This country-specific Q&A provides an overview of renewable energy laws and regulations applicable in Ghana.

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GHANA
RENEWABLE ENERGY

1. Does your jurisdiction have an established renewable energy industry? What are the current production levels?

Ghana has a renewable energy industry with renewable energy plants using solar energy, wind energy, biomass, hydro, wave and tidal energy.

Renewable energy currently contributes about 1% to the energy mix (excluding energy generated from large scale hydro projects.) Ghana aims to achieve a 10% renewable energy target in the energy mix by 2030.

**Total Installed Capacity**

- Renewable energy in the form of hydro power accounts for 29.9% of total installed electricity generation capacity as at 2020, at 1580MW.
- Utility scale solar and waste to energy plants (excluding standalone solar systems and hydro power) accounted for 1.12% of total installed capacity, at 59MW. Solar energy accounts for 96% of the installed renewable electricity capacity (excluding large Hydro).

**Renewable Energy Installed Generation Capacity**

- Solar Photovoltaic (PV) electricity is generated from on-grid and off-grid connected solar PV systems. The first large scale solar PV system installation in Ghana, was the 2.5 MW capacity solar power system at Pungu near Navrongo in the Upper East Region, commissioned by the Volta River Authority (VRA) in May, 2013. There is also 40 MW capacity at Onyandze near Mankoadze in Gomoa East District of the Central Region with BXC Company Ghana Limited and Meinergy Technology Company Limited owning 20 MW each. In addition, about 89 communities across the country have benefited from over 6000 small-scale solar systems with total capacity of 793 kW for household lighting, street lighting, radio and television use, rural mobile phone charging systems and vaccine refrigeration, and institutions such as hotels, schools and hospitals have installed solar power as either their main electricity supply or an alternative energy source when there is a power outage. Moreover, there are several stand-alone PV systems in Ghana that have not been quantified. These include community solar PV systems for water pumping, solar PV systems for irrigation, and systems for individual household and institutional usage.

- Waste to Energy electricity installed capacity for the year 2020, amounted to 0.1MW, forming only 0.1% of the total renewable energy installed generation capacity. Waste includes wood waste, animal waste and organic components of municipal and industrial waste.

At the end of 2020, Off-grid wind energy accounted for 0.02MW of renewable energy installed generation capacity and mini grid-installed generation capacity for wind accounted for 0.01MW of installed generation capacity.

Ghana’s first project establishing the use of wave energy, the Adah Foah Wave Farm is a pilot project.

2. Who are the key regulators for renewables industry in your jurisdiction? How do they impact the industry?

- **The Energy Commission**

The Energy Commission regulates and manages the utilisation of energy resources in Ghana. It collects and analyses energy data and secures a comprehensive database for national decision making on the extent of development and utilisation of energy resources available to the nation. It contributes to the development of national energy policies for the development and utilization of indigenous energy resources, in particular renewable energy sources such as solar, wind and biomass.

The Energy Commission also grants licences to private
and public entities for the transmission, wholesale supply distribution, and sale of electricity and natural gas. The Commission also sets technical performance standards for operators in the renewable energy sector and provides policy advice to the Minister of Energy.

- **Public Utilities Regulatory Commission (PURC)**

The PURC is an independent multi-sectorial regulator set up pursuant to the Public Utilities Regulatory Act, 1997 (Act 538), to regulate the provision of water and electricity utility services.

The PURC calculates and sets electricity tariffs and guides the rates chargeable for the provision of utility services. It also protects consumers through monitoring the quality of services provided by the utilities.

The PURC has the mandate to approve electricity tariffs as set out in Power Purchase Agreements between a generator of electricity (including renewable energy generators) and an electricity distribution utility.

- **Ministry of Energy**

The Ministry of Energy is responsible for energy policy formulation and some aspects of their implementation, monitoring and evaluation as well as the supervision and coordination of the activities of Ghana’s Energy Sector Agencies.

The following entities in particular play key roles in directly impacting the renewable energy industry:

- **The National Petroleum Authority (NPA)**: The NPA ensures that the correct fraction and price of biofuel in the biofuel blend are in line with the agreed petroleum pricing formula according to S.43 of the Renewable Energy Act 2011 (Act 832).

