

Ken Portolese / Primus Wind Power



Northern Power Systems



Bruce Hatchett / Energy Options



Steve Mellin / Cape Cod Air Force Station



Kelsey Kaufman / Pika Energy



2013 Distributed Wind Market Report

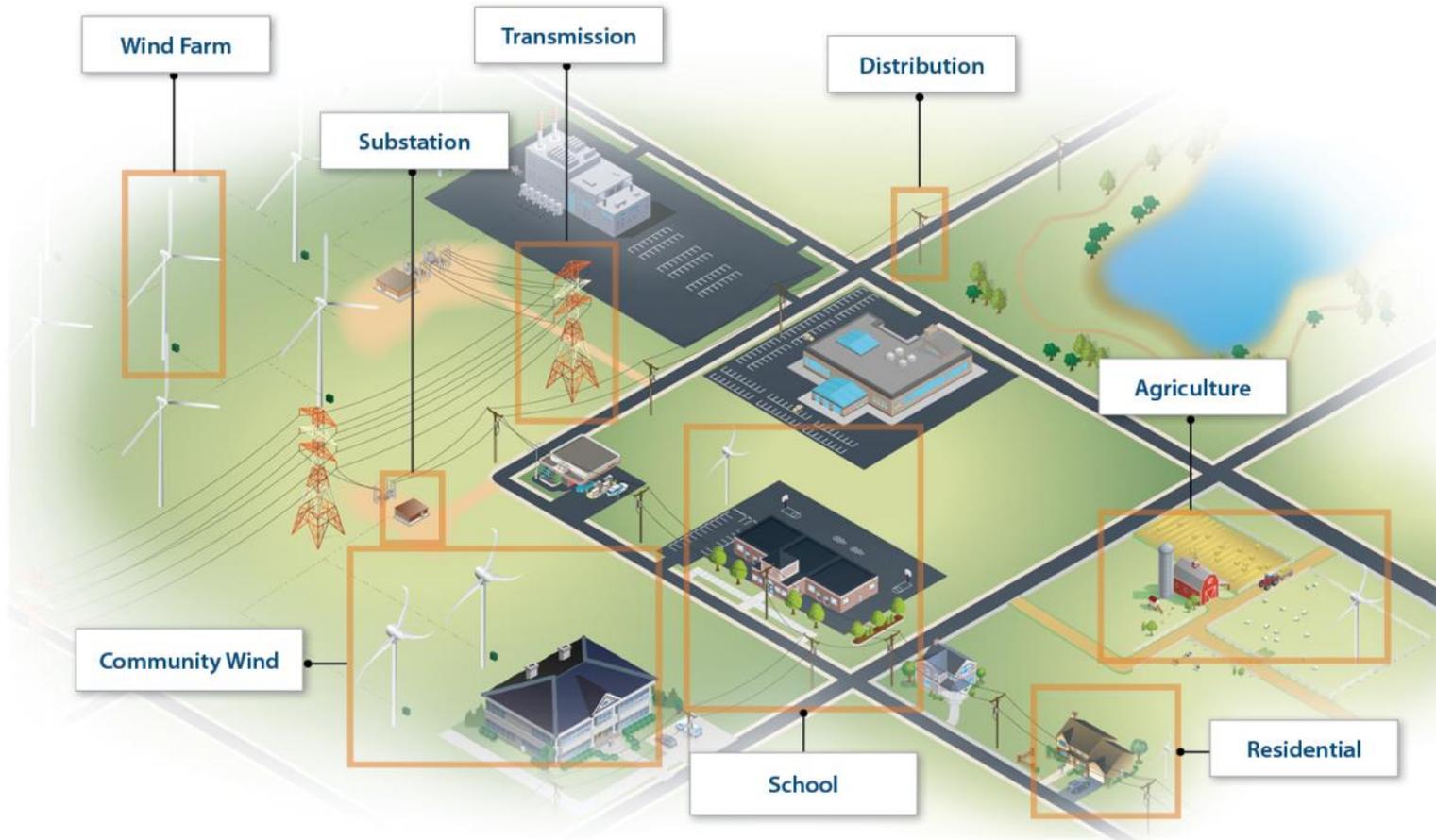
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August 20, 2014

PNNL-SA-104734

What is Distributed Wind?



