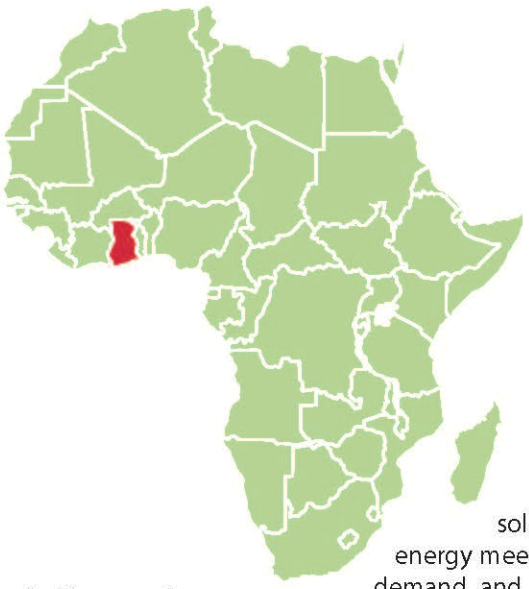
Case Studies



II.2. Ghana

II.2.1 Ghana's energy and climate change profile

Ghana has a dynamic power generation sector that involves public and private sector companies. It has one of the highest rates of access to electricity with more than 87% in urban areas and around 50% in rural areas (IRENA). However, millions of Ghanaians still lack access to electricity.

Ghana's Energy Profile

The country is very well endowed with a good potential of renewable energy resource and its main sources of power supply include hydro, thermal, natural gas, diesel and crude oil. Thermal power generation represents 66% of power generation. The country also exports power to its neighbouring countries namely Benin, Burkina Faso and Togo, and imports from La Cote d'Ivoire. Ghana uses both renewable (10%) and non-renewable (90%) forms of energy, but biomass (46.667%) and oil (40.52%) are the commonly used energy resource. This is followed by natural gas (10%), hydroelectric power (7%), and solar energy (0%)[13]. Renewable sources of energy meet roughly 23.7 percent of global energy demand and energy access is crucial to achieving development goals.

Generation Sources	GWh
VRA Solar (Navrongo)	3
VRA Solar (Kaleo/Lawra)	26.6
Bui Solar Farm	68
BxC Solar	27
Safisana	0.7
Meinergy	27
Total Renewable Supply	152.3

Expansion of the grid is going on and will allow further exports to neighbouring countries and more access to electricity by the population. In the 1980s, the country initiated reforms in the power sector and it resulted in the removal of barriers to allow the involvement of independent power producers (IPPs). In 2021, the total installed capacity is 5,134 MW, with ensured dependable capacity of 4,710 MW. The share of renewable energy in this capacity has been insignificant.

Climate change Profile

Ghana is a highly vulnerable country to global warming and it has demonstrated its commitment to face climate change issues both nationally and internationally. Climate change is expected to affect several areas of socio-economic development of the country. These areas include water resources, energy supplies, crop production and food security. Current and projected negative effects of climate change are expected to unequally affect the country locally, nationally and regionally.

Although Ghana contributes to 0.07% of GHG emissions of the world, it has taken steps to face the negative effects of climate change. Ghanaian authorities have made considerable efforts putting in place the needed institutions and suitable policy conditions to enable the country to carry concrete climate actions. The most recent policy initiatives include the publication of national climate change policy in 2012 and that of the low carbon development strategy in 2015. It also ratified the Paris Agreement in 2016 and has started implementing the measures in the Nationally Determined Contributions (NDC, 2021).

13 TAKASE, Mohamed, et al.- A review on renewable energy potentials and energy usage statistics in Ghana.- In: Elsevier, Fuel Communications n° 11, 2022. 9p.

The country has already started implementing the measures and programmes of these policy initiatives with the objective of promoting renewable energy, lowering deforestation, promoting the adoption of clean cooking, low carbon electricity generation, green industrialisation and rural development (Ghana NC4, 2020[14]).

