

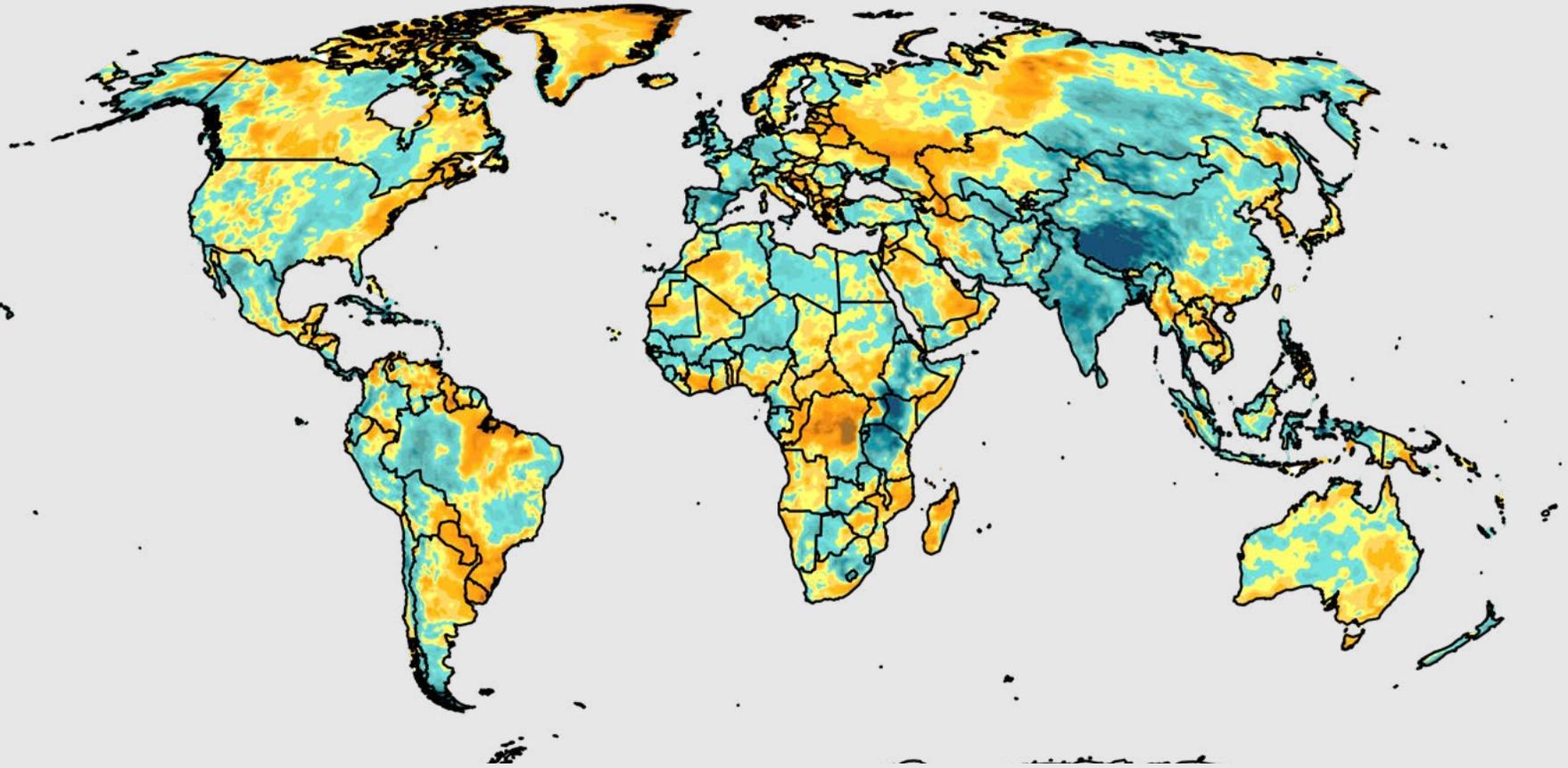
WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

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Global
Q2 2020



Global wind speeds fell slightly below the long-term norm in the second quarter of 2020 (Q2). Wind speeds were above normal across the northeast United States, southern Brazil, and southeast Europe. Below-normal wind speeds took hold over much of Western Europe, Central Europe, and Asia.



