³²⁴

According to the most recent information from the sector regulator General Insurance Committee (*Comité Générale des Assurances*), in 2015, 51.4% of total funds invested by the insurance industry were in government bonds and treasuries. The remainder of investments were divided as follows, with 22% in shares, 17% in the money market or bank deposits, 5.9% in real estate and 3.7% in other assets. Insurers are attracted to the relatively high interest rates and limited risk exposure of government bonds and treasuries, compared to the more volatile stock market.³²⁵ The current investment strategy of an insurance company interviewed is to only make short term placements, as interest rates are constantly on the rise. For example, a three-month investment in a government bond (*bon du trésor*) would yield 7.8% as of early July 2019, with five-year bonds yielding 8.5%. As such, long term corporate bonds currently fall outside the placement strategy.

Bond markets

According to the African Bond Market Development Index 2017, Tunisia was ranked eleventh on the continent, behind Nigeria, Kenya and Ghana but ahead of Tanzania, Zambia and Côte d'Ivoire. Tunisia's bond market has a growing and diversified investor base with marginal presence of foreign investors. Financial institutions are the most active among non-government issuers. Although secondary market activity has increased in recent years, the market remains limited and illiquid³²⁶.

320 There are however many offshore funds that are making investments in Tunisia including in SMEs.

321 PwC (2017), Pension Funds and Private Equity: Unlocking Africa's Potential [online] <http://www.amafrica2020.com/amafrica2020/docs/am-africa-2020.pdf> > [Accessed 16 January 2019]

322 In 2018 the IMF raised concerns around the financials of Tunisian pension funds.

323 PwC (2017), Pension Funds and Private Equity: Unlocking Africa's Potential [online] <http://www.amafrica2020.com/amafrica2020/docs/am-africa-2020.pdf> > [Accessed 16 January 2019]

324 Oxford Business Group (n.d.) Tunisia sees growth in new insurance product lines [online] <https://oxfordbusinessgroup.com/overview/high-potential-growth-new-product-lines-boosting-penetration-and-profitability> > Accessed 4 July 2019

325 Ibid

326 Cbonds (n.d.) Tunisia: bonds. [online] <http://em.cbonds.com/countries/Tunisia-bond> > Accessed 4 July 2019

Issuances of corporate bonds listed on the Tunisian stock exchange are dominated by financial institutions in the form of leasing companies and banks.³²⁷

The government bond yield curve has tenors of up to 15 years, with three benchmark rates along the curve (four, seven, and ten years), while some corporates offer bonds of up to 25 years. The African Financial Markets Initiative (AFMI) found that the challenges to building a more efficient yield curve include market fragmentation; a narrow investor base; a limited and illiquid investor market; and a lack of transparency.

While local currency guarantees aim to facilitate access to local capital markets, for example by covering green bonds issued by banks or companies undertaking renewable energy and energy efficiency investments, the deal flow and institutional infrastructure are too thin in Tunisia for a green bond market to develop in the short to medium term.

6.4.5. Existing credit enhancement solutions in the market

Sotugar

Sotugar (*Société Tunisienne de Garantie*) is a guarantee company, 37% owned by the State and 63% owned by 19 Tunisian banks. It is a financially autonomous institution supervised by the Ministry of Finance. Sotugar's overall mandate is to support SMEs during the critical phases of start-up, development, innovation, and restructuring.³²⁸

Sotugar manages twelve guarantee facilities under agreement with the Ministry of Finance, including:

- The credit guarantee facility for SMEs (*Fonds de Garantie des Petites et Moyennes Entreprises*, FGPME); and
- The energy efficiency guarantee facility (*Fonds de Garantie de l'Efficacité Énergétique*, FGEE).

Sotugar does not appraise the credit risk on individual projects but is 'compliance driven' (i.e. as soon as an application meets the eligibility criteria, it is approved). There is no lender screening or ex ante risk management framework.³²⁹

Sotugar charges low guarantee fees that are not risk-based: 0.6% per annum on guarantees for medium- and long-term loans, 1% for short term loans and 3% flat on guarantees for equity financing.

