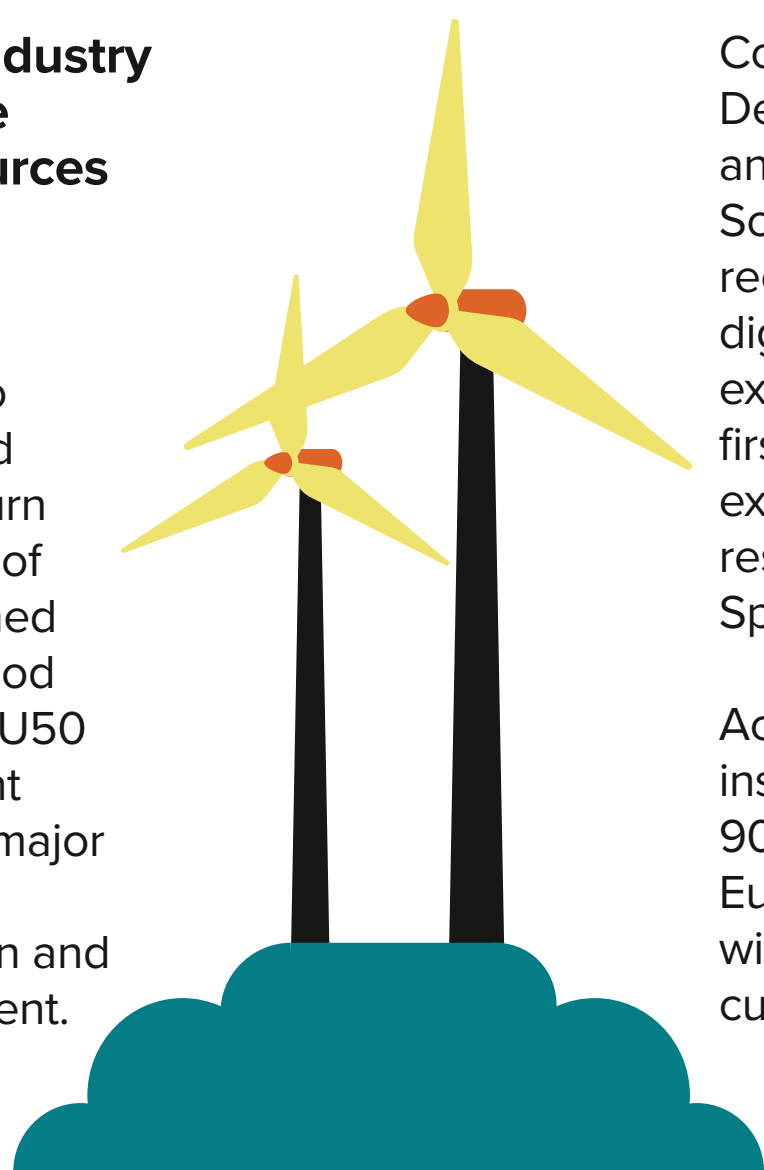


# A NEW GLOBAL WIND ENERGY ATLAS

BY CARLOS M. GONZÁLEZ

**For the wind energy industry to expand, an accurate estimate of wind resources is needed to ensure maximum operating conditions.** Excessive design loads contribute to wind turbine selection and cost. To maximize the return of investment, the design of a wind turbine is determined on the 50-year return period of sustained wind speed (U50 m/s). Stable and consistent wind speed is one of the major determining factors when considering turbine design and wind turbine farm placement.



