

THE STATE OF SOLAR ENERGY IN AFRICA

Trends, constraints, and pathways for scaling solar



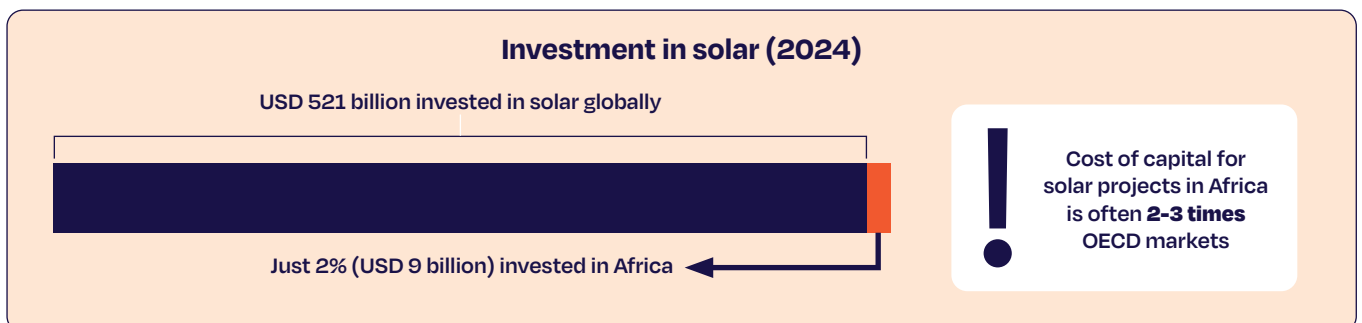
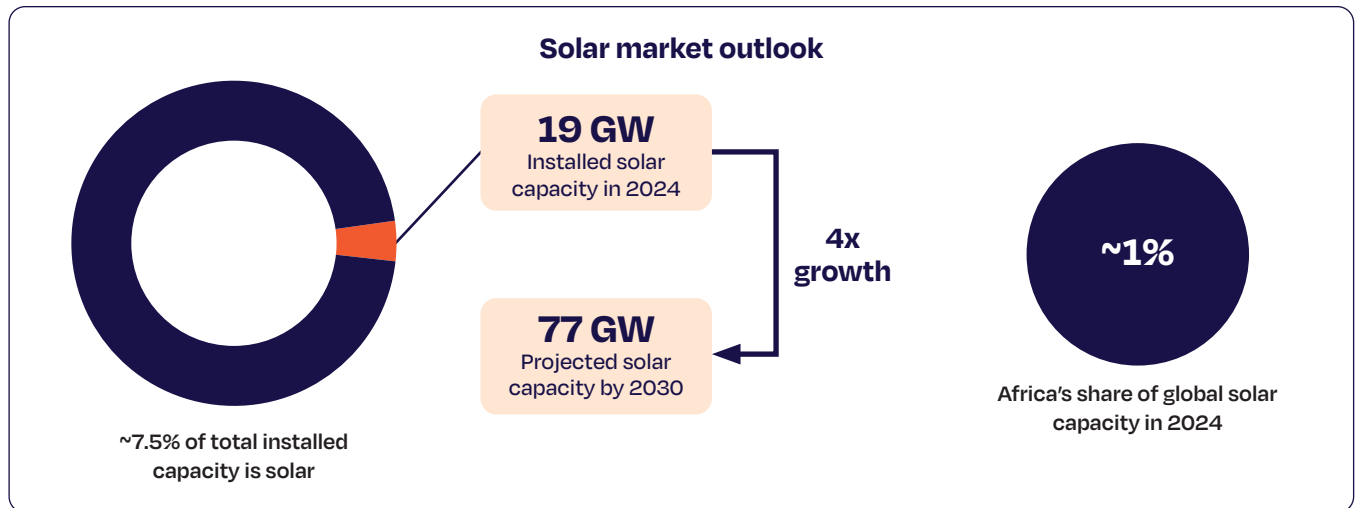
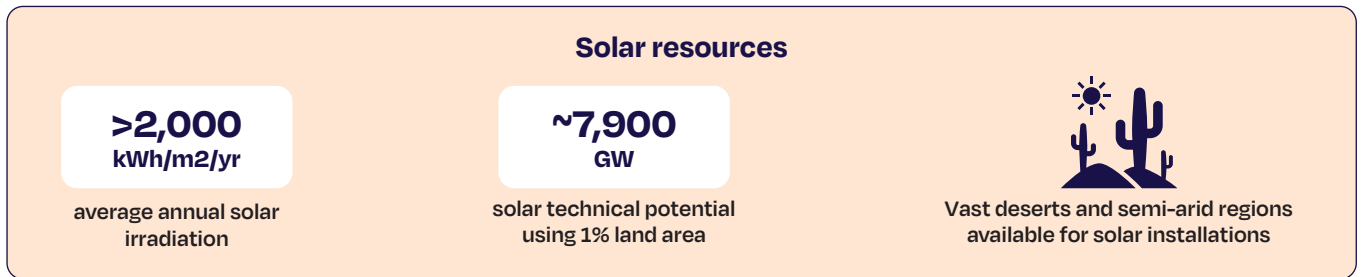
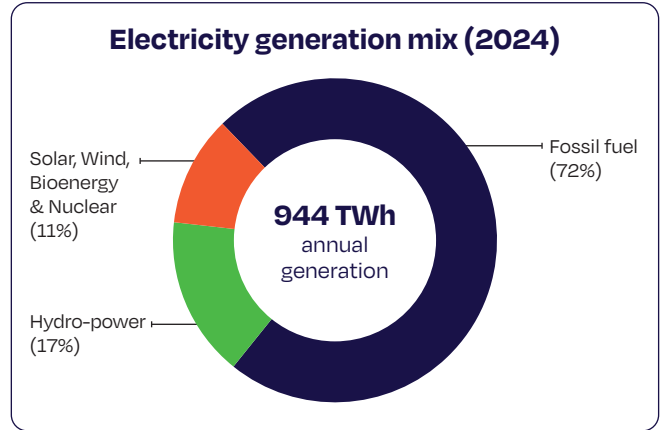
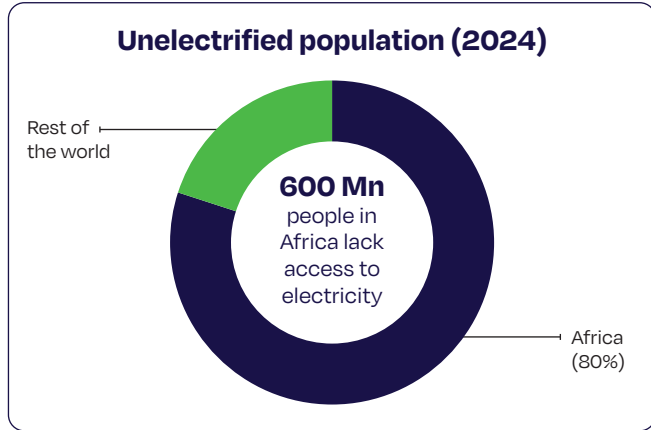
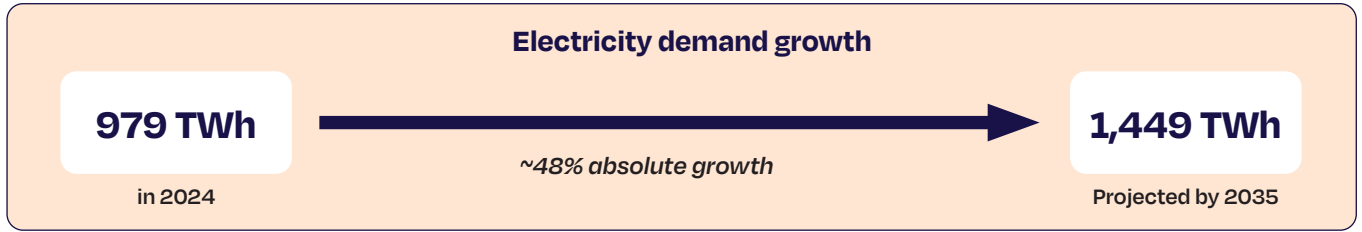
ISA Knowledge Series: Factsheets and Insights

