

AWEA Member Briefing

First Quarter 2020





Moderator



Jana Adams
Senior Vice President
Member Value & Experience



First Quarter 2020 Market Activity



Celeste Wanner
Research & Analytics Manager

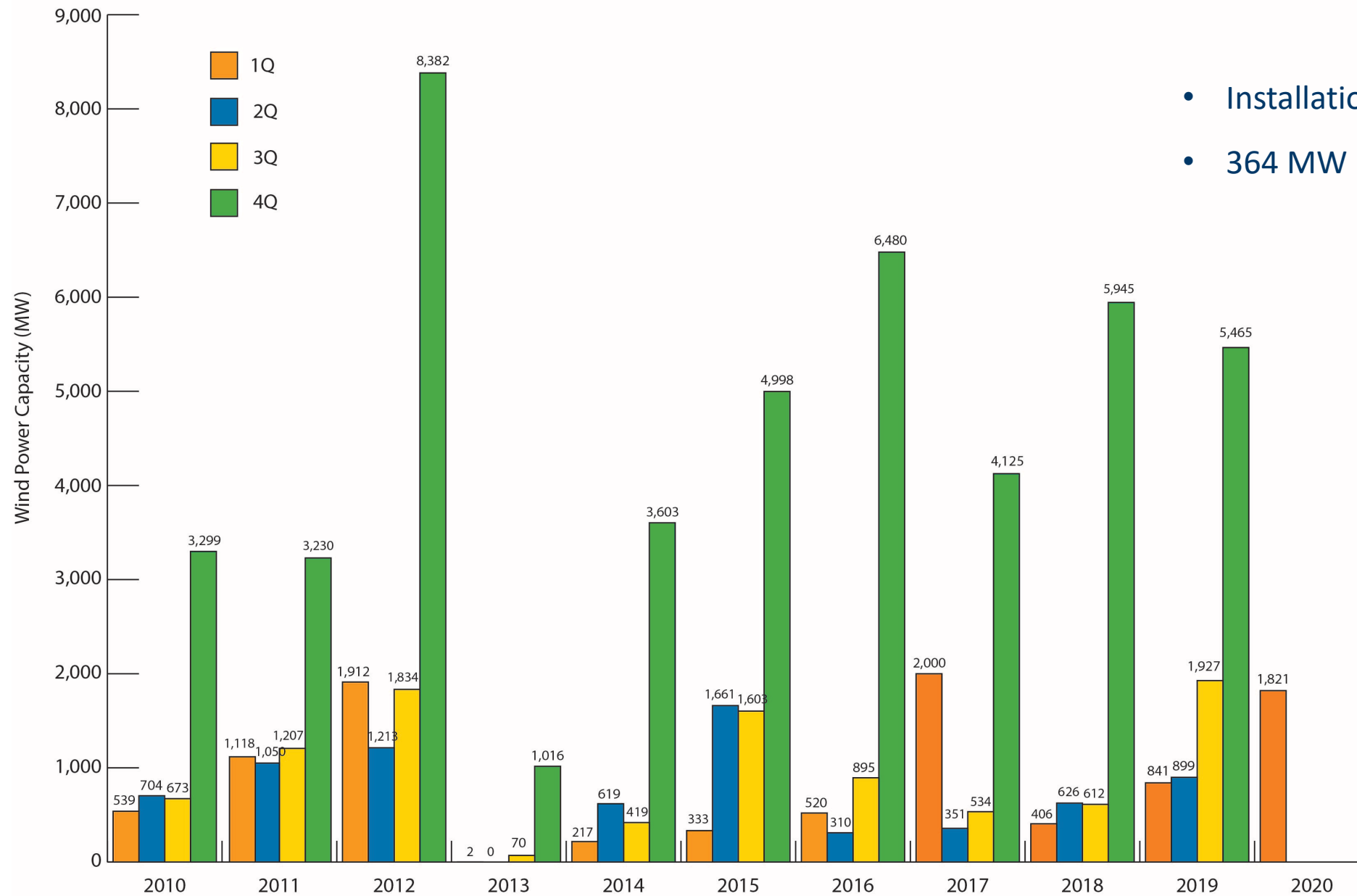
Wind Powers America First Quarter 2020 Report



AWEA members can download the report for free at:
www.awea.org/2020marketreports



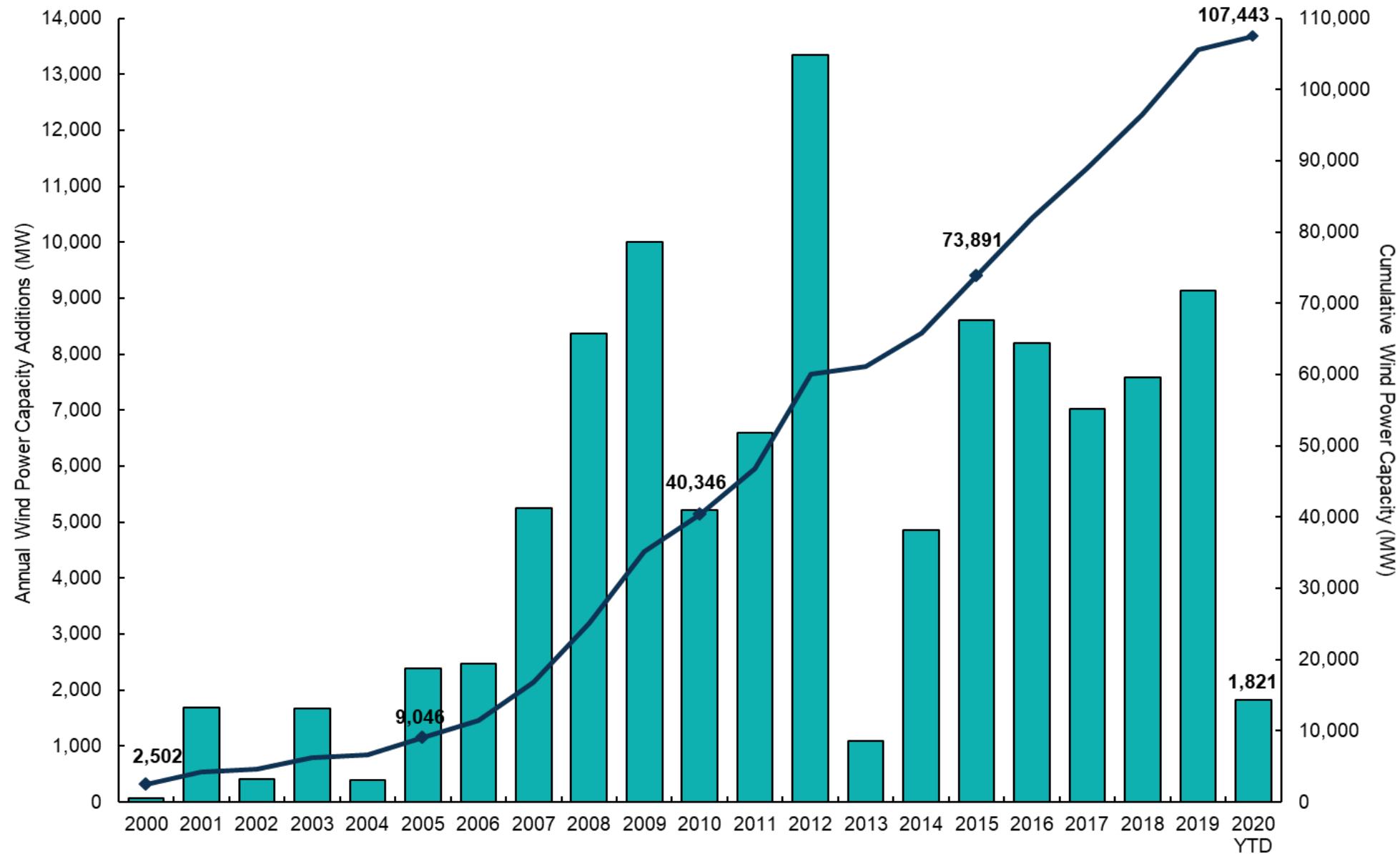
1,821 MW installed in 1Q



- Installations up 117% over 1Q 2019
- 364 MW partially repowered in 4Q

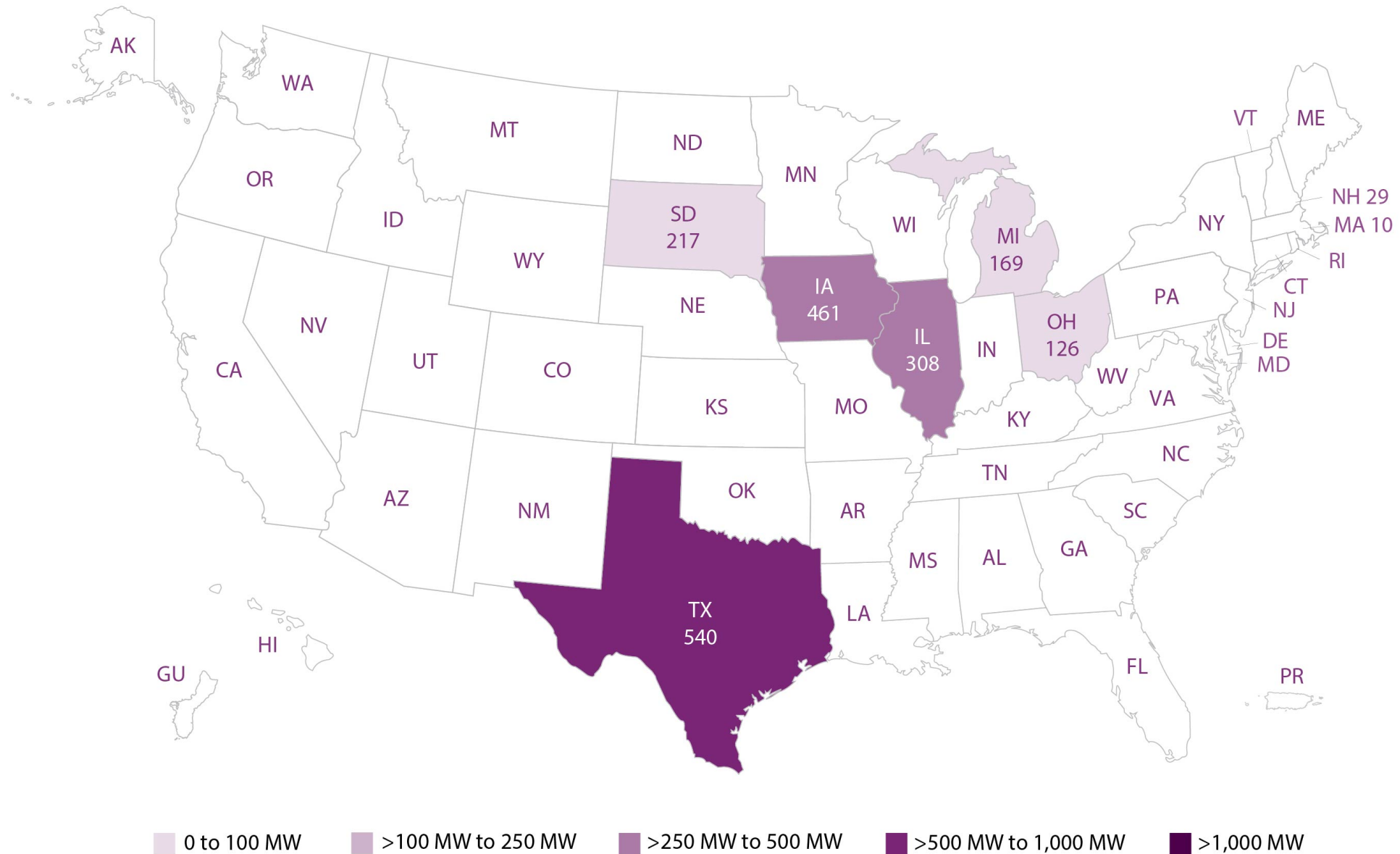


Over 107 GW operating in U.S.