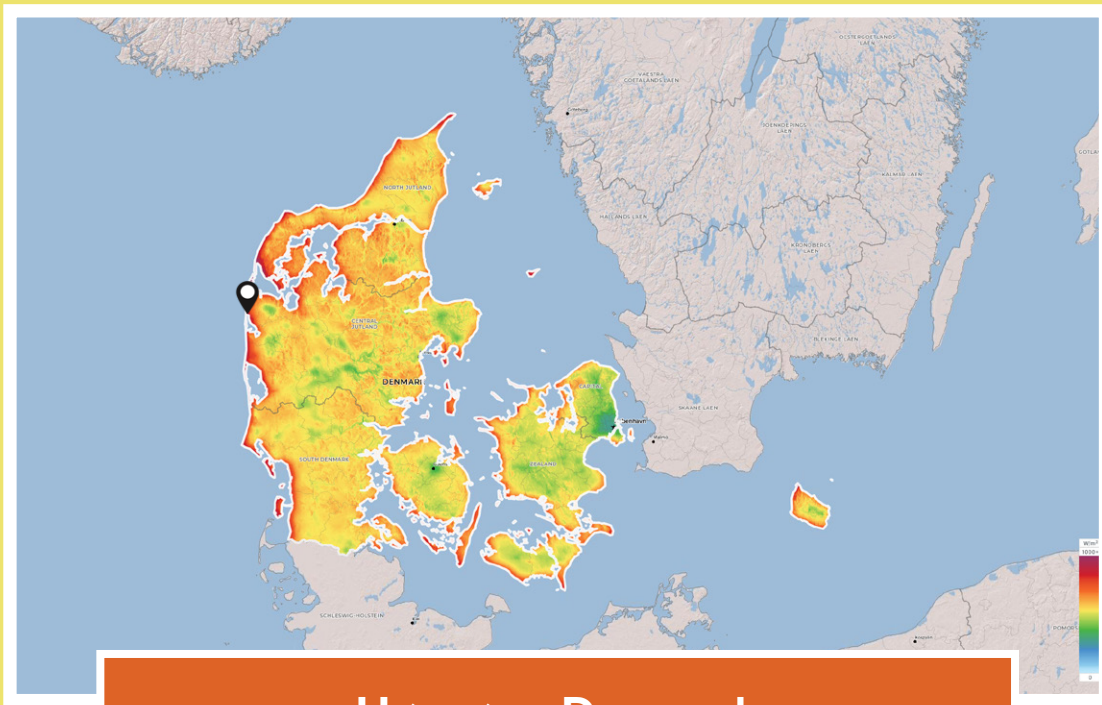
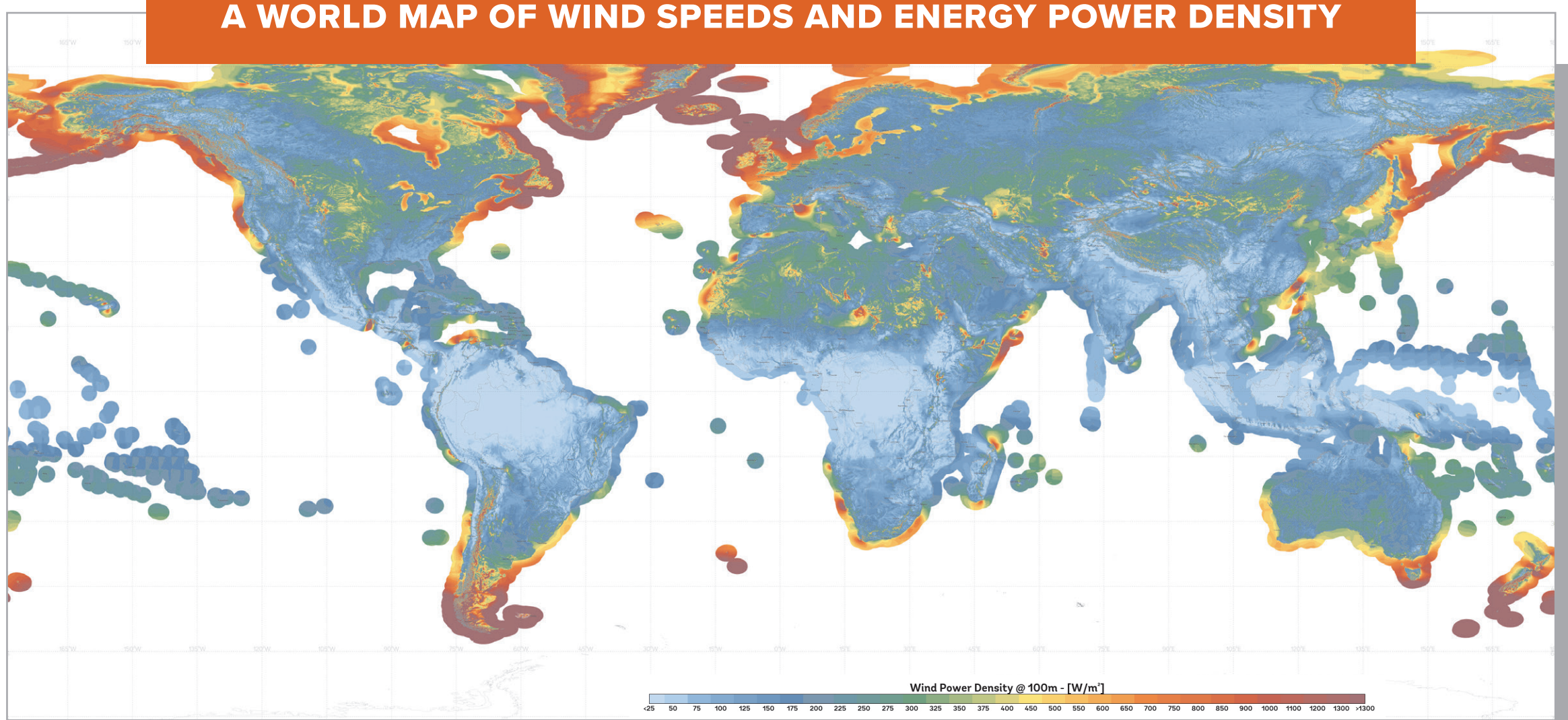
Cornell researchers Sara C. Pryor, professor in the Department of Earth and Atmospheric Sciences, and Rebecca J. Barthelmie, professor in the Sibley School of Mechanical and Aerospace Engineering, recently released a new global wind atlas—a digital compendium of sites around the world with extreme wind speeds. This type of wind atlas is the first publicly available, uniform, and geospatially explicit dataset of locations, according to their research “A Global Assessment of Extreme Wind Speeds for Wind Energy Applications.”

