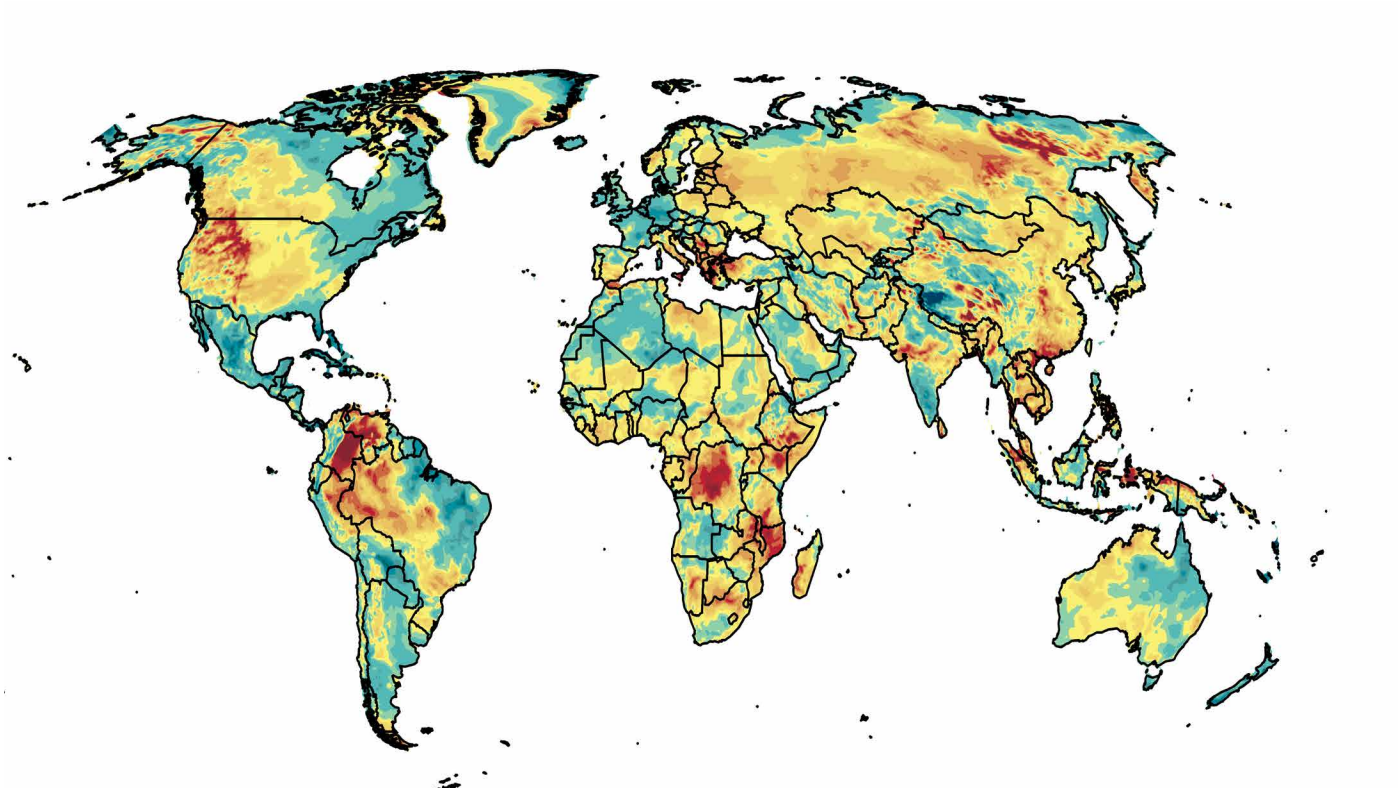
2021 | Q4 Global

Wind Trends

Global wind speed performance



2021 | Q4

Global

The Wind Trends Bulletin depicts anomalies of the global wind resource from the historical norm on a monthly, quarterly, and annual basis. The anomalies are calculated as a percent deviation from the 1995 – 2019 mean speed at 100 m above ground level for the calendar period. The latest Wind Trends dataset is derived using the ERA5, a contemporary global reanalysis dataset. For more information about customized analyses for your project portfolio, data or subscription options, please contact us at renewableenergyservices@ul.com.