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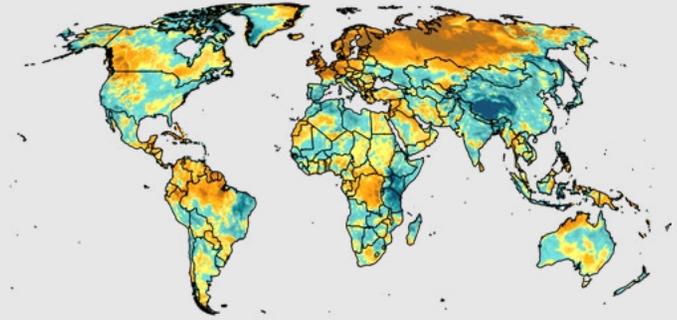
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Global
Q2 2020

Wind speeds across North America rounded out Q2 at the long-term norm, despite large areas well above and below normal. The Northeast United States and the Canadian Maritimes experienced strongly above-normal wind speeds in April and May (more than 21%), which abated by June. Conversely, key wind-power producing areas across much of the western and central United States were below normal in the beginning of Q2, but rose well above the norm by June (more than 21% across Kansas, Nebraska, and Iowa). A wind speed deficit has persisted since the end of last year (2019) across eastern Texas and northeast Mexico. Wind speeds were below normal for Hawaii (-12 to -18%) and much of southern Central America (-6 to -12%).



Q2 Global Wind Trends

Second quarter wind speeds rose above the norm across South America. Strongly above-normal conditions persisted across southern Brazil and Uruguay throughout the quarter (more than 21%), while the strong wind speed deficit across northeast Brazil in the previous quarter has eased to just slightly below normal. Above-normal wind speeds across Ecuador and northern Peru in the previous quarter also waned. Strongly above-normal conditions set up over much of the northern coast of South America in May, with wind speeds in excess of 21% above the norm for parts of Venezuela and northern Brazil.

Wind speeds dipped below normal across many key areas of Europe in the second quarter. Persistently above-normal wind across Scandinavia at the beginning of the year gave way to below-normal conditions by May. Local wind speeds across Western Europe varied well above and below the long-term norm (particularly in May and June), although the area finished Q1 at below normal overall. To the east, Italy and the Balkans rounded out the quarter above the norm, after strong month-to-month variability.

Near-normal wind speeds continued for another quarter across Africa and the Middle East. Slightly above-normal conditions persisted across South Africa for much of Q2, while a wind speed deficit has persisted over East Africa since the previous quarter. Wind speeds across key areas of the northern Arabian Peninsula continue above the norm.

Below-normal wind speeds have persisted across Asia since the end of last year. Although much of China remains below the norm, areas in the southeast rose above the norm (3 to 12%). Elsewhere, wind rose above the norm across South Korea and Japan. Strongly below-normal conditions persisted across India, particularly in the central region across parts of Maharashtra, Madhya Pradesh, and Andhra Pradesh (-12 to -21%).

Wind speeds across Oceania rose only slightly above the quarterly norm, despite strongly above-normal monthly wind speeds in some areas. Above-normal wind speeds established across southern Australia. Wind speeds across much of New Zealand dipped below the norm by the quarter's end, except in the vicinity of the Cook Strait (where wind speeds started the quarter well above normal).