According to the research, the global wind turbine installed capacity was more than 651 GW, with 90 percent placed onshore by 2019. China and Europe are leading the way with 36 and 31 percent wind energy capacity, respectively. The U.S. currently has a wind energy capacity of 17 percent.

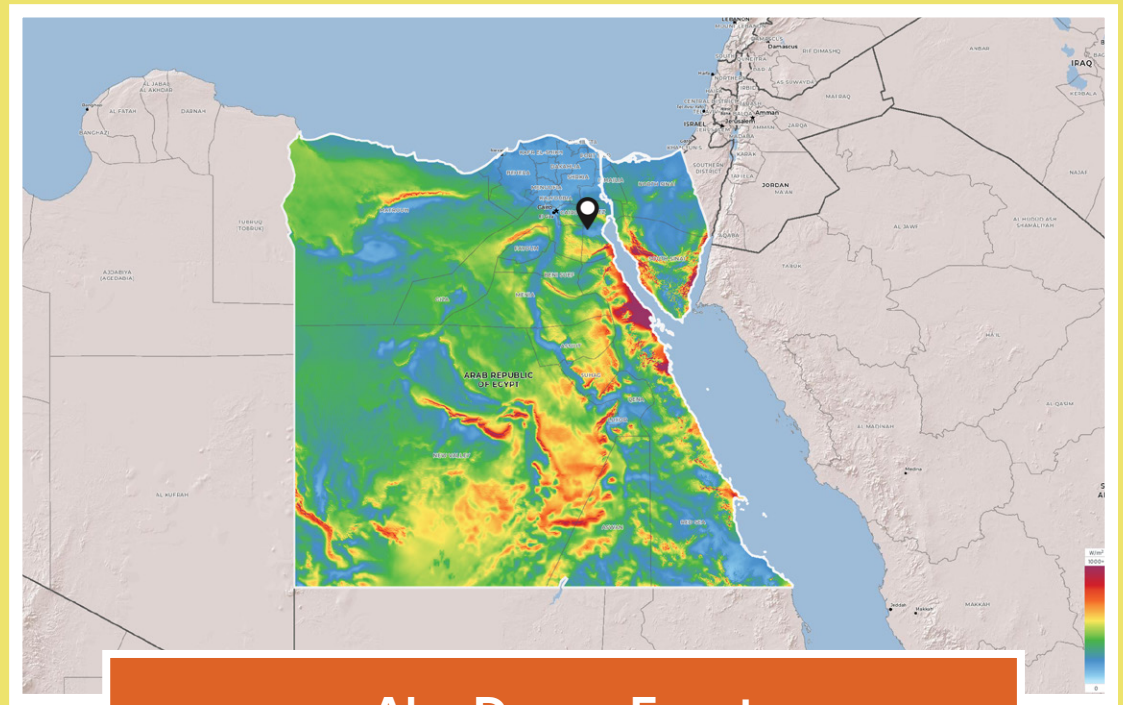
The region maps below are provided by the Global Wind Atlas 3.0 and measure the wind power density ( $W/m^2$ ) for a given region.

