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CÔTE D'IVOIRE

# OFF-GRID SOLAR ENERGY MARKET CÔTE D'IVOIRE

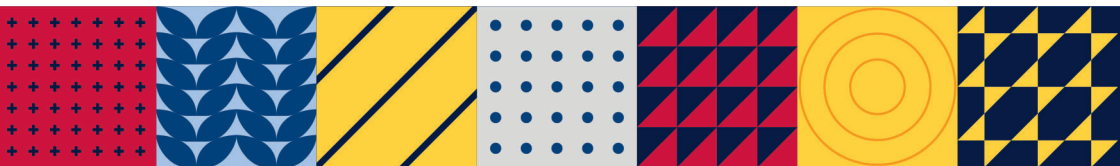
Summary Version of the 2019 Power Africa Off-grid Solar Market Assessment Report

Full report available online at: [usaid.gov/powerafrica/beyondthegrid](https://www.usaid.gov/powerafrica/beyondthegrid)



## INVESTMENT OPPORTUNITIES

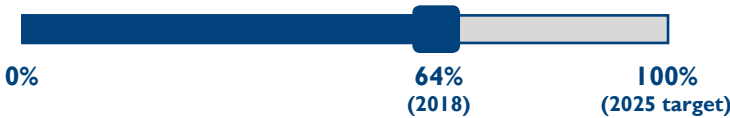
- In 2017, Côte d'Ivoire's gross domestic product (GDP) was approximately \$37 billion, which is anticipated to grow by more than 7% per year through 2022. Economic growth puts additional demands on an already strained national grid. **Continued household and commercial demand for electricity creates an opportunity for the expansion of off-grid solar energy.**
- Côte d'Ivoire is the world's largest exporter of unprocessed cocoa beans. **Off-grid productive use of energy – including local processing of cocoa beans – could increase economic activity, economic growth, and rural development.**
- In Côte d'Ivoire, 49.3% of men and 45.4% of women are self-employed in agriculture. **Access to electricity and productive use of energy can provide substantial economic gains to entrepreneurs and boost the country's agriculture sector, particularly self-employed women in agriculture.**
- With more than 19 million mobile subscribers and 9.8 million mobile money subscribers (the fifth highest in the world), Côte d'Ivoire has the highest mobile money penetration in West Africa. **Mobile money plays a significant role in the country's economy and can facilitate more household participation in the off-grid solar market.**
- The mini-grid market in Côte d'Ivoire is closed off to the private sector due to a concession given to the publicly owned electric utility. However, this concession is expected to expire in 2020 and will open the mini-grid market up to the private sector.



# ON-GRID AND OFF-GRID ELECTRIFICATION

**Target access and renewable energy rates.** The Government of Côte d'Ivoire is committed to achieving universal energy access by 2025, with a renewable energy target of 42%. In 2018, the electricity access rate was 64%, lagging the electrification target of 73% for that year. Particularly in areas where the grid is unlikely to arrive by 2025, off-grid solar will be an important factor in achieving the electrification target.

Actual access rate vs. electrification target



Renewable energy target

**42%**  
by 2025



**Main provider of electricity.** State-owned Côte d'Ivoire Energies (CI-ENERGIES) controls the planning, operational management, and finances. The Ivorian Electricity Company (Compagnie Ivoirienne d'Electricité [CIE]), which sits under CI-ENERGIES, handles part of the generation, transmission, and distribution of electricity.



**Plan to increase electricity access.** CI-ENERGIES created the Rural Electrification Master Plan (Plan Directeur d'Electrification Rurale [PDER]). As part of the PDER, combined systems of off-grid solar power and diesel back-up generators are intended to electrify areas where the grid will not extend.



**Constraints to rural electrical grid extension.** Government budgetary constraints can cause delays for electrification of localities (i.e., 6,000 to 8,500 localities are estimated to not have access with no certain connection dates) and the high cost of connections poses a barrier for less affluent populations.



**Policy and regulation.** The Ministry of Petroleum, Energy, and Renewable Energy (Ministère du Pétrole, de l'Énergie et des Énergies Renouvelables) is prioritizing regulatory change to promote off-grid solar and include it in the rural electrification plan. Additionally, solar kits are afforded a reduced VAT of 9% as opposed to the standard VAT of 18%. Off-grid solar companies have expressed frustration with the importation process and the lack of certainty in how the reduced VAT is applied, with the decision often left to the judgment of customs officers.