April 2026



Africa's Energy & Solar Data Dashboard

Key baseline indicators to contextualize Africa's solar landscape



Purpose & Scope

While solar power has become one of the fastest-growing energy sources worldwide, its adoption in Africa remains at a comparatively early stage, shaped by unique demographic dynamics, infrastructure constraints, and financing conditions. Against this global backdrop, Africa stands out for its exceptional solar resource potential and the strategic opportunity it holds to accelerate renewable energy deployment as part of a sustainable, long-term development pathway.

The objective of this factsheet is to outline the continent's evolving energy landscape, highlight overarching trends influencing solar adoption, and present an integrated view of the opportunities and challenges shaping market growth. It aims to support policymakers, investors, and other stakeholders with a concise understanding of how solar energy can contribute to strengthening energy security, expanding electricity access, and driving inclusive socio-economic progress across the region.

This factsheet builds on insights from ISA's flagship report, "Global Solar Trends and Outlook 2025" and examines the role solar power can play in addressing Africa's energy challenges while unlocking new opportunities for sustainable growth.

Key Insights



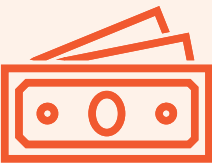
Africa's Power Needs Are Outpacing Supply

Africa's electricity demand is projected to increase from 979 TWh in 2024 to around 1,449 TWh by 2035, reflecting population growth, urbanisation, and expanding economic activity. Meeting this surge will require substantial new capacity additions. Yet with fossil fuels still dominant, balancing reliability and energy diversification remains a challenge for many African countries.



The World's Richest Solar Resource, Barely Tapped

Africa's strong solar resource potential, often exceeding 2,000 kWh/kW-peak annually, makes it well-suited for both large-scale and distributed solar deployments. This abundance enables significant expansion of electricity supply, which can be effectively deployed through utility-scale projects as well as decentralized systems for remote and underserved communities.



The Financing Gap: \$9 Billion in a \$521 Billion Market

Global solar capacity has grown rapidly, with investments reaching about USD 521 billion in 2024. Yet, Africa captures only around 2% of this total, reflecting a significant gap between its strong solar potential and actual deployment. High financing costs, infrastructure constraints, and perceived market risks continue to constrain investment across many African countries.



From 19 GW to 77 GW: Solar's Path to Dominance

In 2024, solar represented a relatively small share of Africa's power mix, but is set to grow rapidly. The continent's installed solar capacity is on track to quadruple by 2030, surpassing hydropower capacity. Ongoing renewable energy programs and procurement processes are accelerating this scale-up, positioning solar as a major contributor to Africa's future electricity demand.

Solar on the Global Stage

The global energy system is shifting, and solar power, enabled by tech advances, cost declines, and policy support, has become a key driver of the clean-energy transition.

