ENERGY SECTOR PROFILE

1. Introduction

The energy sector is the lifeline in the development of any nation. This informed the decision to undertake the construction of the first hydroelectric (Akosombo) dam in 1965, which continues to be one of the most important investments in Ghana's economic history. Over the years, and with the increased demand by power users for greater security and reliability, other sources of power – thermal, solar, and lately windmills, as well as imports – have been added to the generation mix. Ghana has mainly relied on hydro-power plants for electricity generation with a few thermal plants used to regulate the peak load.

Ghana's energy sector has evolved over the last two decades owing to continuous reforms and stability that allowed for increased investment by private players especially in the electricity sub-sector. The discovery of oil and gas in commercial quantities in 2007 and subsequent production also placed the country's energy sector on the path of growth. The country started oil production in 2010 with only one field but now can boast of a total of three oil producing fields namely, Jubilee, Tweneboa Enyera Ntomme (TEN) and OCTP Sankofa Gye Nyame.

The government's energy policy is embodied in the Strategic National Energy Plan (SNEP 2030) which aims to develop a sound energy market that would provide sufficient, viable and efficient energy services for Ghana's economic development through the formulation of a comprehensive plan that will identify the optimal path for the development, utilization, and efficient management of energy resources available to the country.

Ghana's power supply sources continue to be from hydroelectricity, thermal - fueled by crude oil, natural gas, and diesel, solar and imports from Cote D'Ivoire. However, the country also exports power to Togo, Benin, and Burkina Faso with its ongoing grid expansions anticipated to boost the capacity to further exports to other neighboring countries within the sub region.

Hydroelectricity is generated from three power plants: the Akosombo and Kpong Generation Stations, operated by the state-owned Volta River Authority (VRA); and the Bui Generation Station operated by the state-owned Bui Power Authority. Thermal power is generated from a combination of private and public sector outputs operated by VRA and a variety of Independent Power Producers (IPPs). Solar energy generation accounts for only 2.4% of total power generation in Ghana. The country is therefore taking steps to diversify and increase its reliance on solar and wind energy.

Considering the Energy sector's vital role in Ghana's industrial and socio-economic development, the sector has undergone several developmental initiatives to improve overall operational efficiency and supply security. These include the introduction of the Renewable Energy Master Plan by the Energy Commission to spearhead developments within the renewable space. The Renewable Energy Master Plan includes the promotion of local manufacturing and assembling of renewable energy technology products and technology. Currently, the total projected installed RE generation capacity in Ghana in 132.1 MWp. This is made up of 2.5 MWp VRA Solar (Naranjo),6.5 MWp VRA Solar Plant (Lawra), 28 MWp VRA Solar Plant (Kaleo) 20.0 MWp BXC Solar (Winneba), 20.0 MWp Meinergy Solar (Gomoa Onyaadze), Bui Solar (55 MW) and 0.1 MW Safisana Biogas *(Energy Commission).*

The government is committed to increasing the use of renewables to provide power in Ghana and this is supported by the Renewable Energy Act, 2011 (Act 832) which was enacted to enable Ghana to achieve a sustainable renewable energy mix and reduce our dependence on other sources of generation. The policy goal of the renewable energy subsector is to:

- Achieve 10% contribution of modern renewables (excluding large hydro and wood fuels) in the electricity generation mix by 2030.

- Promote development and use of other biomass technologies including biogas, biofuels, gasification, and waste-to-energy.

Also, Ghana published a Renewable Energy Master Plan in 2019 with the aim to achieve the following by 2030:

- *Increase the proportion of renewable energy in the national energy generation mix from 42.5 MW in 2015 to 1,363.63 MW (with grid-connected systems totaling 1,094.63 MW)*
- *Reduce dependence on biomass as the main fuel for thermal energy applications.*
- *Provide renewable energy-based decentralized electrification options in 1,000 off-grid communities.*
- *Promote local content and local participation in the renewable energy industry.*

Ghana is signatory to several international conventions, treaties, and regional programmes such as UN Sustainable Energy for All (SEforALL) Initiative, Sustainable Development Goals (SDGs), Paris Agreement on the Intended Nationally Determined Contributions (INDCs), AU Agenda 2063, Economic Community of West African States (ECOWAS) White Paper on Energy Access, ECOWAS Renewable Energy and Energy Efficiency Policies, among others aimed at promoting sustainable energy development.