Let's explore eight locations around the world that have the fastest wind speeds and energy capacity worldwide

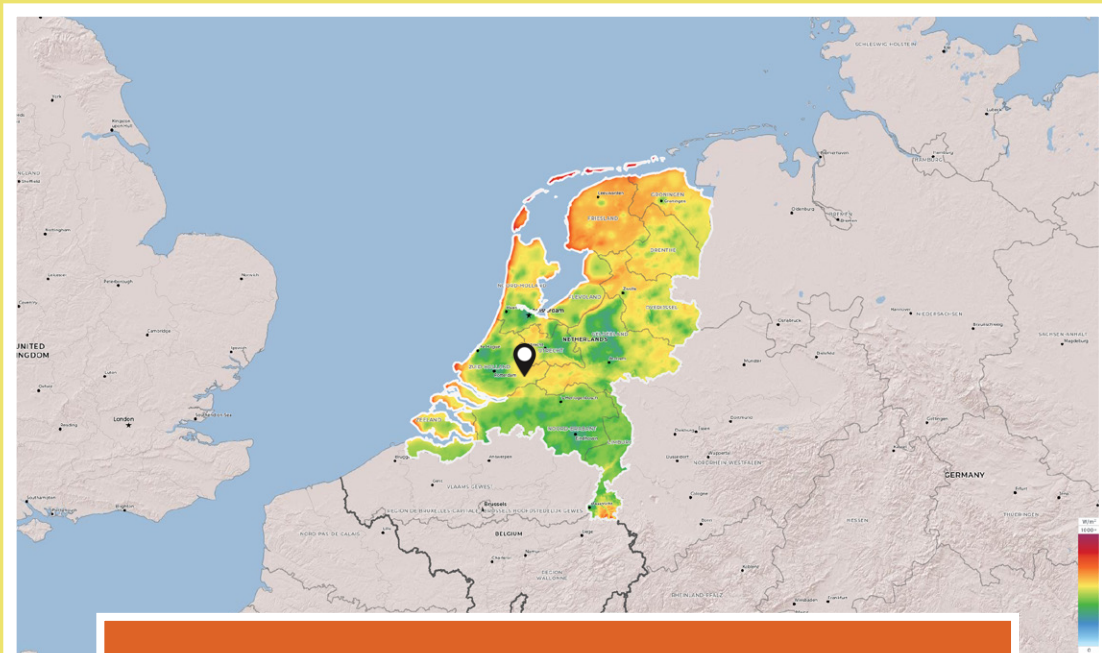
## A WORLD MAP OF WIND SPEEDS AND ENERGY POWER DENSITY



