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







Building U.S. Offshore Wind: Advanced Technology Demonstration Projects

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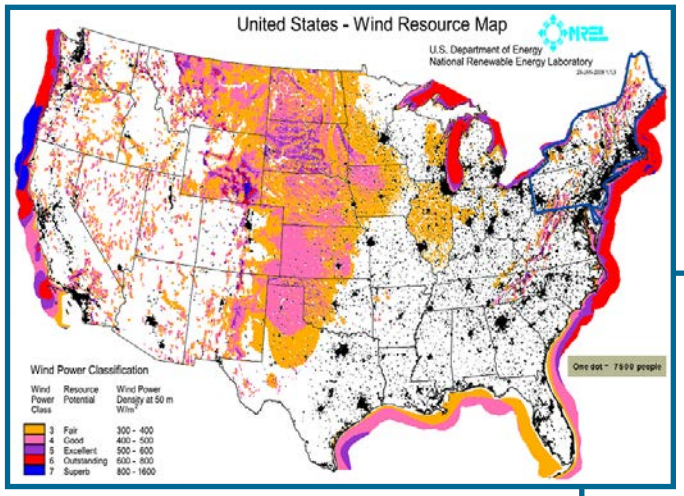
Global State of the Offshore Wind Industry

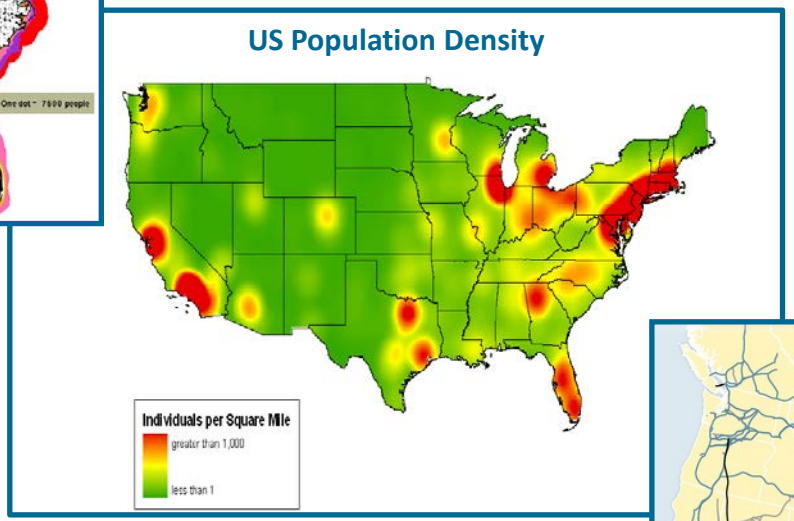
State of the Industry

- 80 projects, 6,800MW installed as of the end of 2013
- Development primarily in Europe to date with the UK leading
- China has over 5 GW approved, with 500 MW under construction
- Trend towards larger direct drive generators
- Japan is investing in floating technology development and demonstration

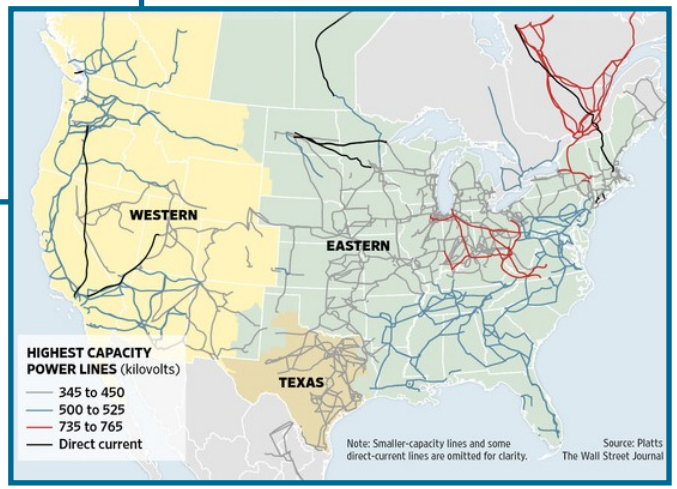
Why Offshore Wind in the U.S.?



