

A photograph of several wind turbines in a valley at sunrise. The sun is low on the horizon, creating a warm, golden glow. The turbines are silhouetted against the bright sky, and the valley floor is covered in a thick layer of fog or low clouds. The overall mood is serene and hopeful, representing renewable energy.

Presentation to:

Governor's Energy Summit

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Laurel Renewable Partners

Wind Power Update

- National Perspective
- WV Perspective
- Who's Buying and Why
- Industry Trends

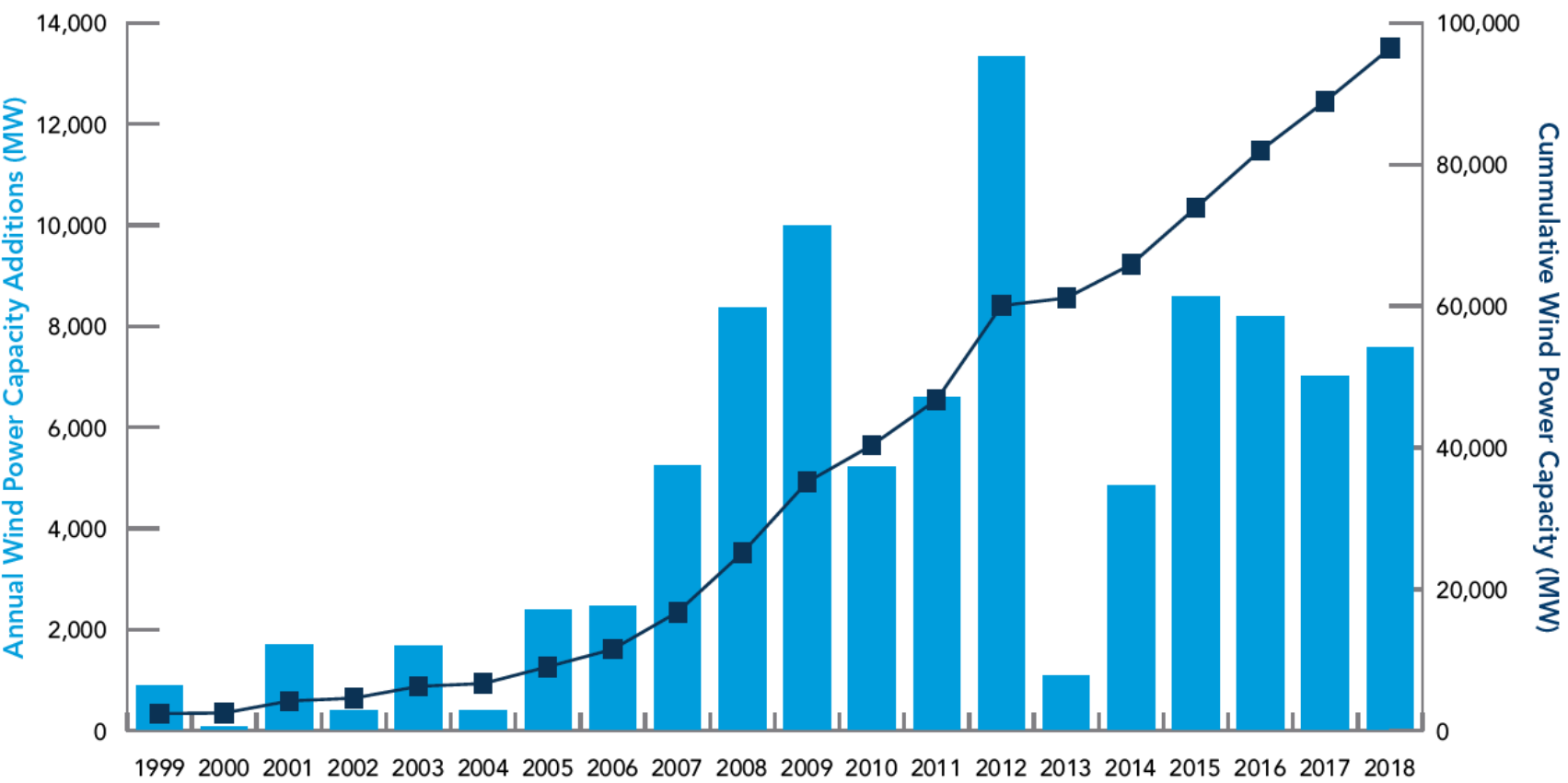


National Perspective

- 35,000 MW in the pipeline
- 23% Increase over 2017
- 99% built in rural America
- > \$1 Billion in State & Local Taxes and Lease Payments
- \$12 Billion in new investment
- 114,000 Employed in Wind
- 500 US Factories



