



Development Credit Authority
Putting local wealth to work

USING DCA'S LOAN GUARANTEE TO INCREASE ENERGY ACCESS IN AFRICA

Columbia University, School of International and Public Affairs

Capstone 2016 Report, May 13th 2016

By

Alexander Abdel Gawad
Heliatrice Marques
Jaime de Piniés
Mei-Xi Gan
Michael Thomas Mudd
Yangchen Dolker Gurung

Faculty Advisor: Dr. Ellen Morris
USAID DCA: Megan Rapp and Andrew Gisselquist

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Executive Summary

- Over the past years, the **off-grid energy sector in Africa has grown substantially** and promises to help many of the 622m people who lack access to electricity on the continent.
- Unfortunately, various types of lenders, with both commercial and development objectives, have proved **reluctant to provide financing to this sector** because of higher perceived risks, smaller transaction size, and less familiarity with off-grid energy systems.
- In this context, the Development Credit Authority (DCA) of the U.S. Agency for International Development (USAID) has become actively engaged in increasing private finance for the off-grid renewable energy sector in sub-Saharan Africa. In the framework of the Presidential Initiative “Power Africa”, **DCA seeks to catalyze USD\$75m in private-sector debt financing by providing loan guarantees to support enterprises along the off-grid and small-scale renewable energy value chains in sub-Saharan Africa** in the course of eight years.
- **Major challenges remain endemic to the sector and limit DCA’s ability to achieve this objective.**
- Specifically, the key obstacles that hinder the participation of different types of *lenders* in making debt investments in the off-grid sector are (1) financial hurdles; (2) information and communication hurdles; (3) hurdles linked to the terms of the DCA loan guarantee.
- Off-grid *developers* face financial hurdles that limit their access to capital necessary for growth. They suffer from a lack of sufficient track record, limited capital inflows, high cost of capital, FX risk, and a mismatch in loan tenor expectations with lenders. While these obstacles are endemic to the off-grid market in sub-Saharan Africa, two major financial hurdles for borrowers can be tackled by DCA’s loan guarantee: (1) the lack of access to working capital and (2) lack of access to consumer finance.
- In order to address the **financial hurdles** of project developers and potential lenders to the off-grid sector, DCA has several options:
 - (A) **Offer securitization guarantees.** Securitization of future receivables could serve as an alternate source of financing provides a way to limit balance sheet usage, provide up-front capital, and lessen consumer credit risk for PAYG companies.
 - (B) **Focus on supply-chain financing.** To avoid the risk of having a skewed supply of funds disproportionately benefitting consumer financing, DCA can play an active role by guaranteeing the debt of funds or entities that seek to finance the supply-chain of PAYGO companies.

- (C) ***Offer a refinancing mechanism for tenor mismatch.*** A fund through which institutional investor capital is channeled to refinance commercial bank loans could be set up. This would effectively transfer the loans from banks to institutional investors, after the risky project development stage is complete. DCA's loan guarantee could be applied to mitigate risks for the institutional investors lending to the projects via the fund.
- Our recommendations to counter the **informational obstacles** of the sector are to:
 - (D) ***Promote the standardization of financial and impact metrics.*** Impact metrics quantify the non-commercial effects that off-grid energy companies cause. They are essential to lenders whose mission goes beyond commercial return. On the other hand, performance metrics quantify the *commercial* risk of investments. DCA can play an active role accelerating the adoption of these metrics by requiring borrowers benefiting from DCA guarantees to report them.
 - (E) ***Enhance communication with lenders and borrowers*** by creating a potential eligibility interface and differentiating value propositions by lender type.
- Finally, we also propose that DCA work together with other divisions at USAID to expand on the current limitations of the guarantee by offering:
 - (F) ***Equity partial guarantees.*** Partial equity guarantees would be used to attract further equity to the off-grid sector, increasing the pool from which to leverage on debt. Allowing to increase through an indirect channel the total debt being issued in this sector
 - (G) ***Foreign Exchange (FX) Risk guarantees.*** DCA could offer a partial guarantee on a contingent foreign exchange liquidity loan facility (FELLF) in order to mitigate FX risk.

I. Introduction & Methodology

In the world today, 1.2bn people are living without access to an electricity grid. Annually, they spend about US\$27bn annually on kerosene, candles, battery torches or other fossil fuels powered stopgap technologies in order to account for their electricity needs. In order to bring cheap and clean energy access to those facing energy poverty, off-grid renewable energy technology has emerged as one potential solution to drastically energy access. Over the past years, the off-grid energy sector in Africa has grown substantially and promises to help many of the 622m people who lack access to electricity on the continent.¹

The primary technology for off-grid energy access has been solar photovoltaic systems, but other renewable energy technologies are also being deployed in Africa, such as hydropower, biogas, and wind. Independent of the specific type of technology used for off-grid, customers and companies need long-term financing. Unfortunately, various types of lenders, with both commercial and development objectives, have proved reluctant to provide financing to this sector because of higher perceived risks, smaller transaction sizes, and less familiarity with off-grid energy systems. The financing that has so far been provided tends to be ill-suited to the African context as it is mostly provided through short-term loans, at high interest rates in foreign denominated currencies, which poses significant foreign exchange risks.

All in all, access to finance has proved to be a substantial hurdle for scaling off-grid energy projects, in spite of the sector's great potential to increase energy access Africa.

In this context, the Development Credit Authority (DCA) of the U.S. Agency for International Development (USAID) has become actively engaged in increasing private finance for the off-grid renewable energy sector in sub-Saharan Africa. DCA implements partial *pari passu* credit guarantees on behalf of USAID Missions and operating units to increase access to finance in support of USAID's development objectives.² Specifically, in the framework of the Presidential Initiative "Power Africa", DCA seeks to catalyze USD\$75m in private-sector debt financing to support enterprises along the off-grid and small-scale renewable energy value chains in sub-Saharan Africa.

The Energy and Development Capstone team at Columbia University's School of International and Public Affairs was tasked with supporting DCA's Africa Team to expand the off-grid energy portfolio. This involved conducting a landscape analysis of off-grid borrowers (e.g., renewable energy

¹ Todd Lindemann, "1.3 Billion are Living in the Dark," Washington Post, <https://www.washingtonpost.com/graphics/world/world-without-power/>. Accessed 05/26/2016.

² *Pari Passu*, Latin for "equal footing", refers to debt instruments that have equal seniority in terms of repayment of principal and interest. Obligations that are *pari passu* have equal right to a debtor's obligations under law. *Pari passu* is a common clause in debt obligations in place to protect current lenders from the risk of subordination in favor of another creditor. Debt that is *pari passu* is an equivalent level on a borrower's capital structure, which may include senior secured, senior unsecured, subordinated, and junior subordinated debt. In the case of the DCA loan guarantee programs, the *pari passu* clause is in place for risk sharing and equal loss between the lender and the United States Treasury.

companies, developers) and lenders (e.g., local and international financial institutions) to identify and assess potential borrowers and lenders that could participate in the DCA loan guarantee program and ideally lead to a new transaction in the pipeline. In addition, the team identified and assessed the key hurdles of the off-grid sector for DCA, and provided several key recommendations on how DCA might address the hurdles.