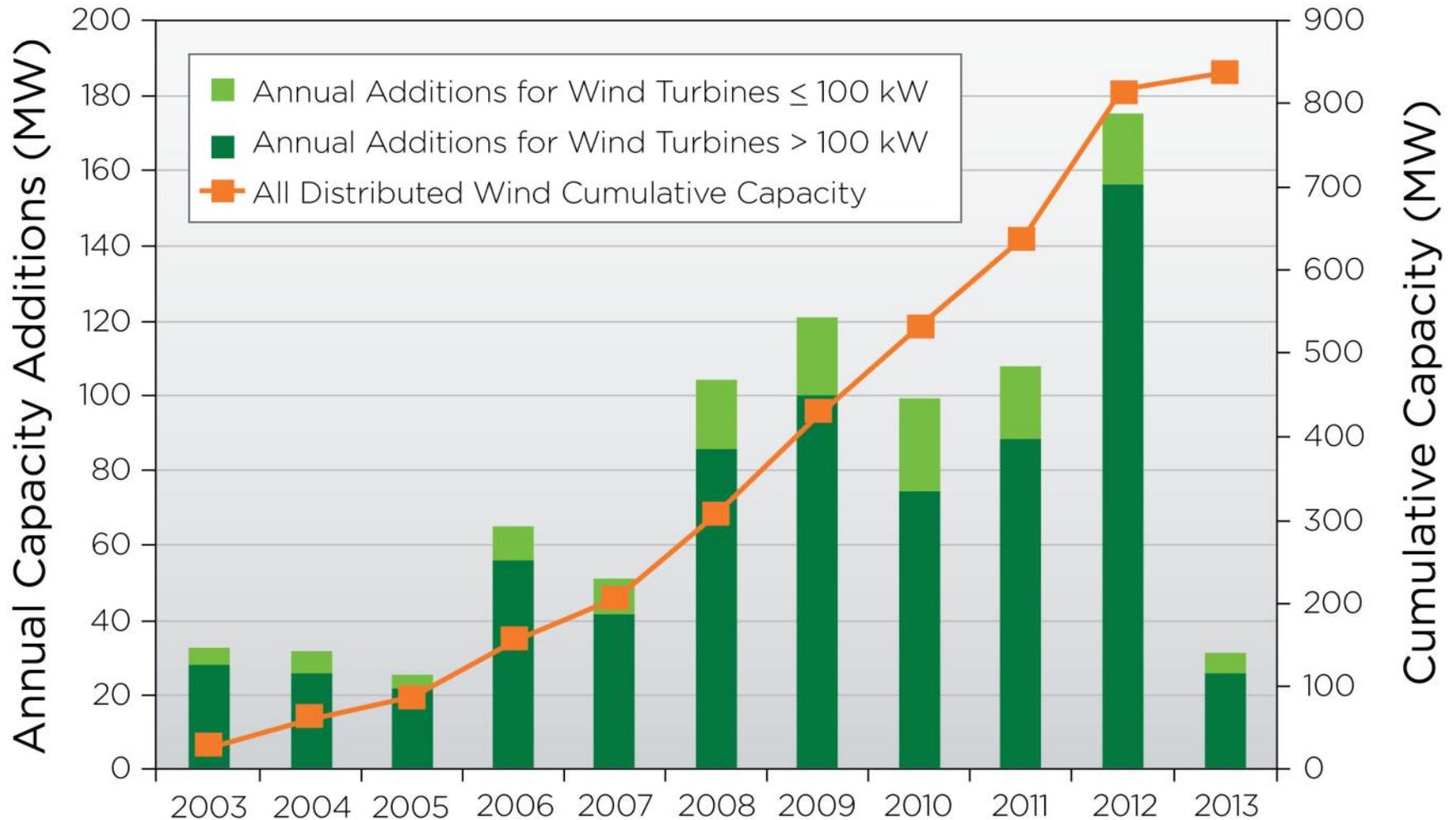
Graphic: NREL

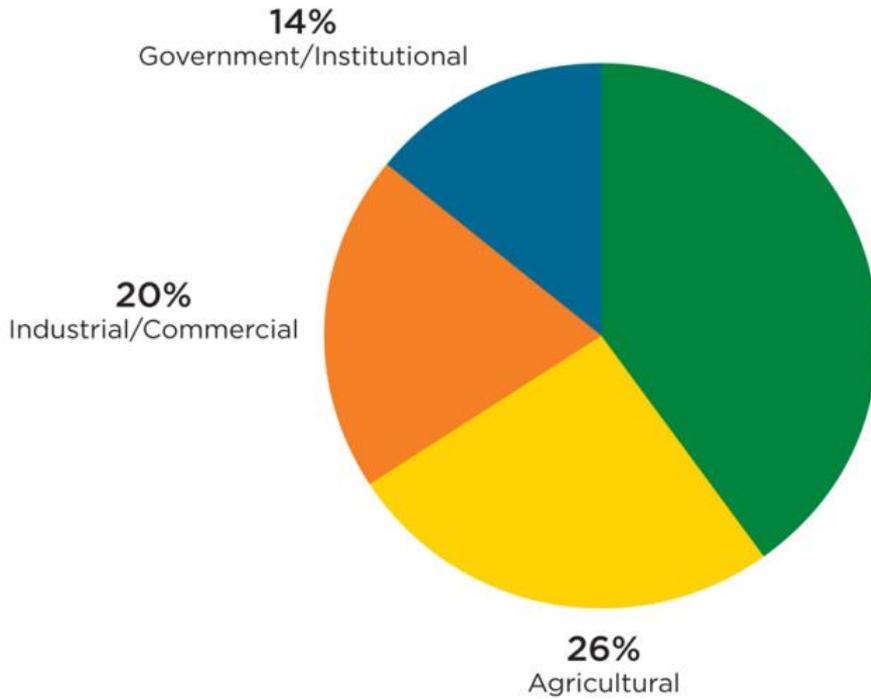
- Prepared for U.S. DOE's Energy Efficiency & Renewable Energy Office's Wind and Water Power Technologies Office
 - By PNNL and **Heather Rhoads-Weaver** of eFormative Options with contributions from American Wind Energy Association and Distributed Wind Energy Association
 - Available at <http://www.energy.gov/wind-report>
- Covers small wind (up through 100 kW) and turbines greater than 100 kW in applications
- Data sources and methodology included in report
- Thank you to all those who provided data, review, and other contributions!



