Department of Legislative Services

Maryland General Assembly
2012 Session

FISCAL AND POLICY NOTE

Senate Bill 237 (The President, *et al.*) (By Request - Administration)
Finance

Maryland Offshore Wind Energy Act of 2012

This Administration bill creates a "carve-out" for energy derived from offshore wind in the State Renewable Energy Portfolio Standard (RPS), beginning in 2017, and extending beyond 2022. The bill establishes an application and review process for proposed offshore wind projects within the Public Service Commission (PSC). PSC may implement specified special assessments on eligible electricity suppliers to carry out the bill's provisions. The bill also makes changes to the requirement to obtain a certificate of public convenience and necessity (CPCN) for specified persons.

The bill takes effect June 1, 2012.

Fiscal Summary

State Effect: Special fund expenditures from the Public Utility Regulation Fund increase by $806,300 for PSC consulting and staff expenses in FY 2013. Future year expenditures include continued consulting and staff expenses which reflect inflation and annualization. Special fund revenues increase correspondingly from assessments imposed on electricity suppliers. State expenditures increase minimally beginning in FY 2013 as electricity suppliers pass on the cost of assessments to all customer classes. Under one set of assumptions, State expenditures (all funds) increase significantly beginning in FY 2017 due to higher electricity prices. No fiscal impact is anticipated in FY 2012, despite the bill's June 1, 2012 effective date.

(in dollars)	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
SF Revenue	$806,300	$1,194,900	$1,199,500	$77,900	$81,500
SF Expenditure	$806,300	$1,194,900	$1,199,500	$77,900	$81,500
GF/SF/FF Exp.	-	-	-	-	$3,570,000
Net Effect	$0	$0	$0	$0	($3,570,000)

Note:() = decrease; GF = general funds; FF = federal funds; SF = special funds; - = indeterminate effect

Local Effect: Local expenditures increase minimally beginning in FY 2013 as electricity suppliers pass on the cost of assessments to all customer classes. Local expenditures increase significantly beginning in FY 2017 due to higher electricity prices. Revenues are not directly affected.

Small Business Effect: The Administration has determined that this bill has a meaningful impact on small business (attached). Legislative Services concurs with this assessment.

Analysis

Bill Summary: A "qualified offshore wind project" means a wind turbine electricity generation facility, including the associated transmission-related interconnection facilities and equipment, that:

- is located on the outer continental shelf of the Atlantic Ocean in an area designated for leasing by the U.S. Department of the Interior after coordination and consultation with the State in accordance with the Energy Policy Act of 2005 (*See* background for additional information);
- interconnects to the Pennsylvania, New Jersey, Maryland Interconnection, Inc. (PJM), interconnection grid at a point located on the Delmarva peninsula; and
- is approved by PSC, subject to specified requirements.

RPS Changes

Under the State RPS, in 2017 and for every following year, State electricity sales must include an amount derived from offshore wind energy. The amount is set by PSC each year, based on the projected annual creation of "offshore wind renewable energy credits" (ORECs) by qualified offshore wind projects, and may not exceed 2.5% of total retail sales. The portion of RPS that represents offshore wind energy may not apply to electricity sales at retail by any electricity supplier in excess of 75,000 megawatt-hours (MWh) of *industrial* process load to a single customer in a year. The Tier 1 alternative compliance payment schedule does not apply to the portion that is to be derived from offshore wind energy.

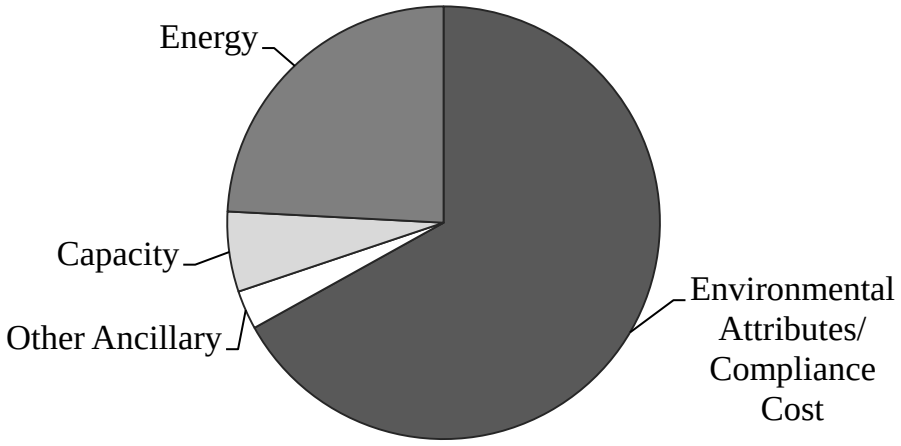
Offshore Wind Renewable Energy Credits

"Offshore Wind Renewable Energy Credit" (ORECs) means a renewable energy credit equal to the generation attributes, including energy, capacity, ancillary services, and environmental attributes of one MWh of offshore wind energy. Legislative Services notes that this is different from other Tier 1 renewable energy credits (RECs) in that the

"generation attributes" of a Tier 1 nonsolar REC in Maryland generally only include the environmental attributes. ORECs as defined in the bill are "bundled" with the energy, capacity, ancillary services, and environmental attributes, whereas other Tier 1 nonsolar RECs are generally "unbundled," meaning the energy, capacity, and ancillary services are not included in the price of the REC. In general, most Tier 1 RECs used for State RPS compliance are traded in a market established by PJM. **Exhibit 1** is a representation of a $200 OREC and its components. Legislative Services notes that, though ancillary services are a component of ORECs in the bill, it is unclear if an offshore wind project could sell ancillary services and, therefore, both PSC and Legislative Services exclude them from their rate payer impact analyses.