The approach used was interviews, both on the phone and in person, with key stakeholders in the off-grid energy sector in sub-Saharan Africa, with a particular focus on East and West Africa. In total, 44 interviews were conducted, 12 with lenders; 12 with borrowers; and 20 with financial intermediaries. The full list of companies and institutions that were interviewed are included in Annex A. In this report, the term “lender” applies to any entity which can disburse a loan to a business in the off-grid sector; the term means off-grid energy companies that provide energy services including project developers, manufacturers, retailers, and distributors operating in sub-Saharan Africa; and “financial intermediary” means a company or institution working to strengthen the sector through technical assistance, catalytic grant funding, or introductions. It should be noted that in order to partner with USAID DCA to offer loan guarantees there are 3 basic requirements for the lender: (1) only debt can be disbursed; (2) they must be a private entity; (3) the financial institution must have a portfolio or be willing to create a portfolio in off-grid renewable energy.

Interviews with lenders covered their existing portfolio in the off-grid sector and/or their desire to expand or enter the sector, as well as how DCA’s guarantee could encourage their investment in the sector. Interviews with borrowers focused on the business model, current and future financing needs, previous experience with loan guarantees and opinion on whether DCA guarantee could help them attract necessary debt capital. Interviews with financial intermediaries were focused on broader sector issues regarding the financing of the off-grid sector, including the key challenges and opportunities, as well as the financing needs of borrowers and of the likelihood for lenders to offer debt (with or without a DCA guarantee).

The research and findings has led to the development of a landscape analysis of current challenges, opportunities and key recommendations for DCA’s engagement in the off-grid renewable energy sector in sub-Saharan Africa. In this report we present our key findings in four major sections. First, we will discuss the key characteristics and challenges for lenders that are currently or plan to be active in the off-grid space. Second, we present the features of off-grid developers as well as their particular hurdles in accessing working or growth capital. Third, we showcase a sample of high-potential transactions that were identified through the research that would be good candidates for the DCA’s loan guarantee program. Finally, key recommendations are offered for increasing uptake of the DCA loan guarantee and expanding the pipeline in the off-grid energy sector.

II. Lenders' perspective for investing in the off-grid sector

A. Lenders' characteristics by group

The analysis of the off-grid sector in sub-Saharan Africa has shown that there are five major segments of lenders active in the space for DCA to consider: (1) Multilateral and bilateral development institutions; (2) Philanthropic organizations; (3) Impact investors; (4) International commercial lenders; and (5) Local commercial lenders. Each segment possesses particular strengths, weaknesses, opportunities and threats with regards to DCA's objective of expanding off-grid in sub-Saharan Africa.

1) Multilateral and bilateral development institutions

This group is comprised of multilateral and bilateral international financial institutions (IFI) that disburse debt either through their private arm or through private partners. Development institutions are active across all countries in sub-Saharan Africa with a range of programs and incentives for increasing private investment in the clean energy sector. Among their initiatives, they feed the private sector through access to affordable capital; provide business development services; and promote new business models for the off-grid sector.

The biggest strength of the development finance institutions (DFIs) lies in their strong reputation and presence in sub-Saharan Africa. They have a strong track record in implementing complex development projects, which brings more certainty for investors who are seeking to limit political, economic and institutional risks. However, this comes with high transaction costs, since each deal requires a careful due-diligence, regardless of their sizes.

IFIs close larger transaction-volume deals, allowing for leveraging capital for companies that already perform relatively well, which is an opportunity to be explored. On the other hand, it represents a hurdle to small and medium borrowers, which can be excluded of IFI's portfolios.

Finally, concessionary loans, with low interest rates and long grace periods, can present a threat to DCA's objective to expand the off-grid sector, since it may crowd out commercial lenders that do not consider themselves in position to compete against IFIs.

2) Philanthropic organizations

Several philanthropic organizations such as Shell Foundation and Rockefeller Foundation have experience providing grants and other forms of concessional financing for development purposes in sub-Saharan Africa. Some North-American and European foundations are becoming increasingly aware of the need for debt investments for promoting energy access in developing countries and have

already set up funds for such investments (e.g. Shell Foundation and ResponsAbility Working Capital Fund).³

Philanthropic organizations are more willing to take the first loss upon default of a company's debt obligations. This feature is a strength and places foundations in a very special position in a financial deal, alleviating the pressure on other lenders and attracting more senior debt. However, their non-profit basis or below market rate approach is a weakness since commercial lenders can question the sustainability of the deals they participate in.

In terms of opportunities, philanthropic organizations encourage innovative financing arrangements, which makes them flexible to adjust to specific terms of different deals, such as providing longer loan tenures and accepting first loss.

As with multilateral and bilateral institutions, foundations can threaten the objective of extending private capital the off-grid sector in sub-Saharan Africa due to the below market interest rates they offer, which has the potential of crowding-out commercial lenders.

3) Impact investors

Impact investors aim to generate positive social and environmental returns in addition to profit. Their biggest strength is that they are less risk averse than purely commercial lenders, and are willing to lend to companies that are otherwise perceived as unproven or too risky.

Many impact investors have yet to expand into the off-grid sector, as most of them tend to focus on areas such as agriculture and microfinance. Their limited experience in off-grid is compensated by their ability to attract larger commercial investors, who consider impact investors well-informed stakeholders and precursors to commercial lending.

In relation to DCA's objective to increase the off-grid market, there is a risk that impact investors offer loans that will default. Systematic defaults in an immature sector are likely to create a generalized mistrust in off-grid and erode investors' appetite for expansion into this market.

4) International commercial lenders

International commercial lenders are institutions that provide debt in order to obtain financial gain. As opposed to impact investors, commercial lenders do not seek additional social effects in the countries in which they operate. They tend to be characterized by larger scale operations, which allows them to leverage considerable amounts of capital and potentially scale-up successful projects.

³ For more information, see: <http://www.responsability.com/investing/en/750/Innovative-investment-fund-launched-to-accelerate-access-to-off-grid-energy-solutions.htm?Article=25674>.

The biggest weakness of international commercial lenders is their exposure to foreign exchange (FX) risk when investing capital in African markets. Although this is a concern not just for off-grid, stakeholders are unanimous in affirming that this risk hurts especially immature sectors.

Similarly, to impact investors, international commercial lenders can lose appetite for off-grid once a series of defaults arise. Instead of doing a more extensive due-diligence every time that a loan is required, the risk is that they lose interest in the sector as a whole, hindering DCA's objective in the near future.

5) Local commercial lenders

This group is similar to international commercial lenders in the sense that it is composed of financial institutions that seek commercial gain, without a social component attached to their mission. The difference is that members of this group are headquartered in sub-Saharan Africa and disburse debt in local currency. The elimination of FX risk is a significant strength because it removes a potential source of large losses.

The main weakness of local commercial lenders is the fact that they show low interest in off-grid. This is due to multiple reasons, including lack of human resources to correctly assess risks in this sector, unfamiliarity with the technologies, need for higher returns, and lack of presence in the rural areas where off-grid is present.

