

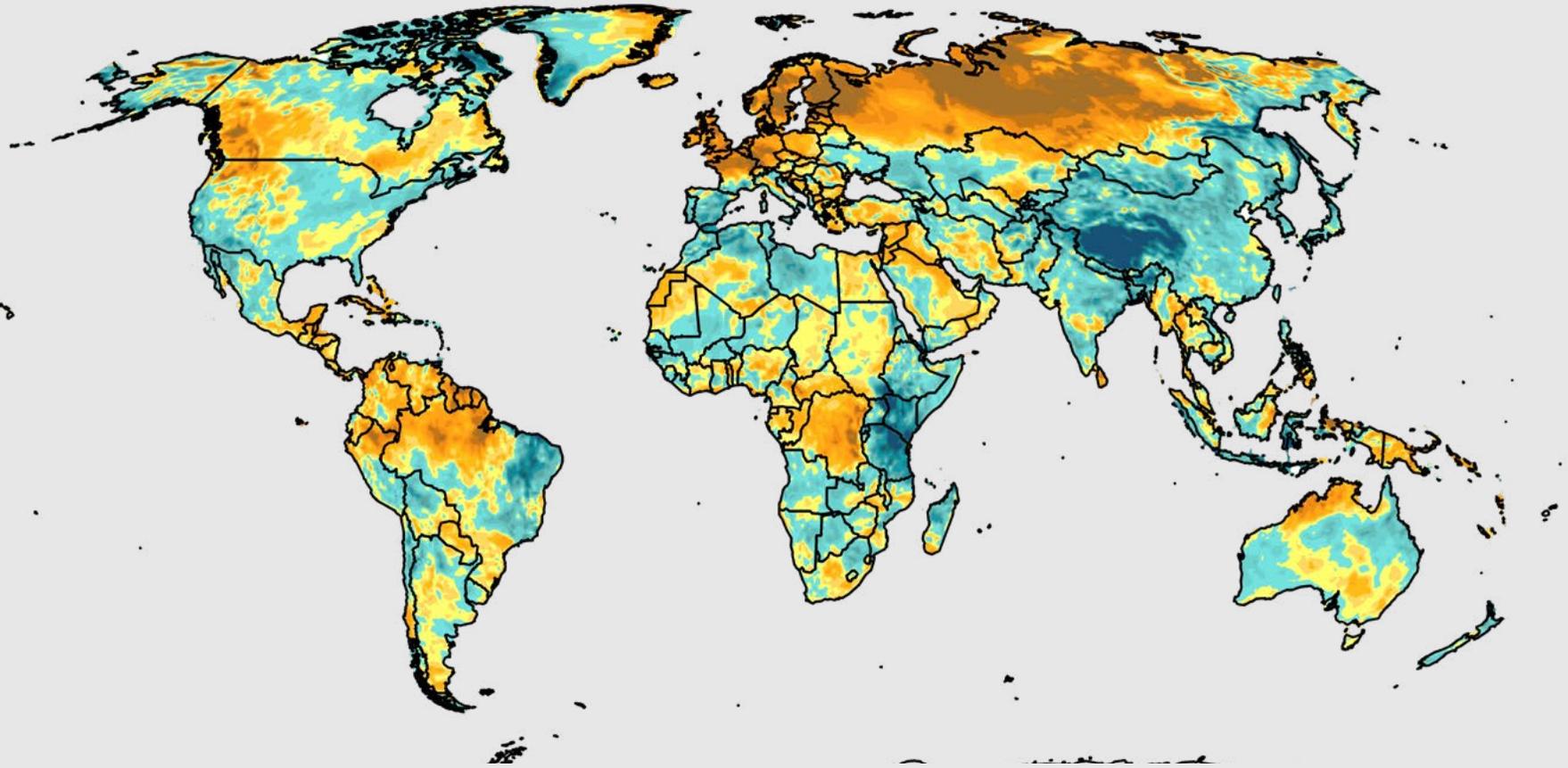
WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

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Global
Q1 2020



Overall global wind speeds rose above the norm in the first quarter of 2020. Regional wind speed anomalies varied substantially, with key wind power producing areas of Europe well above and South America below the long-term norm. Elsewhere, wind speeds moderated to near normal across North America, Africa and the Middle East, and Oceania. Wind speeds continued below normal for much of Asia.