Exhibit 1
Component Portions of a $200/MWh OREC

$200/MWh OREC



PJM Market Data
2010

Energy Components	$/MWh	% of Total
Energy	$48.34	73.1%
Capacity	11.97	18.1%
Other Ancillary	5.84	8.8%
Total	**$66.15**	**100.0%**

Source: Maryland Energy Administration for PJM Market Data

PSC Special Assessments

PSC may implement a special assessment of up to $3.0 million total between fiscal 2013 and 2016 only in order to employ consultants and experts as necessary to carry out the bill's provisions. The special assessment is to be imposed only on eligible electric companies and electricity suppliers. PSC may also implement a special assessment on eligible electric companies and electricity suppliers during any fiscal year in which an OREC obligation exists in order to employ staff and recover administrative costs necessary to carry out the bill's provisions, which is not subject to the cumulative cost-recovery limit established in statute for PSC's annual assessment.

Approval Process through PSC

In addition to specified siting and interconnection requirements, a proposed offshore wind project must submit an application to PSC for approval to be a qualified offshore wind project, which will determine the OREC pricing schedule. The approval process begins with an initial application process, which must begin on the later of July 1, 2013, or 180 days after the U.S. Department of Interior issues specified wind energy leases. PSC must set the closing date for the application period and may provide additional application periods at its discretion. PSC must approve, conditionally approve, or deny an application within 180 days, unless the period is extended by mutual consent of both parties. An application must include a detailed description and financial analysis of the project, the proposed method of financing the project, and a cost-benefit analysis, which must include:

- a detailed input-output analysis of the impact of the project on income, employment, wages, and taxes in the State;
- an assessment of jobs to be created by the project, the location, expected duration, type, and salary of each position, with job totals expressed as full-time equivalents;
- an analysis of the anticipated environmental benefits, health benefits, and environmental impacts of the project to the citizens of the State; and
- an analysis of any impact on residential, commercial, and industrial ratepayers over the life of the project.

The application also must include a proposed OREC pricing schedule for the project, which must set a price for the generation attributes of the offshore wind energy, including the energy, capacity, ancillary services, and environmental attributes. Further, the application must include a decommissioning plan for the project, a description of the applicant's plan for corporate diversity, and a plan for engaging small businesses. Finally, PSC may require any other additional information.

PSC must evaluate the project on the following criteria:

- lowest cost impact on ratepayers of the price set under a proposed OREC pricing schedule;
- long-term reliability of the State's electricity supply;
- potential reductions in transmission congestion prices, capacity prices, and locational marginal prices within the State;
- anticipated climate benefits, health benefits, and environmental impacts to the citizens of the State;
- estimated ability to assist in meeting the State's RPS;
- siting and project feasibility;
- the extent to which the cost-benefit analysis submitted by the applicant demonstrates positive net benefits to the State;
- the extent to which the applicant's plans for corporate diversity and engagement of small businesses meet specified goals as established in statute; and
- any other criteria that PSC determines to be appropriate.

PSC may not approve an application unless (1) the proposed project demonstrates positive net benefits to the State; (2) the projected net rate impact, combined with the rate impact of other qualified projects, does not exceed $2 per month for an average residential customer (1,000 kWh per month) in 2012 dollars, *and* does not exceed 2.5% for the average nonresidential customer, over the duration of the proposed OREC pricing schedule; and (3) the price set in the proposed OREC price schedule does not exceed $200 per MWh in 2012 dollars.

PSC must contract the services of independent consultants and experts when calculating the net benefits to the State and in evaluating and comparing applicants' proposed projects.

An order issued by PSC approving a proposed project must (1) specify the price set in the OREC pricing schedule; (2) specify the duration of the OREC pricing schedule, which cannot exceed 20 years; (3) specify the amount of ORECs the project may sell each year; and (4) provide that payment may not be made for an OREC until electricity supply is generated by the project, and that ratepayers and the State are held harmless for any cost overruns associated with the project. The order vests the owner of the qualified project with the right to receive payments for ORECs according to the terms established in the order.

Compliance Process with RPS

PSC must adopt regulations to establish an escrow account to ensure the transparent transfer of ORECs and revenues between an offshore wind generator and electric suppliers. The process established by the bill is as follows:

- The offshore wind generator delivers ORECs to an escrow agent associated with the actual output of the facility and is paid the established OREC price for the number of ORECs in the pricing schedule.
- Electricity suppliers buy ORECs from the escrow agent to meet their offshore wind RPS obligation. The OREC cost is recovered through customer energy charges.
- The offshore wind generator sells all of the energy, capacity, and ancillary services associated with the creation of ORECs directly into PJM markets.
- The offshore wind generator delivers to the escrow agent all revenues associated with energy, capacity, and ancillary service sales.
- The escrow agent refunds the revenue associated with the offshore wind generator's sale of its energy, capacity, and ancillary services to the electric companies, who in turn refund the revenue through a credit to ratepayers subject to RPS.
- The electricity suppliers apply the ORECs toward their annual RPS compliance, as established by PSC.