In terms of opportunity, local commercial lenders usually have retail operations in the regions targeted by DCA. This represents an opportunity to reach small and medium entrepreneurs who do not have access to international financial institutions.

In terms of threat to DCA's objective, as they are engaged in many sectors of the local economy, local commercial lenders are susceptible to economy-wide shocks. These shocks may drain resources from the off-grid sector.

B. Lenders' hurdles in the off-grid sector

From the analysis and interviews with a range of different lenders relevant for off-grid, we were able to identify three major hurdles that limit the financing in the sector: (1) financial constraints; (2) information and communication gaps; (3) unattractive terms of the DCA loan guarantee.

1) Financial constraints

The business models of many off-grid companies are based either on cash sales or on the pay-as-you-go (PAYGO). Our research has shown that the PAYGO model is becoming increasingly popular with investors and project developers because it does not require upfront payments and is a more adapted system to the sub-Saharan African context. However, the PAYGO model entails uncertainty of future

repayments, which is an obstacle for lenders' risk-assessment of borrowers and for longer term financial forecasting by lenders of all groups.

Another financial hurdle is that lenders and borrowers have different interests and expectations when it comes to the loan tenor. In general, lenders offer loan tenors from two to six months, but borrowers seek tenors from six to twenty four months. This problem forces borrowers to stretch their financial capacities in order to be able to repay the loan, making them more likely to default, which will in turn increase the price of the loan and potentially create a vicious circle.

Finally, international lenders are subject to scarce and inadequate FX risk hedging options, since very few facilities with this purpose are set for the off-grid market. Since most of off-grid financing comes from institutions outside of sub-Saharan Africa, this hurdle is a great strain on access to finance for African off-grid developers.

2) Information and communication hurdles

Information gaps have multiple origins, including immaturity of the sector, lack of resources to track and report metrics, and lack of expertise of lenders to collect this data. Information encompasses both standardized metrics and track records. The first problem refers to harmonized standards for reporting both the social impact and the financial characteristics of projects, for consistent use across the sector. The second issue refers to the lack of data about off-grid projects that is needed to develop trends and projections of consumer behavior.

The absence of a credible benchmark weakens the potential to attract private capital. This is the case because lack of credible benchmarks reduces the comparability of metrics and the ability to aggregate receivables. It also increases the risk of miscommunicating impacts of the off-grid sector. This problem is directly connected to the issue of the limited knowledge of the off-grid sector, including how to assess risks.

There is a communication difficulty corresponding to DCA in particular, which is the lack of awareness of its loan guarantee. It includes misinformation about the process of application for a guarantee, in which the lender does not know how to start and who to approach in case of interest in the DCA product. It also refers to problems related to awareness of the product itself, since some lenders thought the guarantee would have been discontinued.

3) Hurdles linked to the terms of the DCA loan guarantee

Financial and information hurdles are limitations that are intrinsic to the nature of the off-grid sector. Another hurdle exists particular to the loan guarantee provided by DCA. DCA's guarantee is designed in such a way that, in case of default, DCA and the relevant lender share the loss. Usually, DCA bears 50% of the loss, but is flexible to take-up higher percentages. Despite this flexibility, the *pari passu* condition alone does not fully address some lenders' concerns, especially commercial institutions. In

their vision, a *pari passu* agreement is not considered sufficient because it mildly alleviates the burden of a loss in a very immature, and therefore risky, sector.

The off-grid sector still demands equity, which cannot be offered by DCA. The “debt only” condition of DCA loan guarantees may rule out some interesting opportunities just because they have not had time to mature yet. In a broader fashion, USAID should consider other solutions that could attract private equity.

Despite the fact that there are no fees or interest over the loan principal, there are other upfront and recurring costs associated with DCA’s product that are considered too high by some stakeholders, especially when they are not well capitalized. These costs include a one time, up-front fee based on the facility size, and a utilization fee, which is a semi-annual fee based on the value of loans placed under the guarantee.

III. Borrowers' perspective

A. Borrowers' Characteristics by Group

In our analysis, we divided borrowers into three major segments: (1) Local enterprises using cash transactions; (2) Companies using the PAYG platform; and (3) Project Developers. The following paragraphs explain the strengths, weaknesses, opportunities, and threats of each group with regards to DCAs' objectives of increasing access to private capital for the off-grid energy sector.

1) Local Enterprises

We define local enterprises as relatively small off-grid energy companies that are owned and operated by local entrepreneurs who mostly sell and distribute energy products through cash transactions such as Nadji Bi Group and Toyola Energy Limited.

Given their small transaction size and limited access to finance, local enterprises are unlikely to drive growth in the off-grid sector, a threat to DCAs' objective of promoting such growth through its loan guarantee program.

The biggest strength of working with local enterprises is that they are owned by local entrepreneurs, who usually know the markets and customers well, and therefore have a better understanding of local conditions and needs. In particular, local entrepreneurs have a better ability to provide last mile delivery and support and to thus cater their services to the bottom of the pyramid and customers who are usually neglected due to their remote location. However, a limiting factor is that they lack working capital to scale up.

2) Companies using a PAYG Platform

The most well-known companies and leaders of the off-grid sector, such as M-KOPA, BBOXX, and Mobisol use a PAYG platform as a financing solution for their customers. The PAYG model is now widely used to purchase renewable energy products by allowing small, ongoing payments made through the customer's mobile phone. The company installs the system at the customer's location for a nominal deposit. The customer then pays off the remaining cost of the equipment over time by purchasing for the energy as the equipment is used. This essentially means that the company providing the equipment is also providing a form of financing to its customers. PAYG platform is most advanced in sub-Saharan Africa and is receiving great attention from both investors and industry players.

The biggest strength of these companies are that they employ a tested business model which helps to reduce upfront cost for customers. Moreover, PAYG allows companies to receive payments in a timely manner through the mobile money infrastructure. If payments are not made, companies can simply turn off the devices.

A key weakness of the PAYG model is its reliance on the existence of a mobile money infrastructure. Since telecom operators are natural partners for PAYG companies given their reach in rural areas and provision of mobile-money systems, PAYG depends on the few large telecom providers for their data networks. Therefore, limited mobile money infrastructure will slow the growth of companies using PAYG platform.

Currently, PAYG companies are growing rapidly in scale and are attracting a large share of total financing for the off-grid sector. The predominance of these market leaders poses the threat of crowding out investments in smaller local enterprises that are struggling to scale and attract capital for growth.

3) Project Developers

Project developers are larger players that develop and finance larger energy systems with higher capital costs and more complicated business models. Mini-grid projects, also known as rural utilities, that provide electricity to several households, are an example.

The biggest strength of project developers is that they provide energy in a much larger scale than other off-grid energy providers. At the same time, the larger scale operations of project developers mean that they face high upfront capital costs. Mini-grids require larger installations, higher capacities and more skilled labor unlike other off-grid household solutions. These companies also face larger regulatory risk as it is usually seen as a competition to the governments' existing grid or to its plans to expand the national grid to the households that are their potential clients. Moreover, project developers need reliable off-takers and PPAs to secure its large up-front investment.