Download **index values for even more wind power producing countries!**

Wind Trends

Global wind speed performance

Global

According to ERA5 reanalysis data, global wind speeds in the fourth quarter of 2021 were above-normal relative to the long-term, fourth-quarter norm (1995-2019). Most key wind power producing regions experienced near-normal wind speeds — with the exception of South America, where wind speeds dropped even further below the long-term, quarterly norm.

North America

The wind speeds rose across North America overall. This region's wind index was driven by the wind speed surplus in the capacity-rich western and central United States and Canada. However, low wind speeds overspread much of the eastern U.S. and Canada, as well as all of Mexico and Central America.

South America

The wind speeds across South America dropped even further below the long-term norm (this region's wind speeds have been below-normal since the second quarter of 2021). Of the top five counties in the region with the highest installed capacity (representing about 99% of the region's MW), all experienced winds below the long-term norm. Winds were strongly above the norm across northern portions of the region (e.g., Venezuela and the ABC islands), but the relatively low capacity here does little to sway the regional wind index.

Europe

The wind speed index was divided across Europe in the final quarter of 2021; below-normal wind speeds prevailed across Western Europe and Central Europe, while wind speeds rose above the norm elsewhere. Areas of particularly strong quarterly wind speed deficit include central Germany, Luxembourg, Belgium, and south-central France. Wind speeds were moderately above the long-term across Poland and the Baltic States, while particularly strong wind speeds overspread much of the eastern Mediterranean region.

Africa and the Middle East

Africa and the Middle East finished the period at near the long-term, quarterly norm. Above-normal wind speeds across the Mediterranean reached the northern areas of Africa with wind farm development (Morocco and Jordan). Much of East Africa also finished the quarter with a wind speed surplus. However, about a third of the region's wind farms experience wind speeds below the long-term, quarterly norm — including the lesser East African Islands (e.g., Seychelles, Mauritius, and Reunion) and most areas of wind farm development in South Africa.

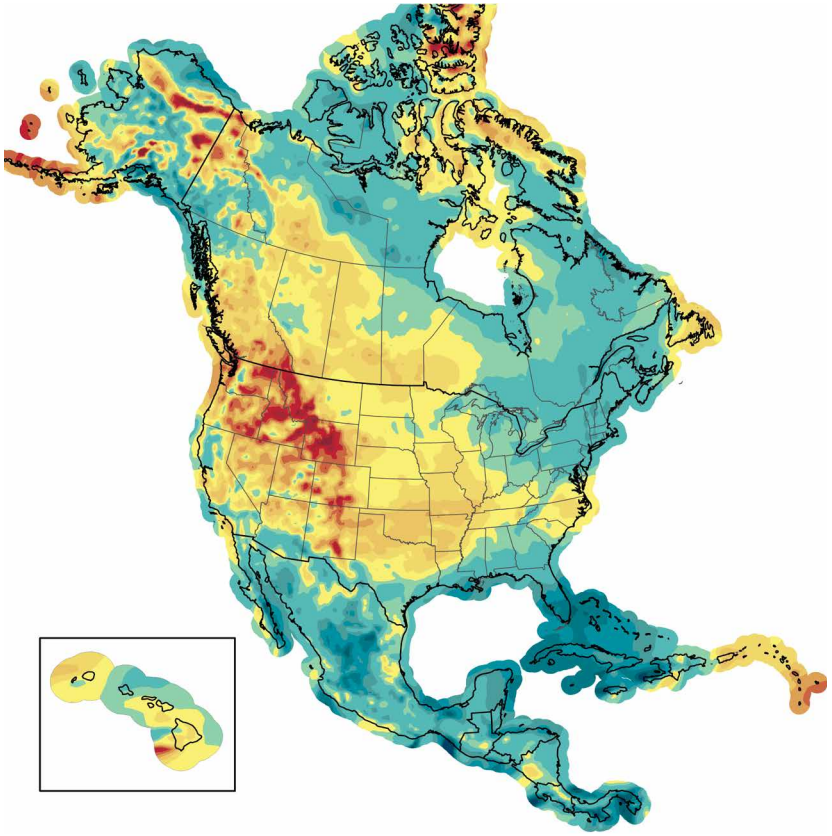
Asia

Asia finished the fourth quarter with above-normal wind speeds. Two-thirds of the region's countries with installed wind capacity experienced winds at or above the long-term norm — this includes the global leader of installed wind capacity, China. Key areas in the region with below-normal winds included Southern India, western Taiwan, and northern Japan.