- **The Ghana Standards Authority (GSA)** - The GSA develops and monitors standards for renewable energy technologies and biofuel.

- **The Forestry Commission**: The Forestry Commission supports the development and execution of programmes for sustainable wood fuel production and usage.

- **The Environmental Protection Agency (EPA)**: The EPA is responsible for regulating the environment and ensuring the implementation of Government policies on the environment.

### 3. How are rights to explore/set up renewable energy projects, such as solar or wind farms, granted? How do these differ based on the source of energy, i.e. solar, hydropower, wind, geothermal and biomass?

The process for being granted such rights are the same regardless of the source of energy. The Energy Commission assesses each project on its merits prior to granting a licence for such renewable energy projects.

The steps are as follows:

- The applicant company wishing to set up a renewable energy project contacts the Energy Commission and the Electricity Company of Ghana (ECG) to present their project and its benefits.

- Upon the Energy Commission’s agreement, and any relevant off taker’s agreement, the applicant must negotiate a power purchase agreement with the relevant off taker which could be ECG, the Volta River Authority or the Northern Electricity Distribution Company’s (NEDCO).

- The applicant obtains a power generation licence from the Energy Commission and a grid connection agreement from the Ghana Grid Company, ECG or NEDCO, depending on the grid the applicant intends to connect to. This licence is usually a condition precedent to the effectiveness of a power purchase agreement. A licence can only be granted to a citizen, a body corporate registered under Ghana’s Companies Act, 2019 (Act 992), or a partnership registered under the Incorporated Private Partnerships Act, 1962 (Act 152).

- The applicant is also required to obtain an approval from the Public Utilities Regulatory Commission (PURC) for the agreed tariff in the power purchase agreement. This approval is usually a condition precedent to the effectiveness of a power purchase agreement.

### 4. What does the energy split look like in your jurisdiction and how is this changing as a result of the green energy transition?

Ghana’s energy mix consists of a combination of hydroelectric, thermal (predominantly fuelled by natural gas, heavy fuel oil, light crude oil and diesel fuel oil) and renewable energy sources such as solar, biomass, waste-to-energy and wind.

**Generation Mix** - In 2000, hydro plants generated the
highest proportion (about 92%) of Ghana’s electricity requirement whereas thermal plants generated the remaining 8%. However, by 2020, the electricity generation mix stood at approximately 36.2% of hydro against 63.6% of thermal energy (generated by natural gas and crude oil) and 0.3% of other renewables. The total electricity generated in 2020 was made up of 7,293 GWh from hydro generation, 12,820 GWh from thermal generation and 57 GWh from renewable sources, totalling 20,170 GWh.

**Total Installed Capacity** - Ghana’s installed electricity generation capacity in 2020 was dominated by thermal (69%), followed by hydro (30%), and renewables such as utility solar and waste (1.12%).

**Renewable Energy Installed Generation Capacity** - Ghana’s renewable energy installed generation capacity in 2020, was made up of solar (96%), wind (0.031%), waste to energy (0.1%), and small to medium hydro below 100MW (4.09%). These figures exclude the installation generation capacity of large-scale hydro projects over 100MW.

There has been a deliberate approach adopted by Ghana to primarily contract renewables, particularly wind and solar, going forward because of Ghana’s Nationally Determined Contributions adopted in the Paris Agreement. In its Nationally Determined Contributions, Ghana is making efforts to shift its energy generation mix away from non-renewable sources of energy, towards renewable sources.

Renewable energy use is increasing as demand and investment related to it also increases around the world. In response to these global trends, Ghana’s government views renewable energy as essential to the country’s overall energy supply mix and as a means of minimising the adverse environmental effects of energy production. Ghana has set a strategic goal to increase the proportion of renewable energy in their energy mix to 10% by 2030 as they concentrate on promoting green energy and making power accessible to all.

The Renewable Energy Master Plan (REMP) was published in 2019 to meet this strategic goal and provide an investment-focused framework for the promotion and development of Ghana’s renewable energy resources to support sustainable economic growth and reduce climate change.

