



Pacific Northwest
NATIONAL LABORATORY

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U.S. Distributed Wind Market Small Wind Snapshot

ALICE ORRELL

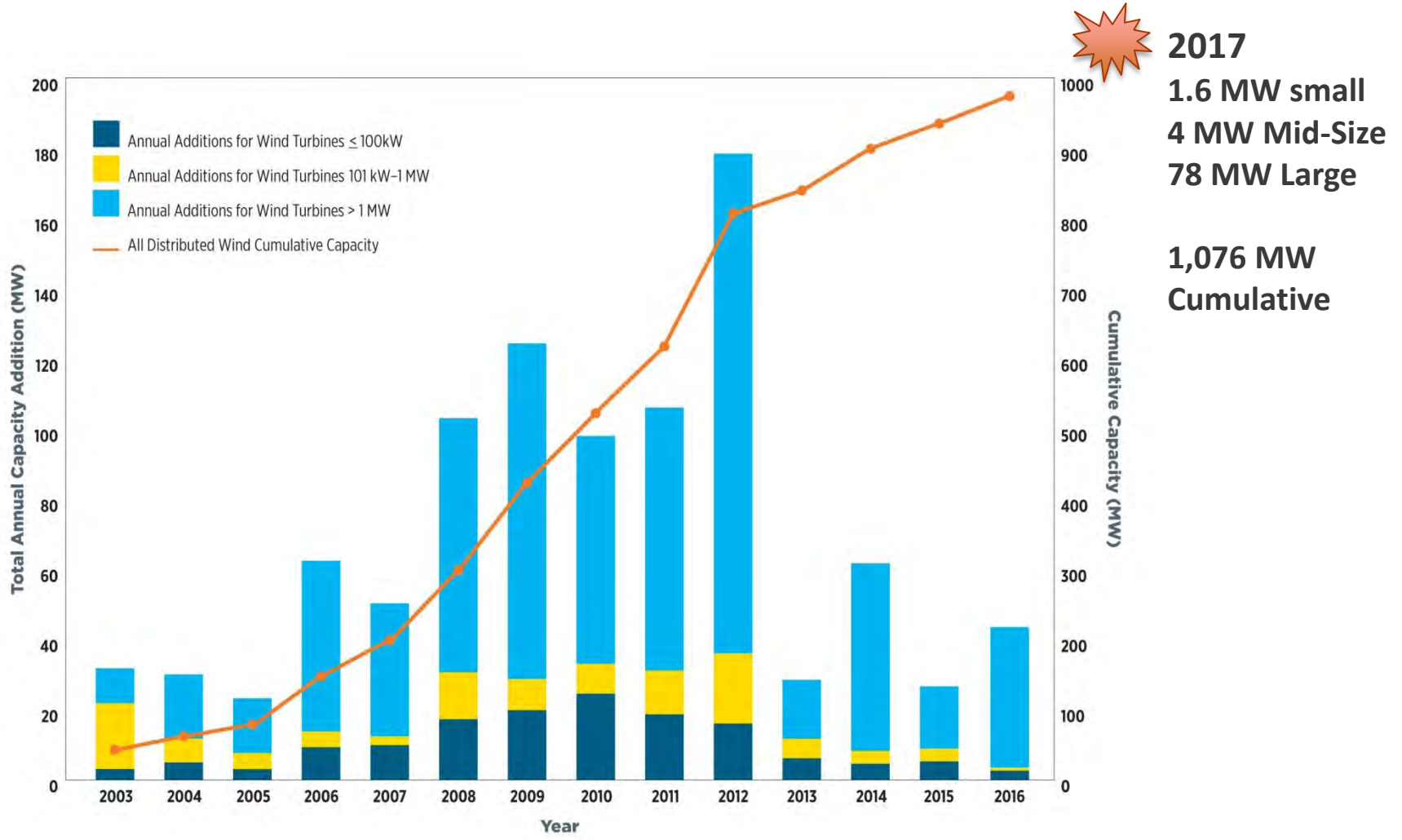
Small Wind Conference 20178

April 10, 2018

PNNL-SA-133325

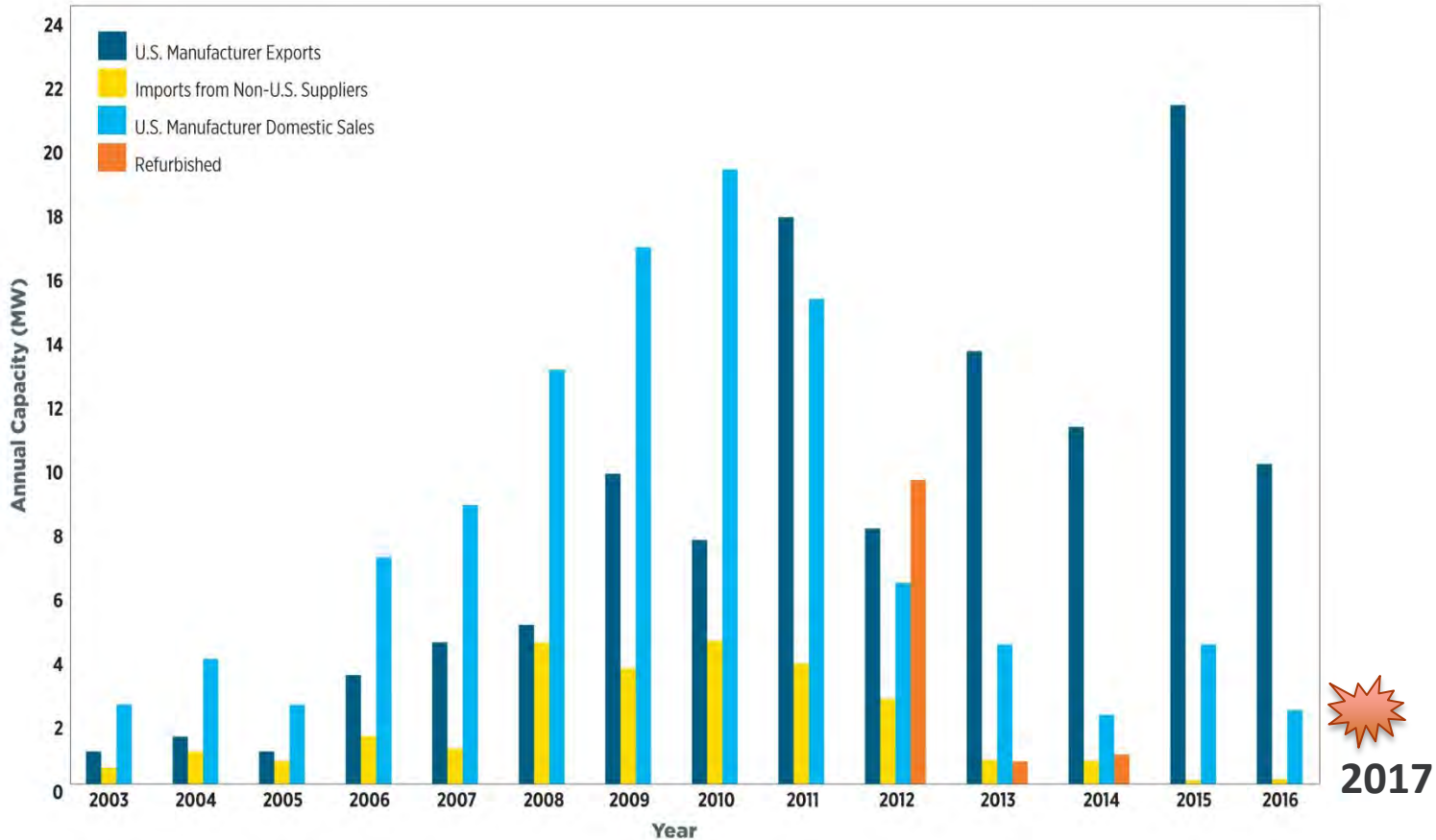


