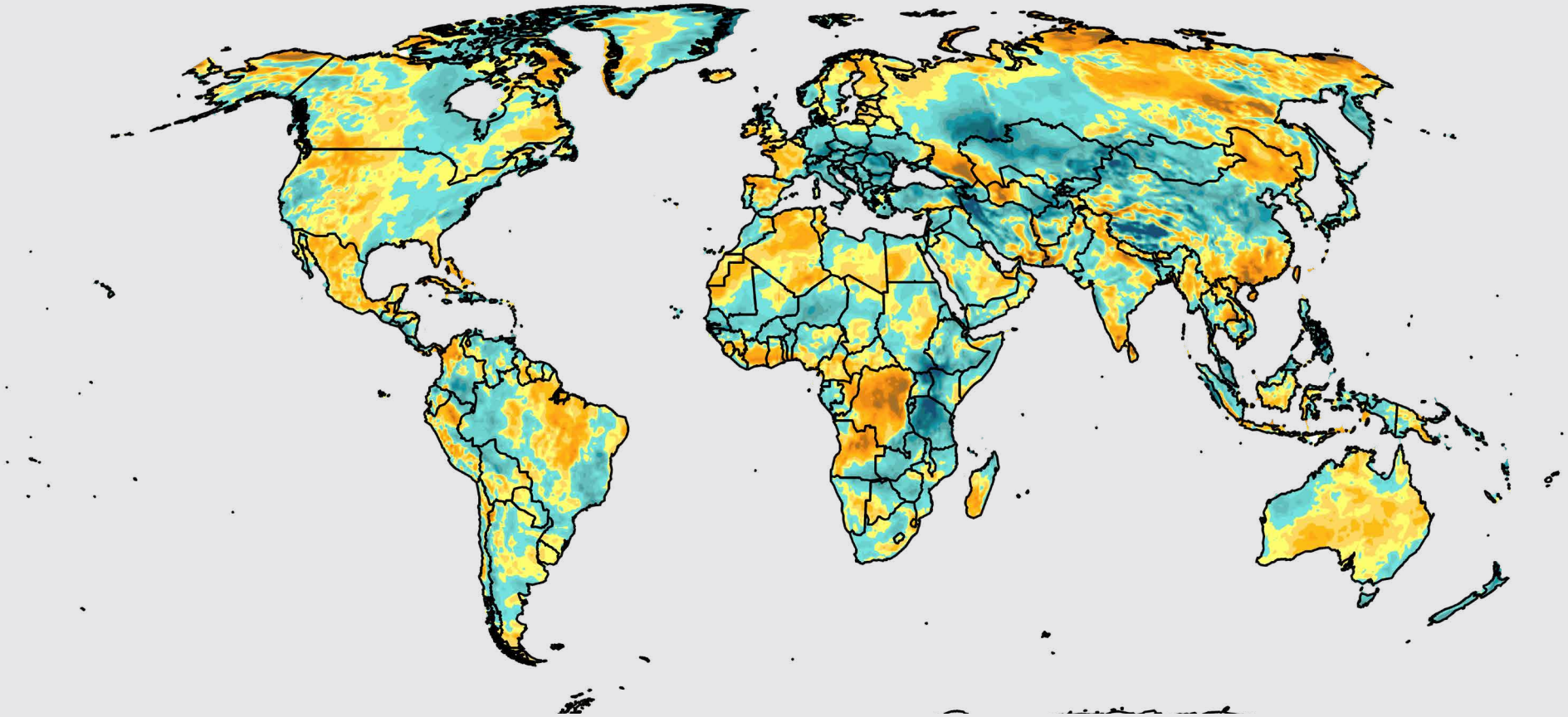
WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Subscribe Now!
To receive our monthly, quarterly and annual Wind Trends Bulletins in your inbox, click here.

Global
Q4 2020



In the final quarter of 2020, the global wind speeds normalized relative to the long-term, fourth quarter (Q4) norm (1988-2014). A surplus of winds across Mexico drove a rise in the North American wind speed index, while the wind speeds across South America dropped to near normal. Wind speed deficits across Europe and Asia persisted into the fourth quarter, although the overall deficits eased relative to earlier in the year.