Figure 1
U.S. Annual and Cumulative Wind Power Capacity Growth (Utility-Scale Wind)



Year	Annual Capacity Installations (MW)	Annual Capacity Decommissionings (MW)	Cumulative Capacity (MW)
1999	892.47	(2)	2,431
2000	70.955	-	2,502
2001	1,692	-	4,195
2002	409	-	4,603
2003	1,665	-	6,268
2004	396	-	6,665
2005	2,382	(0)	9,046
2006	2,466	-	11,512
2007	5,253	-	16,765
2008	8,370	-	25,135
2009	9,997	(2)	35,130
2010	5,218	(2)	40,346
2011	6,604	(171)	46,779
2012	13,340	(52)	60,067
2013	1,087	(17)	61,137
2014	4,857	(119)	65,874
2015	8,599	(583)	73,891
2016	8,203	(88)	82,007
2017	7,017	(59)	88,964
2018	7,588	(127)	96,433

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

Figure 27

U.S. Wind Power Capacity, by State

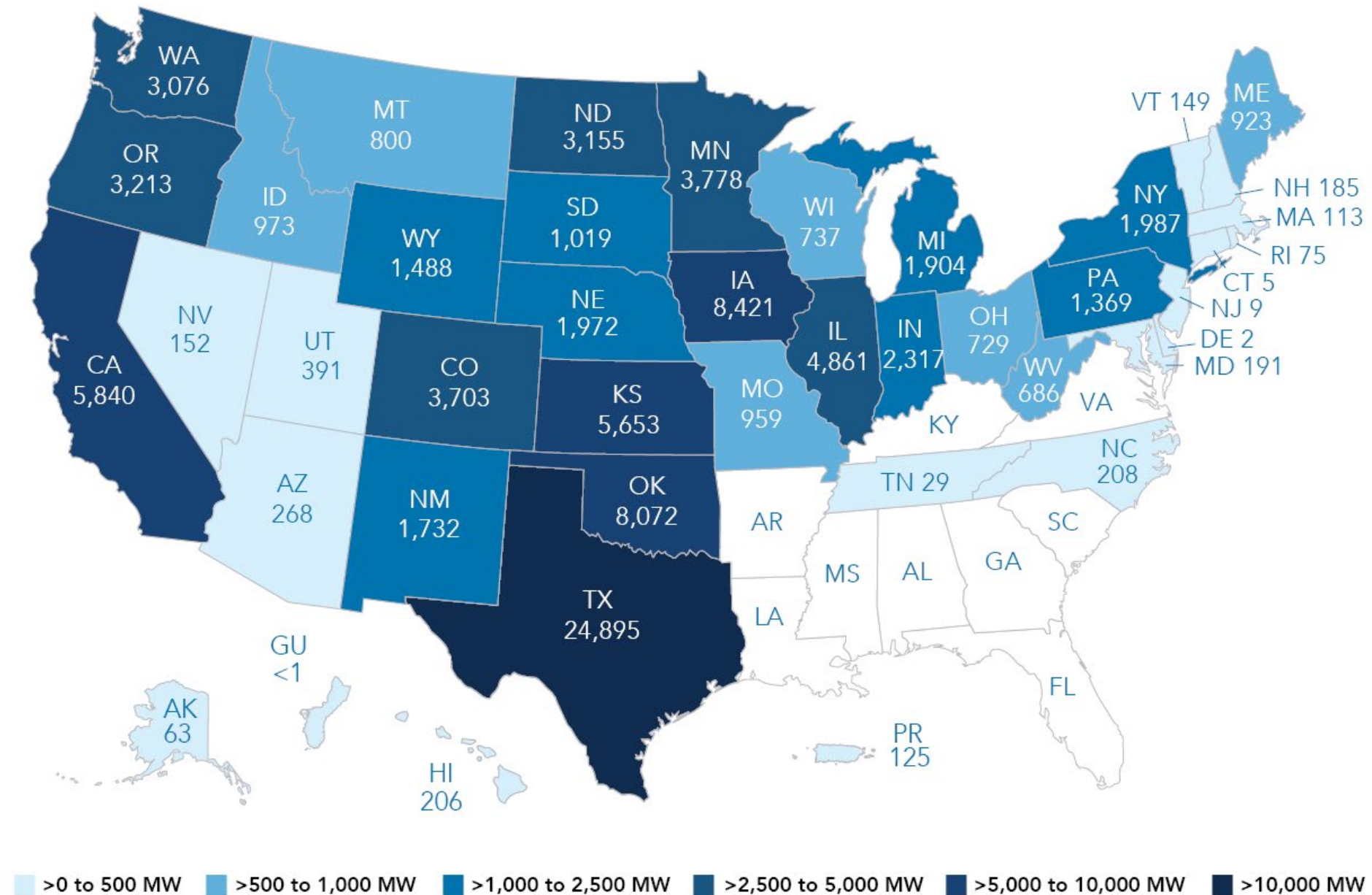
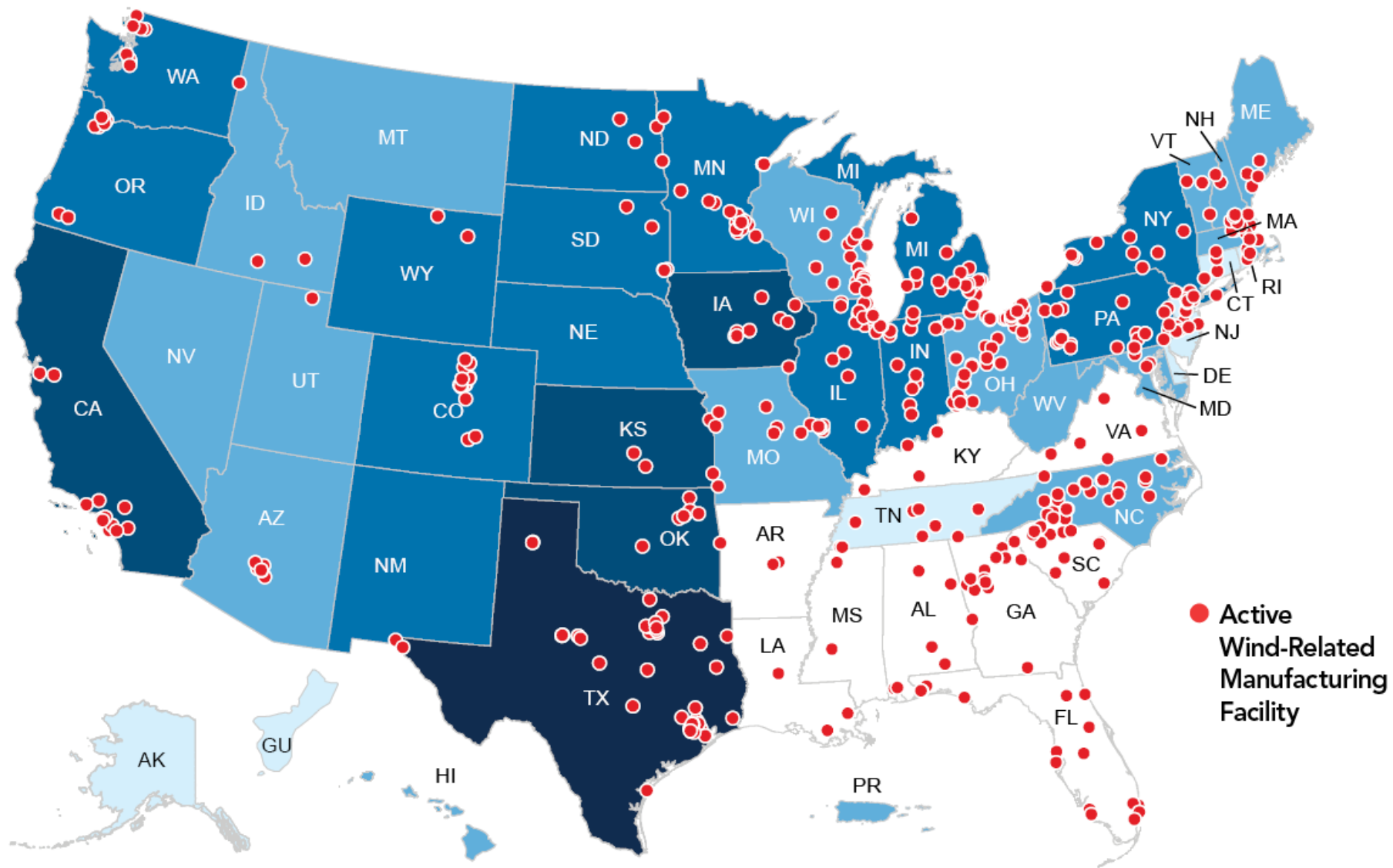