Cumulative Installed Capacity





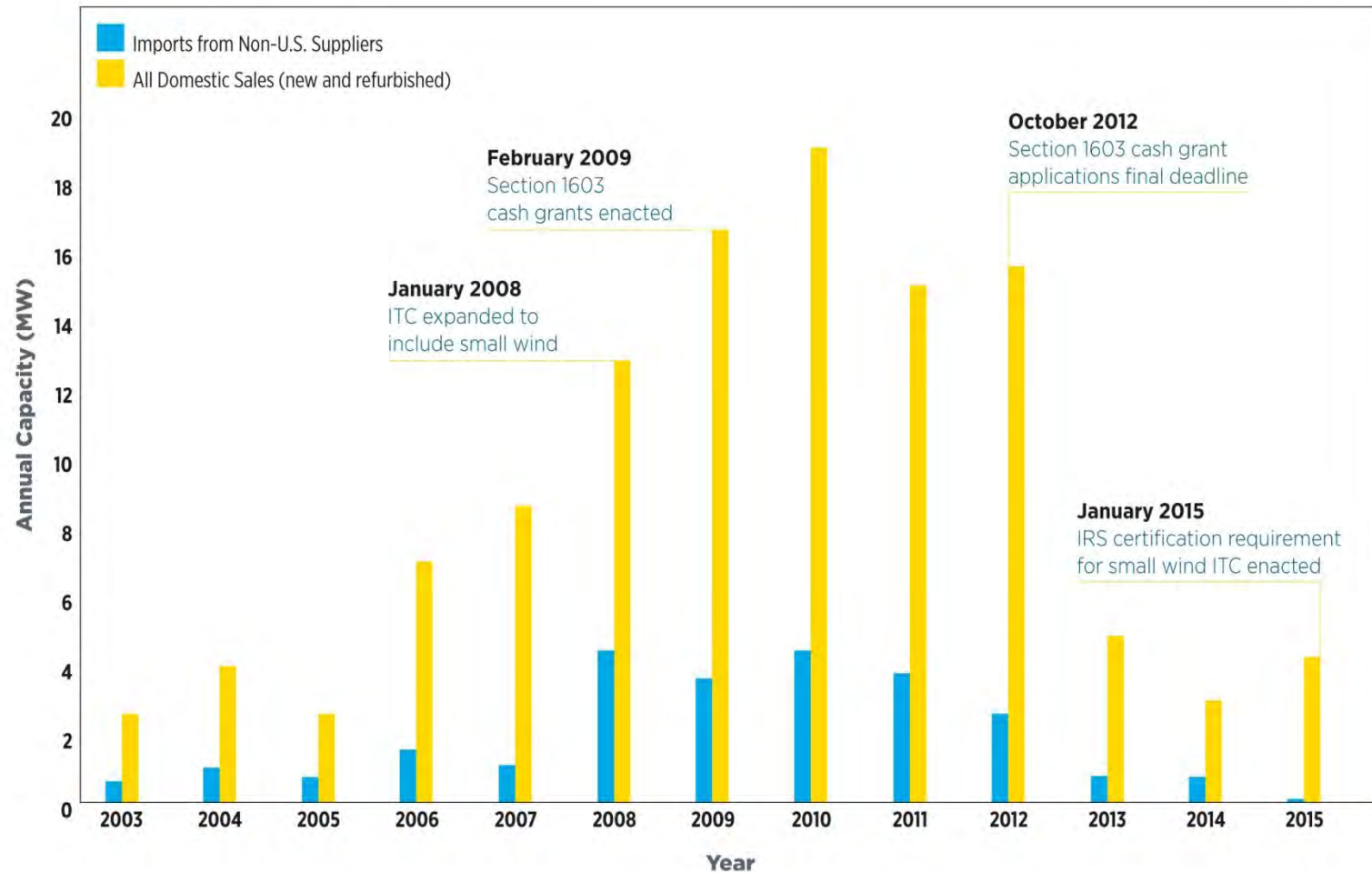
U.S. Small Wind Turbine Sales and Exports