The Credit Guarantee Facility for SMEs (FGPME)

The FGPME guarantee facility is a key component of the government's policy aimed at alleviating the SME finance constraint. It offers PCGs on loans to SMEs and partial guarantees on equity investments in SMEs via risk capital investment companies³³⁰ and private equity funds (*Fonds Communs de Placement à Risque Sotugar*).³³¹

Eligible sectors are manufacturing, information technology, research & development, maintenance services (including vehicle repair), environment, leisure, and agricultural mechanisation. The amount of investment cannot exceed TND5 million (US\$1.74 million), including working capital. The guarantee coverage ratio is in the 50 – 75% range.

In 2017, FGPME had a capitalisation of TND101 million (US\$35 million) and a guaranteed portfolio of TND588 million (US\$204 million). The guarantee portfolio includes SME loans by banks and leasing companies (74%), and equity investments in SMEs by private equity and venture capital funds (26%). During the 2014-2016 period, the facility fell well short of expectations. Its guarantee production decreased by 30%. It also failed to attract significant private financing for SMEs, with mainly public banks using the scheme to transfer off-balance sheet portions of NPLs. Interviewees attributed the poor performance to narrow loan eligibility criteria (limits on working capital loans and ineligibility of loans in economic sectors beyond industry), and a high administrative burden to obtain payment in the event the guarantee needs to be called.³³²

One component under the World Bank's Investment, Competitiveness & Inclusion Development Policy Financing Project seeks to reform the operation of FGPME by:

- Broadening the guarantee eligibility criteria to cover the full spectrum of SME credit needs, through inclusion of more eligible economic sectors and working capital loans, strengthening the financial sustainability of the fund and management of related fiscal risk, through:
 - Introduction of a stop-loss mechanism that caps losses to FGPME;
 - Due diligence on banks that want to use FGPME;

³²⁷ We are only aware of one non-financial issuer of a listed bond, viz. Servicom's issue of a TND9 million (US\$3.1 million) bond in 2016 (7 years, of which 2 years' grace).

³²⁸ Consultees indicated that the government has plans to merge Sotugar with Banque de Financement des Petites et Moyennes Entreprises (Banque de PME), to form a new development bank for the regions (Banque des Régions).

³²⁹ World Bank (2018) Investment, Competitiveness and Inclusion Development Policy Financing Project, Programme Program Document [Online] <http://documents.worldbank.org/curated/en/408781530329592442/pdf/PD-Tunisia-ICI-DPF-Board-Package-052518-fin-06052018.pdf> Accessed 16 January 2019

³³⁰ SICAR: Sociétés d'Investissements dans le Capital Risque.

³³¹ FCPR: Fonds Communs de Placement à Risque. SICAR is an "Investment Company" whereas the FCPR is the French law interpretation of the Anglo-American venture capital and private equity fund structure (i.e. a Fund Management company that manages a series of Funds that are distinct and discrete legal entities, in Common Law this is done via partnerships, French code adopted this pseudo-mutual fund structure to replicate).

³³² World Bank (2018) Investment, Competitiveness and Inclusion Development Policy Financing Project, Program Document [Online] <http://documents.worldbank.org/curated/en/408781530329592442/pdf/PD-Tunisia-ICI-DPF-Board-Package-052518-fin-06052018.pdf> Accessed 16 January 2019

- and
- Auditing of banks' practices concerning underwriting and recovery of NPLs.
- Reviewing operating and payment procedures to attract more private banks into the system, through:
 - The introduction of a portfolio guarantee product for smaller loans; and
 - Pay-out of guarantees as soon as banks initiate legal proceedings.