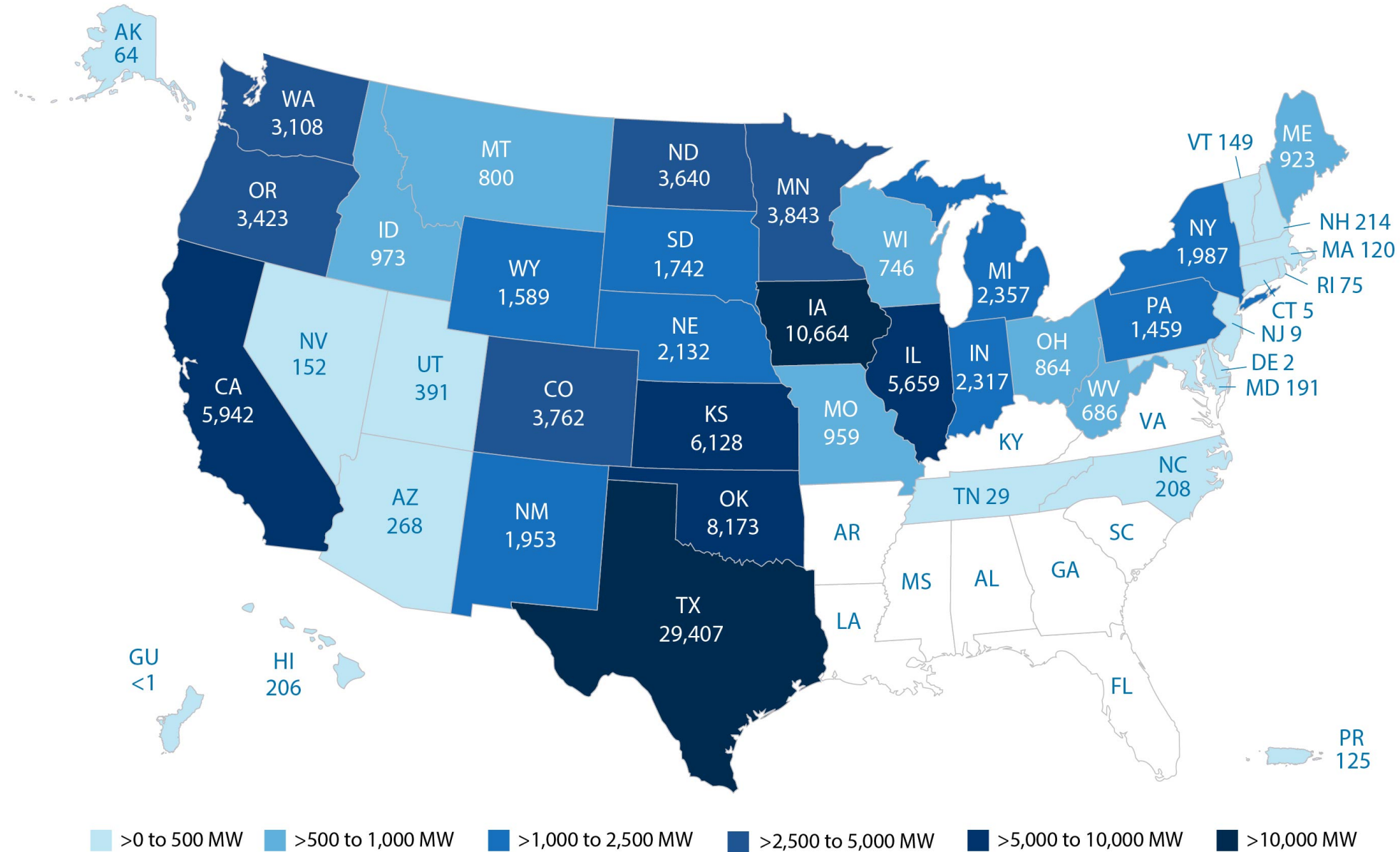


11 Projects Commissioned across 6 States in First Quarter



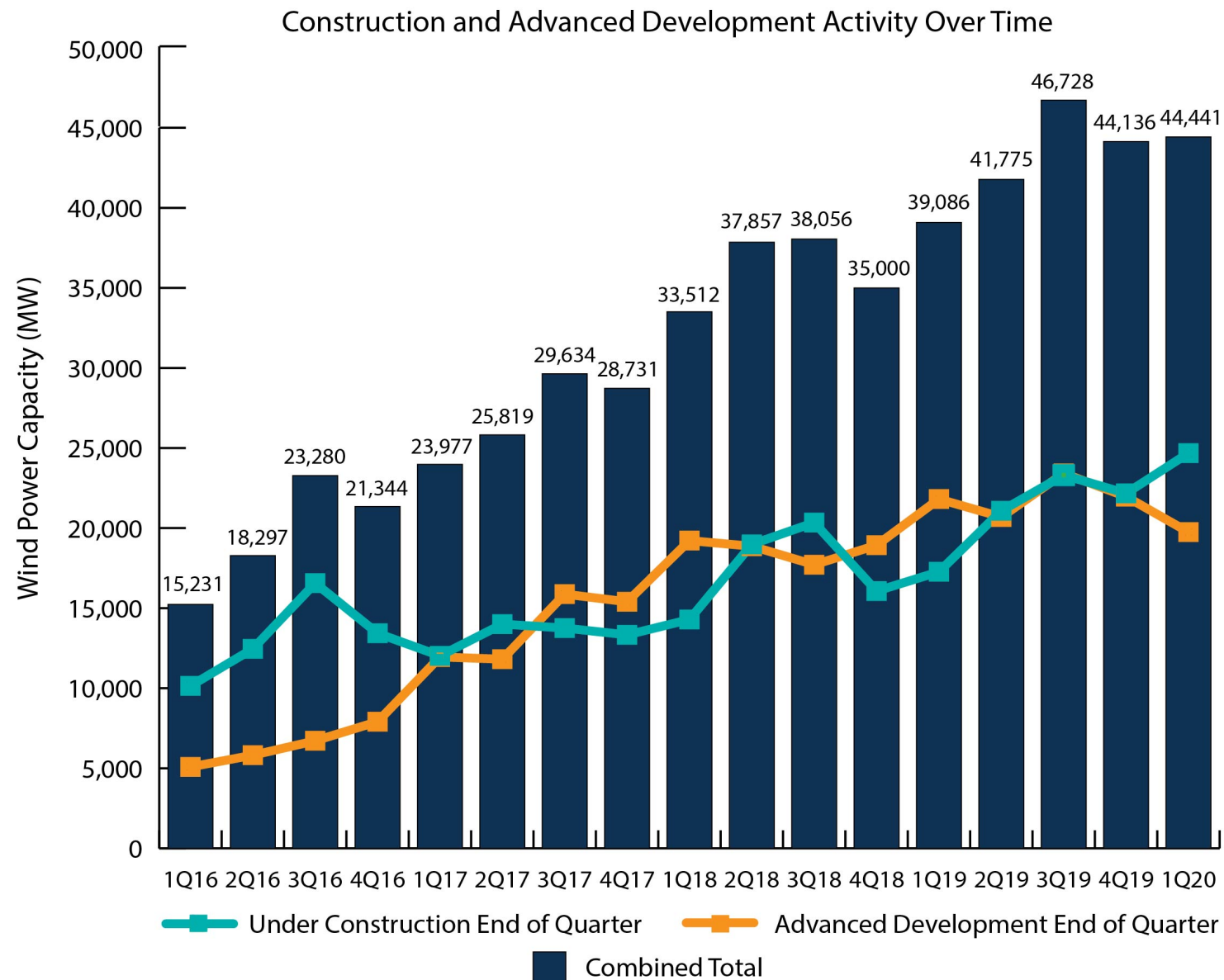


107,443 MW of Wind Power Capacity across 41 States





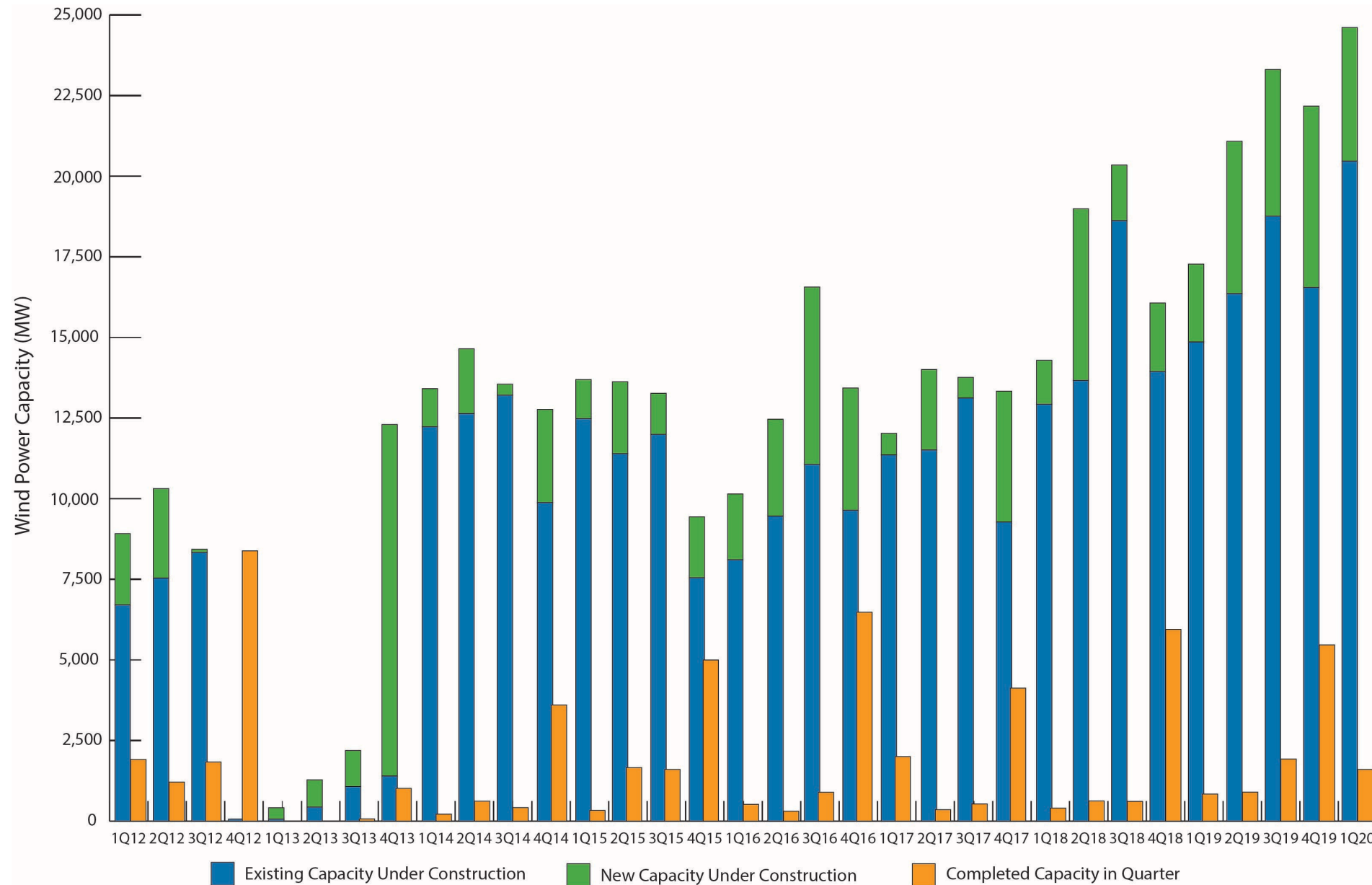
Over 44,000 MW Under Construction or in Advanced Development



- Over 6.5 GW of new project activity in 1Q
- Pipeline up 14% YoY
- Includes 8,308 MW of offshore wind



