

Wind Energy in Ghana

Potential, Opportunities and Challenges

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Ghana – a challenging, yet promising market!

Ghana Energy Market Overview

Land area: 238,500 km
 Population: 24,658.823 (2010 Census)
 Electricity: 76% (2013)
 Rural Access: 48% (2013)
 Average GDP Growth Rate: 7% (2013)

PLANT TYPE	QUANTITY	TOTAL CAPACITY (MW)	%
Thermal Power Plant	8	1,168	42.4
Large Hydro Power Plants	3	1,580	57.4
Off-Grid Solar	41,820	0.8	0.0
Other Renewables	4	2.0	0.1

Sources of Electricity and Generation Capacity 2014
 Source: MOP

Wind Energy Potential & Opportunities

The Ministry of Energy is responsible for driving renewable energy policies in Ghana. The government of Ghana plans to increase generation of electricity from about 2,000 Mw to 5,000 Mw by 2015 by exploiting thermal and renewable energy technologies.

The key targets of the government of Ghana for renewable energy use in Ghana includes an increase in modern renewable energy technology in electricity supply system from 1% to 10% by the year 2020, an increase in the use of renewable energy in remote and poor rural areas and an increase in the contribution of bio-fuel in transportation fuel supply.

The Renewable Energy Act of 2011 provides for the development, management, utilization, sustainability and adequate supply of renewable energy for generation of heat and power for related matters. Key Provisions in the act include the feed-in-tariff scheme and the purchase obligation which are in place, and the Net-Metering which is in the final stages.

Facilitator

The feed-in-tariff for Utility Scale Wind Energy is as follows:

- Without grid stability system: Ghp 55.763/kWh (US\$c14)
- With grid stability system: Ghp 51.4334/kWh (US\$c13)

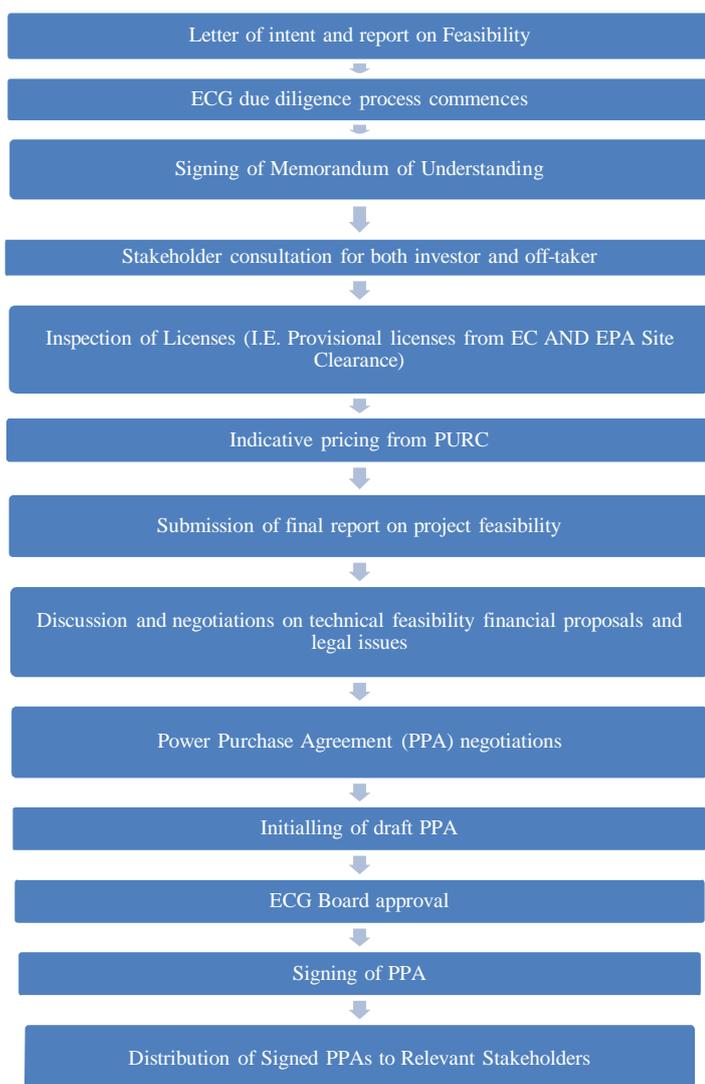
Currently there are no wind energy installations in Ghana except for small off-grid ones installed for demonstration purposes. Three groups of people are currently undertaking wind resource data assessments. These are: the Energy Commission, Volta River Authority and UP Wind Company. Measurements are mostly undertaken on the eastern coast of Ghana. Wind speeds ranges from 4m/second to 6m/second.

Swiss wind farm development, NEK Umwelttechnik is currently the only investor that has acquired a siting permit. The company entered the Ghanaian market in September 2014 announcing the signing of an agreement to develop the 225 megawatt (MW) Ayitepa wind

farm, located 40 kilometers from Accra on the east coast of Ghana. The project represents a total investment of USD525 million and is expected to reach financial close next year and start generating power early in 2016.

Programme	Installed capacity by 2020
Medium hydro sites	3-6 potential sites (200-300 MW)
Biomass & Waste to Energy	50-100 MW
Utility Scale Wind park	150-300 MW
Distributed grid connected RE generation through Net-Metering (solar, wind, biomass, hydro)	30-100 MW
Utility Scale Solar Farms	150 MW

Priority Areas for Renewable Energy Investments (Grid Connected)
Source: Ministry of Power



Process for Renewable Energy Project Development – Source: ECG, Ghana

Wind Energy Challenge

Countries located further from the equator generally have relatively high wind energy potential compared to countries closer. Ghana has wind speeds of 4m/second to 6m/second which is considered by some investors as not being adequate for a bankable PPA.

Banks in developing countries focus more on short-term debt financing and consider renewable energy projects as long term projects. Most investors have faced a lot of difficulties in getting banks to finance their projects. The land tenure system of Ghana makes acquisition of lands for economic activities such as large utility scale wind energy projects difficult.

The Renewable Energy Project Development Programme supports renewable energy development in Ghana through providing business linkages between German and Ghanaian markets, supporting lighthouse projects and providing policy advisory services for sustainable investment.

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