



U.S. WIND INDUSTRY QUARTERLY MARKET REPORT

SECOND QUARTER 2019



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Second Quarter Highlights

2019 Wind Project Installations

- The U.S. wind industry installed 736 MW of new wind power capacity in the second quarter of 2019. The industry has commissioned 1,577 MW in the first half of the year, a 53% increase over the first half of 2018.
- Project owners commissioned four new projects across two states in the second quarter. Texas led with 734 MW installed, followed by California with 2 MW.
- There are now 97,960 MW of cumulative installed wind capacity in the United States, with more than 57,000 wind turbines operating across 41 states and two U.S. territories.

Wind Capacity Under Construction or in Advanced Development

- Construction activity reached a new record of 20,908 MW at the end of the second quarter, with an additional 20,892 MW in advanced development. The combined 41,801 MW represents a 10% year-over-year increase and a new high water mark for the industry.
- Projects totaling 4,448 MW started construction and a further 2,842 MW entered advanced development during the second quarter. The combined 7,290 MW marks the second-highest volume of new announcements on record.
- 15 states have over 1,000 MW under construction or advanced development. Texas hosts 22% of the total development pipeline, followed by Wyoming (12%), New Mexico (7%), Iowa, (6%), and South Dakota (5%).
- In terms of offtake, 47% of capacity in the pipeline has a PPA in place, while 20% is utility-owned and 8% has a hedge contract.

