U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

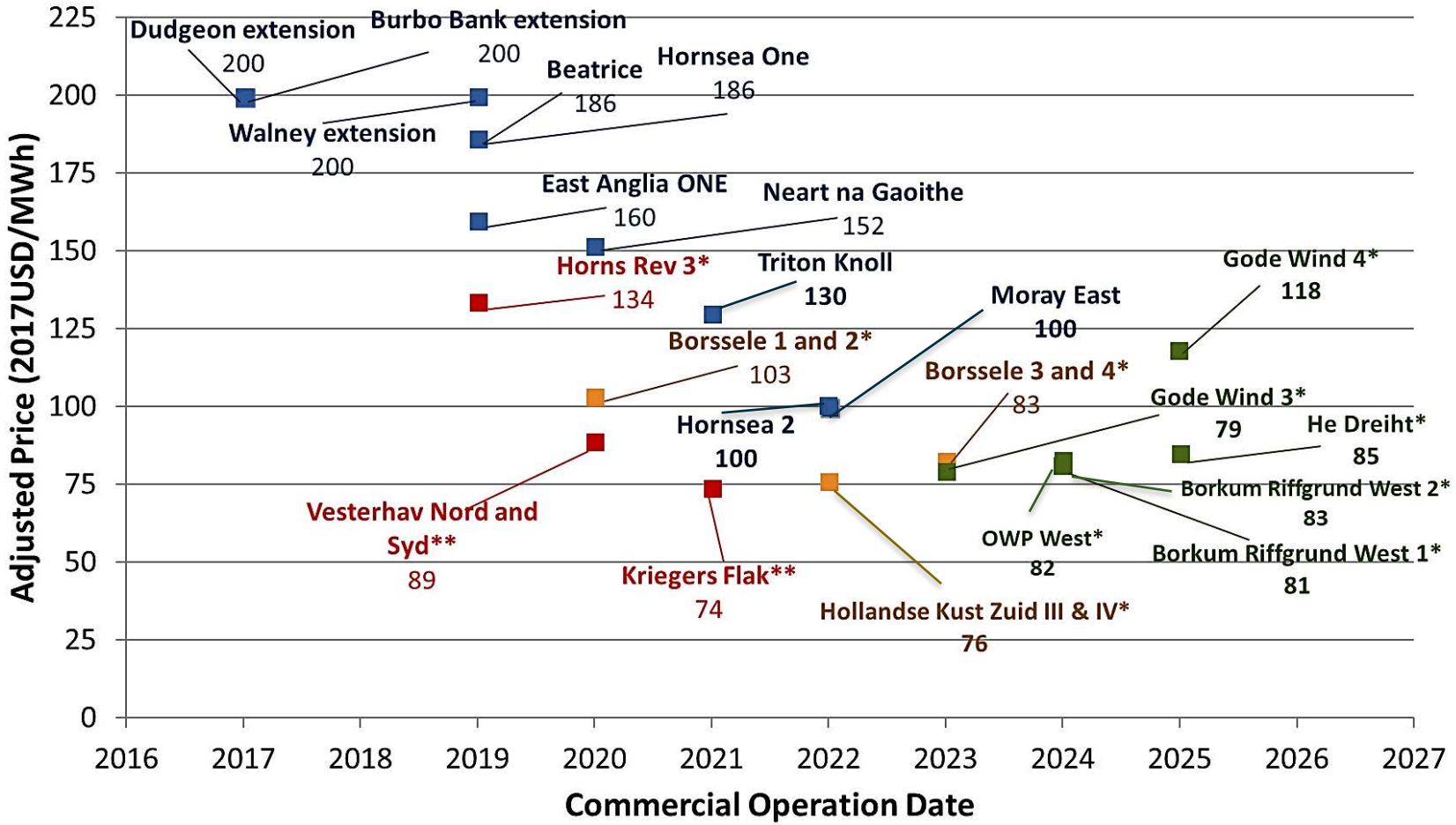
Ocean Renewable Energy Conference

National Laboratories Focus on OSW

September 19, 2018

Patrick Gilman
Wind Energy Technologies Office
US Department of Energy

Industrialization and optimism about technology driving falling EU (and now U.S.) procurement prices – continued R&D crucial