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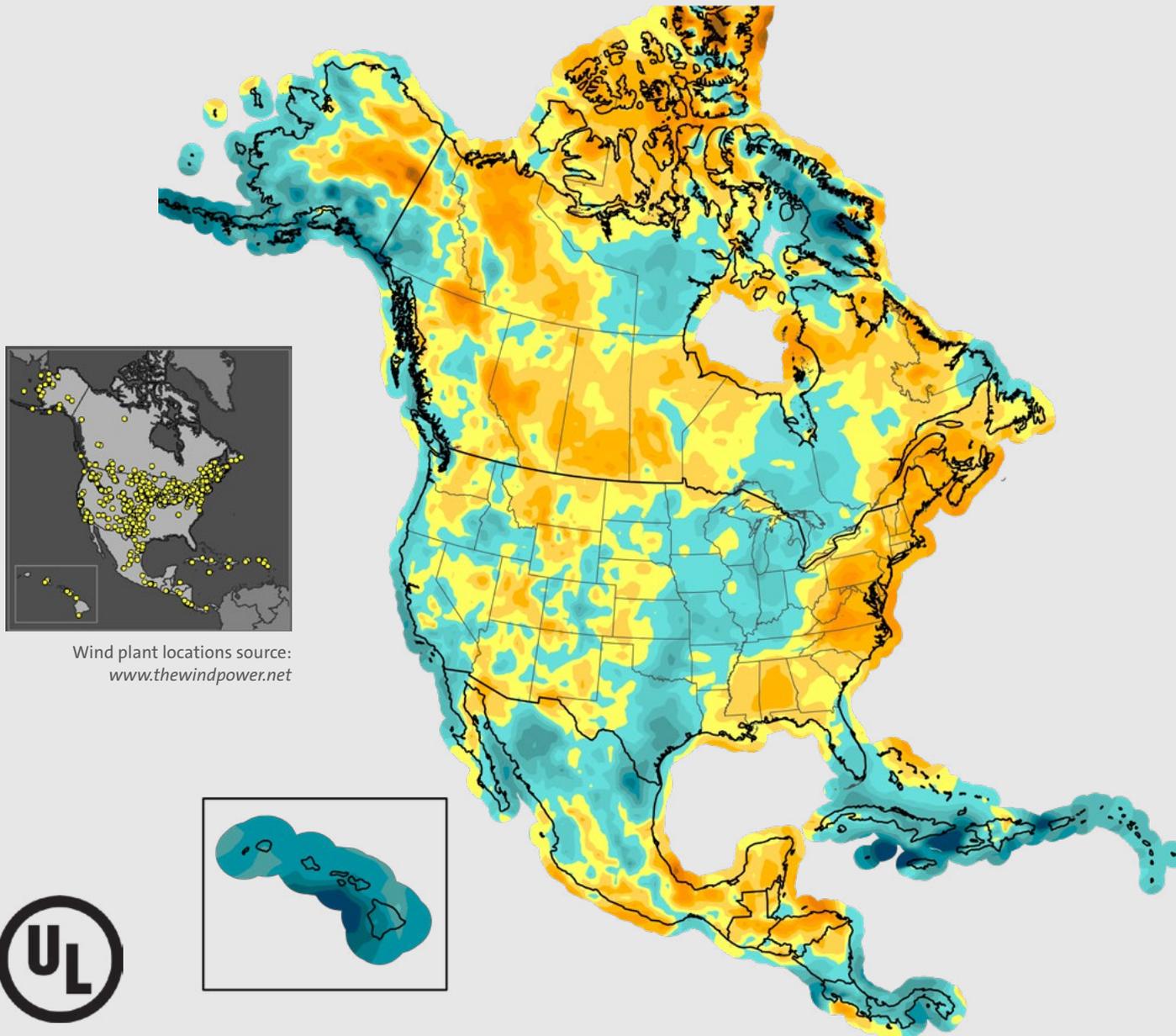
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GLOBAL WIND SPEED PERFORMANCE

North America
Q2 2020



Wind Speed Anomaly (%)

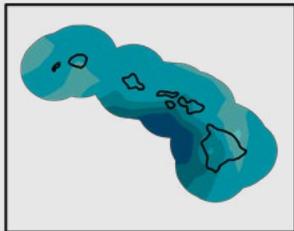


Below Normal:

- Eastern Texas
- Northern Mexico
- Central America
- Hawaii

Above Normal:

- Northeastern U.S.
- Washington, U.S.
- Canadian Maritimes
- Canadian Prairies
- Yucatan Peninsula



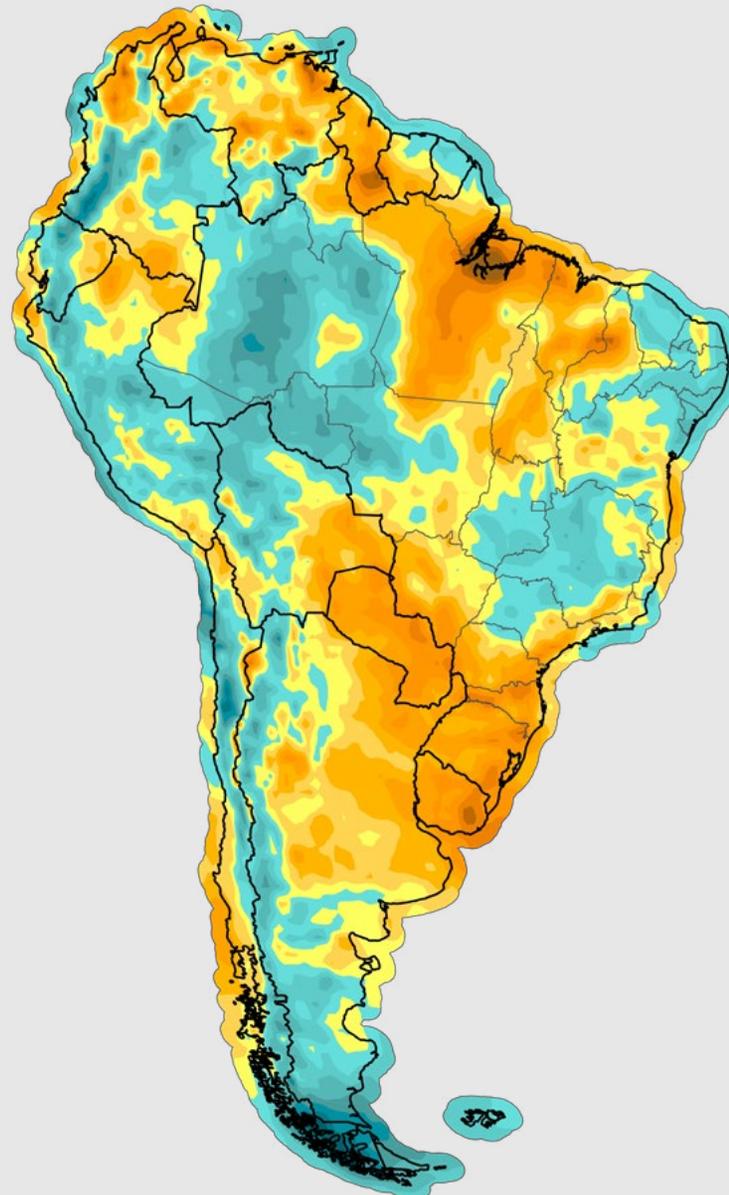
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GLOBAL WIND SPEED PERFORMANCE

