

Ghana

Introduction

This note was developed by GOGLA with the support of the World Bank Group technical team and Lighting Global Program, the Energy Sector Management Assistance Program (ESMAP), the Shell Foundation, USAID, Power Africa, the UK Foreign Commonwealth & Development Office (FCDO) and Sustainable Energy for All (SEforAll). It is part of a series of briefing notes that provide a high-level overview of the status of countries' off-grid solar markets, as well as relevant policies and programs¹.

Key statistics^{2&3}

Demographics

Total Population	31,072,945
Population Density per km ²	137
GDP per Capita	USD 2,205.5
GDP Growth	0.4%

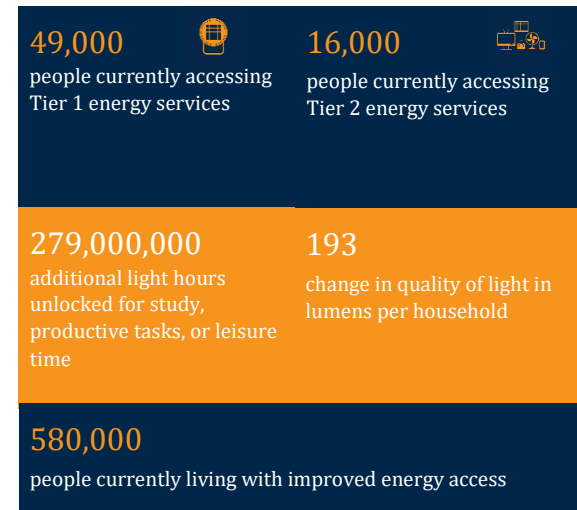
Energy Access Deficit

National Electrification Rate	83.5%
Urban Electrification Rate	93.8%
Rural Electrification Rate	70%
Number of people without access to electricity ⁴	5.02 million
% of quality-verified ⁵ (QV) vs non-QV products in the market ^{6&7} (H1, 2021)	QV: 78% Non-QV: 22%

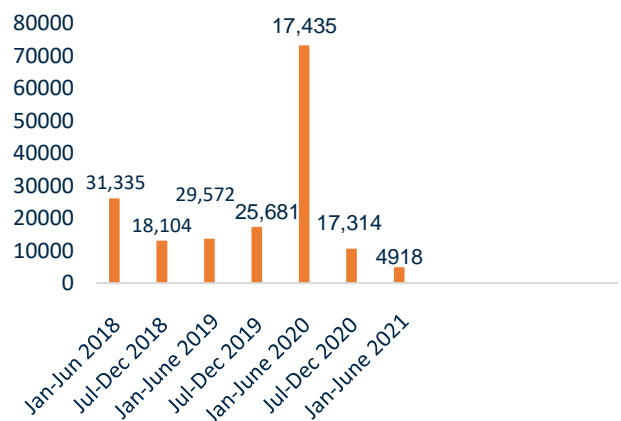
Electrification Planning

Electrification Targets ⁸	Universal access by 2025.
--------------------------------------	---------------------------

Impact⁹



Sales¹⁰



Sales of Portable Lanterns, Multi-light Systems and Solar Home Systems

¹The information and views expressed in this brief are GOGLA's alone and are based on our current understanding of the policy situation in this country. We welcome any updates, revisions, or clarifications at info@gogla.org.

² <https://data.worldbank.org/>

³ <https://www.usaid.gov/powerafrica>

⁴ <https://trackingsdg7.esmap.org/country/ghana>

⁵ Quality-verified products are tested according to the IEC TS 62257-9-8. For more information, please see the [Verasol quality assurance programme](#).

⁶ Share of quality-verified (QV) and non-QV products sold by GOGLA and Lighting Global affiliates.

⁷ Data on a specific region, country or product category is only included when it has satisfied the three-data point rule, meaning that at least three separate product manufacturers have reported data for any single data point. When we have fewer than three responses for a region, country or product category, no results are

shown to protect the proprietary interests of the companies who have supplied data in support of this industry report.

