THE CHALLENGE OF DEVELOPING OFFSHORE WIND ENERGY IN MARYLAND: AN EVALUATION OF THE FINANCING MECHANISMS OF THE 2011, 2012, AND 2013 MARYLAND OFFSHORE WIND ENERGY ACTS

Peter Hogge*

Offshore wind energy has great potential for development in Maryland, particularly as a technology that the state can utilize to meet its obligations under the state renewable portfolio standard. The suitability of offshore wind energy for Maryland depends on the state geography, the economic potential of the industry, and the financing obstacles to implementing the technology. Starting in 2011, the state introduced legislative proposals seeking to deploy different financing structures to develop offshore wind energy, eventually passing the Maryland Offshore Wind Energy Act of 2013. The 2011 bill was rejected because of the risk it placed on the state and ratepayers, but the latter proposals, including the passed 2013 bill, pose financing challenges on offshore wind developers.

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I. OFFSHORE WIND ENERGY POTENTIAL IN MARYLAND

Onshore wind energy is one of the most successful forms of renewable energy implemented in the United States. Over 46,000 megawatts (MW) of onshore wind capacity is installed in the United States, representing more 20 percent of global installed wind power.[1] Wind energy is the form of renewable energy closest to becoming economically competitive with fossil-based energy; in some areas of the United States, the price of wind energy is on par with the price of fossil fuel-based energy.[2] This price disparity will likely decrease with advances in the technology and in implementation processes.[3] Onshore wind energy has developed greatly in the United States in the past decade, and this rapid pace of development hints at the promise and potential of offshore wind energy.

Offshore wind energy has several distinct advantages over onshore wind energy that can aid its development. Winds typically blow at higher, more consistent speeds offshore, allowing offshore wind turbines to produce substantially more electricity than

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**Law clerk to the Honorable Douglas R. M. Nazarian, Court of Special Appeals of Maryland. J.D. University of Maryland Francis King Carey School of Law. Special thanks to Professor Means for his advice and direction in preparing this article. The views herein expressed are solely those of the author.

[1] *Industry Statistics*, AM. WIND ENERGY ASS'N, http://www.awea.org/learnabout/industry_stats/index.cfm (last visited Mar. 20, 2012).

[2] Todd Woody, *Wind Power Now Competitive with Coal in Some Regions*, GRIST, Feb. 8, 2011, http://grist.org/climate-energy/renewable-energy/2011-02-07-report-wind-power-now-competitive-with-coal-in-some-regions/; *Utilities and Wind Power*, AM. WIND ENERGY ASS'N, http://www.awea.org/learnabout/utility/index.cfm (last visited Mar. 20, 2012).

[3] *Id.*

onshore wind turbines.[4] Some people are turned off by the noise production and visual appearance of large onshore wind turbines, but offshore wind turbines lessen these problems.[5] At relatively small distances offshore, turbine design does not need to account for noise reduction measures and visual intrusion is a minimal consideration, permitting larger turbines.[6] Strong offshore winds are also found close to coastal cities with high energy costs, and proximity simplifies the distance component of transmission issues.[7] Offshore wind energy currently faces high costs from underwater construction, operation, and transmission, but the advantages of offshore wind contribute to its vast production potential.

While onshore wind energy resources are somewhat limited in Maryland, the wind resources off of the coast of the state are abundant. A location must experience an annual average wind speed of at least seven meters per second at a height of 90 meters to be suitable for offshore wind energy development.[8] Within 93 kilometers of the Maryland coastline and at waters depths of less than 60 meters, there are over 9,420 square kilometers with wind speeds sufficient for offshore development.[9] Engineering

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[4] *Offshore Wind Power Solutions*, SIEMENS, http://www.energy.siemens.com/fi/en/power-generation/renewables/wind-power/offshore.htm (last visited Mar. 20, 2012); *Offshore Wind Energy*, OCS ALTERNATIVE ENERGY AND ALTERNATE USE PROGRAMMATIC EIS INFORMATION CTR., http://ocsenergy.anl.gov/guide/wind/ (last visited Mar. 20, 2012).
[5] Walt Musial and Sandy Butterfield, *Future for Offshore Wind Energy n the United States*, NAT'L RENEWABLE ENERGY LABORATORY at 7 (June 2004), *available at* http://connect.docuter.com/documents/7215651894adcc67e1cff81255982718.pdf.
[6] *Id.* at 2.
[7] *Id.*
[8] *Maryland Offshore 90-meter Wind Map and Wind Resource Potential*, DEP'T OF ENERGY (May. 16, 2012), http://www.windpoweringamerica.gov/windmaps/offshore_states.asp?stateab=md.
[9] U.S. Dep't of Energy, *Offshore WindPotential Tables*, WIND POWERING AMERICA, http://www.windpoweringamerica.gov/pdfs/offshore/offshore_wind_potential_table.pdf (last visited Mar. 20, 2012).

constraints currently limit the potential for developing offshore wind resources in waters of great depths or waters that are too far from shore. However, over 5,100 square kilometers of offshore area is located within 22 kilometers of the Maryland coast at water depths of less than 30 meters—topography much better suited for development.[10]

The underwater topography off of the coast of Maryland further enhances the viability of the location for offshore wind development. The coastal waters of the Delmarva region experience a gradually sloping outer continental shelf, and water depths remain relatively shallow, even at increased distances from shore. Water depths remain consistently less than 30 meters even at 50 kilometers away from the Maryland shoreline.[11] Existing offshore wind turbine technology primarily utilizes monopile and gravity-based foundation techniques at depths around 30 meters.[12] While companies are currently researching floating turbine designs for use in waters several hundred meters

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[10] Offshore Wind Resource by State, *supra* note 9.

[11] Jeremy Firestone, Willett Kempton, Blaise Sheridan, & Scott Baker, *Maryland's Offshore Wind Power Potential*, CTR. FOR CARBON-FREE POWER INTEGRATION, C. OF EARTH, OCEAN, AND ENV'T at 19 (Feb. 10, 2010), http://offshorewind.net/Other_Pages/Links%20Library/MarylandsOffshorewindPowerPotential-feb2010.pdf; Maryland Offshore 90-meter Wind Map *supra* n. 8; Offshore Wind Resource by State *supra* note 9.