PSC must establish regulations regarding the transfer and expiration of ORECs created in excess of the OREC pricing schedule.

Certificate of Public Convenience and Necessity

Any person constructing a qualified submerged renewable energy line must obtain a CPCN. A "qualified submerged renewable energy line" means a line (1) carrying electricity supply and connecting a qualified offshore wind generator to the transmission system; and (2) in which the portions of the line crossing any submerged lands or any part of a beach erosion control district are buried or submerged. The Maryland Energy Administration (MEA) is added to the list of State agencies PSC must provide notice to in the event of a CPCN application.

Atlantic Coastal Beaches and Environmental Review

Qualified submerged renewable energy lines are exempt from the existing prohibition on building permanent structures within the Beach Erosion Control District as long as the project does not result in significant permanent environmental damage as determined by

the Department of Natural Resources (DNR). An application for a CPCN to construct a submerged renewable energy line is subject to environmental review by DNR and the Maryland Department of the Environment (MDE). A qualified submerged renewable energy line may not be constructed or installed within the Assateague National Seashore Park or the Assateague State Park.

Current Law:

Maryland's Renewable Energy Portfolio Standard

Maryland's RPS requires that renewable sources generate specified percentages of Maryland's electricity supply each year, increasing to 20%, including 2% from solar power, by 2022. Electricity suppliers must submit RECs equal to the percentage mandated by statute each year, or pay an alternative compliance payment (ACP) equivalent to the supplier's shortfall. RECs are classified as Tier 1, Tier 2, or solar. Examples of Tier 1 sources include solar; wind; qualifying biomass; methane from anaerobic decomposition of organic materials in a landfill or wastewater treatment plant; geothermal; ocean, including energy from waves, tides, currents, and thermal differences; a fuel cell that produces electricity from a Tier 1 renewable source; a small hydroelectric plant of less than 30 MW; poultry litter-to-energy; and waste-to-energy. Examples of Tier 2 sources include a hydroelectric plant of greater than 30 MW. Solar RECs may be generated from photovoltaic cells and residential solar hot water heating systems commissioned in fiscal 2012 or later.

CPCN Requirement

State law specifies that an individual must be granted a CPCN from PSC before beginning construction of an overhead transmission line that is designed to carry a voltage in excess of 69,000 volts, or exercise a right of condemnation with the construction. A person that seeks to construct or modify a generating facility with at least 70 megawatts (MW) must also obtain a CPCN from PSC.

An application for CPCN is reviewed before a hearing examiner in a formal adjudicatory process that includes written and oral testimony, cross examination, and the opportunity for full public participation. The CPCN process constitutes permission to construct the facility and incorporates several required permits, including air quality and water appropriation. The CPCN licensing process provides an opportunity for the State to examine all the significant aspects and impacts of a proposed generation facility or transmission line, including the interrelations between various impacts and cumulative effects.

After receiving an application for CPCN, PSC must send notice to all interested persons, including DNR, MDE, the Maryland Department of Agriculture, the Department of Businesses and Economic Development, the Maryland Department of Transportation, and the Maryland Department of Planning.

PSC – Assessments

The costs and expenses of PSC and the Office of People's Counsel (OPC) are paid by the public service companies (electric companies, gas companies, and others) that are subject to PSC jurisdiction through an annual assessment. Each public service company is charged an assessment based on the ratio of the annual gross operating revenues for the public service company derived from intrastate utility and electricity supplier services and the annual gross operating revenues of all public service companies for those services. Expenses of PSC must be approved through the annual budget process. Any unspent funds must be deducted from the appropriation for the next fiscal year before PSC determines the amount to be paid by each public service company for the next fiscal year. The total assessment charged to a public service company in a fiscal year may not exceed 0.17% of the company's gross operating revenues derived from intrastate utility and electricity supplier operations for expenses incurred by PSC and 0.05% for expenses incurred by OPC.

Atlantic Coastal Beaches

For the purposes of maintaining the Atlantic Coast beaches of the State and the Beach Erosion Control District, permanent structures within the Beach Erosion Control District are prohibited. Certain purposes, such as the placement of public utility pipelines carrying treated sewage effluent, are exempt from this prohibition.

Background:

PSC – New Generation Planning

In September 2011, at the end of a process that started with Case Number 9214, which was initiated by PSC to investigate whether it should exercise its authority to order electric companies to enter into long-term contracts to create new generation in the State, PSC required each investor-owned electric company to issue a request-for-proposals (RFP) inviting interested persons to submit proposals to PSC to construct new generation facilities that would produce and sell electricity to the investor-owned electric companies. The RFP requires that a proposal for new generation facilities (1) must include the sale of capacity and energy; (2) must be for a new natural gas-fired unit, not exceeding 1,500 MW in nameplate capacity (the maximum rated output of a generator under ideal conditions); and (3) must be located inside the Southwestern Mid-Atlantic Area Council

(SWMAAC) Locational Deliverability Area. SWMAAC includes the PJM BGE Zone and PJM PEPCO Zone. Further, the RFP requires responses to include a description of other reliability, economic, socioeconomic, and environmental benefits that are likely to be realized in the State as a result of the new generation facility.