Resource



Load



Grid

National Offshore Wind Strategy

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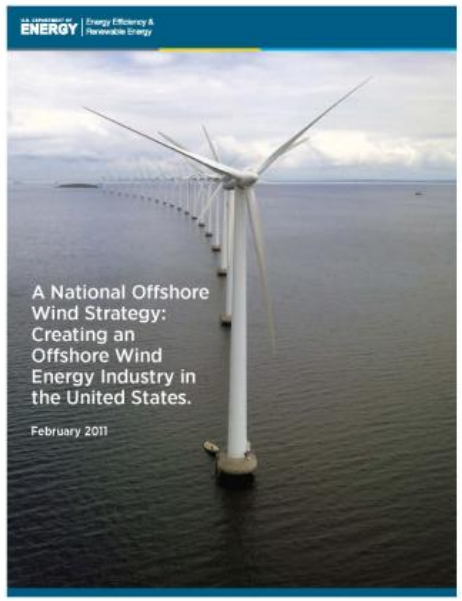
Two Critical Objectives

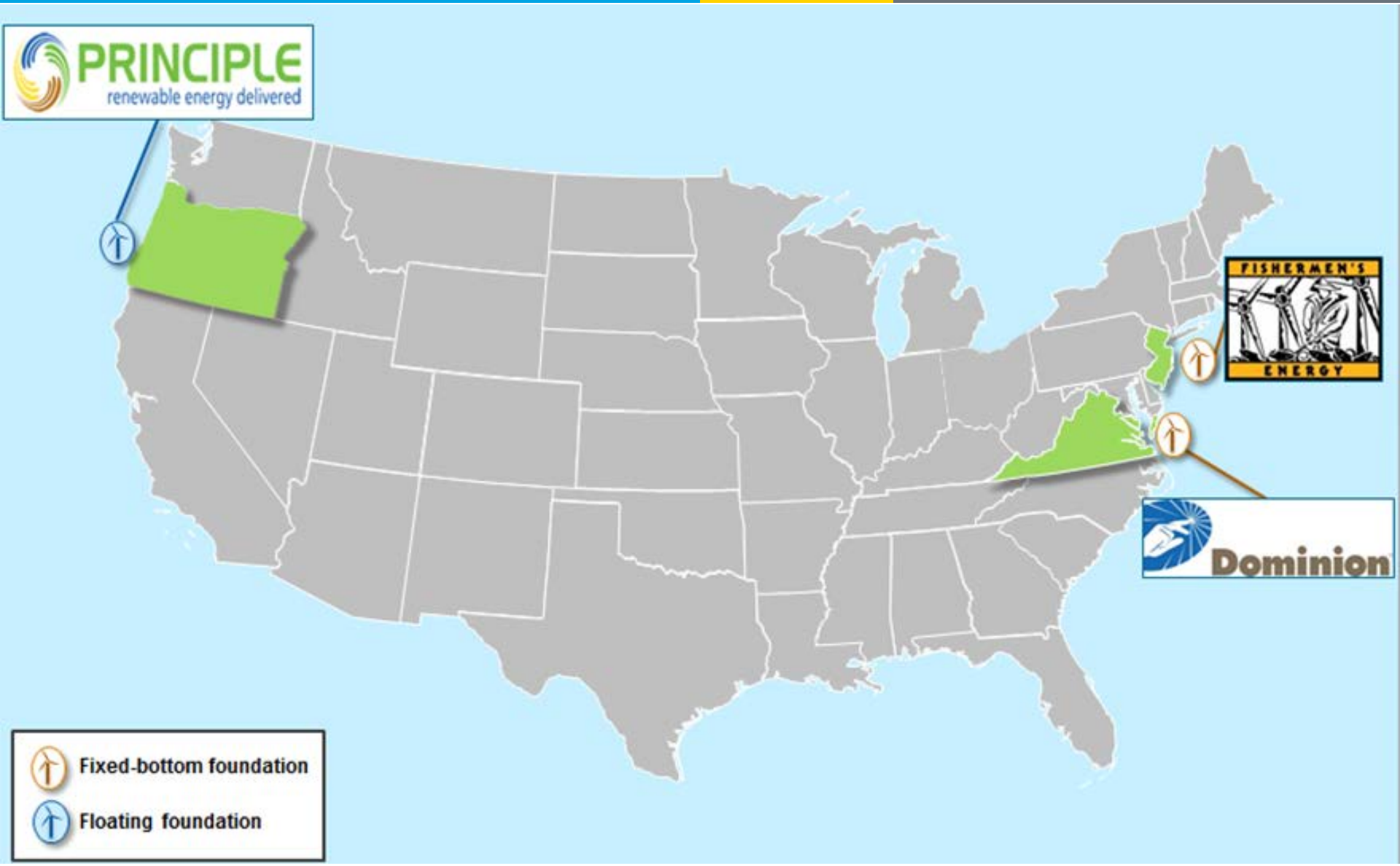
1) Reducing the cost of energy through technology development
2) Reducing deployment timelines and uncertainties



Developed jointly by DOE and DOI

World-Class Test Facilities	Removing Market Barriers	Next Generation Drivetrain R&D	Developing Innovative Technology	Demonstrate Next-Generation Designs
(ARRA Projects)	(Offshore FOA 1)	(Tech. Viability FOA)	(Offshore FOA 2)	(Offshore FOA 3)
Clemson 15 MW Dynamometer	Siting and Permitting	Aggressively Targets Key Cost Components	Computational Tools	Demonstration Project Partnerships with 50% Cost Share
Massachusetts Large Blade Test Facility (to 90m)	Infrastructure		Turbine Design	
	Resource Planning		Marine Systems Engineering	
COMPLETED	ONGOING	ONGOING	ONGOING	
$70M	$16.5M	$7.5M	$26.5M	$168M