Sotugar's risk management function will be strengthened, and the FGPME facility will be upgraded through technical assistance and capacity building funded by World Bank and KfW. It is expected that this will contribute to improving SMEs' access to finance by attracting more lenders to make use of the FGPME guarantee facility, while measures will be taken to exclude banks that generate high levels of NPLs. The reform programme is also expected to strengthen the government's ability to manage the fiscal risks arising from the guarantee scheme.³³³

Energy Efficiency Guarantees (FGEE)

The FGEE guarantee facility was created in cooperation between the Tunisian State and the World Bank to encourage investments in energy efficiency in the industrial sector. The facility was set up with a capital of TND5.8 million (US\$2 million). As per end 2017, there had been 21 subscriptions to the FGEE guarantee facility, amounting to TND11 million (US\$3.8 million).³³⁴

The FGEE targets industrial companies that want to make energy efficiency investments through energy service companies. The investment cost must be above TND50,000 (c.US\$17,300). The underlying investment is a short/medium term credit instrument that must be paid back within three years.

Middle East Investment Initiative (MEII) – DFC

MEII's office in Tunis is running the Tunisian Credit Guarantee Facility, based on a guarantee capacity of US\$50 million from DFC.

This is a local currency guarantee facility sponsored by the United States with the purpose of promoting SME growth and job creation and support an enabling franchising environment. The guarantees offered under MEII are issued by DFC, and participating banks sign a guarantee agreement with DFC, while documents are also signed with MEII. Participating banks include Amen Bank, Attijari Bank and the Arab Tunisian Bank, who also benefit from technical assistance under the programme. The original sector focus was on franchising (franchisees, and their suppliers). However, after an initial operating period with low up-take, there was a 'mission drift' away from

the franchising focus, as the limited demand led to DFC and USAID deciding to open up the facility to other SME sectors, meaning that while the initiative can support the renewable energy and energy efficiency market segments, it is not its only focus. Loans can support both working capital requirements as well as investments in fixed assets. MEII Tunisia (registered as an NGO) is managing the guarantee facility. It reviews the credit appraisal done by the lenders (participating banks) and has 'local decision-making authority' over the guarantees.

The programme is intended to operate for a ten-year period, and during its first three years has approved guarantees worth US\$24.5 million on US\$35 million worth of loans, and there had been no calls on the guarantees as at the end of 2019.

6.5. Estimated demand for guarantee products³³⁵

This section provides indicative estimates of the potential demand for guarantees to support the off-grid sector in Tunisia. From a basic economics standpoint, the size of a given market segment (such as SHS or C&I) in terms of transactions completed and finance provided will depend on where demand for finance intersects with the supply of it.

Demand for finance per segment

Table 6-2 below provides an indication of the extent to which the different market segments in Tunisia provide opportunities for local currency guarantees to stimulate the provision of local credit market and/or capital market finance – the table is colour coded using different shades of blue to illustrate where there is most opportunity. The darker the shading, the stronger the relative opportunity.

The estimates of the size of the local currency financing needs over the next three to five years present an indication of the potential size of demand for the guarantee products. The extent to which developers choose to access local currency guarantees to meet their local currency financing needs will depend on a range of issues on the supply side, for example, the cost of equity, the pricing and tenor of local currency debt offerings, the extent to which the guarantees can reduce collateral requirements and/or the cost of finance available to developers relative to the cost of the guarantee and indeed the cost and availability of foreign currency debt options.

The estimates of local currency financing needs are taken from a combination of the evidence in published reports and the feedback provided by market participants.

³³³ Ibid., p. 27.

³³⁴ Sotugar (2018) Annual Report for 2017. Page 14.

³³⁵ The figures presented in this sub-section are purely illustrative and should be interpreted as such. Furthermore, the mentioned figures do not consider the negative impact resulting from the COVID-19 epidemic, which took place after the market assessment had been concluded.



As the table shows, the most promising opportunities for local currency finance are likely to arise in the C&I sectors as part of the self-generation regime. Self-generation is likely to be adopted in sectors such as textiles, food and beverage and the metals sector. This pattern has been observed in Morocco. Considering the on-going steep increases in tariffs for electricity from the STEG grid, there are good prospects for self-generation projects in the private sector. **It is estimated that there is a market of around 20 MW new capacity annually over the next few years in the textile, food/beverage, and metals sectors.** This market would be comprised of a series of medium-voltage self-generation projects in the 0.3 – 2MW range, with around 15 projects per year, with a combined energy production capacity of 20MW/year, requiring yearly investments of about US\$22 million.³³⁶

The local credit market (banks) should have the capacity to serve such a pipeline of smaller projects, and local currency guarantees could facilitate and speed up the provision of credit. However, the possibility for an industrial entity to oversize its internal generation plant, so that it can sell up to 30% surplus energy to STEG, is not a sufficiently weighty factor in itself to drive the market.

