**STATE OF RHODE ISLAND PUBLIC UTILITIES COMMISSION**

**IN RE: REVIEW OF AMENDED POWER PURCHASE AGREEMENT BETWEEN NARRAGANSETT ELECTRIC COMPANY D/B/A NATIONAL GRID AND DEEPWATER WIND BLOCK ISLAND, LLC, PURSUANT TO R.I. GEN. LAWS § 39-26.1-7**

**DOCKET NO. 4185**

# PREFILED TESTIMONY

**OF**

**WILLIAM M. MOORE**
**CHIEF EXECUTIVE OFFICER**
**DEEPWATER WIND HOLDINGS, LLC**

**FOR**

**DEEPWATER WIND BLOCK ISLAND, LLC**

**July 15, 2010**

## I. INTRODUCTION

**Q. Please state your name and address**

A. My name is William M. Moore and my business address is 56 Exchange Terrace, Providence, RI 02903.

**Q. By whom are you employed and in what capacity?**

A. I am the Chief Executive Officer of Deepwater Wind Holdings, LLC, a leading developer of offshore wind energy facilities, and the parent entity of Deepwater Wind Rhode Island, LLC, and Deepwater Wind Block Island, LLC ("Deepwater Wind"), the developer of the Block Island Wind Farm.

**Q. Please describe your qualifications and experience.**

A. I have a B.A., *cum laude*, from Yale College in Economics and Political Science (1978), and an M.B.A. from the Yale School of Management (1988). I have worked in different sectors of the electric power industry over the last 30 years, starting as an electric utility research analyst for Energy Systems Research Group (Boston, MA) in 1979. As an Electric Utility Policy Analyst for the Massachusetts Executive Office of Energy Resources (Boston, MA), I participated in several proceedings before the Massachusetts Department of Public Utilities (DPU), and led an intervention before the DPU aimed at reforming the regulations governing power purchase agreements for cogenerators and small power producers. Starting in 1989, I worked for 6 years in the utility and project finance arena, first arranging debt offerings for utility and project development clients for a NYC-based investment bank, and then later arranging project financings for a Washington, D.C.-based developer of independent power projects that was jointly owned by PG&E Enterprises and Bechtel Enterprises. From 1996 to 1998, I managed the development of, and arranged a cross-border financing for, each of the Aeroenergia and Tierras Morenas wind projects now operating in the Guanacaste Province of Costa Rica, on behalf of EnergyWorks, a joint venture of Bechtel Enterprises and Pacificorp. In 1998 I co-founded Atlantic Renewable Energy Corporation, an independent developer of wind

energy projects that successfully developed 500 MW of the first commercial wind projects in the northeastern US. I was the lead developer of the first three commercial wind farms in New York, including the 11 MW Madison, 30 MW Fenner and 325 MW Maple Ridge wind farms (the latter of which remains the largest wind project in operation in the eastern US). After Atlantic Renewable Energy was sold to PPM Energy (now Iberdrola Renewables - the largest equity owner of wind projects in the world), I managed PPM/Iberdrola's 500+ MW portfolio of wind development assets in NY until 2008. I then joined Deepwater Wind Holdings in May of 2009 as its Chief Executive Officer.

**Q. Can you summarize what you will be testifying to today?**

A. Yes. First, I will discuss the amendments to the Long-Term Contracting Law.

Second, I will discuss the power purchase agreement filed by The Narragansett Electric Company, d/b/a National Grid's ("NGrid") on June 30, 2010 (the "New PPA"). The New PPA is materially different than the power purchase agreement that was filed with the commission on December 9, 2009 in Docket 4111 (the "Docket 4111 PPA") in two important respects:

- The pricing structure has been changed to provide for significant ratepayer benefits and protections.
- The pricing structure significantly limits Deepwater Wind's ability to enhance its projected 10.5% unlevered return.

These changes, together with the Wind Outperformance Adjustment Credit (which remains unchanged from the Docket 4111 PPA) have the effect of placing the risk of construction cost overruns, operations and maintenance cost overruns, and wind resource underperformance solely on Deepwater Wind. The ratepayer bears none of these risks.

Third, I will discuss Deepwater Wind's expected return.

Finally, I will discuss other benefits that I believe will result from the Block Island Wind Farm.

## II. LEGISLATION

**Q: Why did Deepwater Wind support the new legislation?**

A: Deepwater Wind supported passage of the amendments to the Long-Term Contracting Act because they address the two issues that dominated the litigation of Docket 4111: ambiguity surrounding the appropriate standard of review and concerns regarding Deepwater Wind's expected returns.