Exports 5.5 MW
Imports < 100 kW
Domestic Sales 1.5 MW

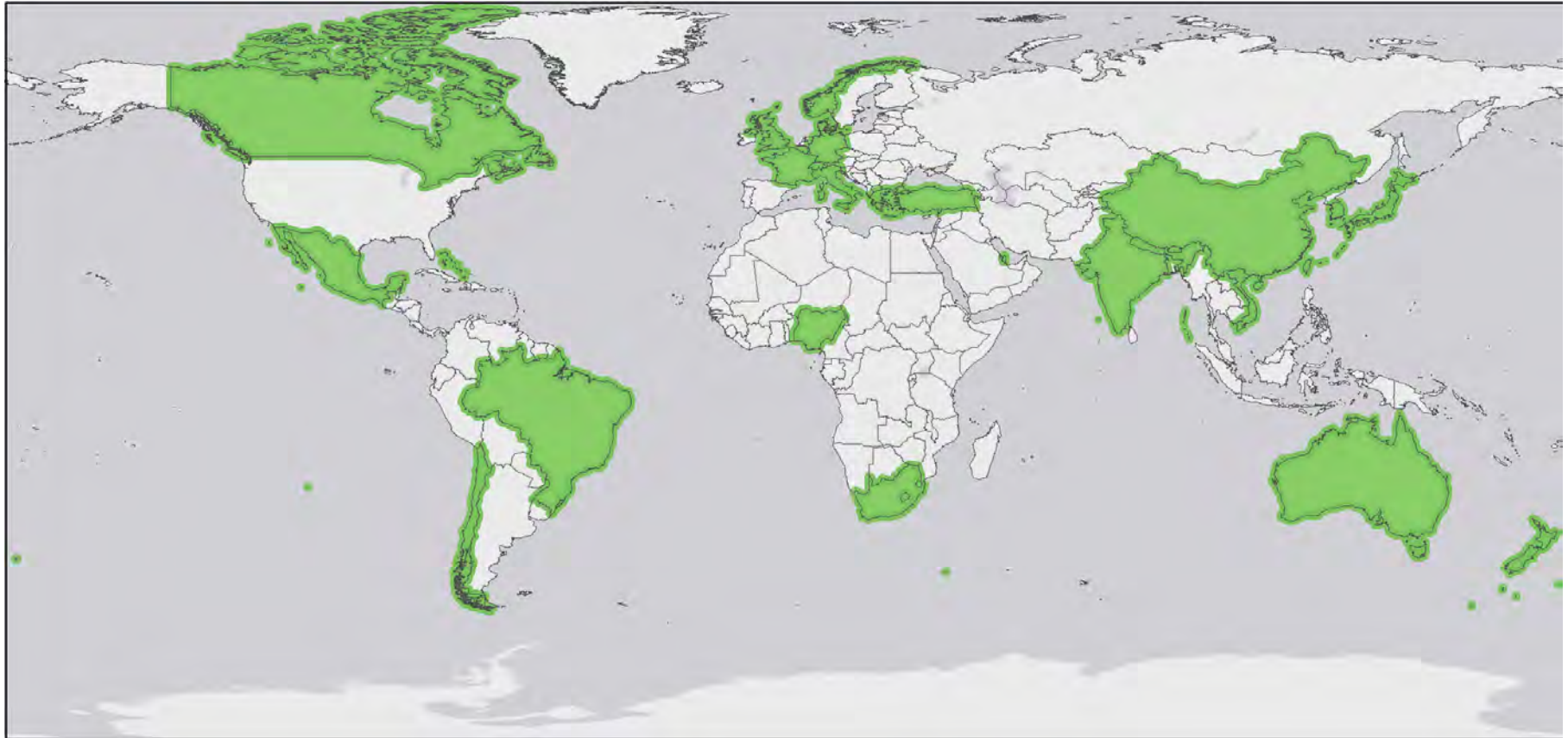


U.S. Small Wind Sales and Federal Policies





U.S. Small Wind Exports, 2012-2017



U.S. Small Wind Exports Map for 2012 through 2017

U.S. small wind manufacturers provide turbines to customers in the following 25 countries:
Australia, Bahamas, Brazil, Canada, Cayman Islands, Chile, China, Denmark, France, Germany, Greece, India,
Italy, Japan, Mexico, New Zealand, Nigeria, Norway, Qatar, South Africa, South Korea, Taiwan, Turkey,
United Kingdom, Vietnam



Global Small Wind Market

	2013 (MW) Installations	2014 (MW) Installations	2015 (MW) Installations	2016 (MW) Installations	Cumulative (MW) Installations	Cumulative Year Range
China	75	72.6	*	45	835.7 ^a	2002-2016
Japan	*	*	0.364	0.952	5.21 ^b	as of 2016
South Korea	*	*	0.322	0.07	4.228 ^c	as of 2016
UK	14.7	28.5	11.7	7.73	135.13 ^d	as of 2016
Denmark	1.216	1.441	5.025	*	17.628 ^e	1978-2015
Germany	*	0.264	0.298	2.25	28.5 ^f	2010-2016
Italy	7.003	15.773	10.809	57.904	112 ^g	2012-2016
United States	5.6	3.7	4.3	2.431	146.559	2003-2016
Brazil	0.029	0.023	0.11	0.038	0.201 ^h	2013-2016
Australia	*	*	0.037	*	1.416 ⁱ	2001-2015
New Zealand	*	*	*	*	0.185 ^j	as of 2015
Total	103.52	122.28	32.97	116.38	1,286.729	

* Not Available

^a China Wind Energy Equipment Association (CWEEA)