What could give a further impetus to the local currency credit market is the requirement that the PPA for the authorisation regime provides for a minimum of 15% of the tariff to be payable in local currency.³³⁷

For the concession, regime there are tariffs being structured as a function of the cost of capital (PRC-capex) and operation costs (PRC opex). Contracts (non-public) stipulate that a “minimum of 20% of PRC-capex must be in Tunisian dinars.”

Leasing operators are making important inroads into the renewable energy and energy efficiency market with support from DFIs, which can augment the role of local currency finance, notwithstanding the absence of a secondary market for PV equipment and the relatively high (about 13%) interest rates.

Although this is the market diagnostic phase of the project, it is useful to get an initial indicative view of the size of demand for local currency guarantees. The figures presented in this sub-section are purely illustrative and should be interpreted as such.

336 This figure is a rough estimate, and further analysis is needed to arrive at an assumed portion of the total financing needs that would be in local currency, and to judge how much of the latter could possibly be supported by guarantees.

337 <http://www.energymines.gov.tn/web/documents/modele-formulaire2-tarif.pdf>

The size of a given market for local currency guarantees in terms of transactions completed and finance provided will depend on where demand intersects with supply. The analysis has led to some insight of the global demand for finance – comprising its different types in terms of currency denomination, tenor, debt / equity etc. But where the market for local currency finance clears will depend on factors affecting its supply, for example price, wholesale market liquidity, risk perceptions and appetite etc. As set out, the demand for local currency guarantees will also depend on the relative attractiveness of competing products and how the availability of different types of guarantee could alter such dynamics.

Approach to developing the illustrative estimates

To illustrate the potential derived demand for local currency guarantees over the next five years, a number of inter-related market factors need to be considered in turn:

- Potential demand for finance. The indicative demand for investment in each segment over the next three to five years. This period is flexible to reflect the fact that time scales over which the estimated value of transactions is realised can differ, depending for instance, on the time required to raise finance, with the total amount either being raised in relatively shorter timescales (three years), or longer (five years). This range is driven by overall demand for finance identified in each market segment.

Table 6-2:

Indication of the relative attractiveness of the market segments for local currency guarantees.

Source: CEPA analysis

Segment	Demand for finance	Scope to use guarantees for credit market	Scope to use guarantees for capital market
SHS	Demand for local currency financing likely to be very limited.	<ul style="list-style-type: none"> • The opportunities to provide guarantees are limited by the state-run PROSOL program, which dominates the sector and is expected to run to 2030. PROSOL suppliers have no need for portfolio guarantees as it is STEG that takes on the default risk. • PROSOL suppliers require working capital or term loans to support their operations, although this need is reduced as they do not have to carry the loans to consumers on their balance sheets. It is also unlikely that these firms have difficulty accessing finance for this sector as a government purchase order will make them a viable borrower. 	<ul style="list-style-type: none"> • Capital market opportunities likely to be limited in the near-term, as the market is not well-developed and there is currently little to no interest in corporate bonds aside from financial institutions.
C&I	Estimated to be US\$77 million over next five years.	<ul style="list-style-type: none"> • With market growth and up-front purchases, there is an opportunity to support the provision of working capital loans to developers through PCGs on larger projects or portfolio guarantees on smaller projects, addressing the prohibitive collateral requirements. • There is also an opportunity for a guarantee to support loans to leasing companies. • Portfolio guarantees may be provided to banks and leasing companies on their loans to consumers of C&I projects. • Currently there is no scope for a guarantee to cover payment stream risk for C&I generators as system payments are up-front. 	<ul style="list-style-type: none"> • Capital market opportunities likely to be limited in the near-term, as the market is not well-developed and there is currently little to no interest in corporate bonds aside from financial institutions.