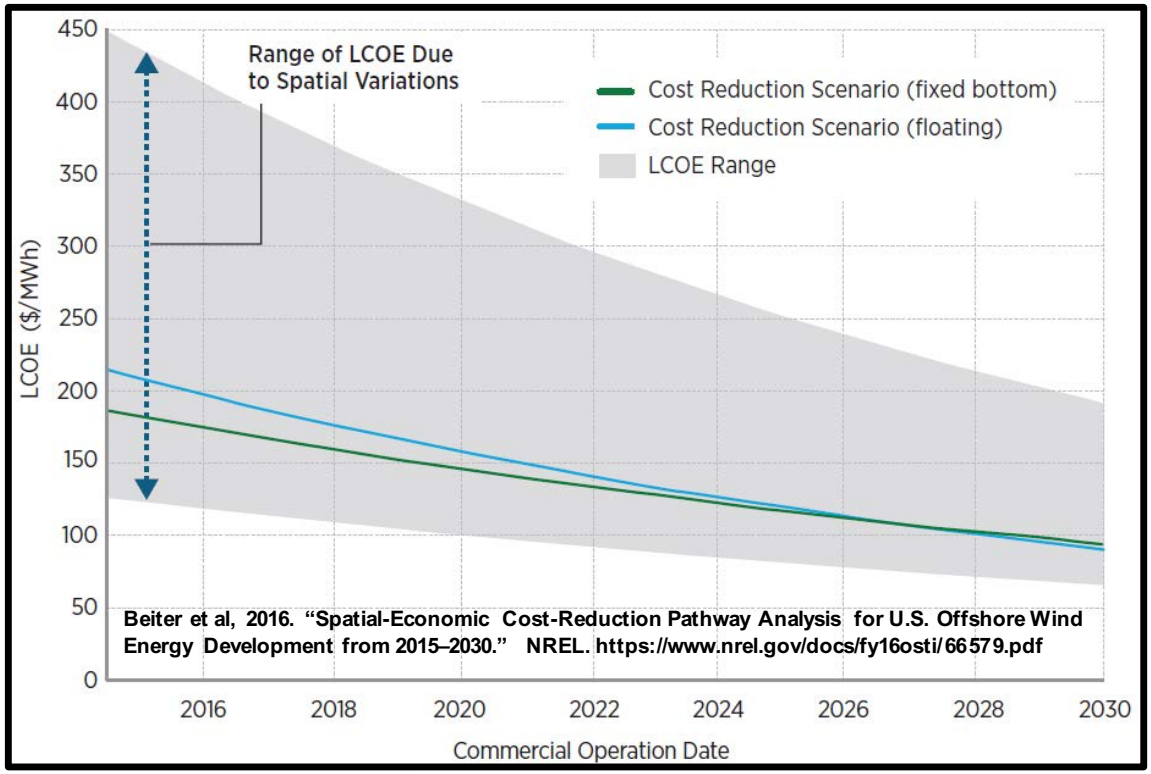


Adjusted Strike Prices from European Offshore Wind Auctions

Notes: *Grid and development costs added; **Grid costs added and contract length adjusted

Sources: NREL Spatial Cost Model; BNEF 2017 (German wholesale price projections); PBL Netherlands Environmental Assessment Agency (2018) (Dutch wholesale price projections)