Figure 94

Active Wind-Related Manufacturing Facilities during 2018



Installed Capacity

0 to 100 MW >100 MW to 1,000 MW >1,000 MW to 5,000 MW >5,000 MW to 10,000 MW >10,000 MW

West Virginia Perspective

- 6 Operating Wind Farms
- \$1.2 Billion Investment
- \$5 Million Annual Taxes
 - Property, State and B&O Taxes
- 5 Projects Under Consideration
 - \$815 Million Investment
 - \$4.3 Million Taxes
 - \$3 Million Lease Payments
 - Hundreds of Construction Jobs

	Mt Storm	New Creek	Pinnacle	Mountaineer	Laurel Mountain	Beech Ridge
MW	264	94.5	55.2	66	97.6	100.5
Owner	CCI	Enbridge	Clearway	Glidepath	AES	Invenergy
County	Grant	Grant	Mineral	Preston/Tucker	Randolph	Greenbrier

What do Voters Think?

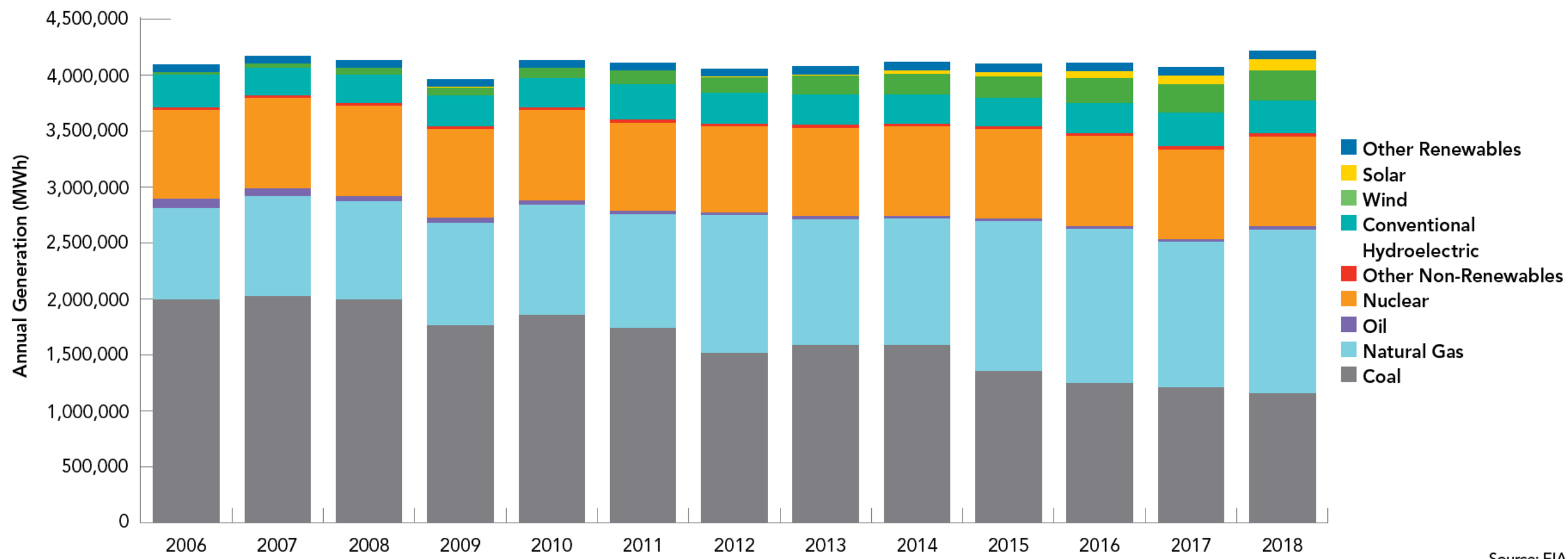
- 70% of Voters - Favorable
- 66% say...
 - “we should encourage wind energy companies to invest more in our state”
 - “wind energy will create jobs and economic opportunity in areas that need it, while helping keep West Virginia’s air clean.”
- 53% have seen a wind farm
- 74% of them have a favorable opinion of them