Record 24,690 MW Under Construction

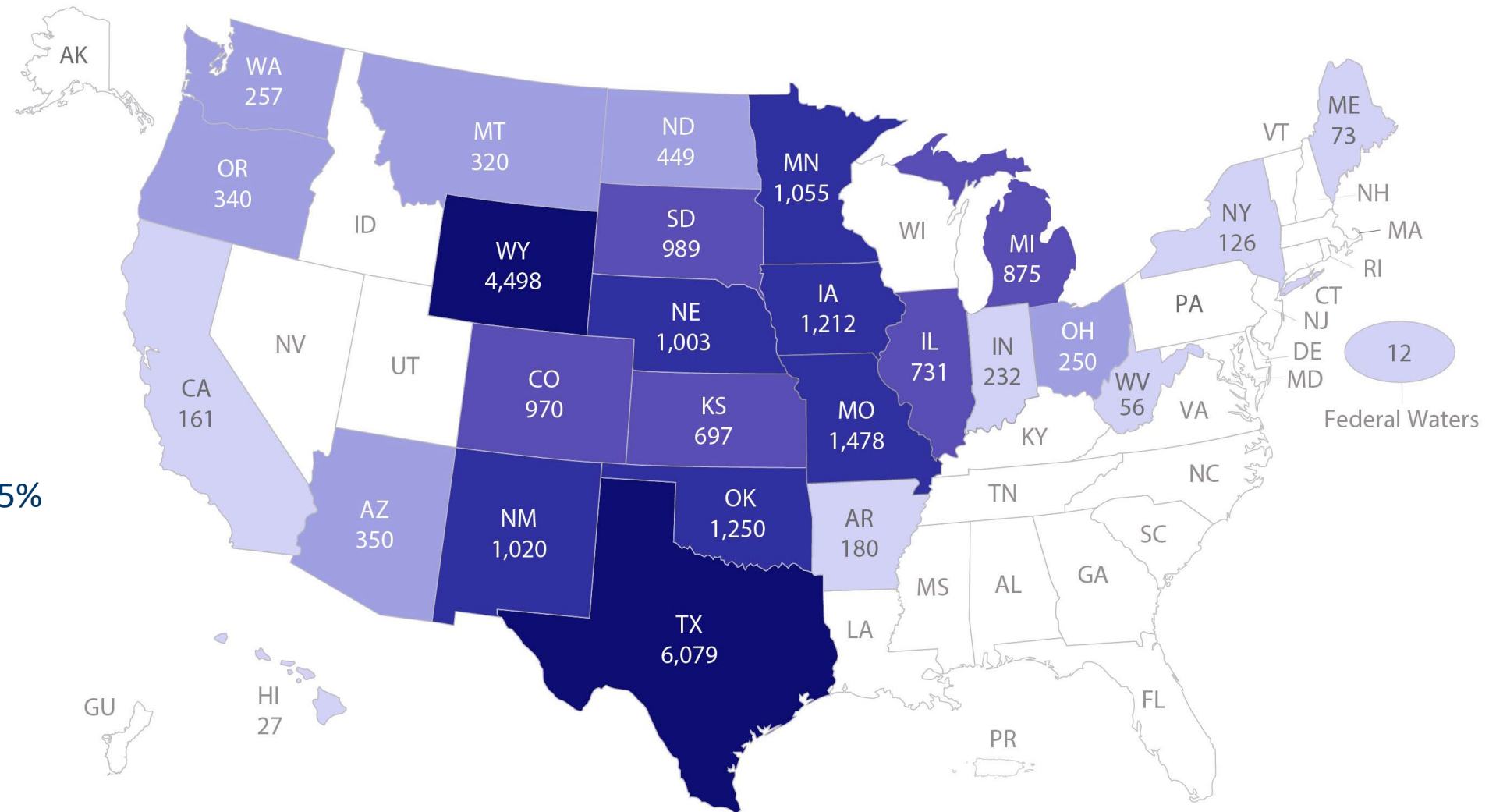


- 4,214 MW started construction in 1Q
- 43% increase year-over-year



Wind Projects Under Construction in 26 States

- 25 projects started construction across 12 states
- Wyoming, Missouri, and Iowa led new construction activity
- Mountain West hosts 28% of total construction activity; Texas hosts 25%

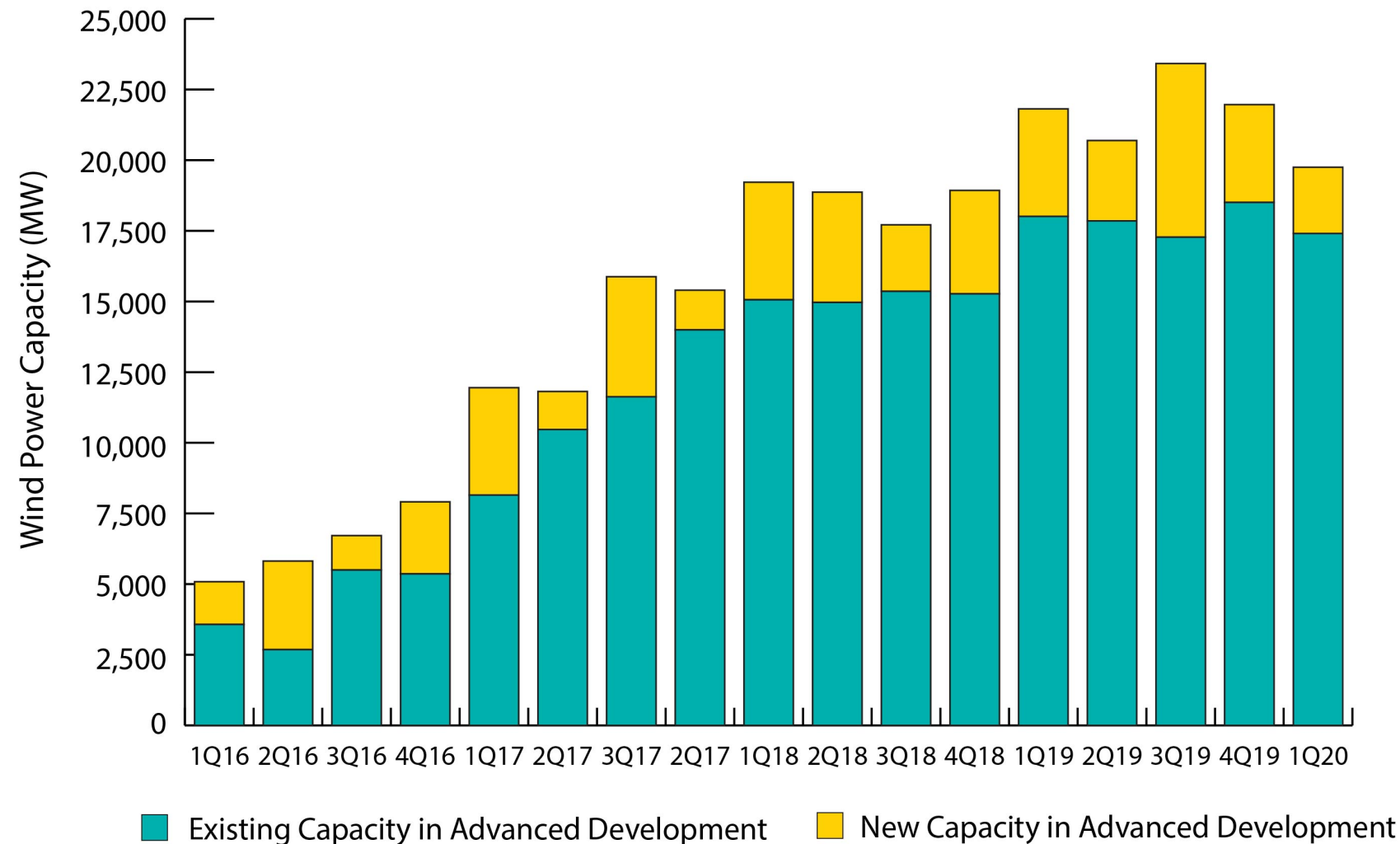


>0 to 249 MW
 250 MW to 499 MW
 500 MW to 999 MW
 1,000 MW to 1,999 MW
 2,000 MW and Above



19,751 MW in Advanced Development

Advanced Development Activity Over Time

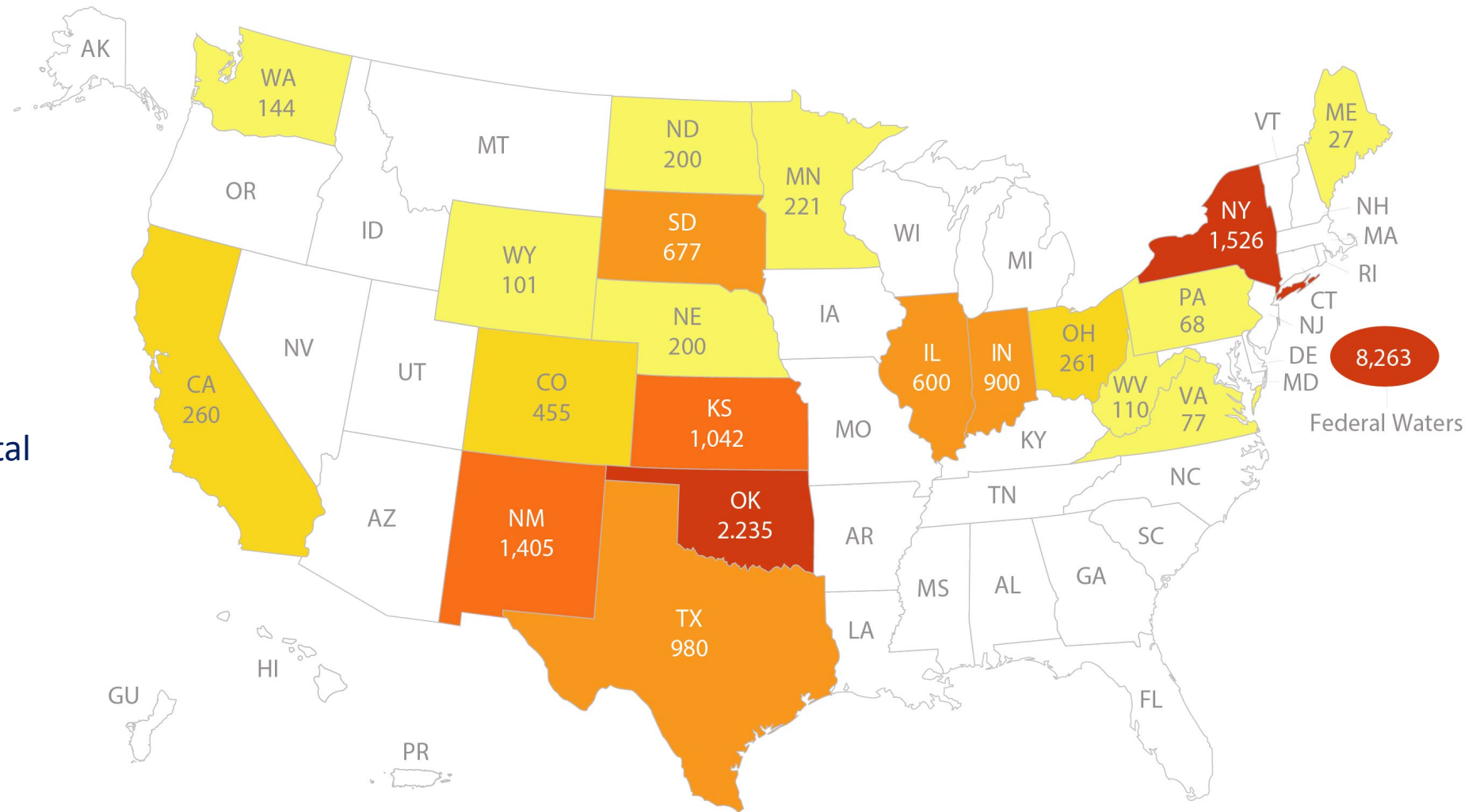


- 2,343 MW entered advanced development in 1Q
- Offshore wind accounts for 42% of advanced development capacity
- 74% of project capacity has a PPA in place; 26% utility-owned