B. Borrowers' financial hurdles

Companies selling energy products and services for off-grid customers all face similar financial hurdles that limit their access to capital necessary for growth. They typically do not have a long track record, they have limited capital inflows, high cost of capital, FX risk, and uncertain regulatory environment. Two major financial hurdles faced by borrowers are (1) lack of access to working capital and (2) lack of access to consumer finance. The hurdles are introduced here, and they will be further explained in the recommendation section in Section V.

1) Lack of Access to Working Capital

This hurdle is most relevant to smaller local enterprises that operate on the basis of cash sales, but it can also be a constraint for larger companies as well. Off-grid companies are usually cash starved and find it challenging to maintain sufficient inventory and to do cash flow projections. It is a significant challenge to obtain access to supply chain financing because of companies' lack of track record. Most banks are not familiar with the off-grid technology and are not comfortable with lending to companies that are mostly start-ups. The lack of working capital restricts a company's ability to meet the demands

of its customers and to scale, which in turn limits its growth potential and thus attractiveness to many investors.

DCA can play an important role by providing a guarantee to promote debt investments in the working capital needs of off-grid developers.

2) Lack of Access to Consumer Finance

Energy companies are seeking longer tenor financing to scale up their businesses. Given their unique growth pattern, it is crucial for these companies to secure consumer financing as it will allow their customers to pay in installments and thus provide cash for companies to grow. This is also important for project developers that seek reliable off-takers for their capital-intensive projects. However, in some contexts, the off-grid market lacks consumer financing due to the absence of the mobile money infrastructure and insufficient track record of customers.

DCA can also address this challenge by promoting consumer financing through guaranteeing of future receivables in the secondary market.

IV. Selected examples of potential transactions for the DCA pipeline

The following sample showcases different ways in which DCA’s product could be applied to facilitate energy access projects. Due to confidentiality reasons, the names of potential lenders and borrowers will not be displayed in this report.

- 1) **To guarantee loans to renewable energy projects.** This is the most straightforward application of DCA’s product, and would be helpful in encouraging lenders that are new to the off-grid energy sector to make investments in this space.
- 2) **To guarantee a loan made by an entity that aggregates energy projects.** This would enable smaller projects that investors may not be interested in individually to still access financing.
- 3) **To guarantee capital markets instruments with underlying energy assets.** Investors in bonds or notes issued with energy projects as underlying assets would benefit from the risk mitigation provided by a DCA guarantee.
- 4) **To support microfinance in the off-grid energy sector.** Lenders providing microfinance loans for providers or consumers of energy products and services could benefit from risk mitigation using the DCA product, and possibly also leverage USAID’s expertise on last-mile delivery.

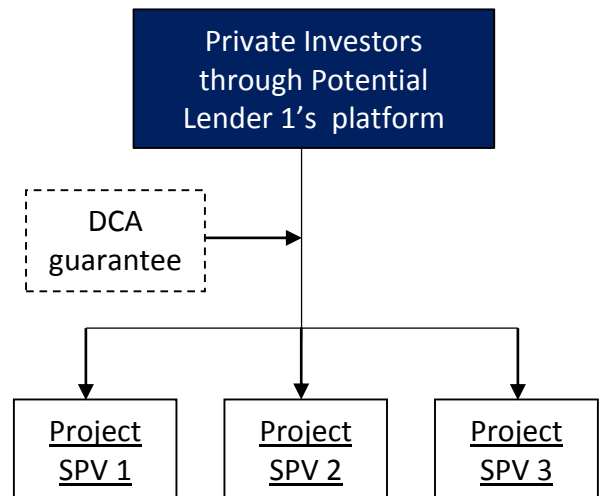
1) Potential Lender 1

Potential Lender 1 supports small to medium-sized renewable energy projects (below 25 MW) throughout sub-Saharan Africa.

Potential Lender 1 provides end-to-end services in financial structuring, technical assistance, and risk mitigation (for credit, FX and off-taker risk) to small and medium renewable energy projects. It is also a platform to match investors with renewable energy projects.

Value proposition of DCA product: Through Potential Lender 1’s platform, DCA could guarantee private investment in renewable energy projects of up to 25MW, to facilitate the lender’s stated goal of supporting 150MW in total generation over five years within five to 12 West and East African countries. The lender could be a valuable partner to DCA as a source of pipeline deals and technical assistance to DCA-guaranteed projects.

Figure 1: Lender 1 and the Potential for DCA’s Guarantee

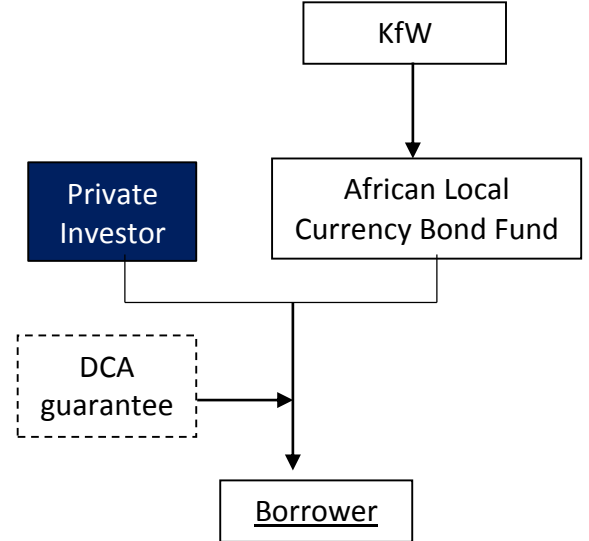


2) Potential Lender 2

An African Local Currency Bond sponsored by German development bank KfW, co-invests in Africa with private local investors in ticket sizes of US\$2-4m. While it has only invested in the financial services sector so far, there is an interest to enter the renewable energy space. The fund is co-managed by Potential Lender 2.

Value proposition of DCA product: DCA’s loan guarantee would support ALCB in co-investing with private investors in renewable energy in sub-Saharan Africa. Specifically, it could guarantee the debt investments of ALCB’s co-investors.

Figure 2: Potential for Guaranteeing ALCB’s co-Investors’ Loans



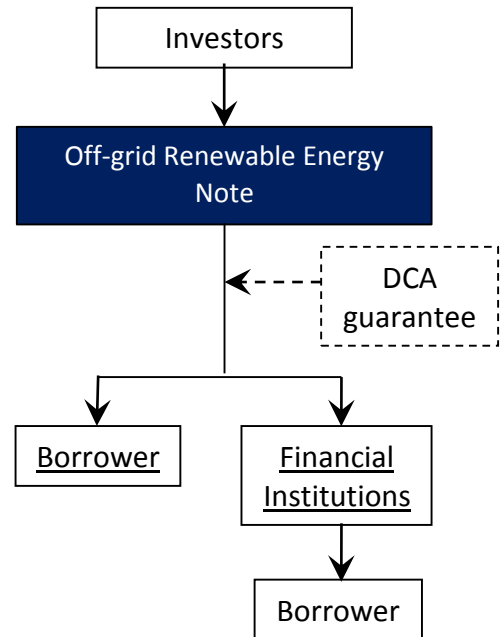
3) Potential Lender 3

This lender is an impact investor with equity and senior debt investments. Its sector focus has been microfinance, but the lender is now exploring investments in adjacent sectors, including renewable energy. Of these, its pipeline development in renewable energy is the most advanced.

