

THE GHANA RENEWABLE ENERGY FAIR (2019)

**PRESENTATION ON: THE CONSTRAINTS AND CHALLENGES TO
THE DEPLOYMENT OF RE SOLUTIONS IN GHANA**

Presentation Outline

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INTRODUCTION

- The promotion and deployment of renewable energy technologies in recent times have been necessitated by the combination of the realization of the realities of the finite nature of fossil fuels and the green house effects associated with the extraction and consumption of fossil fuels on our environment. For example, the BP's 2014 annual report on proved global **oil reserves** says that as of the end of 2013, Earth had nearly 1.688 trillion barrels of crude, which **would last** 53.3 years at current rates of extraction (i.e. 47 years from now).

INTRODUCTION CONT'UED

- If these reports are acceptable to global policy makers, including those in Ghana, then the deployment of renewable energy technologies (RETs) may be considered in the short to medium term, as a process of complementing fossil fuels to power modern economies and civilization. In the long term however, deployment of RETs should be considered as a process of eventually replacing fossil fuels with more sustainable energy sources to power socio-economic growth and sustain the process of civilization.

INTRODUCTION CONT'UED

- It is common knowledge however, that the deployment of RETs at current levels of technological development faces a number of constraints and challenges, that is, operational limitations and circumstances that put to test the innovative and creative abilities of key stakeholders, including policy makers, industry players such as public sector energy institutions, regulators, investors, project developers and end-users.

Constraints and Challenges to the Deployment of Renewable Energy Solutions in Ghana

- Until the passing of the Ghana Renewable Energy Law, Act 832 (2011), key constraints and challenges to the deployment of RE solutions in Ghana Included:

Policy

- There was no comprehensive national policy document providing direction for state institutions to promote the uptake of renewable energy technologies (RETs) in Ghana.

Policy Cont'ued

- This meant that there were no enforceable legal provisions compelling state institutions such as the Ministry of Energy (MoEn), the Energy Commission (EC), and to some extent the Public Utilities Regulatory Commission (PURC), to draw up programmes for the large scale exploitation of indigenous renewable energy resources
- There was no road map for complementing, and or replacing traditional energy sources in the national energy mix with renewable energy resources and associated technologies
- The linkage between the uptake of RETs and environmental sustainability had not been defined by any public policy instruments

Economic

- There were no well-defined economic incentives for individuals, businesses and private RE developers to invest in RE solutions
- Upfront installation costs for RETs were beyond the means of most potential users, while this was due to the high cost of RE materials and equipment on the world market, coupled with the low patronage of RETs on the local market
- The absence of a net-metering Code and tariff, had meant that RE-based customer generators or prosumers, especially those without storage facilities, had no means of storing their excess energy yield for use later, or to offset parts of their energy imports from the grid

Technological

- Until recently, appropriate technologies for solar PV, wind power and mini-hydro (the most common RETs in developing countries) to support the uptake of RE solutions were not accessible to many potential users. This was due to a combination of the following factors:
 - national policy and knowledge gaps,
 - economic limitations and
 - technological immaturity

Impact of the Ghana RE Law on Constraints and Challenges to the Deployment of RE Solutions in Ghana

- Having been in operation for the past eight years, The Ghana RE Law, has shown signs of either eliminating or reducing the impact of the above mentioned constraints on the uptake of RETs. For example, the economic and technological constraints are expected to gradually give way, as a result of the effective implementation of the RE Law, due to the following:

Impact of the RE Law on Technological Constraints and Challenges Cont'ued

- Renewable Energy Power purchase agreements based on Feed-in-Tariff, which is an instrument of the RE Law, or its competitive bidding version, together with the Net-metering instrument provides sufficient economic incentives for businesses, potential RE investors and well-resourced households to invest in RE solutions

Impact of the RE Law on Technological Constraints and Challenges Cont'ued

- As the RE Law provides the policy and economic incentives for the promotion of RE solutions to the energy supply concerns of consumers, it will also impact positively on the costs, knowledge about and quality, as well as appropriateness of RETs