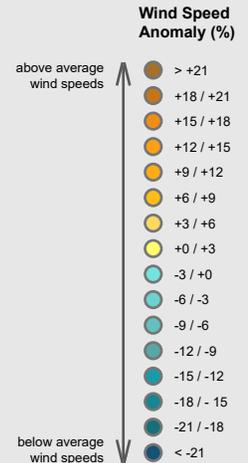
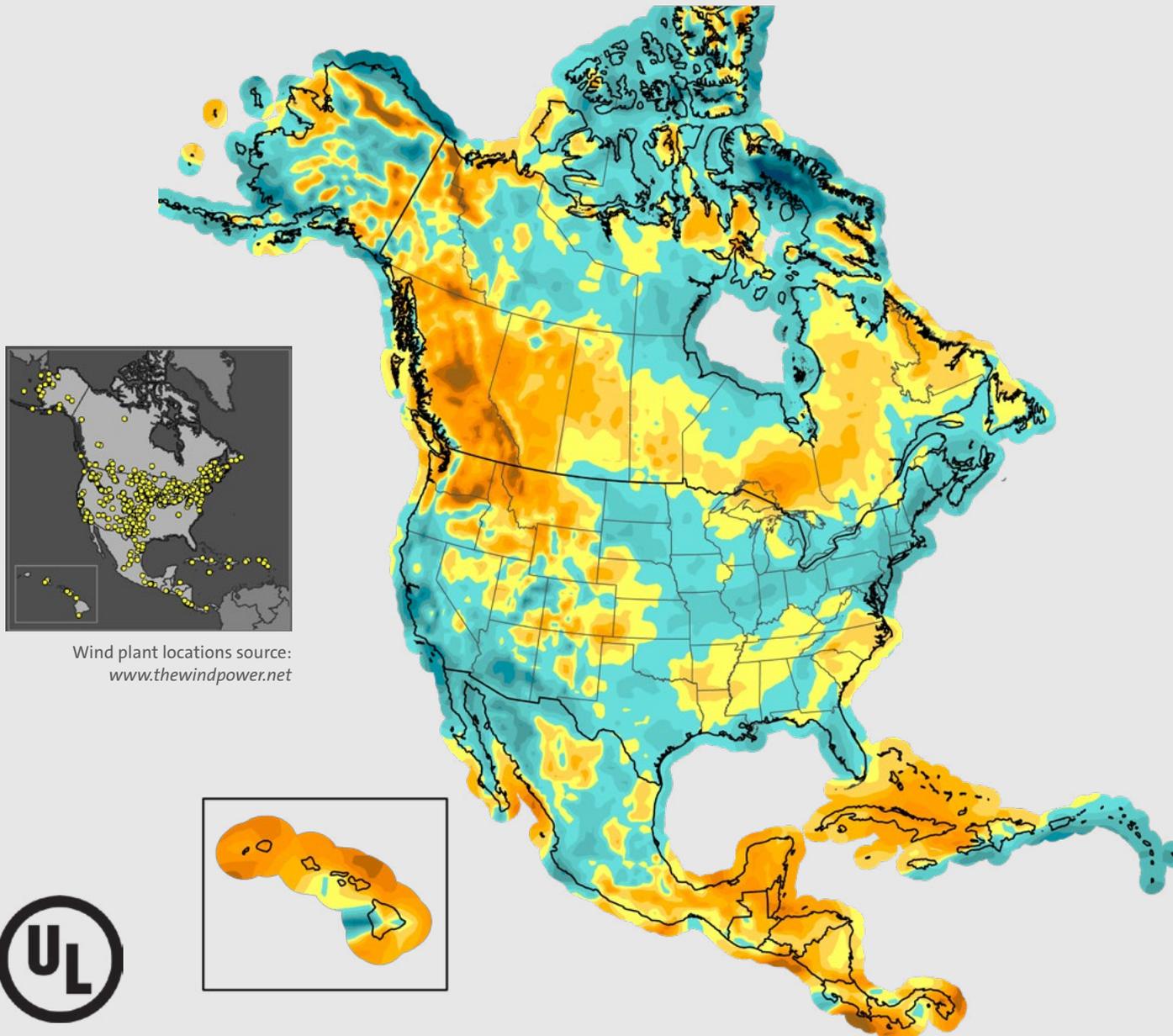


