

Best locations for wind farms

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The study, titled "Identification of reliable locations for wind power generation through a global analysis of wind droughts", saw researchers from the Carnegie Institution for Science in Stanford, US, analyse climate data from as far back as 1979 to identify area trends in wind strength as well as major fluctuations in wind speed across seasons.

The study identified the American mid-west, Australia, Argentina, Central Asia and South Africa as the most ideal locations for generating wind power. The combination of both high power density and low seasonal variation in wind power make these locations well placed for future wind power development.

Areas that combine low seasonal variability and high mean power generation have a significant advantage for wind power over those that only place highly in one of the two factors. North-western Europe, for instance, has an extremely high power density but also has significant variation across seasons and risks facing "wind droughts" in the summer months. Meanwhile, parts of the Amazon and Eastern Russia have more consistent seasonal patterns but relatively low power densities.

Seasonal variations highlight issues in grid stability, an issue brought to the attention of the British public when it was revealed that the British transmission company National Grid had spent ?215m (\$256.75m) to switch off wind turbines at the windiest times due to a lack of cable infrastructure to support power generation and a further ?717m to turn on gas turbines closer to the source of demand to make up for the shortfall.

Areas with high power generation and high seasonal variation must focus on building strong and flexible grid infrastructure, as well as energy storage capacity, to ensure that changing seasons do not mitigate the strong potential of their wind power.

Hover over the best locations for wind turbines by exploring key factors like wind potential; environmental impacts; and infrastructure considerations; it's just the tip of the iceberg;

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