[12] Simon-Philippe Breton & Geir Moe, *Status, Plans and Technologies for Offshore Wind Turbines in Europe and North America*, 34 RENEWABLE ENERGY 646, 650 (2009); *The European Offshore Wind Industry Key 2011 Trends and Statistics*, EUR. WIND ENERGY ASS'N (Jan. 2012), *available at* http://www.ewea.org/fileadmin/ewea_documents/documents/publications/statistics/EWEA_stats_offshore_2011_01.pdf. Of the 336 offshore wind turbines installed in Europe in 2011, 233 turbines utilized the monopile substructure and 66 used a jacket substructure. During 2011, offshore wind turbines were built at an average depth of 22.8 meters – a 31 percent increase over 2010 average construction depth. Only one turbine that came online in 2011 was built either farther than 50 kilometers from shore or at a depth greater than 30 meters. EUR. WIND ENERGY ASS'N, *supra* note 12, at 8, 16.

deep[13], existing turbine technology is suitable for implementation off of the Maryland coast.

There are movements in the offshore wind industry to take advantage of the opportunities associated with development of offshore wind energy off of the mid-Atlantic Coast. The Atlantic Wind Connection is a project aiming to create a "transmission backbone", an energy transmission line running offshore along the Atlantic Coast.[14] The transmission system could integrate a potential wind turbine capacity of 7,000 MW into the high voltage grid for delivery to population centers that could utilize the energy.[15] The transmission system has the potential to stretch at least 700 miles of circuit from southern Virginia to the New York/New Jersey metropolitan area, servicing Maryland and Delaware as well.[16]

In addition to investments in transmission of offshore wind energy, potential manufacturing participants in an industry supply chain are also gearing towards offshore wind in Maryland. An aspiring wind turbine component manufacturing company, AC Wind, recently formed a partnership with the University of Delaware's Center for

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[13] Breton & Moe, *supra* note 12, at 651.

[14] *AWC Intro*, ATLANTIC WIND CONNECTION, http://atlanticwindconnection.com/awc-intro/ (last visited Mar. 20, 2012). Project partners include Google Inc. and Elia, a Belgian company that is one of the five largest transmission system operators in Europe. *Id.*

[15] *Right of Way Application – FAQs*, ATLANTIC WIND CONNECTION, http://www.atlanticwindconnection.com/ferc/BOEM/ROW%20application%20FAQs.pdf (last visited Mar. 20, 2012). *See* Direct Testimony of Johannes P. Pfeifenberger and Samuel A. Newell, Exhibit AWC-400, Fed. Energy Regulatory Comm'n (Dec. 20, 2011), *available at* http://www.atlanticwindconnection.com/ferc/2010-12-Brattle/Brattle_Testimony_AWC-400-403.pdf. The project would relieve congestion for an area deemed a National Interest Electric Transmission Corridor, a designation reserved for areas reflecting "significant transmission constraints. *Id.*

[16] Right of Way Application, *supra* note 15.

Composite Materials.[17] AC Wind and the University aim to make the AC Wind factory a composite center "capable of manufacturing large-scale offshore wind turbine blades up to 100 meters."[18] AC Wind would become the first manufacture in Maryland of wind turbine components.

A. High Cost of Offshore Wind Energy

Even with all of the positive geographic and industrial factors encouraging development along the mid-Atlantic Coast, the high cost of offshore wind energy is a significant hurdle to the industry. There is currently no offshore wind energy production in the United States, with the Cape Wind project in Massachusetts seeking to become the first producer.[19] Developers in the United States do not have experience installing wind turbines, integrating infrastructure, or maintaining energy production in aquatic environments. Offshore wind turbine infrastructure must endure rough environmental conditions, including constant pressure from waves and corrosive ocean salt.[20] Difficult operational conditions and large distances from the mainland increase the downtime between when a turbine malfunction occurs and when repairs can take place.[21]

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[17] *AC Wind, University of Delaware to Join Forces To Advance Offshore Wind Supply Chain Facility in Salisbury*, UNIV. OF DEL. CTR. FOR COMPOSITE MATERIALS (Sep. 2011), *available at* http://www.ccm.udel.edu/News/newsletter/2011/Oct2011/ACWind_Oct2011.pdf.
[18] *Id.*
[19] *2 New England Utilities Agree to Buy Wind Power*, N.Y. TIMES (Feb. 15, 2012), http://www.nytimes.com/aponline/2012/02/15/business/AP-US-Northeast-Utilities-NStar.html?_r=2&src=busln.
[20] Walter Musial and Bonnie Ham, *Large-scale Offshore Wind Power in the United States*, NAT'L RENEWABLE ENERGY LABORATORY (Sep. 2010), *available at* http://www.nrel.gov/wind/pdfs/40745.pdf.
[21] *Study of the Costs of Offshore Wind Generation*, OFFSHORE DESIGN ENGINEERING at 19-20, 23 (2007), *available at* http://webarchive.nationalarchives.gov.uk/+/http://www.berr.gov.uk/files/file38125.pdf (hereafter Costs of Offshore Wind Generation).

Engineering, maintaining, operating and repairing turbine infrastructure is uniquely difficult in an offshore setting, and costs will be high as industry acclimates to these challenges.

The challenges specific to the nature of offshore wind increase the costs of generation in ways not faced by onshore wind development. Foundation construction and installation exceeds 20 percent of capital costs in an offshore wind farm, while onshore wind farms devote approximately five percent of capital to turbine foundation.[22] Harsh wave and weather conditions drive up offshore wind operation and maintenance costs to levels occasionally exceeding 30 percent of the overall cost for the wind farm.[23] Electrical connections between turbines and between the offshore wind farm and the shore account for 21 percent of total investment costs[24], twice the percentage of transmission costs for onshore wind.[25] Offshore wind faces additional hazards and infrastructural impediments that push the cost of generation to levels sometimes two or three times higher than onshore wind generation.[26]

High costs helped to derail development of the Bluewater wind farm project off of the Delaware coast. In late 2011, developer NRG Bluewater announced its withdrawal from a power purchase agreement with utility Delmarva Power for 200 MW of offshore

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[22] María Isabel Blanco, *The Economics of Wind Energy*, 13 RENEWABLE AND SUSTAINABLE ENERGY REV. 1372, 1373-76 (2009), *available at* http://anakena.dcc.uchile.cl/~mnmonsal/sdarticle03.pdf.
[23] *Id*. at 1377.
[24] *Id.*
[25] Costs of Offshore Wind Generation, *supra* note 21 at 21.
[26] Press Release, Pike Research, Offshore Wind Power Capacity to Boom in the Next Six Years (April 29, 2011) (on file at http://www.pikeresearch.com/newsroom/offshore-wind-power-capacity-to-boom-in-the-next-six-years). Pike Research Senior Analyst Peter Asmus noted how, "the long-term fate of the offshore wind power industry may ultimately hinge on driving down the cost of energy (COE) closer to 10 cents per kilowatt-hour (kWh) by 2030, less than half of the current COE." *Id.*

wind energy generation.[27] NRG was unable to secure the financing necessary to fund the capital intensive project.[28] The absence of federal loan guarantees or long-term tax credits exacerbated the risk accompanying the high costs of offshore wind[29], and NRG was unable to find investors willing to bear this risk.[30] The power purchase agreement with the Delaware utility only accounted for half of the energy NRG needed to sell in order to make the offshore wind project economically viable.[31]