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WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

North America
Q1 2020



Wind plant locations source:
www.thewindpower.net

Wind speed departures normalized across North America. Winds rose above the norm across the Northern Rockies, with a wind speed surplus of more than 21% above normal across the Columbia Plateau region of Oregon and Washington State. Winds persisted below normal across much of California, with the Central Valley seeing the strongest deficits (consistently 9 to 21% below the norm throughout the quarter). Departing from recent trends, strongly above-normal (21%+) wind speeds overspread Hawaii in January and February. However, winds subsequently dipped well below the norm by the quarter's end (-21% or less). After much variation, wind speeds rounded out the quarter at below normal for much of the interior and northeast U.S. To the south, wind speeds held moderately above the norm across southern Mexico and Central America.

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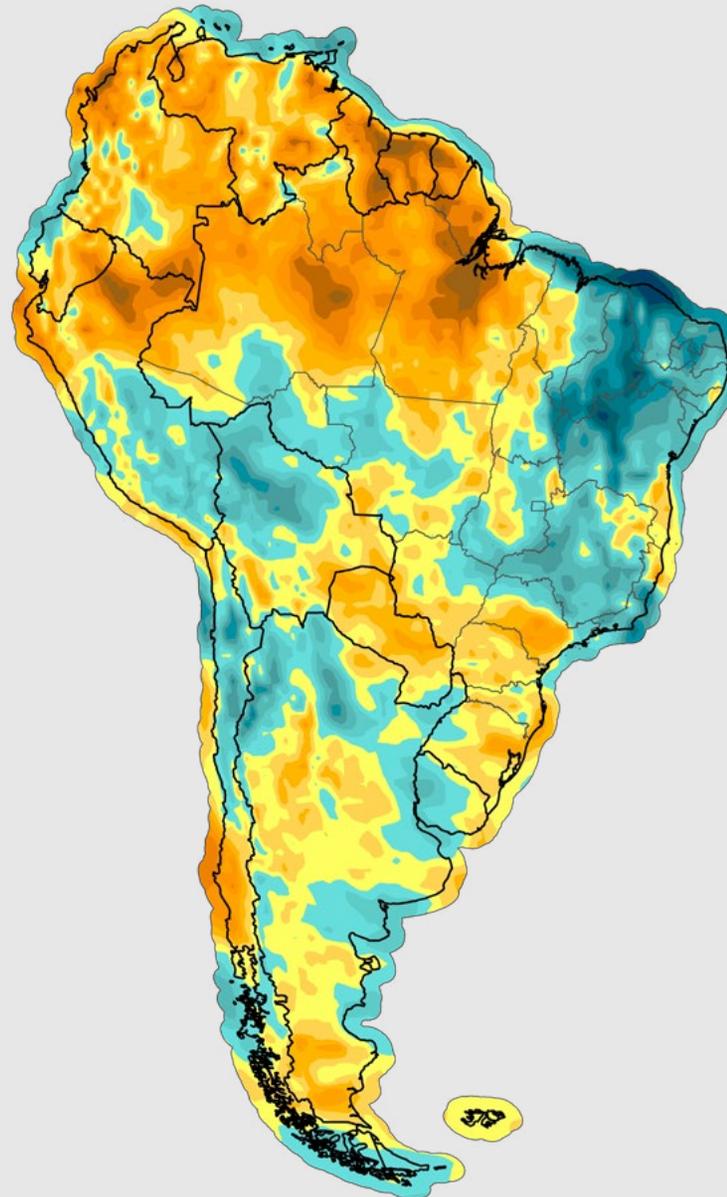
WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