Legend

- Strongest relative opportunity
- Weakest relative opportunity

- Proportion of finance in debt versus equity. Some financing needs will be met through equity solutions rather than debt. Equity finance will not be able to make use of credit guarantee products.
- Potential demand for local currency finance. This considers the proportion of the demand for debt finance that could potentially be satisfied with local currency finance, as shown in Table 6-1. This may be satisfied through either the capital or credit market, both of which may benefit from guarantees, although it is unlikely that there will be any capital market issuances within these segments in the near term.
- Illustrative estimate of demand for guarantees. This refers to the local currency equivalent US dollar value of transactions that have the potential to be supported by guarantees. The extent to which this potential can be realised will depend upon the competitiveness of local currency debt finance, (as regards pricing and tenor

Table 6-3:
Rationale, assumptions, and sources of evidence behind indicative estimates

	Key considerations	Sources/assumptions
Potential demand for finance	<ul style="list-style-type: none"> • Assessment of the investment needs for the sector over the next three to five years to meet demand for the different segments of the market. 	<ul style="list-style-type: none"> • C&I: Based on market feedback of expected projects in the pipeline and their associated values.
Proportion of finance in debt vs. equity	<ul style="list-style-type: none"> • Consideration of the optimal financing mix taking account of the cost and availability of debt and equity and the financing needs of the different segments. • Some of the developers may already have significant equity retained within the business so it may be that all of their additional investment need is in the form of debt. 	<ul style="list-style-type: none"> • Assuming a debt to equity split of 70:30 for C&I based on stakeholder feedback and market data.
Potential demand for local currency finance	<ul style="list-style-type: none"> • Consideration of the optimal split between local and foreign currency financing given costs and revenues for developers. • Also need to consider the demand for and supply of both foreign and local currency in the market, which will be determined by a range of factors e.g. relative costs. 	<ul style="list-style-type: none"> • Based on market feedback, for C&I, the total demand for finance is assumed to be in local currency.
Indicative split between credit and capital markets	<ul style="list-style-type: none"> • Need to take account of the relative availability and of the two options and the financing needs of the individual developers. 	<ul style="list-style-type: none"> • The capital market has limited interest in renewable energy investments and lacks the capacity/ support to develop this in the near term. This suggests all opportunities on which a local currency guarantee may be applied lie in credit markets.
Indicative estimate of demand for guarantees	<p>Will depend on:</p> <ul style="list-style-type: none"> • The cost and coverage of the guarantee, and terms upon which the guarantee can be called. • The extent to which the guarantee enables the lender to provide credit where they otherwise would have been unable to. • The extent to which lenders can reduce the interest rates so that the cost of the guarantee fee can be, at least partly, off-set, to reflect the value of the guarantee. • Alternative guarantee / risk mitigation products available to developers. 	<ul style="list-style-type: none"> • There are guarantee providers operating, increasing competition but also awareness. • Low, medium and high uptake scenarios given to offer a range of scenarios, depending on the nature of the segment in question. • The value of the guarantee, even if first-class, is not likely to be recognized and used by lenders to reduce the need for provisioning; i.e. the potential capital relief benefit of the guarantee is not likely to translate into lower interest rate margins (The regulator BCT and hence the Tunisian banks do not fully observe the Basel regulations, Tunisia not being a member of the BCBS).

etc.) and whether the availability of guarantees is able to increase local currency debt financing. To account for the considerable uncertainty in the potential uptake of the new products, scenarios to illustrate low, medium, and high uptake are presented, depending on the specificities of each segment.

Table 6-3 summarises the key considerations and assumptions made to arrive at the illustrative indication of the potential demand for credit enhancement products in Tunisia.

Illustrative estimates of demand for guarantees by segment

Using the approach and assumptions outlined in the subsection above, illustrative estimates of the demand by segment are presented. Table 6-4 suggests that there is most potential to see opportunities arise in the C&I sector as part of the self-generation regime.