548 GW

Global solar capacity added in 2024

USD 521 bn

Global solar investment in 2024

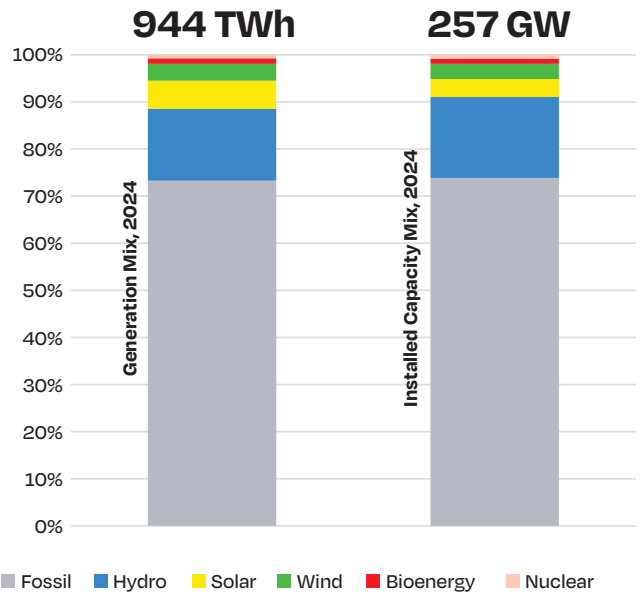
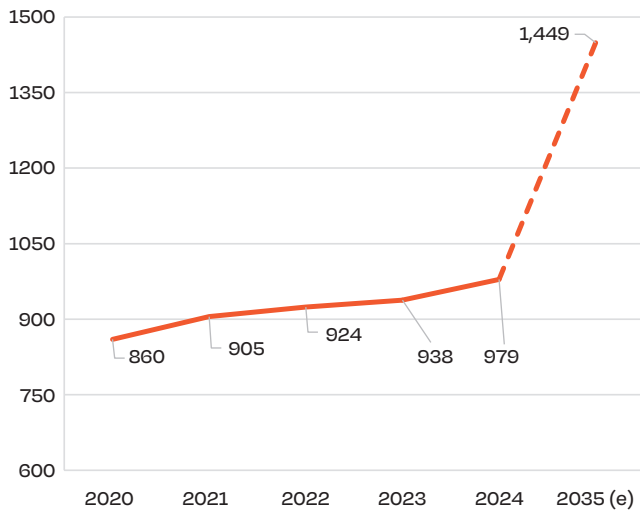
However, this growth has been uneven across regions, with some parts of the world capturing only a small share of global solar deployment. Unlocking this potential could strengthen sustainable energy systems, improve electricity access, and enhance overall energy security.

Rising populations, rapid urbanisation and faster economic growth will drive a sharp increase in global power demand, necessitating significant new capacity. Solar provides a scalable, pragmatic solution that also supports long-term development and climate objectives.

Africa's Electricity Landscape

Africa's Power System: Demand, Generation & Capacity

Total electricity demand (TWh), 2020-2035



Demand for electricity is projected to grow significantly, reaching 1,449 TWh by 2035. However, growth of renewable generation has been slow in Africa compared with global trends, increasing just around 40% over the past decade.

This trend is set to change, with renewable generation projected to grow by more than 250% over the next decade, driven primarily by falling module costs, competitive procurement frameworks, and momentum from the COP28 pledge to triple global renewable capacity by 2030.

The above chart illustrates that **fossil fuels dominated the electricity sector in 2024**, making up almost three-quarters of installed generation capacity as well as overall electricity production.

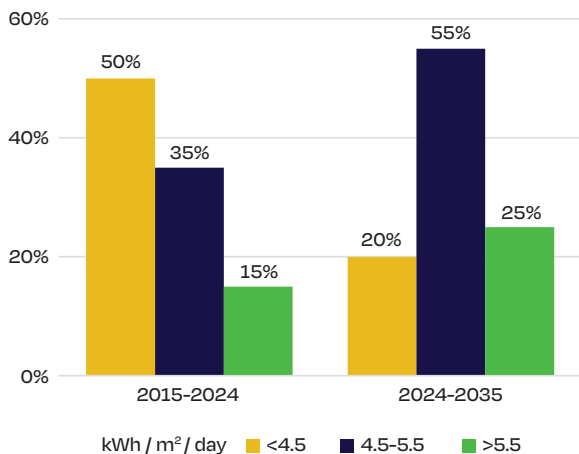
Among renewables, hydropower takes the lead, exhibiting stronger utilization than other sources. **Solar and wind lag behind**, with a combined share of about 10% of Africa's capacity mix.

Source: Energy Institute, EMBER, IEA

Solar as a Solution to Africa's Growing Electricity Demand

Demand is Rising Fastest Where the Sun Shines Most

Global energy consumption growth by solar irradiation level, 2015-2035



As populations grow and economies expand, electricity demand across Africa is rising rapidly. Meeting this growing demand will require significant upgrades to power generation and grid infrastructure.