South America
April 2020



Wind plant locations source:
www.thewindpower.net



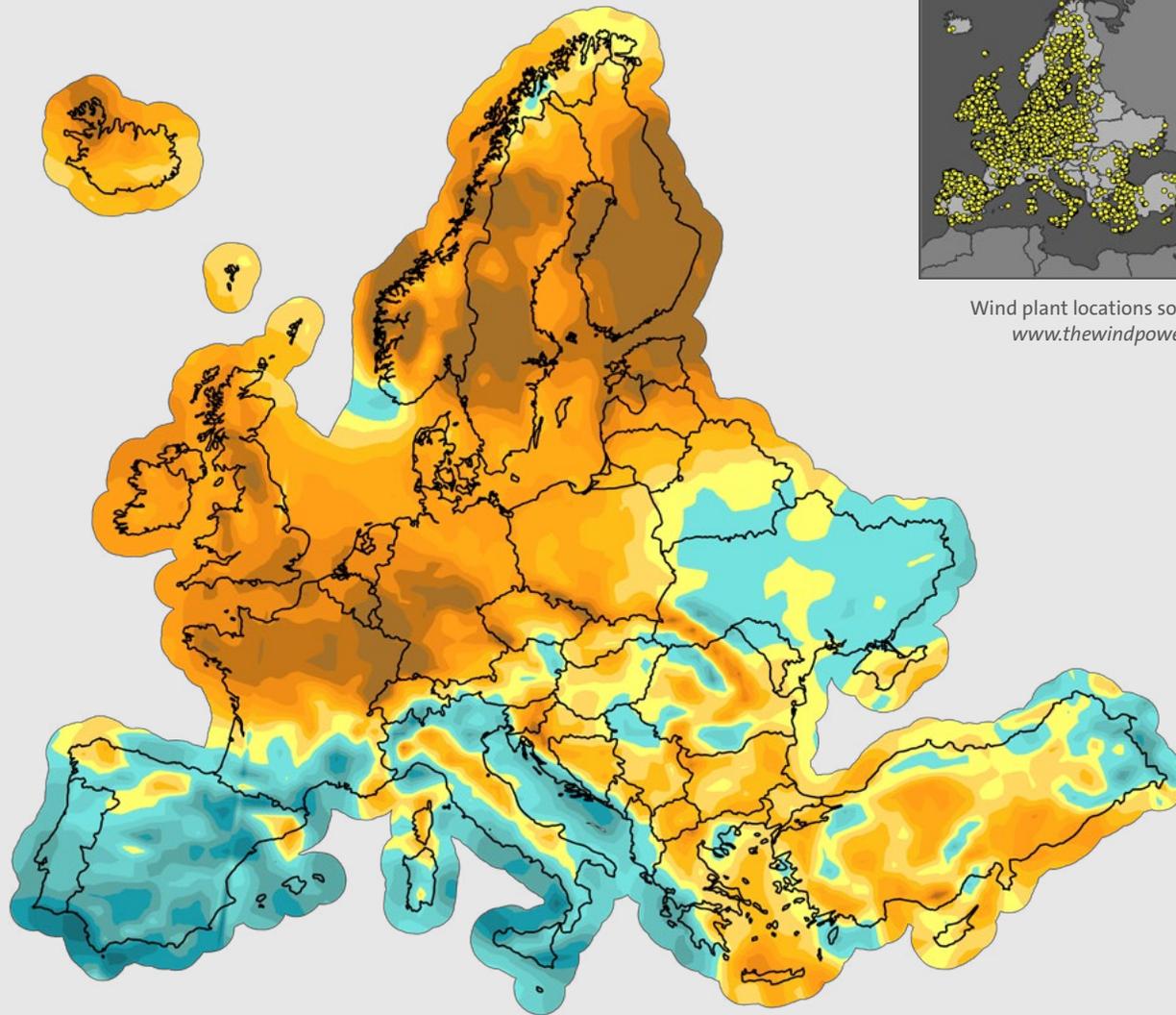
The first quarter regional wind speeds fell well below normal for South America, driven by deficits across northeast Brazil. Below-normal wind speeds persisted throughout the period across northeast Brazil, reaching well below normal in March (in excess of 21% below-normal). Wind speeds held below the norm across Uruguay for much of the quarter, but rebounded to well above-normal by April (21%+). Regional wind speeds varied substantially across Argentina and Chile throughout the first quarter. Key wind power producing areas of Argentina finished the period at above normal, while Chile was below normal at the end of the quarter. To the north, wind speeds across Peru and Venezuela rose to abovenormal and held throughout the quarter.



WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Europe
April 2020



Wind plant locations source:
www.thewindpower.net



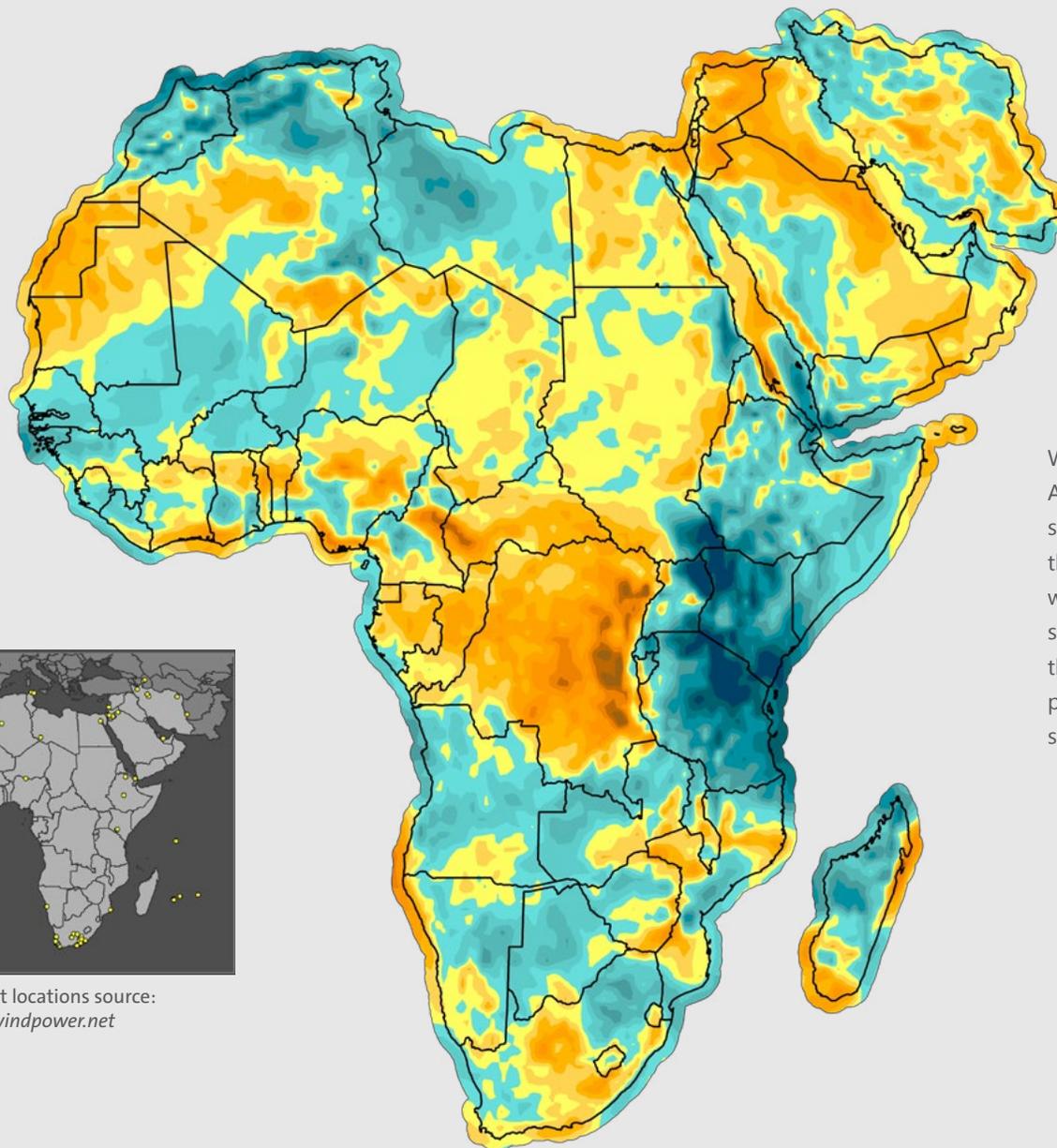
The large-scale pattern of wind speed departures across Europe reversed course in the first quarter of 2020, i.e. areas of below-normal winds at the end of 2019 rose above the norm and vice versa. Above-normal wind speeds overspread much of northern and central Europe, and below-normal wind speeds spread to the south. Very strong regional anomalies developed in February, with speeds across much of northern and central Europe more than 21% above normal, and in excess of 21% below normal across the Iberian Peninsula.