+1 518 213 0044 | ul.com/renewables

WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Global
Q4 2020

Above-normal wind speeds continued to prevail for another quarter across North America. Although strongly above-normal winds west of the Continental Divide in Q3 eased, above-normal winds overspread the Great Plains region in Q4. The Midwest U.S. continued to experience a wind speed deficit, an unfortunate pattern that has held for much of the year. Winds eased relative to the long-term norm across the Northeast U.S. and the Canadian Maritimes. The fourth quarter wind index for Mexico rose above the norm, despite much variability in wind speeds during the period. The month of November brought a strong surplus of winds south of the U.S. border (9 to 21%), although not enough to offset the deficit across Central America during October and December.

Overall, the wind index fell to near normal for South America. Countries with the highest installed capacity in the region experienced winds just at or slightly above the norm (0.5 to 2.5% for Brazil, Uruguay, and Chile), while moderate to strong deficits overspread elsewhere (-3 to -9% across Peru, Venezuela, and other northern areas).

A wind speed deficit remained for much of Europe, continuing a pattern that has held for three consecutive quarters. Below-normal winds extended across Central and Southern Europe, with above-normal winds across Northern and far Western Europe. This wind speed pattern reflects an intense dipole in the wind speed index that was established between Northern Europe and points south during November, with strongly above-normal wind speeds in Scandinavia and strongly below wind speeds throughout Central and Southern Europe. Scandinavia finished Q4 with moderately to strongly above-normal winds (21% or higher). Strongly below-normal winds extended across Central Europe and Southern Europe (-21% or below). Areas to the west had a good end to the quarter, with the wind speed index at 15% or more above the long-term norm across France and the Iberian Peninsula during the month of December.

Wind speeds across Africa and the Middle East fell to near the long-term, fourth quarter norm. Below-normal winds extended across key wind power producing areas of Egypt, Ethiopia, and Iran. As a whole, the wind indices for South Africa, Morocco, and Western Sahara dropped to near normal.

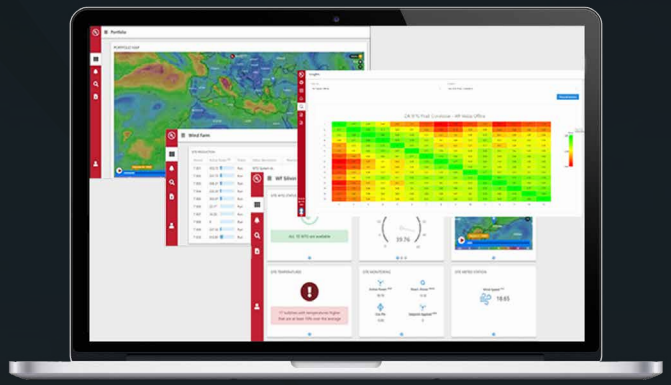
The persistent wind speed deficit across Asia weakened slightly. The wind speed pattern remained unchanged for much of China throughout the quarter. Wind speeds held above the norm across Southeast and Northeast China, while below-normal wind speeds persisted across Northern and Central China. The fourth quarter marked an end to, or at least a pause to, the recent “wind drought” across India. The wind speed index in South Korea plummeted from strongly above-normal in Q3 (12-15%) to near-normal in Q4. Strongly below-normal winds across Southeast Asia from the previous quarter eased.

The wind speed index rose to near normal for Oceania, driven by a wind speed surplus across Central and Western Australia. Wind speeds across the remainder of the region dipped below the long-term norm.

+1 518 213 0044 | ul.com/renewables

Introducing real-time plant monitoring from UL

Transforming data into actionable intelligence



Renewable Asset Monitoring Platform

Manage your renewable assets with UL's connected SaaS platform that brings the power of real-time monitoring, production KPIs, analytics, power forecasting and reporting to renewable project owners around the globe. This platform is designed to provide customized solutions to owners, O&M directors, asset managers and technicians to manage their assets through monitoring, control, advanced analytics and insights. With cloud and mobile access, your team can perform operations monitoring from any office or field location.

For more information, click here.

Contact us at renewableenergyservices@ul.com.