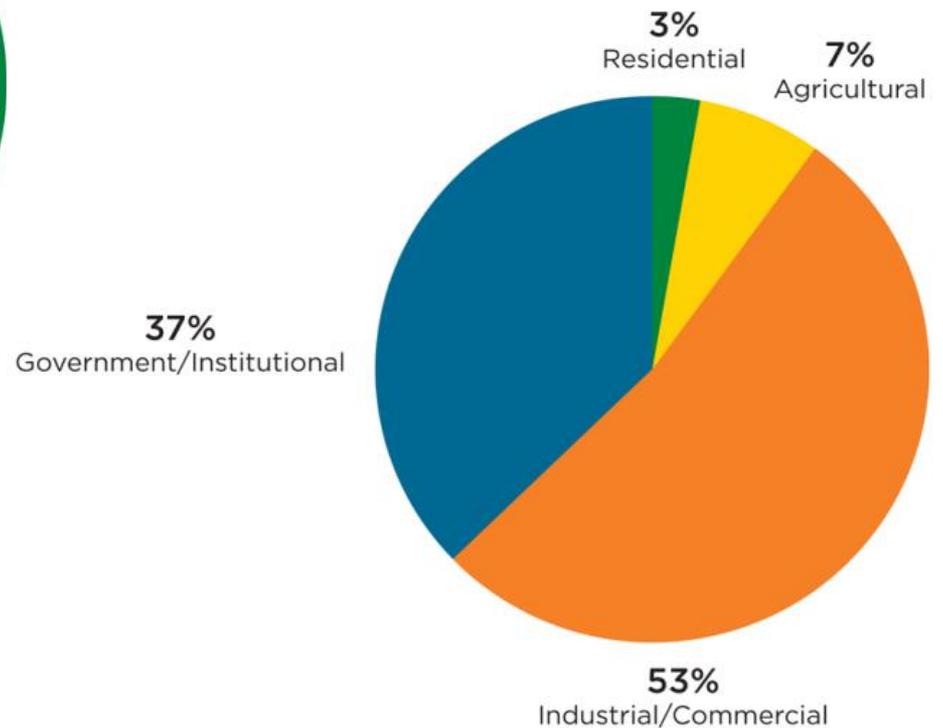
Jeff Ledermann / Minnesota Pollution Control Agency