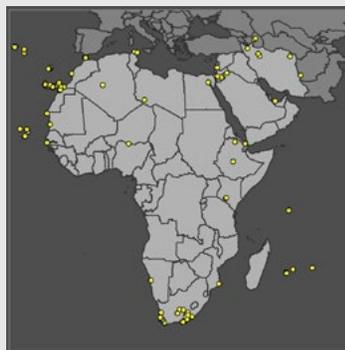
WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Africa and the Middle East
Q1 2020



Wind speeds moderated across much of Africa and the Middle East. Above-normal speeds persisted across South Africa, albeit the magnitude of wind speed departures was less than in the previous quarter. Wind speeds diminished across areas neighboring the Mediterranean, although Western Sahara persisted above normal. Below-normal wind speeds continued across East Africa.



Wind plant locations source:
www.thewindpower.net

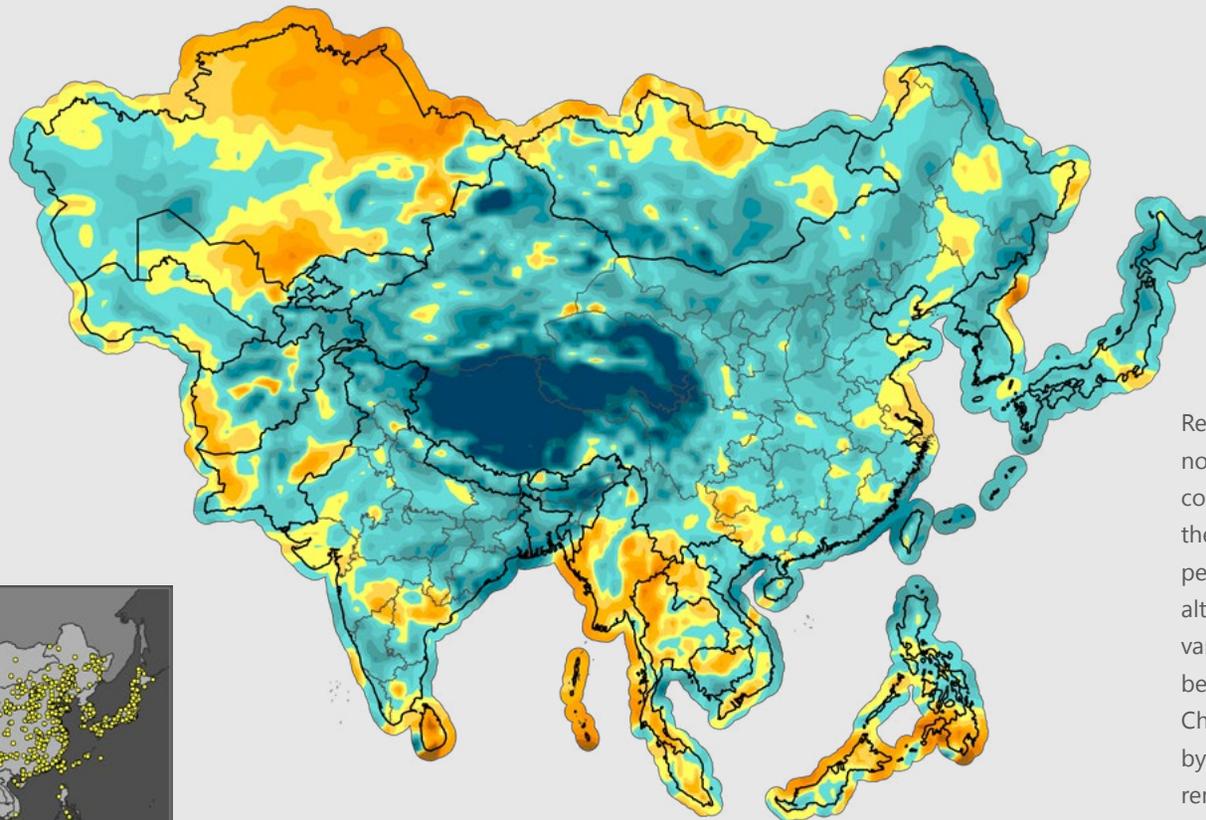


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WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Asia
Q1 2020



Wind plant locations source:
www.thewindpower.net

