Introduction

- Welcome
- DOE’s Mission
- DOE’s Role
- Wind Power Program
  Priorities
Administration & DOE Priorities

**White House**
- Generate 80% of the nations’ electricity from clean energy sources by 2035
- Reduce carbon emissions 80% by 2050
- Stimulate jobs and economic recovery through RE development

**DOE**
- Promote energy security through reliable, clean, and affordable energy
- Strengthening scientific discovery and economic competitiveness through science and technology innovation

**EERE**
- Invest in clean energy technologies that strengthen the economy, protect the environment, and reduce dependence on foreign oil

**WWPP**
- Improve the performance, lower the costs, and accelerate deployment of innovative wind and water power technologies

The **mission** of the Wind Power Program is to enable U.S. deployment of clean, affordable, reliable and domestic wind power to promote national security, economic growth, and environmental quality.
## Wind Program Strategic Overview

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<th>Program Mission</th>
<th>Program Priorities</th>
<th>Key Focus Areas</th>
<th>Targeted Outcomes</th>
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| • Enable U.S. deployment of clean, affordable, reliable, and domestic wind power to promote national security, economic growth, and environmental quality | • Aerodynamics and wind complex flow analysis to improve overall plant performance  
• Offshore wind technology and deployment  
• Wind manufacturing defects analysis  
• Mesoscale data acquisition  
• Wind turbine inflow characterization  
• Turbine to turbine interaction analysis  
• Grid integration analysis  
• Institute regional wind resource centers | • Maximize wind plant performance to reduce LCOE  
• Establish a competitive U.S. offshore wind industry  
• Optimize grid integration and transmission for wind systems  
• Mitigate market barriers | • Reduce the unsubsidized market LCOE for utility-scale land wind energy systems from a reference wind cost of $.071/kWh in 2010 to $.057/kWh by 2020 and $.042/kWh by 2030  
• Reduce the unsubsidized market LCOE for offshore fixed-bottom wind energy systems from a reference of $.225/kWh in 2010 to $.167/kWh by 2020 and $.136/kWh by 2030  
• 47 GW of total U.S. wind installed capacity in 2011 to 125 GW of wind capacity by 2020 and 300 GW by 2030 |
Importance of EERE Wind Program’s Unique Role

- RDD&D not being undertaken by the U.S. wind industry
- High risk, transformational technological innovations
- Different time-scales and/or engage comprehensive competencies
  - NWTC
- Inter- and intra-governmental agency issues
  - The Department of Defense, Department of Health and Human Services, Department of Transportation, Department of Interior, and other agencies.

Interagency government coordination to accelerate deployment
- Collaboration on Permitting barriers with BOEM, FWS, DHS/DOD/FAA, others
- Collaboration on transmission planning and integration with FERC and OE

Funding to benefit Industry
- National Testing Facility infrastructure
- Certification and standards for small wind
- Publicly available national datasets for wind resource data

Perceived High Risk/Long-term R&D Projects
- Offshore Demonstration project
- Next Generation drive-train
- Next Generation wind plants

Accelerate Administration priorities
- Investments in Manufacturing Innovation /U.S. Competitiveness
- R&D targeted on addressing renewables integration and transmission planning challenges
The Wind Program performs **Research and Development of Transformational Technology Innovation** in three markets:

**Land Based Utility Wind**
- 1-5+ MW turbines
- **R&D Focus:** Next generation turbine cost reductions, **improved energy capture & conversion at an “Integrated Wind Plant” level**, advanced controls, extended useful life of components

**Offshore Wind**
- 3-10+ MW turbines
- **R&D Focus:** **Floating platforms (access higher winds);** integrated systems designs (reduce full plant LCOE); optimized O&M strategies (reduce costs, extend life); turbine innovations (less constraints than on land) including rotor, next generation drivetrain and control systems

**Distributed Wind**
- < 1 MW turbines, Grid connected on the customer side of the meter
- **R&D Focus:** Optimized for low Class 3/Class 2 wind speeds, very low maintenance, **LCOE reduction to compete with retail**
Past Wind Program Projects

- National Wind Technology Center (NWTC) Drive Train Testing Facility (2009)
  - $10M DOE investment
  - 5MW capacity
  - Grid simulator

- Next Generation Drivetrain (2012)
  - Mid-speed drivetrain (NREL)
  - Fully superconducting generator
    (Advanced Magnet Lab)
Past Wind Program Projects

- Clemson University Restoration Institute (CURI) Drive Train Test Facility (2009)
  - $45M investment from DOE
  - 7.5MW and 15MW capacity
  - Grid simulator
Past Wind Program Projects

- Offshore Wind Demonstration FOA projects (2013)
  - 7 projects
  - Achieve large cost reductions over existing offshore wind technologies
Past Wind Program Projects

• Scaled Wind Farm Technology (SWIFT) facility (2013)
  – 3 Vestas V27 turbines
  – Turbine to turbine interaction
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<th>Prior Year Priorities</th>
<th>FY 14-18 Priorities</th>
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<td>Component optimization</td>
<td>System-level wind plant performance optimization (plant LCOE)</td>
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<td>(turbine LCOE)</td>
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<tr>
<td>American Reinvestment and Recovery</td>
<td>Leverage U.S. manufacturing and U.S. domestic component production</td>
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<td>Act investments (ARRA)</td>
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<td>Begin offshore wind initiative</td>
<td>Focus on major offshore wind demonstration project and creating a sustainable U.S.</td>
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<td>Grid integration and resource</td>
<td>EERE-level cross-program collaboration on optimizing grid integration for RE sector</td>
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<td>Barriers, siting and permitting (</td>
<td>Increased effort on reducing barriers impacting wind class, including radar-</td>
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<td>stakeholder engagement)</td>
<td>related barriers, to reduce LCOE</td>
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