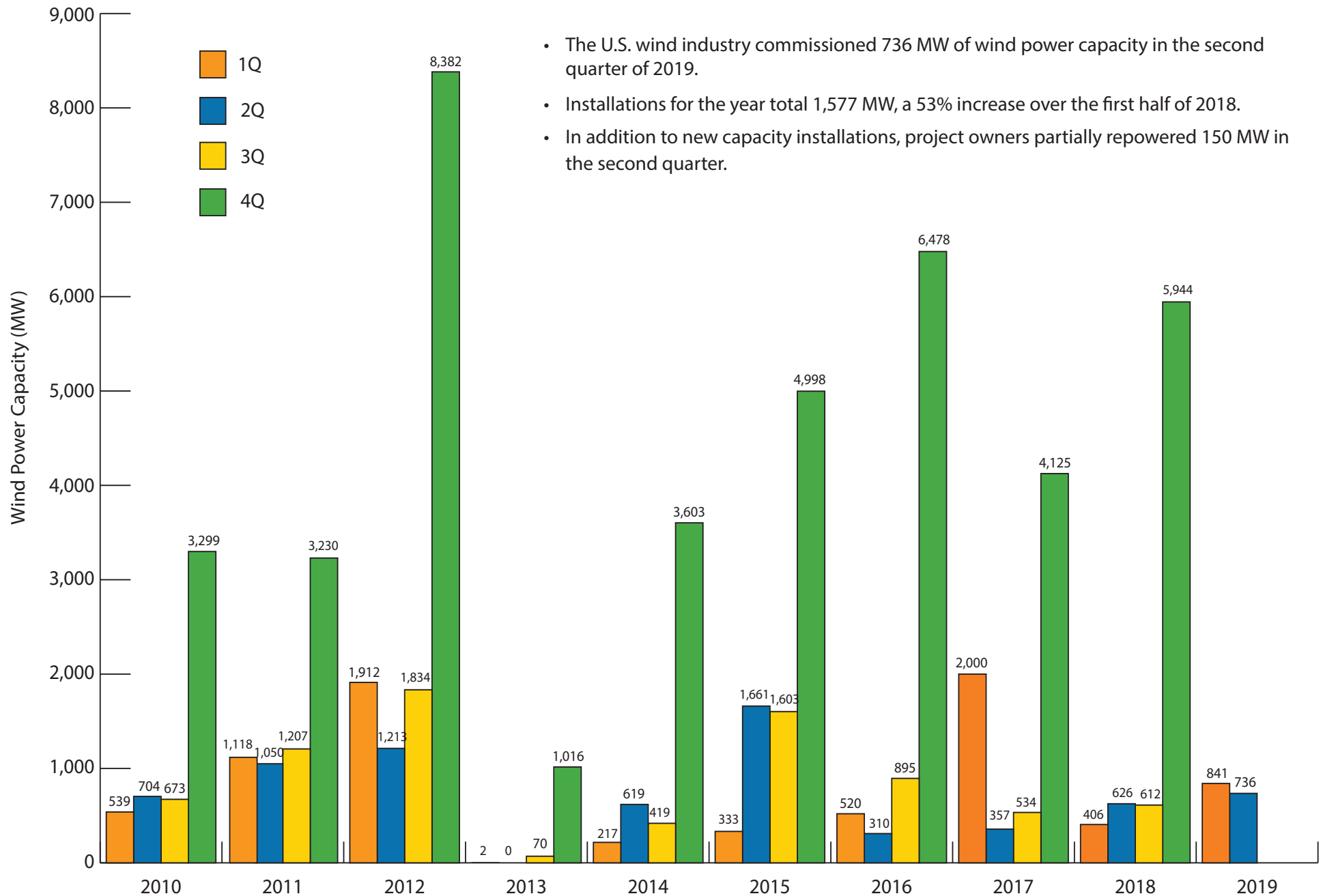
Wind Power Procurement Activity

- Project developers announced 1,962 MW of new PPAs in the second quarter, contributing to a total of 4,799 MW for the year.
- Corporate customers signed 52% (1,013 MW) of capacity contracted in the second quarter. Six companies purchased wind for the first time, including Hormel Foods, Cisco Systems, and Ernst & Young.
- Utilities signed contracts for 949 MW of wind capacity, led by Associated Electric Cooperative and Minnesota Municipal Power Agency. Ameren Missouri also announced plans to add 300 MW of wind capacity under direct ownership in the second quarter.