B. 2011 Maryland Offshore Wind Energy Bill

On February 11, 2011, Maryland Governor Martin O'Malley introduced H.B. 1054, the Maryland Offshore Wind Energy Act of 2011.[32] The bill aimed to develop wind energy resources off of the Maryland coast by requiring public utilities to enter into long-term purchase agreements with offshore wind energy producers.[33] The proposed legislation would have required public utilities to purchase 400-600 MW of power from offshore wind generators adjacent to the PJM region for at least the next 20 years.[34]

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[27] Press Release, NRG Energy, NRG to Put Offshore Wind Development on Hold for the Near Term (December 12, 2011).
[28] Jon Hurdle, *Bluewater Failure Highlights US Offshore Wind Problems*, AOL ENERGY (December 14, 2011), http://energy.aol.com/2011/12/14/bluewater-failure-highlights-us-offshore-wind-problems/.
[29] *See* Negative Federal Political Factors, *infra* pp. 14-16.
[30] Hurdle, *supra* note 28.
[31] *Id.*
[32] Press Release, Office of Governor Martin O'Malley, Governor O'Malley Testifies in Support of the Maryland Offshore Wind Energy Act of 2011 (March 3, 2011) (on file at http://www.gov.state.md.us/pressreleases/110303.asp).
[33] *Id.*
[34] *Id.* The PJM region coordinates wholesale electricity movement and transmission in Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. *See* PJM – Who We Are (Sep. 6, 2012), http://www.pjm.com/about-pjm/who-we-are.aspx.

Offshore wind production of 500 MW of energy would power almost 80 percent of residences on the Eastern Shore of Maryland.[35]

The 2011 bill looked to foster offshore wind development through a long-term purchase agreement between electric utilities and producers of offshore wind energy. In a long-term purchase agreement, utilities and producers agree on and set a price for electricity for a certain period of time. Over this period, utilities are bound to purchase electricity from producers at the set price, and producers are bound to sell electricity to utilities at the same price.

Long-term power purchase agreements encourage development of a fledgling renewable energy source like offshore wind by fixing the price of generated electricity over an extended period of time. Generators of offshore wind have a mandatory market with any utility with which they enter into a long-term purchase agreement. The fixed price of a long-term purchase agreement provides more of a guarantee to investors or other financiers of the wind development project.

The 2011 bill would have created a structure for offshore wind energy generators to enter into long-term contracts with electric utilities in the state. Under the structure, the Maryland Public Service Commission would solicit proposals from "qualifying offshore wind generators" for production of electricity from offshore wind energy.[36] The Commission would evaluate proposals on the criteria of ratepayer cost, price stability, environmental and health benefits, and expected effect on Maryland renewable portfolio standard obligations.[37]

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[35] *See* O'Malley Press Release *supra* note 32.
[36] H.B. 1054, 2011 Leg., Reg. Sess. (Md. 2011).
[37] *Id.*

While environmentalists are drawn to the renewable nature of wind energy, Governor O'Malley pushed the bill as a mechanism to create green jobs.[38] The National Renewable Energy Laboratory estimates that development of offshore wind energy will create "approximately 20.7 direct jobs per annual MW in the United States."[39] In March 3, 2011 testimony before the House of Delegates Economic Matters Committee, O'Malley stated that,

> "a 500 MW wind generation facility in the waters off of the Delmarva coast could generate as many as 2,000 manufacturing and construction jobs during the five-year development period, with an additional 400 permanent jobs once the turbines are spinning."[40]

O'Malley also described how Maryland is uniquely poised to take advantage of development of offshore wind energy on the Atlantic Coast of the United States. Baltimore, the largest city in Maryland, is positioned as a deep-water port with ample manufacturing infrastructure.[41] These qualities, coupled with proximity of the city to offshore wind resources, could make Baltimore a hub for the ongoing construction and maintenance of offshore wind infrastructure.[42] The potential of offshore wind to create

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[38] O'Malley Press Release, *supra* note 32. "In this competitive new economy, the states that win will be those that succeed in leveraging innovation into job creation and economic growth," said Governor O'Malley. "In Maryland, our emerging green sector is a critically important part of our Innovation Economy, and therefore our ability to create jobs and compete globally. This bill would move us forward towards a prosperous, thriving Maryland powered by sustainable, clean energy." *Id.* "Off-shore wind has the potential to be a big 'win' for our State: a win for jobs, a win for consumers, a win for business, and a win for our energy future—an energy future which is cleaner, greener, more sustainable, and more affordable." *Id.*

[39] Walter Musial & Bonnie Ham, *Large-scale Offshore Wind Power in the United States*, NAT'L RENEWABLE ENERGY LABORATORY, 17 (Sep. 2010), *available at* http://www.nrel.gov/wind/pdfs/40745.pdf.

[40] O'Malley Press Release, *supra* note 32.

[41] *Id.*

[42] *Id.*

jobs and spur development in Baltimore and other locations in Maryland explains the support of the labor lobby for O'Malley's bill.[43]

Despite the support for the 2011 bill from environmental and labor lobbies, Maryland legislators decided to postpone a vote on the bill at the end of the 2011 legislative session.[44] Legislators cited the potentially high costs and risks associated with the proposed legislation, requesting more time to examine the likely impacts of long-term investment in offshore wind.[45] Lawmakers balked over concerns of unforeseen overruns in cost and the potential for electricity bills of constituent ratepayers to reflect any cost overruns.[46] Decreasing natural gas prices from developments in domestic production aggravated the perception of offshore wind as a risky and potentially expensive source of energy investment.[47] Senate President Thomas Miller elucidated the qualms some legislators felt with the proposed legislation:

> "The problem is cost. This is a difficult time. . . . [P]eople are up against [difficult economic times]. Gas prices and consumer prices and wages not catching up with inflation, and they are very concerned about if this is necessary at this time."[48]

O'Malley attempted to placate concerns over increased electricity costs by capping potential rate increases for offshore wind energy at $2 per month.[49] However, the above

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[43] Timothy B. Wheeler, *O'Malley to Seek Bill Boosting Offshore Wind Power*, BALTIMORE SUN, Jan. 12, 2011, http://articles.baltimoresun.com/2011-01-12/features/bs-gr-offshore-wind-governor-20110112_1_offshore-wind-wind-farms-turbines.
[44] Timothy B. Wheeler, Julie Bykowicz & Annie Linskey, *Lawmakers Table Offshore Wind Bill for Further Study,* BALT. SUN (Apr. 7, 2011), http://articles.baltimoresun.com/2011-04-07/features/bs-gr-wind-bill-20110407_1_offshore-wind-turbines-electricity.
[45] *Id.*
[46] *Id.*
[47] *Id.*
[48] *Id.*
[49] *Id.*

described concerns and upcoming expiration of the legislative session caused lawmakers to table the proposed legislation for further study.