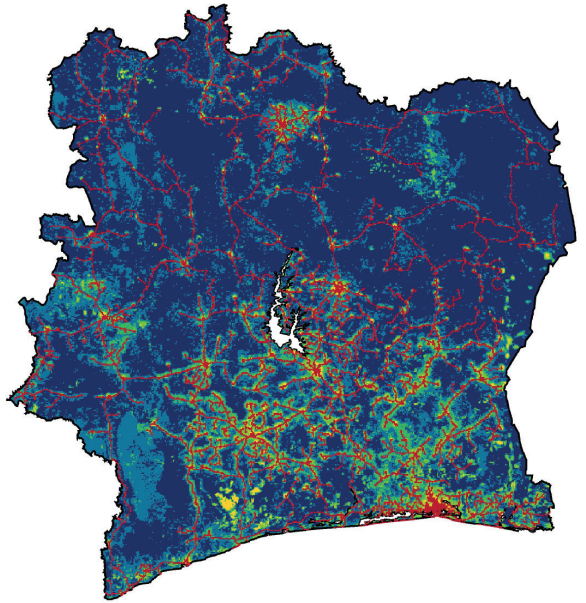


**Associations.** The Ivorian Association of Renewable Energies (Association Ivoirienne des Énergies Renouvelables [AIENR]) is the original renewable energy association. However, because of governance and other challenges, a second association (APER-CI) recently emerged at the initiative of about 20 companies and with the support of several donors, including EU, IFC, and AfDB. At the national level, AIENR promotes renewable energy and energy efficiency throughout Côte d'Ivoire. Members of AIENR include installers, retailers, and distributors of renewable energy products and systems.

# Estimate of households without access to electricity, Côte d'Ivoire, 2019

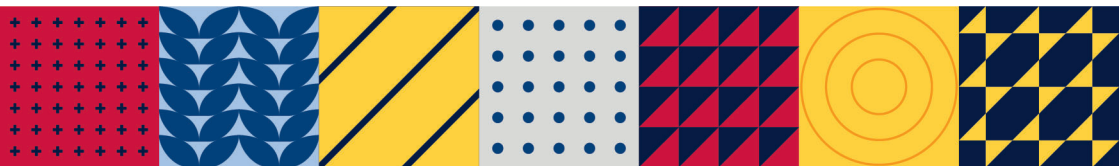
## Percentage of households without electricity

- 0% - 20%
- 21% - 40%
- 41% - 60%
- 61% - 80%
- 81% - 100%
- National Boundaries
- Medium voltage network
- Waterbodies



Source: Power Africa Geospatial Analysis 2019

KEY STATISTICS	
GDP	\$37 billion
GDP growth potential	7% annually over 5 years
Population size	25.07 million
Population density	78 people per km <sup>2</sup>
Population growth rate	2.5%
Household size	5.1
Rate of urbanization	3.4% (2015-2020)
Urban   Rural population	Urban: 50.8%   Rural: 49.2%
Languages	French and 60 dialects



# SHS AND PICO-SOLAR

Côte d'Ivoire's solar sector is young and rapidly developing. Recent growth is directly tied to a fast-growing economy. A large potential market continues to attract SHS companies. Before 2014, only two SHS companies were in operation, but this number has grown to more than 14 by 2018. Despite the sector's nascency, partnerships in the off-grid solar sector have begun to form, and opportunities exist for collaboration.

**Consumer Finance.** Most micro-finance institution (MFI) loans are for working capital requirements, investment credit (e.g. purchase of equipment, commercial development, purchase of goods), and consumer credit (e.g. personal loan, fast credit, school loan). Although no MFI currently provides loans for pico-solar purchases, Credit Access and First Micro-finance Agency (Première Agence de Microfinance [PAMF]) Côte d'Ivoire are planning to develop loans for productive-use appliances and equipment purchases. Mimoye Finance is an MFI dedicated to providing financing to women, although it does not currently provide loans for pico-solar.

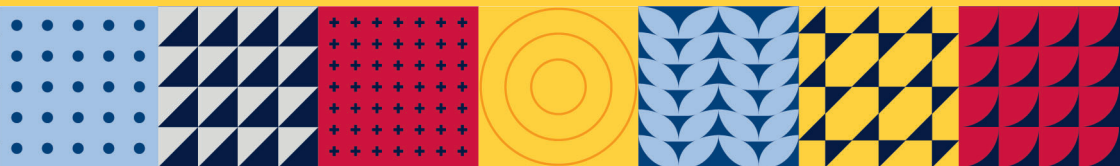
**Commercial Finance.** Commercial lending to the off-grid sector has been limited because of the infancy of the off-grid solar market in Côte d'Ivoire and the lack of experience in lending to SHS companies within the country. To bridge this gap, donors must provide a guarantee to help secure loans for off-grid solar projects and give commercial banks the necessary industry experience. Recent lending activities include the following:

- Zola EDF Côte d'Ivoire (ZECI) has secured a 15.75 billion FCFA loan from SocGen to provide initial capital to finance SHS kits for 100,000 rural households by 2020.
- The KfW Credit Institute for Reconstruction is lending \$32.9 million to Ecobank and the African Trade Insurance Agency to create a new financial instrument to support renewable energy projects of up to 50 MW throughout sub-Saharan Africa.

**Productive Use.** In Côte d'Ivoire, a variety of productive uses for off-grid solar exist (e.g. solar-powered water pumps, solar powered mills, etc.), with most SHS companies in the country focusing their efforts in the agricultural sector. The Power Africa geospatial analysis indicates that approximately 50% of households without electricity own livestock and approximately 70% own agricultural land, highlighting the importance of agriculture and the potential for productive use of off-grid solar.