Wind Projects in Advanced Development in 20 States

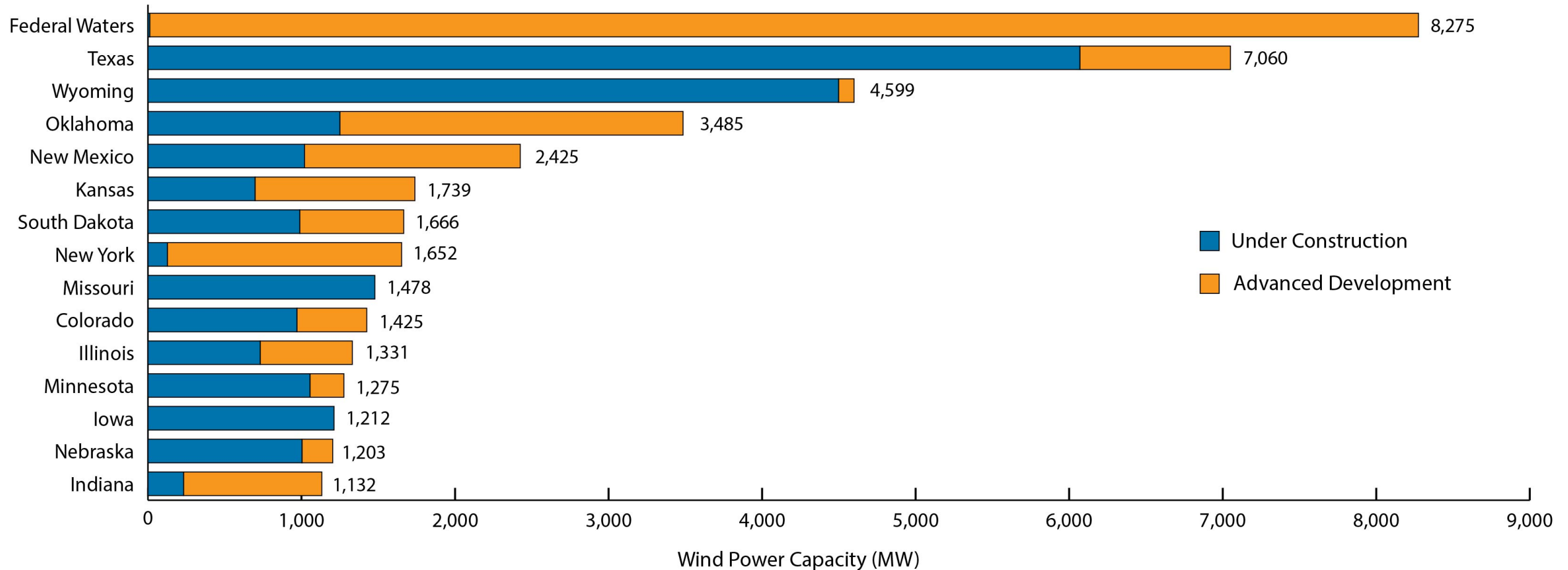
- 9 new project phases in advanced development
- Federal waters, Illinois, and Kansas led new project announcements
- Federal waters now host 42% of total activity; Great Plains hosts 22%



■ >0 to 249 MW
 ■ 250 MW to 499 MW
 ■ 500 MW to 999 MW
 ■ 1,000 MW to 1,499 MW
 ■ 1,500 MW and Above



Top States with Capacity Under Construction or in Advanced Development

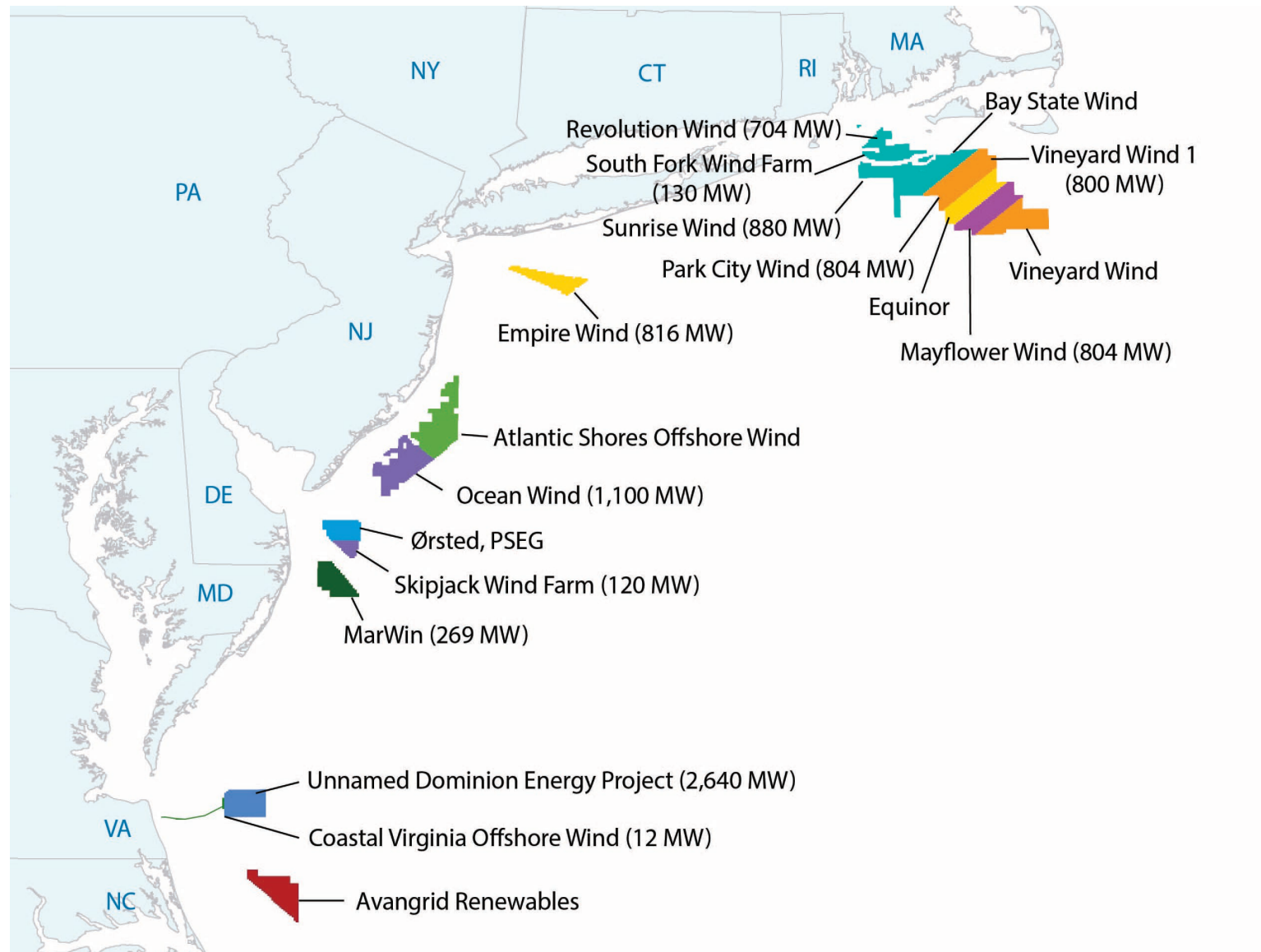


- 166 project phases in 28 states; 14 project phases in federal waters
- 14 states have over 1,000 MW underway
- Top developers include Invenergy, NextEra Energy Resources, and Ørsted



First Quarter Offshore Wind Energy Activity

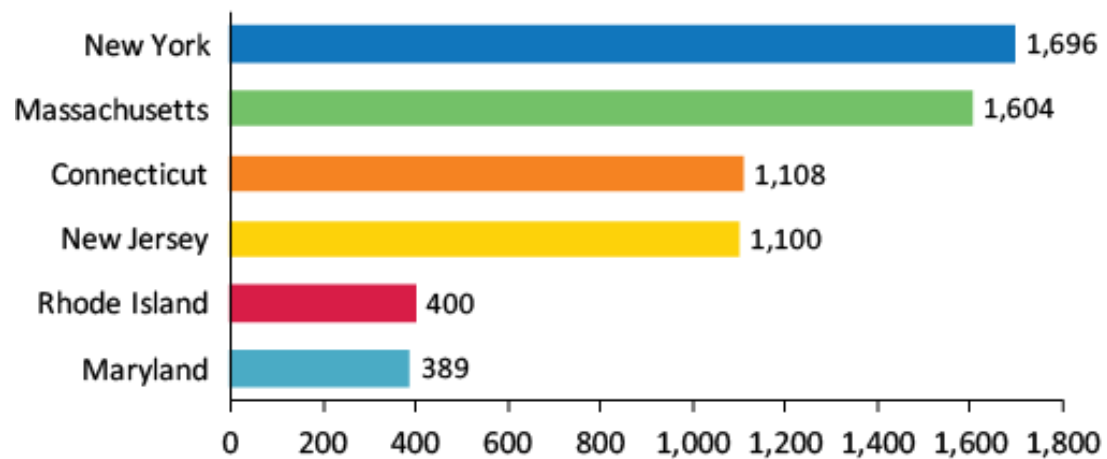
East Coast Offshore Wind Projects and Lease Areas



- Massachusetts utilities signed contracts for 804 MW Mayflower Wind project at levelized price of \$58/MWh (2019 dollars)
- Maryland opened second round of applications for offshore wind
- NYSERDA announced second offshore wind solicitation to come in 2020
- Dominion Energy selected Siemens Gamesa as preferred turbine supplier for 2,640 MW project

