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DRC

OFF-GRID SOLAR ENERGY MARKET
DEMOCRATIC REPUBLIC OF THE CONGO

Summary Version of the 2019 Power Africa Off-grid Solar Market Assessment Report

Full report available online at: **usaid.gov/powerafrica/beyondthegrid**

INVESTMENT OPPORTUNITIES

- In 2016, the Gross Domestic Product (GDP) of the Democratic Republic of Congo (DRC) was approximately $35 billion. DRC is the second largest country in Africa but has relatively little high-voltage transmission infrastructure and unreliable generation capacity. **The lack of grid infrastructure may present an opportunity for increased electrification through less costly mini-grid development.**
- Power Africa geospatial analysis estimates that 84% of the population lacks electricity access and 61 million people live in communities that are likely suitable for mini-grid development. **While there is some limited investment in mini-grid projects in DRC, growth in this sector is held back by political instability, lack of regulatory frameworks to support mini-grid development, and the general difficulty of doing business in DRC.**
- 65% of households without access to electricity own land suitable for agriculture, and 50% own livestock. However, only 10% of arable land is used, forcing DRC to import most of its food. **DRC has a need for solar systems to power irrigation and process crops or animal products, such as peanuts, palm oil, milk, and meat. Additionally, productive-use solar systems are critical in DRC's refugee camps.**
- DRC has one of the lowest rates of banking participation in Africa at around 6% and financing options for solar products are very limited due to the perceived repayment risks. **Increased mobile money availability and design of financing mechanisms specifically for off-grid solar products could encourage increased adoption of SHS and pico-solar.**

ON-GRID AND OFF-GRID ELECTRIFICATION

Actual access rate vs. electrification target

0% 19.1% (2017) 100% (2050 target)

Main provider of electricity. The state utility in DRC, the National Electricity Company (Société Nationale d'Électricité [SNEL]), has a long track record of operational and financial underperformance. This is due to a high rate of illegal user connections and an average electricity tariff of $0.07/kWh, which is one of the lowest in Africa. SNEL has 500,000 registered connections, including those through two hydroelectric and nine diesel mini-grids.

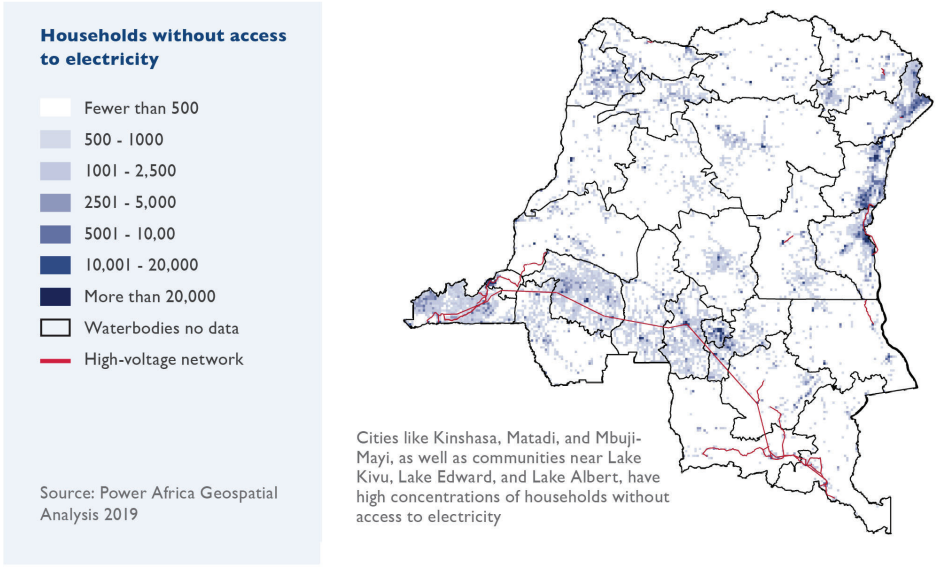
Plan to increase electricity access. In 2018, the government drew up the National Plan for Strategic Development (Plan National Stratégique de Développement [PNSD]), containing only one section devoted to electricity-sector development, and DRC still has no national policy or regulatory authority for electricity supply.