Offshore Wind Development

Recent changes in federal regulations established the U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM) as the federal agency responsible for overseeing the safe and environmentally responsible development of energy and mineral resources on the Outer Continental Shelf (OCS). BOEM has relied on intergovernmental task forces in several states, including Maryland, to prepare for granting leases, easements, and rights-of-way for offshore renewable energy development activities, such as the siting and construction of wind generation facilities on OCS. MEA is the lead agency for Maryland's State/Federal Offshore Wind Task Force. On February 2, 2012, BOEM designated 80,000 acres of water off the coast of Maryland as suitable for wind farms, and issued a lease form to streamline the issuance of leases off much of the east coast.

In response to the BOEM request for interest (RFI), in January 2011, nine indications of interest were received from eight parties wishing to obtain a commercial lease for wind energy projects in the Maryland portion of OCS. The area off of Maryland is made up of 29 whole OCS blocks and 4 partial OCS blocks. The western edge is approximately 10 nautical miles from the Ocean City, Maryland coast, and the eastern edge is approximately 27 nautical miles from the Ocean City, Maryland coast. The entire area is approximately 207 square nautical miles.

New Jersey's Offshore Wind Carve-out

In 2010, New Jersey became the first state to establish an OREC carve-out in its RPS. The carve-out is for at least 1,100 MW of capacity, which is significantly more than what this bill would support, given its cost-containment measures. The program allows for tax credits and financial assistance to qualified offshore wind projects and related manufacturing and assembling facilities. The New Jersey Board of Public Utilities adopted regulations for the program in February 2011, and announced it was seeking applications for offshore wind projects in May 2011. As of June 2011, 11 offshore wind energy developers have expressed interest with BOEM in leasing federal land off the coast of New Jersey.

The Economics of Offshore Wind

Offshore wind generating facilities have a higher installation cost per unit of generating capacity than onshore wind facilities. Costs for offshore facilities are higher due to turbine upgrades needed for operation at sea; turbine foundations; and nonturbine components, including interconnection and installation. The resulting lifecycle costs of an offshore generator cause energy produced by such a generator to be more expensive than conventional power sources. In an October 2010 report, the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) estimated future installed project costs for offshore wind at $4,250 per kilowatt (kW) based on energy market surveys. Legislative Services notes that NREL has since updated their data on their website, and now reports a weighted-average capital cost of approximately $5,000 per kW. This equates to a $2 billion installation cost for a 400-MW facility, and a $3 billion installation cost for a 600-MW facility. Operating and maintenance costs of offshore facilities are also higher, though because the industry is still in its early stages, forecasts of these life-cycle costs remain difficult; however, the Maryland Long-Term Electricity Report (LTER), prepared for the Maryland Department of Natural Resources, estimate is $73.88 annually per kW.

Legislative Services further notes that projected installed project costs for offshore wind projects in the United States show significant variation, ranging from under $3,000 per kW to over $6,000 per kW, and that these cost uncertainties underline the need for the thorough project analysis as required by the bill. For example, the installed project cost for the 400-MW Cape Wind project in Massachusetts has been estimated at $6,500 per kW, though exact costs have not been released to the public. Further, capital costs for proposed offshore wind projects are over 50% higher than capital costs for projects installed between 1991 and 2006, due to increased demand for turbines, supply chain bottlenecks, increased project complexity, and higher commodity prices.

Power Purchase Agreement

The OREC model is just one way for a state to develop offshore wind energy generation. A previously more prevalent model, and the proposed model in the Maryland Offshore Wind Energy Act of 2011 (SB 861/HB 1054), is the long-term power purchase agreement (PPA). Under that legislation, State investor-owned utilities would have been contractually obligated to pay for the energy, capacity, ancillary services, and environmental attributes generated from a qualified offshore wind project. The investor-owned utilities would then have been required to sell the energy and other products into the available markets. PSC would have established a nonbypassable charge or other mechanism to ensure that any costs or savings associated with the obligation to purchase energy or other products from a qualifying offshore wind generator were shared among all customers and distribution territories.

To date, two U.S. offshore wind generators have PPAs with utilities. **Exhibit 2** shows the prices and terms of these PPAs, which include the electricity and environmental attributes. Legislative Services notes that the developer NRG Bluewater Wind put active development of the Mid-Atlantic Wind Park off the coast of Delaware on hold, citing Bluewater's inability to find an investment partner. Bluewater cancelled its PPA with Delmarva Power & Light in December 2011.

Exhibit 2
Announced PPA Prices for U.S. Projects under Development

Project Name	Developer Name	Power Purchaser	Capacity Contracted (MW)	PPA Price (¢ per kWh)	PPA Base Year	Escalator (%)	Term (Years)
Cape Wind	Cape Wind Associates	National Grid	234	18.70	2013	3.5	15
Block Island Wind Farm	Deepwater Wind	National Grid	28.8	23.75	2010	3.5	20