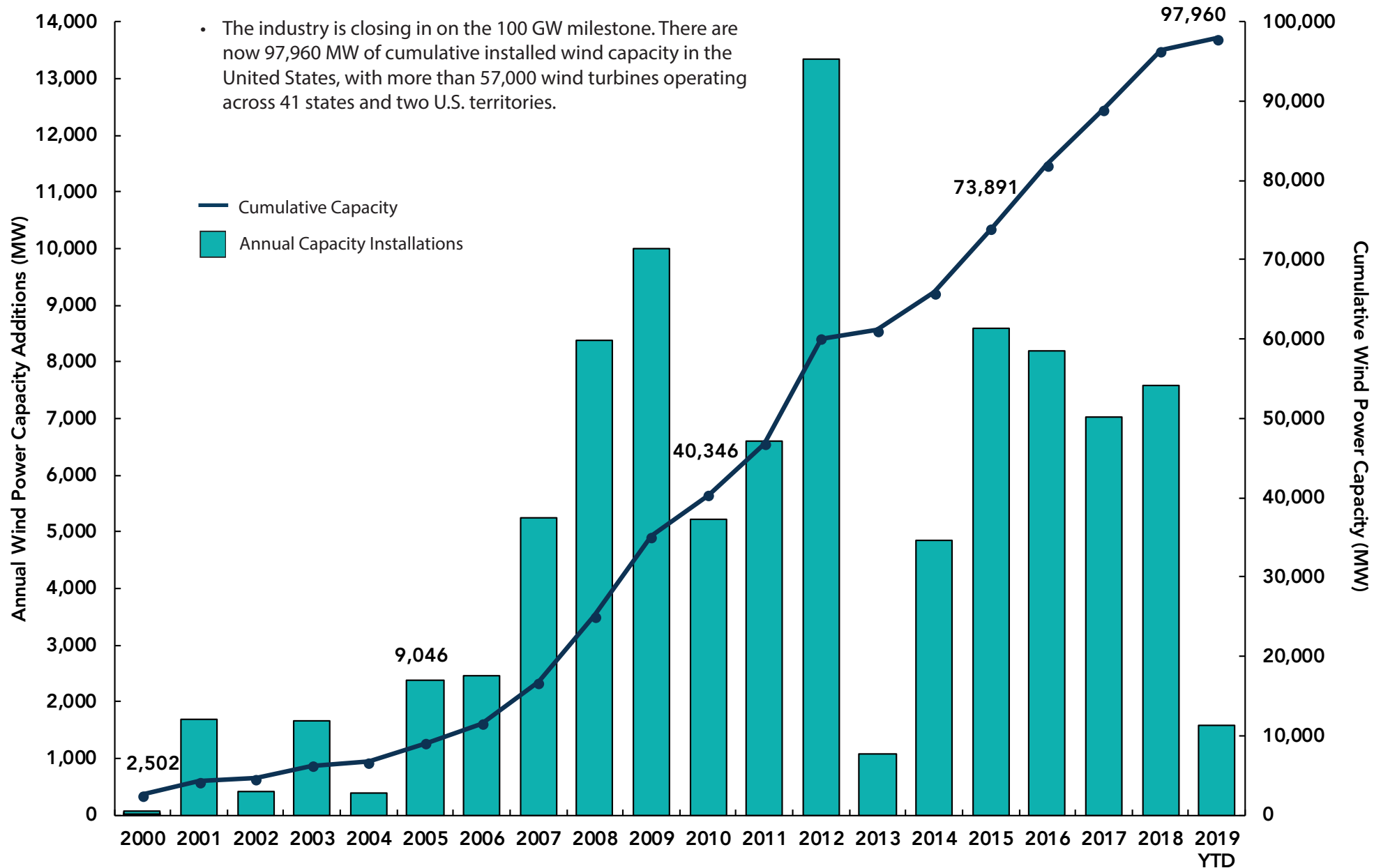
Turbine Technology Trends

- Vestas turbines represent 49% of turbine installations in the first half of 2019, while GE Renewable Energy accounts for 42% and Siemens Gamesa Renewable Energy represents 9%.
- Average turbine capacities continue to increase, with 14% of turbines installed year-to-date rated between 3.4 MW to 3.6 MW. In the second quarter, the Patriot Wind project became the sixth operating project in the country with turbines rated above 3.5 MW.
- Looking forward, the majority of projects underway that have reported turbine models are using turbines with a nameplate capacity between 2 MW and 3 MW, while 33% have selected turbines rated 3 MW or higher.