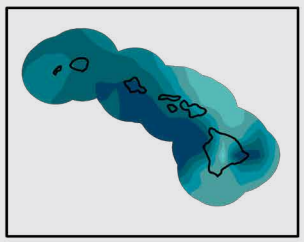
Empowering Trust®

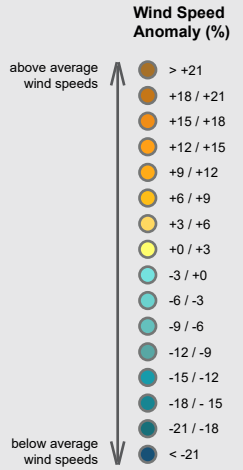
WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

North America
Q4 2020

Wind plant locations source:
www.thewindpower.net





Below Normal:

- Hawaii
- California
- Midwest, U.S.
- Eastern Seaboard, U.S.
- Puerto Rico
- Central America

Above Normal:

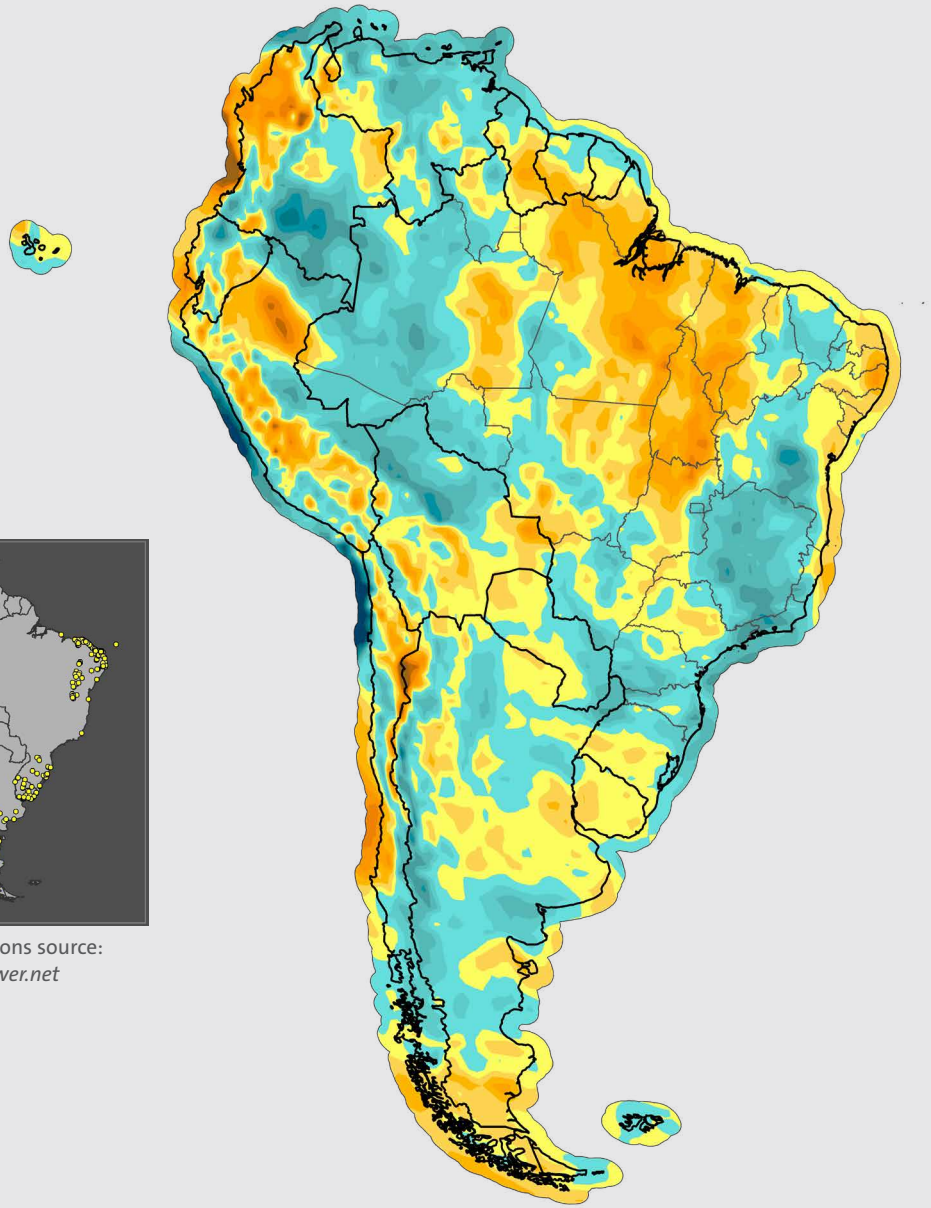
- Western Texas
- Great Plains of the U.S. and Canada
- Montana
- Pacific Northwest, U.S.
- Mexico
- Cuba

