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Solar and Energy Storage Opportunities in Ghana

Intersolar Africa 2025 - Deep Dive West Africa

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Presentation Overview



Ghana's Energy Landscape

Current energy mix and access rates across the country.



Solar & BES/ESS Potential

Geographic advantages and key drivers.



Ghana's Gameplan

Government initiatives



Opportunities & Challenges

Pro's and Con's in the sector



Conclusion

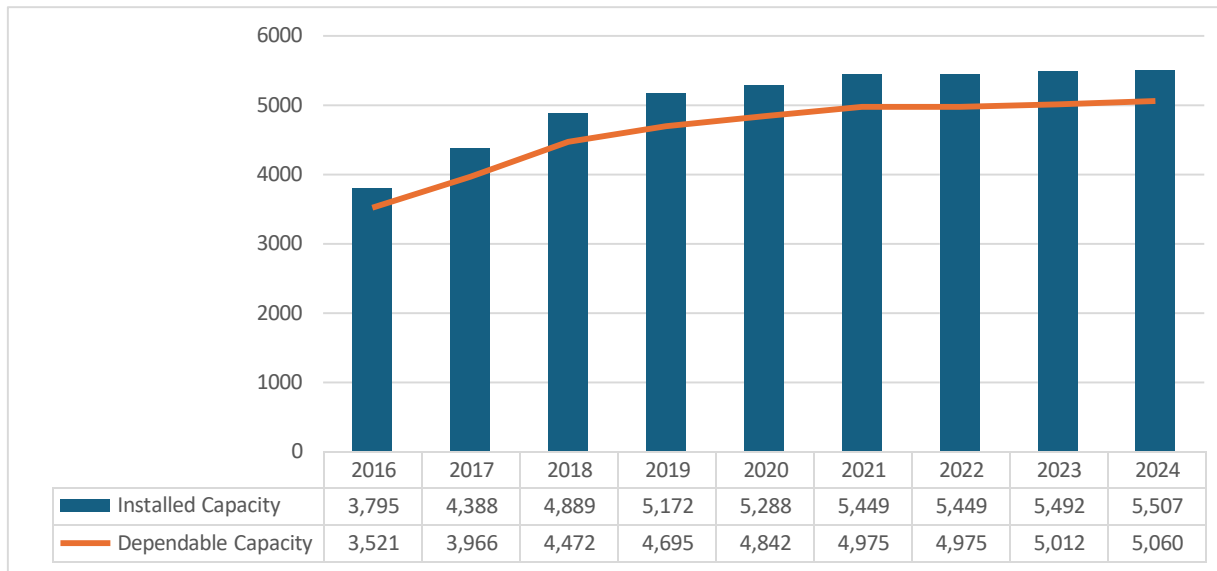


Ghana's Energy Landscape

86% of Ghana's population has access to electricity (94% Urban / 77% Rural)

The electricity generation mix is made up of Hydro (28.8%), thermal (68.8%), and renewables (2.4%). Installed generation capacity is 5,260 MW, with a total dependable capacity of 4,856 MW. This excludes embedded capacity, mainly comprising privately owned Solar PV that makes up an estimated 196MW.

Thermal plants owned by private IPP's (65%), contributed to meeting 70.0% of the peak demand in 2024. In 2025, no power plants are expected to come online during the year.