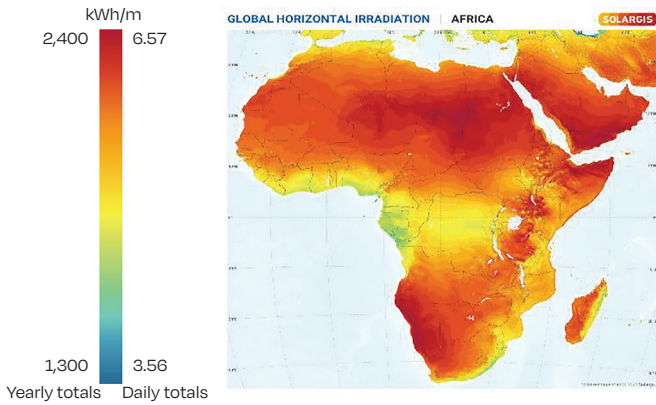
By 2035, areas receiving more than 4.5 kWh/m²/day of solar irradiation are projected to drive nearly 80% of global energy demand growth, with electricity accounting for about 35% of that increase. **As much of the African continent lies in high solar irradiation zone, demand is expected to grow the strongest in this region.**

Rising temperatures and urbanization are also increasing demand for cooling. In regions such as Africa, cooling is expected to contribute roughly 20% of electricity-demand growth by 2035.

Source: IEA World Energy Outlook 2025

Despite this demand, Africa's exceptional solar potential offers a scalable and sustainable pathway to meet future energy needs while supporting long-term development.

Africa's Solar Advantage



>2,000 kWh/m²/year

is the average GHI across much of Africa, making it one of the most solar-rich regions in the world

- Africa's strong solar irradiation supports high electricity generation. In many countries, solar installations can produce over 5 kWh/kWp per day, equivalent to more than 2,000 kWh/kWp annually.
- Solar remains viable even in regions with moderate resources. Areas such as Central Africa can achieve over 1,400 kWh/kWp annually, making solar deployment feasible across most parts of the continent.
- Abundant land enables large-scale solar deployment. Vast desert and semi-arid regions in Africa provide significant opportunities to scale utility-scale solar projects.



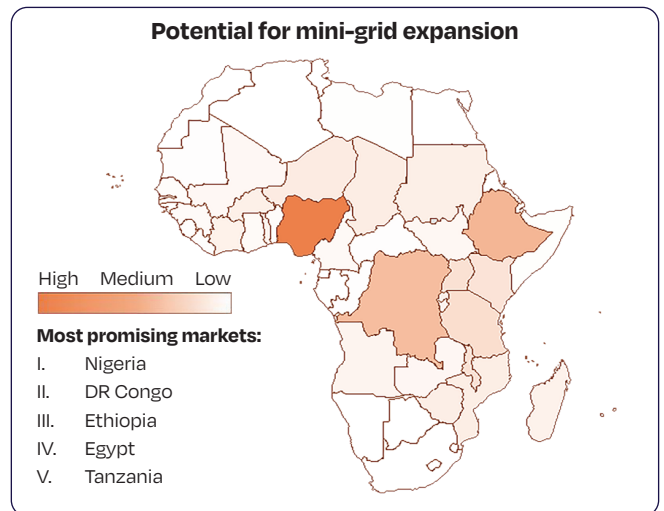
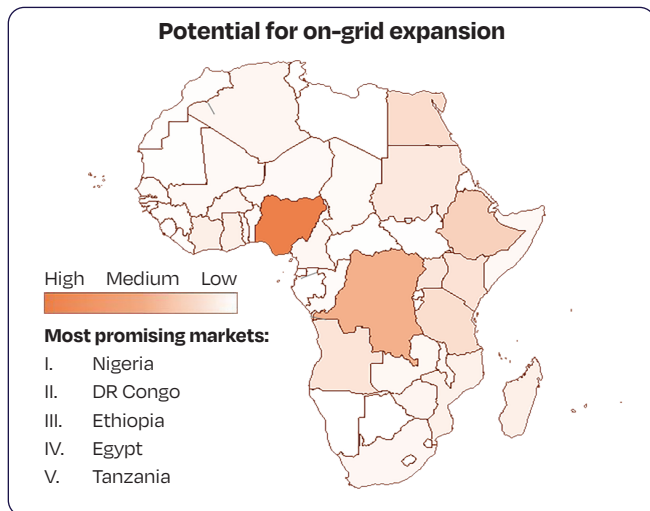
Africa has an estimated solar technical potential of about 7,900 GW, using just 1% of its land area.

Source: IRENA Renewable Energy Market Analysis

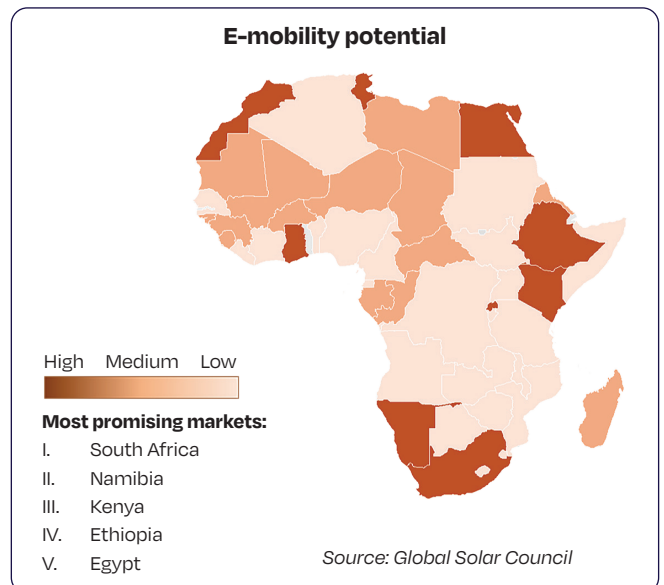
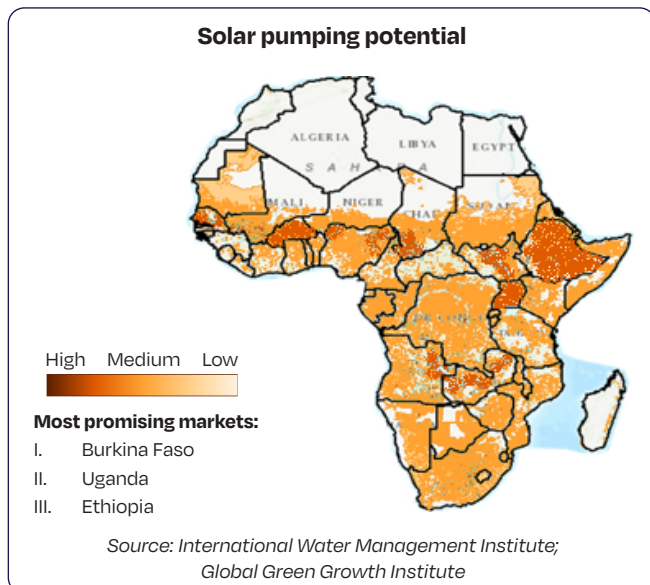
Source: Global Solar Atlas