+1 518 213 0044 | ul.com/renewables

WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

South America
Q4 2020



Wind plant locations source:
www.thewindpower.net

Below Normal:

- Venezuela
- ABC Islands
- Coastal Peru
- Central Bahia and Minas Gerais, Brazil

Above Normal:

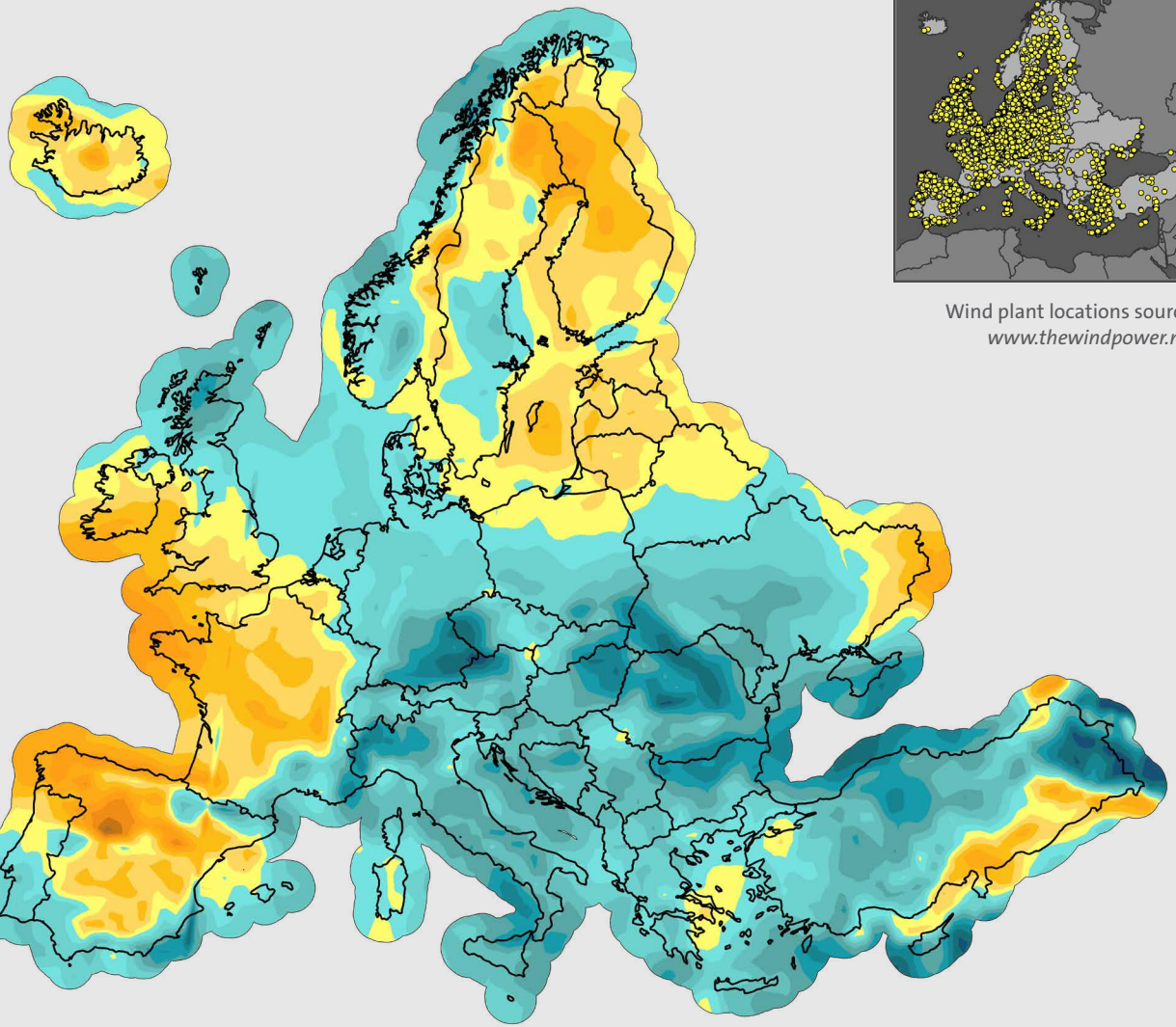
- Coastal Northeast Brazil
- Uruguay
- Northern Chile