⁸ [Ghana National Electrification Scheme Target date for Universal electricity coverage pushed back](#)

⁹ Impact numbers have been estimated on the basis of the Standardized Impact Metrics for the Off-Grid Solar Energy Sector. The reported estimates differ from the previous edition of the country briefings due a change in the calculation approach. Note that while the numbers shown represent the aggregate impact of key players in the off-grid solar sector, these estimates do not present the full country impact of off-grid solar lighting products sold.

¹⁰ All sales data included in this briefing is derived from the "Global Off-Grid Solar Market Report Database", result of a joint primary data collection effort carried out by GOGLA in partnership with IFC Lighting Global and the Efficiency for Access Coalition. The public version of the resulting report of the effort is available [here](#).

Current Status

Ghana currently has one of the highest electrification rates in Africa with a national electrification rate of 83.5%. 93.8% of the urban population and 70% of the rural population have access to the grid.¹¹ The majority of the 5 million people who do not have access to electricity reside in isolated rural communities on islands in Lake Volta, on the island communities created by the Akosombo Dam in the Volta River, and in some areas in Northern Ghana.¹² Extending the national grid to these underserved islands and lakeside communities is economically and practically unfeasible, and decentralized electrification solutions such as solar home systems (SHS) and mini-grids present viable alternatives to deliver reliable energy access.

Policy, Regulation and Sector Planning

The country's Strategic National Energy Plan (SNEP) of 2019¹³ developed by the Energy Commission provides a comprehensive framework to guide policymakers to meet national energy demand, including the postponement of the universal access to electricity target from 2020 to 2025. The 2019 Renewable Energy Master Plan (REMP)¹⁴ provides the first national roadmap for the long-term development of renewable energy resources in the country, aiming to increase renewable generation capacity to about 1,360 MW by 2030. It also outlines a US\$5.6 billion investment plan, and targets the deployment of one million solar lanterns, 46,150 units of solar irrigation systems, 700 units of solar dryers and 135,000 units of solar heaters to support the achievement of universal energy access by 2025.

The 2010 Energy Policy¹⁵ acknowledges the role of off-grid solutions in renewable energy-based electrification and is governed by the Renewable Electrification Unit under the Renewable Energy Directorate of the Ministry of Energy. The government of Ghana supports public sector-driven development of off-grid electrification. Government agencies have taken the lead in deploying stand alone solar systems, solar lanterns, and mini-grids guided by deployment targets laid out in the high-level Renewable Energy Master Plan.¹⁶ The

implementation of electrification projects is typically donor funded through projects such as the African Development Bank's (AfDB) Scaling-up Renewable Energy Programme (SREP).

Promoting Quality & E-Waste Management

The Ghana Standards Authority (GSA) is the national standards body in Ghana. The GSA maintains standards catalog that lists several quality standards for solar and solar devices and ensures that imported solar home systems (SHS) comply with the local standards.¹⁷ As part of the requirement of the Energy Commission, businesses dealing in SHS are required to have their products certified.¹⁸ Lighting Africa supported the Regional Off-Grid Electricity Access Project (ROGEAP) by working with the government and the private sector to make quality-verified off-grid solar lighting and energy products more readily available in West Africa.¹⁹

The Environmental Protection Agency is the leading public body that implements and enforces environmental regulations.²⁰ E-waste in Ghana is governed by the Hazardous and Electronic Waste Control and Management Act (Act 917)²¹ and is complemented by the Legislative Instrument on Hazardous and Electronic Waste Control and Management Regulations (LI 2250). This legal framework covers the SHS sector and requires producers and private importers to register with the EPA and pay an eco-levy all for all electrical and electronic equipment imported into the country. The rates are US\$1.5 for solar lanterns and a minimum of US\$8 for SHS kits, depending on the components and appliances included in the kit. The fees are collected by an external service provider and are handled by the e-waste fund to facilitate implementation, monitoring and enforcement of the legal framework and support the formalization of informal actors, including the set-up and management of a dedicated treatment facility.²²

Taxation

The Customs Division of the Ghana Revenue Authority (GRA) is responsible for the mobilization of revenue from imports and exports including duties, VAT, and import excise.²³ The Ghana Investment Promotion Council (GIPC) then oversees the implementation of incentive schemes and assists investors in negotiating specific incentive packages

¹¹ <https://data.worldbank.org/>

¹² [Power Africa Off-Grid Project Ghana Off-Grid Solar Market Assessment, 2019](#)

¹³ Visit the [Strategic National Energy Plan II](#) for more information.