Constraints to rural electrical grid extension. One of the biggest challenges local solar companies face is access to finance, particularly consumer finance, because many households are not able to pay cash for systems and do not yet have access to mobile banking. Many potential off-grid customers live in remote areas of the country making it difficult for companies to reach them in an inexpensive and timely manner.

Policy and regulation. The Ministry of Energy and Hydraulic Resources (MEHR) is the main authority in the electricity sector. In addition to overseeing the national utility, SNEL, MEHR's responsibilities include planning, policy, program development, and oversight. Electricity Law No. 14/011—which the Government of DRC put into effect on June 17, 2014—removed SNEL's monopoly. However, the law contains no specific mention of pico-solar systems, only grid and mini-grid systems.

Associations. Leading renewable energy companies in DRC, with support from the Department for International Development's (DFID) ELAN program, established the Congolese Association for Renewable and Decentralized Energy (Association Congolaise pour les Énergies Renouvelables et Décentralisées [ACERD]) in July 2018. ACERD's primary objective is to coordinate among DRC energy companies to respond to DRC's energy-access problems. Members include major players, such as BBOXX, Greenlight Planet, BURN, Altech, and Dev Solaire.

Estimate of households without access to electricity per 10km, DRC, 2019



Note: Only areas with at least 500 households per 10 km^2 are shown as squares.

KEY STATISTICS	
GDP	**$35 billion**
GDP growth potential	**2-4% annually**
Population size	**85.8 million**
Population density	**38 people per km^2**
Population growth rate	**3.24%**
Household size	**5.3**
Rate of urbanization	**54.6%**
Urban | Rural population	**Urban: 40.7% | Rural: 59.3%**
Languages	**French, Kikongo, Lingala, Swahili, Tshiluba**

SHS AND PICO-SOLAR

The DRC's undeveloped grid electrification sector translates to a huge opportunity for the solar-energy sector. Given that SNEL only has 500,000 connections, it is not far-fetched to forecast that DRC could become the first country in which the virtual grid surpasses the physical one—where more people are connected with SHS than through the grid.

The leading pico-solar company in DRC is Altech Group, which had over 170,000 PAYGO-enabled solar and clean-cooking technology sales since 2013 and at least $500,000 in funding. By 2030, Altech Group aims to sell two million products, which may positively impact ten million people and create 2,000 jobs. Other active companies include d.light (about 87,450 sales since 2016), Ecomwinda (more than 35,000 since 2013), and Dev Solaire (more than 25,000 since 2016).

Commercial Finance. The Congolese market is occupied by 13 banks of different sizes: local banks such as Rawbank, Sofibanque, and Trust Merchant Bank (27%); Pan-African banks, such as Access Bank, Afriland First Bank, and Ecobank (53%); and international banks, such as Advans Group, Citigroup, and Standard Bank (20%).

Rawbank, created in 2002, was the first bank in the country. Rawbank supports the private sector, particularly small and medium enterprises (SMEs), which it recognizes as the country's driving force for growth. Its credit portfolio is approximately $428 million disbursed in 2017. Rawbank recently launched a new product, Credit Energy, which provides loans to purchase energy systems, but it is limited to employees of certain companies.

Consumer Finance. DRC has about 20 microfinance institutions (MFIs); among the leading ones are Finca DRC, IFOD, Advans Bank, Vision Fund and Baobab+. The largest is Finca DRC, with around one million customers. Its credit portfolio is mainly oriented toward SMEs. Energy financial products are starting to emerge, often offered to employees, since the existence of an employment contract is a form of guarantee that reduces banks' perceptions of payment risk. Generally, customers make payments for energy systems through a deduction from an employee's monthly salary at the source, which is an additional guarantee for the bank.

MINI-GRID

It is estimated that 61 million people could be connected to mini-grids in the future, with annual market value of $921 million (assuming household spending comprises 60% of the total revenue of a mini-grid, along with revenue from businesses, public sector buildings, and industrial users). 141 main population centers beyond the existing grid represent a theoretical mini-grid market of ten million people, worth $153 million per year. This is an early estimate that assumes the entire population of these centers could be connected to mini-grids.