2. Energy Sector Investment Opportunities

As part of the strategies to achieve the objectives in the National Energy Strategic Plan, the Government, through the Ministry of Energy, is encouraging public-private sector partnership by securing private sector investment partnerships for re-capitalization of the energy supply system. Investment opportunities in the sector include:

- Energy service companies to provide energy services in these areas:
  - Energy Audits & Energy Management Strategies
  - Power Factor Correction
  - Electrical Load Management
  - Boiler Efficiency/Heat Recovery
  - Monitoring and Targeting Energy Management
  - Tariff Analysis
  - Refrigeration and Air Conditioning Systems
  - Compressed Air Systems
  - Kilns and Furnaces
  - Fuel Substitution
- Energy Manufacturing Companies supply energy-monitoring equipment to meet the increased requests for power monitoring and tariff analysis from industry in the country.
- Companies provide an alternative decentralized sustainable energy system that can easily be deployed in remote and deprived communities into the overall national energy mix.
- Companies to provide solar vaccine refrigerators for the preservation of vaccines for child immunization programmes in remote and off-grid parts of the country.
- Provision of solar energy systems to schools in off-grid communities.
- New, higher quality and cost competitive energy services for the poor, for cooking, transport, water heating and other home appliances.

Investment Opportunities in The Demand Sector

- Given the desire to alter the generation mix to include more renewable sources, the main opportunities in the renewable energy subsector include setting up local manufacturers and assemblers of renewable energy technology. There is now a concerted push to increase the contribution of renewable energy to total power supply sources and this will come with incentives to attract investors into this sector.

- There are some initiatives to attract investments into this sector, and a number of opportunities exist in harnessing wind power to generate electricity, mainly located along the coastal areas of Ghana. Various locations exist across the country which are also suitable for use as solar parks.

The following opportunities also exist in the Energy sector:

- Penetration of rural electrification by decentralized renewable energy complementation.
- Penetration of solar energy in hotels, restaurants and institutional kitchens using solar water heaters.
- Increased LPG penetration.
- Improved efficiency cook-stove penetration.
- Penetration of biogas for cooking in hotels, restaurants, and institutional kitchens
- Increase the penetration of modern energy into agriculture for increased agricultural production, to help achieve the nation's food supply security objectives.
- Substitution of diesel with biodiesel in agricultural mechanization
- Drying of exportable farm produce such as pepper with solar dryers.
- Displacing the use of diesel for irrigation with grid electricity and mechanical wind pumps.
- Large-scale commercial poultry farmers to meet at least 10% of their electricity needs from biogas, using the droppings from the birds.

3. Ghana's competitive advantage for FDI in the Energy sector

As Ghana's economy grows, it has become increasingly important that the growth of the country's Energy Sector reflects this phenomenon. The key factors that make the Energy sector attractive for FDI include the following:

Natural Resources:

- Ghana is well endowed with renewable energy resources which are yet to be fully harnessed. These include biomass, hydropower potentials, wind potentials along the coast and high solar radiation.
- Ghana has four sedimentary basins that are considered to have high prospects for the discovery of oil and gas. They are Western (Tano- Cape Three Points) Basin, Central (Saltpond) Basin, Eastern (Accra –Keta) Basin which are all offshore and are well explored and the Voltaian Basin which is onshore and has seen little exploration. Ghana currently has three offshore producing fields, Jubilee, Tweneboa, Enyera and Ntomme (TEN) and Sankofa and Gye Nyame Field. These fields provide a constant and cheap supply of hydrocarbons to provide energy for power plants.