C. 2012 Offshore Wind Proposal

Despite failing to pass a bill devoted to development of offshore wind in 2011, O'Malley stood by his intention to push for a bill focused on offshore wind energy in 2012. In the months preceding the 2012 Maryland legislative session, O'Malley reiterated the "tremendous potential" of offshore wind energy as a vehicle to achieve both green electricity and green jobs.[50] O'Malley highlighted how close Maryland is to developing offshore wind energy, describing how "our greatest challenges are not primarily financial, nor are they technological. Our greatest challenges are political."[51] On January 20, 2012, pursuant to gubernatorial request, senators introduced S.B. 237, the Maryland Offshore Wind Energy Act of 2012.[52]

D. 2012 Maryland Offshore Wind Energy Bill

The Maryland Offshore Wind Energy Act of 2012 proposed to develop the industry by instituting financial incentives for the production of electricity from offshore wind turbines. The bill incorporated a renewable portfolio standard specific to offshore wind energy into the already existing state renewable portfolio standard.[53] Qualifying offshore wind projects would be turbine facilities (1) located on the Outer Continental

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[50] Timothy B. Wheeler, *O'Malley Vows New Offshore Wind Push*, BALT. SUN (Oct. 11, 2011), http://articles.baltimoresun.com/2011-10-11/features/bs-gr-wind-conference-20111011_1_offshore-wind-cape-wind-maryland-s-atlantic-coast.
[51] *Id.*
[52] S.B. 237, 2012 Leg., Sess. (Md. 2012).
[53] Todd Griset, *ANALYSIS: Maryland's New Offshore Wind Plan*, OFFSHORE WIND WIRE (Jan. 26, 2012), http://offshorewindwire.com/2012/01/26/analysis-md-new-plan/.

Shelf and (2) interconnected to the PJM grid on the Delmarva Peninsula.[54] Under the proposed framework, producers of electricity from qualifying offshore wind projects would receive an offshore wind renewable energy credit (OREC) for each MWh generated.[55]

Utilities would need to obtain ORECs in order to meet obligations under the 2012 statute. The existing state renewable portfolio standard requires utilities to obtain 18 percent of electricity from Tier 1 renewable sources by 2022, and offshore wind qualifies as a Tier 1 renewable source.[56] The proposed legislation would require utilities to obtain at least 2.5 percent of electricity of the 18 percent Tier 1 obligation from offshore wind energy or credit equivalents.[57] This 2.5 percent obligation would start in 2017 and run through 2022.[58] Utilities could meet this standard by either independently developing qualifying offshore wind projects or by obtaining the transferable ORECs from qualifying producers.[59] In this latter option, utilities would enter into contracts with qualifying producers of offshore wind for the purchase of ORECs.[60] The Maryland Public Service Commission would regulate this marketplace of credit production and transfer and would be required to cap the OREC price at $190 per MWh.[61]

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[54] S.B. 237, 2011 Leg., Sess. (Md. 2011).
[55] *Id.*
[56] Database for State Incentives for Renewables & Efficiency, *Maryland: Incentives/Policies for Renewables & Efficiency*, DEP'T OF ENERGY (May 23, 2011), http://dsireusa.org/incentives/incentive.cfm?Incentive_Code=MD05R.
[57] S.B. 237, *supra* note 52. Under the bill, 2.5 percent of energy from offshore wind would be the maximum obligation the Public Service Commission could impose each year on electricity supplies.
[58] *Id.*
[59] Griset, *supra* note 53.
[60] *Id.*
[61] S.B. 237, *supra* note 52.

Another important facet of the 2012 bill was a cost limiting mechanism. The bill directed the Public Service Commission to reject any offshore wind project application that would impose an increase on the average residential customer's bill of more than "$2 per month in 2012 dollars."[62] If the Public Service Commission anticipated that the cost of a project would exceed this amount, the Commission was to suspend the project.[63] This cap was later strengthened, decreasing the limit on average monthly rate exposure from $2 to $1.50.[64] The proposed legislation also capped the bill rate increases attributable to offshore wind development at 2.5 percent for nonresidential customers, including commercial and industrial businesses.[65] Officials estimated that the proposed program would increase the average residential consumer's monthly electricity bill between $1.50 and $2, a figure that aligned with the legislative cap.[66]

E. Maryland Offshore Wind Energy Act of 2013

In the 2013 legislative session, Maryland was able to pass the Maryland Offshore Wind Energy Act of 2013.[67] The 2013 passed bill is quite similar to the bill of the

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[62] *Id.* (based on the average residential customer's annual consumption of 12,000 kilowatt hours). *See* H.B. 441, 2012 Leg., Reg. Sess. (Md. 2012). In the passed House version of the bill, the Economic Matters Committee lowered the maximum ratepayer increase from $2 to $1.50 per month. *Id.*
[63] Griset, *supra* note 53.
[64] *House Panel Approves Offshore Wind Bill*, ASSOCIATED PRESS, Mar. 26, 2012, http://baltimore.cbslocal.com/2012/03/26/house-panel-approves-offshore-wind-bill/.
[65] S.B. 237, *supra* note 52. The projected net average rate impact for a nonresidential customer, combined with the projected net rate impact of other qualified offshore wind projects, does not exceed 2.5 percent of the nonresidential customer's total annual electric bill, over the duration of the proposed OREC pricing schedule. *Id.* *See also* H.B. 441, 2012 Leg., Reg. Sess. (Md. 2012) (limiting the nonresidential customer rate impact to 1.5 percent of the customer's annual electric bill, a decrease from the 2.5 percent stated in the Senate version of the bill).
[66] Griset, *supra* note 53.
[67] http://www.governor.maryland.gov/blog/?p=8510.

previous year, mirroring the financing structures and language used in the 2012 bill.[68] Several sections in the remainder of this article will contrast the different financing mechanisms employed by the original 2011 bill and the 2012 and 2013 bills.

