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Overcoming electricity crisis in West Africa: An overview of the renewable energy status and development in West Africa

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Global renewable energy generation during 2016 was led by plants owned by utilities or large investors and the scale of plants (solar PV, wind power and CSP) and of some generator equipment (such as wind turbines) continued to grow. Utilities in China, Denmark, Germany, India, Sweden and the United States continued to invest in large-scale renewable energy projects, especially in solar PV and wind power and in some cases, they also invested in renewable energy technology companies. For the more than globally, there are over 1 billion people living devoid of energy access (majority of them are located within the sub-Saharan Africa and Asia regions), renewable energy systems, particularly those in rural areas not connected to the national grid, keeps offer important and often cost 97. During the course of 2016, high percentage of levels renewable energy sources were attained by many countries: such as, 37.6% wind power in electricity demand of Denmark, Ireland 27%, Portugal 24%, Cyprus 19.7% and Costa Rica 10.5 %; solar PV, on the other hand, contributed 9.8% of electricity demand in Honduras, 7.3% in Italy, 7.2% in Greece and 6.4% in Germany. Higher dissemination levels of the mutable renewable source of energy were met with restrictions in some countries, principally in China. The current renewable energy growth and geographical development was motivated by the constant drop in renewable energy prices (specially, for solar PV and wind power), solar PV and onshore wind power are competing with new fossil fuel generation today in an increasing number of sites due in part to drops in system component prices and to improve the generation efficiency. There was a considerable fallen in bid prices for offshore wind power in Europe all through 2016. These such drops are mainly essential in developing and embryonic economies and in isolated electric systems (such as islands or isolated rural communities) where electricity prices are higher (if not greatly subsidized), where there is scarcity in generation as well as places with abundant renewable energy resources, making renewable energy source more economical compared to other possibilities. In Africa, Egypt, followed by Morocco, leads the region in installed renewable power capacity; both countries have significant hydropower capacity. In South Africa (together with Ethiopia) which leads sub-Saharan Africa in total installed renewable power capacity-renewable energy reached 5% of the total electricity generating capacity in 2016. South Africa and several countries in Northern Africa (Algeria, Egypt and particularly Morocco) are becoming important markets for CSP as well as centers of industrial activity for solar PV modules and wind turbine components. Several countries, including Ghana, Senegal and Uganda, commissioned solar PV plants during the year and Kenya was one of the few countries worldwide to bring additional geothermal capacity online. Several large hydropower projects also are under development on the continent. The West African continent is currently facing an energy crisis in the form of electricity and natural gas load shedding as a result of inadequate obtainability of indigenous energy. Alternatively, the continent has huge potentials of Renewable Energy Resources (RERs) especially small hydropower which is that has not been tapped. Due to the lack of institutional and governmental support. This paper is designed to discuss the past and current energy demand and supply situation in the region followed by an assessment of the potential for RERs which can be harnessed for meeting energy demand of the country. The paper also describes various problems faced during renewable energy generation and the approaches used to resolve the problems. An extensive literature review is undertaken in this study, focusing therein the potential of RERs in the region covering hydro, solar, wind and biomass energy resources. It is revealed from this review that the highest potential out of all RERs exist for hydropower energy. Besides, it is observed that the highest number of ongoing potential energy projects pertain to mega hydropower generation. The research concludes that West African continent needs to invest more and more in hydro energy and keep the pace of research and investment in the solar and wind energy as much as possible so that region can have self-reliant and economically viable for all types of RERs in the long run.

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