Market size and growth prospects

- Ghana is a country of approximately 34 million people. It is a young and fast-growing country, with a relatively high population growth rate of 2.2%. More than half the population (57%) is under 25 years old with 67% of the population within the youthful age range (*Ghana Statistical Service*). This provides a youthful workforce and creates a ready market for energy products.
- As a result of regional and international economic agreements, investing in Ghana gives access to the African market through the African Continental Free Trade Area (AfCFTA), whose secretariat is in Accra. By signing on the Africa Growth and Opportunities Act (AGOA) with the USA, and the Economic Partnership Agreements (EPA) with the EU, investing in Ghana gives access to the US and EU markets for certain goods and services.

- Ghana is also an excellent platform for market entry into 55 countries of Sub-Saharan Africa, a market of about 1.3 billion people.
- Ghana is the 2nd largest economy in West Africa with an active retail market and healthy consumption levels. Fitch reports, household spending is expected to increase from US$ 55bn in 2021 to US$ 81bn in 2025 which will provide a ready market for energy products.

Stable political environment

- Ghana is known as one of the most politically stable countries in West Africa. For instance, Ghana is ranked 2nd in West Africa, 4th in Africa and 51st globally in the Global Peace Index 2023 which provides protection for investments.

Access to International market

- Ghana's location, as the closet landmark to the Centre of the earth allows for reasonable flight times across the globe. The average flight time is 6 hours to Europe, 9 hours to North America and 8 hours to the middle east.

Rankings

- Ghana ranked 1st in West Africa, 13th in Africa and 81st in the World, in the World Energy Council's Energy Trilemma Index tool, produced in partnership with Oliver Wyman. It ranks countries on their ability to provide sustainable energy through dimensions. (2024 country rankings)
- Ghana ranked 6th in Africa in RMB Investment Attractiveness Rankings 'Where to Invest in Africa'. 2024 report
- In the 2024 energy transition index (ETI), Ghana registered a score of 62.1 under the system performance sub-index which assesses its ability to support economic development and growth, its universal access to secure reliable energy supply, and its environmental sustainability across the energy value chain. Moreover, the country obtained 34.1 points in terms of its energy transition readiness. Overall, compared to other countries in Africa, Ghana ranked 11th in the 2024 ETI. (World Economic Forum - Fostering Effective Energy Transition).

4. Key Investment Drivers for the Energy sector in Ghana

- ***Investment Guarantees and Incentives:***

  Guarantees and Incentives against expropriation of private investments provided under law are buttressed by the Ghanaian Constitution. These include:

  - Free transferability of capital, profits, and dividends
  - Insurance against non-commercial risks – Ghana is a signatory to the World Bank's Multilateral Investment Guarantee Agency (MIGA) Convention
  - Double Taxation Agreements (DTAs) with some countries to rationalize tax obligations of investors.
  - The Ministry of Energy and Petroleum has put in place the Renewable Energy Feed -in-Rates schemes to encourage investments in the Renewable Energy Sector.
  - The Renewable Energy Act (Act 832) mandates the PURC to set preferential guaranteed rates for renewable energy known as Feed-in-tariff (FIT).
  - The FIT rates shall be guaranteed for a period of 10 years to enable investors recoup costs associated with construction, commissioning, operations, and maintenance of plants and subsequently be reviewed every two years.

  Incentives proposed for renewable energy manufacturing and assembling firms include:

  - Substantial tax reduction.
  - Exemption of materials, components, equipment, and machinery (that cannot be obtained locally) for manufacturing or assembling, from import duty and VAT

- Exemption of import duty on plants and plant parts for electricity generation from renewable energy resource.

In furtherance of this objective, the Renewable Energy (Amendment) Act 2020 provides a competitive bidding system for renewable energy projects and establishes a net-metering scheme to encourage self-generation of renewable electricity by consumers, essentially aiming to incentivize greater private sector involvement in renewable energy development in Ghana.

