U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

WIND POWER TECHNOLOGIES OFFICE FY 2015 BUDGET AT-A-GLANCE

The Wind Power Technologies Office accelerates U.S. deployment of clean, affordable, and reliable domestic wind power through research, development, and demonstration. These advanced technology investments directly contribute to the goals for the United States to double renewable electricity generation again by 2020 and to achieve 80% of its electricity from clean, carbon-free energy sources by 2035 by reducing costs and increasing performance of wind energy systems. Wind power currently provides more than 4% of the nation's electricity, and more wind-powered electricity generation capacity was installed in the United States in 2012 than that of any other power source.

What We Do

The Wind Power Technologies Office uses an integrated, three-pronged approach to drive technology development and project deployment in the wind energy sector:

- ✓ **Research and Development** provides industry-wide wind technology improvements targeted at reducing costs and improving overall plant performance and reliability.
- ✓ **Risk Mitigation** activities and demonstrations help overcome financial, institutional, and technical barriers to financing and deploying wind energy projects, with a focus on U.S. offshore wind.
- ✓ **Reduction of Market Barriers** includes solving radar, environmental, and permitting issues that impact access to strong wind resource areas.

Program Goals/Metrics

- Reduce the unsubsidized market levelized cost of energy (LCOE) for utility-scale land wind energy systems from a reference wind energy cost of $0.074/kWh in 2012 to $0.057/kWh by 2020 and $0.042/kWh by 2030, which would compete with the predicted LCOE of electricity generation from the lowest-cost fossil generation (natural gas). This would include wind grid integration and variability costs.
- Reduce the unsubsidized market LCOE for offshore fixed-bottom wind energy systems from a reference cost of $0.20/kWh in 2012 to $0.17/kWh by 2020 to enable regionally competitive pricing.
- Support growth of domestic wind energy deployment from 60 GW of wind-installed capacity in 2012 to 125 GW of capacity by 2020 and 300 GW total by 2030. This targeted total wind-installed capacity would supply an estimated 20% of U.S. electricity demand in 2030.

FY 2015 Priorities

- **Enable a U.S. offshore industry** by investing in the technology development and demonstration of offshore wind systems, speeding deployment of the first U.S. offshore wind projects, and refining technologies by domestic wind technology manufacturers.
- **Reduce costs of energy at the wind plant level** through research in complex wind plant aerodynamics, advanced component development, wind plant reliability improvement, and distributed wind applications. Key research institutions and computational assets will be leveraged to conduct high fidelity modeling to understand the complex flow of the resource in wind farms to increase wind farm energy capture, reduce annual operational costs, and improve project financing terms.

(Dollars in Thousands)	FY 2013 Current	FY 2014 Enacted	FY 2015 Request
Resource Characterization & Technology RD&T (Land, Offshore, Distributed)	52,939	34,409	38,416
Technology Validation and Market Transformation	8,000	21,049	42,613
Mitigate Market Barriers	11,301	10,129	17,209
Modeling and Analysis	13,889	13,539	12,062
NREL Site-Wide Facility Support	0	9,000	4,700
Total, Wind Power Technologies	**86,129**	**88,126**	**115,000**

- **Address logistical and transportation constraints** of very tall wind towers (120 meters and above) and very large turbine blades (~100 meters) through R&D—enabling access to better wind resources, lower energy costs, and improved domestic manufacturing competitiveness.
- **Facilitate environmentally responsible wind deployment** through continued multi-year R&D efforts to overcome permitting challenges associated with wind-wildlife interactions, collaboration with federal agencies on mitigating the effects of wind turbines on long-range surveillance and terminal radars, system reserve and power markets evaluation, next-generation wind integration studies, and operational tool development.

Key Accomplishments

- **Accelerated the wind industry's technological progress by an estimated six years:** Without EERE involvement, the overall reliability, commercial risk, and cost of wind energy would be six years behind where it is now,[1] at a loss of more than two-thirds of cumulative wind power deployed through 2008. In 2012, wind energy added nearly half of all new power capacity in America—even more than new natural gas capacity.
- **Drove improvements in wind components and continues to showcase technology innovations to increase viability and reliability of wind:** Through research, development, and demonstration, EERE and its partners have achieved significant improvements in the production of key wind turbine components, particularly composite-related structures. Through innovation and a robust U.S. wind market, U.S. manufacturing captured more than 70% of the domestic wind energy market in 2012, up from around 35% in 2005. The United States is home to more than 400 manufacturing companies, across more than 40 states, in the wind energy supply chain.
- **Awarded funding and began development of the first U.S. offshore wind energy projects:** The Offshore Wind Demonstration Funding Opportunity—a 5-year, $168 million initiative with multiple recipients competitively awarded in FY 2013—has completed the preliminary engineering and project development phases. In 2014, the Office is selecting and funding three of seven projects to move to final design, construction, and installation. The selected demonstration projects are anticipated to complete construction and be in operation by the end of 2017, accelerating the deployment of breakthrough wind power technologies, which will help diversify our nation's energy portfolio, promote economic development, and launch a new U.S. industry.
- **Spearheaded construction of wind technology testing centers:** In collaboration with universities and national laboratories, EERE and its partners have driven construction of facilities where academic and industry technology developers can validate their wind technology designs in controlled settings and speed technology transfer, commercialization, and manufacturing.

[1] Pelsoci, Thomas M (2010). "Retrospective Benefit-Cost Evaluation of U.S. DOE Wind Energy R&D Program: Impact of Selected Energy Technology Investments."

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