

# OFFSHORE WIND POWER

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## PROS & CONS

## What is the working group charge?\*

- To study how Delaware can participate in developing offshore wind
- To identify ways to leverage relevant economic opportunities
- To make specific recommendations for engaging in the development of offshore wind for Delaware

\*Executive Order 13

## What to consider in the process?\*

- Review of pertinent laws and regulations governing offshore wind
- Environmental benefits of developing offshore wind
- Economic opportunities presented by the offshore wind industry
- The benefits and costs of developing offshore wind
  - Environmental & Health benefits
  - Energy market impacts
  - Economic opportunities
  - Rate impacts
- Barriers and opportunities in developing offshore wind

\*Executive Order 13

## Pertinent laws and regulations (I)

- Compliance with Section 388 of the Energy Policy Act of 2005 to obtain a lease on the Outer Continental Shelf (OCS) for alternative energy projects, including offshore wind. (Bureau of Ocean Energy Management, BOEM)
- Compliance with Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf (REAU) rule
- Environmental compliance review under the National Environmental Policy Act

## Pertinent laws and regulations (II)

- Environmental compliance with the Coastal Zone Management Act, Magnuson-Stevens Fishery Conservation and Management Act, National Historic Preservation Act (Section 106), Endangered Species Act (Section 7), Clean Air Act and the Migratory Bird Treaty Act.
- Permits from the U. S. Coast Guard, National Oceanic and Atmospheric Administration, Environmental Protection Agency, U.S. Fish and Wildlife Service, U. S. Army Corps of Engineers, Federal Aviation Administration, U.S. Geological Survey and Department of Defense.

## Pertinent laws and regulations (III)

- Federal/PJM Interconnection Planning Studies and Interconnection Requirements
  - 7 Del. C., Chapter 70, Compliance with Delaware Coastal Zone Management Act
  - 7 Del. C. Environmental and Land Use Permitting
  - Other local laws and regulations
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- Certificate of Public Convenience and Necessity from the Delaware PSC

## Offshore Wind Plant Size

- Maryland total retail sales for 2015 was 61,781,719 MWhrs\*
- Delaware total retail sales for 2015 was 11,498,205 MWhrs\*
- Delmarva Power retail sales was 8,257,824 MWhrs\*
  
- Maryland anticipates a 368 MWs\*\* of offshore wind
- Proration to Delaware provides for an equivalent 68 MWs
- Proration to Delmarva power would be 49MWs
  
- Presentation looks at potential impacts of 50 MW and 200 MW offshore wind plants with proration from the Maryland Report

\*U.S. Energy Information Administration, State Energy Profiles for 2015

\*\*Based on Levitan & Associate Report to the Maryland Commission, Revised March 17, 2017

## Environmental Benefits\*

- Displaced Generation - With no requirement for additional generation to meet load or reliability requirements, the benefits of offshore wind are primarily those related to the reduced air emissions and water usage from the displaced PJM generation.
- Level of displaced generation is dependent on the size of the proposed offshore wind facility but for Delaware would most likely be a marginal gas generation unit.
- 50 Megawatts would displace 2.5 million tons of CO<sub>2</sub>, 3,400 tons of NO<sub>x</sub>, and 30 tons SO<sub>2</sub> over life of plant
  - CO<sub>2</sub> is 0.14% of RGGI annual target at a cost of \$10-14.4 million/yr.
  - \$124 million in health care benefit over life of plant
- 200 Megawatt plant would displace 9.9 million tons of CO<sub>2</sub>, 13,686 tons of NO<sub>x</sub> and 118 tons of SO<sub>2</sub> over life of plant
  - CO<sub>2</sub> is 0.57% of RGGI annual target at a cost of \$40-57.8 million /year
  - \$490 million in health care benefit over life of plant

\*Based on Levitan & Associate Report to the Maryland Commission, Revised March 17, 2017



## Energy Market Impacts\*

- Market impacts could include Energy, Capacity, Ancillary Services and REC price impacts.
- 50 Megawatt Plant in DPL Zone would:
  - Reduce one megawatt of energy costs by 1.8 cents (21.6 cents/yr)
  - Reduce one megawatt hour of capacity by 1.4 cents (16.8 cents/yr)
  - Residual average REC price impacts would be minimal
- 200 Megawatt Plant in DPL Zone would:
  - Reduce one megawatt of energy cost by 7.2 cents (86.4 cents/yr)
  - Reduce one megawatt-day capacity by 5.6 cents (67.2 cents/yr)
  - Residual average REC price impacts would be minimal
- 50 Megawatt Plant saves \$0.38 per megawatt-hour per year
- 200 Megawatt Plant saves \$1.54 per megawatt-hour per year

