Utility-scale energy storage accra

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A favorable business environment would help in wind energy deployment in the country. After all, it is the private sector that would play a catalytic role in scaling up wind energy in Ghana, as have been done in South Africa with the REIPPP (SEWEA 2019), Kenya (Kazimierczuk 2019), and Morocco (Government of Morroco 2019), together with the African Development Bank (AfDB), a multilateral development institution, and other private developers.

The rest of the paper is organized as follows: the "Literature review" section makes a deep dive to the literature on the wind industry in Ghana. The "Data and methodology" section describes research and methodology. The results of the analysis are described in the "Results and discussions" section. The "Conclusions and recommendations" section ends the paper with conclusions and recommendations.

This section provided a deep dive to the wind energy situation prevailing in the country, as well as the electricity generation dynamics of the country. It reviewed the literature related to the technical, theoretical, economic, and geographic wind energy potential of the country. It equally briefly reviewed that of Africa.

Figure 1 shows, from the figure above, a plot of the average wind speed of Ghana at height 100 m, the vertical axis as the mean wind speed, and the percentage windiest of the area on the horizontal axis. This figure shows Ghana has the potential of generating utility-scale wind projects at height 100 m and wind frequency rose.

Figure 3 shows that wind power density is used to evaluate the wind resource potential of a site. It explains the amount of wind energy available at a place that could be converted by wind turbines to produce electricity. It is measured in watts square meters. A wind power density in the range of 150-200 m2 indicates a wind speed of 5.1-5 6 m/s. Thus, by this mean of 150 w/m2, the wind speed is given in that range.

Figure 4, the above figure, shows the wind power density of the eastern region. It is indeed one of the regions in Ghana well-endowed with wind energy resources. Its wind power density is 232 W/m2. This, therefore, suggests that the wind speed there is between 6.0 and 6.4 m/s. This has met the universal requirement for building a utility-scale wind farm. This is attributed to its mountainous area. The country should exploit this potential for its socioeconomic gains.

Figure 6 shows that the Greater Accra has a huge potential for utility-scale wind farm, with the mean speed density of the 10% windiest areas to be 232 W/m2. Power density explains the wind resource availability of the area to produce electricity by wind turbines. This has a wind speed in the range of 6.0-6.4 m/s. The figure from above shows the direction of the blow of wind in the Greater Accra region. The direction is mostly from southwest and west south, south. The direction of the flow of wind speed is 100%.

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