Oceania

Wind speeds dipped below the long-term norm across key areas of Oceania including New Zealand, New Caledonia and wind power producing areas of Australia and Indonesia.

Download index values for even more wind producing countries!



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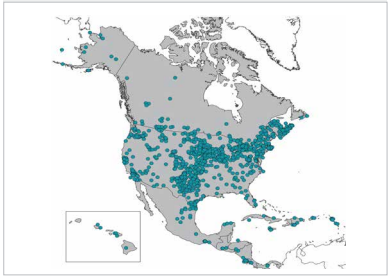
North America

Below normal:
- Northeast, U.S.
- Canadian Maritimes
- Eastern Ontario, CAN
- Quebec, CAN
- Western Caribbean
- Mexico

Above normal:
- The Plains Region, U.S. and CAN
- The Rockies, U.S. and CAN
- The Pacific Northwest, U.S.
- Eastern Caribbean



Wind plant locations source:
www.thewindpower.net

Wind Trends

Global wind speed performance

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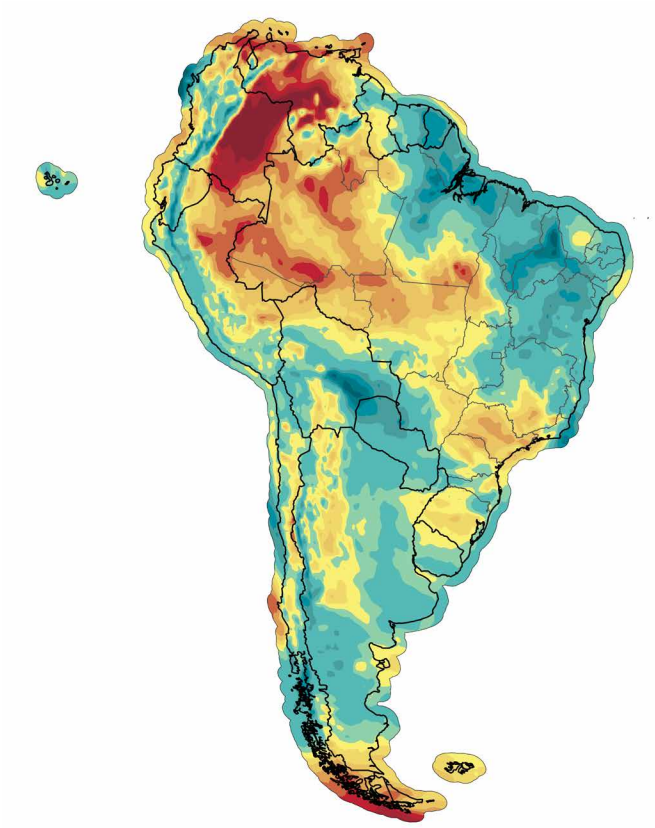