Excellent Labour Force

- Ghana has some of the best technicians and experts in all-sub sectors of the energy sector on the African continent, who have excelled not only in Ghana but in the African continent and other parts of the world. The University of Energy and Natural Resources was established in 2012 to provide leadership and management of energy and natural resources has been producing qualified graduates since its inception. In 2020, 30% of its graduates graduated in Energy related courses.
- Ghana boasts of highly skilled and trainable labour. The World Bank Data 2022 indicate youth literacy rates are high in Ghana- among individuals aged 15-24 years, 90% of males and 83% of females are literate.

***Openness to regional and international trade*:**

- Ghana has signed agreements with various countries and bodies that encourage free trade among the bodies such as European Liberalization Agreement, and ECOWAS Trade Liberalization Agreement.
- The Africa Continental Free Trade Agreement presents a great opportunity to trade products of the energy sector to other countries across the continent. For instance, in 2021 when trade officially started, alcoholic product manufacturers Kasapreko airfreighted a container-load of goods to South Africa, while Ghandour Cosmetics items to Guinea shipped by sea. This is opening gates for petroleum products like crude oil, natural gas, and diesel to be traded in larger markets across the continent.

Key governmental policies & initiatives driving growth & transformation of the economy.

- Ghana's economic growth and transformation are driven by a comprehensive set of policies focused on job creation, industrialization, and financial sector empowerment. The flagship 24-Hour Economy policy aims to boost productivity and create jobs by enabling businesses and public institutions to operate continuously, fostering an export-led and import substitution economy. Complementing this are targeted job creation programs such as national apprenticeships and digital skills training, alongside reforms to expand financial inclusion and support youth- and women-led enterprises through a National Venture Capital Fund. Additionally, the administration plans to ease the tax burden on citizens by cancelling several levies while reviewing taxes on industrial and agricultural imports to stimulate growth.

- The government also prioritizes industrial and agricultural transformation by reviving key factories, promoting value addition to raw materials, and modernizing agriculture with technology and insurance schemes to protect farmers. Social policies include free tertiary education for first-year students and persons with disabilities, as well as sanitary pad distribution to schoolgirls, reinforcing social equity. Governance reforms focus on fiscal discipline, reducing government size, and improving procurement processes to ensure efficient use of resources. Collectively, these initiatives seek to create a stable, inclusive, and dynamic economy that delivers sustainable growth and broad-based prosperity for Ghana.

Source: (2025 Budget and Economic Policy)

5. Summary of the current Energy sector in Ghana

- **Main Agencies in The Energy Sector**

  The Power Sub-Sector of Ghana is divided into separate jurisdictions which are Generation, Transmission and Distribution.

  - *Generation*

  Generation and wholesale supply of electricity are liberalized and are undertaken by state owned and privately-owned entities usually referred to as Independent Power Producers (IPPs).

  Volta River Authority (VRA): Is a state-owned generation agency established under the Volta River Development Act 1961, (Act 46) with the core mandate of developing and generating power by such means as the Authority deems fit for industrial, commercial, and domestic users in Ghana and neighboring countries.

  Bui Power Authority: The Bui Power Authority was established by an Act of Parliament, the Bui Power Authority Act 2007 (Act 740), with the mandate to plan, execute and manage the Bui Hydro Electric Project. The BPA amended Act 2020 (Act 1046), mandates BPA to develop renewable and other clean energy alternative sources.

  Nuclear Power Ghana Limited: Nuclear Power Ghana (NPG) Limited was approved by Cabinet to be the Owner-Operator of the first Nuclear Power plant in Ghana and was subsequently incorporated in 2018. Stakeholders of NPG Limited are the VRA, BPA and the Ghana Atomic Energy Commission (GAEC).

  Independent Power Producers (IPPs): There are Independent Power Producers (IPPs) licensed to build, own, and operate power plants. As of November 2024, IPPs continue to play a significant role, providing about 65% of the dependable Capacity while the remaining 35.1% is supplied by the VRA.