^b Japan Small Wind Turbines Association

^c Korea Wind Energy Industry Association; Korea Energy Agency

^d www.gov.uk, Monthly MCS and ROOFIT degression statistics

^e www.energinet.dk

^f Bundesnetzagentur; Bundesverband Kleinwindkraftanlagen;
0-50 kW capacity

^g www.assieme.eu; 0-250kW capacity

^h www.aneel.gov.br

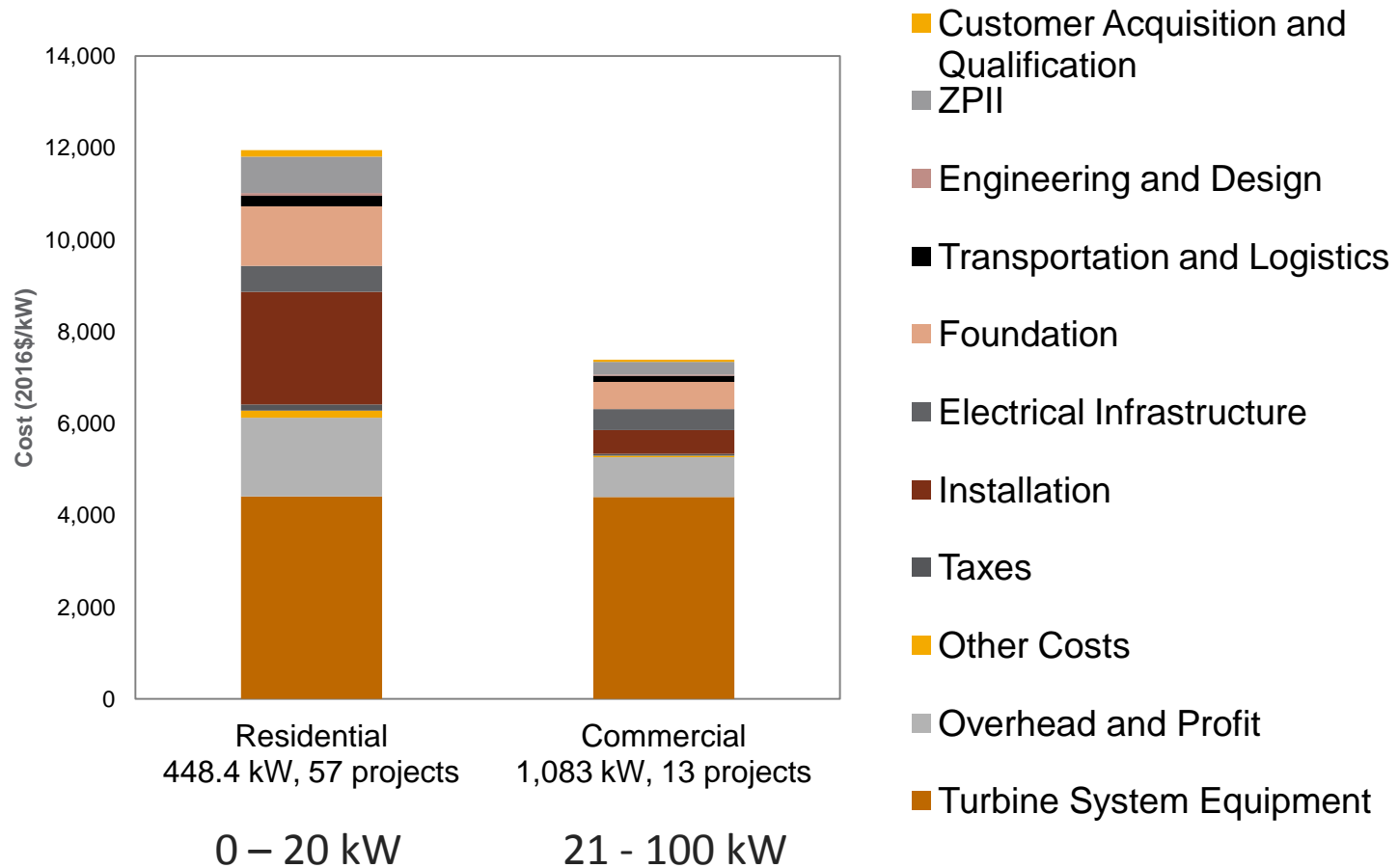
