

NEWPORT NEARSHORE WIND PARK – INITIAL EVALUATION



The wind resources in the Delaware Bay are plentiful and initial evaluations of the wind resource suggests the Newport Nearshore Wind Park is viable. A number of measurements (including wind data from light houses in the Delaware Bay) and findings from recent research on offshore wind farms (Frandsen, 2007¹; Sorensen, 2008²) were plugged into industry-leading computer models to assess the winds off of Fortescue in the Delaware Bay. The resulting models showed that the Newport Nearshore Wind Park, using the widely-used Siemens 3.6 MW offshore wind turbine, could produce up to 1,060 GWhr of electricity, enough to replace 1,000,000 tons of CO2/year and supply up to 126,000 houses in New Jersey annually or 1.75% of all in-state generation³. The Newport Nearshore Wind Park would provide non-polluting, renewable energy that is produced locally in New Jersey. Additionally, the Newport Nearshore Wind Park would provide long-term economic benefits for New Jersey through the employment of hundreds of skilled laborers during the construction and operation phases of the farm as well as through possible tax revenues.

¹ Frandsen, S. et. al., *Summary report: The shadow effect of large wind farms: measurements, data analysis and modeling*. Risø National Laboratory, 2007

² Sørensen, T. et. al., *Adapting and calibration of existing wake models to meet the conditions inside offshore wind farms*. EMD International A/S, 2008

³ 2006 Statistics - Energy Information Administration - Net Generation (megawatthours) - 60,700,139

SIEMENS 3.6 MW OFFSHORE WIND TURBINE⁴

Layout	Park Size		Annual Energy (MWh)	Capacity Factor ⁵
	Nameplate MW	Turbines	Net Result	Net Result
Optimized: All Turbines	381.6	106	1,060,098	31.7
Optimized: Phase1	180	50	500,148	31.7
Optimized: Phase2	104.4	29	294,096	32.1
Optimized: Phase3	97.2	27	275,890	32.4

⁴ based on 10x7 rotor diameter spacing and 0.075 wake decay constant

⁵ Capacity Refers to the percentage of time a wind turbine would operate to produce its annual production if it was operating at nameplate capacity

POWER PRODUCTION FROM THE NEWPORT NEARSHORE WIND PARK

	All Phases	Phase 1	Phase 2	Phase 3
Net Annual Energy Production (MWh) – Siemens 3.6 MW Offshore Wind Turbine	1,060,098	500,148	294,096	275,890
% of New Jersey Net Generation ⁶	1.75	0.82	0.48	0.45
% of New Jersey Total Retail Sales ⁷	1.33	0.63	0.37	0.35
Percentage of Energy Master Plan proposed 30% from renewable sources (21333 GWh)	4.97	2.34	1.38	1.29
Percentage of Energy Master Plan proposed offshore generation (3000 MW)	12.72	6.00	3.48	3.24
Number of New Jersey Houses Served ⁸	125,928	59,400	34,452	32,076

^{6,7} 2006 statistics – Energy Information Administration - Net Generation (megawatthours) - 60,700,139; Total Retail Sales (megawatthours) 79,680,947

⁸ Number of houses served by offshore wind – 33,000/100MW - Energy Master Plan FAQs, State of New Jersey Energy Master Plan website

NEWPORT NEARSHORE WIND PARK COMPARED TO TRADITIONAL GENERATION – POLLUTANT DISPLACEMENT⁹

Fuel	CO2 Emitted Per Kilowatt-hour (kWh) Generated (in pounds)	SO2 Emitted Per Kilowatt-hour (kWh) Generated (in pounds)	NOx Emitted Per Kilowatt-hour (kWh) Generated (in pounds)
Coal	2.13	0.0134	0.0076
Natural Gas	1.03	0.000007	0.0018
Oil	1.56	0.0112	0.0021
US Average	1.52	0.008	0.0049
Wind	0	0	0
Total Displacement (Tons) for Newport Nearshore Project vs. coal	1,129,004.37	7,102.66	4,028.37
Total Displacement (Tons) for Newport Nearshore Project vs. US Average	805,674.48	4,240.39	2,597.24

⁹ "Comparative Air Emissions of Wind and other Fuels" www.awea.org American Wind Energy Association.