F. Differences in the 2013 Act and the 2012 bill from the 2011 bill

The biggest difference between the Maryland Offshore Wind Energy Act of 2011 and the Maryland Offshore Wind Energy Acts of 2012 and 2013 is the financing structures of the two bills. Both sets of bills sought to help developers offset the high cost of building offshore wind turbines through programs financed by increases in the electricity rates that consumers pay.[69] However, the 2012 and 2013 bills replaced the long-term power purchase contracting provisions of the 2011 bill with a specific offshore wind credit scheme and renewable portfolio standard. The 2012 and 2013 financing mechanisms incentivized developers to build offshore wind energy projects, but removed the mandate requiring utilities to purchase offshore wind electricity at a fixed price.

The cap on increases in electricity rates from offshore wind energy in the 2012 and 2013 bill is another provision that was not present in the 2011 bill. The stronger cost limitation provision gave the passed version of the Act a lower price tag than the 2011 bill. As previously stated, officials estimated that the program proposed in the 2012 and 2013 bills would increase the average residential consumer's monthly electricity bill

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[68] http://mgaleg.maryland.gov/2013RS/bills/hb/hb0226E.pdf. The 2013 Act maintains the principle components of the financing structure of the 2012 bill: the OREC requirement (§ 7.703), the $190 per MWh cap on the OREC price (§ 7-704.1(E) and (F), and the cost limiting mechanism (§ 7-704.1(E)). *Id.*

[69] Jay Hancock, *New O'Malley Wind Farm Proposal Still a Long Shot*, BALT. SUN (Jan. 23, 2012), http://articles.baltimoresun.com/2012-01-23/business/bs-bz-hancock-omalley-offshore-wind-20120123_1_bluewater-wind-project-wind-farm-offshore-wind.

between $1.50 and $2.[70] These figures are significantly lower than increased monthly costs between $2.16 and $8.70—the predicted costs of the 2011 bill determined by the Public Service Commission.[71]

The 2012 proposal eliminated the concerns of bias that plagued the 2011 proposal. The 2011 bill gave the executive-controlled and appointed Public Service Commission full control over project evaluation and selection.[72] While the bill granted the Public Service Commission the permissive authority to "utilize consultants and experts", the Commission retained full decision making and evaluation authority.[73] Contrastingly, the 2012 bill required the Commission to "contract the services of independent consultants and experts" for the process of "evaluating and comparing applicants' proposed offshore wind projects."[74] Approval of a project proposal was contingent upon demonstration that the project would result in "positive net benefits to the state," a calculation also conducted by independent consultants.[75] The incorporation on an independent, external evaluation into the project evaluation and selection process supplied an element of accountability to the project approval process.[76] This focus on independent evaluation was incorporated into the language of the passed 2013 Act.[77]

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[70] Griset, *supra* note 53.
[71] *Id.*
[72] S.B. 237, *supra* note 52.
[73] *Id.*
[74] *Id.*
[75] *Id.*
[76] *See* Aaron C. Davis, *For O'Malley and Friend, Interests Align in Offshore Wind Bill*, WASH. POST (Mar. 15, 2011), http://www.washingtonpost.com/local/politics/for-omalley-and-friend-interests-align-in-offshore-wind-bill/2011/03/04/ABDNI8W_story.html. Another source of bias detrimental to the 2011 proposal was a perceived conflict of interest with one of the key role players in the plan. Michael Enright served as the chief of staff for Governor Martin O'Malley until January 2010, when he then left the position to become managing director for Beowulf Energy. Beowulf Energy was one of the

The reductions in cost and eliminations of bias present in the 2012 and the 2013 allowed for increased political support of the bill in comparison to the 2011 bill. Congress people had increased familiarity with the 2012 bill and the commodity market concept the bill endorsed, a concept similar to the market currently in place for solar energy.[78] The absence of a mandate requiring utilities to enter into set, above-market-price long-term purchase agreements with offshore wind energy producers made the bill more politically palatable.[79] This political palatability is evidenced in the passage of the Maryland Offshore Wind Energy Act of 2013, which, as previously stated, is structurally similar to the 2012 bill.

II. FEDERAL FACTORS AFFECTING POTENTIAL DEVELOPMENT OF OFFSHORE WIND ENERGY

The current federal climate offers a mix of positive and negative circumstances for potential offshore wind energy development in Maryland. The production tax credit for the generation of electricity from wind energy was renewed in January 2013 under the American Taxpayer Relief Act of 2012.[80] This renewed form of the production tax credit allows developers to receive the credit for any renewable electricity projects they begin

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companies competing for federal leasing rights to develop the 2011 proposal, and stood to benefit financially upon passage of the proposal. Governor O'Malley heavily supported the 2011 bill, and lawmakers felt uncomfortable supporting a bill potentially open to allegations of favoritism. While Governor O'Malley remained in wholehearted support of the 2012 legislative proposal, Beowulf Energy, the company of O'Malley's former chief of staff, was not involved with the proposal. The removal of this potential conflict of interest gave the 2012 offshore wind energy act better integrity and greater congressional support than the 2011 proposal, momentum that carried over in the passage of the 2013 version of the bill. *Id.*

[77] *See* § 7-704.1(D) at http://mgaleg.maryland.gov/2013RS/bills/hb/hb0226E.pdf.

[78] Aaron C. Davis, *O'Malley to Try Again for Offshore Wind Development*, WASH. POST (Jan. 22, 2012), http://www.washingtonpost.com/local/md-politics/omalley-to-try-again-for-offshore-wind-development/2012/01/22/gIQAc18MJQ_story.html.

[79] *Id.*

[80] http://dsireusa.org/incentives/incentive.cfm?Incentive_Code=US13F

construction of before 2014.[81] Furthermore, the Obama administration is committed to supporting offshore wind energy and capitalizing on a developing industry. The Bureau of Ocean Energy Management backs the leasing of offshore waters for wind energy projects, and seeks to reduce the federal permitting hurdles facing offshore wind energy projects.

A. Production tax credit

The production tax credit is the most important financial mechanism employed by the federal government in aiding the development of wind energy. Under the credit, producers of electricity generated from renewable sources receive a tax credit for each kilowatt hour (kWh) of production.[82] The credit amount for wind energy is 2.2 cents per kWh.[83] Originally enacted by the Energy Policy Act of 1992, the production tax credit has been expanded and renewed through periodic legislation, most recently in January 2013.[84] The credit encourages the production of renewable energy by making the cost of renewable energy more competitive with the cost of electricity produced from non-renewable sources.

