

Zambia

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), Africa Clean Energy Technical Assistance Facility (ACE-TAF) 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	18,383,956
Population Density per km ²	25
GDP per Capita	USD 985.1
GDP Growth	-2.8%

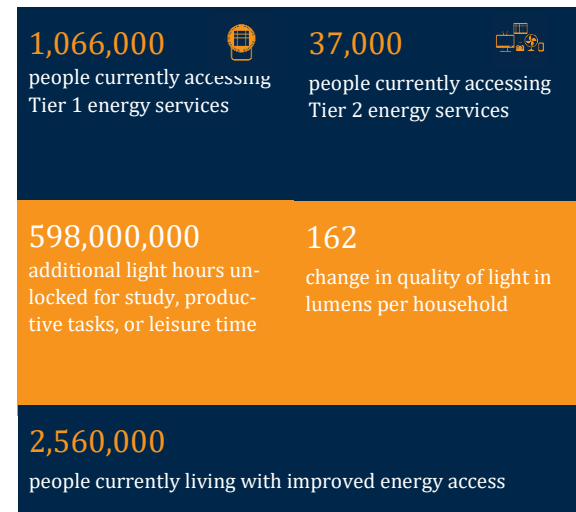
Energy Access Deficit

National Electrification Rate	43%
Urban Electrification Rate	79.9%
Rural Electrification Rate	13.9%
Number of people without access to electricity ⁴	10.18 million
% of quality-verified ⁵ (QV) vs non-QV products in the market ^{6&7} (H1, 2021)	QV: 85% Non-QV: 15%

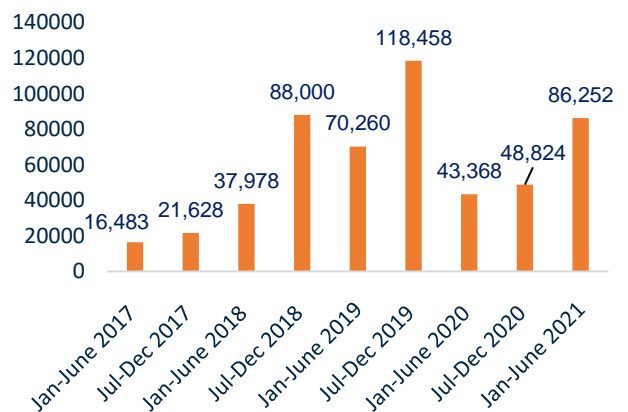
Electrification Planning

Electrification Targets ⁸	Universal access by 2030
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Impact⁹



Sales¹⁰



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

¹ The 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/country/zambia>

³ <https://www.usaid.gov/powerafrica>

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

⁵ Quality-verified products are tested according to the Lighting Global Quality Standards. For more information please see the [Lighting Global Quality Assurance Program](#). Quality-verified products are tested according to the IEC TS 62257-9-8. For more information, please see the Verasol quality assurance programme (<https://verasol.org/>)

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 [Vision 2030, Republic of Zambia](#)

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

Zambia's national electrification rate is 43% with only 13.9% of the rural population having access to electricity.¹¹ Zambia's population is highly dispersed in rural areas.¹² This makes remote expansion of the national utility grid to rural areas both economically and technically unfeasible for the government and the private sector. Decentralized energy solutions including off-grid energy are critical in the efforts already undertaken by the Zambian government, to achieve its official target of universal access to energy by 2030 with an aim to deploy 500 MW of solar PV by 2023.¹³

Rural Zambia has a higher concentration of off-grid solar devices with 87.2% of rural households who have access using it as their primary source of energy.¹⁴ Solar lanterns are the most popular off-grid solar solution, followed by rechargeable batteries and Stand Alone Solar systems.¹⁵

Policy, Regulation and Sector Planning

The Rural Electrification Authority (REA) is mandated by the government of Zambia to facilitate the increase of access to electricity in rural areas to 51% by the year 2030 guided by the Rural Electrification Master Plan (REMP).¹⁶ The REMP has identified 1,217 rural growth centers throughout the country as targets for electrification between 2008 to 2030. This includes the installation of solar home systems at a total cost of US\$1.1 billion.