Cumulative Installed Capacity



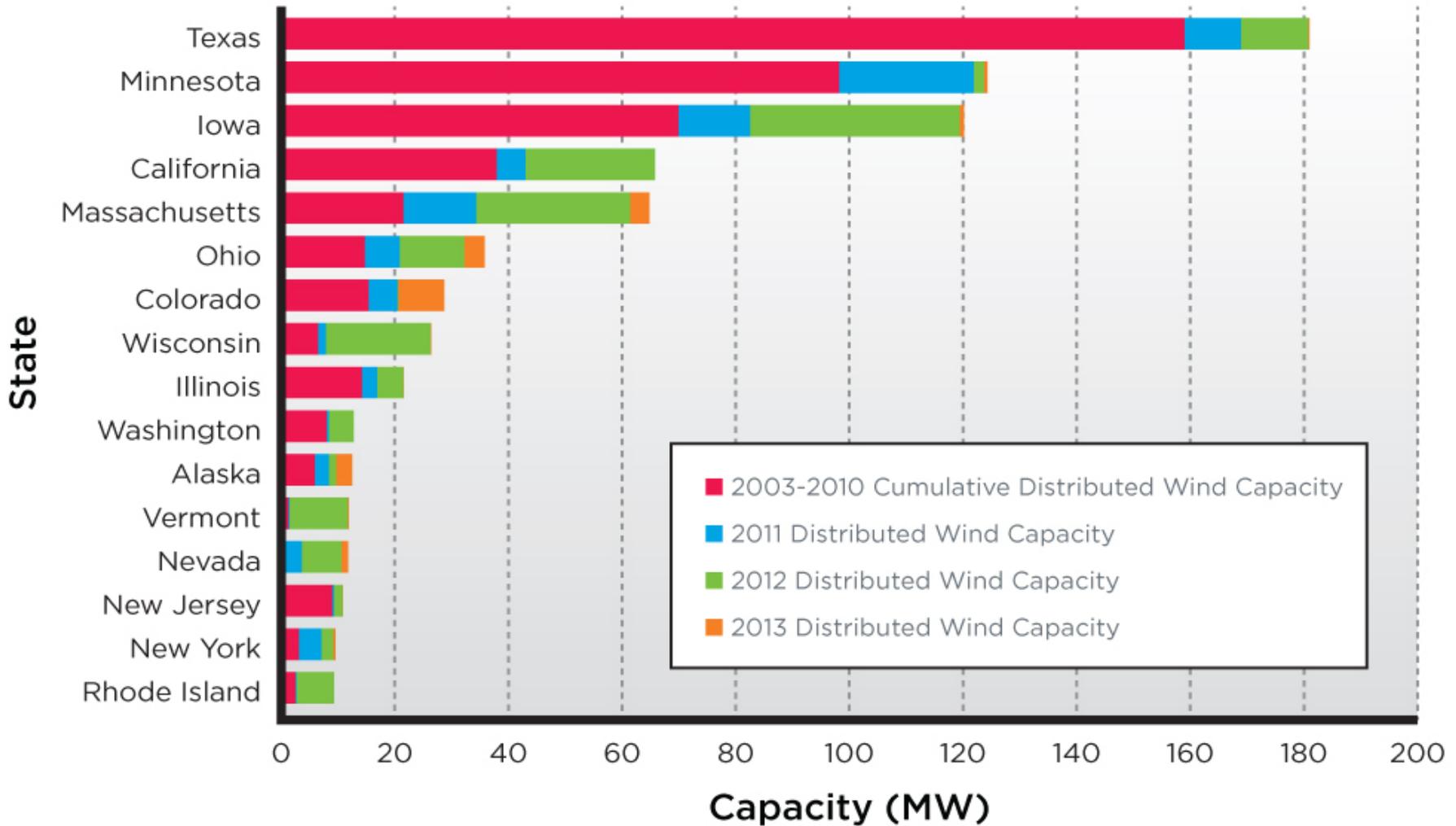


By Project

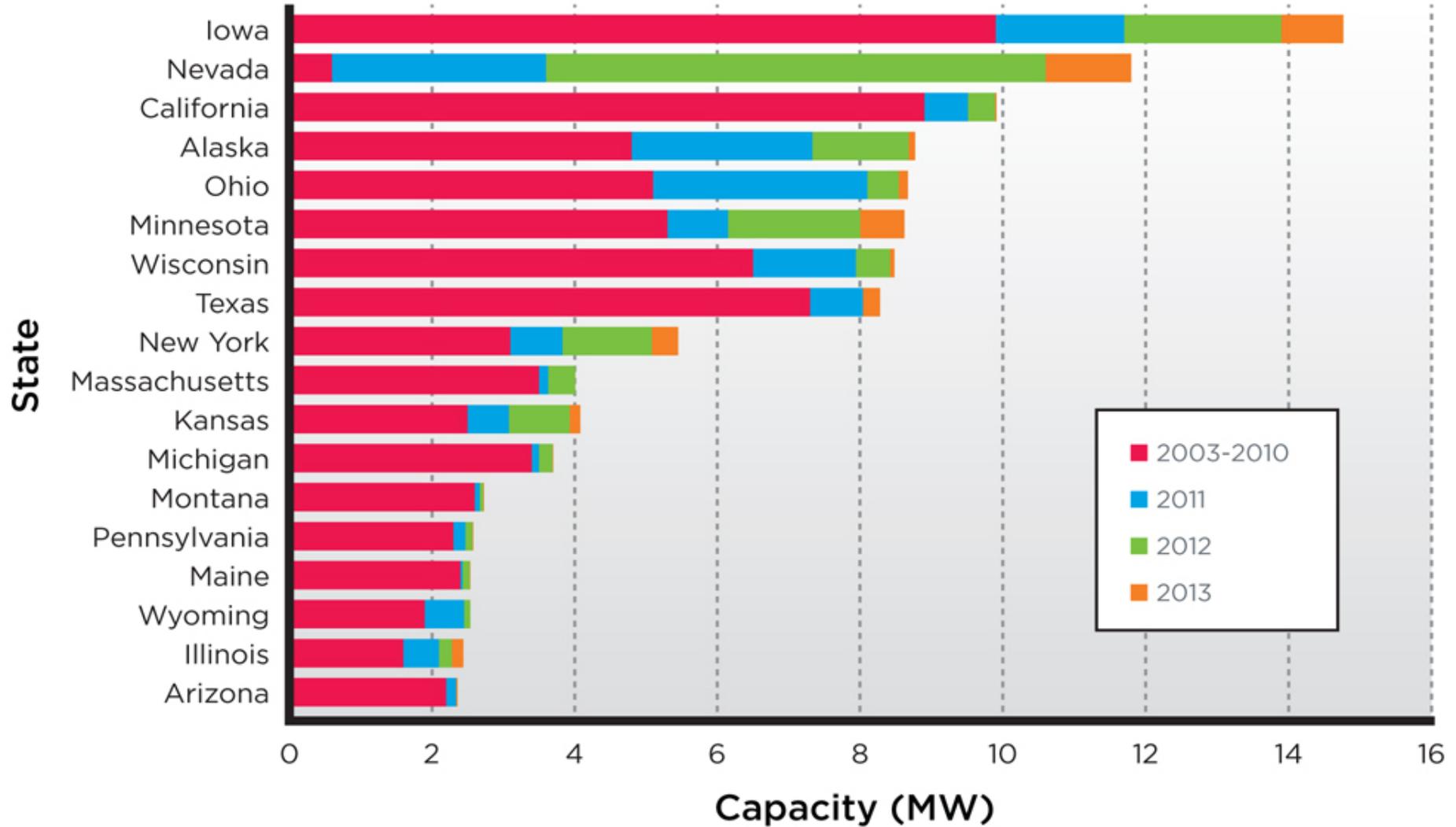


By Capacity

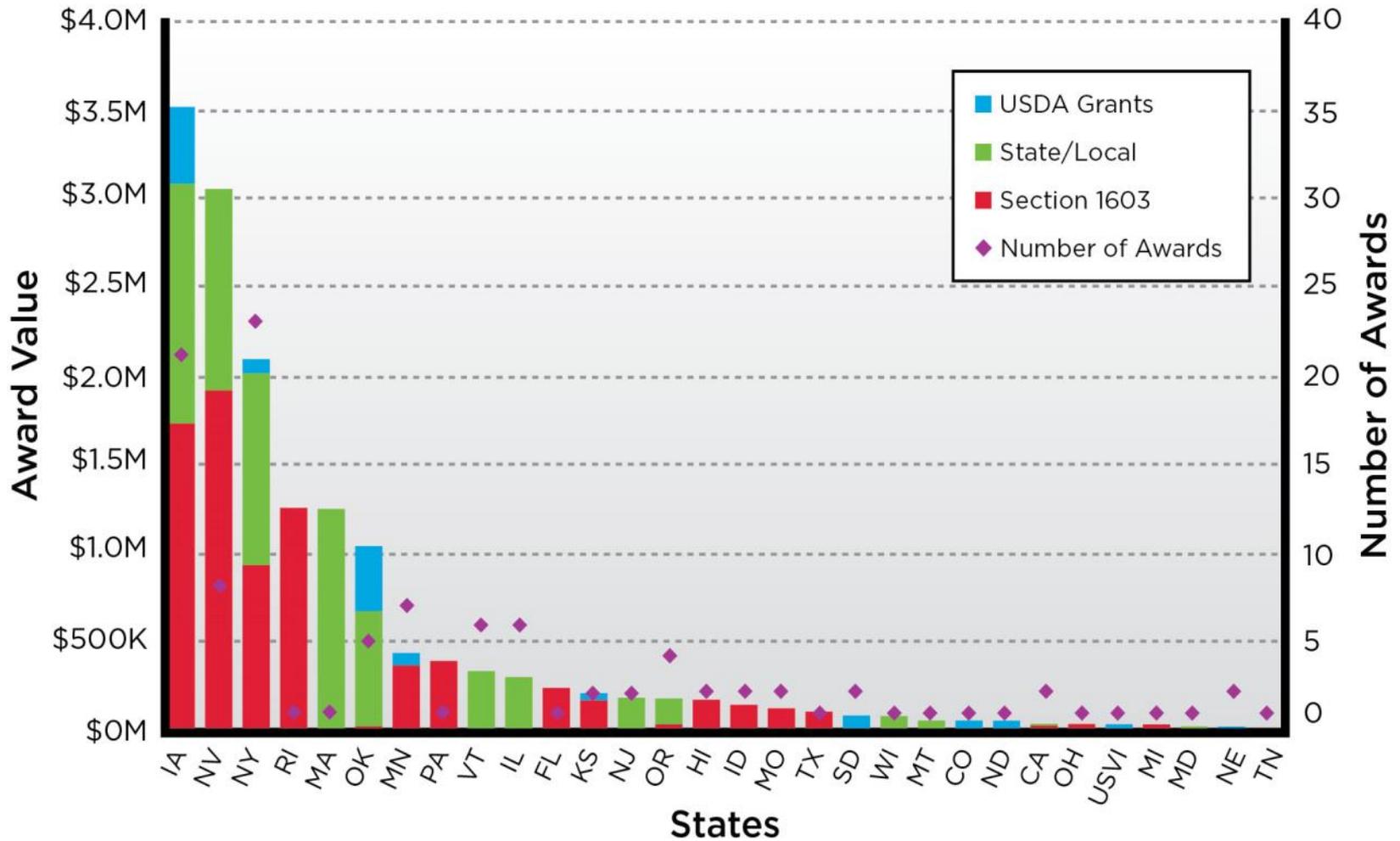
Top States for Distributed Wind



Top States for Small Wind



2013 Incentive Awards



- Federal Example: 2013 USDA REAP Awards

Type of Project	Awards	Funding
Energy Efficiency	57%	41%
Solar	31%	35%
Wind	2%	3%

- State Incentive Examples

State	Solar PV Funding	Wind Funding
Massachusetts (2013 only)	\$5.1 million, 2,506 projects, 15.7 MW	\$1.2 million, one 3.3-MW project
Wisconsin (2013 only)	\$600,000	\$75,000
New Jersey (since 2003)	\$363 million	\$6 million; suspended in July 2013