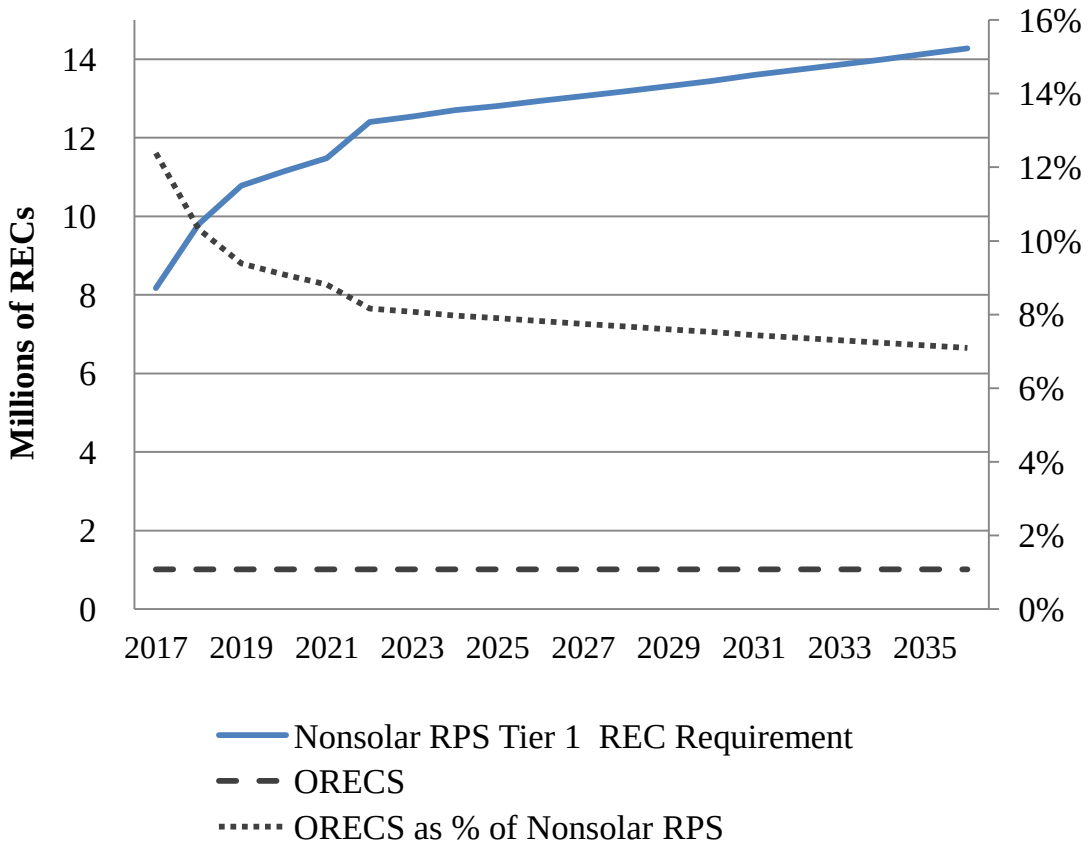
Source: U.S. Department of Energy, National Renewable Energy Laboratory

Federal Tax Credits

Two important federal tax credits available for wind energy generation facilities are the federal Investment Tax Credit (ITC) and the federal Production Tax Credit (PTC). The American Recovery and Reinvestment Act of 2009 allows facilities eligible to take the ITC or PTC to instead receive a grant from the U.S. Treasury Department. (Only one credit or grant may be taken). The ITC for wind energy is equal to 30% of the basis of the property (*i.e.*, the cost), while the PTC is a $22 per-MWh tax credit for qualifying renewable energy technologies which applies for the first 10 years of a generation facility's operation. Both credits will expire at the end of 2012 without an extension from the federal government, and there remains some uncertainty as to whether or not either credit will continue. The credits allow renewable energy generation facilities to sell electricity below their production costs and therefore compete with traditional energy sources. Therefore, the credits remain important determinants to the decision to construct a proposed wind farm. For example, one of Bluewater's cited reasons for halting development off the coast of Delaware was the uncertainty of the continuation of federal incentives.

To date, electricity suppliers generally have been able to meet their nonsolar RPS obligations through the submission of RECs, with little reliance on ACPs. However, Legislative Services notes that nearly all of the Tier 1 RECs generated in the State are from black liquor (a byproduct of paper manufacturing), landfill gas, and hydroelectric at 61.9%, 24.5%, and 11.9%, respectively. An offshore wind generator of a size consistent with the rate-cost caps in the bill has the potential to produce between 6% and 12% of the Tier 1 RECs necessary for compliance. **Exhibit 3** shows the nonsolar RPS requirement, the potential generation from a 294-MW offshore wind generator (the maximum size of a project as determined by a PSC analysis under baseline conditions), and the percentage of the Tier 1 nonsolar RPS requirement the ORECs would satisfy.

Exhibit 3
Annual Tier 1 Nonsolar RPS Requirement Versus
Annual ORECs from 294-MW Offshore Wind Generator



Source: Public Service Commission, Maryland Long-Term Electricity Report Data

State Fiscal Effect:

Public Service Commission Administrative Costs and Special Assessment

Special fund expenditures from the Public Utility Regulation Fund increase by $806,254 in fiscal 2013, which accounts for a 120-day start-up delay. This estimate reflects the cost of hiring independent consultants to review the cost-benefit analysis and ratepayer impact calculations included within offshore wind developer applications, and of hiring one accountant *half time* and one regulatory economist *half time* within PSC to design and implement the regulations associated with ORECs, establish OREC requirements, and reconcile account balances. It includes salaries, fringe benefits, one-time start-up costs, and ongoing operating expenses.

Position(s)	1
Consulting Expenses	$750,000
Salaries and Fringe Benefits	49,631
Equipment and Operating Expenses	6,623
Total FY 2013 PSC Expenditures	**$806,254**

Future year expenditures reflect full salaries with annual increases and employee turnover as well as annual increases in ongoing operating expenses. Fiscal 2014 and 2015 expenditures also reflect $1,125,000 per year for independent consultants.