The lender plans to issue a senior note of more than US\$50m to be invested in off-grid energy companies, and financial institutions that lend to off-grid energy projects. 30% of total loans will be in sub-Saharan Africa.

Value proposition of DCA product: DCA’s loan guarantee would facilitate fundraising of an additional US\$10-40m.

Figure 3: Potential for Guaranteeing a Note



4) Potential Lender 4

Potential Lender 4 is a Kenya-based, deposit-taking microfinance bank whose competitive advantage is rural penetration and a female-focused clientele. Potential Lender 4 has been lending to the off-grid energy sector for three years, through the group co-guarantee methodology typical for microfinance. It has a portfolio of US\$1.2m in Kenya. Potential Lender 4 would like to grow this portfolio in terms of size and geography, with a focus on off-grid projects in East Africa.

Value proposition of DCA product: DCA’s loan guarantee will enable Potential Lender 4 to expand its pipeline of debt investments across East Africa, and possibly leverage USAID’s expertise on last-mile delivery.

Figure 4: Lender 4 and the Potential for DCA’s guarantee

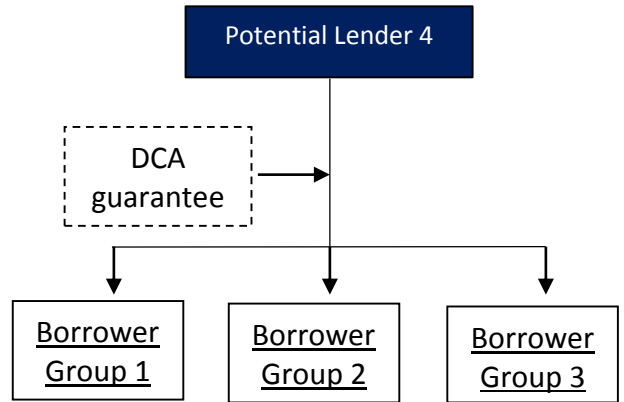
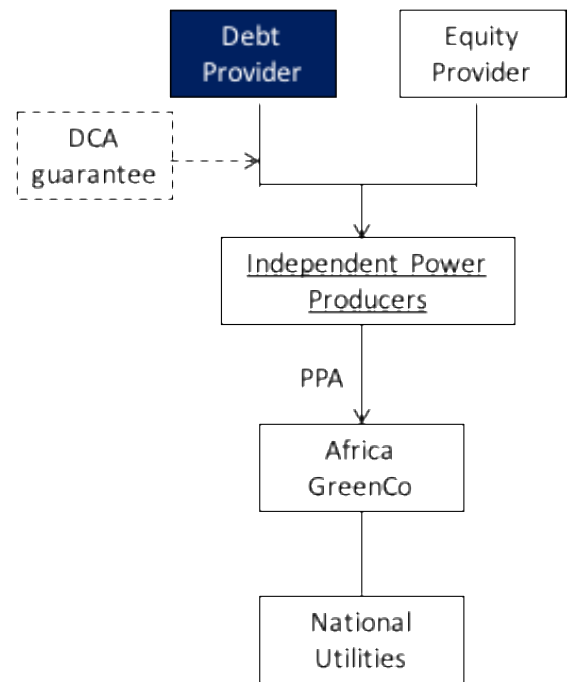


Figure 5: Increasing the borrower’s creditworthiness through a Guarantee

5) Potential Borrower 1

Potential Lender 5 is a planned US\$50-100m entity that will act as a creditworthy regional off-taker for African independent power producers (IPPs). Its purpose is to facilitate the IPPs in obtaining private sector financing, particularly large renewable energy projects that require more than one off-taker. Potential Lender 5 will enter power purchase agreements with IPPs on one side and national utilities on the other. With a \$500,000 grant from a big foundation, the entity is intended to launch in the next 12 months.

Value proposition of DCA product: DCA’s loan guarantee would increase the lender’s creditworthiness as off-taker, enabling the IPPs to obtain commercial finance on better terms.



V. Recommendations for increasing DCA's off-grid portfolio

Even though there are several high potential deals and interested actors in the off-grid sector in sub-Saharan Africa, its full potential is yet to be realized. As discussed in the earlier sections of this report there are important financial, informational and DCA-specific hurdles that currently provide obstacles for DCA's states objective of promoting private capital to enter the space. Some of these challenges are simply endemic to the sector, such as the lack of track record of many off-grid developers. However, DCA has the opportunity and ability to address other major financial and informational hurdles of the sector as well as challenges directly related to the terms of the DCA loan guarantee.

In order to address the financial hurdles of project developers and potential lenders to the off-grid sector, DCA can:

- (A) offer securitization guarantees,
- (B) focus on supply-chain financing, and
- (C) offer a refinancing mechanism for tenor mismatch.

Our recommendations to counter the informational obstacles of the sector are to:

- (D) promote the standardization of financial and impact metrics and
- (E) to enhance communication with lenders and borrowers by creating a potential eligibility interface and differentiating value propositions by lender type.

Finally, we also propose that DCA work together with other divisions at USAID to expand on the current limitations of the guarantee by:

- (F) offering equity partial guarantees and
- (G) FX Risk guarantees.

A. PAYG Securitization: The Case for Debt Guarantees

In their current state, PAYG companies require significant balance sheet financing in order to fund their creation of consumer receivables. As a result, PAYG companies, in addition to providing off-grid energy services, act as consumer finance institutions exposed to large amounts of credit risk and large upfront capital requirements to finance receivables. Currently, the six largest PAYG off-grid solar companies have an estimated US\$100m in receivables on their balance sheets, a number that is projected to grow to US\$1–2bn by 2020.⁴ At the same time, the World Bank and Bloomberg New Energy Finance forecast that PAYG companies will need at least US\$1bn in debt financing to reach 15m households by this 2020 timeframe.⁵ Given these large financing needs, the current structure of balance sheet financing along with PAYG firms' associated exposure to consumer credit risk is not sustainable.

⁴ Persistent Energy Capital, Telephone Interview, March 30, 2016.

⁵ Bloomberg New Energy Finance and Lighting Global (2016), Off-Grid Solar Market Trends Report 2016.

Securitization of receivables as an alternate source of financing provides a way to limit balance sheet usage, provide up-front capital, and lessen consumer credit risk for PAYG companies. Additionally, this market may attract the necessary institutional investors for off-grid debt financing with the potential for a tradable secondary market that can provide liquidity and the scale the off-grid industry needs for sustainable growth.