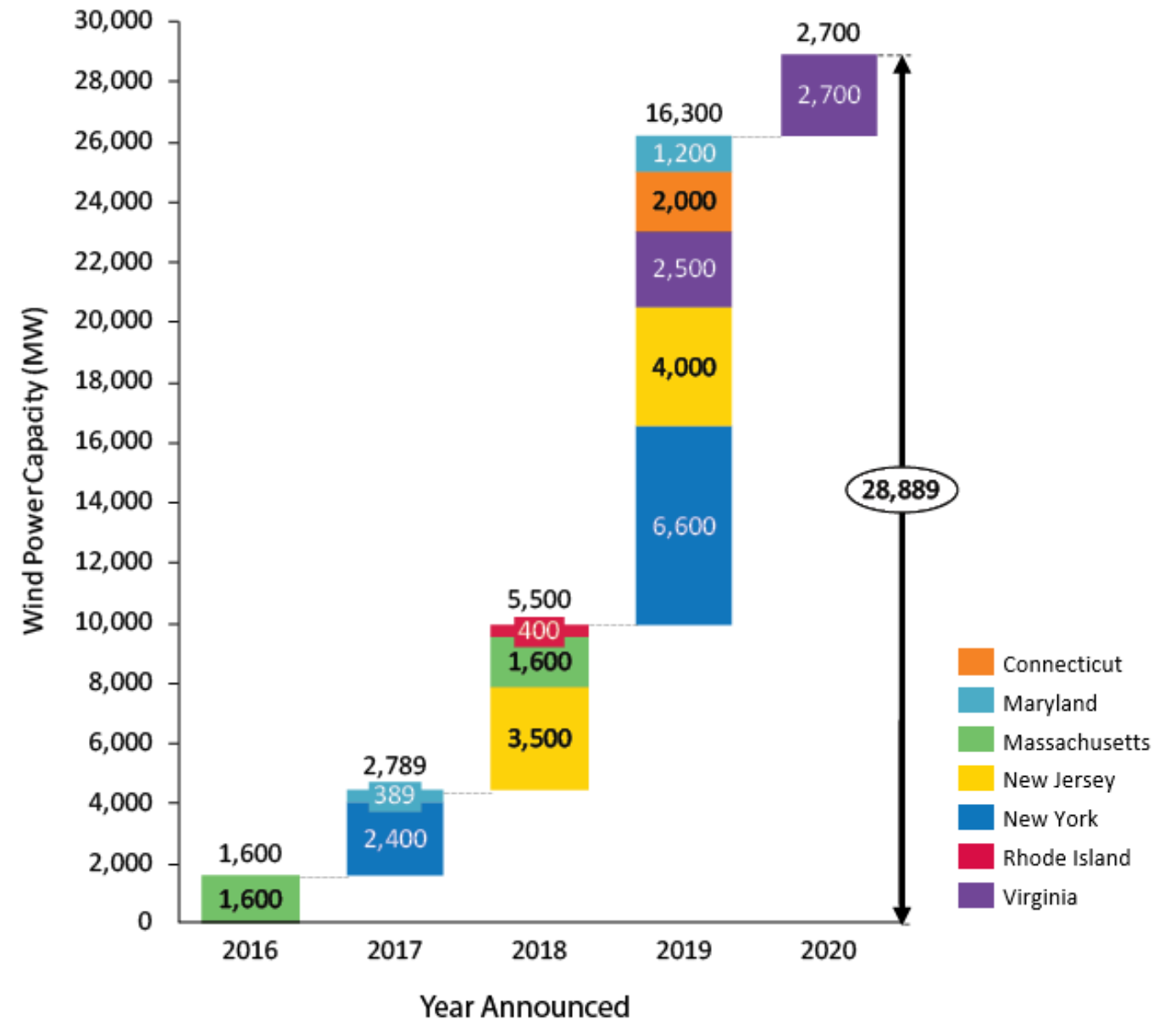
State Offshore Wind Procurement

Offshore Wind Capacity Selected through Competitive Solicitations



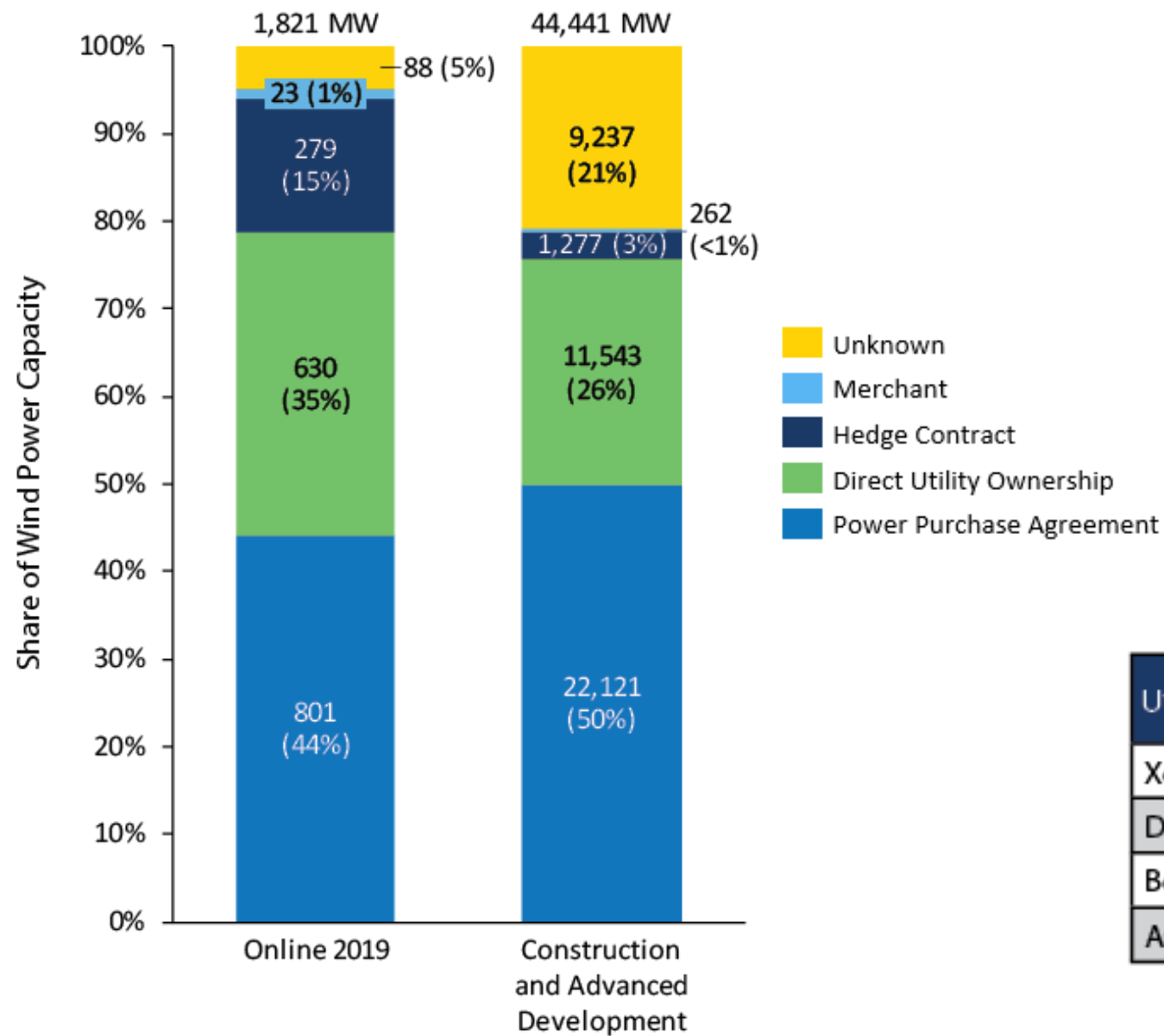
- Virginia passed new target of 5,200 MW by 2034 in Q1
- States have selected 6,297 MW of offshore wind to date

Growth in State Offshore Wind Commitments





PPAs Lead Wind Power Capacity Offtake



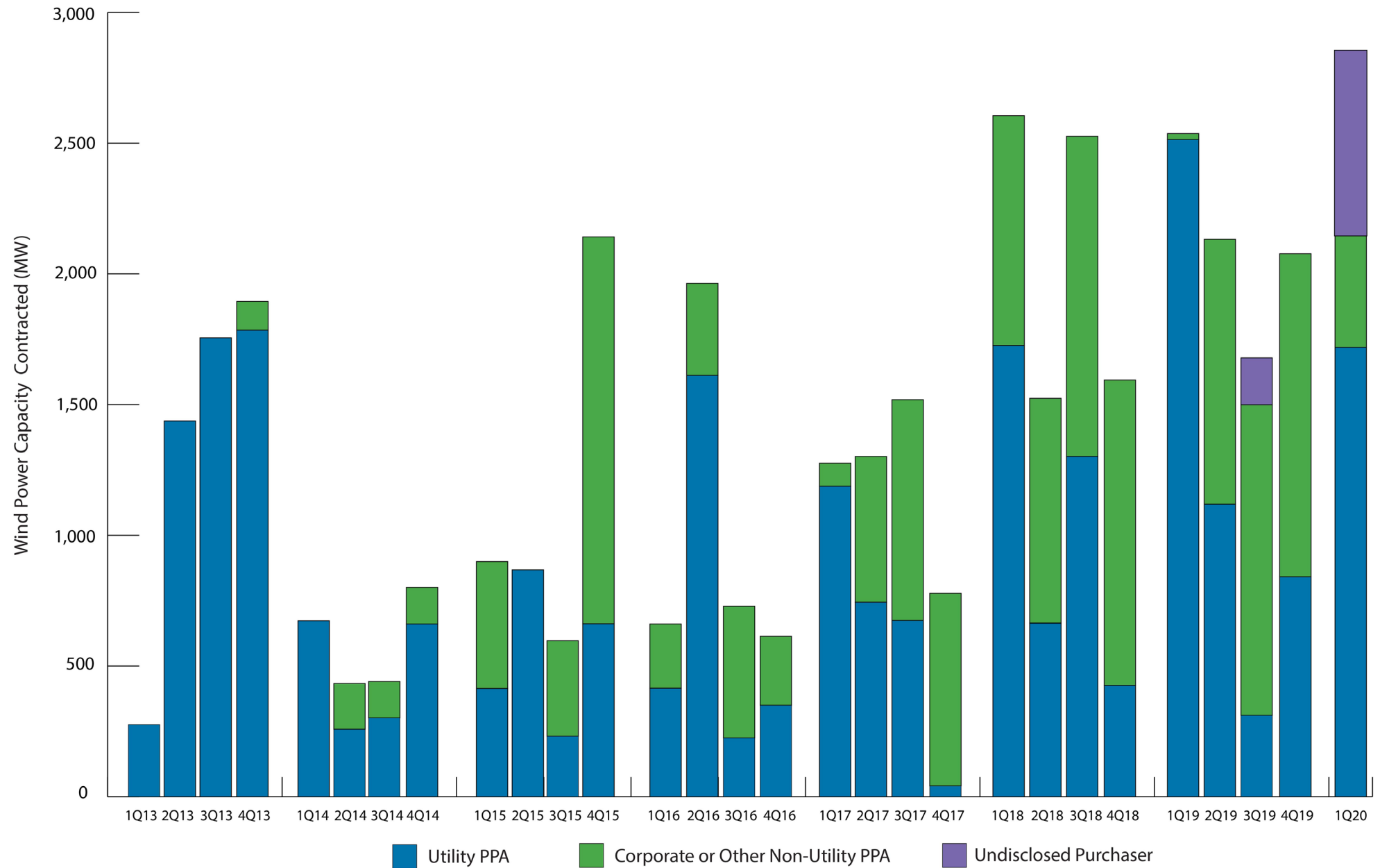
- PPAs lead offtake for 1Q projects and project pipeline
- Corporate customers purchasing 534 MW installed in 1Q
- Utility ownership continues to grow
- 29 utilities have directly-owned wind capacity under construction or advanced development

Top Utilities with Construction and Advanced Development Project Capacity (MW)

Utility	Direct Ownership	Long-Term Contracts	Total Capacity
Xcel Energy	2,147	640	2,786
Dominion Energy	2,652	77	2,729
Berkshire Hathaway Energy	1,950	360	2,310
American Electric Power	1,485	295	1,780



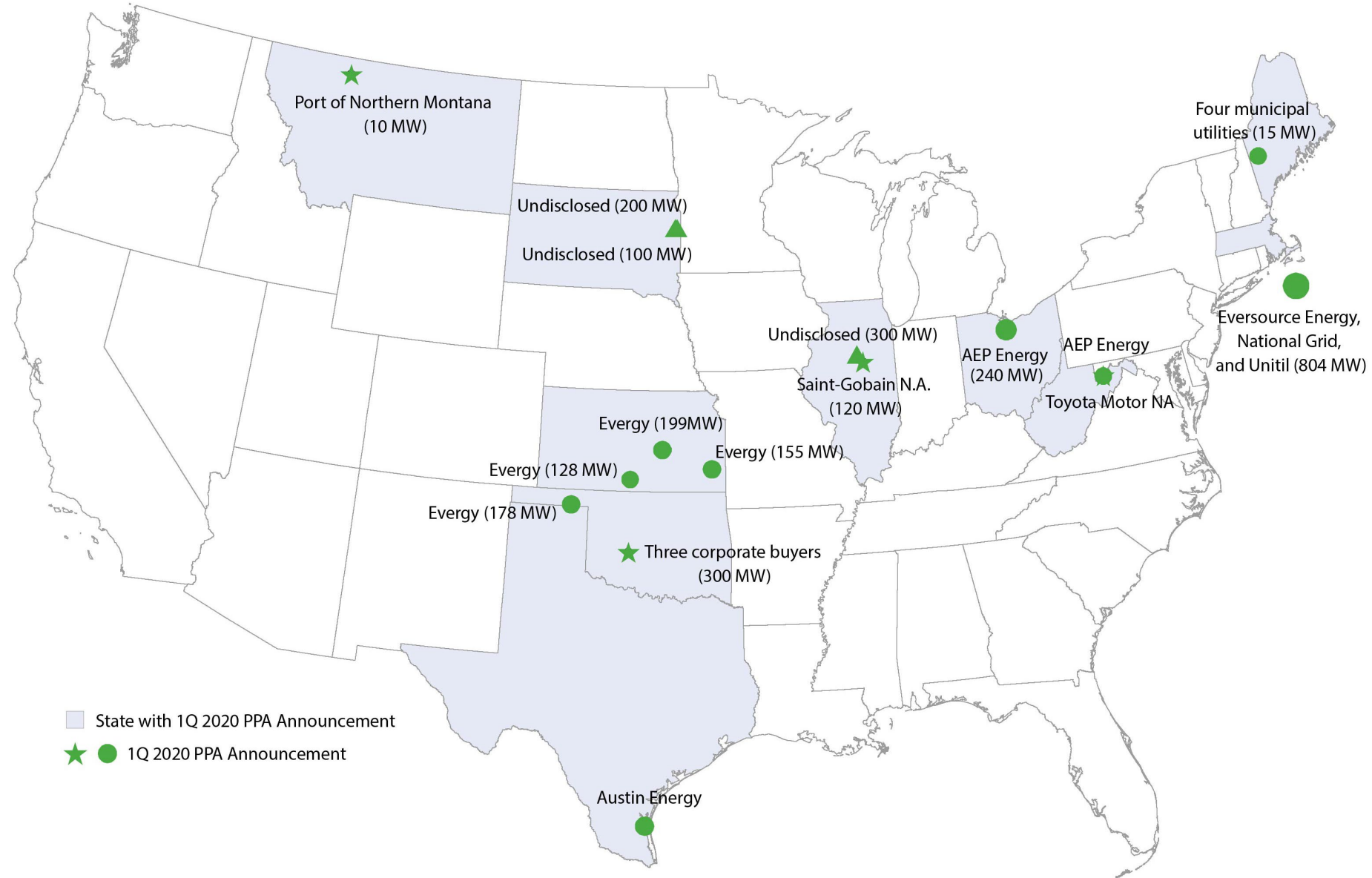
New Record for Power Purchase Agreements