## MINI-GRID

Currently, the only private mini-grids operating in Côte d'Ivoire are from development projects supported by donor agencies. However, the regulatory constraints that the mini-grid industry is experiencing in Côte d'Ivoire is expected to ease in 2020. With the expected decrease of barriers, companies are preparing for future market expansion.

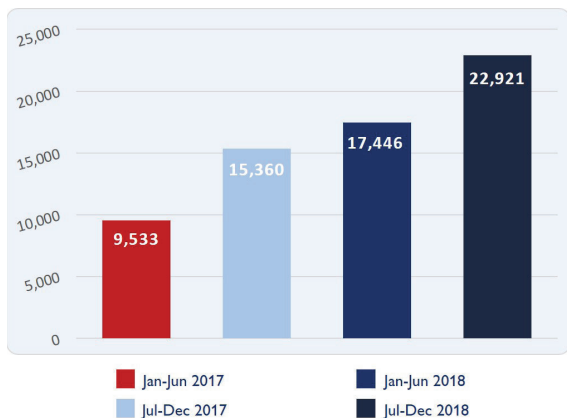


# MARKET INTELLIGENCE USING GOGLA DATA

Sales and investment data from the Global Off-Grid Lighting Association (GOGLA) provides details on the off-grid solar sector in Côte d'Ivoire. From the beginning of 2017 through the end of 2018, sales of pico and solar home system (SHS) units increased from 9,533 units in the first half of 2017 to 22,921 units in the second half of 2018.

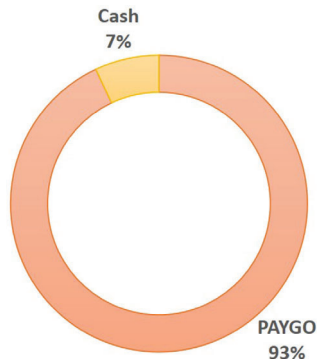
## Sales of pico/SHS units

Jan 2017 - Dec 2018



## Sales by business model

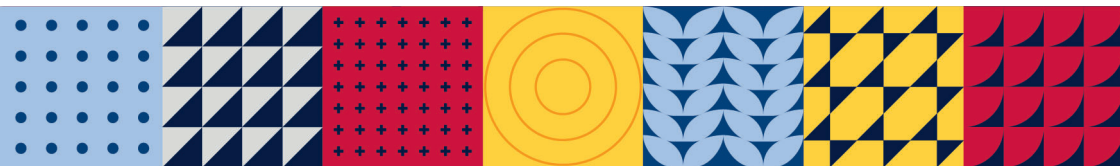
Jul-Dec 2018

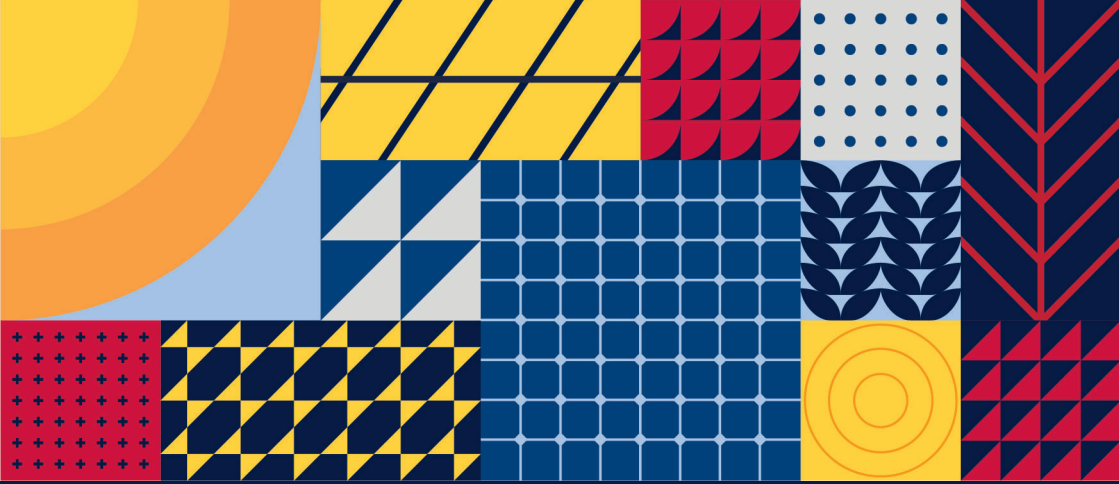


Of the units sold in the second half of 2018, 1,496 units (7%) were sold as cash-only transactions, while 21,425 units (93%) were sold on pay-as-you-go (PAYGO) basis. The success of PAYGO in Côte d'Ivoire highlights the need for consumers to be able to pay down solar assets over time. Additional funding opportunities for solar companies would allow for continued expansion of sales, thereby increasing the potential market for off-grid solar.

Following the growth in sales, 2018 was marked by a sharp increase in the number of investment transactions for West Africa. Increasing from only five transactions in 2017, to 24 in 2018 (total funding in 2018 was \$67,659,139).

Both the growth in sales and recent increase in funding are signs of a growing economy and growing off-grid solar sector. Additionally, 2018 funding was mostly by for-profit investors, indicating confidence by the private sector to invest in Côte d'Ivoire's off-grid solar sector.





*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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