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South America

Below normal:
- Brazil
- Argentina
- Chile
- Uruguay
- Peru

Above normal:
- Venezuela
- ABC Islands
- Guajira Peninsula, COL

Wind plant locations source:
www.thewindpower.net

Wind Trends

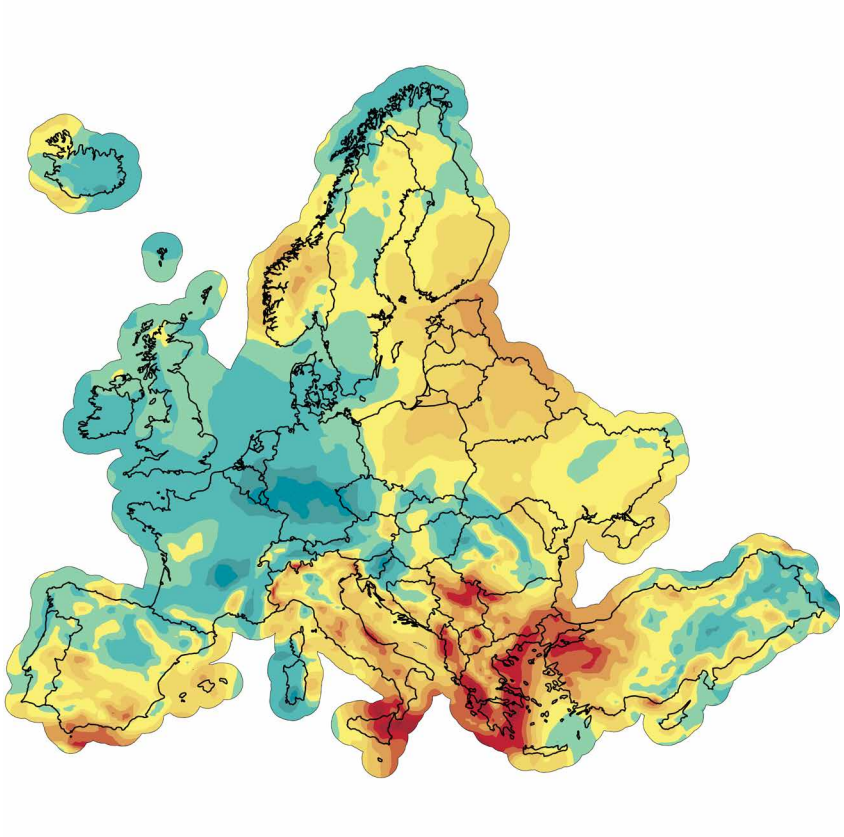
Global wind speed performance

above average wind speeds

Wind Speed Anomaly (%)

> +21 +18 +15 +12 +9 +6 +3 -3 -6 -9 -12 -15 -18 -21 <

below average wind speeds



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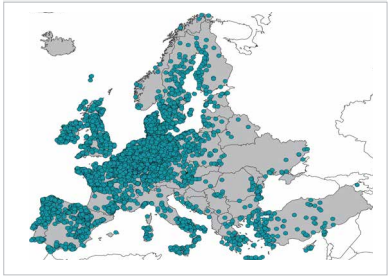
Europe

Below normal:
- Western Europe
- Central Europe

Above normal:
- Poland
- The Baltic States
- Southern Europe
- Portugal



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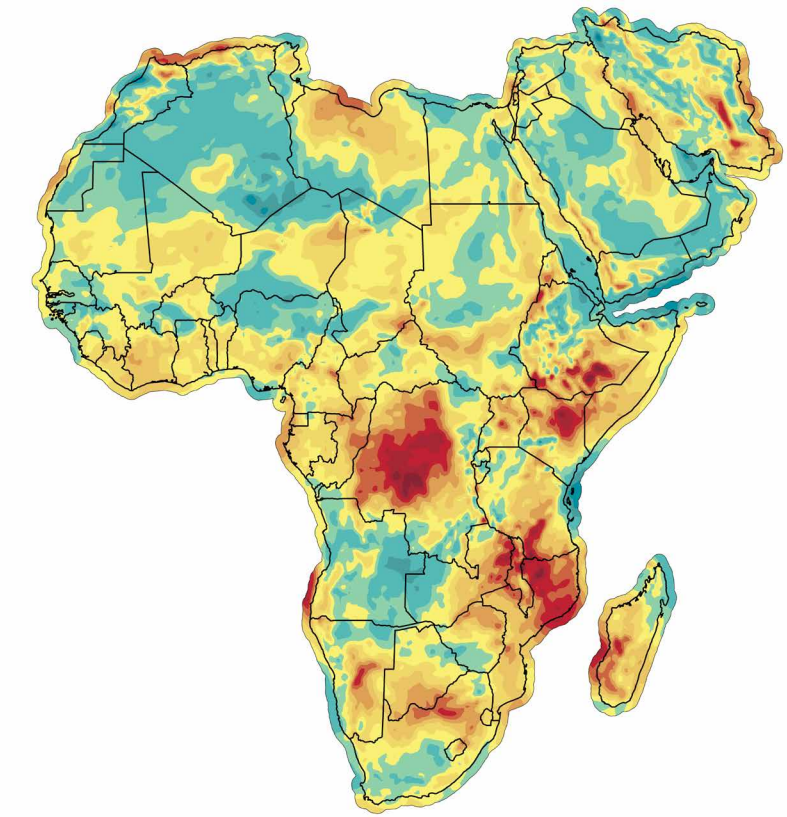