ⁱ www.cleanenergyregulator.gov.au

^j Sustainable Electricity Association of New Zealand



Small Wind Costs in the United States

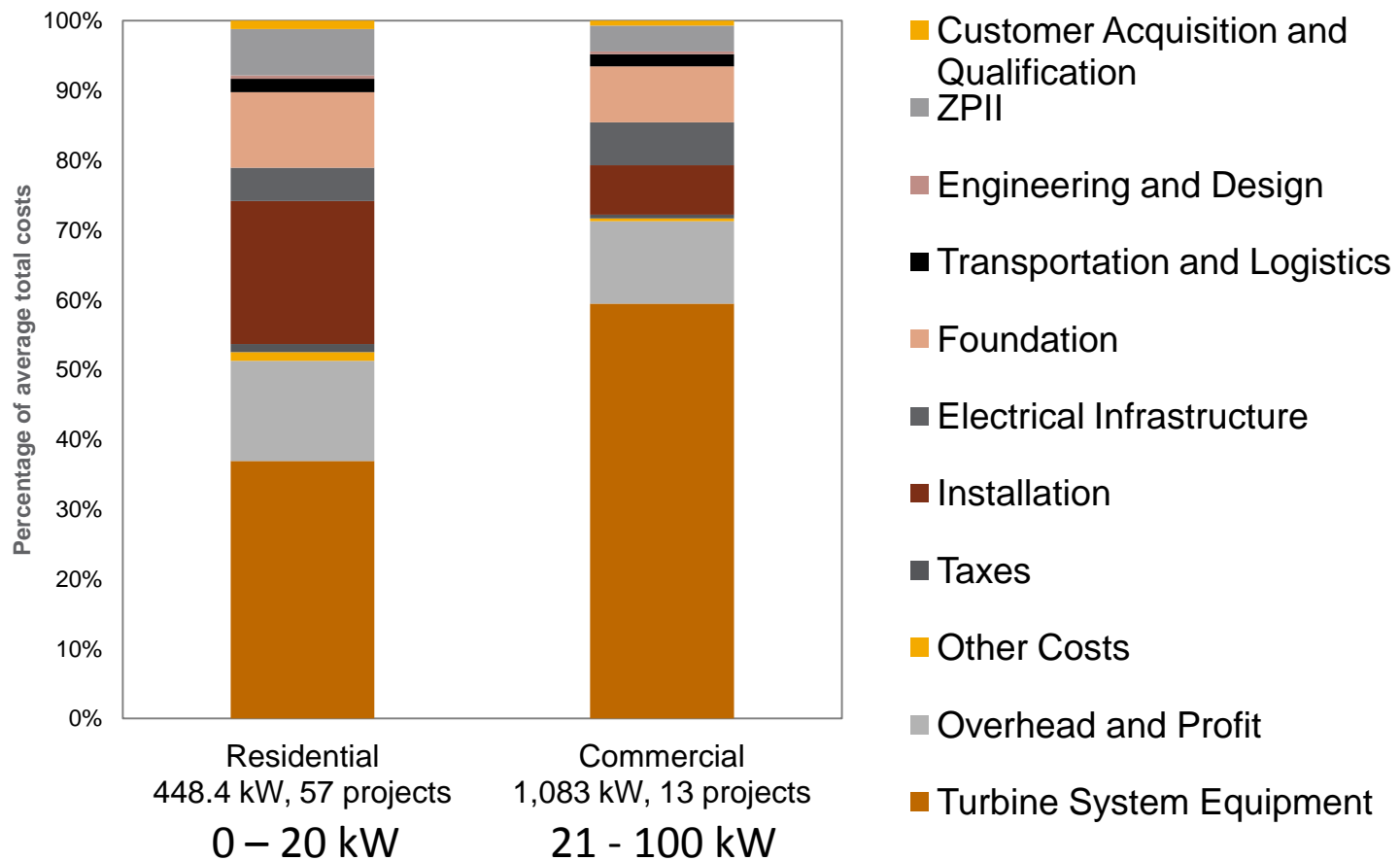
Small Wind Turbine System Equipment and Balance of Station Costs on a per kW Basis





Small Wind Costs in the United States

Small Wind Turbine System Equipment and Balance of Station Costs on a Percentage Basis