South America
Q2 2020



Wind plant locations source:
www.thewindpower.net



Wind Speed Anomaly (%)



Below Normal:

- Northeast Brazil
- Patagonia
- Peru
- Ecuador

Above Normal:

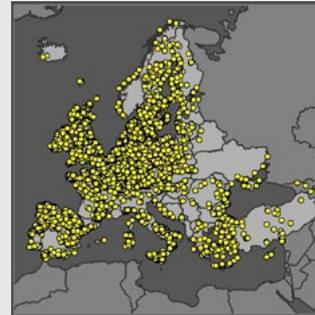
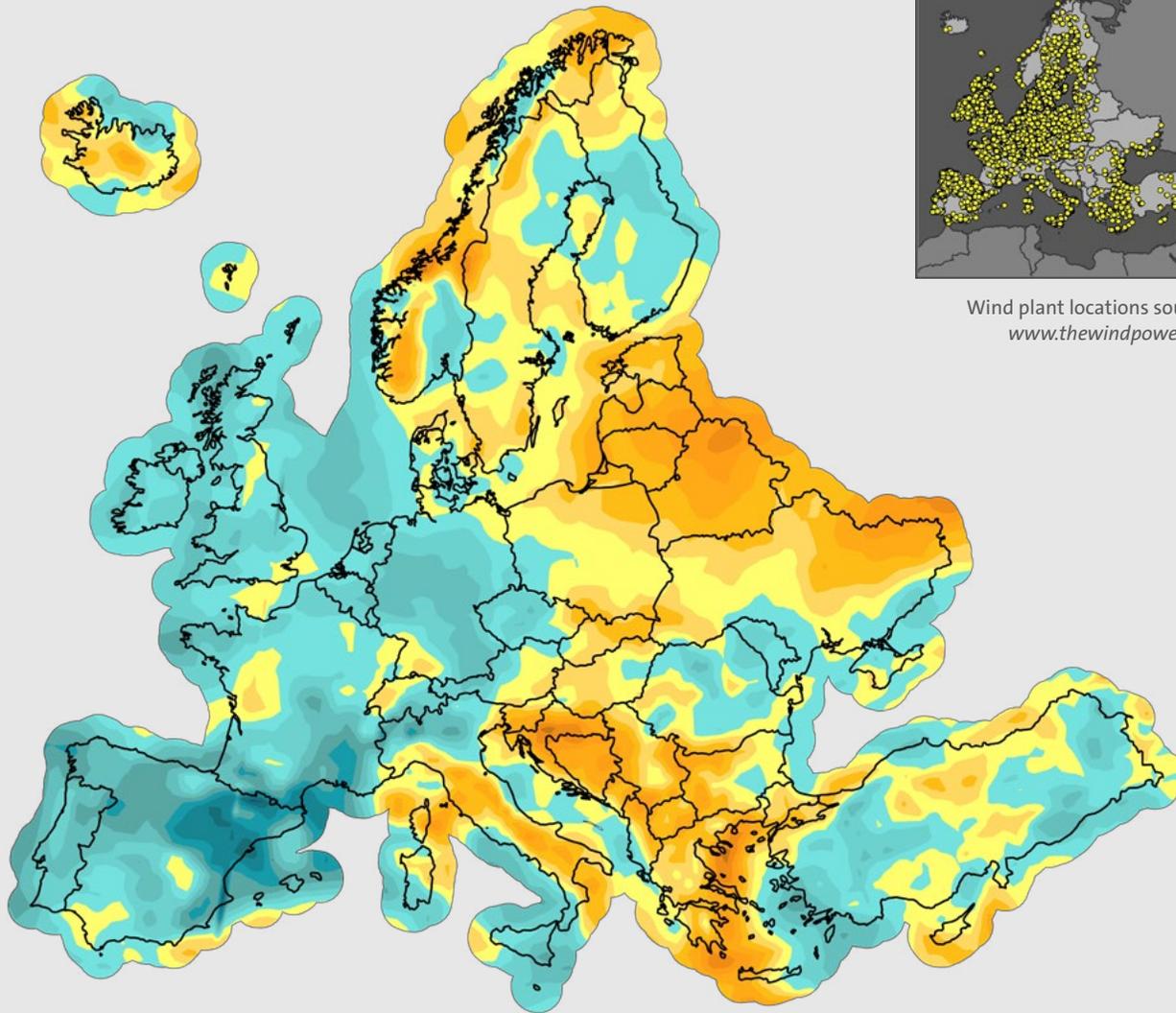
- Southern Brazil
- Uruguay
- Venezuela
- Northern Colombia



WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Europe
Q2 2020



Wind plant locations source:
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Wind Speed Anomaly (%)



Below Normal:

- Western Europe
- Central Europe
- Western Turkey
- Finland

Above Normal:

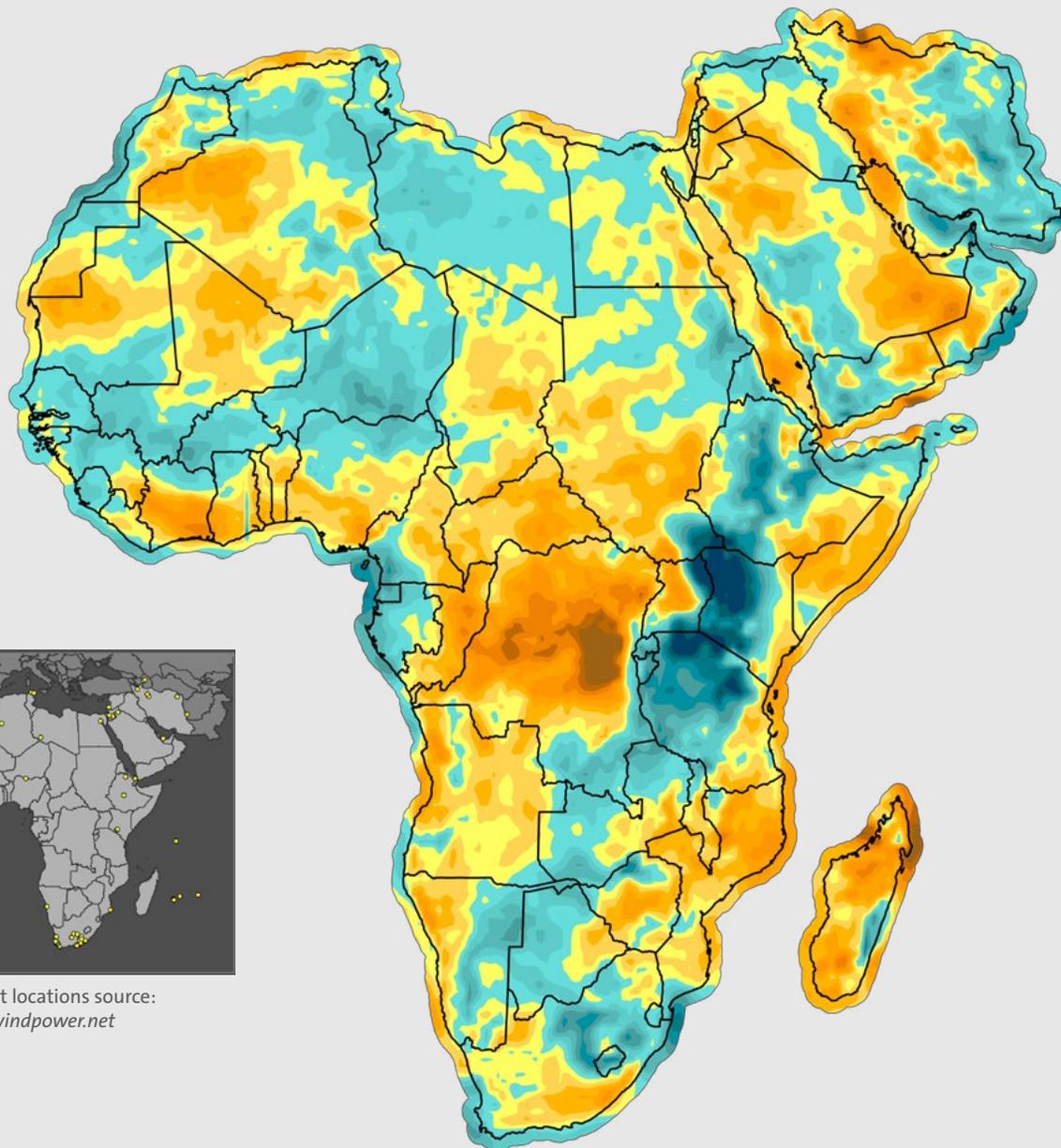
- Baltic States
- Poland
- Belarus
- Italy
- Balkan Peninsula