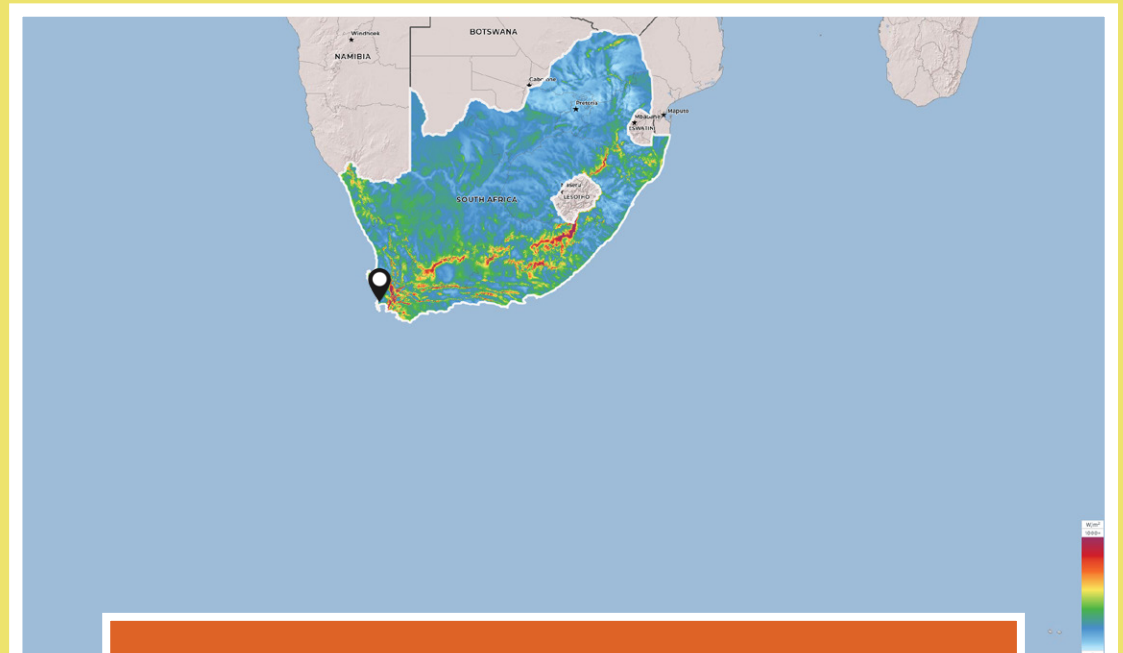
**Høvsøre, Denmark**  
Latitude: 56.4397°N, Longitude: 8.1517°E  
Wind speed (U50): 42.8 m/s



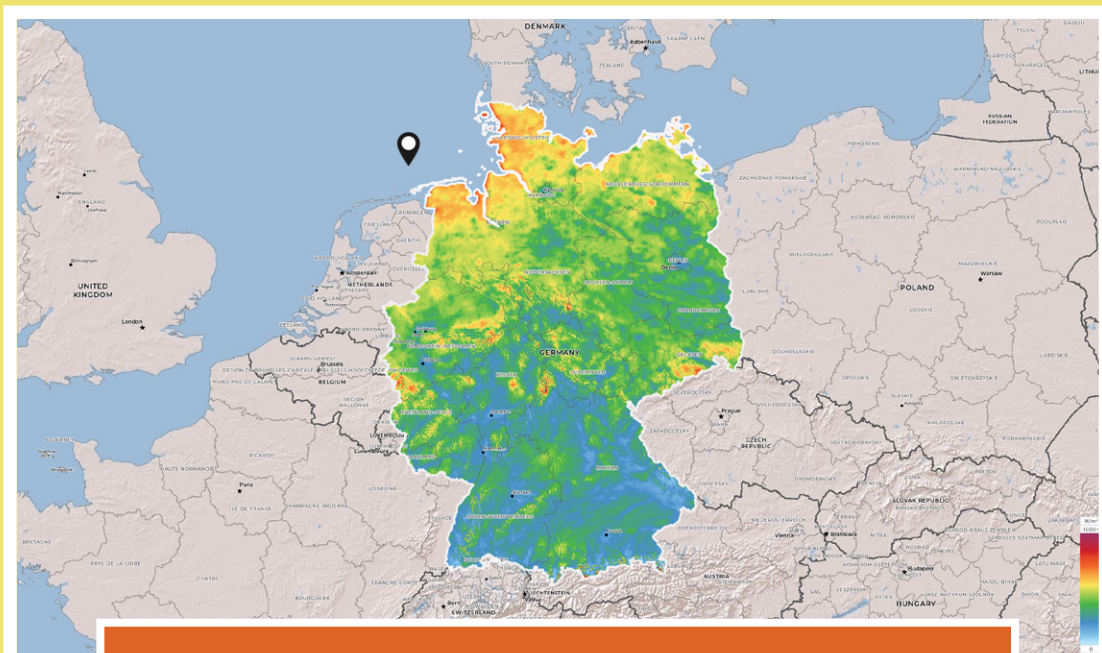
**Abu Darag, Egypt**  
Latitude: 29.28°N, Longitude: 32.599°E  
Wind speed (U50): 27.6 m/s