  - *Transmission*

  The Ghana Grid Company (GRIDCo) is the only transmission utility in the country. It was established in accordance with the Energy Commission Act, 1997 (Act 541) and the Volta River Development (Amendment) Act, 2005 (Act 692), which provided for the establishment and exclusive operation of the National Interconnected Transmission System (NITS) for electricity by an independent utility and the separation of the transmission functions of the Volta River Authority (VRA) from its other activities within the framework of the Power Sector Reforms.

  GRIDCo is the operator of the NITS and is responsible for the real-time dispatch (monitoring, coordination, and control) of power system operations as well as cross-border power exchanges with neighboring countries.

  - *Distribution*

  There are three power distribution entities comprising two state-owned utilities: Electricity Company of Ghana (ECG) and Northern Electricity Distribution Company (NEDCo). There is only one private distributor (En Clave Power) which operates in the Free-Zone Enclave and industrial estates in the Greater Accra region.

Electricity Company of Ghana (ECG): The Electricity Company of Ghana (ECG) is a limited liability Company wholly owned by the Government of Ghana and is the oldest electricity distribution entity in the country. It was incorporated under the Companies Code 1963 (Act 179) in February 1997. ECG is responsible for the distribution of electricity in southern Ghana including south of Volta and up to Ashanti Region, an area coverage referred to as Southern Electricity Distribution Zone (SEDZ).

Northern Electricity Distribution Company Limited (NEDCo): The Northern Electricity Distribution Company Limited (NEDCo) was created in 1987 as the Northern Electricity Department (NED) of VRA, as part of the arrangements to expedite the Northern Grid Extension and Systems Reinforcement Project.

The Volta River Development Act, 1961, (Act 46) was amended to extend VRA's mandate to the distribution of electricity in Ghana and to implement the northern distribution zone component of the National Electrification Programme (NEP). NEDCo is responsible for electricity distribution in the Northern Zone of Ghana.

As of November 2024, hydro plants contributed 28.8% of the total installed capacity, with conventional thermal plants and renewable sources contributing 68.8% and 2.4% respectively. Thermal plants contributed to meeting about 70.0% of the peak demand in 2024.

Also, tables 1 to 3 in the appendix below provide information on total generation capacity of installed power in Ghana, by VRA and by Independent Power Producers.

- **Brief profiles of top companies in Ghana's Energy sector with Testimonials of top performing companies in the sector**

GOIL
Good energy

Ghana Oil Company Limited (GOIL) is a prominent state-owned oil marketing company in Ghana, established on June 14, 1960. Initially founded as AGIP Ghana Company Limited, it transitioned to its current name and structure after the government acquired full ownership in 1974. GOIL is recognized as the leading indigenous petroleum marketing company in Ghana and plays a crucial role in the country's energy sector.

It's core operations specializes in the marketing and distribution of a wide range of petroleum products, including diesel, gasoline, liquefied petroleum gas (LPG), kerosene, bitumen, aviation fuel lubricants.
GOIL's sustainability and community engagement initiatives emphasize health, safety, environmental stewardship, and social responsibility in its operations. The company actively participates in efforts to promote cleaner energy solutions and foster community development.

The company has received numerous awards for its performance in the energy sector, including multiple accolades as Petroleum Company of the year at the Ghana Energy Awards, Recognition from the Chartered Institute of Marketing Ghana (CIMG) for excellence in marketing.

Founded in 1983 and operational since 1985, GNPC (Ghana National Petroleum Corporation) is Ghana's state-owned oil company and the cornerstone of the nation's petroleum industry. It plays a critical role in driving economic development by overseeing the exploration, development, and production of oil and gas resources, ensuring that Ghana fully benefits from its hydrocarbon assets. GNPC's mandate and operations include.

- **Exploration & Production:**
  GNPC is charged with identifying and developing oil and gas reserves. It spearheads exploration activities and frequently partners with international oil companies to tap into global expertise and advanced technologies.
- **Resource Management:**
  The corporation is responsible for managing Ghana's petroleum resources, ensuring that the extraction and processing of these resources foster sustainable economic growth.
- **Upstream Focus:**
  Concentrating primarily on the upstream sector, GNPC handles contract negotiations, asset management, and the optimization of production from key oil fields, including landmark discoveries like the Jubilee Field.