Regional wind speeds persisted below the norm across Asia for yet another quarter, continuing a pattern that held throughout the previous year. China finished the period with wind speeds below the norm, although localized wind speed departures varied during some months. The strongly below-normal speeds across northeast China in January were somewhat mitigated by above-normal conditions during the remainder of the period. India finished a second consecutive quarter below the norm, although above-normal wind speeds made a brief appearance across central and southern regions during the first half of the quarter. Above-normal conditions were seen in the south and east, including Sri Lanka and wind power producing areas of mainland Southeast Asia.

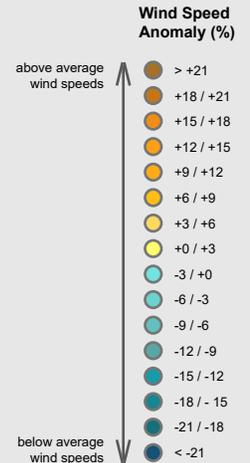
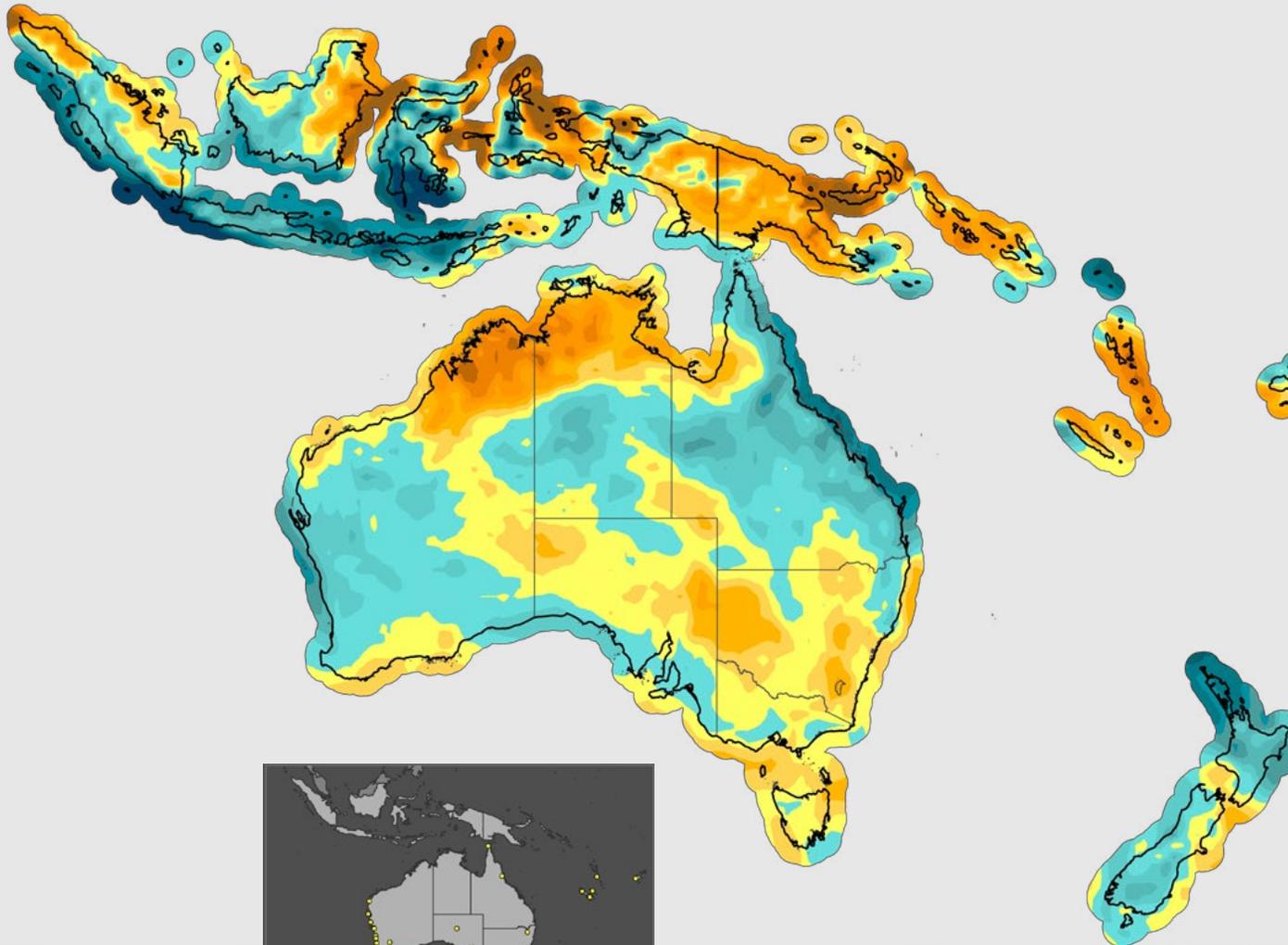