Under the REMP Ghana aims to:

- 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 totalling 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 manufacturing and assembly in the renewable energy industry.

Moreover, the Energy Commission’s report on annual generation of energy is usually based on grid connected figures. However, as a result of the green energy transition, individuals have increasingly installed renewable energy plants and are supplying themselves with energy through private entities. Ghana is therefore seeing a shift in the generation of renewables.

5. Is the government directly involved with the renewables industry? Is there a government-owned renewables company?

Government of Ghana is directly involved with the renewables industry. It has two renewables companies, namely: the BUI Power Authority (BPA) and the Volta River Authority.

1. The **BPA** is committed to exploring renewable energy projects in line with the Government of Ghana’s target of increasing Renewable Energy in the country’s energy mix. It was established by the Bui Power Authority Act, 2007 (Act 740), with a mandate to plan, execute and manage the Bui Hydroelectric Project which was commissioned in 2013 and now the Bui Generating Station (BGS). The BGS is a peaking plant with a capacity to generate 404MW of hydro-generated power. The BPA has undertaken specific hydropower initiatives on the Western Rivers of the Republic of Ghana: The Tsatsadu Micro Hydro Project and the 250 MW Solar Project at the Bui enclave. Additionally, the Ministry of Energy in February 2020 instructed BPA to assume the functions of the Renewable Energy Authority proposed under section 53 of the Renewable Energy Act, 2011 (Act 832).

2. The **Volta River Authority (VRA)** is a state-owned entity responsible for the generation and transmission of electricity in Ghana. VRA operates the largest hydro generation facility in Ghana, the Akosombo plant.

- State-owned Ghana Grid Company (GRIDCO) is still solely responsible for power transmission throughout the entire country.
- Government of Ghana has undertaken a pilot
solar energy project on Pediatorkope Island backed by Foreign Direct Investment as part of the World Bank funded construction of five pilot mini-grids under the Ghana Energy Development and Access Project (GEDAP). These solar projects have a total of about 200kW and are expected to provide 24-hour electricity to about 3,500 residents of 5 island communities in Ghana.

6. What are the government’s plans and strategies in terms of the renewables industry? Please also provide a brief overview of key legislation in the renewable energy sector?

The Renewable Energy Act, 2011 (Act 832) was enacted to provide a framework for the development and utilization of renewable energy sources.

The Government of Ghana published the Renewable Energy Master Plan (REMP) in 2019, extending the strategic goal to increase the proportion of renewable energy in their energy mix to 10% in 2030 and providing an investment-focused framework for the promotion and development of Ghana’s renewable energy resources to support sustainable economic growth and mitigate the negative impacts of climate change.

Under the REMP Ghana aims by 2030 to:

- Increase the proportion of non-hydro renewable energy in the national energy generation mix from 42.5 MW in 2015 to 1,363.63 MW (with grid-connected systems totalling 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 manufacturing and assembly in the renewable energy industry.

A number of projects have been developed under the REMP to promote renewable energy in Ghana.

These include:

**Sustainable Energy for All (SE4ALL)**

The Sustainable Energy for All (SE4ALL) initiative is a global initiative that was launched by the Secretary General of the United Nations Mr. Ban Ki-moon in September 2011, to mobilise the UN system, governments, the private sector and civil society to take concrete action toward three critical objectives to be achieved by 2030:

1. ensuring universal access to modern energy services;
2. doubling the global rate of improvement in energy efficiency; and
3. doubling the share of renewable energy in the global energy mix.

Ghana has prioritised the following under its SE4ALL Action Plan established in 2013 namely:

1. Universal Adoption of Clean Cooking Solutions
2. Off-Grid Lighting & Charging
3. Sustainable Energy for Island Economies
4. Clean Energy mini grids
5. Productive Uses of Electricity.