We can achieve similar cost reductions in the U.S. market

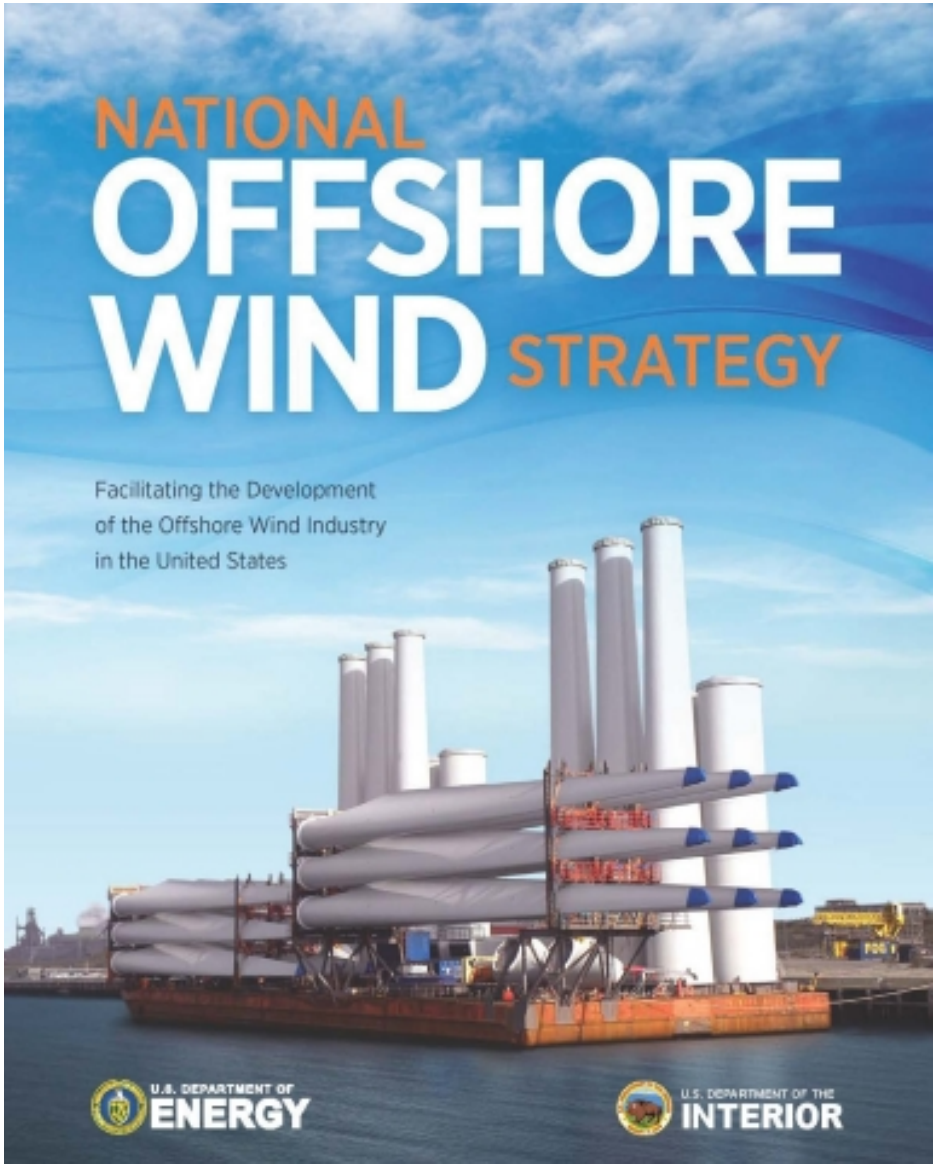


LCOE (in $/MWh): <=100, 100 - 125, 125 - 150, 150 - 175, 175 - 200, 200 - 225, 225 - 250, 250 - 275, 275 - 300, >300

Assuming:

- We can leverage European experience and replicate supply chain maturity
- Adapt and improve technology to fit unique U.S. market and metocean conditions
- For floating systems, optimize from seafloor to blade tip
- But: It's not just cost! Also need to quantify and improve the value of the OSW product

DOE/DOI National Offshore Wind Strategy



Goal: Facilitate the development of a robust and sustainable offshore wind industry in the United States

Three pillars guiding DOE offshore wind R&D investments:

1. **Reducing costs and technology risks**
2. **Supporting effective stewardship**
3. **Increasing understanding of benefits and costs**

Highlights

Offshore Wind R&D Consortium FOA

$18.5M (+$2M to DOE labs) to support fundamental R&D in:

- Offshore Wind Plant Technology Advancement
- Resource and Site Characterization, and Installation
- O&M and Supply Chain Technology Solutions

NYSERDA Selected as Administrator; RCG, Carbon Trust, NREL key partners

- Currently in contract negotiations
- Roadmap published by AWEA Offshore
- **First call for proposals out in early 2019**

Advanced Wind R&D to Reduce Costs and Environmental Impacts FOA

$6M to support the development and validation of advanced technology to reduce environmental impacts

- Topic Area 3: Development and Validation of Offshore Wind Monitoring and Mitigation Technologies

2017 Offshore Wind Technologies Market Update

Deep insight on global deployment, technology and cost trends

The Panel – National Labs Focus on Offshore Wind

Moderator:

- Patrick Gilman, U.S. Department of Energy

Speakers:

- Amy Robertson, National Renewable Energy Laboratory
- Jesse Roberts, Sandia National Laboratory
- Will Shaw, Pacific Northwest National Laboratory
- Dev Millstein, Lawrence Berkeley National Laboratory

Format:

- 10-12 minute presentations
- Moderated Q&A