Quarterly U.S. Wind Power Capacity Installations

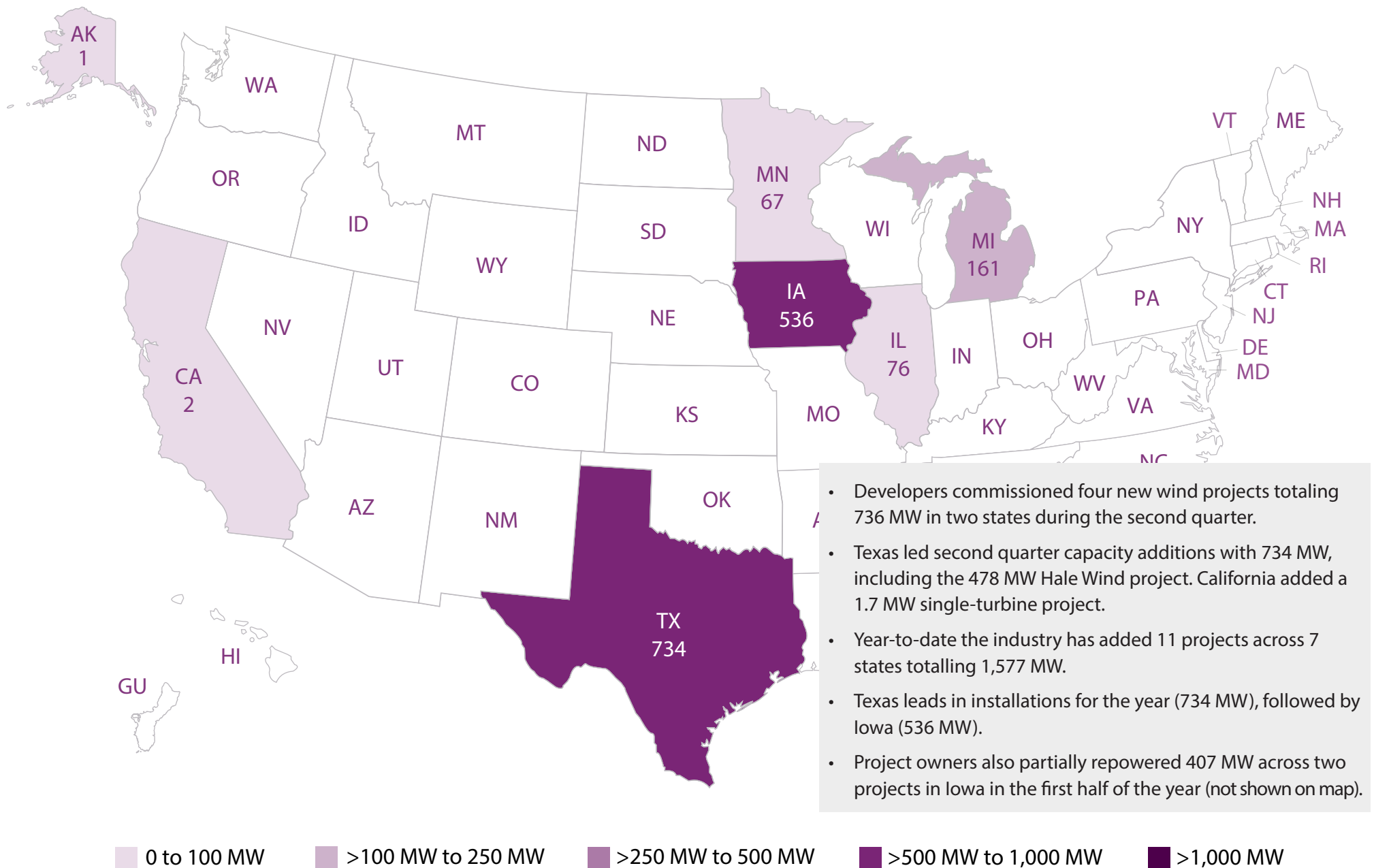


U.S. Annual and Cumulative Wind Power Capacity Growth



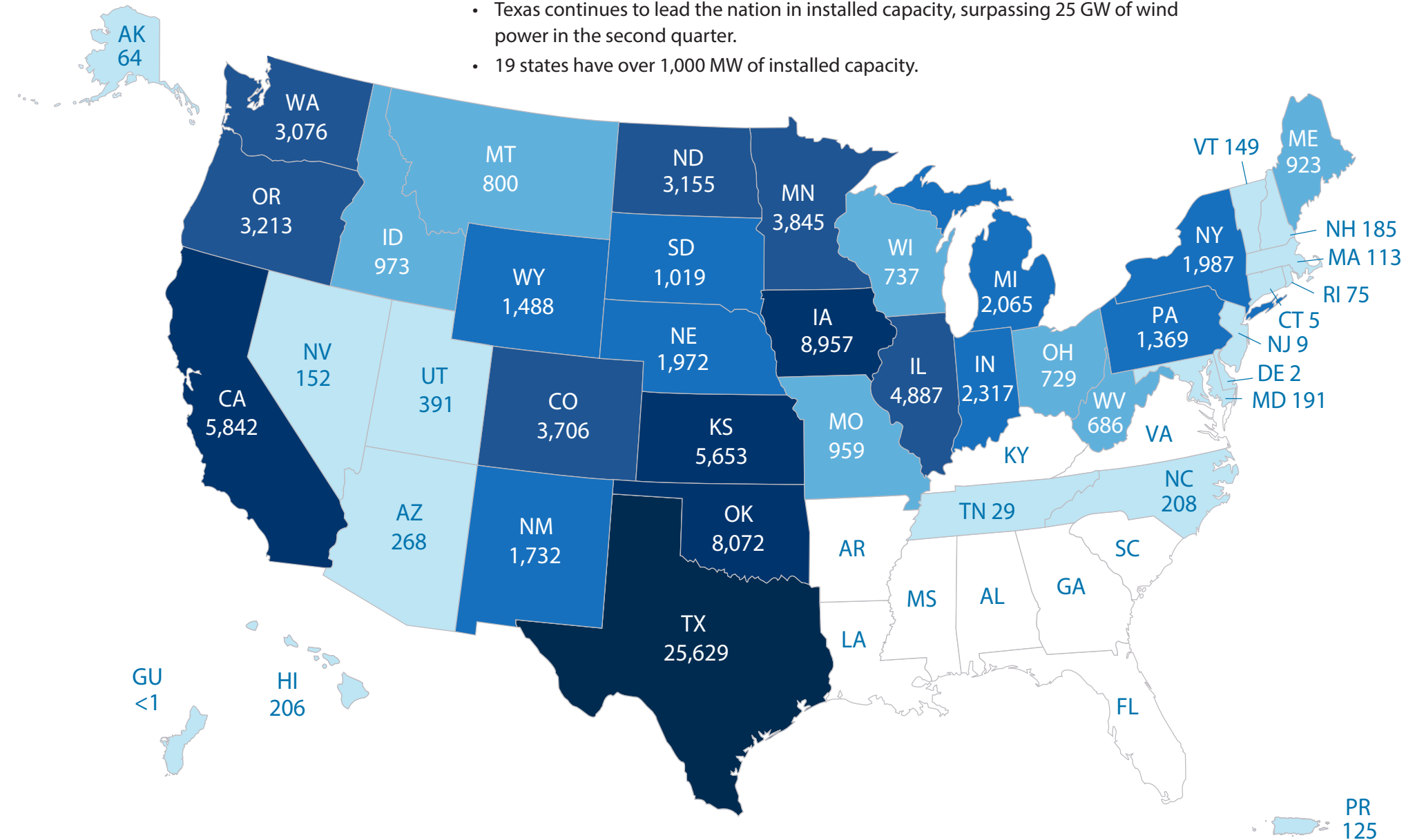
Note: Utility-scale wind capacity includes installations of wind turbines larger than 100-kW for the purpose of the AWEA U.S. Wind Industry Quarterly Market Reports. Annual capacity additions and cumulative capacity may not always add up due to decommissioned and repowered wind capacity. Wind capacity data for each year is continuously updated as information changes.