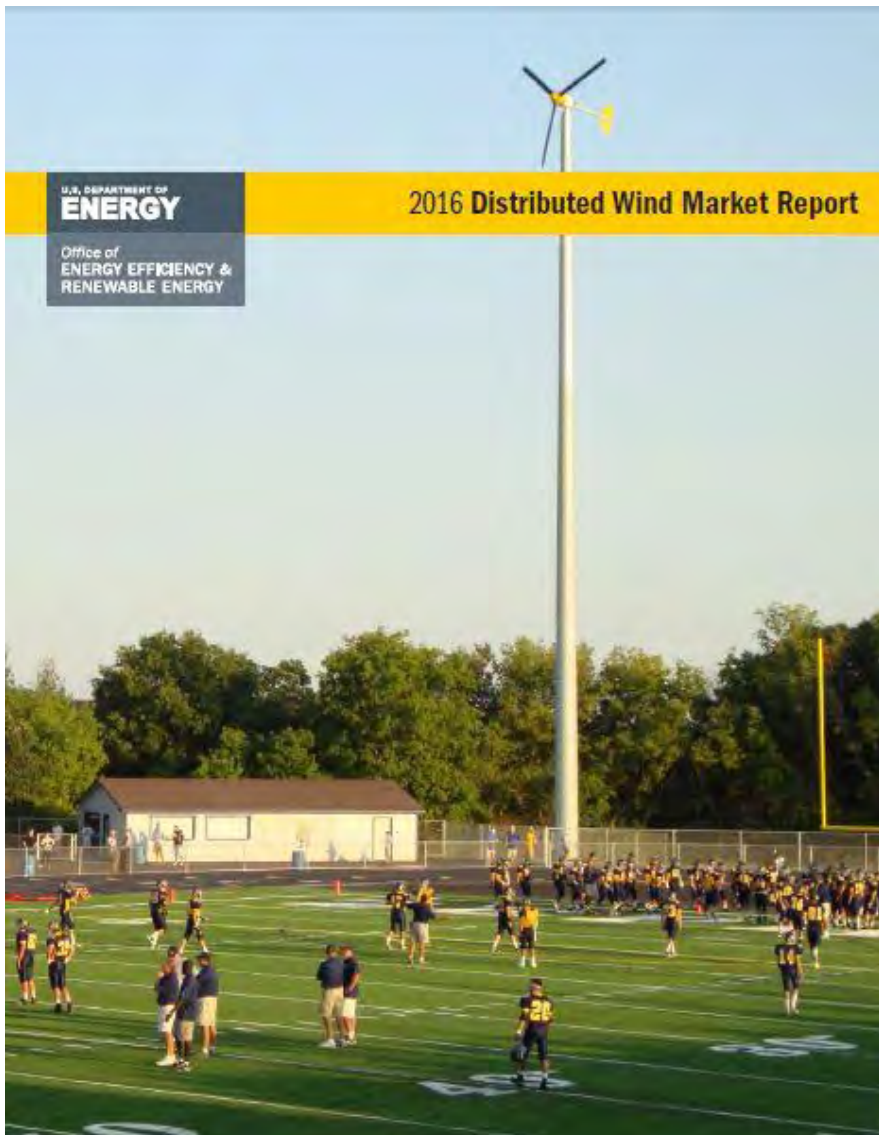
PNNL Distributed Wind Data and Reports



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<http://wind.pnnl.gov/distributedwind.asp>



Wind Research

Wind Research at PNNL

- Home
- Research Areas
 - Distributed Wind**
 - Atmospheric Remote Sensing
 - Boundary Layer Processes
 - Mesoscale and LES Modeling
 - Uncertainty Quantification
- Instrumentation
 - Coastal Wind Profilers
 - Lidar Buoys
 - Lidar Buoy Loan Program
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Distributed Wind

Distributed wind supports our nation's goal to develop a more resilient power system, mitigate energy security concerns and power-quality issues, and deliver cleaner energy to its citizens.

PNNL provides market analysis and policy tools for distributed wind stakeholders that enable increased understanding of the U.S. and international markets, state and federal policies, as well as trends and projections that help accelerate the widespread and intentional implementation of wind technologies.

What is Distributed Wind?

“ When the public thinks of wind power, they most likely picture large, centralized wind projects with long rows of turbines that generate electricity for distant end-users, but distributed wind projects produce electricity consumed on site or locally. Distributed wind can provide energy for farms, homes, school, businesses, and manufacturing facilities. Wind turbines in distributed applications are found in all 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands. — **Alice Orrell, Energy Analyst** ”

Distributed Wind Market Report

Since 2012, PNNL has provided distributed wind stakeholders with statistics and analysis of the market along with insights into its trends and characteristics. By providing a comprehensive overview of the distributed wind market, the Distributed Wind Market Report can help plan and guide future investments and decisions by industry, utilities, federal and state agencies, and other interested parties.

Additional Information

- Distributed Wind Market Reports
 - 2015 | 2014 | 2013 | 2012
- Distributed Wind Market Report Data Tables
 - 2015 | 2014 | 2013 | 2012
- Distributed Wind Market Report Factbooks
 - 2015 | 2014 | 2013 | 2012
- Related Links
 - Distributed Wind Photo Gallery
 - Distributed Wind Policy Comparison Tool
 - Download Distributed Wind Data
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 - Alice Orrell
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Resources

- 2015 Distributed Wind Market Report
- 2014 Distributed Wind Market Report
- 2013 Distributed Wind Market Report

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