¹⁴ Visit the [Ghana Renewable Energy Master Plan](#) for more information.

¹⁵ Visit the [Ghana Energy Policy](#) for more information.

¹⁶ [Ghana Renewable Energy Master Plan](#)

¹⁷ [Ghana Standards Catalogue](#)

¹⁸ [Stand Alone Solar \(SAS\) Market Update: Ghana, 2021](#)

¹⁹ <https://www.lightingafrica.org/country/ghana/> (Lighting Africa shut down in June 2021)

²⁰ Visit the [Environmental Protection Agency](#) for more information.

²¹ [Hazardous and Electronic Waste Control Management Act 917](#)

²² [Stand Alone Solar \(SAS\) Market Update: Ghana, 2021](#)

²³ Visit the [Ghana Revenue Authority](#) for more information.

available to them such as exemptions on import duties.²⁴

Under the Renewable Energy Master Plan (REMP), the stated incentives include a tax reduction for renewable energy manufacturing and assembling firms, and import duty and VAT exemption on their materials, components, equipment, and machinery until 2025.²⁵

All off-grid solar system components benefit from VAT exemptions. Solar panels currently incur no import duty unless pre-assembled into a generating set (like SHS) in which case a 5% duty applies. Wind turbines and batteries are charged 5% and 20% import duty respectively.²⁶

Investments

There are 55 licensed private-sector solar companies in Ghana working within distribution, system integration, and import of components or appliances, offering variety of value-addition services including pay-as-you-go (PAYGo) and last mile distribution.²⁷

The Renewable Energy Master Plan outlines monetary incentives to boost private sector investment that promotes the use of renewable energy. The plan continues to create opportunities through feed-in tariffs, competitive procurement of renewable energy tenders, and purchase obligations.²⁸

Wangara Green Ventures is the first local currency climate-focused fund in Ghana. The fund is sponsored by Innohub Foundation through the Ghana Climate Venture Facility (GCVF) from the World Bank under the InfoDev Climate Technology Program. The fund invests between GHS 250,000 and GHS 2,500,000 (US\$50,000 to US\$500,000) through equity and quasi-equity instruments and provides technical assistance to portfolio companies.²⁹

PEG Africa is a PAYGo solar company that deploys and finances solar products to SMEs, and rural and peri-urban households. They have raised more than US\$50 million in funding since 2018 to continue its growth in Ghana, Côte d'Ivoire, Senegal, and Mali.³⁰

Rolls-Royce Power Systems invested in Berlin-based start-up Kowry Energy in July 2021 as part of its

support for sustainable growth and electrification in Africa. Kowry Energy has a project pipeline in Ghana of 1.8 MW of off-grid solar systems for SMEs.³¹

Industry Association

The Association of Ghana Solar Industries (AGSI) is an industry association founded in March 2006 by solar industry stakeholders in Ghana to help provide a joint forum to discuss industry issues. AGSI has 46 members ranging from solar suppliers to small-scale installers and SHS distributors, and individuals in Ghana. They champion the sector through advocacy with the relevant state agencies, technical training, and collaboration with both donors and the private sector involved in policy formulation and regulations. AGSI has actively participated in the World Bank-funded Ghana Energy Development and Access Project (GEDAP).³²