Solar Application Potential in Africa

The maps below highlight market potential for four solar applications across African countries. While market potential drives the view, it also implicitly reflects investment attractiveness and technical suitability, offering a practical guide to near-term opportunities.

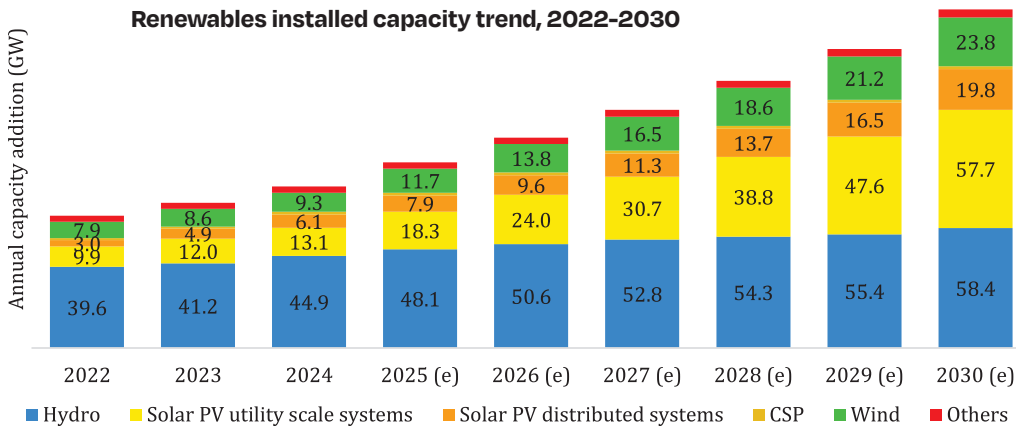


Source: Estimating investment needs for the power sector in Africa 2023-2030 Report (AfDB).



Note: The above maps are not to scale.

Solar in Africa: Current Capacity and Growth Outlook



Distributed solar made up 32% of Africa's 2024 additions, close to the 40% global share.

Yet, volumes are still far short of serving the 600 million without electricity. Scaling decentralised solar is thus critical for rural electrification, especially in LDCs.

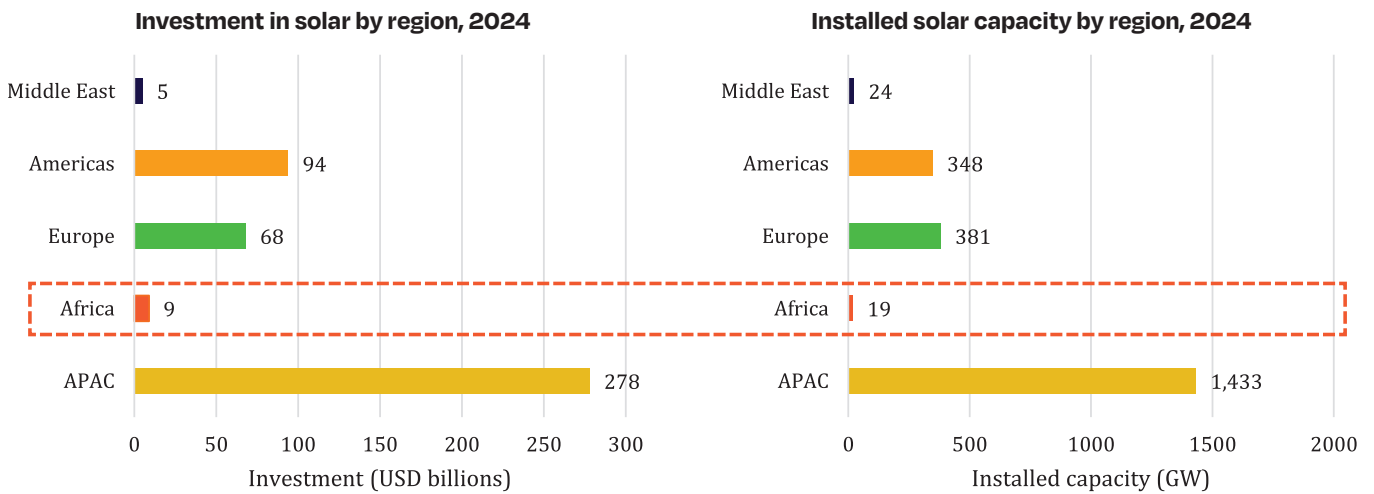
Source: ISA Global Solar Trends & Outlook 2025; IEA Renewables 2025

Globally, solar is projected to be the fastest-growing energy source through 2030.

