



Environmental Energy Technologies Division Lawrence Berkeley National Laboratory

Wind Energy: Core Trends

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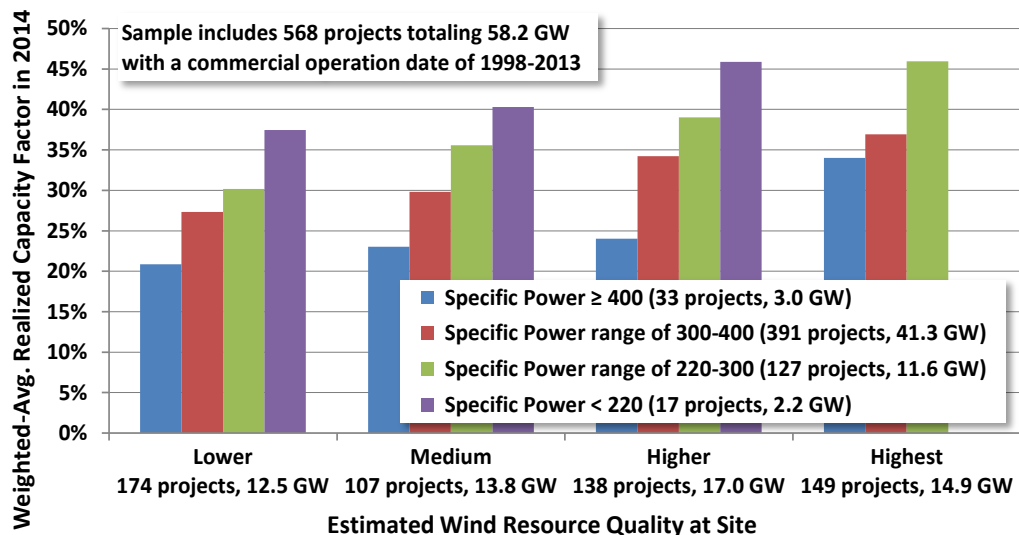
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National Summit on RPS

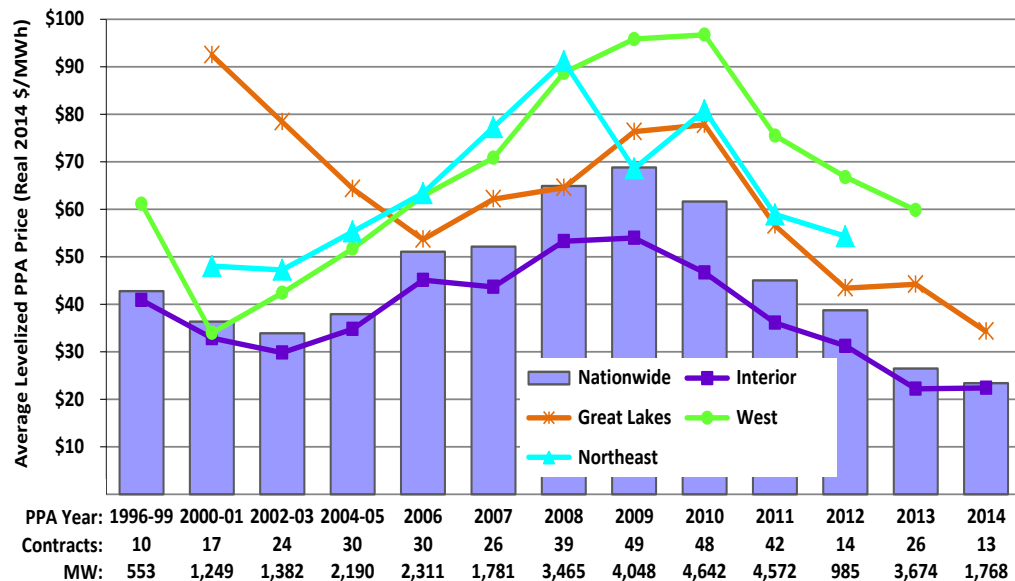
Arlington, Virginia

November 2015

Technology Changes and Cost Reductions Have Affected and Will Continue to Influence Deployment

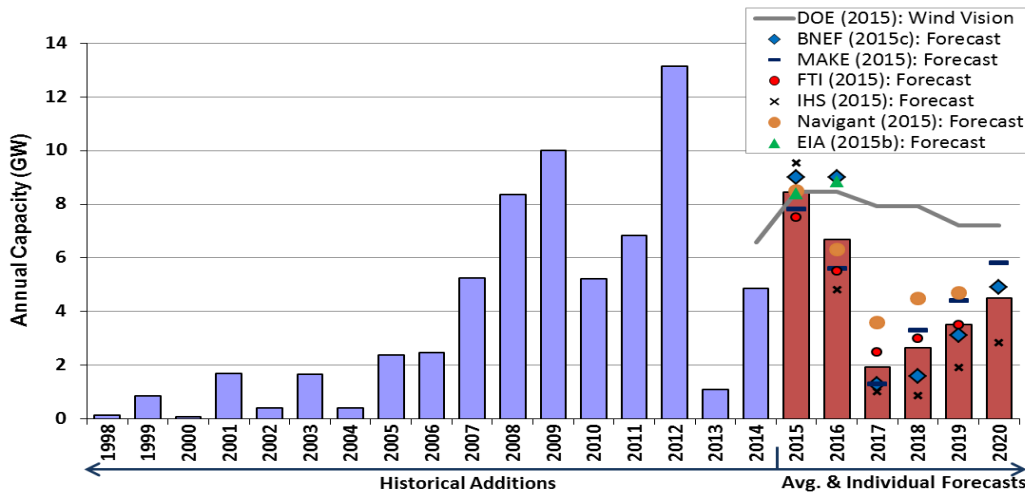


Turbines Originally Designed for Lower Wind Speeds Are Now Regularly Used in Lower and Higher Wind Speed Sites, Boosting Capacity Factors



Steep Decline in Average Power Sales Prices Since 2009; Especially Low Pricing in Interior Region, Competitive with Operating Cost of a CCGT (includes benefit of PTC)

Market Has Grown Rapidly, but Federal Policy Creates Uncertainty After 2016, Notwithstanding Significant Benefits of Expansion in Longer Term



- 69 GW of wind capacity installed
- Wind represented 33% of total capacity additions from 2007-2014
- Wind ~5% of U.S. electric generation
- But, RPS' support <3 GW/year; fate of PTC unknown; CPP effect TBD

- DOE *Wind Vision* showed that increased growth (to 400 GW by 2050) can deliver long-term benefits & reduced total costs
- ...but with some incremental cost in near to medium term

Costs		Benefits		
\$149 Billion [3%] savings				
		GHG: 14% less GHG; \$400 Billion savings	108 Billion savings; 22,000 lives saved	260 Billion gallons [23%] less consumption
Additional Impacts				
Energy Diversity	Jobs	Local Revenues	Land Use	Public Acceptance and Wildlife
Electricity prices 20% less sensitive	~ 600,000 gross jobs	\$1.0 Billion/year in land leases \$3.2 Billion/year in tax payments	1.5% area of contiguous US Less than 1/3 area occupied by golf courses in US today	Responsible siting; Optimizing coexistence