The production tax credit is critical to the development of wind energy in the United States. From 2006 to 2011, the wind industry benefited from an uninterrupted production tax credit and experienced a strong annual growth rate of 35 percent.[85] The

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[81] http://www.irs.gov/pub/irs-drop/n-13-29.pdf
[82] FEDERAL Incentives for Renewables & Efficiency, *Federal: Incentives/Policies for Renewables & Efficiency*, DEP'T OF ENERGY (Jan. 3, 2013), http://dsireusa.org/incentives/incentive.cfm?Incentive_Code=US13F.
[83] *Id.*
[84] *Id.*
[85] *Production Tax Credit (PTC),* AM. WIND ENERGY ASS'N, http://awea.org/issues/federal_policy/upload/PTC_April-2011.pdf (last visited Mar. 20, 2012).

production tax credit provides a degree of financial certainty to the wind industry, helping developers raise capital from investors, achieve wind project financing, and fully complete wind projects.[86] Additionally, the renewed form of the production tax credit creates a specific incentive for developers to begin construction of wind projects in the immediate future.[87] Developers can receive the credit for any eligible facilities that begin construction before January 1, 2014.[88] This guaranty of credit reception for pre-2014 facilities provides developers with a degree of certainty and stability in financing their projects—two factors that encourage project forecasting and development.

B. Other positive federal political factors

In addition to support in the form of the renewal of the production tax credit, the Executive also heavily supports development of renewable energy. In the 2012 State of the Union Address, President Obama advocated for the passage of tax credits to support a "clean energy industry that's never been more promising."[89] The President also announced an Executive declaration to "allow the development of clean energy on [public lands]," including a clean energy purchase commitment from the Navy.[90] These actions are part of a larger goal of generating 80 percent of electricity in the United States from sources of clean energy by 2035.[91] The Obama Administration is also requesting

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[86] *Id.*
[87] http://www.irs.gov/pub/irs-drop/n-13-29.pdf
[88] *Id.*
[89] Barack Obama, President of the U.S., State of the Union Address (Jan. 24, 2012).
[90] *Id.*
[91] *Id.*; *Securing American Energy*, THE WHITE HOUSE, http://www.whitehouse.gov/energy/securing-american-energy (last visited Apr. 23, 2013). This commitment consists of the Department of Navy "adding 1 gigawatt of renewable energy . . . to its energy supply for shore-side installations." *Id.*

Congress to create "a new Energy Security Trust," aimed at investing $2 billion over the next ten years in energy research and development.[92]

The Department of Energy is supporting the development of offshore wind energy by creating a source of Department funds accessible by developers. On March 1, 2012, Secretary of Energy Stephen Chu announced that the allocation by the Department of Energy of up to $180 million over the next five years for offshore wind demonstration projects.[93] Developers can competitively apply for these funds to cover "up to 80 percent of a project's design costs and 50 percent of the hardware and installation costs."[94] Allocating funds for project research and demonstration will provide for long-term cost reduction for offshore wind technologies.[95]

In 2012, the Department of Energy announcing funding for seven Advanced Technology Demonstration offshore wind projects.[96] The seven projects will receive a combined $168 million over the next six years.[97] These projects involve the installation of different turbine designs in various locations around the United States, including off the coast of Virginia and New Jersey.[98] While these pilot projects will not directly

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[92] http://www.whitehouse.gov/the-press-office/2013/03/15/fact-sheet-president-obama-s-blueprint-clean-and-secure-energy-future
[93] *Energy Department Announces $180 Million for Ambitious New Initiative to Deploy U.S. Offshore Wind Projects*, DEP'T OF ENERGY (Mar. 1, 2012, 3:22 PM), http://energy.gov/articles/energy-department-announces-180-million-ambitious-new-initiative-deploy-us-offshore-wind.
[94] *Id.*
[95] *Id.*
[96] http://www1.eere.energy.gov/wind/offshore_wind.html.
[97] *Id.*
[98] *Id.*

impact development in Maryland, they will contribute to a growing bank of expertise in facility design, installation, and operation of offshore wind energy in the United States.[99]

The Department of the Interior is also focusing to develop renewable energy, particularly offshore wind power. This focus includes a commitment to issue "permits for 10,000 MW of renewable power on ... public lands and … offshore waters by the end of 2012."[100] Secretary of the Interior Ken Salazar acknowledged the particular promise of offshore wind in the United States, describing Interior efforts to move "full-steam ahead to accelerate the siting, leasing and construction of new projects."[101]

On February 2, 2012, the Department of the Interior's Bureau of Ocean Energy Management published several measures streamlining the leasing process for offshore wind energy projects.[102] The Bureau issued a finding that renewable energy leases for defined areas off of the mid-Atlantic Coast would have no significant impact on the environment.[103] The environmental assessment examined the potential impacts and

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[99] *Id.*

[100] Securing American Energy, *supra* note 95; *see also*, http://www.whitehouse.gov/the-press-office/2013/03/15/fact-sheet-president-obama-s-blueprint-clean-and-secure-energy-future. In 2013, President Obama released a budget increasing "funding for energy programs of the Bureau of Land Management by roughly 20 percent," with particular emphasis on renewable energy permitting and infrastructure. *Id.*

[101] Press Release, Dep't of the Interior, Obama Administration Announces Major Steps toward Leasing for Offshore Wind Projects in Mid-Atlantic (Feb. 2, 2012) (on file at http://www.doi.gov/news/pressreleases/Obama-Administration-Announces-Major-Steps-toward-Leasing-for-Offshore-Wind-Projects-in-Mid-Atlantic.cfm).

[102] Timothy B. Wheeler, *U.S. Gives Green Light to Offshore Wind Farms*, BALT. SUN (Feb. 2, 2012), http://articles.baltimoresun.com/2012-02-02/features/bs-gr-offshore-wind-power-20120202_1_offshore-wind-wind-farms-turbines.