**Scaling-up Renewable Energy Program (SREP)**

Ghana instituted the Scaling-up Renewable Energy Program in 2015, with the African Development Bank as the lead Multilateral Development Bank for the implementation of the program. This program means to unlock financing opportunities which can accelerate the development of renewable energy. It focuses on three main projects:

1. Renewable energy mini-grids and stand-alone solar PV systems: Fifty-five (55) island/lakeside communities are to be selected for mini-grid and six hundred (600) households in thirty (30) selected sparsely populated off-grid communities for standalone solar PV projects.
2. Solar PV based net metering with battery storage; Ghana aims for the development of a comprehensive net metering programme, the deployment of at least 15,000 units of roof-mounted solar PV systems to reduce the economic cost of power on SMEs and households, and as a result, the addition of 25-30MW of capacity to the generation mix.
3. An increase in Utility-scale solar PV and wind power generation.

**Nationally Determined Contributions**

It should also be noted that Ghana updated its Nationally Determined Contributions (NDC) under the Paris Agreement in 2021, with a view to addressing the impacts of climate change on the country’s economy and its vulnerable people. The NDCs are the actions taken by a country as its contribution to mitigate the effects of climate change, pursuant to the United Nations
Framework Convention on Climate Change, 2015. Per the updated NDCs Ghana aims to increase its reliance on renewables versus non-renewables.

In addition, under the 7th Sustainable Development Goal (SDG), Ghana aims to ensure access to modern energy for all in an affordable, reliable and sustainable manner by 2030.

**Renewable Energy Fund**

The Renewable Energy Act requires that a fund be created to provide finances for the promotion, development, management etc. of renewable energy resources. The fund is yet to be operationalised.

**Overview of Key Legislation**

- **The Renewable Energy Act, 2011 (Act 832):** Act 832 is the primary legislation for the development, management, utilisation and adequate supply of renewable energy for the generation of heat and power and for other related matters. The Act provides the regulatory framework and monetary incentives to boost private sector investment and promote the use of renewable energy in an efficient and sustainable manner. It provides a regulatory licensing regime and imposes an obligation on utilities and bulk customers to purchase part of their electricity requirements from renewable resources. In addition, the Act established a feed-in-tariff scheme which requires distributors to purchase electricity obtained from renewable sources at a rate determined by PURC. The Act also established a Renewable Energy Licensing Manual for service providers in the Renewable Energy Sector which provides a framework for licensing service providers.

- **The Renewable Energy (Amendment) Act, 2020 (Act 1045):** Act 1045 amends Act 832 to enable consumers of electricity in Ghana to benefit from the reduced cost of electricity generation from renewable energy sources through competitive procurement instead of the feed-in-tariff scheme.

- **The Energy Commission Act 1997 (Act 541):** Act 541 establishes the Energy Commission and governs the transmission, sale, distribution and wholesale supply of electricity.

- **The Ghana Investment Promotion Centre Act, 2013 (Act 865):** governs the operation of the Ghana Investment Promotion Centre. It was enacted as an instrument to show the Ghanaian government’s commitment to encouraging foreign investment in its economy, including the renewable energy sector.

- **Local Content and Local Participation (Electricity Supply Industry) Regulations 2018 (LI 2354),** specifies local content and participation requirements for the Renewables Industry as relates to the generation of electricity.

7. Are there any government incentive schemes promoting renewable energy? For example, are there any special tax deductions or incentives offered?

There are several incentives for the promotion and development of renewable energy in Ghana:

- **Rooftop Solar PV Programme:** The Energy Commission undertook an incentive scheme by which private individuals could apply to the Energy Commission to receive a capital subsidy in the form of cash payment for solar panels or the supply of solar panels at no cost, after the Individuals had purchased and installed the requisite Balance of System (BoS) components such as inverter, batteries, charge controllers, etc.

- **Locational Tax Rebates:** Locational tax rebates can be enjoyed by companies generating renewable energy outside of Greater Accra or Tema.

- **Import Duty Exemptions:** Companies engaged in renewable energy who are registered with the Ghana Investment and Promotion Centre (GIPC) can apply to the GIPC for exemptions from import duties and related charges on their industrial or energy plant, machinery or equipment or parts of the same.

- **VAT Exemptions:** VAT exemptions are enjoyed by participants within the renewable energy industry. Solar panels imported into Ghana are exempt from VAT and all off-grid solar system components are VAT exempt as well, if imported wholly or already assembled although such systems are not exempt from VAT if the components are imported separately.