New Wind Power Capacity Installations in 2019, by State



U.S. Wind Power Cumulative Installed Capacity, by State

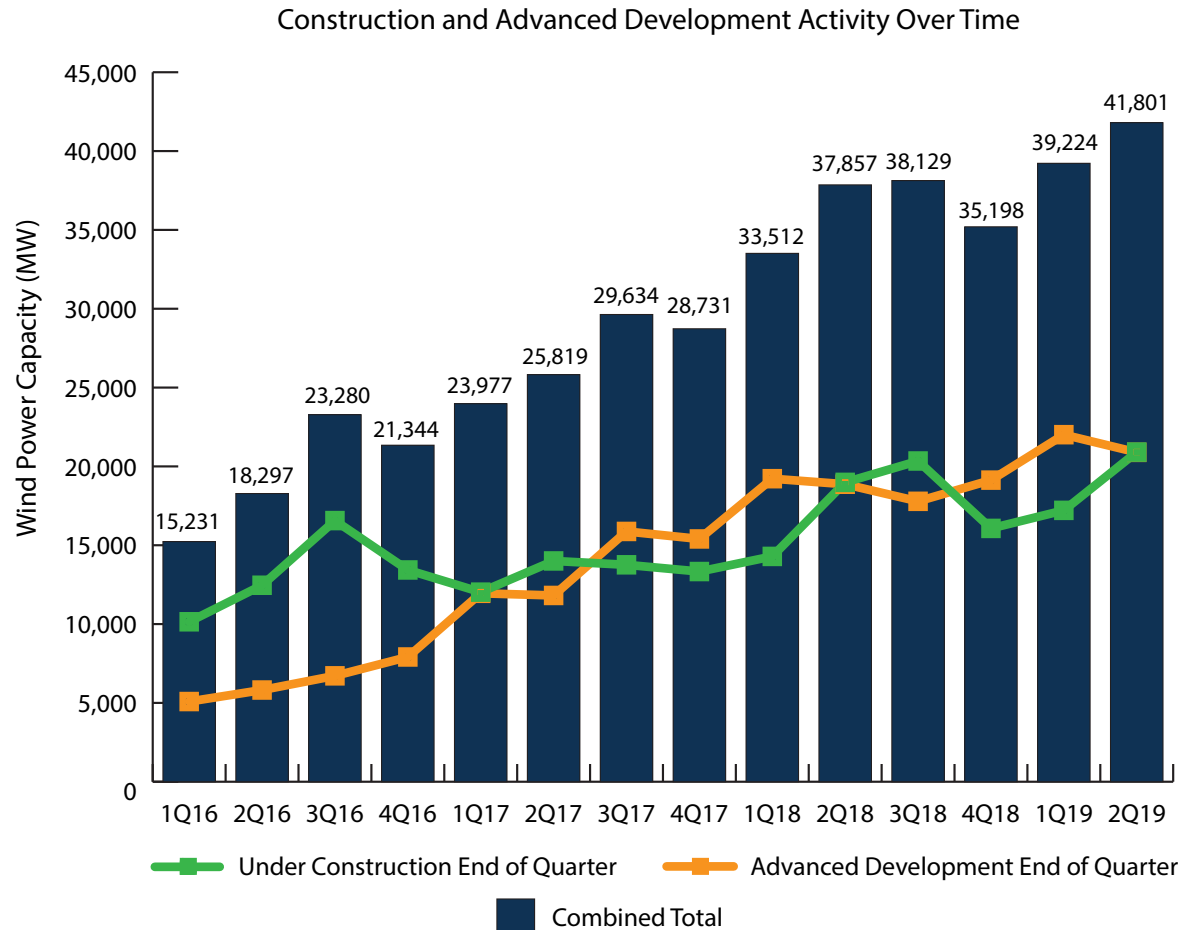
- Texas continues to lead the nation in installed capacity, surpassing 25 GW of wind power in the second quarter.
- 19 states have over 1,000 MW of installed capacity.