- 2,859 MW of PPAs announced in 1Q
- Utilities signed 60% of PPA capacity
- Corporate customers signed 430 MW of PPAs



Power Purchase Agreements Signed in 2020



- 16 PPAs signed for 14 projects across 10 states

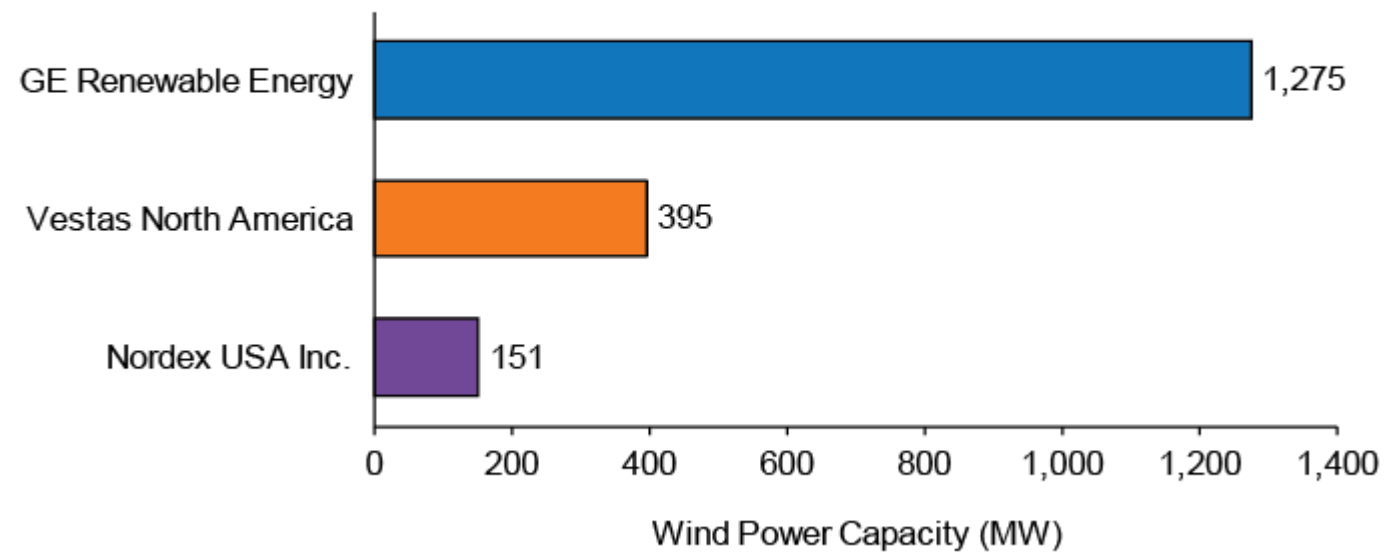
■ State with 1Q 2020 PPA Announcement
★ ● 1Q 2020 PPA Announcement

★ Project with Non-Utility Buyer
 ● Project with Utility Buyer
 ▲ Project with Unknown Purchaser Type

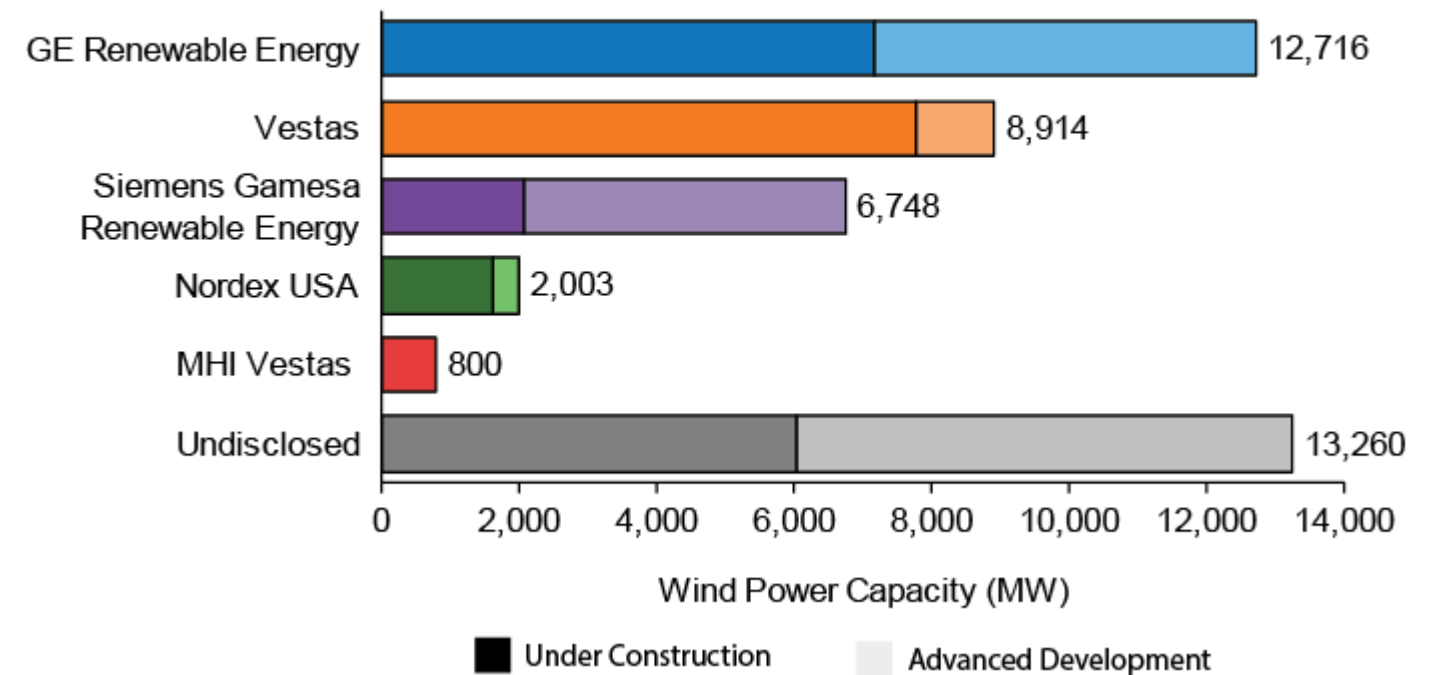


GE and Vestas Lead U.S. Turbine Manufacturer Market

Wind Turbine Manufacturer Market Share of Wind Power Capacity Installed in 2020



Wind Turbine Manufacturer Market Share of Construction and Advanced Development Wind Capacity