The off-grid solar market has grown in recent years. This is due to regulatory reforms that have enabled private investment in the sector, such as the Renewable Energy Feed-In Tariff Strategy (2017)¹⁷ which accelerates private investments in small- and medium-sized renewable energy projects of up to 20 MW. In February 2020, to improve the economic environment, the National Energy Policy¹⁸ was introduced by the Ministry of Energy with the support of the European Union under the Increased Access to Electricity and Renewable Energy Production (IAEREP) program, to promote the scaling up of clean energy technologies and construct Stand Alone Solar power systems (i.e., solar home systems and mini-grids) between 2020 to 2025.¹⁹

Promoting Quality & E-Waste Management

The Zambia Bureau of Standards (ZABS)²⁰ is the statutory national standards body for Zambia and is responsible for standards formulation, quality control, quality assurance, import and export quality inspection, and certification. The Energy Regulatory Board (ERB)²¹ began operations in 1996 as an independent regulator and develops technical standards in conjunction with ZABS. In 2017 the ERB revised the regulations related to imports of solar components. The current license required to import and install off-grid solar systems is the 'License for the Manufacturing, Wholesale Importation, and Installation of Solar Energy Systems'.²²

In collaboration with ZABS and the Zambia Revenue Authority, only companies licensed by the ERB are allowed to import VAT exempt and duty-free solar products. The licensed companies must then meet the quality standards set by ZABS by obtaining a quality certification from the manufacturer and should specify that their product is certified by the standards bureau of the country of origin.

By June 2021, ZABS and Energy Regulation Board (ERB) supported by ACE TAF (Africa Clean Energy Technical Assistance Facility) adopted and gazetted the International Electrotechnical Commission (IEC) 62257-9-5 and 62257-9-8 Standards for both pico-solar systems, and solar home system (SHS) kits.²³

The Zambian Bureau of Standards (ZABS) and Zambia Information and Communications Technology Authority (ZICTA)²⁴ are leading the adoption of e-waste standards with 11 proposed standards, of which four have been adopted.²⁵ The Extended Producer Responsibility (EPR) Statutory Instrument No.65 of 2018²⁶ is a legally binding piece of legislation that regulates e-waste in Zambia. Stand Alone Solar systems are within the scope of responsibility. This extends the responsibility of the producer to the post-consumer stage of the product lifecycle. Therefore, in practice, off-grid solar companies have a legal responsibility to develop an EPR strategy – requiring both manufacturers and importers to take back and recycle the products placed in the national markets. This is still in its infancy.

¹¹ <https://data.worldbank.org/>

¹² <https://data.worldbank.org/>

¹³ <https://www.pv-magazine.com/2021/03/10/first-ppa-linked-solar-park-in-zambia/>

¹⁴ [Mapping the Off-Grid Solar Market in Zambia, Signify – November 2020](#)

¹⁵ [Mapping the Off-Grid Solar Market in Zambia, Signify– November 2020](#)

¹⁶ [Rural Electrification Master Plan](#)

¹⁷ [The Renewable Energy Feed-In Tariff Strategy](#)

¹⁸ [The National Energy Policy, 2019](#)

¹⁹ Visit [the IAEREP programme](#) for more information.

²⁰ Visit [the Zambia Bureau of Standards](#) for more information.

²¹ Visit [the Energy Regulatory Board](#) for more information.

²² [License for the Manufacturing, Wholesale Importation, and Installation of Solar Energy Systems](#)

²³ <https://www.ace-taf.org/standards-adoption-a-critical-first-step/>

²⁴ Visit [the Zambia Information and Communications Technology Authority](#) for more information.

²⁵ [Stand Alone Solar \(SAS\) Market Update Zambia - March 2021](#)

²⁶ [Statutory Instrument No 65 on Extended Producer Responsibility Regulations](#)

E-waste materials are usually sent to South Africa or Namibia (via NamiGreen) for recycling. The first Zambian Electronic Waste Recycling Company, TCH E-Waste Zambia in collaboration with the European Union Commission was launched in October 2019. It is one of the most promising recycling facilities, founded by the South African E-waste recycler (AST). It is currently the only company licensed by the Zambia Environmental Management Agency (ZEMA) and is looking to obtain international certification.²⁷

Taxation

Solar and battery technologies are exempt from import duties and are zero-rated for VAT since 2008, formalized by the enactment of two statutory instruments. The Value Added Tax (VAT) Zero-rating (Amendment) Order Statutory Instrument No. 88 of 2019²⁸ which came into effect in 2020, also zero-rates energy-saving appliances, machinery, and equipment.

The government, with support from ACE-TAF, is currently reviewing and updating Statutory Instruments 32: the Custom and Excise Act and 33: the VAT Act enacted in 2008, relating to energy-saving appliances, machinery, and equipment.²⁹ There is also a call for updated and clearly enforceable statutory instruments to prevent the inconsistent taxation at various points of entry.