[103] *Id.*; Bureau of Ocean Energy Mgmt., *Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore New Jersey, Delaware, Maryland, and Virginia – Final Environmental Assessment*, DEP'T OF THE INTERIOR (Jan. 2012), *available at* http://www.boem.gov/uploadedFiles/BOEM/Renewable_Energy_Program/Smart_from_the_Start/Mid-Atlantic_Final_EA_012012.pdf.

consequences of issuing leases for Wind Energy Areas.[104] Several site characterization activities accompany the identification of an area as a Wind Energy Area, including the performance of biological, geotechnical, geophysical, and archeological surveys in the Area.[105] The environmental assessment analyzed the environmental impact of installing and operating the buoys and meteorological towers necessary to conduct these surveys in the Wind Energy Areas.[106] The finding fulfills evaluation requirements under the National Environmental Policy Act, and reduces the environmental review and permitting requirements offshore wind project developers need to perform.[107]

The Bureau of Ocean Energy Management also published a new lease form and Calls for Information and Nominations for both Virginia and Maryland.[108] The new lease form incorporates financial terms, site-specific mitigation measures, and other terms into an individual lease prior to its execution.[109] The latter publications serve to solicit industry lease nominations and request public comments on resources, site conditions, and multiple uses for Wind Energy Areas off of Maryland and Virginia.[110] The leasing area off of the coast of Maryland consists of 80,000 acres, stretching from "10 nautical miles off Ocean City to 27 nautical miles out to sea."[111]

The release of the programmatic environmental assessment, new lease form, and Calls for Information and Nominations by the Bureau of Ocean Energy Management are part of a broader Interior effort to streamline the permitting and regulatory process for

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[104] Press Release, Dep't of the Interior, *supra* note 101.
[105] *Id.*
[106] *Id.*
[107] *Id.*
[108] *Id.*
[109] *Id.*
[110] *Id.*
[111] Wheeler, *supra* note 102.

offshore wind energy.[112] Salazar issued the first least for an offshore wind project in the United States in 2010 for the Cape Wind project in Massachusetts.[113] The Bureau of Ocean Energy Management is anticipated to complete leasing of the Maryland Wind Energy Area in 2013.[114]

III. PROCESS THAT PROJECT DEVELOPMENTS NEED TO FLLOW TO DEVELOP OFFSHORE WIND ENERGY PROJECTS OFF THE COAST

The programmatic environmental assessment and finding of no significant impact for the mid-Atlantic offshore sites removes one hurdle from the siting and permitting process developers must follow. The finding allows developers to obtain leases and measure and test the wind conditions of different areas for potential wind turbine viability.[115] The Bureau of Ocean Energy Management can use the environmental assessment as a base of information when make further leasing decisions in Wind Energy Areas off the coast of Maryland.[116]

While the decision eliminates a two year step from the permitting and environmental review process, developers still need to conduct environmental and other reviews for individual project proposals.[117] The National Environmental Protection Act requires the Bureau of Ocean Energy Management to evaluate individual project plans by

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[112] *Id.* "Eight companies or partnerships had expressed interest in 2010 for renewable energy leases off of the Maryland coast." *Id.*
[113] *Id.*
[114] Maryland Energy Administration, Maryland Offshore Wind Energy Act of 2013 Facts & Figures, http://governor.maryland.gov/documents/MOWEA2013FactSheetMEA.pdf (last visited Apr. 21, 2013).
[115] Ryan Tracy, *Administration Fast-Tracks Offshore Wind Farms*, WALL ST. J. (Feb. 6, 2012), http://online.wsj.com/article/SB10001424052970203711104577199064065156548.html.
[116] Press Release, Dep't of the Interior, *supra* note 101.
[117] Tracy, *supra* note 115.

preparing separate project- and site-specific analyses of the project construction and operations plans.[118] Prior to construction, developers need to conduct environmental studies on the potential impact of turbines on shipping and other commercial activities and on wildlife like fish, bats, and birds.[119] Even with the programmatic environmental assessment, construction will not happen for at least five years as project developers seek to eliminate other political and economic barriers.[120] Developers also need to install buoys to measure winds at prospective turbine locations, and developers must receive leases from the federal government before they can begin this wind surveying.[121] The additional steps of project and site analyses, environmental review, and wind surveying will take developers at least five years from the point of signing a federal lease for offshore development.

A. Additional Steps in the Process From the Maryland Offshore Wind Energy Act of 2013

With the passage of the Maryland Offshore Wind Energy Act of 2013, developers need to conduct additional steps prescribed by the statute prior to construction on an offshore wind project. The developer would need to submit a competitive bid on an Offshore Renewable Energy Credit (OREC) price incorporating the energy, capacity, ancillary services and environmental attribute of the wind project.[122] In order to derive this price, "a developer determines the total revenue needed to ensure financing, on a per

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[118] Press Release, Dept't of the Interior, *supra* note 101.
[119] Wheeler, *supra* note 102.
[120] *Id.*
[121] *Id.*
[122] http://mgaleg.maryland.gov/2013RS/bills/hb/hb0226E.pdf; *Offshore Wind Renewable Energy Credits*, OFF. OF GOVERNOR MARTIN O'MALLEY (Feb. 23, 2012), http://governor.maryland.gov/documents/OSWtestimonySenateFinance.pdf.

MWh basis over the 20 year project horizon."[123] The developer sells the energy, capacity, and ancillary services to the PJM market to obtain revenue.

In order for a project to achieve viability under the 2013 Act, the net cost of the offshore wind projects must not exceed certain overrun thresholds described in the Act. The Public Service Commission determines the net cost of the project by examining the difference between the expected revenues of the sale to PJM and the submitted OREC price bid.[124] The Commission then uses conventional forecasts of energy costs to calculate whether the net project cost would increase average ratepayer bills by too large a margin in each year of the 20 year contract.[125] Under the passed legislation, the projected average monthly cost cannot exceed a $1.50 (in 2012$) increase over the regular bill of the average residential customer for any year during the contract.[126] Similarly, the cost cannot exceed 1.5 percent of a nonresidential customer's regular bill over the same time frame.[127] The legislation mandates that if the Public Service Commission determines a project to violate either of these financial constraints, then the project is disqualified.[128] The project developer is responsible for any cost overruns attributable to miscalculations or underestimates in the costs of generating electricity as submitted in its OREC bid.

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[123] *Offshore Wind Renewable Energy Credits*, OFF. OF GOVERNOR MARTIN O'MALLEY (Feb. 23, 2012), http://governor.maryland.gov/documents/OSWtestimonySenateFinance.pdf.
[124] §§ 7-704.1(F) and 7-704.2 at http://mgaleg.maryland.gov/2013RS/bills/hb/hb0226E.pdf; *Offshore Wind Renewable Energy Credits*, OFF. OF GOVERNOR MARTIN O'MALLEY (Feb. 23, 2012), http://governor.maryland.gov/documents/OSWtestimonySenateFinance.pdf.
[125] *Id.*
[126] § 7-704.1(E) at http://mgaleg.maryland.gov/2013RS/bills/hb/hb0226E.pdf
[127] § 7-704.1(E) at http://mgaleg.maryland.gov/2013RS/bills/hb/hb0226E.pdf
[128] § 7-704.1(F) at http://mgaleg.maryland.gov/2013RS/bills/hb/hb0226E.pdf

IV. EVALUATION OF THE 2012 BILL

The primary difference between the 2012 and 2013 Maryland Offshore Wind Energy Acts and the 2011 bill is in the financing structure employed by the two sets of bills. Both the 2012 and 2013 proposal scored well with legislators with its cost-limiting provisions, but the bill distributed risk in a manner that will make financing offshore wind projects rather difficult. In 2011, the Bluewater Wind project collapsed from the inability of NRG to obtain financing for the planned 150 turbine offshore wind farm.[129] Even with the passage of the 2013 bill, financing the projects approved by the Public Service Commission remains a significant obstacle to development of offshore wind.