West Virginia Perspective

- Long history of energy production and export
 - Coal
 - Natural Gas
 - Wind
 - Solar



Figure 17
U.S. Electricity Generation Mix over Time



Source: EIA



Wind Industry's Perspective

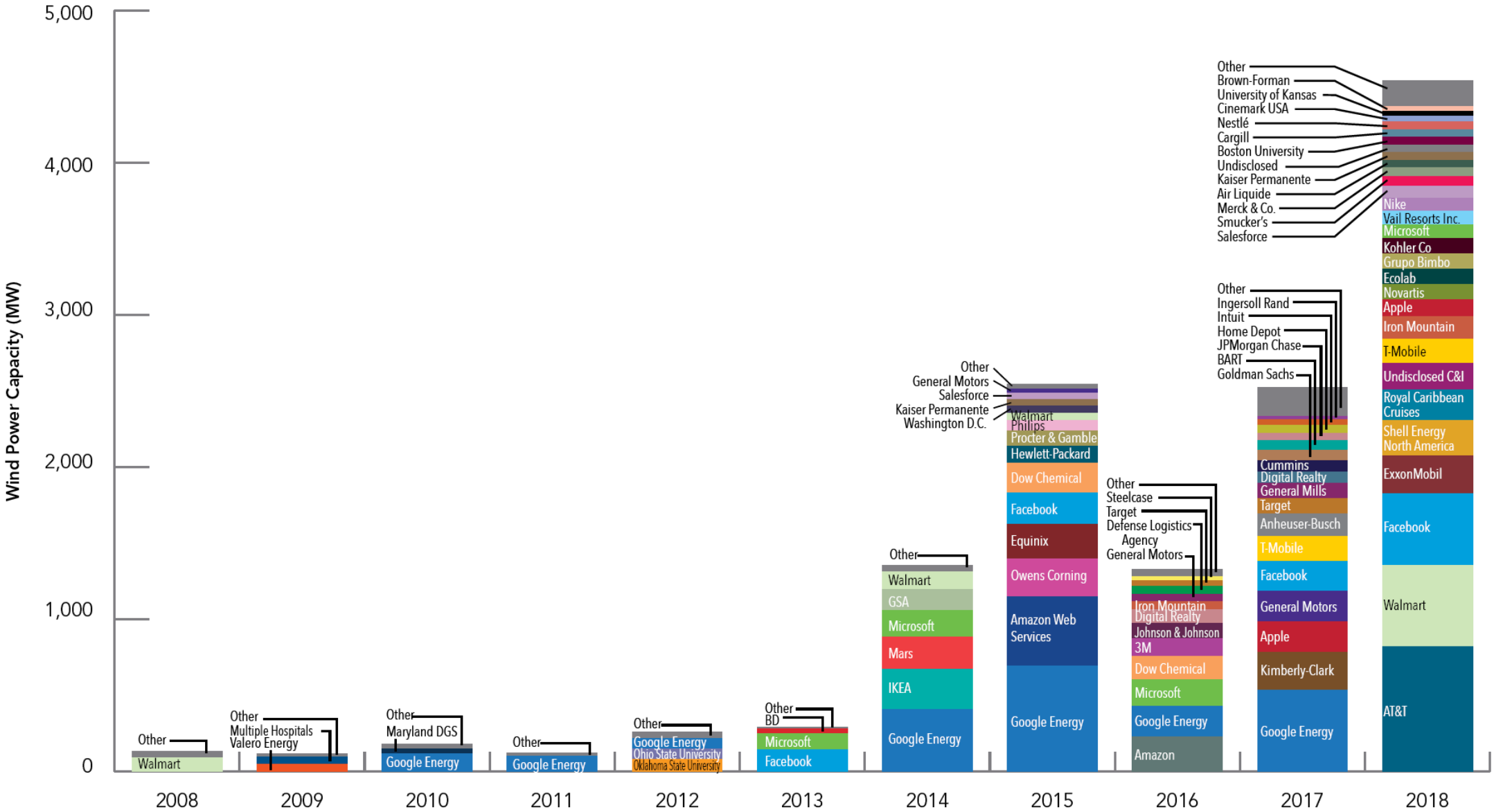
- Part of the Community
 - Investment
 - Jobs
 - Lease Revenue
 - Taxes
 - Community Benefit Funds