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GLOBAL WIND SPEED PERFORMANCE

Africa and the Middle East
Q2 2020

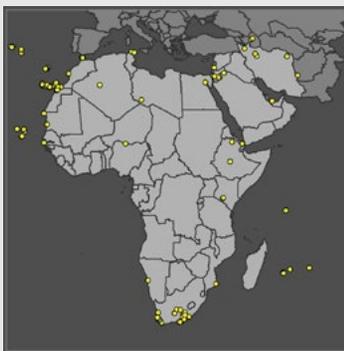


Below Normal:

- Morocco
- Western Sahara
- Tunisia
- Ethiopia
- Western Kenya

Above Normal:

- South Africa
- Eastern Egypt
- Jordan
- Western Iran



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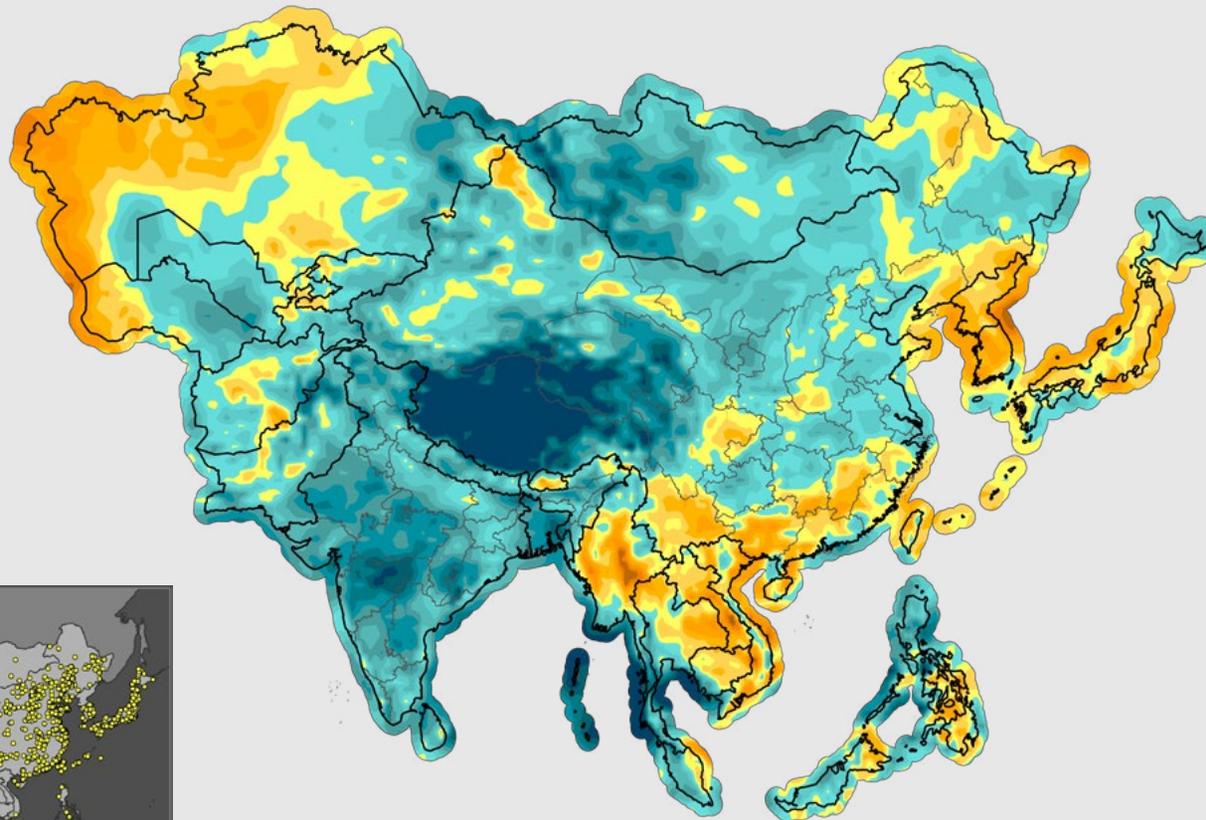