An example is BBOXX's December 2015 securitization of US\$500,000 in PAYG receivables, which was the first instance a company in the off-grid solar industry used this structure and highlights the potential for this large source of additional financing. BBOXX plans to expand the program with US\$16m of securitizations in 2016 and the largest off-grid providers indicate a significant likelihood of their own securitization programs in 2016.⁶ While the securitization market is still nascent and a proven track record of receivables' payment history is needed for this method to be a major source of financing, there is significant opportunity for a development agency to provide credit and logistical support in the early stages of development of a market for off-grid receivable securitization.

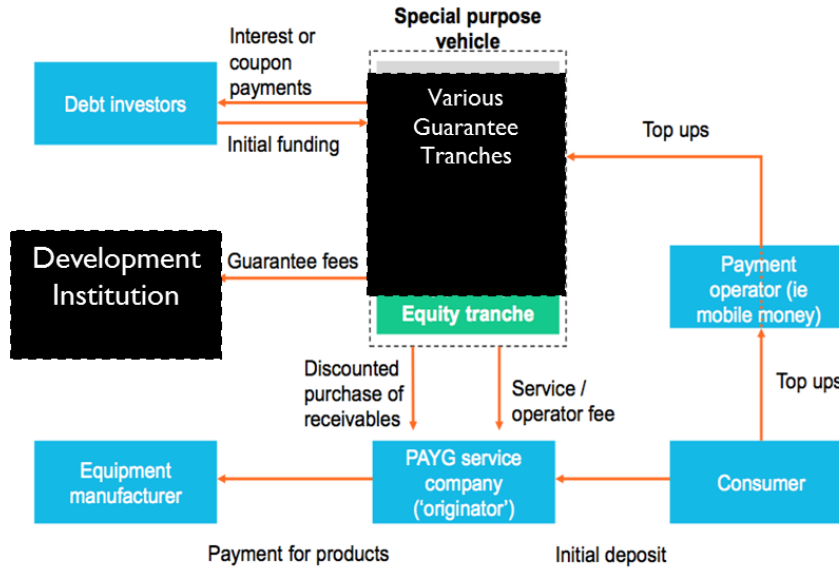
Securitization has the potential to benefit the off-grid market as a whole by:

- Removing the debt off the balance sheet of PAYG companies which are currently acting as consumer finance institutions with large upfront capital requirements;
- Decoupling the credit risk of PAYG companies and residential consumers for debt investors. This limits balance sheet leverage and layered credit risk of PAYG companies;
- Creating a secondary (tradable) market for off-grid consumer lending, which will allow lenders access to liquidity before a securities' maturity;
- and attracting institutional investors with successful performance of initial securitization programs.

⁶ Ibid.

Figure 6 illustrates how a securitization structure may look like, which can be a departure point for DCA:

Figure 6: Sample Securitization Structure



Source: Bloomberg New Energy Finance

1. A special purpose vehicle (SPV) is created to purchase future discounted cash flows from a PAYG company (provides upfront capital that is needed to expand business). The debt can be tranching to allocate risk among different investor bases. The securitized bonds will be significantly over-collateralized as the present value of receivables will be substantially higher than the par value of the bonds.⁷
2. Receivable payments are transferred back to investors to pay principal and interest with losses taken by investors.
3. PAYG company continues to operate as servicer for nominal fee to incentive repayment
4. Development Institution provides partial or full guarantee of various debt tranches as credit enhancement. A development institution can also purchase a mezzanine tranche as an alternative loss buffer to investors.

This securitization structure is consistent with those in developed markets. However, the off-grid securitization market presents some unique challenges that need to be addressed before securitization

⁷ For example, Solarcity's three securitizations of US\$320m in 2013-14 were over-collateralized by 27-38%.

can become a large scale source of financing for the off-grid sector. The set up costs and legal fees are somewhat punitive for these programs. Transparency of receivable payment history and overarching credit metrics are needed to create an institutional investment base. Additionally, though the developed world has successful securitization markets which have supported the growth of consumer lenders, investors are still be exposed to FX risk, shorter terms of PAYG receivables, and the potential for regional correlation of payments.

DCA and other DFIs can help tackle some of these challenges to evolve securitization into a large-scale and sustainable source of financing in the off-grid sector. Further, with success, securitization can be expanded to other PAYG industries in the developing world and provide significant consumer driven development growth. Development institutions must recognize and support this burgeoning market the following ways:

1. Providing full or partial guarantees of debt tranches or have outright mezzanine guarantee tranche in order to provide an additional buffer to the over-collateralization common in securitizations, a significant credit enhancement in and of itself.
2. Facilitating the infrastructure, finance, and expertise to aid in the creation of securitization programs;⁸ Facilitating the legal and set-up costs through subsidies or in-house program expertise lowers the costs of the set-up fees for securitization programs.
3. Supporting ratings of SPV and their underlying receivables through support of ratings companies in frontier markets. It will increase transparency and liquidity in the market and help draw institutional investors.
4. Guaranteeing SPV credits in FX hedging agreements. The receivables underlying the securitization are still denominated in local currency which may inhibit investors wary of the market and liquidity risk of sub-Saharan African currencies. In this instance, a development institution can guarantee an SPV's credit risk so that the SPV can engage in bi-lateral FX hedging agreements and remove the currency risk of the securitized product. Potential ways to limit FX risk are further discussed in recommendation (G).

B. Supply-Chain Financing Focus

The expected growth of securitizations of future receivables of PAYG companies to access liquidity can skew the balance between funding sources, benefiting consumer financing at the expense of supply-chain financing.

The increased liquidity and the window of time between the access to liquidity and the receivable origination can tempt otherwise cash-strapped borrowers to allocate these resources to meet current

⁸ The estimated cost of the creation of BBOX's securitization program was US\$500,000 in both legal and advisory fees.

outstanding commitments. By doing so, PAYG companies could run out of the required cash to finance the growth in receivables.

If this risk were to realize, commitments made to the SPVs could be unmet. Automatically generating losses for the investors in the SPVs due to the likely unsecured nature of these loans until the origination of the receivable could be an adverse result of such a development.

If instead of using the increased liquidity made available through the securitization, the PAYG company had access to supply-chain financing, this risk would be diminished.

There is currently a facility that focuses on this niche of the off-grid market: The ResponsAbility Energy Access Fund, a US\$34 million short-term lending facility which was set up together with the Shell Foundation.

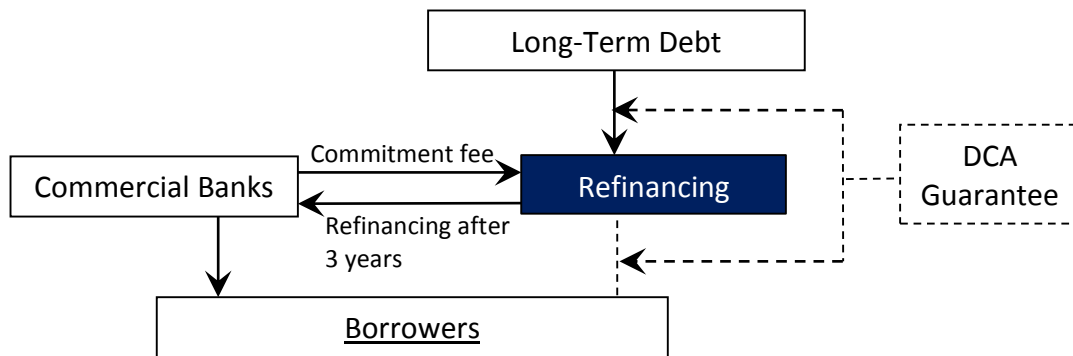
To avoid the risk of having a skewed supply of funds disproportionately benefitting consumer financing, DCA can play an active role by guaranteeing the debt of funds or entities that seek to finance the supply-chain of PAYGO companies.