+1 518 213 0044 | ul.com/renewables

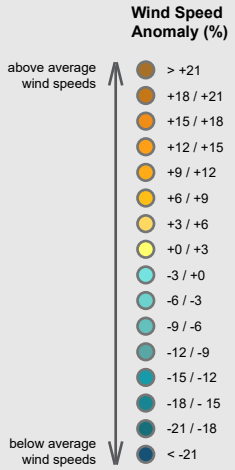
WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Europe
Q4 2020



Wind plant locations source:
www.thewindpower.net



Below Normal:

- Northern United Kingdom
- Central Europe
- Mediterranean region

Above Normal:

- Ireland
- Southern United Kingdom
- France
- Spain and Northern Portugal
- Eastern Scandinavia and Baltic States

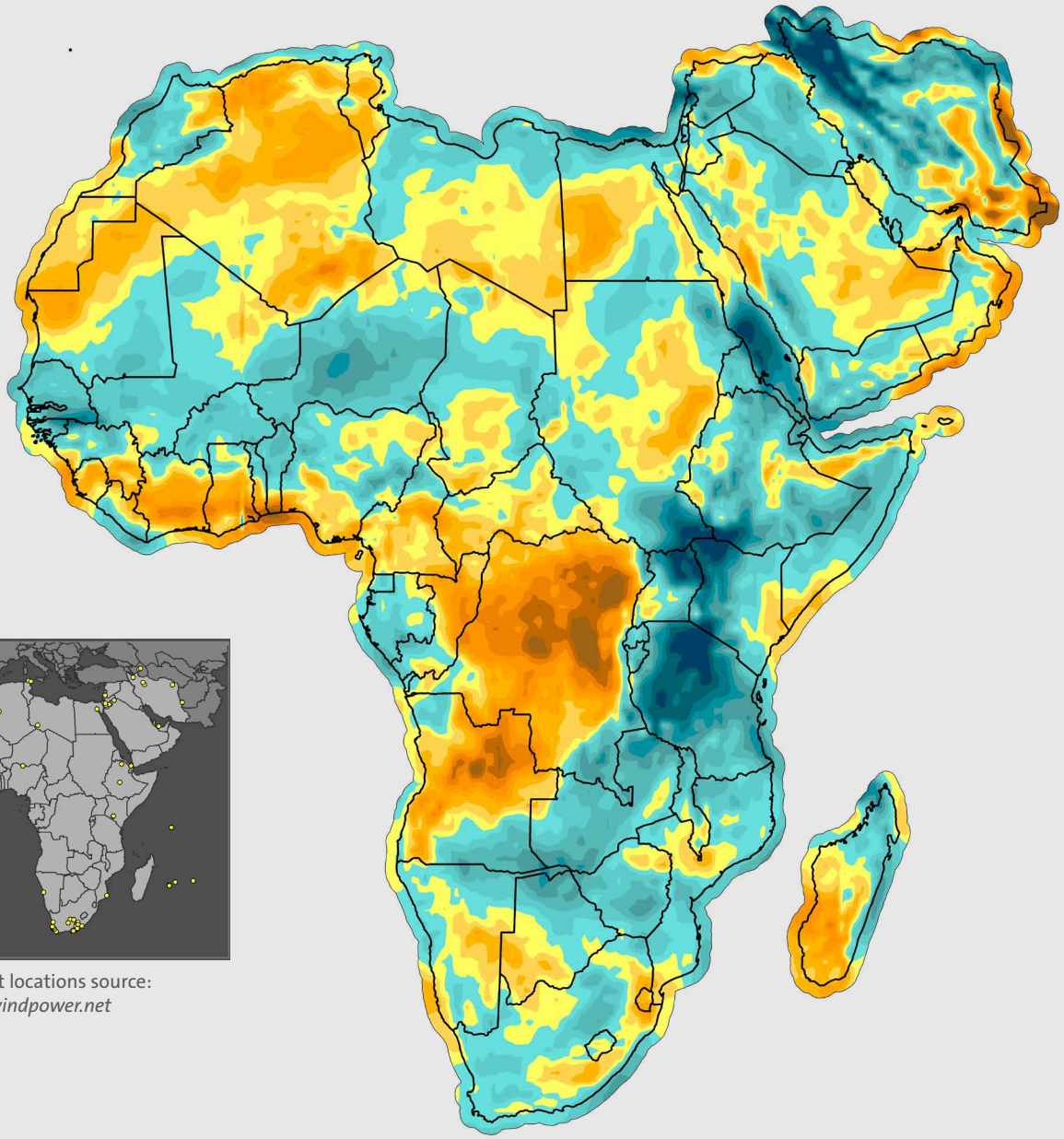
+1 518 213 0044 | ul.com/renewables

WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Africa and the Middle East

Q4 2020



Wind plant locations source:
www.thewindpower.net

Below Normal:

- Northern Egypt
- Ethiopia
- Iran
- Western South Africa

Above Normal:

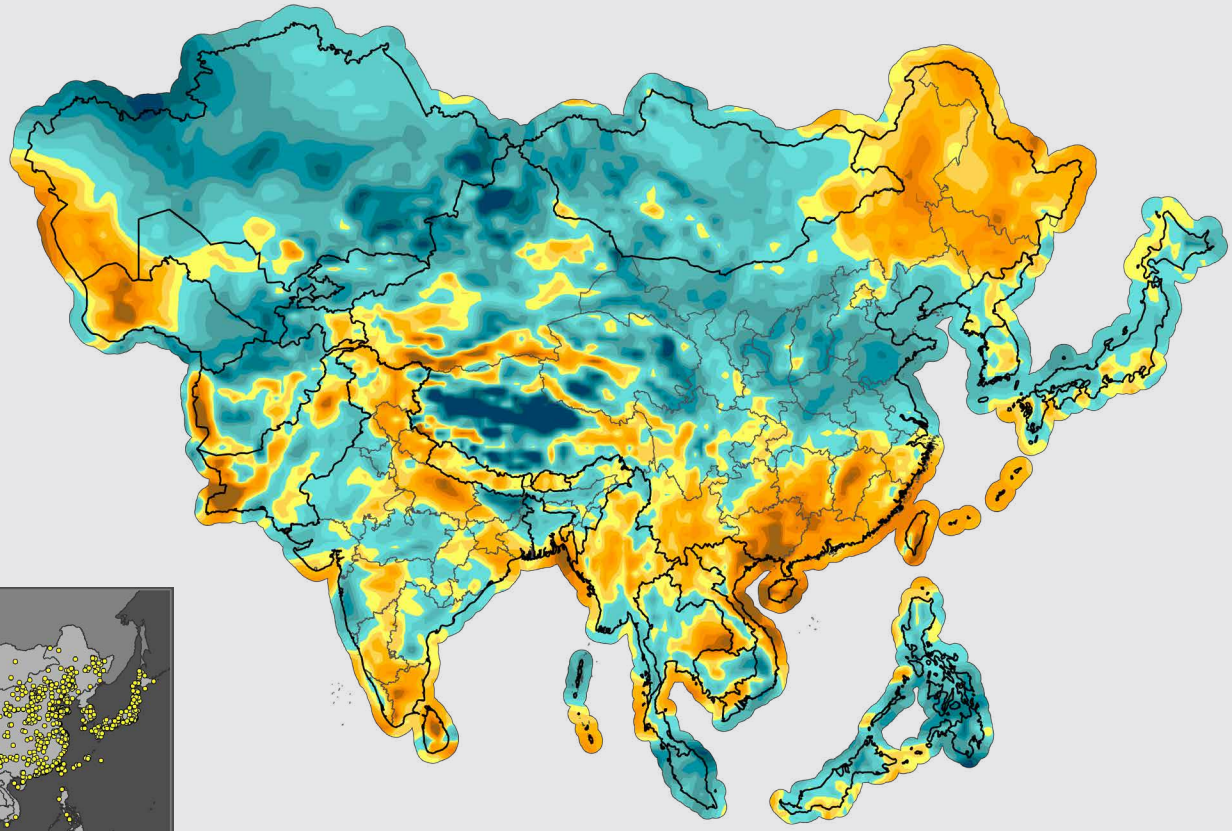
- Southern Morocco and Western Sahara
- Eastern South Africa
- East African Islands

+1 518 213 0044 | ul.com/renewables

WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Asia
Q4 2020



Wind plant locations source:
www.thewindpower.net

Below Normal:

- Central China
- Philippines
- Japan

Above Normal:

- Northeast and Southeast China
- Southern India

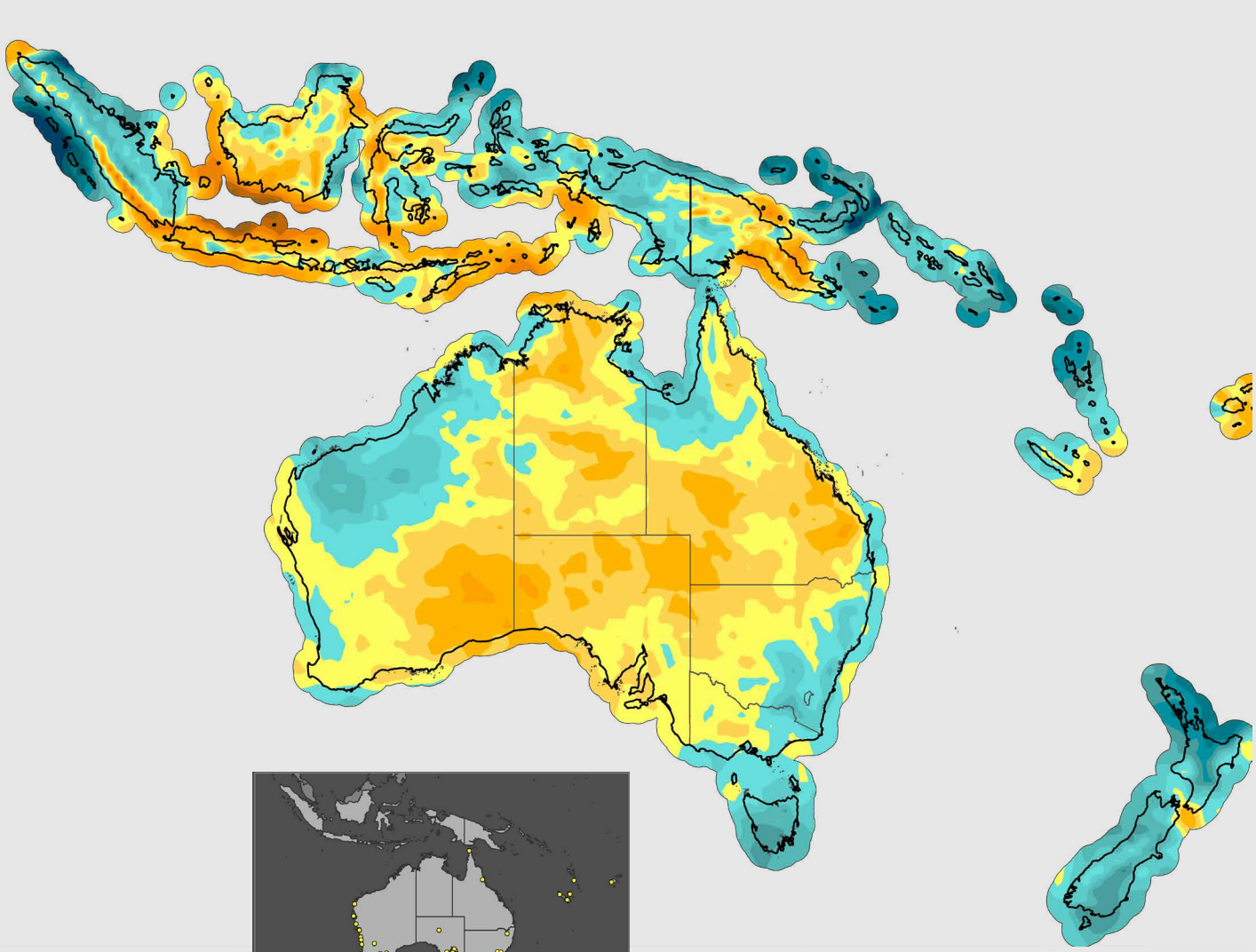
+1 518 213 0044 | ul.com/renewables

WIND TRENDS

GLOBAL WIND SPEED PERFORMANCE

Indonesia, Australia and Oceania

Q4 2020



Below Normal:

- New Zealand
- Tasmania
- Southeast Mainland, Australia
- Vanuatu
- New Caledonia

Above Normal:

- Western and Central Australia

Wind plant locations source:
www.thewindpower.net

+1 518 213 0044 | ul.com/renewables

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	-1.2	2.1	2.0	1.0	2.8	4.5	-1.0	2.1	
Canada	-9.5	6.3	4.1	-0.1	5.6	6.2	1.2	4.5	-4.4	6.7	7.7	3.5	-1.1	6.0	3.0	2.7	
USA	1.2	2.2	-1.9	0.2	-5.7	-2.0	8.2	-0.2	-0.3	1.7	1.8	1.1	3.3	4.4	-1.4	2.1	
Mexico	2.4	5.7	-5.9	0.6	-12.2	3.3	6.5	-2.0	-13.3	1.4	-2.0	-5	3.2	5.8	1.3	3.3	
South America	-8.8	-6.7	-12.9	-9.3	0.8	4.5	2.5	2.7	0.9	2.9	1.3	1.7	-1.1	-2.7	6.1	0.6	
Brazil	-10.8	-9.6	-15.9	-11.9	-0.5	3.2	1.8	1.7	1.6	2.4	2.7	2.3	-2.1	-2.8	7.3	0.5	
Argentina	5.1	1.4	-4.1	1.0	-3.8	2.5	3.1	0.7	-1.9	13.7	11.0	7.6	5.2	-1.9	2.0	1.8	
Europe	0.4	22.3	5.3	9.1	-5.6	0.0	-2.0	-2.7	-0.9	-2.9	-3.5	-2.5	5.8	-6.2	-1.5	-1.0	
Denmark	8.2	25.8	0.0	11.4	2.8	6.6	-10.3	-0.2	17.3	-14.2	-8.4	-2.2	-0.6	2.4	-6.2	-1.6	
France	0.4	36.6	11.5	15.7	-10.6	1.2	0.5	-3.2	-0.2	2.8	-2.7	-0.1	16.9	-7.6	5.0	4.4	
Germany	1.0	39.4	5.5	14.7	-3.0	-2.8	-4.6	-3.5	-5.2	-5.9	-15.2	-8.9	8.9	-5.5	-12.2	-3.9	
Great Britain	5.0	35.9	5.2	15.2	-9.4	-1.6	5.2	-2.3	7.1	0.6	2.7	3.4	1.2	1.2	-7.0	-2.0	
Ireland	-1.1	36.0	5.5	13.2	-18.9	1.7	7.2	-4.0	5.7	-4.4	-0.3	0.4	13.8	1.6	3.3	5.7	
Italy	-10.4	13.4	-7.8	-1.7	-11.6	12.7	11.8	3.6	-12.5	-0.6	2.4	-3.6	5.6	-24.8	-5.9	-8.7	
Portugal	-1.5	-16.1	0.6	-5.3	-13.5	-10.2	1.3	-7.7	-5.2	0.5	0.6	-1.5	2.7	-4.5	8.8	2.5	
Spain	-7.8	-15.1	6.5	-5.5	-16.8	-4.6	-4.5	-9.1	-1.2	-2.9	2.9	-0.6	11.3	-15.4	21.3	6.0	
Africa / Middle East	-2.2	0.3	1.8	-0.1	-3.8	1.4	0.1	-0.7	5.3	6.7	1.4	4.5	2.4	-3	-1.5	-0.8	
South Africa	2.4	2.8	4.2	3.2	1.7	2.3	3.2	2.6	9.3	6.3	1.0	5.6	-1.0	0.8	2.7	0.8	
Egypt	5.8	-12.5	-8.0	-5.2	4.7	7.1	-3.6	2.5	7.1	-0.8	4.3	3.6	3.4	-6.4	-6.2	-2.8	
Asia	-11.9	-0.1	-0.3	-4.1	-5.5	0.4	-3.1	-2.8	-6.3	1.8	-4.6	-3.1	0.7	-3.3	-2.9	-1.9	
China	-13.5	-1.2	0.4	-4.7	-6.0	3.2	-1.3	-1.4	-3.7	2.9	-3.4	-1.5	0.7	-4.4	-3.6	-2.5	
India	-5.5	6.6	-3.4	-1.1	-7.9	-14	-13.8	-12	-20.3	-2.0	-14.3	-12.3	1.0	2.4	1.5	1.6	
Ind, Aus, Oceania	0.0	-0.3	2.2	0.6	11.4	10.4	-10.2	3.2	-16.4	0.1	7.5	-2.8	-5.1	0.3	6.1	0.3	
Australia	-0.1	-0.2	2.7	0.8	11.6	14.1	-11.5	4.0	-18.6	0.5	4.7	-4.3	-4.6	1.4	6.3	0.9	
World	-5.3	8.3	4.6	2.3	-2.2	-0.4	0.1	-1.1	-2.5	-2.4	-2.6	-2.5	1.8	-1.3	2.6	0.8	

+1 518 213 0044 | ul.com/renewables