The long-term power purchase agreement proposed in the 2011 bill set forth a guaranteed market for any electricity produced by offshore wind markets. In this framework, developers would only have to worry about constructing functional offshore wind projects and connecting the projects into the transmission grid. The proposed legislation mandated utilities to enter into long-term purchase agreements with developers, and developers would fulfill their contractual obligations by building offshore wind projects capable of producing electricity. Developers could base planning of offshore wind projects solely around the fixed price determined by the purchase agreement.

Developers could more easily find investors for their projects in a business climate with a fixed energy price and a guaranteed purchaser for generated electricity. A developer has leeway in designing a project that only must meet a certain, known price in

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[129] David Hill, *O'Malley to Again Tout Offshore Wind, But Shifts Direction*, WASH. TIMES (Jan. 1, 2012), http://www.washingtontimes.com/news/2012/jan/1/omalley-again-tout-offshore-wind-changes-course/.

order to achieve economic viability. A fixed price for electricity produced from offshore wind allows project developers to design projects without predicting or accounting for fluctuations in the market price for electricity. As a general proposition, investors are more likely to fund projects that are less risky and more assured of profitable returns. While offshore wind energy production is a capital intensive venture, developers will find it easier to amass sources of capital when investors can rely on the clear, consistent signal of a fixed price.

The strength of the 2011 legislative proposal was in the bill's creation of an environment favorable for offshore wind energy production based on low risk to developers and investors. However, in order to create low risk investment conditions, the bill required utilities to serve as guaranteed purchasers for the electricity produced by offshore wind developers. By requiring utilities to enter into long-term power agreements with developers, the utilities would be forced to bear the risk carried by lower than anticipated electricity prices. Drops in the market price of electricity by factors like a shale gas boom decreasing natural gas prices would heighten the comparative price of offshore wind. If the contract price of electricity generated from offshore wind ended up exceeding the market price for electricity, the utilities would pass on the cost increase to ratepayers. A large reason legislators opposed the 2011 bill was the potential for utilities to enter into high priced long-term contracts, leaving taxpayers to pay for expensive offshore wind energy.

The financing structure of the 2013 Maryland Offshore Wind Energy Act distributes risk in an opposite fashion to the 2011 proposal. Legislators were much more likely to support the bill that limits the cost increases on ratepayer bills attributable to

offshore wind. In the passed version of the Act, both the State and ratepayers are not bound in long-term contracts for utility purchase of fixed price offshore wind energy from developers. The Public Service Commission only has the authority to approve offshore wind energy projects that fit within the cost-limiting provisions contained in the Act. Developers are liable for any cost overruns in executing an approved project proposal, insulating the utility, ratepayers, and the State from the price effects of cost overruns.

The 2013 Maryland Offshore Wind Energy Act minimized the risk faced by utilities and ratepayers by shifting the financial risk to developers and investors. Under the 2011 bill, developers would have only needed to account for wind energy production towards a fixed price goal, but the 2013 Act will force projects to account for variations in the market price of electricity. This type of financing structure selects for only the most cost efficient offshore wind projects, and proposals that do not meet the cost-limiting mandates of the bill are rejected. However, under this financing structure, developers are less likely to achieve financing for their offshore wind energy projects. The bill created ORECs as an additional source of value in the development of offshore wind energy projects, but the risks to developers and investors may outweigh this incentive.[130] Stability, predictability, and low-risk returns are attractive traits to investors, and the cost-limiting provisions of the 2013 Act distribute risk in a manner that inhibits these qualities.

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[130] Aaron C. Davis, *Maryland offshore wind plan likely to pass, but will it be built?*, WASH. POST (Feb. 4, 2013), http://articles.washingtonpost.com/2013-02-04/local/36741341_1_offshore-wind-subsidy-peter-mandelstam.

Under the 2013 Act the viability of a developer's offshore wind project is a function of anticipated electricity prices and OREC prices. Aside from any federal tax credits, selling electricity and ORECs is the only method by which a developer could obtain revenue from an offshore wind project. No developer will rationally construct an offshore wind farm that is not expected to receive a return that exceeds the costs of developing the project.

Developers face risk in relying on an uncertain source of revenue, and the future prices of electricity and ORECs are flexible and difficult to forecast. Electricity markets are notoriously mercurial and unpredictable, and a market for ORECs does not presently exist in the United States. While the renewal of the federal production tax credit alleviates some of this financial instability, developers must still contend with a new market in an industry new to the United States.

The capital intensive nature of offshore wind energy only exacerbates the high risks faced by developers and investors. Constructing an offshore wind farm requires a high upfront cost for an economic benefit that is spread out over the production life of the turbines in the wind farm. The size of this economic benefit depends on how electricity prices change over the production life; low electricity prices decrease generation revenues and high prices increase revenues. Developers must design project plans around long-term forecasts of electricity prices. Projected economic benefit over the long run must reach a sufficient level to justify substantial cost over the short term in an industry in only its fledgling stages in the United States.

Large scale offshore wind projects also require greater sums of capital than smaller projects. Economies of scale dictate that large offshore wind farm projects are

more likely to achieve low production costs per MW of energy generated. While larger projects are capable of producing electricity at a more cost efficient rate, it is difficult to obtain the requisite capital to finance large offshore wind farms.

CONCLUSION

Passing the Maryland Offshore Wind Act of 2013 is a gust of victory for proponents of offshore wind energy technology and advocates for its development as an industry in the United States. However, the Act only passed after undergoing dramatic changes to the financing mechanisms at the heart of the bill. These changes resulted in risk shifting from the State to potential developers of offshore wind projects. This risk shift resulted in a more politically palatable subsidy that was able to pass the Maryland Legislature, but also removed a degree of stability and predictability from the financial calculations of offshore developers. It remains to be seen whether developers are willing to invest in projects under the financing system created by the 2013 Act or whether they view the risk of developing offshore wind energy in Maryland as too great to warrant the investment.