Sector Support Programs

Ghana is one of the pilot countries selected in 2015 to benefit from the Scaling-up Renewable Energy Programme (SREP) with the African Development Bank's (AfDB) as the lead multi-lateral bank managing a US\$1.5 million grant facility on behalf of the Climate Investment Fund. This is a major multi-donor initiative to leverage financial resources and catalyze private investment in renewable energy solutions. The objective of this project is to encourage sustainable public and private financing for scaling-up renewable energy mini-grids and Stand Alone Solar (SAS) systems to achieve the universal energy access targets by electrifying lakeside and island communities in Ghana, with a special focus on gender. The project aims to attract public sector investment in 55 renewable mini-grids, and private-sector investment in SAS systems to benefit 33,000 households, 1,350 schools, 500 healthcare centres, and 400 communities. This will include associated technical assistance and implementation support.³³

The Power Africa Off-Grid Programme (PAOP) provides technical assistance and targeted grant funding to support the development of Africa's off-grid SHS and mini-grid sectors. In Ghana, the program provides technical assistance to support regulatory and policy reforms, provide market intelligence and insights to investors and companies. PAOP facilitates entry of micro-grid and SHS companies into the last mile market in Northern Ghana and provides them

²⁴ Visit the [Ghana Investment Promotion Centre](#) for more information.

²⁵ Visit the [Ghana Renewable Energy Master Plan](#) for more information.

²⁶ <http://www.smartsolar-ghana.com/solar-sector-information/subsidies-for-solar-in-ghana/>

²⁷ [Stand Alone Solar \(SAS\) Market Update: Ghana, 2021](#)

²⁸ [Ghana Renewable Energy Master Plan](#)

²⁹ Visit [Wangara Green Ventures](#) for more information.

³⁰ <https://disrupt-africa.com/2021/02/17/peg-africa-has-emerged-as-the-largest-provider-of-financed-solar-water-pumps-in-west-africa/>

³¹ <https://www.afrik21.africa/en/africa-rolls-royce-invests-in-kowry-energy-s-off-grid-solar-systems/>

³² Visit the [Association of Ghana Solar Industries](#) for more information

³³ Visit [SREP Investment Plan for Ghana](#) for more information.

with business advisory and capacity building. The program also facilitates funding and technical assistance for the installation of 91 SAS systems for community-based health planning and service compounds.³⁴

The AECF is a US\$256 million private sector challenge fund that provides catalytic funding to enterprises in 24 countries in Sub-Saharan Africa including Ghana.³⁵ The REACT Household Solar Round Two (REACT HS R2) under AECF funded by the FCDO is a 5-year US\$20.8 million project running since 2018 that provides funding for companies that are commercially active or have a plan to enter the market and operate SHS in Ghana. The project stresses on gender inclusive practices in company operations (e.g., women-centered design) and 30% percent of the companies being female-owned and/or managed. Start-ups and scaling companies also receive targeted technical assistance.³⁶

In 2007 the Government of Ghana deployed the US\$220 million Ghana Energy and Development Access Project (GEDAP) which is in phase III (2014 - 2021), financed by the World Bank, the Global Environment Fund, and the Swiss Development Agency. GEDAP focused on inclusive access to renewable energy through the deployment of off-grid solar products. The GEDAP installed pilot PV mini-grid systems with a back-up generator providing electricity supply to five isolated rural communities on islands in the Volta Lake in Ghana. The five pilot mini-grids provide 24/7 electricity to about 10,000 beneficiaries. Ownership of the project's assets is vested in the Government of Ghana. The project includes subsidies to make energy more affordable. It also collaborates with local financiers like rural banks to support access to financing. The project also supports regional policy makers as they address ongoing barriers to a regional market for stand alone solar systems.³⁷

As part of the Ghanaian-German cooperation, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) has been involved in supporting Ghana in a wide range of sectors for over 30 years. Under the irrigation component of the Energising Development (EnDev) program which ended in 2019, GIZ supported small-scale farmers to access and use solar PV pumps for irrigation.³⁸ GIZ funded 40% of the solar technology for Groitai

Company Ltd, a socially focused agribusiness based in Ghana.³⁹ GIZ also partnered with the University for Development Studies (UDS) in 2021 through a funding agreement to train technicians, installers, and agricultural extension agents to effectively service solar-powered irrigation system for farmers to enhance food production. The funds were allocated under GIZ-Ghana's Green People's Energy project. This initiative formed part of the Green People's Energy project being implemented by the GIZ to build beneficiaries capacities in solar pumping and irrigation systems.⁴⁰