GNPC has played a crucial role in shaping Ghana's energy future. By focusing on innovation, strategic partnerships, and a commitment to sustainable growth, the Corporation is not only unlocking the nation's resource potential but also setting the path toward a more prosperous future for all Ghanaians. The key achievement of the Corporation includes.

- **Jubilee Field Discovery:**
  One of GNPC's signature accomplishments, the discovery and development of the Jubilee Field, has elevated Ghana's standing as a significant player in the global oil market.
- **Economic Impact:**
  Through its comprehensive operations, GNPC has significantly boosted government revenues, spurred job creation, and enhanced local capacity by facilitating technology transfer and skill development in the energy sector.
- **Gas Commercialization:**
  The corporation meets 90% of domestic gas demand via the Atuabo Gas Processing Plant, underscoring its vital role in the nation's energy supply chain.

6. Next Steps/Contact

For further information, please contact:

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APPENDIX

Table 1: **Generation Capacity of installed capacity in Ghana:**

Installed Power	Capacity
Total installed power capacity	5,507.145MW
Hydro Generation	1,584.045MW
Thermal Generation	3,791MW
Renewable Energy (Meienergy, VRA Solar Plant (Navrongo, Lawra & Kaleo), BXC Solar, Bui Solar and Safisana Biogas.	132.1MW

Table 2: **VRA Installed Generation Capacity**

PLANT	INSTALLED CAPACITY (MW)	DEPENDABLE CAPACITY (MW	TYPE OF PLANT	FUEL TYPE
Akosombo GS	1,020	900	Hydro	Water
Kpong GS	160	140	Hydro	Water
TAPCO-T1	330	315	Thermal	Gas/LCO
TICO-T2	340	330	Thermal	Gas/LCO
Tema Thermal 1 Plant- TT1PP	110	100	Thermal	Gas/LCO
Tema Thermal 2 Plant- TT2PP	80	70	Thermal	Gas
Kpone Thermal Power Station-KTPS	220	200	Thermal	Gas/Diesel
Ameri Power Plant	250	230	Thermal	Gas
VRA Navrongo Solar Plant	2.5	2	Solar	Sunlight
VRA Lawra Solar Plant	6.5	4.5	Solar	Sunlight
VRA Kaleo Solar Plant	13	10	Solar	Sunlight
Anwomaso Thermal Power Place	250**	200	Thermal	Gas
Kaleo Solar Plant (Plant II)	15	12	Solar	Sunlight
TOTAL CAPACITY	**2,547**	2,513.5		

*LCO – Light Crude oil / *DFO – Distillate Fuel oil / *HFO – Heavy Fuel Oil
**150MW presently available; additional 100MW yet to be relocated to Anwomaso.

Table 3: **Installed Capacity of Independent Power Producers (IPPS) And Other Plants**

PLANT	INSTALLED CAPACITY (MW)	DEPENDABLE CAPACITY (MW)	TYPE OF PLANT	FUEL TYPE
Bui	404	330	Hydro	Water
CENIT Energy Ltd (CEL)	110	100	Thermal	Oil/NG
Sunon-Asogli Power (SAPP)	560	530	Thermal	NG
Karpower	470	450	Thermal	NG/HFO
AKSA	370	330	Thermal	NG/HFO
BXC Solar	20	16	Solar	Sunlight
Meinergy Solar	20	16	Solar	Sunlight
Safisana Biogas	0.1	0.1	Biogas	Biogas
Tsatsadu Hydro	0.045	0.045	Hydro	Water
Bui Solar	55	44	Solar	Sunlight
Cenpower	360	340	Thermal	Oil/NG
Amandi	210	201	Thermal	Oil/NG
Early Power*	200	190	Thermal	Oil/NG
Genser	181	157.8	Thermal	Oil/NG
TOTAL CAPACITY	2,960.145	2,704.945		

NB: * Being converted to run on natural gas