6.6. Conclusions

6.6.1. Demand for finance

Unlike in other countries reviewed, electricity access rates in Tunisia are almost universal, meaning that activities in the renewables space are driven by the extent to which solar is competitive with grid-connected tariffs, as opposed to allowing households to access electricity or switch from relying on self-generation from diesel.

The analysis shows that the market segment that offers the best opportunity for local currency guarantees is industries' self-generation of electricity (C&I). A guarantee could tip-the-scales in catalysing a relatively large number of transactions within this segment. The more STEG's tariffs increase, the more such projects will be viable.

There are also opportunities in other segments of the market, such as IPPs selling solar and wind power to the national grid.

There is little evidence to suggest local currency guarantees could or should have a role in the government-subsidized PROSOL-type of energy efficiency programmes.

6.6.2. Supply of finance

Tunisia's currency control regime makes access to hard currency for residents (individuals or corporates) that are not export-oriented or in offshore zones difficult and impractical. Domestic regulation does not allow holding of hard currency. Due to ongoing currency stress, financial institutions are rationing hard currency. Local currency finance is thus prevalent, and, in addition, lending rates are comparatively low when compared to Nigeria and Ghana. Consequently, there is a general gap in the availability of long-term credit, and the SME sector is underserved also with short- and medium-term credit.

Table 6-4:

Illustrative demand for local currency guarantees by segment (US\$ local currency equivalent over three to five years)

Source: CEPA analysis

Market segment		C&I
Potential demand for finance		US\$110 million
Proportion of finance in debt vs. equity		Up to US\$77 million in debt
Potential demand for local currency finance		Up to US\$77 million
Illustrative demand for local currency guarantees	Low	10% - US\$8 million
	Medium	25% - US\$19 million
	High	40% - US\$30 million
Rationale		The self-generation regime will increase the attractiveness of renewable energy projects. Credit guarantees support the provision of finance to both industrial customers and lessors, making for better financing terms (e.g. more reasonable collateral requirements).

The commercial bank market is highly fragmented and made up of private and by state-owned banks. Sector regulation include interest rate caps on term loans and leasing products, which may impede adequate risk pricing, thereby holding back transactions that do not have an appropriate risk-reward relationship, which, in turn, can restrict growth. Banks' financing offers to the renewable energy and energy efficiency sectors have come with highly stringent collateralisation requirements (mainly for land and property), which many borrowers are unable to meet. Many banks tend to resort to 'name lending'. Most banks do not have a specialised unit for assessing renewable energy and energy efficiency transactions (with the exception of Attijari Bank) and most local banks do not yet have the capacity to evaluate the risk profile of renewable energy projects, suggesting that for banks to become comfortable with lending to these sectors extensive technical support is likely to be needed in conjunction with funded or contingent interventions. Banks often lack liquidity, and given their collective small size, are ill-equipped to provide finance to multiple large infrastructure projects.

A crucial factor is the interest of banks to collaborate with guarantee providers and their willingness to limit both the overall interest rates – ideally absorbing part of the cost of the guarantee – and collateral requirements. It will be important for local currency guarantees to work with collaborative banks of high standing.

While there are several challenges associated with accessing commercial bank finance, which could be unlocked by local currency guarantees, leasing companies could also act as an alternative to these institutions, particularly for SMEs who struggle to meet collateral requirements imposed by commercial banks. But like commercial banks, leasing companies are hampered by

interest rate caps and a general lack of liquidity. There is also no secondary market for solar PV in Tunisia, which makes it difficult for leasing companies to resell assets in the event of defaults. Such market might be established on the back of increased local currency guarantee issuance and the corresponding expected easier access to local currency financing. However, the cross-cutting law mentioned above has introduced the possibility of creating an SPV under the self-generation regime which may alleviate the secondary market issues as creditors could possibly accept an energy generating SPV as collateral rather than individual pieces of a PV kit for which there is no resale market. Leasing operators are about to make inroads into the renewables segment with support from DFIs, which can augment the role of local currency finance. For example, GIZ and AFDB are exploring a leasing credit line for small-scale renewable energy investments, with a focus on PV generation projects.