Special fund revenues to the Public Utility Regulation Fund increase correspondingly in all years from assessments imposed by PSC on electricity suppliers. Specifically, special fund revenues increase in aggregate by $3.0 million in fiscal 2013 through 2015 from the special assessment authorized under the bill to cover the costs of independent consultants, and special funds revenues increase in aggregate by $359,935 in fiscal 2013 through 2017 from an increase in the annual assessment issued by PSC in order to cover PSC's administrative costs to implement the bill.

State Electricity Expenditures

The incremental cost associated with an offshore wind energy carve-out will be absorbed by all electric customers and allocated to different rate classes by PSC. As an electric customer, State agencies and the University System of Maryland used approximately 1.5 million MWh of electricity in fiscal 2010. One baseline estimate by PSC shows a rate increase of $0.00205/kWh in 2017, in 2011 dollars, which yields a total annual increase of $3.57 million across all State agencies and USM in fiscal 2017.

State expenditures on electricity also increase minimally beginning in fiscal 2013, as PSC costs ($3,359,935 over a five-year period) are recovered through assessments

charged to electric companies and gas companies, which are passed on to electric customers, including the State.

Local Fiscal Effect: Counties and municipalities use electricity for street lighting, wastewater treatment plants, office facilities, and recreational facilities. Local school systems are also large consumers of electricity. Thus, local government expenditures on electricity also increase minimally beginning in fiscal 2013, due to PSC assessments charged to electric companies and gas companies. Local government expenditures for electricity increase significantly beginning in fiscal 2017.

Additional Comments: PSC advises, and Legislative Services concurs, that it is very difficult to estimate the amount of energy that would be excluded under the bill's annual cost-allocation maximum of 75,000 MWh per industrial customer, and that the effect will depend in particular on the definition of "customer," as opposed to the usual definition of "account." However, it would be unlikely to increase rate and bill impacts by more than 1% or 2%.

PSC Impact Calculations, AEO and LTER Baseline Estimates

Appendix A summarizes some of the factors that influence estimates of the costs of an offshore wind generation facility. PSC has calculated many potential residential and commercial and industrial (C&I) rate impacts, using energy forecasts from both the U.S. Energy Information Administration's Annual Energy Outlook (AEO) and the LTER. **Exhibit 4** shows the findings for the baseline of each forecast. Legislative Services notes that PSC also calculated impacts under high and low energy cost scenarios. A larger project is also possible under the LTER assumptions, however this assumption projects higher energy prices than AEO moving forward. The maximum size for a project under LTER assumptions is 294 MW, while the maximum size under AEO assumptions is 268 MW.

Exhibit 4
Ratepayer Impacts – $200/MWh OREC
LTER and AOE Baseline Scenarios – 20-year Project Life
(In 2011 Dollars)

	$200/MWh OREC	
Baseline Energy Forecast	**AEO**	**LTER**
Project Nameplate Capacity (MW)	268	294
Base Case Market Values		
Total Payments to Wind Project	$3,654,725,303	$4,048,591,680
Total Market Value of Wind Production	$1,110,567,842	$1,548,202,315
Total Net Cost for Wind Project To Be Recovered From Ratepayers	$2,544,157,461	$2,500,389,365
Average Rate Impact (Over Life of Wind Project) to All Customers (C&I and Residential) $/kWh:	0.0017	0.0016
C&I Average Bill Impact %:	1.8%	1.9%
Residential Average Bill Impact %:	1.8%	1.2%
Residential First Year Monthly Bill Impact $/Bill:	$2.04	$2.05
Residential Maximum Monthly Bill Impact $/Bill	$1.81	$1.74
Residential Average Monthly Bill Impact $/Bill:	$2.04	$2.05

Source: Public Service Commission

Legislative Services Sensitivity Analysis of Rate Impacts

For illustrative purposes only, as shown in **Exhibits 5** and **6**, Legislative Services has calculated the potential residential and C&I impacts, by nameplate capacity of an offshore wind generation facility, and the incremental cost between a $200 OREC and conventional electricity and capacity. Similarly, **Exhibits 7** and **8** calculate the potential residential and C&I impacts by capacity factor and total State energy sales. For consistency, Legislative Services assumes the same generation, prices, capacity factor, number of residential ratepayers, and energy consumption profiles as PSC in its "LTER Baseline $200 REC Scenario" in year 2017. A detailed breakdown of the various costs under PSC assumptions, calculated by Legislative Services, is included in **Appendix B** for the years 2017 and 2030. Legislative Services notes that the primary drivers of ratepayer impacts are the size of the project, conventional energy prices, and total State energy sales.