Investments

Private sector, international and local financing is stymied due to a number of reasons including fiscal weakness; legal and regulatory framework provisions that restrain mobilization of capital (planning, procurement, licensing, energy efficiency, rural electrification, etc.).³⁰

Many local lending institutions are still not very conversant with the renewable energy market and are hesitant, resulting in a lack of available and affordable working capital. COVID-19 also negatively impacted the banking sector, with interest rates standing 8% higher than the 6 to 8% medium term target as of August 2020. The Kwacha also rapidly depreciated in value by 31.5% between March and September 2020.³¹

Despite this, the financial sector has managed to raise funds in response to COVID-19, notably through the support of the World Bank (US\$2.5 million), and the

Bank of Zambia's ZMW10 billion (US\$500 million) Targeted Medium-Term Refinancing Facility, to lend specifically to micro, small, and medium enterprises (MSMEs), including renewable energy players.³² Other funding available to the Zambian Stand Alone Solar sector includes that from the Bank of China, German Development Bank (KfW), Beyond the Grid Fund for Zambia (BGFZ), African Development Bank, Electrifi, and Infracore Africa.³³

The Energy Regulation Board maintains an off-grid technology focused portal with access to information about licensing and permitting processes, financing options and available geospatial data.³⁴

Industry Associations

The Solar Industry Association of Zambia (SIAZ) began operations in 2019 and has 40 registered solar companies.³⁵ SIAZ works with the government and other stakeholders to develop policies and regulations that enable and grow the solar industry and promote best industry practice among its members. In July 2021 SIAZ signed a MoU with the Alliance for Rural Electrification (ARE). The MoU sets out the shared goals of the two organizations to support the transition to renewable energy sources including joint advocacy to create a sustainable decentralized solar energy market.³⁶ SIAZ is also working closely with the Ministry of Energy, the Off-grid Taskforce Secretariat, and the Ministry of Finance to improve regulations and tariffs in the country.³⁷

The Zambia Renewable Energy Agency (ZARENA) is an interest group for renewable energy stakeholders in Zambia. ZARENA's mission is to promote and advocate for the increased use of renewable energy by developing an effective network of members and stakeholders, emphasizing the need for quality and best practice throughout the sector. The main aim is the proliferation of sustainable energy, to be achieved through improvements in the regulatory frameworks for renewable energy and in the transfer of renewable energy technology.³⁸

Sector Support Programs

In 2019, the government of Zambia received a grant from the African Development Bank (AfDB) to finance the Zambia Renewable Energy Financing Framework. This initiative which is currently under implementation aims to support the Government of Zambia's Re-

²⁷ Visit [TCH E-Waste](#) for more information.

²⁸ [Statutory Instrument No 88 of 2019 The Value Added Tax \(Zero Rating\) \(Amendment\) Order](#)

²⁹ [Stand Alone Solar \(SAS\) Market Update Zambia - March 2021](#)

³⁰ [Country Orientation Paper: The Africa Energy Marketplace, African Development Bank, 2018](#)

³¹ [Stand Alone Solar \(SAS\) Market Update Zambia - March 2021](#)

³² [Stand Alone Solar \(SAS\) Market Update Zambia - March 2021](#)

³³ [Stand Alone Solar \(SAS\) Market Update Zambia - March 2021](#)

³⁴ Visit [Zambia Off-Grid Electricity Portal](#) for more information.

³⁵ [Stand Alone Solar \(SAS\) Market Update Zambia - March 2021](#)

³⁶ <https://www.ruralelec.org/news-from-are/are-siaz-sign-mou-accelerate-achievement-energy-access-objectives-zambia>

³⁷ [Power Africa Southern Africa Energy Program Year 4 Work Plan, 2021](#)

³⁸ Visit [ZARENA](#) for more information.

renewable Energy Feed-in Tariff (REFIT) policy to develop 100 MW of renewable projects, mostly solar power, through long-tenor project loans. The project is estimated to be completed in February 2025.³⁹ The total funding for the initiative amounts to US\$154 million.

The USAID Southern Africa Energy Program (SAEP), a Power Africa initiative, works to advance energy policy and regulatory reform and accelerate investment to increase power generation and access to electricity throughout Southern Africa. In collaboration with the Zambian Ministry of Energy and Rural Electrification Authority (REA), SAEP developed a geospatial model to serve as the basis for Zambia's new electrification strategy, with an emphasis on off-grid solutions.⁴⁰

Beyond the Grid Fund for Zambia (BGFZ), a multi-year program funded by Sweden, and designed by Sida and REEEP aims to reach at least one million Zambians who are not connected to the national grid with clean renewable energy services by 2021. As of September 2019, the contracted companies had connected over 145,000 households, translating to 750,000 people in all provinces of Zambia. The program's success to date led Sida to expand it to Burkina Faso, Liberia and Mozambique, and to create an additional funding cycle for Zambia under The Beyond the Grid Fund for Africa (BGFA) set-up in 2019.⁴¹ BGFA has invested over €17 million in Zambia.