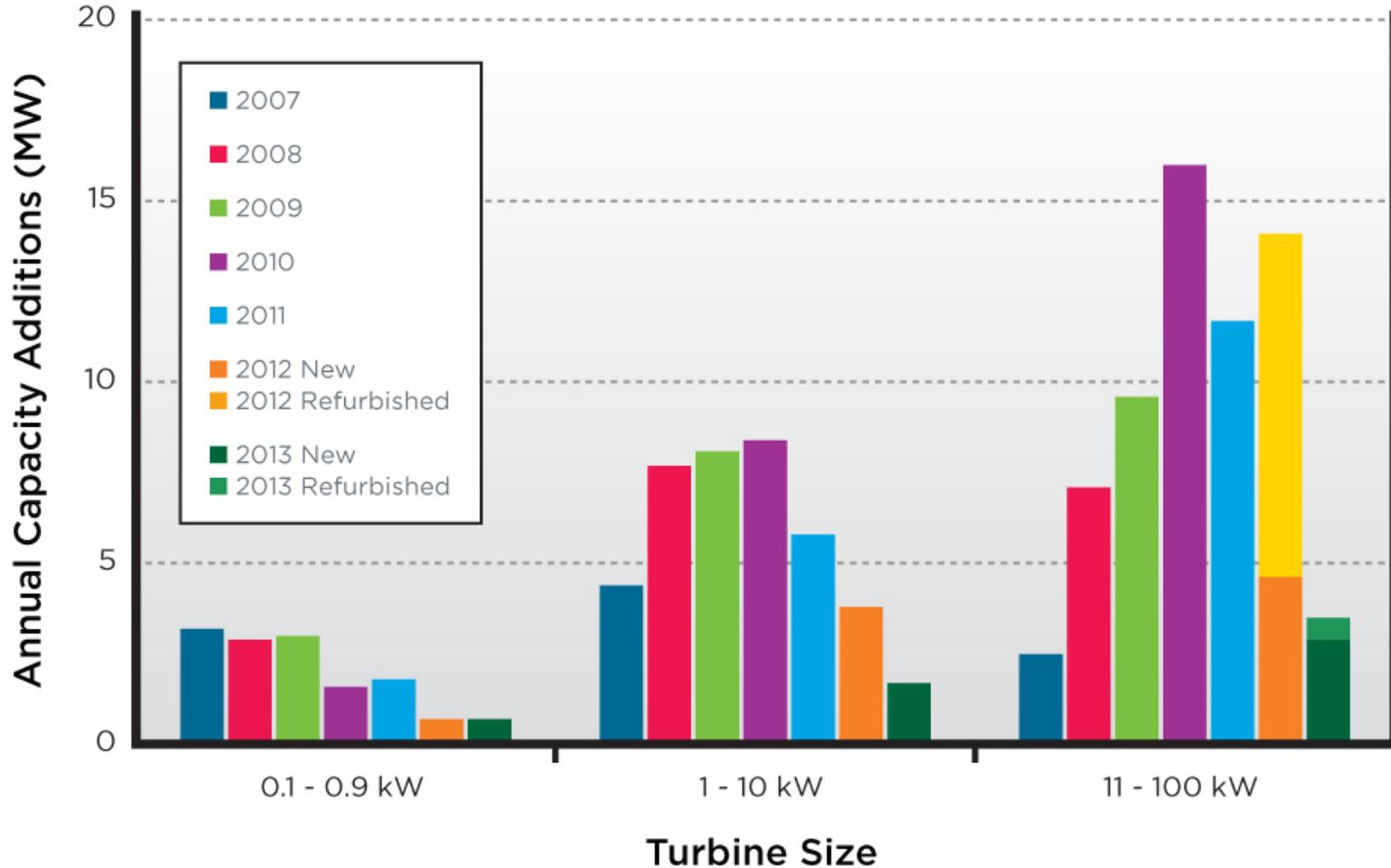
Wind Leasing Example Scenarios

10-kW wind turbine on a 100-ft (30.5 m) tower
in a 5 m/s hub-height wind resource

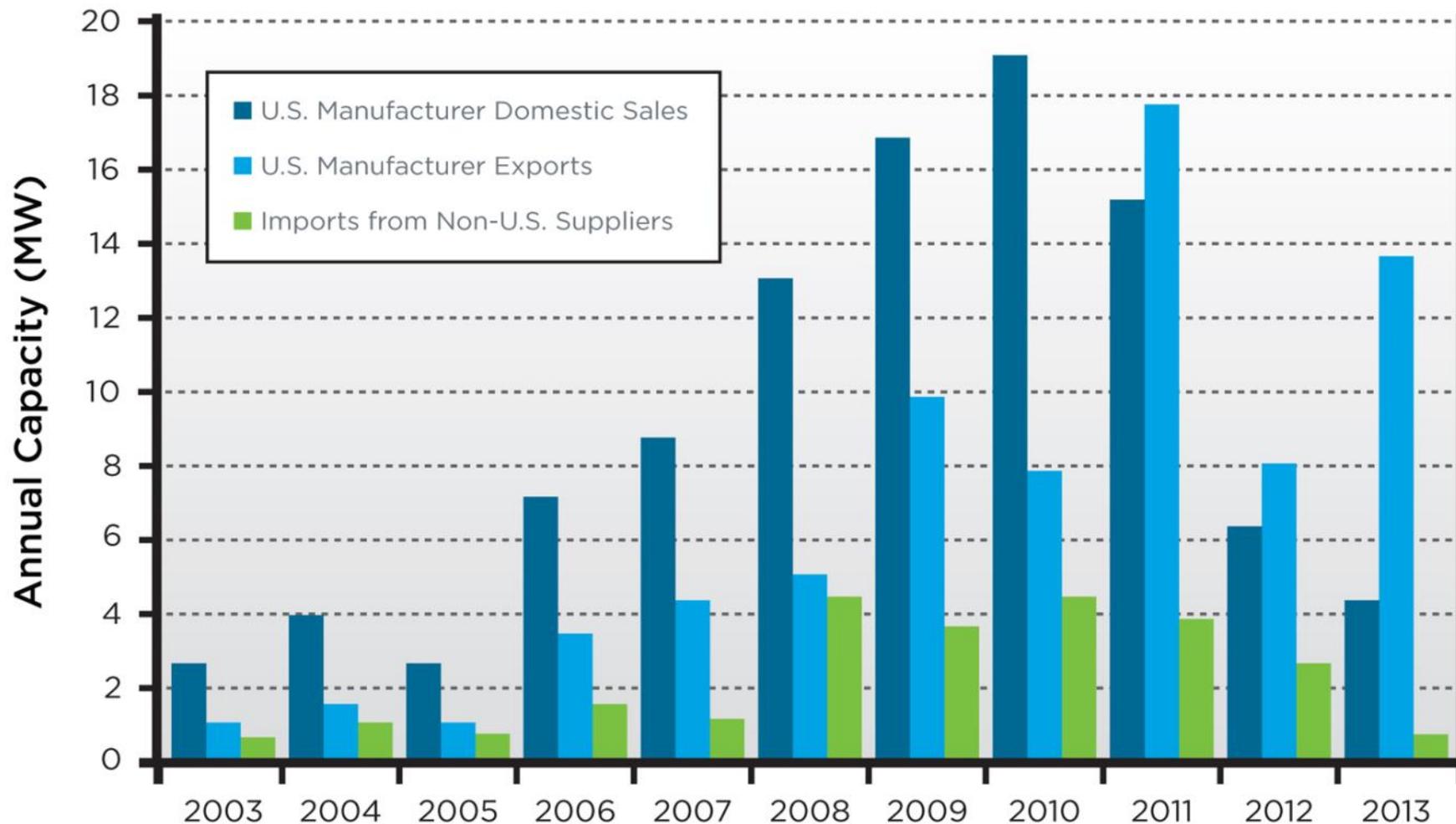
	Upfront Payment (\$)	Monthly Payment (\$)	Installed Cost (\$)	Value of ITC (\$)	NYSERDA Incentive (\$)	Annual Energy (kWh/yr)	20-Year Energy Cost Savings (\$)
Zero Down	0	125	100,000	30,000	40,000	15,000	15,000
Partial Payment	5,000	70	100,000	30,000	40,000	15,000	22,000