- **Mandatory Purchase Policy:** - There is a mandatory purchase policy under the Renewable Energy Act as amended that
obliges electricity distributors, bulk customers or fossil fuel-based wholesale electricity suppliers to procure a percentage of their total purchase of electricity from a renewable energy source.

- **Mandatory Connection Policy** - Under the mandatory connection policy, the transmission and distribution system operators are obliged to provide connection services for electricity from renewable energy.

- **Renewable Energy Fund** - The Renewable Energy Fund is a fund under Act 832 which will offer financial support for activities for the promotion, development and utilization of renewable energy such as: i) financial incentives, capital subsidies and production-based subsidies to renewable energy developers; and ii) equity participation in renewable energy projects. The Fund is yet to be operationalised.

- **Energy Fund** - The Energy Fund, established under the Energy Commission Act, applies its monies to promote projects for the development and utilisation of renewable energy resources including solar energy.

- **Competitive Procurement Scheme**: The Competitive Procurement scheme under the Renewable Energy Act, as amended, is established for the purpose of attracting a competitive market rate for electricity generated from a renewable energy source. It enables consumers of electricity in Ghana to benefit from the reduced cost of electricity generation from renewable energy sources through competitive procurement instead of the feed-in tariff scheme.

- **Renewable Energy Master Plan** - The Renewable Energy Master Plan proposes incentives for renewable energy manufacturing and assembling firms including substantial tax reductions; exemption of materials, components, equipment and machinery that cannot be obtained locally for manufacturing or assembling, from import duty and VAT up to the year 2025; and exemption from import duty on plants and plant parts for generating electricity from renewable energy sources.

### 8. How have private companies outside of the renewable energy sector responded to the renewables industry? Have you seen more companies set net-zero and/or science-based targets?

Private companies outside the renewable energy sector have responded to Ghana’s increasing renewables industry by expressing an increasing interest in investing in the sector.

Various private companies make enquiries to distributors into the composition of energy sold to them with a view to ensure that part of that energy is renewable. Mining companies in particular have indicated that renewable energy is very important to their operations. A number of private companies have also set themselves up to take advantage of the renewables industry; some seek to begin generating into the grid. It should be noted that in some ways, the increased desire of private companies to participate in the renewable energy industry comes with its complications, a significant one being that these private companies often do not have the required generation licence under the Renewable Energy Act.

**Net zero or science-based targets**

The achievement of a net zero target is a gradual process. In Ghana, it requires that the entity in question should be off the grid otherwise there is an inevitable comingling of energy sources, and the entity cannot claim to be net zero.

As the government works to increase its energy mix from 1% renewable energy to 10% renewables by 2030, we may see companies setting net zero targets in the future.

### 9. What are the key contracts you typically expect to see in a new-build renewable energy contract?

- Power Purchase Agreement with off takers.
- Grid Connection Agreement with the Ghana Grid Company or distribution companies.
- EPC contract for the construction of the plant.
- O&M (Operation and Maintenance) agreement with a third-party provider as relevant.
- Financing agreement with financiers as relevant.

### 10. Are there any restrictions on the export of renewable energy, local content obligations or domestic supply obligations?

**Restriction on exports**

According to the Energy Commission’s Licence Manual for service providers in the renewable energy industry,
entities seeking to export or re-export renewable energy must apply for an export licence and seek specific approval from the Energy Commission.

It is noted that provision in the manual is only made for export licences for charcoal, biofuel and briquettes/pellets produced from biomass waste authorising the licence holder to export charcoal, biofuel such as ethanol and biodiesel and briquettes/pellets produced from biomass waste, respectively.

It is also noted that Section 22 of the Renewable Energy Act as amended provides that "where the board grants a licence to an applicant to market a renewable energy product, the licensee shall obtain from the commission, approval for the export of each consignment of woodfuel and bio fuel". Woodfuel here includes firewood and charcoal.

Exceptions to the above can be seen with the examples of the Akosombo and Kpong dams which were given a specific approval by the Energy Commission to export the hydro power generated.