The potential deal flow and institutional infrastructure are presently too thin in Tunisia for a green bond market to develop in the short to medium term.

Another aspect to consider is that there are many government initiatives, DFIs and development banks working in the renewable energy and energy efficiency space, and the introduction of new guarantee products could overlap with that of some of the current players in the market. For example, guarantees offered by Sotugar and MEII/DFC are available to businesses in the sub-sectors examined, and are priced at sub-market rates, which may constrain the appetite for new commercially priced products. If local currency guarantees are to operate in Tunisia, products will need to ensure they meet the demands faced by the different sub-sectors and address the needs that others may not be seeking to address.

Appendix A

Organizations consulted

Ref	Organization	Sector
	Pan African	
1	Crossboundary	Advisory
2	Energy 4 Impact	Advisory
3	Solarise Africa	C&I
4	Stanbic Bank	Bank
5	Citi Group	Bank
6	InfraCoAfrica	Developer
7	EleQtra	Developer
8	Berkeley Energy	Developer
9	PIDG	DFI/Developer
10	Rensource	Developer
11	Solar Nigeria Programmeme	Development programme
12	KfW	DFI
13	UK CDC	DFI
14	Solar Kiosk	E-Hub
15	UMEME	Electricity distribution company
16	Aldwych International	Energy company
17	Lions Head Global Partners	Financial advisory
18	GuarantCo	Guarantee issuer
19	InfraCredit	Guarantee issuer
20	Sunfunder	Impact investor
21	Energy Access Ventures	Impact investor
22	Oikocredit	Impact investor
23	responsAbility	Impact investor
24	All-on-Fund	Impact investor
25	Rockefeller Foundation	Impact investor/grants
26	Odyssey Energy Solutions	Investment platform
27	Trine	Investment platform
28	Rafiki Power	Mini grid developer
29	AcobLighting AMDA	Mini-grid developer
30	AIIM	Private equity
31	Bboxx	SHS
32	Azuri	SHS
33	M-Kopa Solar	SHS
34	Fenix Intl	SHS

Ref	Organization	Sector
Ghana Country Study		
35	Translight Solar	SHS/C&I
36	Plug the Sun	SHS/C&I
37	PEG Africa	SHS
38	Association of Ghana Solar Industries	SHS/C&I
39	Zola/Off-Grid Electric	SHS
40	Crossboundary	C&I
41	Daystar Power	C&I
42	Wilkins Engineering	C&I
43	Dutch & Co	C&I
44	TINO Solutions	C&I
45	Association of Ghana Industries	C&I
46	BloombergNEF	C&I
47	Black Star Energy	Mini-grids
48	Standard Chartered	Commercial bank
49	Barclays Bank	Commercial bank
50	Fidelity Bank	Commercial bank
51	Ghana Commercial Bank	Commercial bank
52	Ecobank	Commercial bank
53	Sentinel Global	Institutional Investor
54	Petra Trust	Institutional Investor
55	Enterprise Trust	Institutional investor
56	Databank	Institutional investor
57	Stanlib	Institutional Investor
58	African Alliance Securities Ghana	Institutional Investor
59	NPRA	Regulator
60	SEC	Regulator
61	KFW	Development Bank
62	GIZ	TA agency
63	World Bank	Development Bank
64	USTDA	Development Agency
65	Power Africa	Development Agency
66	Independent/IFC	DFI
67	Energy Commission	Government