These scenarios were developed using the Distributed Wind Policy Comparison Tool, Version 3.0, last DSIRE update 8/16/13 (www.windpolicytool.org) to demonstrate the leasing model. Additional inputs and assumptions (e.g., escalation, discount, and electricity rates) not shown in the table are the default values for New York state in the Distributed Wind Policy Comparison Tool. Actual lease agreements from vendors will differ from these sample scenarios.

Small Wind Sales by Turbine Size

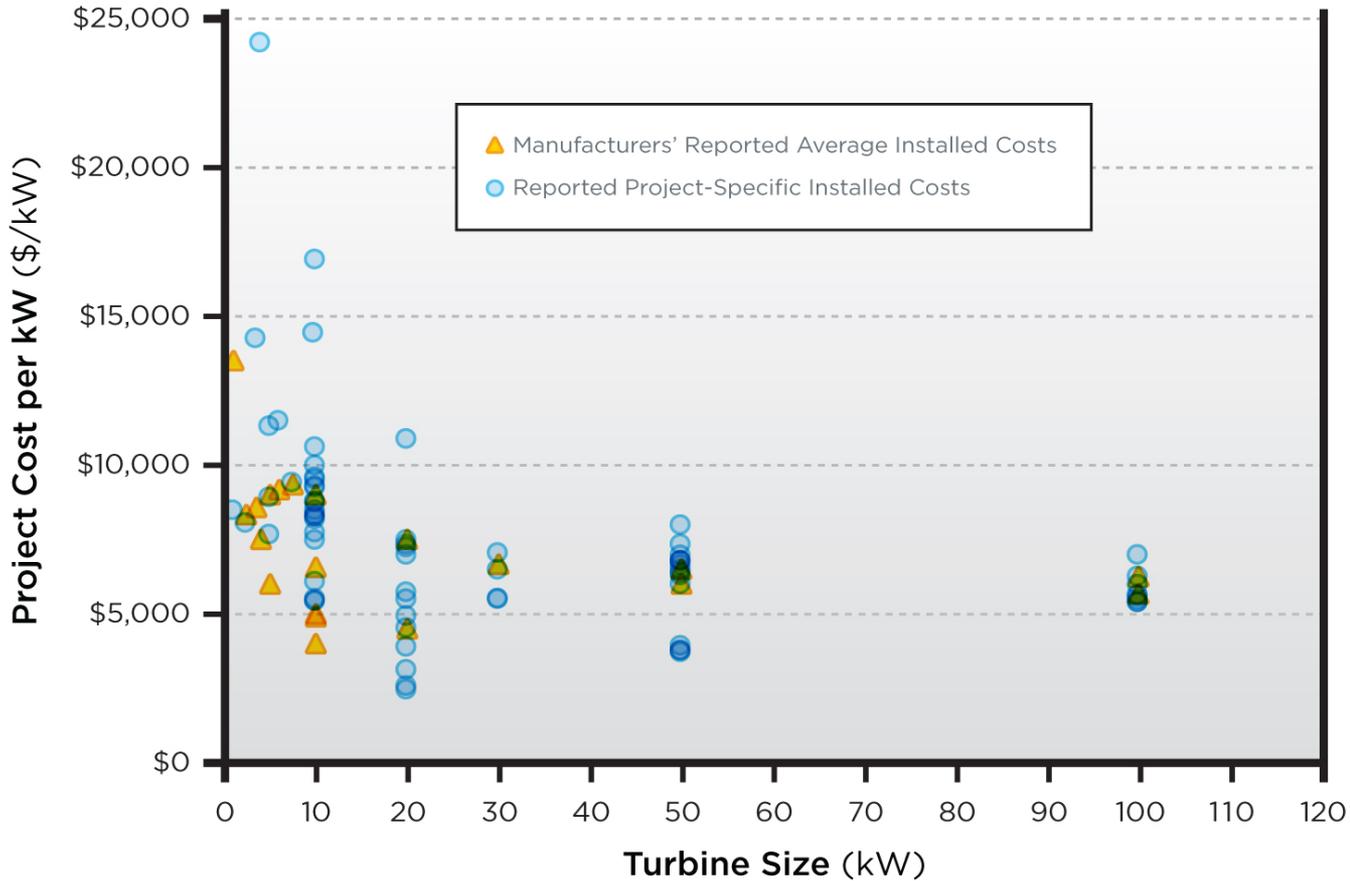


Small Wind Domestic, Imports, and Export Sales



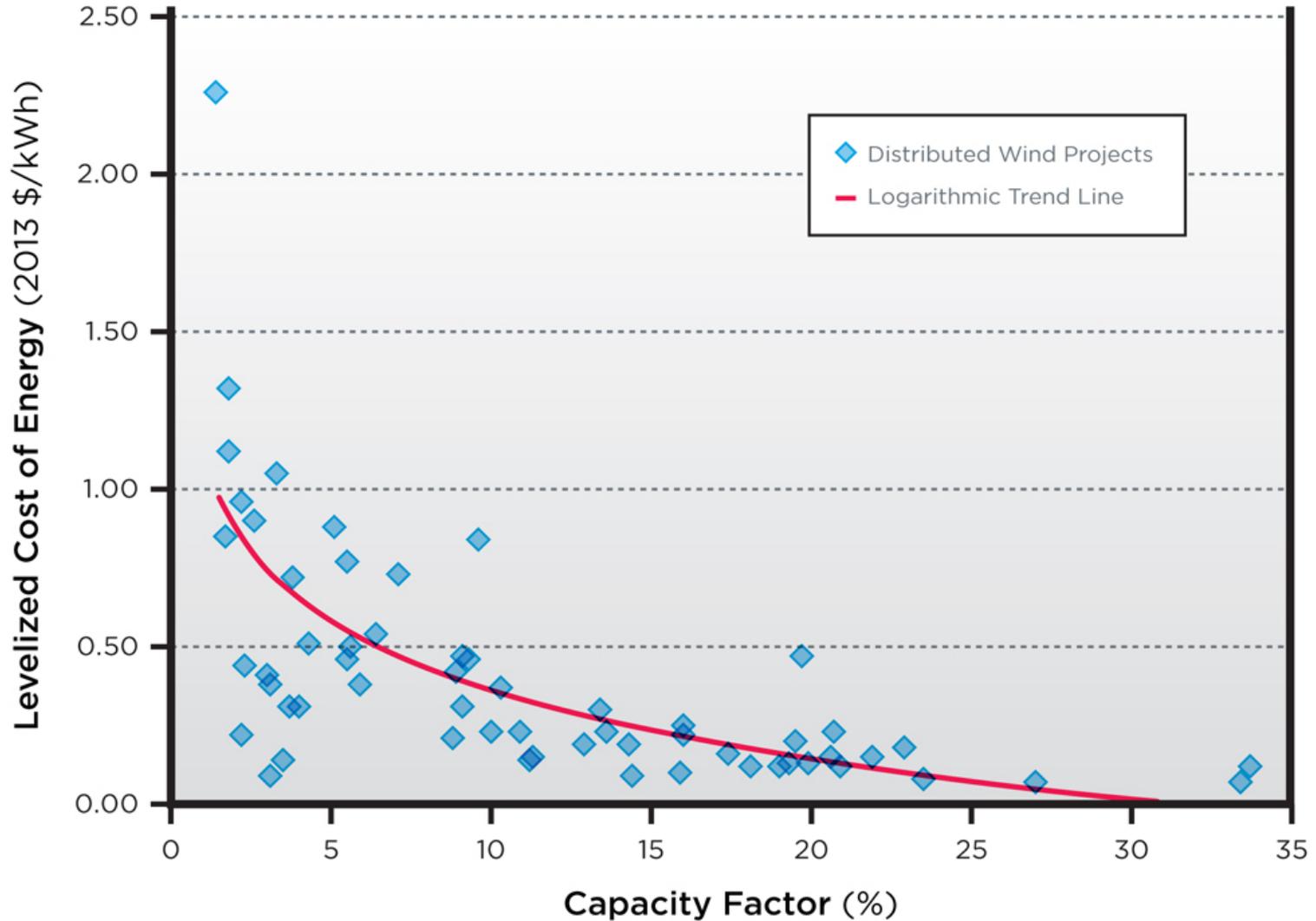
NOTE: Refurbished sales are not shown

Small Wind Installed Costs



Turbine Size (kW)	1	2.4	3.5	4	5	6	7.5	10	20	30	50	100
Turbines with Reported Costs	1	3	1	14	3	1	1	21	13	4	15	8

LCOE and Capacity Factor

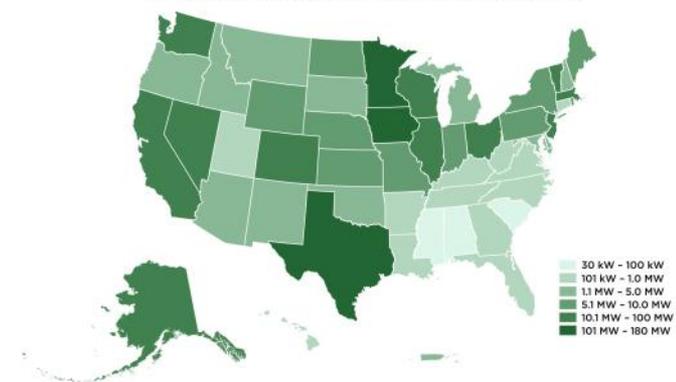


- 13 small wind turbine models are fully certified to AWEA Standard 9.1 – 2009
- 2 medium wind turbine models have published power performance and acoustics certifications to IEC 61400-12-1 (power) and IEC 61400-11 (acoustics)
- 8 small and medium wind turbine models have limited or conditional certifications
- More than 20 additional wind turbine models have conducted testing or have pending applications



- Other topics covered in report: manufacturers' countries of origin, types of turbines and towers, capacity additions by state, policies and market drivers, and more.
- Supporting Excel file data tables also available: <http://energy.gov/eere/wind/information-resources>
- 2014 Outlook
 - Higher installed distributed wind capacity
 - New third-party financing opportunities and innovative business models
 - New Farm Bill (REAP funding)
 - Exports to remain strong, but influenced by changes to policies, such as feed-in tariffs

2003-2013 Cumulative U.S. Distributed Wind Capacity



- <http://www.energy.gov/wind-report>
- <http://www.energy.gov/eere/wind/distributed-wind>
- <http://energy.gov/eere/wind/information-resources>

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