**Local content obligations**

- The Local Content and Local Participation (Electricity Supply Industry) Regulations 2017 (LI 2354), provides local content and participation obligations for the renewable energy sector. The regulations aim to achieve a minimum of 15% local participation in ownership.
- Local content obligations for the renewable energy sector are as follows:
  - **Engineering and Procurement**: a minimum of 70% of the project must go to Ghanaian Companies; to be increased to 100% within ten years.
  - **Construction works and Installations**: a minimum of 60% of the construction works of the project shall go to Ghanaian Companies; to be increased to 90% in six years.
  - **Post Construction works supplies**: a minimum of 70% of the value of all supplies shall go to Ghanaian owned Companies; to be increased to 100% in ten years.
  - **Services**: minimum local content levels for Catering (100%), Janitorial Services (100%), Vehicle Maintenance (100%) and Equipment Servicing (70%) to be increased to 100% in ten years.
  - **Management**: a minimum of 60% of management staff shall be Ghanaians at the beginning of business operations; to be increased to 90% in five years.
  - **Operations and Maintenance staff**: a minimum of 70% operation and maintenance staff shall be Ghanaians at any time in the lifetime of the business; to be increased to 80% in five years.
  - **All other staff**: must be 100% Ghanaian at all times.
  - **Operation and Maintenance contract**: a minimum of 50% of the value of all operation and maintenance shall be awarded to indigenous Ghanaian Companies, to be increased to 80% in five years.

**Domestic supply obligations**

It is noted that there are special requirements relating to licences granted by the Energy Commission. For Production and Supply licences, Section 20 of the Renewable Energy Act provides that:

"Where the board grants a licence to an applicant to produce and supply a renewable energy product, the licensee shall

a. Manufacture and assemble that renewable energy product
b. Install, generate and supply electrical energy or
c. Produce bio-fuel or woodfuel

in accordance with the directives of the commission".

11. Does the regulatory regime include any specific decommissioning obligations? How do these obligations differ across solar, hydropower, wind, geothermal and biomass?

The decommissioning obligations for renewable energy projects, regardless of the type of renewable energy, are usually located in the licence granted by the Energy Commission to an entity to engage in that renewable energy project. The relevant power purchase agreement would also typically contain decommissioning provisions.
12. Could you provide a brief overview of the major projects that are currently happening in your jurisdiction?

**Major Completed Project**

- The Akosombo, Kpong and Bui dams form three of the major hydropower projects in Ghana that have been completed and are currently running. The Akosombo and Kpong dams are two large hydropower stations where Ghana generates most of its electricity with an installed capacity of 1020MW and 600MW respectively. In 2013, the Bui Dam, Ghana’s third dam in the Brong Ahafo region was constructed on the Black Volta River with a generation capacity of approximately 400 MW.

- **Meinenergy** - Huawei Digital Power Technologies, a unit of Chinese multinational tech giant Huawei, has signed a deal with Ghana-based solar project developer Meinenergy Technology to build a 1GW solar plant and 500MWh of storage at an unspecified location in Ghana. Under the terms of the deal, Huawei would supply storage systems for the project and Meinenergy was responsible for the development and construction of the facility, which is currently operating in Ghana.

- **Safisana**: Safisana is a Waste-to-Energy plant commissioned in 2017 by the local Municipality of Ashaiman, the Ghanaian Ministries of Energy and Agriculture, and financed by the African Development Bank, the Dutch Ministry of Foreign Affairs and private funds.

- **Bui Solar Farm**: The Bui Power Authority as part of the first phase of a 250MW solar project, commissioned Ghana’s first hydro-solar hybrid power generating system in December 2020 which includes a 5MW floating solar PV system and a 22.25MW solar farm. The Solar generation system was connected to the national grid as of April 2021 and currently has an installed capacity of 400MW.

- **The Beijing Xiaocheng Company (BXC)**: provided Ghana with its first large-scale solar plant to support the country’s power generation. Located near Winneba, about 70 km West of the capital, it produces 20 MW of power during the day.