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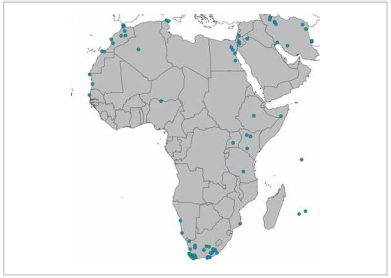
Africa / Middle East

Below normal:
- South Africa
- Canary Islands, ESP
- Western Sahara
- East African Islands

Above normal:
- Coastal Morocco
- Jordan
- East Africa



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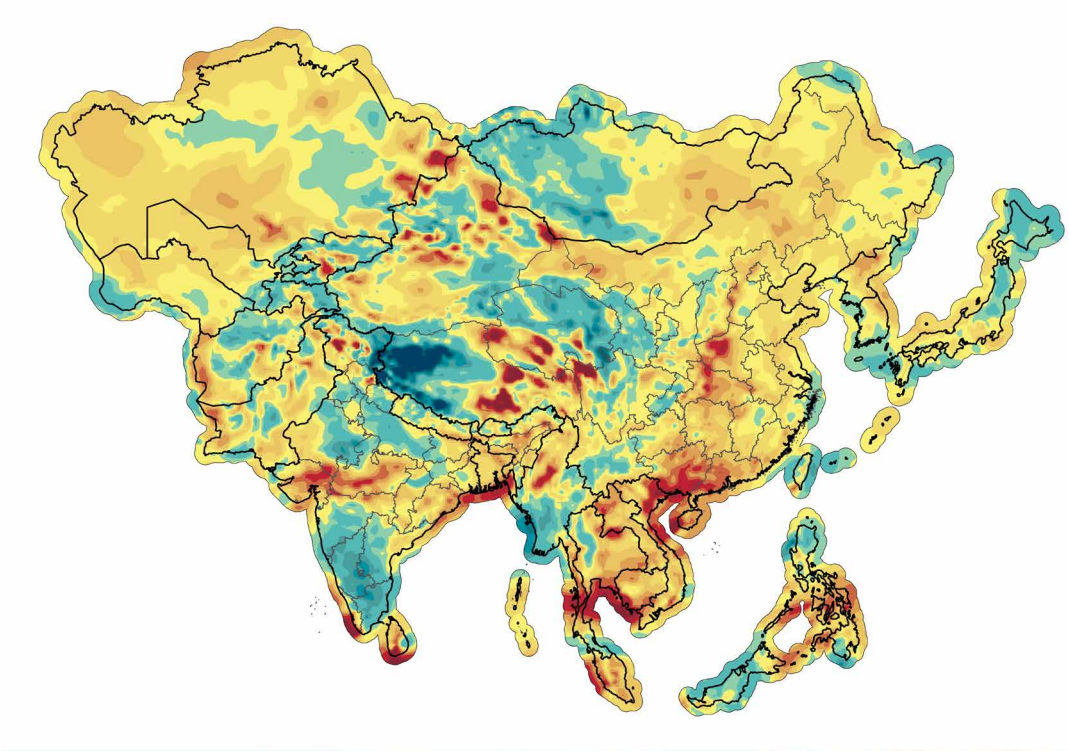
Wind Trends

Global wind speed performance



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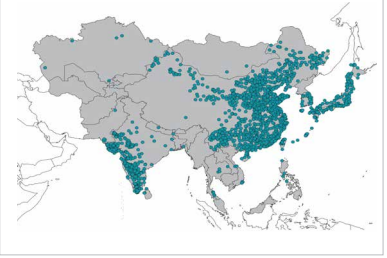
Asia