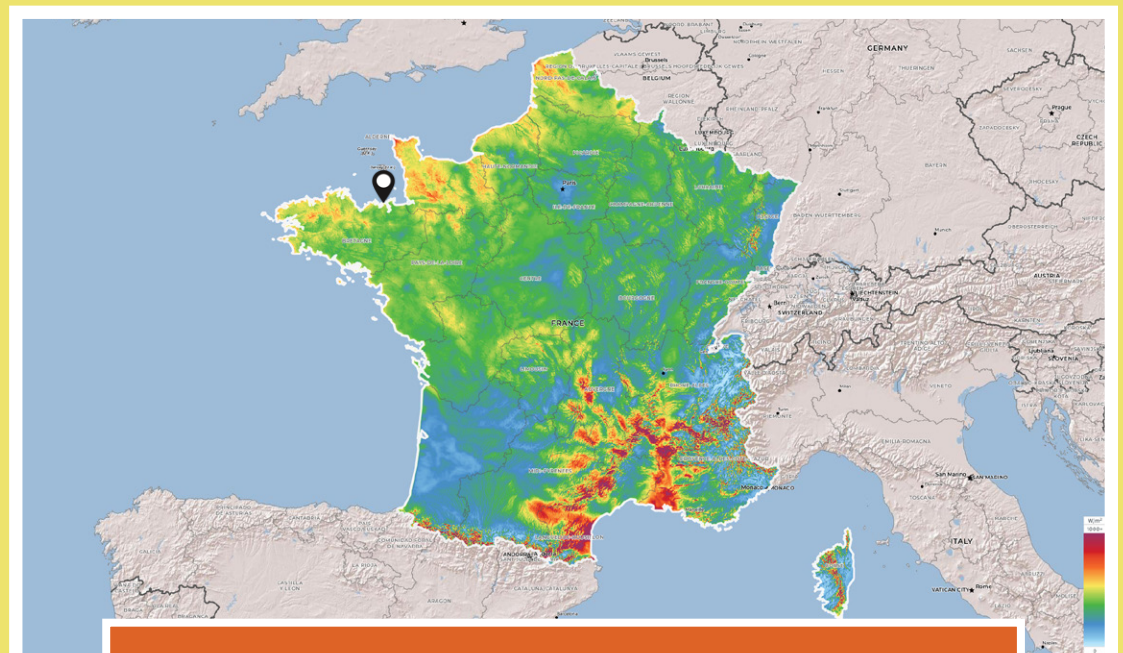
**Cabauw, Netherlands**  
Latitude: 51.917°N, Longitude: 4.927°E  
Wind speed (U50): 40.1 m/s



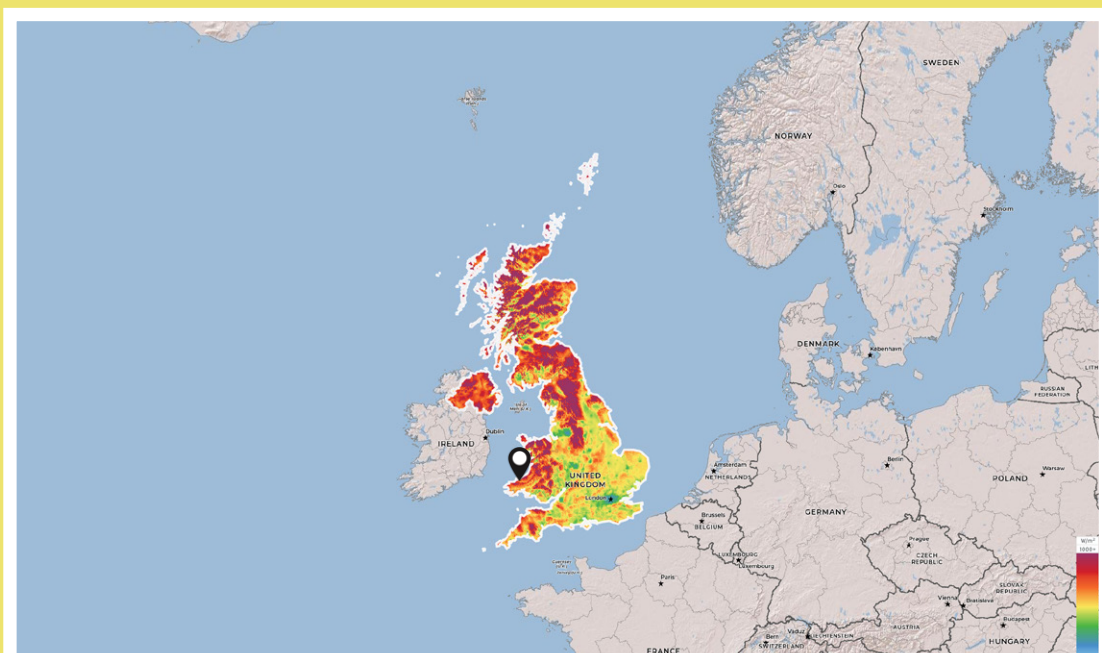
**Cape Town, South Africa**  
Latitude: 33.978°S, Longitude: 18.599°E  
Wind speed (U50): 24.3 m/s