U.S. Offshore Wind: Advanced Technology Demonstration Projects



Offshore Wind Demonstration Projects: Goals

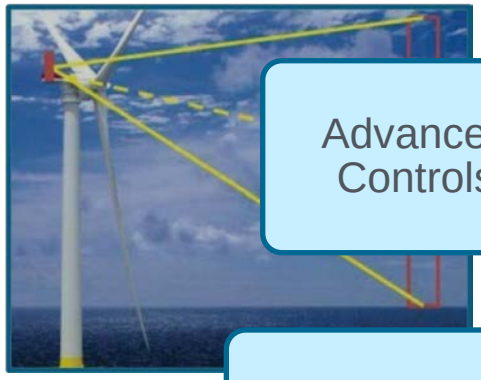
Support the development of a world-leading domestic offshore wind industry that provides clean wind energy to the U.S. and abroad

- Establish commercial scale offshore wind demonstrations to validate technology
- Establish an infrastructure and supply chain for the domestic offshore wind industry
- Facilitate development of the regulatory framework for domestic offshore wind installations

Installed, Commissioned and Grid Connection by the end of 2017

OSW Demonstration Project Goals

- **Install innovative offshore wind systems in U.S. waters, rapidly and responsibly**
- **Drive down the cost of offshore wind with demonstration project innovations**