II.2.2 Existing policies and laws, including the country's NDC and national, regional and local legislation relating to climate change and energy

Ghanaian authorities have developed numerous policies with a view to improve the adoption of renewable energy for electricity production and ensure efficient use of electrical energy setting targets and implementation periods. Some of these policies aimed to support the modernization and expansion of the energy infrastructure to meet the growing demands, ensure reliability and accelerate the development and utilisation of renewable energy and energy efficient technologies.

Similarly, environmental policies have also been put in place. Ghana became a party to the United Nations Framework Convention on Climate Change (UNFCCC) in September 1995 after the ratification. Since then, it has committed itself to reduce greenhouse gas emissions (GHG) and the climate change impacts on its population.

Renewable energy policies and laws

In Ghana 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 is the Renewable Energy Act of 2011 (Act 832). It also aims to provide an enabling environment to attract renewable energy sector investors. It targets a 10% renewable energy share of energy generation by the year 2020. Actually, this target was already set in 2006 and was never met. In 2018, in spite of this 2011 law, the percentage of renewable energy in the electricity mix still remained less than 2% due to a number of factors. This objective of generating 10% of renewable energy in the national energy mix was then pushed back to 2030 (Kuamoah, 2020)[15].

On the regional level, Ghana as a country member of the ECOWAS, was the first to develop a Sustainable Energy for All (SE4ALL) Action Plan[16], showing the strong policy commitment of the government.

In 2019, Ghana has launched its Renewable Energy Master Plan (REMP)[17] to address the consequences of policy issues mentioned here above, short-term planning for the overall development of the renewable energy sector and reduce adverse climate change effects. It was developed in the framework of the implementation of the SE4ALL Action Plan, with the goal to provide investment-focused framework for the promotion and development of the country's rich renewable energy resources for sustainable economic growth, contribute to improved social life and reduce adverse climate change effects.

2019
In 2019, Ghana has launched its Renewable Energy Master Plan (REMP)

The specific objectives of the REMP are 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 1363.63 MW (1);
- Reduce the dependence on biomass as main fuel for thermal energy applications (2);

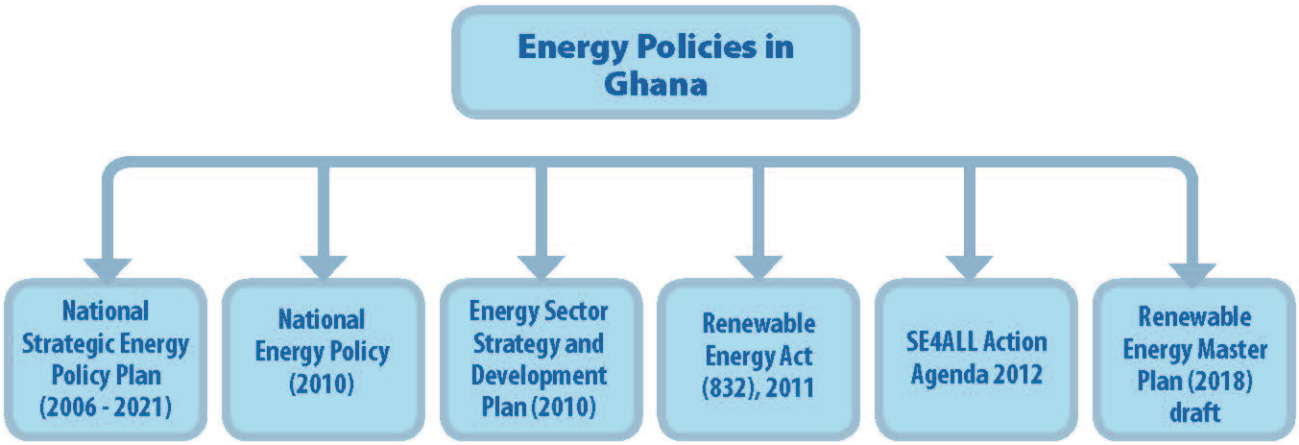
14 https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/562873149_Ghana-NC4-2-Gh_NC4.pdf

15 KUAMOAH, Catherine.- Renewable Energy Deployment in Ghana : The Hype, Hope and Reality.- Shangai : African Studies, 2020. 20p.