The Electricity Services Access Project (ESAP) is a five-year World Bank-funded project with total funding worth US\$36.8 million. The project aims to increase access to off-grid electricity services in rural areas through the active participation of private sector energy service providers (ESPs) in developing, financing, and implementing viable renewable-energy-based business models to provide rural electrification services in Zambia.⁴² ESAP was launched in 2017 and is scheduled to end in August 2022.

Under the Foreign, Commonwealth and Development Office (FCDO), the Africa Clean Energy Technical Assistance Facility (ACE-TAF) has been pivotal in providing targeted support to enable a suitable environment for private sector delivery of access to energy through stand-alone solar systems. In Zambia, ACE-TAF has enabled enterprise finance, and has tested innovative approaches to stimulate private sector investment and market development.⁴³ ACE-

TAF developed the Off Grid Solar Publicity and Information Dissemination Strategy for the Rural Electrification Authority⁴⁴ which was launched by the Ministry of Energy in July 2021. This is to be implemented by REA and other players in the solar energy space to accelerate and promote the uptake of off-grid solar solutions in Zambia. ACE-TAF, the World Resources Institute (WRI) and other stakeholders also supported the Government of Zambia to develop the Energy Access Explorer (EAE)⁴⁵ which was launched in October 2021. This is an online, open-source, interactive, geospatial platform that enables evidence-based integrated energy planning and identifies high priority areas where energy access can be expanded.

The Mobilising Renewable Energy Investments Programme by GET.invest implemented by GIZ is also active in Zambia and supports investments in decentralized renewable energy projects. Currently, they offer extensive market insights that enable access to finance, support industry associations, and help regulators implement regulatory processes for private investments.⁴⁶

Opportunities and Barriers

Given a national electrification rate of 43% and more than 7.2 million un-electrified households, there is a tremendous market opportunity for off-grid solar solutions. The market opportunity for off-grid solutions is estimated at US\$234 million.⁴⁷

The relatively small size of the off-grid market and poor affordability among end-users makes the Zambian market less attractive for investors. Limited penetration of mobile money usage requires off-grid solar providers to invest in increasing consumer awareness of digital finance, explore non-mobile money enabled PAYGo models, or consider a dual strategy

Incoming developers and investors should be prepared to adapt business models to accommodate Zambia's low population density, an underdeveloped mobile money ecosystem, a developing regulatory regime, and a rapidly changing competitive landscape.⁴⁸ The depreciation rate of the Kwacha is also a critical barrier.

Affordability of off-grid products is also problematic for the off-grid solar industry in Zambia. Customers' ability to pay is low and there is a lack of comprehen-

³⁹ Visit [Green Climate Fund](#) for more information.

⁴⁰ Visit [Power Africa Zambia](#) for more information.

⁴¹ [Reducing Energy Poverty: Beyond The Grid Zambia, Oxfam, 2021](#)

⁴² Visit the [Electricity Supply Access Project](#) for more information.

⁴³ Visit [ACE-TAF Zambia](#) for more information.

⁴⁴ [OGS Publicity and Information Dissemination Strategy](#)

⁴⁵ [Energy Access Explorer](#)

⁴⁶ Visit [Get.invest Zambia Market Information](#) for more information.

⁴⁷ [Mapping the Off-Grid Solar Market in Zambia, Signify- November 2020](#)

⁴⁸ [Stand-alone Solar Businesses in Zambia, RECP, 2018](#)

sive external fiscal incentives that would allow companies to reduce prices for end-users and improve their ability to reach last mile customers.

Further Information

- [The Case for Border Taxation Exemptions and Harmonising Product Classification for Off-Grid Solar in SADC, Kuungana Advisory and Greencroft Economics, 2021](#)
- [Regulatory review of the electricity market in Zambia: towards crowding-in private sector investment, United Nations Economic Commission for Africa, 2021](#)
- [Power Africa Zambia Fact Sheet, 2021](#)
- [Tracking SDG7: The Energy Progress Report: Zambia](#)
- [Stand Alone Solar \(SAS\) Market Update Zambia - March 2021](#)
- [E-waste Management Recommendations for BGFA Programme, Sofies, 2020](#)
- [Mapping the Off-Grid Solar Market in Zambia, Signify- November 2020](#)
- [Regulatory Indicators for Sustainable Energy \(RISE\): Zambia](#)
- [Zambia Revenue Authority](#)
- [ESMAP: Renewable Energy Resource Mapping in Zambia](#)