As of 2024, Africa had ~19 GW of installed solar capacity, compared with ~45 GW of hydropower. **By 2030, solar contribution is expected to surpass hydropower with a 4x growth to reach ~77 GW of installed capacity**, while hydropower is projected at 58.4 GW.

Investment Gap and Priority Solar Markets

Investment & Installed Capacity: Africa in the Global Mix



With global solar finance still concentrated in mature-policy markets, Africa captures only a small share of total investment, reflecting the broader uneven global financing distribution. This underinvestment translates directly into limited installed capacity, with Africa contributing roughly **1% of the global total**.

While financing costs in Africa are higher than OECD markets due to perceived risks, the continent's strong solar resource potential and improving policy and regulatory environments help offset this gap. As a result, capital efficiency, in terms of capacity deployed per dollar, can be closer to global benchmarks than headline financing costs suggest, indicating a compelling opportunity for investors as market conditions continue to improve.

Source: ISA Global Solar Trends & Outlook 2025; Wood Mackenzie Global Solar PV Market Outlook, 2025; IEA World Investment Outlook 2025

Investment, coupled with Africa's macro fundamentals - demographics, urbanisation, growth and credit risks, defines the runway for demand expansion and bankable project pipelines.

Assessing Solar Market Readiness in Africa

The **Ease of Doing Solar (EoDS) 2025** report is ISA's flagship tool that serves as a comprehensive benchmark for assessing the solar readiness of countries worldwide. It evaluates Member Countries across seven drivers - macroeconomy, policy enablers, technological feasibility, market maturity, infrastructure, financing, and energy investments - using 19 key parameters directly related to the solar sector, followed by parameters reflecting the power & utilities ecosystem and overarching macroeconomic conditions. Countries are benchmarked via a composite scoring approach and grouped into four categories based on their solar ecosystem maturity: Achievers, Influencers, Progressives, and Potentials.

Achievers:

Countries with highly favourable policy, technical, and market conditions—most attractive for solar investment.

Influencers:

Countries with moderately favourable policy, technical, and market conditions—moderately attractive for solar investment.

Progressives:

Countries in early ecosystem development, with commercial feasibility and investment beginning to take shape.

Potentials:

Countries at an emerging stage of ecosystem development.

Below is a list of each driver and its corresponding parameters:

Macroeconomy

- Economic development
- Macroeconomic stability
- Investments
- Investor protection

Infrastructure

- Power infrastructure
- Capacity building

Policy Enablers

- Support for renewables
- Sustainability targets
- Financial support mechanisms
- Regulatory quality

Financing

- Accessibility
- Investment

Market Maturity

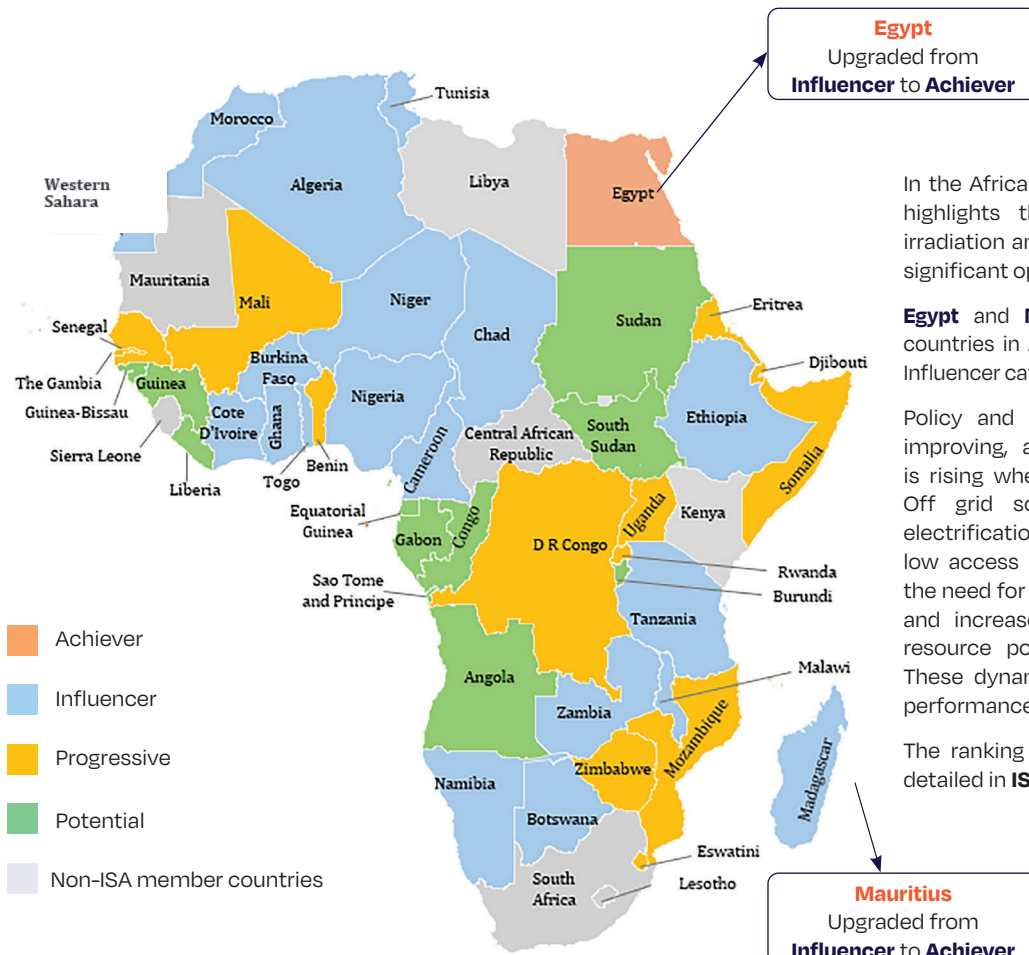
- Access to electricity
- Operational solar projects
- Power market
- Sub-segments market