Below normal:
- Southern India
- Western Taiwan
- Northern Japan

Above normal:
- China
- Mainland Southeast Asia



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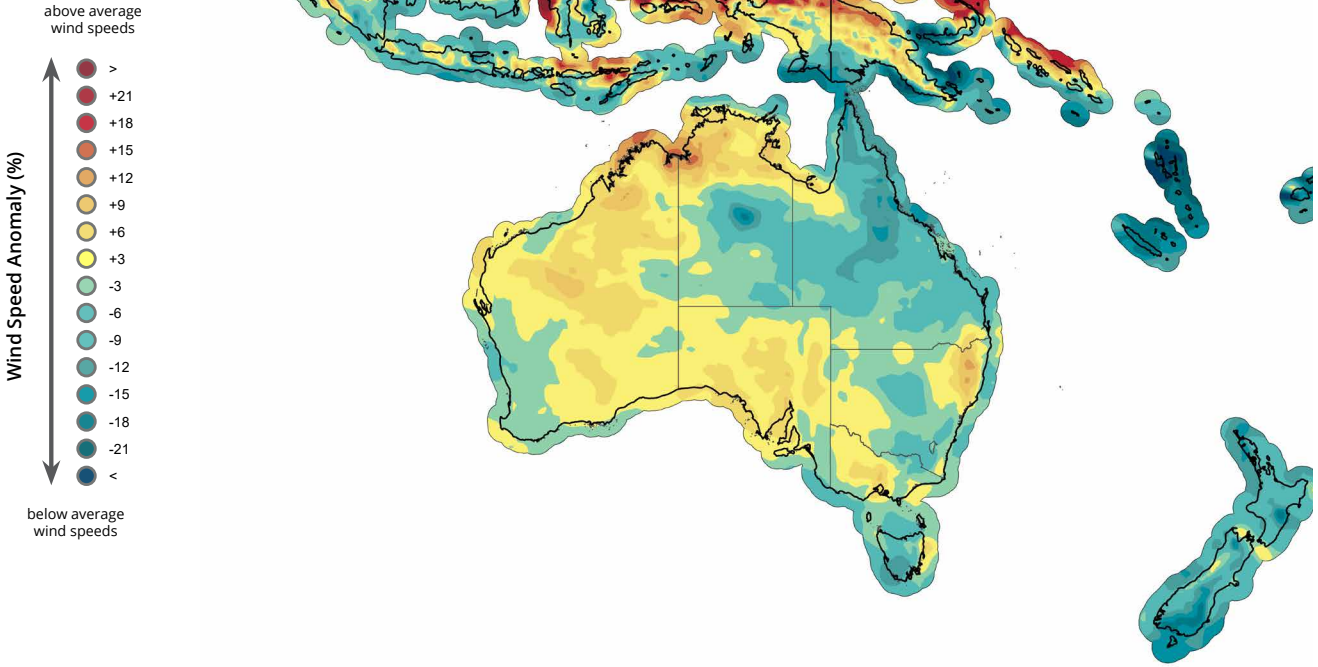