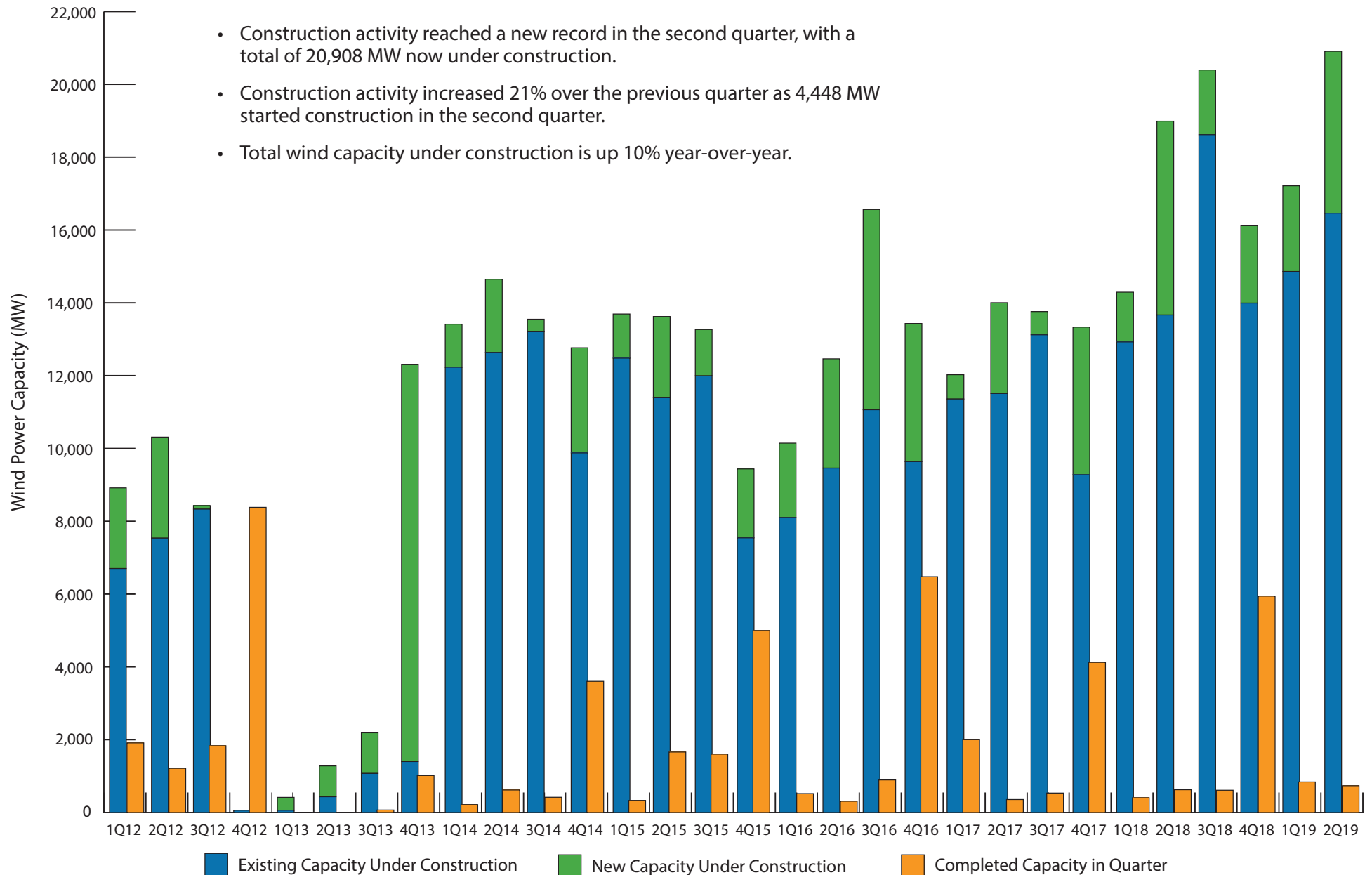
■ >0 to 500 MW
 ■ >500 to 1,000 MW
 ■ >1,000 to 2,500 MW
 ■ >2,500 to 5,000 MW
 ■ >5,000 to 10,000 MW
 ■ >10,000 MW

Wind Power Capacity Under Construction or in Advanced Development

- The near-term U.S. wind project pipeline grew to a new record in the second quarter of 2019. There are now 41,801 MW of wind power capacity either under construction (20,908 MW) or in advanced development (20,892 MW), including 3,152 MW of offshore wind. The total pipeline increased 7% over the first quarter and 10% year-over-year as developers continue to find offtake for PTC-qualifying projects.
- Project developers announced 7,290 MW in combined new activity for the second quarter of 2019, with projects totaling 4,448 MW starting construction and a further 2,842 MW entering advanced development.
- Project developers continue to move their near-term pipelines forward. Fifteen projects previously in advanced development moved into the construction phase in the second quarter. Wind projects currently under construction have been underway for an average of roughly 12 months, while projects in advanced development have been underway for 14 months, on average. Over 63% of the 41,801 MW underway started construction or entered advanced development in 2018 or 2019.



Wind Power Capacity Under Construction



Note: Project developers self-report projects as under construction. The AWEA under construction definition is at the discretion of the project developer and may be different from the start construction definition under IRS Notices 2013-29 and 2013-60; projects are presumed to have taken steps to qualify for the PTC through safe harbor or physical construction.

Wind Power Capacity Under Construction, by State

Member Version Only

Note: Project developers self-report projects as under construction. The AWEA under construction definition is at the discretion of the project developer and may be different from the start construction definition under IRS Notices 2013-29 and 2013-60; projects are presumed to have taken steps to qualify for the PTC through safe harbor or physical construction.