16 In September 2011, the UN Secretary General launched the Sustainable Energy for All (SE4All) initiative with the aim of achieving three goals 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 mix from 18% to 36%. Africa is at the forefront of the implementation of SE4All.

17 GHANA Renewable Energy Master Plan. Accra : Ghana, 2019. 98p. https://www.energycom.gov.gh/files/Renewable-Energy-Masterplan-February-2019.pdf

- Provide renewable energy-based decentralised electrification options in 1000 off-grid communities (3);
- Promote local content and local participation in the renewable energy industry (4).



The reason behind these repeated planning was that the growth of renewable energy was very low because of policy issues related to the transition to renewable energy, as well as the potential for renewable energy, policies concerning the move towards renewable energy, etc. Studies also show network and technical barriers such as system failure and financial barriers[18]. The assessment of these policies and the review and evaluation of the country's climate change policies and programmes will certainly allow for more topical interventions.

Despite the shown strong policy commitments to the development and promotion of renewable energy, investment in the industry has been limited due to a difficult capital market. The high upfront capita cost or capital investment is the main challenge in deploying and using renewable energy.

Power sector bodies, regulators, financiers, domestic investors, and national technology and service providers appear to have inadequate understanding and experience with developing and deploying renewable energy technologies. There are difficulties getting equipment and spare parts for some technologies, and poor facility operations and maintenance.

The high dependence on charcoal and wood fuels, renewable energy market size, high-interest rate to finance RE projects, among others, are also the main obstacles of renewable technology transfer in Ghana[19].

Climate change policies and laws

Following the ratification of the United Nations Framework Convention on Climate Change (UNFCCC) in 1995, Ghana has demonstrated its commitment to contribute to the fight against climate change and its adverse effects both nationally and internationally. Thus in 2013, the country has put in place a National Climate Change Policy (NCCP) to ensure a climate-resilient and climate-compatible economy that addresses a low-carbon growth pathway while achieving sustainable development.

As a party to the UNFCCC and the Paris Agreement, Ghana submitted its updated Nationally Determined Contribution (NDC) in November 2021 as one of its latest climate

18 ODURO, Margaret Adubea, et al.- Evaluating the Success of Renewable Energy and Energy Efficiency Policies in Ghana: Matching the Policy Objectives against Policy Instruments and Outcomes.- Algiers : IntechOpen, 23p.

19 KIPKOECH, Rogers.- Renewable Energies in Ghana in Relation to Market Condition, the Environment, and Food Security.- In : Journal of Renewable Energy, vol. 2022, Article ID 8243904, 8 pages. Accessed on 21 March 2023.

change policy instruments. This NDC is aligned with priority areas in the National Climate Change Policy (NCCP).

On the regional level, Ghana is also involved in the following selected initiatives:
- Regional ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE)
- West African Science Centre on Climate Change and Adapted Land Use (WASCAL), headquartered in Accra
- West African Alliance on Carbon Markets and Climate Finance
- Climate change, Agriculture and Food Security, West Africa (CCAFS)
- West Africa Gas Pipeline that is used by Ghana, Benin and Togo to import natural gas from Nigeria
- Sustainable Greenhouse Gas Inventory in West Africa.

The regional initiative in the framework of the Regional ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) in particular is noteworthy. Confronted with the challenge of the population welfare and the dire effects of climate change, ECOWAS heads of states decided to adopt the regional renewable energy and energy efficiency policies in 2013[20]. In order to implement these policies as well as the SE4ALL initiative in West Africa, ECREEE helped member countries to develop, implement and monitor National Renewable Energy Action Plans (NREAPs), National Energy Efficiency Action Plans (NEEAPs), and SE4ALL Action Agendas. Ghana like the other member countries has also developed these reports.