Installed and dependable capacity in the recent past

Installed generation capacity as of the end of December 2024

Power Plant	Fuel Type	Installed Capacity (Nameplate)	% Share	Dependable Capacity	% Share
Hydro Power Plants					
Akosombo	Hydro	1,020		900	
Bui	Hydro	404		371	
Kpong	Hydro	160		140	
Sub-total		1,584	28.8%, *30.1%	1,411	27.9% *29.1%
Thermal Power Plants					
Takoradi Power Company (TAPCO)	Oil/NG	330		315	
Takoradi International Company (TICO)	Oil/NG	340		330	
Sunon-Asogli Power (SAPP)	NG	560		530	
Tema Thermal Plant1 (TT1P)	Oil/NG	110		100	
Tema Thermal Plant2 (TT2P)	Oil/NG	80		70	
CENIT Energy Ltd (CEL)	Oil/NG	110		100	
Kpone Thermal Power Plant (KTPP)	Oil/NG	220		200	
Anwomaso Thermal	NG	250		230	
Karpower	NG/HFO	470		450	
AKSA	HFO/NG	370		330	
Cenpower	Oil/NG	360		340	
Amandi	Oil/NG	210		201	
Early Power	NG/LPG	200		190	
Genser (grid)	NG/LPG	66		58.8	
Sub-total		3,676	69.9%	3,444.8	70.9%
Genser (embedded)	NG/LPG	115		99	
Sub-total (incl. embedded gen.)		3,791	68.8%	3,543.8	70.0%
Renewables (excl. large hydro)					
VRA Solar (Navrongo)	Solar	2.5		2	
Meinergy Solar	Solar	20		16	
BXC Solar	Solar	20		16	
VRA Solar (Lawra)	Solar	6.5		5.2	
VRA Solar (Kaleo)	Solar	28		22	
Tsatsadu Hydro	Hydro	0.045		0.045	
Bui Solar	Solar	55		44	
Safisana Biogas	Biogas	0.1		0.1	
Sub - total		132.145	2.4%	105.345	2.1%
Total (excl embedded gen.)		5,260		4,855.8	
Total (incl embedded gen.)		5,507.145		5,060.345	

Solar Energy & BES Potential

Owing to its location near the equator, solar power potential in Ghana is enormous, with a specific yield between 4 and 6 kWh per M2 per day.

Ghana's electricity rates are high when comparing to other Countries, especially for industrial and bulk users, and grid unstable.

Ghana is also one of the fastest growing solar PV markets in Africa and poised for significant growth between 2025 and 2030. Projections indicate that Ghana's installed solar capacity could reach 800 MW by 2030, growing at an annual compounded growth rate of 20%.

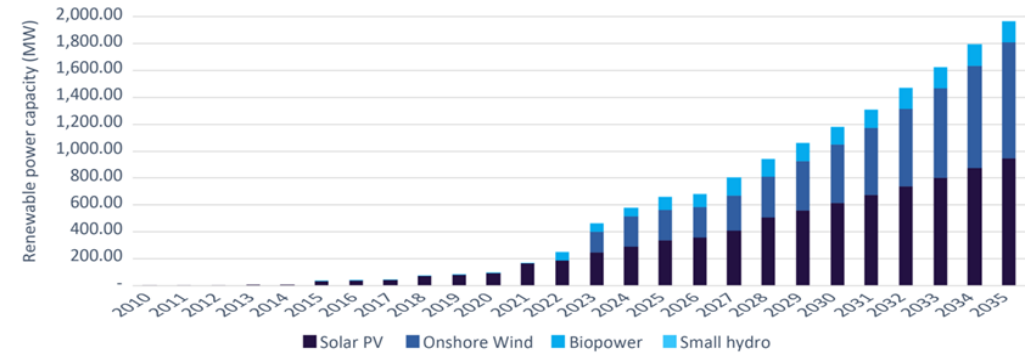
The Ghana Government is actively evaluating the current regulatory framework as to align investor interest with Government plans and development of the (renewable) energy sector.

The lack of existing projects or plans to add thermal power plants to the existing installed capacity, whilst promoting National industrial growth created a massive opportunity for renewable energy projects and investment.

The growing demand for compliance of manufacturing and service industries adds on to this opportunity.

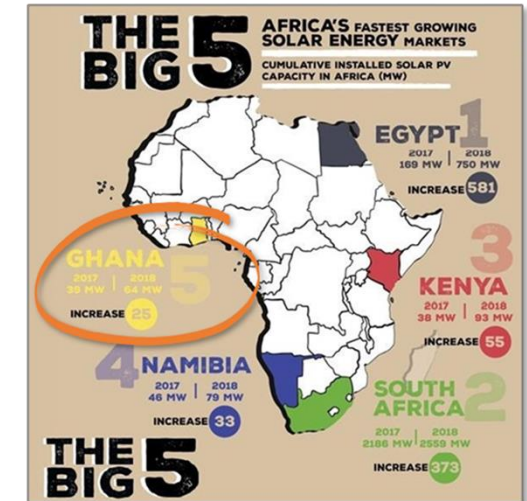
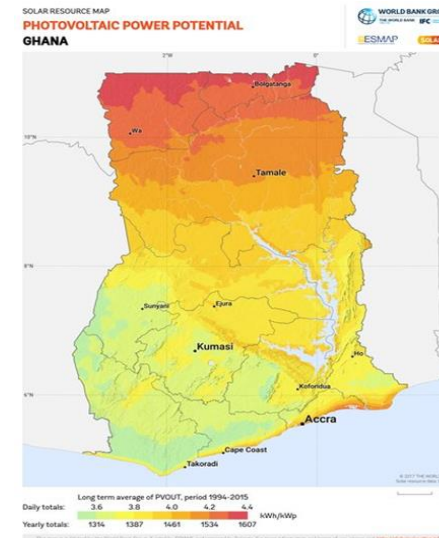
The opportunity for BES / ESS is growing for the provision of grid stability, back up power and facilitation of hybrid set ups.