Wind Power Capacity in Advanced Development

Member Version Only

Wind Power Capacity in Advanced Development, by State

Member Version Only

Note: AWEA defines a project as in advanced development if it has not yet started construction but has either signed a PPA (or similar long-term contract), announced a firm turbine order, or been announced to proceed under utility ownership. Offshore wind capacity is assigned to a state based on the BOEM lease area location.

Member Version Only

Wind Power Capacity Offtake Status

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Quarterly Wind Power Purchase Agreements

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Note: PPA totals reflect the original offtaker and do not include sleeved PPAs or subsequent sales through utilities. Totals do not include PPAs for projects that were later cancelled.

2019 Power Purchase Agreements

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Map of Power Purchase Agreements Signed in 2019

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Mergers & Acquisitions Activity

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Wind Turbine Manufacturer Market

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Turbine Technology Trends

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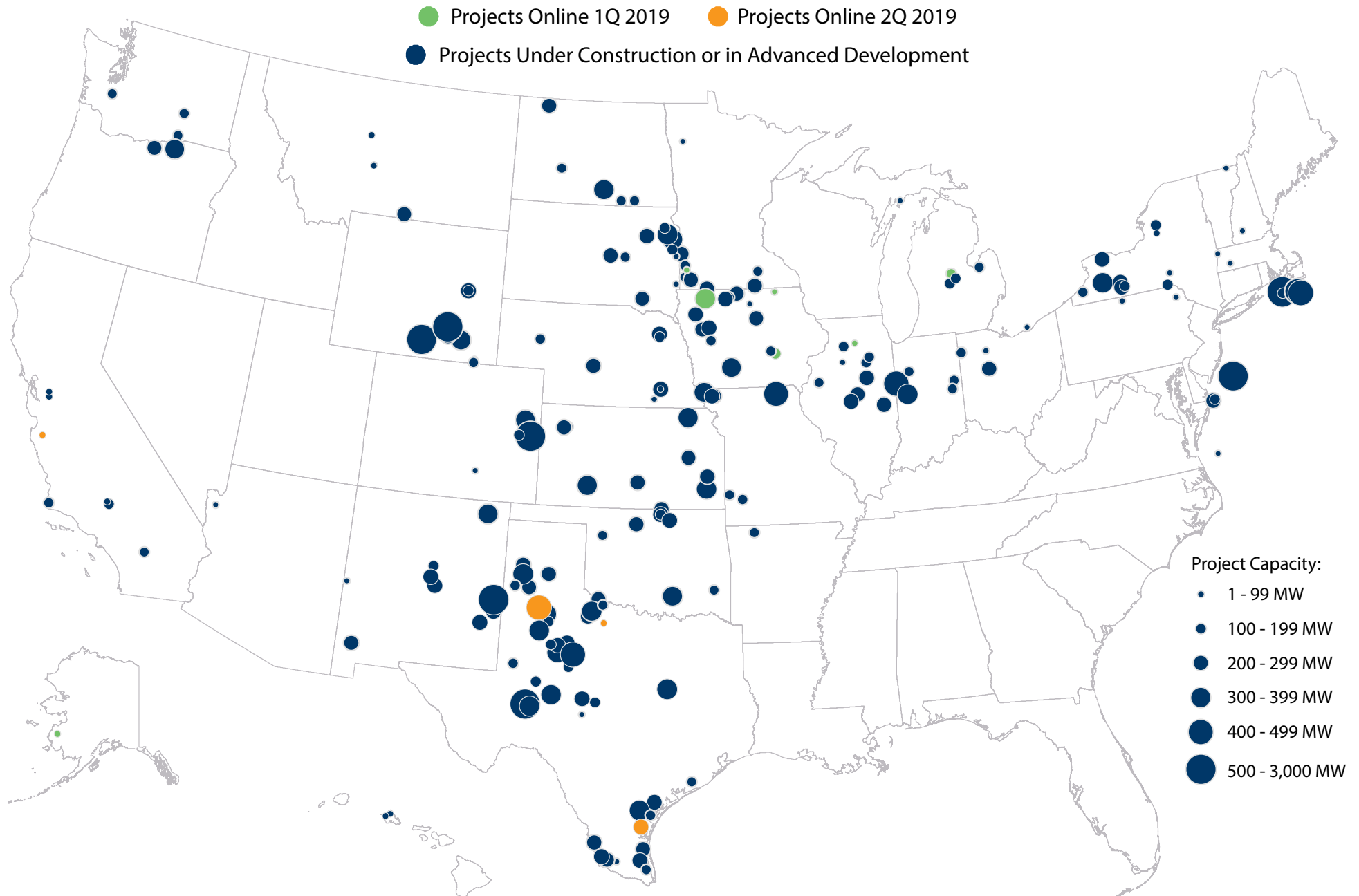
Regional Turbine Technology Trends