Ref	Organization	Sector
68	Ghana Alliance for Clean Cookstoves	Cookstoves
69	Sage/Quantum Terminals	Gas
70	IPC	Consultant
Kenya Country Study		
71	Skypower Global	IPP
72	Kenya Green Bonds Programme	Green bonds
73	Astonfield Solar	EPC
74	Equity Bank, Ecomoto Loan	Energy Efficiency, Cookstoves
75	Spenomatic	Developer
76	Financial Sector Deepening	Financial inclusion
77	Solarise Africa	C&I
78	Africa Trade Insurance Agency	Insurance
79	Jubilee Insurance	Insurance
80	Sunfunder	Impact investor
81	Prime Bank	Bank
82	Ariya Finergy	Developer
83	Lions Head	Advisory
84	Dry Associates	Private Equity
85	Sanlam Investments	Fund Manager
86	Sunref	Green finance
87	BURN	Cookstoves
88	Rentworks	Leasing
89	NIC Bank	Commercial bank
90	Crossboundary	Advisory
91	Solarise Africa	C&I
92	Stanbic Bank	Bank
93	Bboxx	SHS
94	Azuri	SHS
95	M-Kopa Solar	SHS
96	Dream Kenya	SHS
97	CP Solar	SHS
98	Energy 4 Impact	Advisory
99	Berkeley Energy	Developer
100	Aldwych International	Energy company
101	Energy Access Ventures	Impact investor

Ref	Organization	Sector
102	Oikocredit	Impact investor
103	responsAbility	Impact investor
104	Rockefeller Foundation	Impact investor/grants
105	Trine	Investment platform
106	AIIM	Private equity
107	African Guarantee Fund	Guarantee fund
Nigeria Country Study		
108	Sterling bank	Commercial bank
109	Access Bank	Commercial bank
110	Eco Bank	Commercial bank
111	First Bank	Commercial bank
112	Sura Shopping Complex	Commercial Cluster
113	Solar Wox	C&I
114	Consistent Energy	C&I
115	Daystar	C&I
116	Crossboundary	C&I
117	Odyssey Energy Solutions	Data platform
118	Bank of Industry	DFI
119	Sura Independent Power Limited (SIPL)	Distribution company
120	Starsight	Energy Efficiency/ C&I
121	Lions' Head Global	Fund
122	Climate Finance Advisory Limited	Fund
123	Nigeria Infrastructure Debt Fund	Fund
124	Dunn Loren Merrifield	Fund
125	Rural Electrification Agency	Government
126	InfraCredit	Guarantee fund
127	All-on-Fund	Impact investor
128	LAPO microfinance bank	Micro-finance bank
129	Grooming Centre	Micro-finance bank
130	Acob Lighting	Mini-grid developer
131	Zylab technologies	Mini-grid developer
132	GeeDee Engineering Ltd.	Mini-grid developer
133	A Y Global Res Nigeria Ltd	Mini-grid developer
134	Green Village Energy	Mini-grid developer/ C&I
135	Havenhill	Mini-grid developer/ C&I

Ref	Organization	Sector
136	Rubitec Solar	Mini-grid developer/ C&I
137	AIICO Pensions	Pension fund
138	Pensions Association (Penop)/ AXA Mansard Pensions Limited	Pension fund
139	Azuri	SHS company
140	Solynta	SHS company
141	Lumos Africa	SHS company
142	Solar Nigeria	Solar development programme
143	Forte Oil	Solar/ renewable projects
144	Sky Power	Utility scale PPA developments
145	West Africa Energy	Waste to Energy
146	GIZ	Donor
Tunisia Country Study		
147	African Development Bank	DFI
148	Agence Nationale pour la Maîtrise de l'Energie	Government
149	AMEF Consulting	Advisory
150	Attijari Bank	Commercial bank
151	Banque Internationale Arabe de Tunisie	Commercial bank
152	Caisse des Dépôts et Consignations (CDC)	State-owned financial institution
153	CDC Gestion	French state-owned financial institution (Equity)
154	EBRD	DFI
155	Lloyd Assurances	Insurance
156	Lux LED	Energy Efficiency
157	Mena Capital Partners	Institutional investor
158	Middle East Investment Initiative	Non-profit fund
159	Soft NRJ Solar Power Solutions	SHS/C&I
160	Solar Energy Systems	SHS/C&I
161	STEG Energies Renouvelables	State-owned utility
162	TuNur Ltd	IPP developer

Appendix B

References

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