Energy Imperatives

- Electricity outlook
- Electricity tariff

Technological Feasibility

- Solar Irradiation



In the African context, the EoDS 2025 report highlights the continent's abundant solar irradiation and growing electricity demand as significant opportunities for solar expansion.

Egypt and **Mauritius** are the only Achiever countries in Africa, having moved up from the Influencer category in the previous EoDS edition.

Policy and macroeconomic conditions are improving, and private sector participation is rising where regulatory clarity is stronger. Off grid solar remains pivotal for rural electrification, particularly in countries with low access rates. However, it also identifies the need for enhanced regulatory frameworks and increased investor confidence to turn resource potential into bankable pipelines. These dynamics help explain differences in performance across African markets.

The ranking approach and methodology are detailed in **ISA's EoDS 2025** report.

Challenges in Africa's Electricity Sector

Infrastructure Constraints and Their Ripple Effects

Constraints in Transmission and Distribution (T&D) networks across several regions hinder the integration of new generation capacity and slow overall energy system expansion.

In addition to significant T&D challenges, frequent power outages result in numerous challenges that impact the socio-economic growth of Africa. Limited electricity access constrains health services, educational outcomes and industrial development.



Only 50% healthcare facilities in Sub-Saharan Africa have access to reliable electricity.



As of the most recently available data (2022), ~32% of primary schools and ~50% of secondary schools lacked access to electricity.

Source: Empowering quality education through sustainable and equitable electricity access in African schools – Joule; Electricity in health-care facilities, WHO

Unreliable electricity holds African firms back

78%

of firms in Africa experienced power outages in 2024

41%

of African firms identify electricity as a major constraint- **the highest of any world region**

~5%

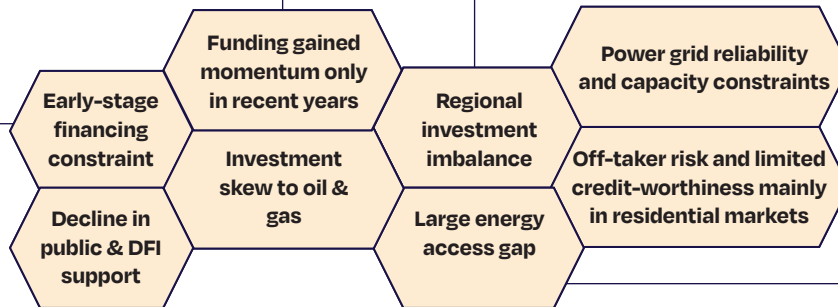
of the firms' total annual sales value is lost due to power outages

Financial Barriers in Solar Markets

Despite vast solar potential, investments face hurdles that slow project execution and deter large-scale adoption, even as demand for clean energy grows:

Annual clean energy investment remained below USD 30 billion until 2021, picking up momentum thereafter

Despite growth in clean energy investment, Africa received only 2% (USD 9 billion) of global solar investment in 2024.



Energy investment is concentrated in South and North Africa, while the more populous Sub-Saharan Africa remains underfunded

As of 2024, around 600 million people lack access to electricity, and over 1 billion lack access to clean cooking solutions

Source: ISA Global Solar Trends and Outlook 2025, IEA World Energy Investment 2025

Together, these constraints show that underinvestment continues to limit large-scale solar deployment, slowing the pace of Africa's clean energy transition.

How ISA is Accelerating Africa's Solar Transition

Africa's solar shortfall is not due to a lack of solar resources, but from structural financing constraints, capacity constraints, and market fragmentation. ISA's engagement in Africa is therefore structured to directly address these barriers through its four core pillars:

Pillar 1: Catalytic Finance Hub

ISA works to mobilize **catalytic and blended finance mechanisms** that help reduce investment risks and unlock private capital for solar deployment. Through the Global Solar Facility and other financial instruments, ISA supports project preparation, demand aggregation, and risk-mitigation approaches that improve project bankability and attract investors to emerging solar markets.

Engagement in Africa:

The Africa Solar Facility (ASF), launched as the first regional window of the Global Solar Facility beginning with Africa, is managed by Africa50, with a dedicated GSF account established in GIFT City, India. With ISA's catalytic support, ASF's pilot, the Nuru Project in the DRC, has already delivered 28,000 connections across 15 MW of mini-grids, strengthening energy access and resilience for over 100,000 people. This proof of concept is now being used to design replicable frameworks for scaling across the continent.

Pillar 2: Global Capability Centre and Digitisation

ISA is establishing a **Global Capability Centre (GCC)** at its headquarters in Gurugram, India, designed to serve as a "**Silicon Valley for Solar**" for ISA member countries. The GCC will host world-class facilities to support research, training, knowledge exchange, and development of digital public infrastructure for solar deployment.