Cumulative capacity (in MW) of Ghana's renewable power market, 2010 - 2035



Source: GlobalData, Power Intelligence Center

 GlobalData.



Government Initiatives

Change from Ministry of Energy to **Ministry of Energy and Green Transition** with a dedicated department for Green Transitional and for Renewable Energy.

Establishing a **Renewable Energy and Green Transition Fund**, to support research and development of home-grown green technologies.

Establishing a **Renewable Energy Authority** to manage the Renewable Energy and Green Transition Fund and drive the government's green energy agenda. The Authority will promote investments, forge collaborations, and support local research and development of renewable energy technologies.

Solar-Powered Streetlights, deploying solar-powered streetlights nationwide to enhance community security and reduce the financial burden on citizens by eliminating extra charges for street lighting.

Electricity Access Expansion, to achieve 90% nationwide electricity access by accelerating the deployment of renewable energy mini-grids, with support from international partners such as SECO, KfW, AfDB, GIZ, and the World Bank and to target island and rural communities.

Execution of the **SREP Project** and the **Government goes Solar Project** installing Solar PV and Net meters on all public buildings and state-owned hospitals, universities. (70MWp).

Developing a **Nuclear Power plant** with a capacity of 1GW by 2030.

** All the above is part of the Renewable Energy Master Plan (REMP)*



We'll encourage MPs to use electric vehicles says Minister



A New Era for Ghana's Energy Sector: John Abdulai Jinapor's appointment gives hope

Expert recommendations for sustainable solutions for Ghana's energy sector

ECG privatisation: Energy Minister sets committee to design roadmap

John Abdulai Jinapor calls for establishment of renewable energy fund to drive Africa's energy transition

Less than 1% of Ghana's poorest households use clean fuels for cooking

CEF Energy: 1.25 billion euros for cross-border energy infrastructure projects

“Ghana's energy sector operates under a hybrid market model that involves both public and private actors. Over the years, power purchasing agreements (PPAs) signed with IPGs have led to the under-utilization power generation capacities, which has often resulted in huge idle capacity charges or compensation payments.”

Opportunities & Challenges

1. **Abundant Renewable Resources:** Ghana has significant potential for renewable energy, including solar, wind, and hydropower. The country enjoys high solar irradiance, making it ideal for solar energy projects.
 2. **Government Support:** The Ghanaian government has implemented policies and incentives to promote renewable energy. The Renewable Energy Masterplan aims to increase the share of renewables in the energy mix to 20% by 2030.
 3. **Investment Potential:** There is growing interest from both local and international investors in Ghana's renewable energy sector. The establishment of the Renewable Energy Investment Fund is expected to attract further investments.
 4. **Energy Transition Framework:** Ghana's National Energy Transition Framework outlines a pathway to decarbonize the energy sector and achieve net-zero carbon emissions by 2070. This includes increasing renewable energy penetration and integrating nuclear power.
 5. **Job Creation and Economic Growth:** The expansion of the renewable energy sector is expected to create job opportunities and contribute to economic growth. This includes jobs in manufacturing, installation, and maintenance of renewable energy systems.
1. **Financial Sustainability:** The energy sector faces financial challenges, including liquidity crises and the need for sustainable funding mechanisms.
 2. **Infrastructure and Grid Stability:** Inadequate grid infrastructure and the need for modernization pose significant challenges. Ensuring grid stability and expanding access to remote areas are critical issues.
 3. **Technological and Knowledge Gaps:** There is a need for capacity building and technological advancements to support the development and deployment of renewable energy solutions.
 4. **Regulatory and Policy Implementation:** While policies are in place, effective implementation and regulatory capacity remain challenges. Ensuring transparency and consistency in policy enforcement is crucial.
 5. **Climate Vulnerability:** Hydropower, a key component of Ghana's energy mix, is vulnerable to climate variability, affecting its reliability.



Case Study & Conclusion





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Thank you

Website

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