**Projects Under Construction**

- **Mere power** – Blue Energy Plc., a United Kingdom-based renewable energy developer, is developing a 155 MW solar PV plant at Nzema near Aiwiaso in the Western Region of Ghana, which when completed would be the largest solar PV plant in Sub-Saharan Africa. *Mere Power Nzema Limited*, has been formed to develop, build, operate and own the power station. Construction on the Solar plant began in 2016 and it is projected to provide electricity to over 100,000 households upon completion and increase the nation’s electricity generating capacity by 6%.

- **Scaling-up Renewable Energy Program (SREP)**: Under SREP the government of Ghana has begun taking steps towards the accomplishment of the following projects:
  1. Renewable energy mini-grids and stand-alone solar PV systems: Fifty-five (55) island/lakeside communities are to be selected for mini-grid and six hundred (600) households in thirty (30) selected sparsely populated off-grid communities for standalone solar PV projects.
  2. Solar PV based net metering with battery storage: Ghana aims for the development of a comprehensive net metering programme, the deployment of at least 15,000 units of roof-mounted solar PV systems to reduce the economic cost of power on SMEs and households, and as a result, the addition of 25-30MW of capacity to the generation mix.
  3. An increase in Utility-scale solar PV and wind power generation.

13. Who are the key players that are driving the green renewable energy transition in your jurisdiction?

- The key players driving renewable energy in the jurisdiction include the Ministry of Energy, the Environmental Protection Agency, the BUI Power Authority, Electricity Company of Ghana, the Volta River Authority, the Energy Commission and the Ghana Grid Company (GRIDCO).

- In addition, a number of international bodies also drive the green renewable agenda in Ghana. These include the United Nations with its Sustainable Development Goals, according to which Ghana has committed to ensure access to modern energy for all in an affordable, reliable and sustainable manner by 2030. The African Development Bank, which has funded a number of renewable energy
14. Please can you give a summary of the key renewable projects in the pipeline in your jurisdiction?

Some projects in the pipeline which are at various stages:

- **Ayitepa**: Ayitepa Wind Farm is a 225MW onshore wind power project planned in Greater Accra, Ghana. The project is expected to be commissioned in 2023.
- **Eleqtra Windstar Project**: Eleqtra is developing a 50MW wind energy project located in the Greater Accra region of Ghana.
- **Kwamoka**: The Kwamoka Energy renewable power project will consist of approximately 10MW of waste to energy generation and 4 MW of solar PV generation, to be developed in phases. It will be located strategically on a 14.17 acres land at the Oti light industrial area near Sokoban Wood Village in the Ashanti Region of Ghana. The biomass plant will be using the unutilized wood and agricultural residues which are usually burnt or sent to landfills.
- **African Plantation for Sustainable Development (APSD)**: The Africa Plantation for Sustainable Development (APSD) is a 60MW biomass project located near the Atebubu town, Brong Ahafo Province in Central Ghana. APSD is developing a large concession of up to 42,000 hectares. The project involves growing eucalyptus as a biomass fuel.
- **Village Corps**: Village Corps Ghana (VCG) seeks to develop an integrated renewable energy and agroforestry Project in the Akyem Abuakwa Kingdom in the Eastern Region of Ghana. The project consists of a 40 MW biomass renewable energy plant integrated with a 10,000+ hectare organic farming system. Agricultural waste from the farming system will provide the feedstock for the power plant.
- **Temple Power**: Plans a 100MW solar plant to be developed in the Northern Part of Ghana and a 50MW solar plant in the Volta region of Ghana.
- **Siginik**: Siginik Energy Limited, is developing a 50MW ground mounted tracking solar installation in the Sawla-Tuna Kalba District of Ghana.
- **Pwalugu Multipurpose Dam and Irrigation Project**: The Pwalugu Multipurpose Dam and Irrigation Project in the Northern part of Ghana aims to produce 60MW hydropower and 50MW solar components.
- **The VRA Wind Power Project**: The Volta River Authority is working with two wind developers, Vestas and El Sewedy, to develop 150MW of wind power at 4 identified sites in the southern part of Ghana based on wind resource potential; namely: Anloga, Anyanui, Lekpoogunu and Akplabany.
- **Eni’s 20MW Solar Power Plant**: Italy’s oil group Eni announced it is planning to build a 20 MW photovoltaic power plant in the area of Tamale, in the north of Ghana. The company has started to assess the possibility of installing floating PV power plants in the Volta basin.
- **TFI Power**: This is a 60MW solar plant to be developed in Ghana.
- **TC Energy**: A local Ghanaian company, TC Energy, in collaboration with Swede Energy, is installing a pilot 14.5 MW Tidal Wave Power Plant at the confluence of the Volta River and the Gulf of Guinea, at Ada Foah, in the Greater-Accra Region. The company intends to utilize sea-based wave energy converters to generate up to 1000MW of electricity.