The **ISA Academy**, which forms a core component of the GCC, will strengthen technical skills, policy capacity, and institutional knowledge across the member countries. Through **STAR-C centres**, training programmes, and digital platforms, ISA aims to build a skilled workforce and enhance national capabilities to design and implement solar projects.



These activities strengthen technical expertise and support the development of national solar ecosystems.

Pillar 3: Regional and Country-Level Engagement

ISA works closely with member countries through **regional platforms, country partnership frameworks, and targeted solar programmes**. These engagements help identify national priorities, develop implementation strategies, and coordinate partnerships among governments, development partners, and private sector actors.

Engagement in Africa:

- ~12 GW Aggregated capacity from 44 Member Countries
- 40 Countries where interventions are complete
- 13 Demonstration projects completed
- 30 Pilot projects across the continent

ISA is also supporting the deployment of projects (including technical assessment support) across multiple solar sectors:

Solar for Agriculture		Solar Mini-Grids	
Completed	In progress	Completed	In progress
14	13	4	1

Solar Rooftop		Solar Parks	
Completed	In progress	Completed	In progress
11	7	11	7

In addition, ISA has undertaken technical assessment reports for **Solar EV projects** in 31 African countries, **storage projects** in 4 African countries, and **green hydrogen projects** in 6 African countries.

To deepen cooperation with member countries, ISA is advancing Country Partnership Frameworks with the following countries:

Signed members					Planned members			
Mauritius	Ethiopia	Ghana	Gambia	Nigeria	Uganda	Rwanda	Senegal	Egypt

Through these frameworks, ISA partners directly with governments to align solar deployment with national development priorities. ISA is also supporting the development of National Solar Energy Roadmaps for the following countries:

Finalised	Planned members			
Chad	Mauritius	Ethiopia	Nigeria	Gambia

These initiatives support the integration of solar technologies into national energy strategies and help accelerate the adoption of solar solutions across the continent.

Pillar 4: Technology Roadmap and Policy

ISA supports member countries in developing **technology roadmaps, policy frameworks, and value-chain assessments** to accelerate solar deployment. These initiatives help governments identify priority technologies, develop deployment strategies, and strengthen regulatory and policy environments that enable solar investments. ISA's current technology frameworks are listed below:

- The global floating solar framework (FSPV)
- ISA's technology evaluation framework
- The green hydrogen hubs framework
- The Solar EV Ecosystem Readiness Assessment (SEERA) framework

ISA Knowledge Series: Factsheets

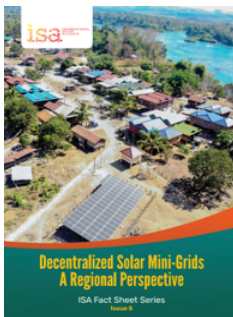
The ISA knowledge Series Factsheets aim to build and disseminate a structured, accessible knowledge base to support the scale-up of solar energy across Member Countries. Published on a bimonthly basis, they synthesise insights from ISA's flagship reports, country engagements, and global datasets into concise, easy-to-use knowledge products.

Adopting a technology-agnostic approach, each factsheet presents a high-level view of market trends, policy and regulatory contexts, investment landscapes, and implementation opportunities. Designed as rapid insight tools, they help stakeholders understand market dynamics, identify key challenges, and spot opportunity areas.

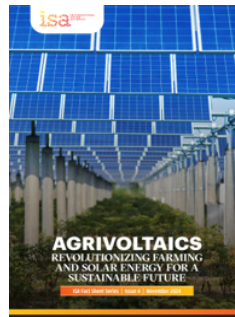
Developed collaboratively across ISA teams, the Factsheets ensure consistency, analytical rigour, and alignment with country priorities, while serving as a common reference across ISA's programmes.

Target Audience

- Government institutions supporting policy and programme design
- Development partners and international organisations
- Private sector stakeholders exploring markets and applications
- Investors seeking an initial view of opportunities and risks
- Think tanks, technical experts, and implementation agencies



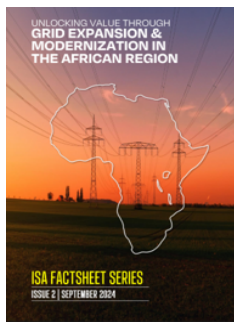
Decentralized Solar Mini-Grids — A Regional Perspective



Agrivoltaics: Revolutionizing Farming and Solar Energy for a Sustainable Future



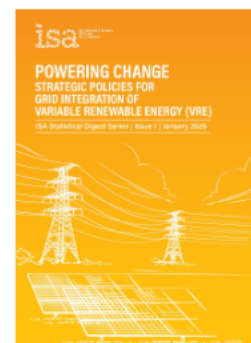
Distributed Solar Applications: Powering Global Energy Access



Unlocking Value through Grid Expansion & Modernization in the African Region



Bifacial Solar Technology Fact Sheet



Power Change: Strategic Policies for Grid Integration of VRE

Looking Ahead

The Factsheets complement ISA's broader knowledge ecosystem by providing timely, structured insights that support informed dialogue and guide stakeholders towards deeper analysis and implementation.

Stay tuned for upcoming editions of the ISA Knowledge Series.



INTERNATIONAL
SOLAR
ALLIANCE

Contact Us: International Solar Alliance

Surya Bhawan, National Institute of Solar Energy Campus Gwal Pahari, Faridabad-Gurugram Road, Gurugram, Haryana – 122003, India | **Email:** info@isolaralliance.org



Follow us on social media



For more information, visit: <https://isa.int/>