Opportunities and Barriers

The government of Ghana's policy on off-grid electrification supports public sector-driven development. Policy limitations on private sector participations affect the mini-grids sector because all mini-grids must be government-owned with private sector participation limited to an EPC role.⁴¹ Similarly, the Local Content and Local Participation Regulation of 2017 implemented by the Energy Commission requires companies operating in Ghana's energy sector to have at least 51% local ownership and incorporate at least 60% local material or goods into their products by 2025.⁴² This intends to promote Ghana as a regional manufacturing hub by building local capital, expertise, and material throughout the energy product supply chain. However, the prohibition on equity transfers has a negative impact on the attractiveness of Ghanaian power projects to foreign investors.

Investment in renewable energy development in Ghana faces considerable financing challenges and conditions such as high commercial interest rates, limited tenor loans, high inflation, and currency depreciation. The current interest rate on loans ranges between 25% and 30%, but most commercial banks considering clean energy lending impose short tenure loans with an interest rate above 40%.⁴³ Stanbic Bank, Ecobank Ghana, Fidelity Bank, and CalBank have supply chain financing available to the SAS sector.⁴⁴ Currency depreciation increases foreign exchange risk given that the debt offered to renewable energy companies is often U.S. dollars.

SHS companies operating in Ghana experience a lack of clarity in the application of import tariffs, one of

³⁴ Visit the [Power-Africa Off-Grid Programme \(PAOP\) Ghana Fact Sheet](#) for more information.

³⁵ Visit the [AECF](#) for more information.

³⁶ Visit [REACT Household Solar Programme](#) for more information.

³⁷ Visit the [Ghana: Energy Development and Access Project](#) for more information

³⁸ <https://endev.info/13-years-of-impact-in-ghana/>

³⁹ Solar Photovoltaic Technology for Small-scale Irrigation in Ghana: Suitability Mapping and Business Models. July 2021.

⁴⁰ Visit [Green People's Energy](#) for more information.

⁴¹ [Power Africa Off-Grid Project Ghana Off-Grid Solar Market Assessment, 2019](#)

⁴² [Local Content and Local Participation Regulations, 2017](#)

⁴³ [Stand Alone Solar \(SAS\) Market Update: Ghana](#)

⁴⁴ [Stand Alone Solar \(SAS\) Market Update: Ghana](#)

AGSI's advocacy priorities.⁴⁵ Two tariff regimes prevail in Ghana, tariffs set by the Economic Community of West African States (ECOWAS)⁴⁶ and GRA tariffs⁴⁷. For the most part, the two tariff regimes are aligned, with ECOWAS providing the underlying policy and the GRA generating additional tariffs specific to Ghana. However, their policies around product categorization and naming conventions for SHS are not aligned and duties, VAT, and other fees are applied inconsistently.⁴⁸

Further Information

- Renewables Readiness Assessment: Ghana', International Renewable Energy Agency, November 2015, <https://www.irena.org/publications/2015/Nov/Renewables-Readiness-Assessment-Ghana>,
- Philip Kyeremanteng, 'The role of Solar Energy in Ghana Energy Security and Climate change', Modern Ghana, March 2021, <https://www.modernghana.com/news/1065806/the-role-of-solar-energy-in-ghana-energy-security.html>
- United Nations Economic Commission for Africa, 'Regulatory review of the electricity market in Ghana: towards crowding-in private sector investment' 2021, <https://repository.uneca.org/ds2/stream/?#/documents/46d99b98-b97c-43d1-9c1d-bc1b7e3234eb/page/1>

⁴⁵ [Power Africa Off-Grid Project Ghana Off-Grid Solar Market Assessment, 2019](#)

⁴⁶ Visit the [ECOWAS Community Customs Code](#) for more information.

⁴⁷ <https://gra.gov.gh/customs/>

⁴⁸ [Power Africa Off-Grid Project Ghana Off-Grid Solar Market Assessment, 2019](#)