Exhibit 5
Monthly Household Bill Increase by Nameplate Capacity and PJM Wholesale Energy Rate ($/MWh) – 2017
(In 2011 Dollars)

PJM Wholesale Energy Rate ($/MWh)	Nameplate Capacity (MW) 250	275	300	325	350
130	$0.93	$1.02	$1.11	$1.20	$1.30
120	1.06	1.16	1.27	1.38	1.48
110	1.19	1.31	1.43	1.55	1.67
100	1.32	1.46	1.59	1.72	1.85
95	1.39	1.53	1.67	1.81	1.94
90	1.46	1.60	1.75	1.89	2.04
85	1.52	1.67	1.83	1.98	2.13
80	1.59	1.75	1.91	2.06	2.22
75	1.65	1.82	1.99	2.15	2.31
70	1.72	1.89	2.06	2.24	2.41
65	1.79	1.97	2.14	2.32	2.50
60	1.85	2.04	2.22	2.41	2.59
55	1.92	2.11	2.30	2.50	2.68
50	1.99	2.18	2.38	2.58	2.78

Note: Shaded areas represent ratepayer impacts in excess of those authorized by the bill.
Source: Department of Legislative Services

Exhibit 6
Percentage Increase in C&I Rates by Nameplate Capacity and PJM Wholesale Energy Rate ($/MWh) – 2017

PJM Wholesale Energy Rate ($/MWh)	Nameplate Capacity (MW) 250	275	300	325	350
130	0.99%	1.09%	1.19%	1.29%	1.39%
120	1.13%	1.25%	1.36%	1.47%	1.59%
110	1.28%	1.40%	1.53%	1.66%	1.78%
100	1.42%	1.56%	1.70%	1.84%	1.98%
95	1.49%	1.64%	1.79%	1.93%	2.08%
90	1.56%	1.71%	1.87%	2.03%	2.18%
85	1.63%	1.79%	1.96%	2.12%	2.28%
80	1.70%	1.87%	2.04%	2.21%	2.38%
75	1.77%	1.95%	2.13%	2.30%	2.48%
70	1.84%	2.03%	2.21%	2.39%	2.58%
65	1.91%	2.10%	2.30%	2.49%	2.68%
60	1.98%	2.18%	2.38%	2.58%	2.78%
55	2.05%	2.26%	2.47%	2.67%	2.88%
50	2.13%	2.34%	2.55%	2.76%	2.97%

Note: Shaded areas represent ratepayer impacts in excess of those authorized by the bill.
Source: Department of Legislative Services

Exhibit 7
Monthly Household Bill Increase by Nameplate Capacity and Total State Energy Sales – 2017
(In 2011 Dollars)

Total MD Energy Sales (Gwh)	Nameplate Capacity (MW) 250	275	300	325	350
80,000	$1.42	$1.56	$1.70	$1.85	$1.99
78,000	1.46	1.60	1.75	1.89	2.04
76,000	1.49	1.64	1.79	1.94	2.09
74,000	1.54	1.69	1.84	2.00	2.15
72,000	1.58	1.74	1.89	2.05	2.21
70,000	1.62	1.79	1.95	2.11	2.27
68,000	1.67	1.84	2.00	2.17	2.34
66,000	1.72	1.89	2.07	2.24	2.41
64,000	1.78	1.95	2.13	2.31	2.49
62,000	1.83	2.02	2.20	2.38	2.57
60,000	1.89	2.08	2.27	2.46	2.65

Note: Shaded areas represent ratepayer impacts in excess of those authorized by the bill.
Source: Department of Legislative Services

Exhibit 8
Percentage Increase in C&I Rates by Nameplate Capacity and Total State Energy Sales – 2017

Total MD Energy Sales (Gwh)	Nameplate Capacity (MW) 250	275	300	325	350
80,000	1.52%	1.67%	1.83%	1.98%	2.13%
78,000	1.56%	1.72%	1.87%	2.03%	2.18%
76,000	1.60%	1.76%	1.92%	2.08%	2.24%
74,000	1.64%	1.81%	1.97%	2.14%	2.30%
72,000	1.69%	1.86%	2.03%	2.20%	2.37%
70,000	1.74%	1.91%	2.09%	2.26%	2.43%
68,000	1.79%	1.97%	2.15%	2.33%	2.51%
66,000	1.84%	2.03%	2.21%	2.40%	2.58%
64,000	1.90%	2.09%	2.28%	2.47%	2.66%
62,000	1.96%	2.16%	2.36%	2.55%	2.75%
60,000	2.03%	2.23%	2.43%	2.64%	2.84%

Note: Shaded areas represent ratepayer impacts in excess of those authorized by the bill.
Source: Department of Legislative Services

Finally, Legislative Services advises that the above scenarios are provided as an example of how the underlying assumptions used to evaluate a potential offshore wind project can affect the estimated impacts. Actual impacts may vary significantly depending on the bids submitted and ultimately approved. Total costs will also be impacted by any additional federal or State subsidies made available to offshore wind developers.

Additional Information

Prior Introductions: A similar bill, SB 861 of 2011, was heard by the Senate Finance Committee. Its cross file, HB 1054, was heard by the House Economic Matters Committee. No further action was taken on either bill.

Cross File: HB 441 (The Speaker *et al.*) (By Request – Administration) – Economic Matters.

Information Source(s): New Jersey Board of Public Utilities; U.S. Department of Energy; Energy Information Administration; Bureau of Ocean Energy Management, Regulation, and Enforcement; 2010 Wind Technologies Market Report; National Renewable Energy Laboratory; Department of Natural Resources; Maryland Department of the Environment; Maryland Energy Administration; Public Service Commission; Department of Legislative Services

Fiscal Note History: First Reader - February 13, 2012
mlm/lgc

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Appendix A
Key Variables in the Cost of Offshore Wind Generation

Total Project Costs – The total cost of an offshore wind project includes the cost of turbines, foundations, integration, maintenance, financing, and other inputs. Total costs may be estimated in a variety of ways, such as averaging the costs of existing facilities. They may also be estimated based on the experience of specific PPAs or other purchase agreements. Legislative Services notes that actual project costs are generally proprietary information. Therefore, project costs may vary greatly depending on project size, siting characteristics, and financing methods.