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GLOBAL WIND SPEED PERFORMANCE

Asia
Q2 2020



Below Normal:

- India
- China
- Philippines

Above Normal:

- Japan
- South Korea
- Northern Thailand



Wind plant locations source:
www.thewindpower.net



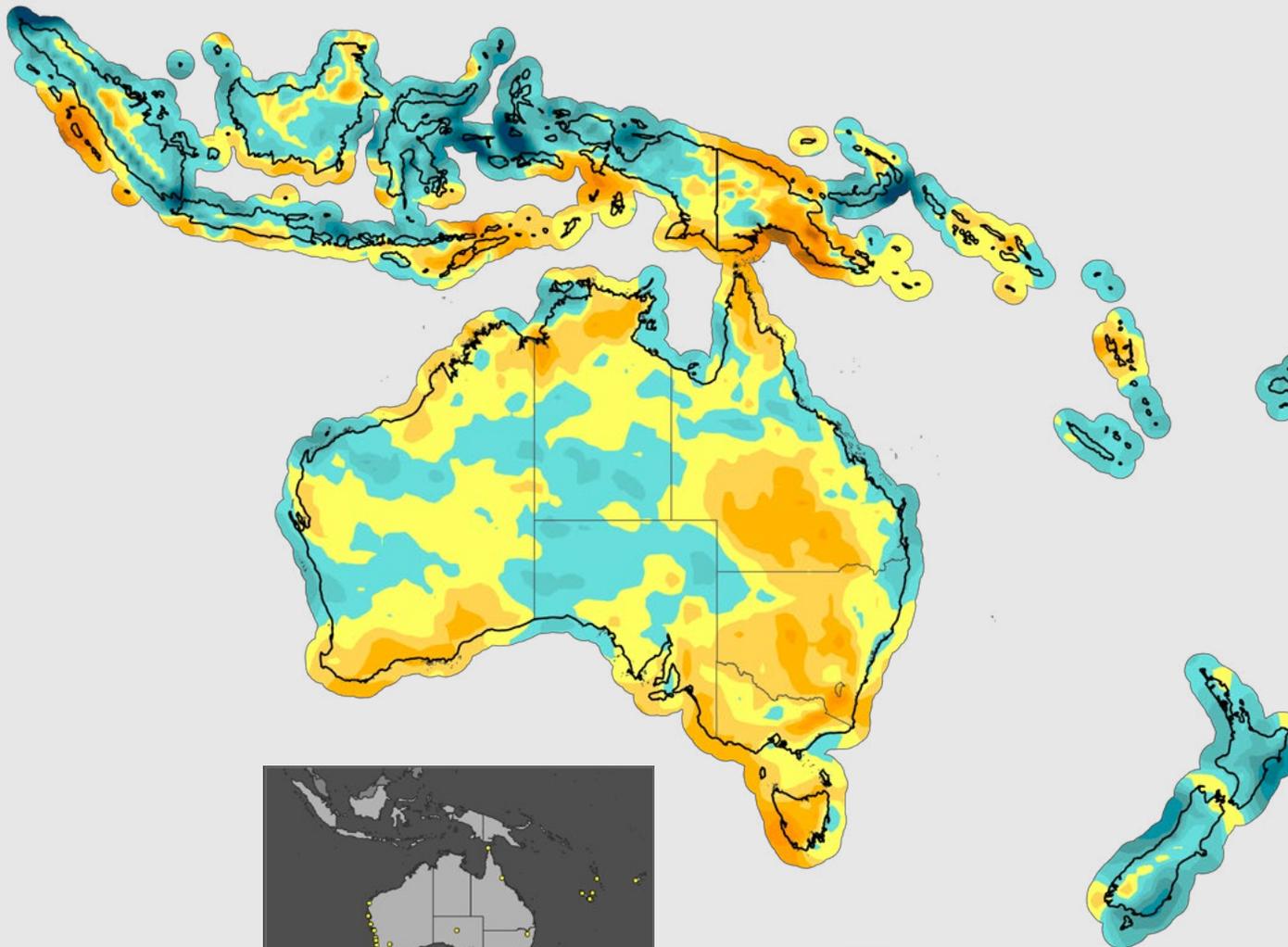
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WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Indonesia, Australia and Oceania