C. Fund to Offer Refinancing for Tenor Mismatch

Companies in the off-grid energy sector report that they require loan tenors of at least 5 to 7 years to plan for scaling up. However, capital requirements and regulatory constraints will increasingly limit the capacity of commercial banks to offer such long-tenor loans. On the other hand, there is growing interest from institutional investors like insurance companies and pension funds to invest in energy projects. While these investors may be better able to provide longer term financing, they may not have the same risk assessment expertise that banks do.

The proposed solution is a fund through which institutional investor capital is channelled to refinance commercial bank loans, effectively transferring the loans from banks to institutional investors, after the risky project development stage is complete. The commercial bank could then recycle its capital and invest in more new energy projects. It would also not have to hold long-tenor loans on its balance sheet.

Figure 7: Sample Structure for a Fund to Offer Refinancing for Tenor Mismatch



It is likely that such a fund will need to be capitalized by a credible guarantee (such as one from a multilateral development bank), to give the banks certainty that the fund will take over its loans after the agreed period. A guarantee will also better enable the fund to raise private capital from investors. In addition to this guarantee, DCA's loan guarantee could be applied to mitigate risks for the institutional investors lending to the projects via the fund.

This structure is similar to the Infrastructure Debt Fund framework established by the Indian Government in 2011 for infrastructure project financing. In the Indian example, loan transfers into the funds have been impeded by banks' reluctance to sell the loans and incur market-to-market losses in the process. To solve this problem, the proposed fund could be involved upfront in evaluating the projects alongside the banks, and commit to later buy the loans at par value from the banks (i.e. price is agreed at the point of loan origination).

Possible additional features include the following:

- Capital markets solutions such as bond issuance and securitization could be explored as a means of transferring loans from banks to institutional investors.
- The fund could require banks to retain a portion of the original loan, to mitigate the risks of banks "dumping" poorly performing loans into the fund.
- To catalyse best practices (e.g. the standardization of impact metrics), the fund could also mandate these as its investment criteria for energy projects.

Broadly, this fund would contribute towards increasing the amount and diversity of debt financing available to energy projects in sub-Saharan Africa.

D. Standardization of Metrics

As mentioned above, inconsistent metrics reduce the potential to attract private capital by reducing the ability to aggregate receivables, as well as increasing the risk of misanalysing risks and impact on the part of lenders. These factors reduce the scale-up potential of the off-grid energy sector, especially via securitizations.

This problem affects both impact and financial performance metrics. On one hand, impact metrics quantify the non-commercial effects that off-grid energy companies cause. They are essential to lenders whose mission goes beyond commercial return, such as impact investors, multilateral institutions, and foundations. On the other hand, performance metrics quantify the commercial risk of investments. They are vital for all actors who value a commercial return, provided they are essential to assess accurately the risk of any investment.

The problem of non-standardized impact and financial metrics has been observed by several actors in the industry. Since 2013 the Global Off-Grid Lighting Association (GOGLA) has set up a working group to produce a set of standardized impact metrics. However, even though progress in the production of metrics has advanced, the workforce lacks the ability to enforce their adoption by the sector.

DCA can play an active role accelerating the adoption of these metrics by requiring borrowers benefiting from DCA guarantees to report them.

E. Enhance Communication

A key finding on lenders' side of our analysis was that several lenders, regardless of the segment they belong to, were not fully aware of DCA's guarantee program. For example, a lender in Nigeria was interested in expanding lending in the off-grid sector but thought that DCA program was discontinued. Moreover, a large foundation that is active in the energy access space was also interested in the guarantee but uncertain on how the process of applying for it works even though they had previously worked with USAID.

These issues could be circumvented without great cost and enhanced communication with relevant partners has the potential to greatly expand DCA's status as a key stakeholder in a space that is still in its initial phase of growth. One possible solution for increasing DCA's visibility would be to create a guarantee eligibility interface on its website. This interface would prompt developers and lenders who are interested in the guarantee to enter the key data of the project in question into the interface. This would allow for a preliminary assessment of the project's opportunity and eligibility for a DCA Guarantee. The interface would also present an easy method to build a pipeline, collect data, and enhance knowledge of players in the market at little cost.⁹

Another way to enhance communication with relevant stakeholders would be to differentiate value propositions when pitching the potential for a DCA guarantee to different kinds of lenders. Based on our research, we propose to approach the key lender segments as follows:

1. **Multilateral and bilateral institutions:** In our interviews we found that some development institutions are not well informed about DCA's products and current sector strategy. In order to harness the knowledge of and experience with the off-grid sector of other development partners, we believe it is essential to establish a dialogue about best practices and synergies in off-grid; e.g. through the organization of an annual off-grid forum.
2. **Foundations:** Some foundations are becoming increasingly aware of the fact that the off-grid sector is in need of private investment, not just grant financing. DCA should stress the need for debt investments in the off-grid sector and promote the creation of debt funds in lieu of grants, as Shell Foundation is currently doing.
3. **Impact investors:** Given the commercial and development objectives of impact investors, DCA should direct their attention to the high development impact of off-grid projects using standardized metrics such as number of households reached or number of people who have gained access to electricity through off-grid energy.

⁹ The Renewable Energy Performance Platform (REPP) has already created such an interface, which can be consulted at: <http://www.repp-africa.org/#!eligibility-checklist/sjoup>.

4. **International commercial institutions:** Several international commercial investors have become interested in investing in energy access projects because of their expanding Corporate and Social Responsibility (CSR) as well as sustainable investing portfolios. Therefore, when communicating with this group of lenders, DCA should highlight the CSR opportunities of investing in off-grid in sub-Saharan Africa in addition to the commercial viability of such investments through standardized metrics.
5. **Local commercial institutions:** Admittedly, this is one of the hardest segments among lenders to encourage to become involved in debt financing for the off-grid sector. Nonetheless, DCA should highlight the potentially untapped commercial opportunities of the sector by referring local commercial institutions to key financial data and, once available, standardized metrics that showcase the financial performance of off-grid developers and future growth potential.

F. USAID Equity Guarantees

A number of interviewees mentioned that the limited equity available to invest in Sub-Saharan Africa's Off-grid sector is the main bottleneck for additional lending in this sector. Equity acts as a natural first loss absorber, and as such it covers the main concern of lenders: to not lose money at all. Several interviewees also mentioned the limitations of a *pari passu* partial guarantee to attract lenders to this sector, provided it does not cover this main concern.

Equity partial guarantees however do adapt to the risk profile of equity providers, which are willing to take a loss, and would tolerate a partial cover.