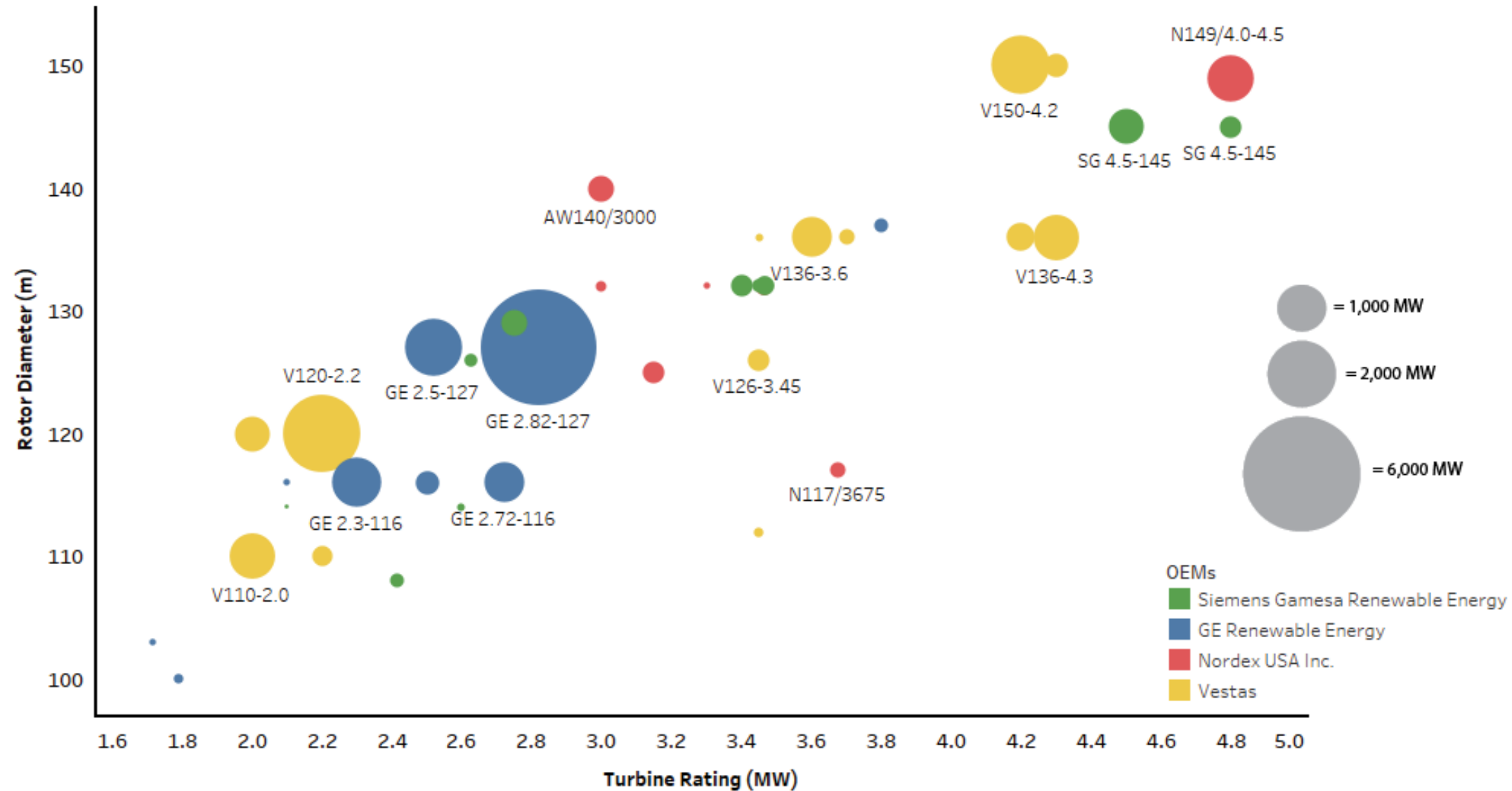


- Nation's first 4 MW machines started operations in 1Q



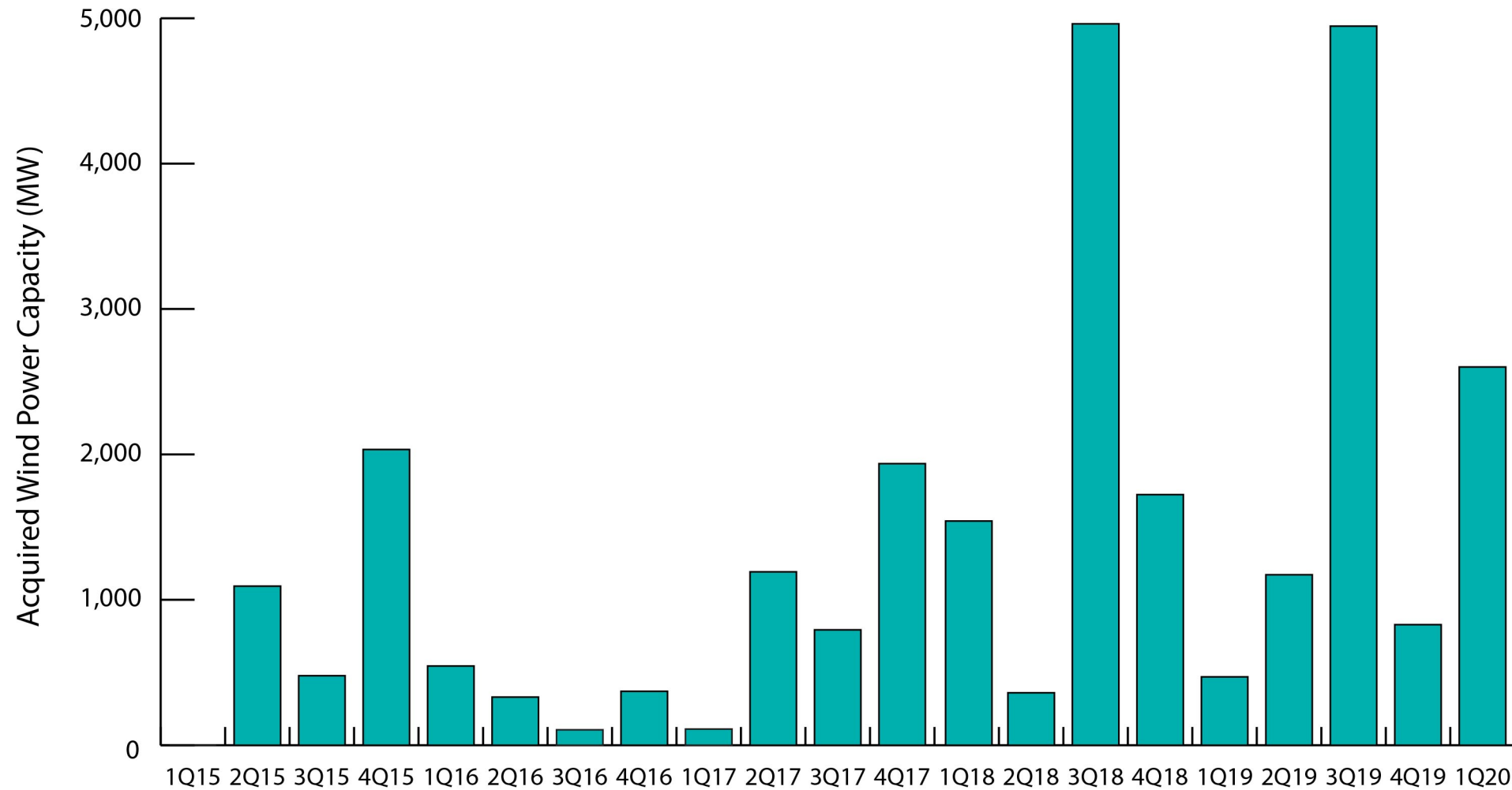
Turbine Technology Trends for Projects in Development

Turbine Models for Land-Based Projects Under Construction or in Advanced Development





Merger & Acquisition Activity



- 7 companies acquired combined 2,601 MW in 1Q
- Canada Pension Plan Investment Board acquired Pattern Energy Group

AWEA members can download the full report at www.awea.org/2020marketreports

The report includes full lists of:

- Wind projects installed in 2020
- Wind projects currently under construction and in advanced development
- 2020 PPA announcements
- Operating project acquisitions
- Electric utility requests for proposals (RFP)



Past quarterly and annual market reports can be found at www.awea.org/marketreports

Questions or Feedback? E-mail cwanner@awea.org or stats@awea.org



This Report is Powered by WindIQ

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 logo for WindIQ, featuring the word "WindIQ" in a bold, blue, sans-serif font. A stylized blue starburst graphic is positioned above the letter "i".



Industry Milestones and Outcomes January – April 2020 Examples



Amy Farrell
Senior Vice President,
Government & Public Affairs



Markets and Transmission

- PJM MOPR compliance filing contains AWEA requests on unit-specific exemption, competitive entry exemption and voluntary RECs
- FERC announces tech conf on hybrid resources and publishes transmission incentives NOPR as requested by AWEA

Carbon

- House E&C Committee Climate bill reflects AWEA input
- Led coalition filing petition with FERC seeking tech conf on carbon pricing in wholesale markets; FERC notices petition for public comment

Siting and Asset Management

- Filed comments in support of Administration's draft reforms to CEQ's NEPA implementing regs
- FWS published template habitat conservation plan (HCP) developed with AWEA and our members to provide more legal/economic certainty related to listed bat species
- New York adopts permitting reforms supported by AWEA and regional partner ACENY

Offshore

- AWEA published offshore wind economic benefits analysis; published BOEM public engagement guide; released public opinion survey results finding strong bipartisan support for offshore wind; launched #supportoffshorewind social media campaign

Operations

- Finalized and submitted to Standards Committee: Wind Tech Entry Level Requirement; AWEA Fall Protection and Rescue Requirements in the Wind Industry
- Published Guidance for Determining Ground Bearing Capacities for Crane Movement; Proper Lifting Techniques; AWEA Pad Mount Transformer Study; Safety Data Report; and launched 2019 Safety Database Collection effort



Industry Actions on COVID-19



Bree Raum
Vice President
Federal Affairs



	Up to 4 Years Prior	2-4 Years Prior	1-2 Years Prior	6-9 Months Prior	1 Month Prior
	Qualify for PTC/ITC	Site Development	"Advanced Development"	Construction	Commissioning
Development Timeline	Via either: - 5% safe harbor - Physical work of a significant nature * <i>Project economics established</i>	- Land Control/Leasing - Site surveys/data collection/permitting - Start grid Interconnection process - Preliminary Engineering	- Finalize turbine deals - Negotiate power offtake agreement - Seek financing - Obtain Notice to Proceed * <i>Economic commitments and financing terms locked in</i>	- Turbine delivery - BOP equipment delivery - Close financing - Access construction loans - Heavy Equipment moved onsite - Onsite crews mobilized	- Onsite engineers, construction team and lawyers certify project meets all warranties, state and county permits, plus utility and/or ISO specs and standards - ISO / Utilities / Permitting bodies accept certification
COVID-19 Challenges		➤ Landowner access Limited ➤ Permitting process delay from public hearing postponement; reduced staffing/ office closures ➤ Site survey delay from stay-at-home/ illness	➤ Turbine orders delayed/canceled ➤ Frozen capital markets ➤ Impaired / limited tax equity	➤ Turbine delivery delays due to factory shutdowns; transportation restrictions and capacity limits; port closures; raw material availability ➤ Impaired construction financing ➤ Transportation and logistics disrupted by delivery days, stay-at-home orders and worker illnesses ➤ Productivity reduced by changes to construction means and methods	➤ Onsite certification delayed by worker illness, travel restrictions ➤ ISO/Utility staffing approval delayed by staffing disruptions

Placed in Service



AWEA Advocacy Response

Essential Worker Designation

- Secured essential worker designation for wind workforce in DHS guidance
- State-by-State Summary of Guidance on Identifying Essential Critical Infrastructure Workers on [awea.org/COVID-19](https://www.awea.org/COVID-19)

Project Development Related Policy Asks

- **Priority 1:**

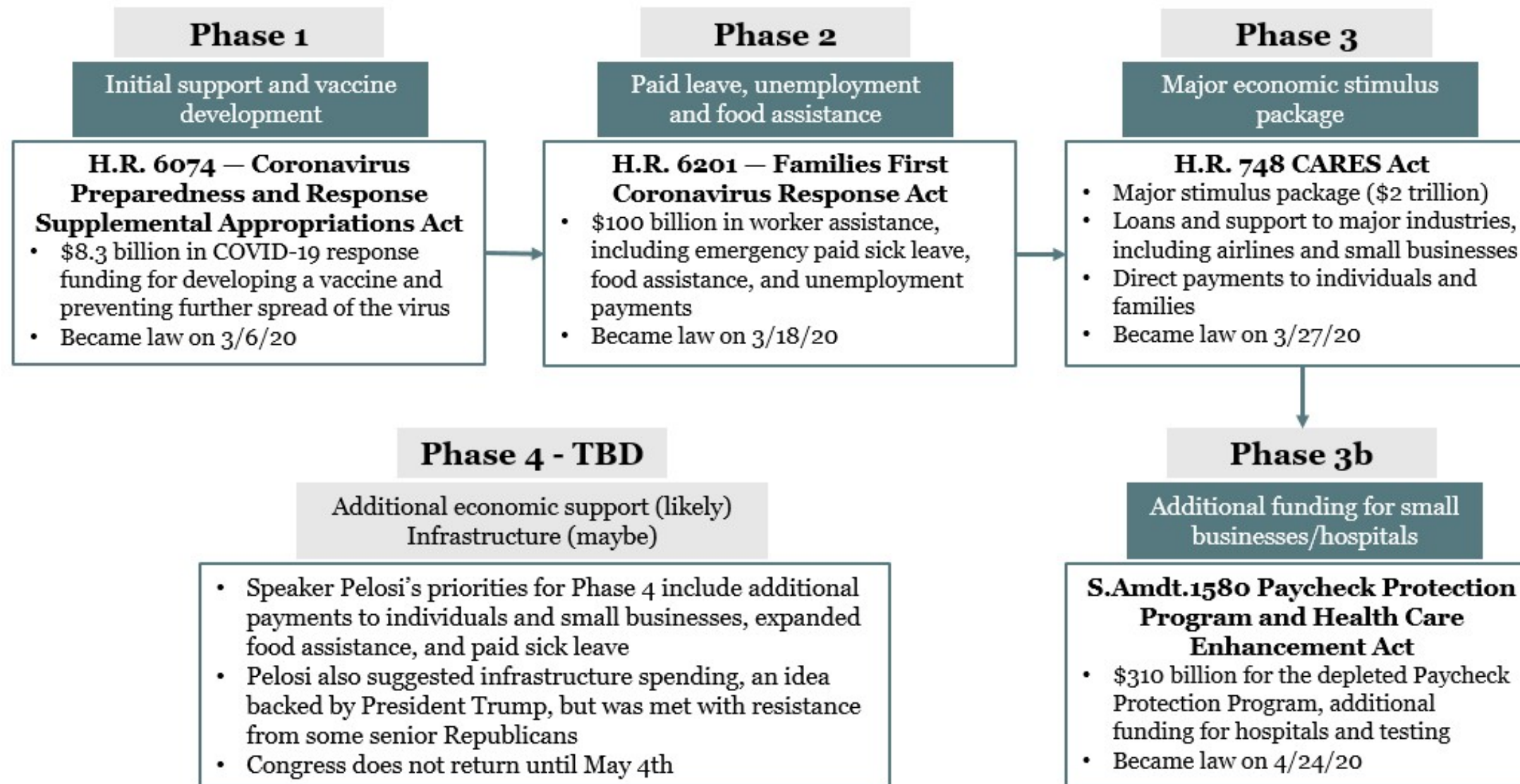
Provide relief under the existing continuity safe harbor by allowing 5 rather than 4 years for project completion for all projects that started construction in 2016 or 2017 and clarify that except as revised, prior notices continue to apply.