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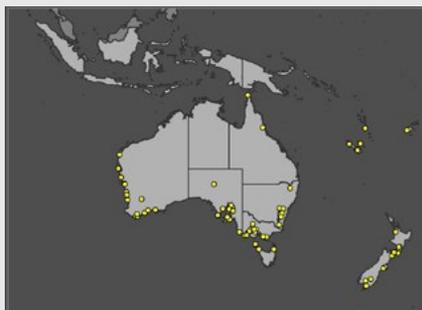
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GLOBAL WIND SPEED PERFORMANCE

Indonesia, Australia and Oceania Q1 2020



The wind speeds across Oceania fell to near normal. Wind speeds increased across southwest Australia, and decreased to the east across Victoria and much of Queensland. Wind speeds fell below the norm across much of New Zealand, except in the vicinity of the Cooke Strait where the previous quarter's pattern of above-normal wind speeds continued.



Wind plant locations source:
www.thewindpower.net

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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												
Canada	-9.5	6.3	4.1	-0.1	5.6												
USA	1.2	2.2	-1.9	0.2	-5.7												
Mexico	2.4	5.7	-5.9	0.6	-12.2												
South America	-8.8	-6.7	-12.9	-9.3	0.8												
Brazil	-10.8	-9.6	-15.9	-11.9	-0.5												
Argentina	5.1	1.4	-4.1	1.0	-3.8												
Europe	0.4	22.3	5.3	9.1	-5.6												
Denmark	8.2	25.8	0.0	11.4	2.8												
France	0.4	36.6	11.5	15.7	-10.6												
Germany	1.0	39.4	5.5	14.7	-3.0												
Great Britain	5.0	35.9	5.2	15.2	-9.4												
Ireland	-1.1	36.0	5.5	13.2	-18.9												
Italy	-10.4	13.4	-7.8	-1.7	-11.6												
Portugal	-1.5	-16.1	0.6	-5.3	-13.5												
Spain	-7.8	-15.1	6.5	-5.5	-16.8												
Africa / Middle East	-2.2	0.3	1.8	-0.1	-3.8												
South Africa	2.4	2.8	4.2	3.2	1.7												
Egypt	5.8	-12.5	-8.0	-5.2	4.7												
Asia	-11.9	-0.1	-0.3	-4.1	-5.5												
China	-13.5	-1.2	0.4	-4.7	-6.0												
India	-5.5	6.6	-3.4	-1.1	-7.9												
Ind, Aus, Oceania	0.0	-0.3	2.2	0.6	11.4												
Australia	-0.1	-0.2	2.7	0.8	11.6												
World	-5.3	8.3	4.6	2.3	-2.2												