For these reasons, we suggest that USAID considers offering an additional tool: a partial equity guarantee. Partial equity guarantees would be used to attract further equity to this sector, increasing the pool from which to leverage on debt. Allowing to increase through an indirect channel the total debt being issued in this sector.

There is at least a precedent of the use of partial equity guarantees by a partnership in which USAID has participated. In 2014 USAID partnered with Berytech Foundation to provide this type of guarantees for equity investments in Lebanese early-stage businesses¹⁰.

G. FX Risk Guarantees

Foreign exchange risk is a significant barrier for the flow of international capital. Due to the potential losses lenders may face driven by a local currency depreciation, the pool of international lenders is below its potential.

¹⁰ <https://www.usaid.gov/news-information/press-releases/nov-20-2014-announces-new-investment-entrepreneurs-iraq-and-lebanon>

There are several solutions that can be offered to deal with this problem. Derivatives offer a short-term solution at a high premium. Issuers of these products identify counterparty risk as their main bottleneck, that is, the risk of default on payment of the counterparty of the derivative, provided these are over the counter (OTC) transactions. DCA could play an active role participating in a structure in which these derivatives would be offered. However, even if derivatives were to be offered, the pricing and limited time coverage will hinder the overall growth of international capital.

A second option is a contingent foreign exchange liquidity loan facility (FELLF). This is a revolving credit facility offered contingent on the Debt Service Coverage Ratio¹¹ (DSCR) of a loan falling below a pre-agreed floor due to the depreciation of the local currency. If the DSCR remains above the floor, the credit line is not drawn. However, if the DSCR falls below the floor due to the depreciation of the local currency, then the borrower can draw from the FELLF to meet the commitments for a limited period of time. When the credit line drawing period expires, any free cash flow remaining after the payment of the original debt service would be used to repay the FELLF. FELLFs can be offered by private political risk insurers. The advantage of this tool is that it covers the foreign exchange risk for a longer tenure, potentially unlocking a significant amount of foreign capital. The limitations of this tool is that it can only be applied to currencies that are expected to both depreciate and appreciate over the period in consideration, and it can only be applied to loans with long tenures, for example over 10 years. These limitations reduce their scope to minigrids type of projects with cash flows generated in currencies that are expected to both depreciate and appreciate.

DCA could offer a partial guarantee on the FELLF. In the event the foreign exchange rate would appreciate after the disbursement of the FELLF, then the guarantee would not be disbursed. However, in the event the currency would not recover, then the guarantee would be paid to the private issuer of the FELLF.

FELLF is a tool that has been used in previous transactions in power infrastructure projects. For example, the AES Tiete Transaction. This was a \$US 300 million loan with a 15 year maturity used to finance 10 hydroelectric generating facilities ran by AES Tiete in Brazil. The FELLF was issued by OPIC for \$US 30 million. This was the first electric project transaction in a below-investment grade country that managed to obtain an investment-grade rating. It had the longest tenor achieved by a Brazilian corporate issuer up until then, and it was priced at 237bps below the then Brazilian sovereign debt¹².

¹¹ Measure of the cash flow available to pay current debt obligations: Net operating income / Total Debt Service. A DSCR greater than 1 means the entity has sufficient income to pay its current debt obligations. A DSCR less than 1 means it does not.

¹² Source: Structured Finance in Latin America: Channeling Pension Funds to Housing, Infrastructure, and Small Businesses. Hela Cheikhrouhou. World Bank Publications, 2007; J. R. Sheppard & Company, LLC

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VII. Annex**A. List of interviews**

LENDERS				
	Name	Type	Sector Focus	Website
1	GroFin	Impact Investor	SME Financing	http://www.grofin.com
2	Citigroup	Private Financial Institution	Sector agnostic	http://www.citigroup.com/citi/
3	International Finance Group (IFC)	Multilateral institution	Sector agnostic	http://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/industries/infrastructure/power/renewable/sdefaultcontent
4	Kenya Women Microfinance Bank (KWFT)	Microfinance Institution	Off-Grid	http://www.kwftbank.com/
5	Sunfunder	Impact Investor	Solar energy (grid and off-grid)	http://www.sunfunder.com
6	Developing World Markets	Impact Investor	Off-Grid	https://www.dwmarkets.com/
7	Total Impact Capital	Impact Investor	Renewable Energy	http://www.totalimpactcapital.com/
8	Shell Foundation	Foundation	Renewable Energy	www.shellfoundation.org/
9	Power Africa (USAID)	Bilateral Organization	Renewable Energy	https://www.usaid.gov/powerafrica
10	Diamond Bank	Commercial Bank	Oil & Gas, Power	http://www.diamondbank.com/index.php/other-services/energy
11	CAMCO Clean Energy	Impact Investor	Renewable Energy	www.camcocleanenergy.com

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12	Lion's Head Global Partners	Impact Investor	Renewable Energy	www.lhgp.com
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BORROWERS

	Name	Type	Sector Focus	Website
1	Solarcentury	Developer	Solar	http://www.solarcentury.com/uk/
2	AESP Energy	Manufacturer	Solar	http://i-kabin.com/
3	Ghana Capital Partners	Developer	Solar	http://www.ghanacp.com
4	Africa Power Ltd.	Developer	Solar Home Systems	http://www.africapowerltd.com/da/130607
5	East Africa Biogas Initiative	Developer	Biogas	N/A
6	Off Grid Electric	Developer	Solar	http://offgrid-electric.com/#home
7	Nadji.Bi Group	Manufacturer	Solar	http://www.nadjibi.com/nadjibi/en/
8	Product Health	Smart technology provider	Solar Home Systems	http://producthealth.com/

FINANCIAL INTERMEDIARIES

	Name	Type	Sector Focus	Website
1	Aspen Network of Development Entrepreneurs	NGO	Entrepreneurship in emerging markets	www.andeglobal.org
2	World Bank Consultative Group to Assist the Poor (CGAP)	Multilateral Institution	Financial Inclusion	http://www.cgap.org/

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3	Bloomberg New Energy Finance	Think Tank	Renewable Energy	www.newenergyfinance.com
4	World Resources Institute	Think Tank	Sustainable development	http://www.wri.org
5	GVEP International	NGO	Off-grid	www.gvepinternational.org
6	The Currency Exchange Fund (TCX)	Financial Institution	Financial Sector	https://www.tcxfund.com
7	Bruce Usher	Expert	Renewable Energy	http://usherworks.com/
8	Open Capital Advisors	Financial Consulting	Financial Sector	http://www.gvepinternational.org/
9	Rockefeller Foundation	Foundation	Renewable Energy	https://www.rockefellerfoundation.org/
10	Daniel Tomlinson	Expert	Off-grid energy	N/A
11	Leehe Skuler	Expert	Renewable Energy	N/A
12	Persistent Energy Capital	Financial Institution	Renewable Energy	www.persistentnrg.com
13	CrossBoundary Energy	Financial Consulting	Off-grid Energy for utilities	http://www.crossboundary.com
14	Delphos International	Financial Consulting	Grid for utilities	www.delphosinternational.com