Q2 2020

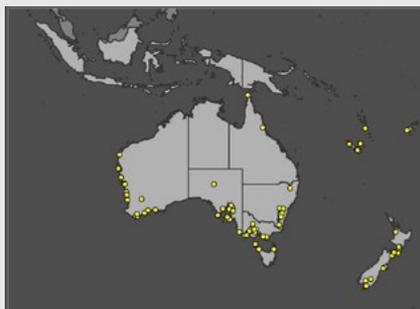


Below Normal:

- India
- China
- Philippines

Above Normal:

- Japan
- South Korea
- Northern Thailand



Wind plant locations source:
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WIND TRENDS

2020 Wind Index

This index represents the average wind anomaly (expressed as a percent deviation in mean speed from the 1988-2014 baseline for the corresponding calendar period) for each region and country shown, weighted by the location and megawatt capacity of wind projects in production by the end of 2019. The wind project locations and rated capacities are from The Wind Power database (TheWindPower.net). Note that not all operating projects are in the database, and coverage in certain countries such as China is weak. However, UL believes the findings are reasonably representative of wind conditions for the industry as a whole and for the key wind-producing countries.

[Click HERE](#) to download index values for even more wind producing countries!



Regions/Leading Wind Producing Countries	Jan	Feb	Mar	Q1	Apr	May	Jun	Q2	Jul	Aug	Sep	Q3	Oct	Nov	Dec	Q4	ANNUAL
North America	0.0	2.7	-1.3	0.2	-4.8	-1.0	7.3	0.2									
Canada	-9.5	6.3	4.1	-0.1	5.6	6.2	1.2	4.5									
USA	1.2	2.2	-1.9	0.2	-5.7	-2.0	8.2	-0.2									
Mexico	2.4	5.7	-5.9	0.6	-12.2	3.3	6.5	-2.0									
South America	-8.8	-6.7	-12.9	-9.3	0.8	4.5	2.5	2.7									
Brazil	-10.8	-9.6	-15.9	-11.9	-0.5	3.2	1.8	1.7									
Argentina	5.1	1.4	-4.1	1.0	-3.8	2.5	3.1	0.7									
Europe	0.4	22.3	5.3	9.1	-5.6	0.0	-2.0	-2.7									
Denmark	8.2	25.8	0.0	11.4	2.8	6.6	-10.3	-0.2									
France	0.4	36.6	11.5	15.7	-10.6	1.2	0.5	-3.2									
Germany	1.0	39.4	5.5	14.7	-3.0	-2.8	-4.6	-3.5									
Great Britain	5.0	35.9	5.2	15.2	-9.4	-1.6	5.2	-2.3									
Ireland	-1.1	36.0	5.5	13.2	-18.9	1.7	7.2	-4.0									
Italy	-10.4	13.4	-7.8	-1.7	-11.6	12.7	11.8	3.6									
Portugal	-1.5	-16.1	0.6	-5.3	-13.5	-10.2	1.3	-7.7									
Spain	-7.8	-15.1	6.5	-5.5	-16.8	-4.6	-4.5	-9.1									
Africa / Middle East	-2.2	0.3	1.8	-0.1	-3.8	1.4	0.1	-0.7									
South Africa	2.4	2.8	4.2	3.2	1.7	2.3	3.2	2.6									
Egypt	5.8	-12.5	-8.0	-5.2	4.7	7.1	-3.6	2.5									
Asia	-11.9	-0.1	-0.3	-4.1	-5.5	0.4	-3.1	-2.8									
China	-13.5	-1.2	0.4	-4.7	-6.0	3.2	-1.3	-1.4									
India	-5.5	6.6	-3.4	-1.1	-7.9	-14	-13.8	-12.0									
Ind, Aus, Oceania	0.0	-0.3	2.2	0.6	11.4	10.4	-10.2	3.2									
Australia	-0.1	-0.2	2.7	0.8	11.6	14.1	-11.5	4.0									
World	-5.3	8.3	4.6	2.3	-2.2	-0.4	0.1	-1.1									