Advanced Controls

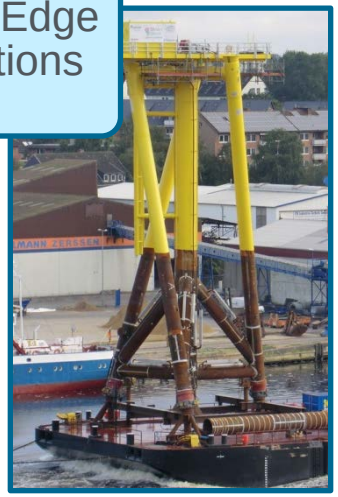
Demonstrating Innovations

Improved Installation Methods

Floating Platforms

Large Direct Drive Turbines

Leading-Edge Foundations



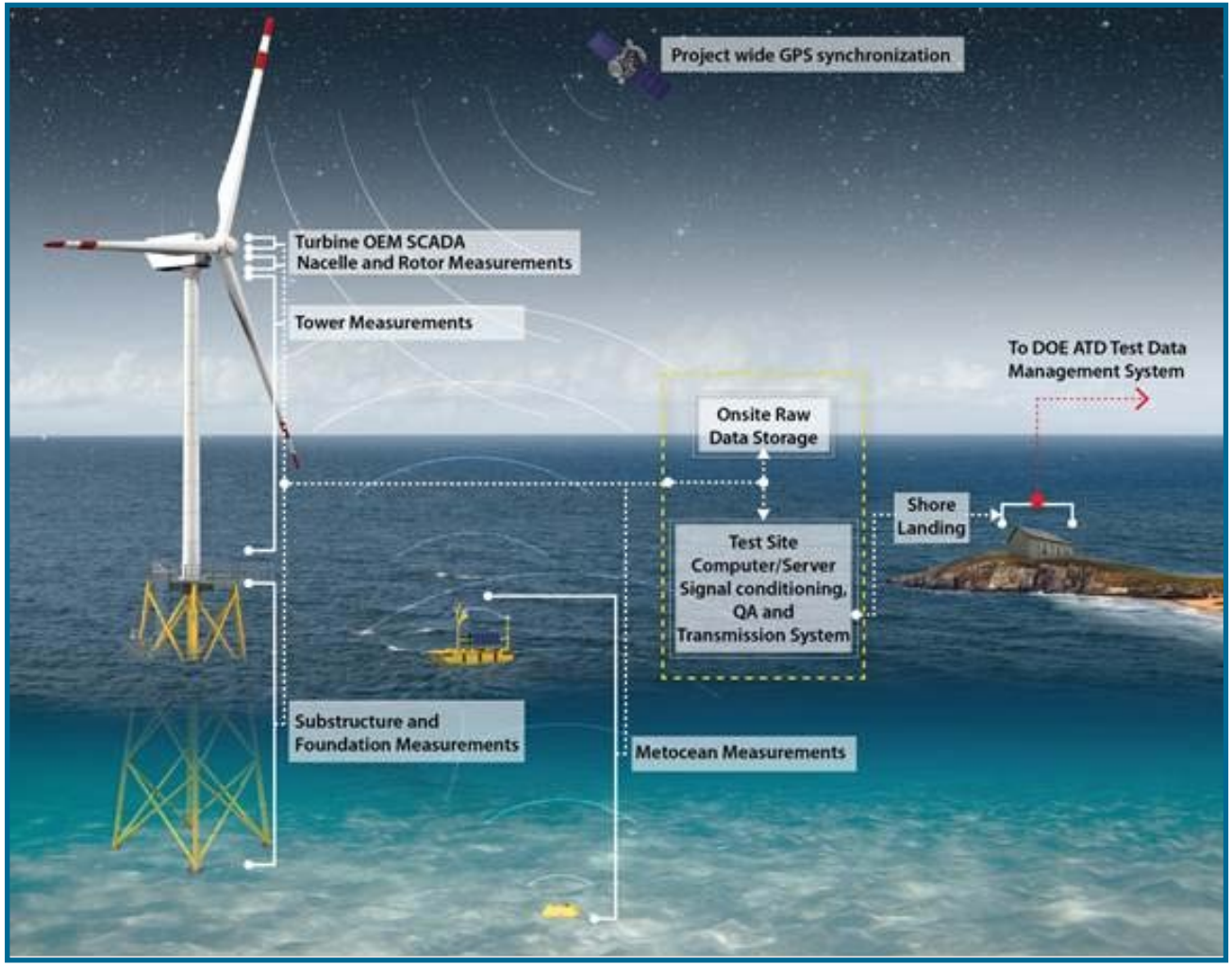
OSW Demonstration Project Goals

Projects to be well instrumented and collect data for 5 years after installation

Measurements

- Metocean Conditions
- Turbine Performance
- Structural Response
- Environmental Impacts

Data will inform future technology development, standards development, environmental and wildlife protection measures, and NEPA and permitting processes, helping promote responsible commercial deployment.



OSW Demonstration Project Goals

- Evaluating current siting and approval processes and identifying opportunities for improvement
- Address public concerns associated with the concept of offshore wind
- Reduce environmental uncertainties by creating an opportunity for learning

Dominion (Virginia Power) VOWTAP Project

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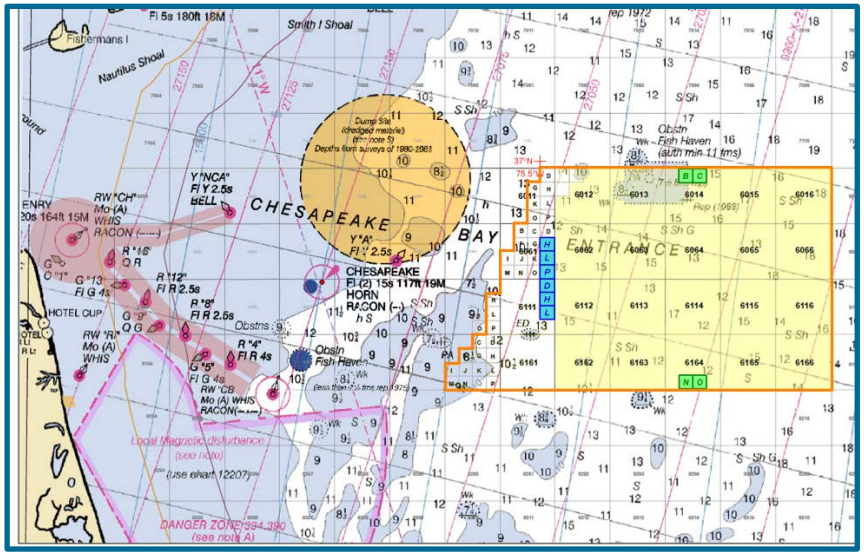
Project Highlights

- 23 nm off Virginia in 25 m of water
- Two 6-MW Alstom direct drive wind turbines
- IBGS foundation
- Advanced feed-forward controls and health monitoring
- Hurricane ride through capabilities
- Adjacent to BOEM Wind Energy Area

Project Partners

Alstom, Keystone Engineering, KBR, NREL, Newport News Shipbuilding and VA DMME



DOE NEPA Process

- BOEM is lead NEPA agency
  - DOE is a Cooperating Agency
  - Efficient use of resources and streamlines the process
  - Enhances agencies ability to adopt environmental documents
- DOE will conduct independent review of EA
  - If DOE concludes its NEPA requirements, comments and suggestions have been satisfied, DOE can adopt the document
  - DOE will issue its own decision document
- DOE/EERE NEPA documents are posted at: http://www.eere.energy.gov/golden/Reading_Room.aspx

Contacts

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Manages DOE NEPA Process for Offshore Wind Demo Projects

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Manages Offshore Wind Demonstration Projects

Questions on DOE NEPA may be directed to: gonepa@go.doe.gov

Thank you!

www.wind.energy.gov