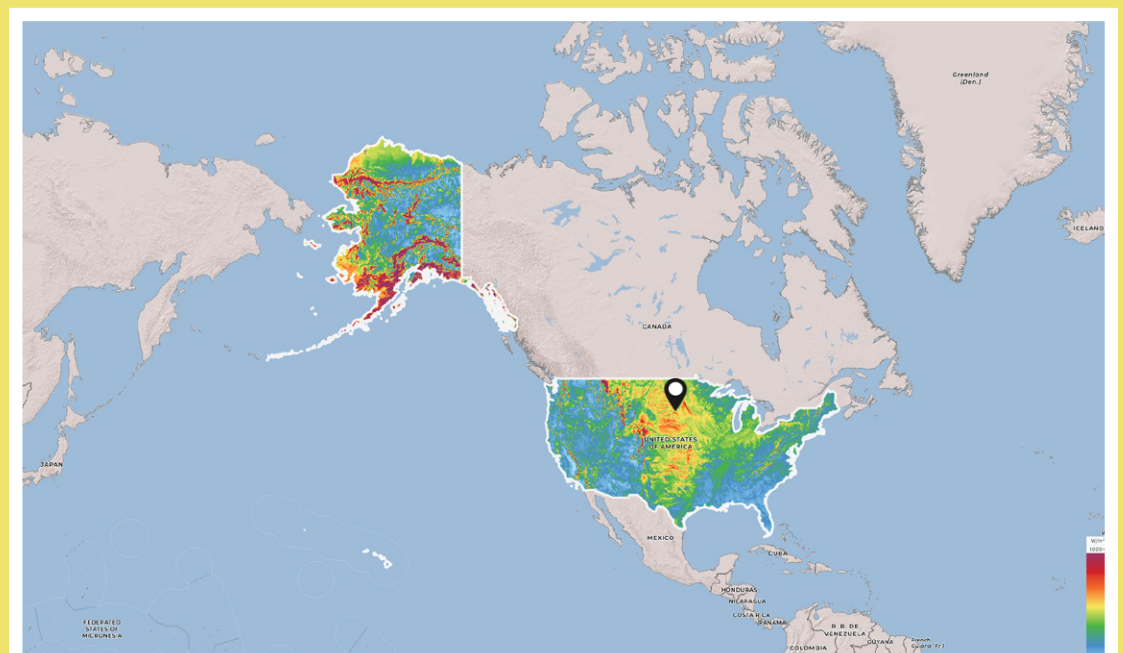
**FINO1, Germany (North Sea)**  
Latitude: 54.014861°N, Longitude: 6.58763889°E  
Wind speed (U50): 39.3 m/s



**Dinard, France**  
Latitude: 48.633°N, Longitude: 2.051°W  
Wind speed (U50): 24.3 m/s



**Aberporth, UK**  
Latitude: 52.133°N, Longitude: 4.5505°W  
Wind speed (U50): 32.05 m/s



**Huron, South Dakota, USA**  
Latitude: 44.359167°N, Longitude: 98.218056°W  
Wind speed (U50): 22.6 m/s

### MAP IMAGES CREDIT:

[Data/information/map obtained from the] “Global Wind Atlas 3.0, a free, web-based application developed, owned and operated by the Technical University of Denmark (DTU). The Global Wind Atlas 3.0 is released in partnership with the World Bank Group, utilizing data provided by Vortex, using funding provided by the Energy Sector Management Assistance Program (ESMAP). For additional information: <https://globalwindatlas.info>”