U.S. corporate & industrial (C&I) renewables market activity through 2018

Offtaker	GW under contract	# of PPAs	% of market share (MW)
Facebook	2.2	24	14.1%
Google	2.1	15	13.7%
Amazon	1.1	14	7.3%
AT&T	0.8	4	5.2%
Walmart	0.8	10	5.1%
Apple	0.8	7	5.0%
Microsoft	0.6	5	4.1%
Exxon Mobil	0.5	2	3.2%
Equinix	0.4	3	2.4%
Zotos International	0.3	3	2.2%
Other	5.9	138.0	37.7%

Source: Wood Mackenzie

Figure 61
Non-Utility Wind Power Purchases, by Year



Note: Data include publicly announced physical and virtual power purchase agreements (PPA), direct ownership of onsite or offsite wind projects, and large-scale REC purchases associated with specific wind projects. Data is recorded at the time of announcement and does not indicate when the associated wind project is placed into operation.

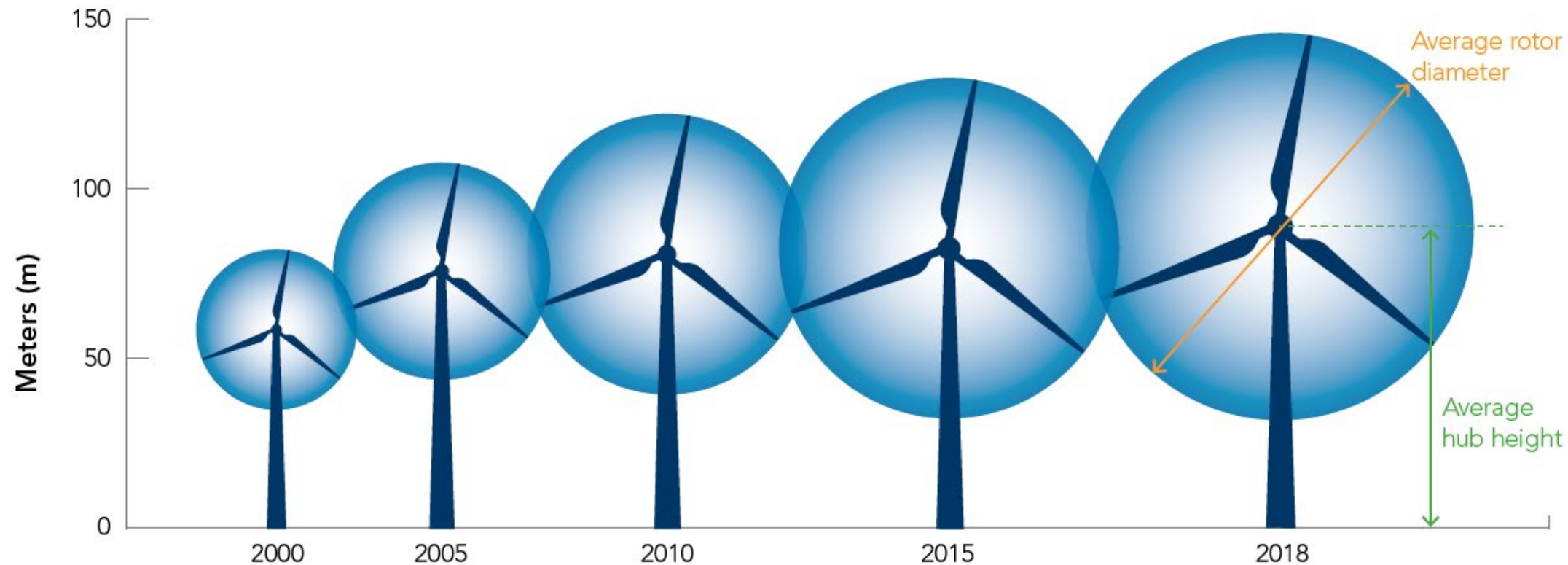
Wind's Future – The Trends

- We must innovate
 - Continue to drive down costs
 - Advance Technology
 - Offshore
 - Storage
 - Repowering



Figure 84

Evolution of the “Average” Utility-Scale Turbine



Year	Average Hub Height (m)	Average Rotor Diameter (m)
2000	58	48
2005	75	65
2010	80	84

Year	Average Hub Height (m)	Average Rotor Diameter (m)
2015	82	102
2018	88	116