15. What are the key issues facing the renewables industry in your jurisdiction across solar, hydropower, wind, geothermal and biomass?

Renewable energy plants are “must run plants” and are given priority dispatch.

In addition, key issues in the renewables industry include:

- Lack of financing and high costs of financing;
- Unavailability of Government support agreements;
- Low payment ratio by utilities;
- Land acquisition challenges;
- Low level of research, development, demonstration and deployment (R&DDD) on Renewable Energy;
- Poor knowledge management and information sharing on RE technologies;
- Concerns on waste disposal of renewable energy appliances;
16. How has the consequences of the Covid-19 pandemic particularly impacted the renewables industry?

The Covid-19 pandemic does not appear to have particularly impacted the renewable energy industry in Ghana in a manner different from the way in which it has affected all industries in terms of import delays, interruptions resulting from personnel being ill etc.

17. How do you think the impact of foreign investment and changes in regulation will affect investment in the renewables industry?

The renewable energy industry in Ghana relies almost exclusively on foreign investment. Therefore, an increase in foreign investment and positive changes in regulation will cause an uptake in investments in the renewables industry.

As a developing nation, foreign investment in the renewable energy sector will go a long way towards helping Ghana to achieve its set targets. It will help in capacity building and local participation and the availability of logistics through foreign investment will help in meeting renewable energy targets.

Foreign investment will also help alleviate the burden on government in the renewable energy sector.

18. How has your jurisdiction performed against its commitments as part of the Paris Agreement?

In line with Article 4 of the Paris Agreement and UNFCCC decisions 1/CP.21 and 4/CMA.1, Ghana has updated its Nationally Determined Contribution (NDC) under the Paris Agreement from 2020 to 2030.

Per the updated NDC, Ghana has developed 19 policy actions in 10 priority areas to achieve the NDC goals in the next decade, including the scaling up of renewable energy penetration by 10% by 2030. As of 2022, renewable energy still forms only 1.12% of total installed capacity, excluding large scale hydro projects.

The 19 policy actions translate into 13 adaptation and 34 mitigation programmes of action (referred to as measures). The 19 policy actions that have the potential to maximise the synergies between adaptation and economic diversification, resulting in mitigation co-benefits, will lead to the following outcomes in the long term:

- Accelerate sustainable energy transition
- Build resilient economies and societies
- Enhance early warning and disaster risk management
- Enhance landscape restoration
- Ensure responsible production and consumption
- Foster social inclusion focusing on youth and women
- Provide smart and safe communities.

Ghana expects that implementing the 19 policy actions will achieve the following by 2030:

- Generate absolute greenhouse gas (GHG) emission reductions of 64 MtCO2e;
- Avoid at least 2,900 premature deaths per year from improved air quality;
- Create over one million decent and green jobs; and
- Benefit cumulatively nearly 38 million people, with the majority being the youth and women.

19. How has the government used COP26 as an opportunity to drive the green energy transition?

The Nationally Determined Contributions (NDCs) were updated following the COP26 and included plans to combat climate change in its NDCs. As stated above, the updates will drive green energy transition in Ghana.

20. How is the government stepping up its commitment as a part of the COP26 agreement?

The Government of Ghana established the Carbon Credit Fund under the Environmental Protection Agency. Companies outside Ghana are interested in the Net Zero agenda but are having difficulty meeting the goal. To facilitate their achievement of a Net Zero standard, companies buy carbon credit by providing funding to renewable energy projects in Ghana. This funding in turn makes the renewable energy projects more bankable.
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