Discount Rate – The discount rate reflects the cost of capital, comparable to the interest rate, for installing a major wind project. The discount rate EIA uses for its levelized cost of energy estimates is 7.4%, which is what PSC uses as well. However, in some analyses where projects are financed by equity investments, the true cost of capital and, therefore, the discount rate, may exceed 20%. With a hard cap existing in this bill of $200 per OREC, the discount rate is unlikely to affect ratepayers (Legislative Services believes any project will likely apply for the maximum OREC price), but certainly impacts the financial viability of a proposed offshore wind project.

Capacity Factor – A wind generating station does not generate electricity at 100% of its nameplate capacity. The expected generation from a wind turbine is calculated by applying a capacity factor to the nameplate capacity (expected generation = nameplate capacity *x* hours in a year *x* capacity factor). Depending on wind conditions and facility location, the capacity factor of offshore wind facilities is estimated to be between 30% and 40%. Most U.S. estimates are close to 38%, although since no offshore facilities are operating on the Atlantic Coast, this assumption has not been tested. PSC, MEA, and Legislative Services use 39.3% as the baseline capacity factor in these analyses.

Other Market Factors – Installing an offshore wind facility of sufficient size could have a significant impact on capacity markets, locational marginal prices, the value of existing RECs, and market clearing prices.

Cost for Conventional Resources – To calculate the increased cost of energy purchased from an offshore wind generating facility, a baseline of projected energy prices is needed. The assumptions made to project the baseline prices have a significant impact on the calculation of increased costs. If an estimate assumes that the cost of conventional electricity increases over time, the incremental cost of an offshore wind generator is decreased. If an estimate assumes that the cost of conventional electricity does not increase over time, the incremental cost of an offshore wind generator is increased. Additionally, when considering options for new generation, costs may be compared between projects, instead of against a baseline.

Appendix B
Detailed Breakdown – Costs Associated with a $200/MWh OREC – LTER Baseline
(In 2011 Dollars)

Total Compliance Cost	**2017**	**2030**
Nameplate Capacity (MW)	294	294
Capacity Factor	0.393	0.393
Generation (MWh)	1,012,148	1,012,148
PJM Wholesale Energy Rate ($/MWh)	$68	$79
Total Annual Compliance Cost (Res. + C&I)	**$133,594,142**	**$122,391,254**
Rate Increase – All Categories ($/kWh)	**$0.00205**	**$0.00164**

Residential Impact		
Total Maryland Usage (GWh)	65,107	74,685
Residential Usage (GWh)	27,866	31,965
Residential Share	42.8%	42.8%
Annual Total Residential Cost ($)	$57,178,293	$52,383,457
Annual Residential Impact	$24.65	$19.69
Monthly Residential Impact ($)	**$2.05**	**$1.64**
Maximum Industrial Monthly Impact (75,000 MWh Annual Cap) ($)	**$12,812**	**$10,250**

C & I Residential Impact		
Annual C&I Usage (GWh)	37,241	42,720
C & I Share	57.2%	57.2%
Annual Total C&I Cost ($)	$76,415,849	$70,007,798
EIA C&I Retail Rate ($/MWh)	$93.30	$89.67
Annual C&I Cost of Conventional Energy ($)	$3,475,643,894	$3,830,698,764
Annual C&I Cost Percentage Increase	**2.20%**	**1.83%**

Source: Public Service Commission, Department of Legislative Services

ANALYSIS OF ECONOMIC IMPACT ON SMALL BUSINESSES

TITLE OF BILL: Maryland Offshore Wind Energy Act of 2012

BILL NUMBER: SB 237

PREPARED BY: MEA

PART A. ECONOMIC IMPACT RATING

This agency estimates that the proposed bill:

__ __ WILL HAVE MINIMAL OR NO ECONOMIC IMPACT ON MARYLAND SMALL BUSINESS

OR

__X__ WILL HAVE MEANINGFUL ECONOMIC IMPACT ON MARYLAND SMALL BUSINESSES

PART B. ECONOMIC IMPACT ANALYSIS

These bills requires electricity suppliers to include electricity from offshore wind generation within the renewable portfolio standard in the year 2017 and beyond. To the extent that electricity suppliers increase electricity prices as a result, small businesses in Maryland will be impacted. Under this bill, the Public Service Commission will reject any proposals which it projects will increase non-residential rates by more than 2.5%. As non-residential ratepayers, small businesses will be protected by this threshold test.

The bill may also have beneficial effects on small businesses in Maryland. It requires that the Public Service Commission, before approving a proposal for certification of Offshore Wind Renewable Energy Credits (ORECs), find that the proposal demonstrates positive net benefits based on enumerated criteria, including (1) the project's effect on "income, employment, wages and taxes in the state" as well as (2) "jobs to be created by the offshore wind project." Also, offshore wind project proposals will compete for eligibility to generate ORECs based on certain criteria, including the extent to which the applicant's "plan for engaging small businesses meets the goals specified in Title 14, Subtitle 3 of the State Finance and Procurement Article."