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Map of Projects Online in 2019, Under Construction, or in Advanced Development



Utility-Scale Wind Projects Completed in 2019

State	Project Phase Name	Project Capacity (MW)	Turbine OEM	Turbine Model	Project Developer(s)	Project Owner(s)	Power Purchaser(s)
First Quarter 2019							
AK	St. Mary's Wind Turbine	0.90	EWT Americas	DW-52-900	Alaska Village Electric Coop	Alaska Village Electric Coop	Alaska Village Elec Coop
IL	Mendota Hills Repowering	76.13	Siemens Gamesa Renewable Energy	SG 2.6-126	Leeward Renewable Energy Development, LLC	Leeward Renewable Energy, LLC	Digital Realty
IA	English Farms	170.30	GE Renewable Energy	GE 2.3-116; GE 2.5-127	Interstate Power and Light Co, Tradewind Energy	Interstate Power and Light Co	Interstate Power and Light Co
IA	Saratoga	66.00	Vestas	V116-2.0	Madison Gas & Electric Co	Madison Gas & Electric Co	Madison Gas & Electric Co
IA	Upland Prairie	299.30	GE Renewable Energy	GE 2.3-116; GE 2.5-116	Apex Clean Energy, Interstate Power and Light Co	Interstate Power and Light Co	Interstate Power and Light Co
MI	Pine River	161.30	GE Renewable Energy	GE 2.3-116; GE 2.5-116	Invenergy	DTE Energy	The DTE Electric Company
MN	Stoneray	66.63	Siemens Gamesa Renewable Energy	SWT-2.3-108; SWT-2.625-120	EDF Renewables	EDF Renewables	Southern Minnesota Municipal Power Agency
Second Quarter 2019							
CA	Mann Packing	1.70	GE Renewable Energy	1.7-100	Foundation Windpower	Foundation Windpower	Mann Packing, Excess to PG&E
TX	Hale Wind	478.00	Vestas	V110-2.0; V116-2.0	Tri Global Energy, NextEra Energy Resources	Xcel Energy	Southwestern Public Service Co
TX	Patriot Wind	226.05	Vestas	V126-3.45; V136-3.6	Apex Clean Energy; Clearway Energy Group	Avangrid Renewables	Merchant Hedge Contract (ERCOT)
TX	Seymour Hills	30.00	GE Renewable Energy	GE 2.5-127	ENGIE North America	ENGIE North America	Akamai Technologies (8MW); Ingersoll Rand (22 MW)

Utility-Scale Wind Power Projects Under Construction

Member Version Only

Note: The AWEA under construction definition is at the discretion of the project developer and may be different from the start construction definition under IRS Notices 2013-29 and 2013-60.

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Utility-Scale Wind Power Projects in Advanced Development

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Note: AWEA defines a project as in advanced development if it has not yet started construction, but has either signed a PPA, announced a firm turbine order, or been announced to proceed under utility ownership.

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2019 Power Purchase Agreements

Member Version Only

2019 Power Purchase Agreements

Member Version Only

2019 Project Acquisition Activity

Member Version Only

Note: Data include operating project acquisitions, and do not include projects acquired either upon or prior to commercial operation. YieldCo drop-downs are not considered project acquisitions.

Electric Utility Renewable Energy Requests for Proposals (RFPs)

Member Version Only

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WindIQ is your comprehensive database of all online, under construction, and advanced development wind projects and wind-related manufacturing facilities in the United States, with interactive web mapping features.

All current AWEA Business and Utility members can access WindIQ at www.awea.org/windiq or www.windiq.awea.org.

For additional AWEA industry data & analysis, please visit www.awea.org/marketreports where you can download previous versions of the Quarterly Market Reports and the latest Annual Market Report.

The U.S. Wind Industry Second Quarter 2019 Market Report can be accessed at www.awea.org/2019marketreports.





About the American Wind Energy Association

AWEA is the national trade association of the U.S. wind energy industry. We represent 1,000 member companies and over 100,000 jobs in the U.S. economy, serving as a powerful voice for how wind works for America. Members include global leaders in wind power and energy development, turbine manufacturing, and component and service suppliers. They gather each year at the Western Hemisphere's largest wind power trade show, the AWEA WINDPOWER® Conference & Exhibition. Find information about wind energy on the AWEA website, www.awea.org. Gain insight into industry issues on AWEA's blog, Into the Wind. And please join us on Facebook, and follow @AWEA on Twitter.



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