- **Priority 2:**

Create a direct pay option for the PTC/ITC value to address liquidity and tax equity availability issues for those same projects.



Congress's three-phase response to the coronavirus crisis and potential next steps





Communicating Essential Wind Workforce Industry Continuity and Recovery COVID-Related Community Response



Stacey Kerans
Senior Director
Communications

American Wind Energy Association @AWEA · Apr 23

#CleanEnergy can be a 'huge job creator' as #economy recovers, @TomSteyer says to @latimes' @Sammy_Roth:



Clean energy can be a 'huge job creator' as economy recovers, Tom Steyer says. Gov. Gavin Newsom tapped Steyer to help craft California's economic response to the COVID-19 pandemic. He discusses some of his task ...
latimes.com

American Wind Energy Association Retweeted

BCSE Clean Energy @BCSECleanEnergy · Apr 23

Today at 10 am PT/1 pm ET: @LJacobsonEnergy joins Dan Whitten of @SEIA, Amy Farrell of @AWEA and John Eliadson of @FoleyandLardner to discuss the #renewables industry and #COVID19.

Register here:

WEBINAR: Renewable Industry's Response to COVID-19: Legislation, Construction, Financial Incentives

MODERATOR John Eliason Partner FOLEY & LARDNER PANELISTS Amy Farrell Senior Vice President infocastinc.com

April 23, 2020, at 10:00 - 11:00 AM ET

American Wind Energy Association
 22,931 followers
 4d · 🌐

#WindPower Fact of the Day: Today, more than 120,000 Americans work in wind #energy, marking an increase of 6,000 more #jobs than 2018. During #COVID19, many of these jobs are considered essential to the nation's critical #infrastructure as the renewable energy workforce plays a vital role in ensuring #energy services that Americans depend on. Learn more #windfacts from AWEA's #WindPowersAmerica Annual Report: bit.ly/2XELzqu

The U.S. wind industry
 employs 120,000 Americans
 across all 50 states

Wind Powers America
 Annual Report 2019




120,000
 Wind Energy Jobs



Investing \$14 billion annually
 in new wind projects

American Wind Energy Association @AWEA · 2h

Monday Must-Watch: Reliable #energy is not a luxury. It is a necessity, especially now. During #COVID19, it's important to keep essential #infrastructure workers, including those in #windenergy, safely on the job so they can keep the lights on for millions of Americans.



While the nation faces unprecedented times during the COVID-19 pandemic,

1:37 226 views


22,931 followers
 3w · 🌐

One of the many ways AWEA's #windenergy industry members are taking action to utilize #technology, existing lines of production, and supply chains to help communities and front-line workers affected by #COVID19 the most. 1

GE Renewable Energy
 322,943 followers
 3w · 🌐

+ Follow

Rapid response: GE Renewable Energy's #windturbine factory in Pensacola, Florida, develops #3D-printed shield for #N95 face masks to help clinicians fighting #coronavirus <https://renew.ge/3aOmeOw> #COVID19 #addit ...see more



American Wind Energy Association (AWEA)
 Published by Jen Scungio [?] · April 21 at 3:04 PM · 🌐

AWEA Member Spotlight: NextEra Energy has committed \$1.5 million in #COVID19 emergency assistance to be distributed to partner organizations on the frontlines supporting most vulnerable in communities in the country. <https://bit.ly/34THUXv>



Being there for our communities when we're needed the most.

COVID-19 UPDATE

NextEra Energy
 March 17 · 🌐

NextEra Energy's family of companies has committed \$1.5 million to partner organizations working on the frontlines of the COVID-19 crisis to provide critical support to the most vulnerable among us. <http://spr.ly/61851smOD>

AWEA members and American wind power support COVID-19 recovery efforts

As the novel coronavirus disease (COVID-19) continues to impact communities across the country and the broader economy, America's wind energy companies are making the health and well-being of their employees, customers and the communities they serve their top priority. AWEA members throughout the wind energy supply chain are also taking charitable steps to give back to their communities in their time of need, providing support to emergency relief organizations and initiatives while continuing to execute their own business continuity plans under challenging conditions.

Any member that wants to be added to this list can share its response initiatives with AWEA by emailing a summary to [Greg Alvarez](mailto:Greg.Alvarez@awea.org).

AWEA Environmental Health and Safety Guidance for Pandemics: COVID-19



Michele Myers Mihelic
Senior Director
Standards & Assent Management

AWEA Operations Activities

AWEA EHS Guidance for Pandemic: COVID 19

- Enhanced health and safety guidance procedures for wind energy employers
- Provides general precautions and outlines common business impacts and general response guidelines
- Available on awea.org/COVID-19 and in the AWEA Bookstore

AWEA Essential Operations

- Currently in development
- Provides guidance on essential business operations and preparedness: Business Continuity

AWEA Remote Operations

- Currently in development
- CISA: Critical Infrastructure Operations Centers and Control Rooms Guide for Pandemic Response (April 23, 2020)



State Update



Susan Sloan
Vice President
State Affairs



State Affairs Updates

Legislative

- Sessions halted due to Covid-19
- Some legislatures reconvening

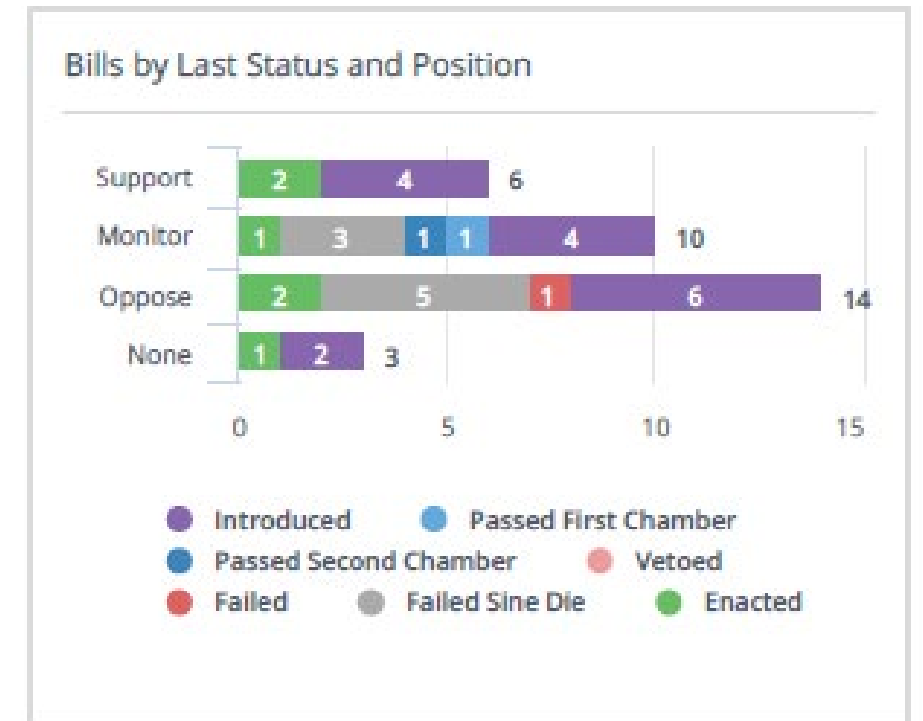
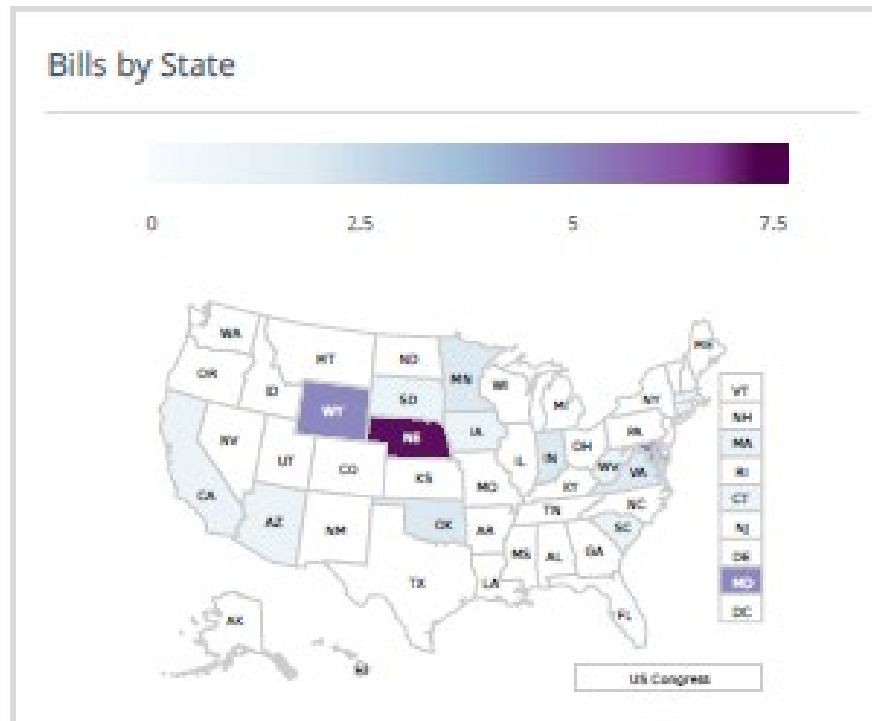
Regulatory

- NARUC outreach
- CLEANPOWER Regulators Lunch

Electoral Action

Coalition Building

- Texas manufacturers and service providers
- Public Affairs states campaigns





Industry Actions on COVID-19



Ann McCain
Director
Advocacy



State Campaigns

POWERING  **TEXAS**



POWERING
New Mexico


POWER UP
IOWA

B O O S T
CALIFORNIA 

POWERING
NORTH
DAKOTA 

Kansas Coalition
Program

 **POWER UP**
ILLINOIS

 **New Power**
NEBRASKA

South Dakota Program

Indiana Program

New York Program



Spring Virtual Learning Series | May 6th – June 19th

Topics Include:

- Battery Failure Analysis Case Studies
- Radically Rethinking Solar O&M – Robots, Drones and Automation
- Will Wind Compete with Solar+Storage?
- The Grand Challenges in the Science of Wind Energy
- Wind Turbine Foundation Gapping: How to Avoid Issues During Operational Life
- Hybrid Projects - The Advantages and Future Implications
- Wind Energy, School Budgets and Classroom Outcomes: Empirical Evidence of How They Interact?
- Boosting the Value of Wind and Solar in Wholesale Power Markets
- Battery Energy Storage Analysis: A NYISO Case Study
- Sizing-up Risk in the New Era of Supersized Wind Turbine Technology
- Winning the Social Wars: Educating, Recruiting, and Mobilizing Support Using Digital Media



Upcoming Webinar:

DOE Wind Energy Technologies Office Program Update and Research Priorities

May 5, 2020 | 1:00 PM – 2:00 PM ET

Please join AWEA and the U.S. Department of Energy's Wind Energy Technologies Office for an informational webinar highlighting key U.S. government investments and partnerships with the wind industry in driving wind energy research and innovation. The decades-long partnership between DOE, its National Laboratories, and the wind industry underlie many of the technical advancements in scale, efficiency, reduced costs, and public acceptance that have led to the dramatic expansion of wind energy in the United States. This growth, which now positions wind as the #1 source of renewable electric power, has spurred economic and environmental benefits across all 50 states. Come see what DOE has planned for its future research programs in offshore, land-based, and distributed wind; in atmospheric, environmental and siting research; and in the integration of increasing amounts of wind power on the grid.



Thought Leadership Opportunities: Call for Abstracts Now Open!



**AWEA WIND RESOURCE
& PROJECT ENERGY
ASSESSMENT CONFERENCE**

September 29 - 30, 2020 | Minneapolis, MN



Submission Deadline:
Tomorrow, April 30 | 11:59 PM



**AWEA OFFSHORE
WINDPOWER CONFERENCE
& EXHIBITION**

October 13 - 14, 2020 | New York, NY



Submission Deadline:
Sunday, May 31 | 11:59 PM



SAVE THE DATE: CLEANPOWER Live Stream

