

Does Djibouti have a wind energy potential and micro-turbine performance analysis?

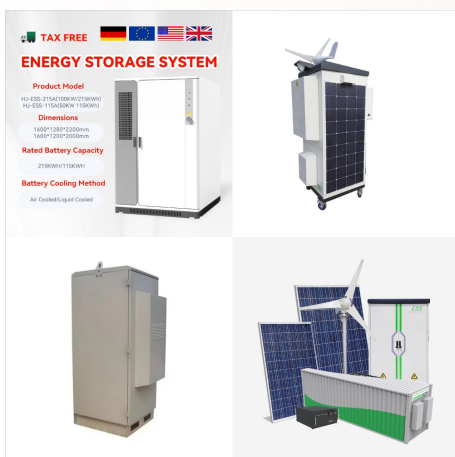
In this study, the first wind energy potential and micro-turbine performance analysis were carried out in Djibouti. Five years wind speed data were subjected to Weibull k and c parameters and other statistical analyses.

What is Djibouti's electricity demand?

Based on 2020 data, Djibouti's national electrification rate reached 42%, (1% in rural areas, 54% in urban areas). Djibouti has vast untapped renewable energy sources, namely geothermal, solar, and wind. The peak annual demand in 2014 was about 90 MW but is expected that it will grow to about 300 MW by around 2020.

What is Djibouti's Vision 2035?

Djibouti's Vision 2035 aims to achieve universal electricity access and power the nation with 100% renewable energy. Already, it sources approximately 65% of its electricity from Ethiopia (mainly hydroelectricity; renewable) via an intertie, reducing its reliance on imported fossil fuels.



Using the WindPRO program and two commercial wind turbines in according to IEC 61400-1 design criteria, the electricity generation were technically assessed. These wind farms can produce 1073 GWh of electricity per year, approximately equal to Djibouti's expected average annual electrical demand in 2030.

MICRO ELECTRICITY GENERATION DJIBOUTI



In the Republic of Djibouti, due to increasing electricity demands, the government has planned to increase power supply by using renewable resources such as geothermal, solar and wind energy. This work presents the first wind resource assessment in the Republic of Djibouti using measured wind speed data for the period of three years by



The motivation for this study was to investigate the potential of wind resources in the Republic of Djibouti and to analyze for the first time the economic risk of wind energy production for electricity generation and green hydrogen production in an African country.



economic development goals, Djibouti needs to look into power generation options that are more affordable, reliable and predictable. Djibouti has significant geothermal, wind and solar energy resources that could be developed to address its twin concerns of energy access and energy security. Developing these renewable resources would reduce

MICRO ELECTRICITY GENERATION DJIBOUTI



According to USAID's Energy sector overview for Djibouti, Djibouti has the potential to generate more than 300MW of electrical power from renewable energy sources, and much more from other resources. Based on 2020 data, Djibouti's national electrification rate reached 42%, (1% in rural areas, 54% in urban areas).



3 . Mini-grids powered by renewable energy can help improve electricity access and aligns with Djibouti's goal of 100% Renewable Energy by 2035. This policy memo advocates for accelerating mini-grid deployment through capital subsidies, public-private partnerships, and capacity-building programs.



In this study, a five-year wind speed data of Djibouti was analyzed by micro wind turbine in the city center of Djibouti. The data obtained from the anemometer at a height of 10 m were used in the analysis. The goal of this study is to determine the economic impact of energy produced by micro wind turbines and attract the interest of investors.

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To date, Djibouti has relied on imported fossil fuels to generate power, with most of its electricity coming from neighbouring Ethiopia through a 283-km interconnection link. Djibouti Vision 2035 targets the generation of 100% of energy from renewables and achieving energy security by the close of the plan.



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