However, for Ghana, the essential part of the NREAP has been taken up by the Renewable Energy Master Plan.

II.2.3 Overview of opportunities and barriers

From the analysis of the studies and reports on renewable energy in Ghana, the key issues that are highlighted include the following:
- Lack of financing and high costs of financing (initial investment): to the cost of RETs is very high capital costs, with regards to the first investment, for solar power for instance
- Unavailability of Government support agreements: for the support of the private sector
- Low payment ratio by utilities: low profit margin;
- 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;
- Inadequate indigenous capacity building to drive the development and deployment of renewable energy technologies: lack of well trained personnel at all levels[21].

With reference to the Renewable Energy Master Plan, the country has shown solid policy commitments towards the development and promotion of renewable energy. However, a number of barriers and constraints could be listed. These include:
- limited investment
- limited technological capacity
- Limited awareness on renewable energy potential and opportunities at the local level;
- insufficient experience in RE development: limited knowledge and experience in the development and deployment of RE technologies
- human and socio-cultural challenges

20 http://www.ecreee.org/sites/default/files/documents/ecowas_renewable_energy_policy.pdf
http://www.ecreee.org/sites/default/files/documents/ecowas_energy_efficiency_policy.pdf
21 https://www.legal500.com/guides/chapter/ghana-renewable-energy/

- lack of or insufficient partnerships
- lack of qualified personnel at all levels
- limited business-oriented models for private sector involvement.

Being endowed with RE resources, Ghana offers several opportunities for the development and deployment of renewable energies. These include:

- wide range of possible application of resources such as solar energy (mini-grids, standalone street lighting, traffic controls, telecommunication, light electronic devices, household uses, etc.;
- demand side management (example: introduction of REs in existing or new buildings);
- applications of solar, wind energy or hydropower in agriculture;
- development of local market;
- establishment of assembling or manufacturing plants;
- capacity building for skills development;
- green job creation,
- climate finance: funding from climate change schemes relating to deforestation and afforestation for instance, (such as REDD+)
- promotion of incentive schemes put in place by the Energy Commission, etc.

II.2.4 Points of Action for local civil society organisations

CSOs could engage in the following actions:

- Advocate to realign the target of 10% of renewable energy share in the energy mix by 2030 (considering that the Renewable Energy Act (832) has been amended to take into account large hydro) to be more ambitious
- Campaign for better knowledge of legislation including the Local Content and Participation Regulations for better ownership and involvement at local level ;
- Promote local content and local manufacturing and assembly in the renewable energy industry
- Encourage capacity building to get skilled technicians for maintenance and installation
- Disseminate information on costs and benefits of REs and RETs
- Advocate/Encourage the development of national programmes on specific/ prioritized REs
- Encourage the dedication of funds for the deployment of REs;
- Sensitize on the various incentive schemes put in place by the Energy Commission (including the Rooftop Solar PV Programme; the Import Duty Exemptions; the VAT Exemptions; the Mandatory Purchase Policy for the procurement of a percentage of electricity from a renewable energy source for electricity distributors or bulk customers; the Competitive Procurement Scheme; the Mandatory Connection Policy, etc., and advocate for more incentives;
- Sensitize the private sector on the existence of funding related to CC, such as deforestation and afforestation programmes (REDD+)

One of the key elements that needs to be considered in line with the SE4ALL approach, is the need for partnership building and concertation between government, civil society, research and academia communities, and the private sector, with a view to addressing the identified gaps, challenges and barriers of the energy sector. Coordination between different stakeholders is essential to ensure a successful deployment and development of REs in Ghana. Without a stable policy environment offering commercial opportunities, and without action by private companies or civil society organizations, national policy programmes will not achieve the desired goal. Civil society organisations have an important role to play in this approach by trying to approach all the other stakeholders through policy dialogue.