Current electrification plans are either related to big hydro-generation projects such as Inga 3 and Ruzizi 3 or aimed at developing local grids. DFID and World Bank are committing significant funding to the development of mini-grids through 2024. DFID aims to support 33 solar mini-grids across the country through the "For an Environment Conducive to Investment" program (Pour Un Environnement Propice a l'Investissement en DRC [ESSOR]) program, and the World Bank plans to develop mini-grids in all electrified provincial capitals and major population centers through its Energy Access and Services Expansion (EASE) program.

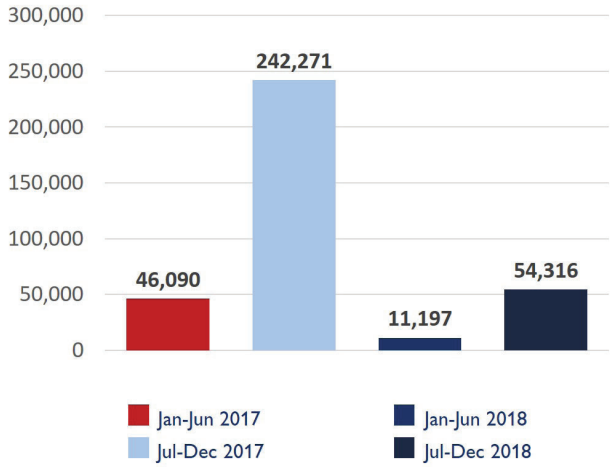
Regulation. The institutional setting relating to mini-grids in DRC is quite complex and involves multiple parties. The 2014 Electricity Law states that the electricity sector involves both central and provincial governments, with MEHR overseeing the sector. The law also mandates the creation of the Centre for Technical Energy Support, the National Regulatory Authority for the Electricity Sector (ARE), and the National Agency for the Electrification of Rural and Suburban Areas (ANSER). None are yet operational, but they expect to play a significant role in the development of the mini-grid sector in DRC. ARE will have the responsibility of drafting specifications for such generation and distribution projects. ARE will also review and authorize new electricity tariffs proposed by any new operator. ANSER will promote and finance rural and peri-urban electrification, including mini-grids.

MARKET INTELLIGENCE USING GOGLA DATA

Sales and investment data from the Global Off-Grid Lighting Association (GOGLA) provide details about the off-grid solar sector in DRC. Sales of pico-solar systems in DRC since 2014 have fluctuated greatly and peaked in 2017. Data show that sales are generally higher for solar lanterns, while sales of solar home systems (SHS) are limited.

There are no exact data available on levels of pay-as-you-go (PAYGO) sales compared to cash sales. The majority of payments have been in cash. PAYGO is relatively new in DRC, but more companies are starting to adopt it. BBOXX entered the DRC market in late 2017 and, to date, has electrified more than 75,000 customers across DRC with PAYGO solar. Additionally, BBOXX has been a founding member and serves as Vice President of the industry association ACERD. Through this channel, BBOXX has played a key role in government by lobbying on behalf of the sector to improve the overall PAYGO solar business environment for the benefit of future players.

Sale of Solar Units (0 - 10 Wp)
Jan 2017 - Dec 2018



The figure includes sales of SHS, solar lanterns, and other solar products between 0 and 10 Wp (Watt peak); GOGLA could not disaggregate this data to the product level for all periods.

So far, investment in Central Africa off-grid solar has been almost entirely through crowd-funded initiatives ($1.38 million in 2018) and government or donor funding ($3.75 million in 2017). The year 2017 was Central Africa's largest investment year ($4.05 million). Investments in 2017 and 2018 mainly focused on regional expansion and scaling up of existing business models. There was a significant increase in crowdfunding in 2018, which indicates a positive trend for future investments in Central Africa.

Power Africa aims to achieve 30,000 megawatts of new generated power, create 60 million new electrical connections, and reach 300 million Africans by 2030.

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