Current Constraints and Challenges to the Deployment of RETs in Ghana

- Notwithstanding the positive impacts of the Ghana RE Law on the known constraints and challenges to RE solutions, some challenges remain that retard the promotion and deployment of RETs. These include:

Current Constraints Cont'ued

- Inadequate public education on the availability, economic and environmental benefits of RE solutions
- Lack of funds for potential users of RETs, especially households, to pay the relatively high upfront investment costs for rooftop solar PV facilities. With the industry learning curve, the costs of solar PV systems for example, are gradually falling to levels where more businesses and households can afford such systems. This notwithstanding, the initial upfront costs remain high relative to grid electricity services

Current Constraints Cont'ued

- Availability, suitability and costs of lands for the deployment of community-based mini grids or grid scale solar PV and wind power plants

Current Constraints Cont'ued

- Availability, suitability and costs of lands for the deployment of community-based mini grids or grid scale solar PV and wind power plants
- Appropriateness and suitability of some RETs, for example, solar PV-based mini-grids for productive uses of electricity for inhabitants of rural communities
- Attitudes of public electric utilities and some conventional power engineers towards RETs are often not encouraging enough

Current Constraints Cont'ued

- Technical capabilities of public electric utilities to manage significant penetration of variable renewable energy technologies (v-RETs) into grid systems while ensuring grid integrity
- Attitudes of public electric utilities and some of their conventional power engineers towards RETs are often not encouraging enough

Current Constraints Cont'ued

- Alleged inequity of the prevailing PURC approved renewable energy based net-metering tariff, which allows renewable energy-based customer-generators, or prosumers to “sell” their energy yield in excess of their own consumption into the grid, at the same tariff as they purchase energy from the grid system. The Distribution companies have complained that this tariff fails to compensate them for the use of their grid by customer-generators to store their excess energy without contributing to the construction and maintenance of their network

Way Forward/Recommendations

- The following recommendations are hereby being presented to public policy makers, energy sector regulators and public electric utilities, as a set of strategies to eliminate, in some cases, the above listed constraints and challenges to the deployment of RETs, and minimize the impact of those that cannot be eliminated in the short term:

Way Forward/Recommendations Cont'ued

- Policy makers may consider embarking on community-based public education on the economic and environmental benefits of RETs
- Special purpose banks and similar financial institutions with expertise in the economics of RETs may be created to provide loans at attractive interest rates to renewable energy project investors, public sector energy utilities, businesses and end-users with the desire to invest in, or procure RE solutions
- Rooftop solar PV and wind power applications should be given priority in the selection of RETs for deployment, due to the land use neutrality of these applications

Way Forward/Recommendations Cont'ued

- To encourage island and other remote communities to embrace solar PV and or wind power in a hybrid configuration with diesel powered gen-sets, it is crucial that the electricity from the system is appropriate support not only domestic, but also productive uses of electricity
- Engineers and Managers of public electric utilities must realize that the most beneficial way to react, or respond to the deployment of RE solutions is to “flow” with the wind of change, and not oppose, or seek to suppress it. We must all understand that if we refuse, or fail to move with the wind of change, we run the risk of being left behind, just like the land-line telephone operators failed to move with the mobile phone technologies, and were left behind in the industry

Way Forward/Recommendations Cont'ued

- Public electric utilities must invest in training of relevant engineers and other professional to be equipped with appropriate and adequate skills to manage high penetration of v-RETs in the grid systems to ensure system integrity
- It is expected that once the electricity distribution companies have been adequately compensated, through net-metering tariff that is mutually acceptable to both the utility and customer-generator, the utilities are likely to facilitate the implementation of the Energy Commission's Net-metering Code of 2012, a potentially effective instrument for the smooth implementation of the Ghana RE Law.

- Thank you for your attention
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