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Oceania

Below normal:
- Australia
- New Zealand
- New Caledonia
- Fiji

Above normal:
- Northern New Guinea
- Northern Indonesia

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www.thewindpower.net

Wind Trends

Global wind speed performance

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Locations	Jan	Feb	Mar	Q1	Apr	May	Jun	Q2	Jul	Aug	Sep	Q3	Oct	Nov	Dec	Q4	ANNUAL
North America	-4.9	-1.5	8.1	0.5	-3.4	-1	-4	-2.9	- 6	4.4	3.7	0.7	-1.6	0.3	-6.1	1.6	
USA	-4.2	-1.3	7.6	0.7	-3.3	-1.5	-4.7	-3.2	-6.5	5.7	3.6	0.9	0.2	0.2	7.5	2.6	
Canada	-12.1	-2.6	14.2	-0.4	-6	-3.7	9.7	-0.5	-2.8	-1	8.6	1.9	-11.8	1.5	2.1	-2.7	
Mexico	-3.7	-4.1	5.8	-0.7	0.2	9	-18.3	-2.3	-5.6	-3.8	-1.9	-3.9	-9.9	-0.5	-8.7	-6	
South America	7.4	-5.4	-0.3	0.7	1.9	-1	-4.7	-1.7	-2.3	-0.2	-3.1	-1.8	-3.6	-7.7	-4.6	-5.5	
Brazil	10.2	-5.8	1.2	2	3.5	-2.5	-5.9	-2.2	-3.2	1	-4.2	-2.1	-5.7	-10.5	-4.6	-7	
Argentina	1.1	-4.9	-3.1	-2.2	-4.7	0.6	-4.1	-2.8	3.9	1.3	-1	1.4	4.3	-4.5	-10.2	-3.6	
Chile	-0.1	-4.2	-2.8	-2.4	-0.8	-0.1	-5.1	-2.1	-8.8	0.5	-0.7	-2.8	3.1	-2.9	-2.9	-1.1	
Europe	-1.7	1.3	-3.8	-1.5	-4.4	7.9	-10.7	-2.4	-2.9	0.6	-9	-4	3.2	-5.1	-1.1	-1	
Germany	-8.9	-7.8	-4.7	-7.2	1.6	17.3	-19.7	0.1	-8.6	6.1	-14.7	-6.1	5	-10.6	-12.7	-6.3	
Spain	11.7	8.2	-10.7	3.1	-15.1	1.5	-3.5	-6.2	3.7	-2.8	-7.6	-2.2	-7.1	0.2	7.6	0.8	
France	-2.0	5.3	-1.5	0.6	-2.5	21	-16.4	1	6.2	6.2	-14	-0.9	3.1	-16.8	-2.7	-5.6	
United Kingdom	-18.5	14.9	2	-0.7	-21	-8	-6	-12	-28.6	-16.4	-16.2	-20.1	2.2	3	-11.6	-2.4	
Italy	19.9	-10.3	-10.9	-0.6	-4.3	13.2	-8.7	0.3	1.4	7.9	-13.4	-1.8	11.7	-2	14.3	7.8	
Portugal	10.9	15.4	-9.6	5.4	-23	4.8	0	-6.6	6.7	-7.7	4.4	1.1	-5.9	-5.9	13.6	0.7	
Denmark	-15.1	-3.1	-3.4	-7.4	4.5	-6.9	-13.7	-5.2	-4.3	5.1	-13.6	-4.6	3.1	-5.5	-9.6	-4	
Ireland	-15.9	15.8	-0.1	-0.2	-15	-1.8	-4.6	-7.3	-25.7	-12.5	-17.2	-18.3	-4.4	-7.7	-2.4	-4.8	
Africa / Middle East	3.8	0.5	1.8	2.1	-3.7	2.3	3.4	0.7	4.4	-3.5	2.9	1.3	5.3	-3.6	0.6	0.8	
South Africa	-0.1	1.6	-1.1	0.2	-9	4.4	2.3	-0.5	5.3	-3.2	5.3	2.5	5.4	-3.2	-1.5	0.1	
Morocco	6.7	-4.6	-7.1	-1.8	-13.3	4.8	1.3	-2.6	9.3	-3.8	-4	0.5	8.6	0	0	3.4	
Egypt	3.1	11.7	11.8	9.1	9.6	7	7.5	8	4.5	-3.7	6.5	2.4	9	-7.7	-4.3	-0.8	
Asia	10.4	3.4	-3.8	2.9	-4.6	5	-1.8	-0.5	1.2	-2.4	-3.7	-1.8	2	7.8	-0.2	3.3	
China	12.0	4.2	-4.4	3.4	-4.4	6.6	-1	0.3	1.8	-2	-4.5	-1.6	2.9	8.3	0.2	3.9	
India	-0.9	-3.9	0.7	-1.6	-7.7	-6.9	-8.2	-7.8	-2.6	-7	3.3	-2.8	-4.4	4.6	-4.4	-1.6	
Thailand	10.4	5.2	-6.5	3.3	-12.5	-7.8	10.5	-1.8	2.5	-14.3	-7.1	-6.2	1.4	5.3	9.9	6.3	
Ind, Aus, Oceania	3.6	-0.1	-2.5	0.4	-1.1	3.5	-1.2	0.4	11.3	1.7	4	5.6	-3	-0.2	-1.7	-1.5	
Australia	3.6	1	-1.9	0.9	-1.6	3.4	-0.8	0.4	12.7	1.1	3.3	5.6	-1.8	0.6	-2	-0.9	
New Zealand	4.7	-18.3	-11.4	-8	1.7	3.6	-4.5	0.3	-3.7	10.9	16.4	8	-14.8	-9.5	0.2	-9	
World	3.5	1.3	-0.8	1.1	-4	4.1	-4.6	-1.6	-1.5	0.1	-3.1	-1.6	1.2	1.9	0.8	1.3	

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Wind index

The wind index represents the average wind speed anomaly across all plants of the country or region in production by the end of 2020. The anomalies are calculated as a percent deviation from the 1995 – 2019 mean speed at 100 m above ground level for the calendar period, and are weighted by the location and rated capacity of wind projects.

The wind project details have been obtained from Windpower Monthly Intelligence.

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