\*Based on Levitan & Associate Report to the Maryland Commission, Revised March 17, 2017

## Economic Opportunities

- Based on the estimates contained in the Maryland Report\* one could expect the following:
  - 50 Megawatt Plant (12.5)
    - \$14.4 million in OREC costs
    - **\$10.0 million best case\*\***
    - 293 FTEs for Construction jobs for 3-4 years
      - \$82 million new business
      - \$3 million in tax revenue
    - 14 FTEs for Operation
      - \$43 million new business
      - \$0.3 million in tax revenue
  - 200 Megawatt Plant (50.0)
    - \$57.8 million in OREC costs
    - **\$40.0 million best case\*\***
    - 1,100 FTEs for Construction jobs for 3-4 years
      - \$288 million new business
      - \$10 million in tax revenue
    - 50 FTEs for Operation
      - \$165 million new business
      - \$1.0 million in tax revenue

\*Based on Levitan & Associate Report to the Maryland Commission, Revised March 17, 2017

\*\*Bloom Energy receives approx. \$8 million annually for 26 MWs of generation.

## Benefit Analysis – 20 Year Life of Plant (not levelized)

- Benefits will depend on two key factors:
  - The size of the offshore wind project under consideration (50-200)
  - The accuracy of economic model forecasts
- CONSTRUCTION FOR 50-200 MW
  - Between 293 and 1,100 FTE's for construction period
  - Between \$82 and \$288 million in new business
  - Between \$3 and \$10 million in tax revenue
- OPERATIONS FOR 50-200 MW
  - Between 14 and 50 FTEs for life of project operations
  - Between \$43 and \$165 million in new business
  - Between \$0.3 and \$1.8 million in tax revenue
- Reduction of 2.5 to 9.9 million tons CO<sub>2</sub>
- Reduction of 3,400 to 13,686 tons NO<sub>x</sub>
- Reduction of 30 to 118 tons of SO<sub>2</sub>
- Reduction of \$124 to \$490 million in health care savings
- Added generation diversity

\*Based on Levitan & Associate Report to the Maryland Commission, Revised March 17, 2017

## Cost Analysis – 20 Year Life of Plant (not levelized)

- The Cost to consumers and business will depend on the size of plant and the allocation across Delaware customers
  - Between \$200 million(10x20) & \$800 million (40x20) -**best case**
  - Between \$288 million (14.4x20) & \$1.156 billion (57.8x20) -**worst case**
- Customer and small business costs for 12,000 Kwhrs
  - 50-200 MW - Based on all Delaware sales
    - Between \$10.44 & \$41.74 per year– **best case**
    - Between \$15.03 & \$60.32 per year -**worst case**
  - 50-200 MW - Based on Delmarva Power sales
    - Between \$14.53 & \$58.13 per year– **best case**
    - Between \$20.93 & \$83.99 per year -**worst case**

# Barriers & Opportunities

- **BARRIERS**

- Legislation to enact appropriate statutes to permit cost recovery mechanism
  - OREC Requirement across all utilities or just Delmarva
  - PPA with Delmarva or joint with all utilities
  - Public financing arrangement via utility tax
- Costs for 50-200 Megawatt Plant
  - For 200 MWs Delaware will spend at least \$800 million over 20 years to:
    - Acquire 50 FTEs (\$800,000 per FTE per year)
    - Acquire \$165 million in permanent new business
    - Acquire \$490 million in health care savings
    - Provide \$1.5 million in energy and capacity savings
    - **Net loss of \$143.5 million (Net loss of \$32.6 million for 50 MW facility)**

- **OPPORTUNITIES**

- Potential development of Delaware City port facilities via financial contribution from developers
- Potential development of Delaware training facility to meet technical certification needs for offshore wind personnel
- Contributions to Small Business and Tourism development

## Concerns

- Each jurisdiction (Massachusetts, Rhode Island, New York, New Jersey & Maryland) have identified their own potential ports as a major East Coast port facility and have required developers to use their specific facilities. The ability for Delaware to evolve as a major East Coast port is limited based on existing restrictions.
- The costs, no matter how allocated, are substantial in comparison to the benefits derived and will be locked in for 20 years at a point in time when prices are declining.
- While an offshore wind project would help meet RPS goals, there are several other less expensive resources that achieve the same result.
- Economic development based on model projections
- Best case scenarios only creates between 14 and 50 FTEs