It needs to be emphasized that these amendments were adopted by the General Assembly with the full knowledge that a state-waters, demonstration-scale offshore wind farm will produce energy at prices that are above today's average market levels. Thus, it is clear that as a matter of State energy policy, the General Assembly wants to support investment in this kind of state-waters project as long as its total costs to build are deemed reasonable for an offshore wind energy project of similar scale and location.

In other words, the General Assembly's overwhelming passage of the Rhode Island General Laws §39-26.1-7, as amended by 2010 Senate Bill 2819 Sub A as amended and 2010 House Bill 8083 Sub A as amended (as amended, the "New Law") clearly demonstrates that it does not expect the price of power from the Block Island Wind Farm to be the lowest of all new renewable energy sources in the region. Due to the inherent diseconomies of building a demonstration-scale project, higher-cost energy is to be expected from a facility of this size. The new standard of review for the New PPA requires that Deepwater Wind demonstrate that the costs to build the Block Island Wind Farm are reasonable, in alignment with industry norms, for an offshore wind farm of this size, built in similar water depths.

Secondly, the amendments also address the concerns raised with respect to Deepwater Wind's rate of return on investment by mandating a transparent and open pricing mechanism. The New PPA provides unprecedented protections to the ratepayer by requiring Deepwater Wind to fully

disclose its expected costs to build this project, to have its actual costs to build verified, and to pass along any capital cost savings in the form of lower contract-specified energy prices. In addition, Deepwater Wind is disclosing its expected return on investment.

This transparent pricing approach reflects Deepwater's appreciation for the General Assembly's objective of creating a demonstration scale offshore wind project that serves multiple *public* objectives, including:

- Creating a "beach head" at Quonset, and Rhode Island more broadly, for the whole supply chain of manufacturers and service companies interested in offshore wind;
- Creating new jobs and training programs to help fill them; and
- Supplying Block Island with a new source of renewable energy generation that will displace Block Island Power Company's dirty old diesels and facilitate a new transmission link to the mainland.

**Q. Why does a small demonstration project make sense for Rhode Island and Deepwater Wind?**

A. Currently there is no infrastructure in the Northeast for offshore wind. The development of that infrastructure will take time but it is logical that the infrastructure will grow in proximity to the first wind farms. In fact, we have been aggressively courted by several manufacturers who want to place factories in Rhode Island if they can gain confidence that Rhode Island is a natural location for building and maintenance of offshore projects. We believe it is for the following reasons:

- Rhode Island is centrally located;
- Quonset is a unique asset which could serve a number of markets; and
- Rhode Island has a qualified maritime and construction workforce which is available to support a growing industry.

By building a smaller state water project before a larger federal project, Rhode Island has a better chance at solidifying its natural advantages to serve the offshore industry.

The governors of ten of the eastern seaboard states recently formed a consortium to support the development of offshore wind projects in this region. Many of these states are actively competing with Rhode Island to host the first offshore wind project, hoping to claim some of the expected economic development benefits. Clearly, the wind turbine vendors and submarine cable suppliers are not going to build factories in each of these states. While the construction of the Block Island Wind Farm alone is no guarantee that these companies will locate new facilities in Rhode Island, if this first-of-its kind offshore wind facility does get built in Rhode Island, it will clearly pave the way for larger projects that will have significant economic development benefits for the region. Moreover, these projects could leverage the Quonset Point facility into the offshore wind hub of the northeast, creating both increased economic development as well as significant regional environmental benefits.

The second reason for a demonstration project is that in addition to the Block Island Wind Farm, Deepwater Wind is also actively developing utility-scale offshore wind farms in Rhode Island Sound, the New York Bight and off of New Jersey. As such, we have a keen appreciation for the difficulty of "leapfrogging" to a 300 - 400 MW offshore wind project, without building a smaller facility first. It should be no surprise that experienced engineering, procurement and construction firms will expect to receive a significant premium - what could be termed a "demonstration premium" - in connection with any large infrastructure project that employs novel technologies, new construction methods or is located in a challenging environment. The immature supply chain for offshore wind in the US including lack of suitable vessels for either installation or O&M, no local suppliers of key components, limits on experience and capabilities of offshore constructors all add to this "demonstration penalty." Experience and familiarity with the technology will drive this demonstration premium down - yet another reason to start with a smaller project.

Another reason to start with a smaller-scale project is to give builders, suppliers and workers a chance to gain experience with these new methods and technologies. The rationale for "starting small" has been around for a long time in the power industry:

- The Shippingport atomic power station, built in western Pennsylvania, went on-line in 1958 at a size of 60 MW, and is celebrated as the first commercial nuclear power station in the US;
- The first commercial wind plant in New England was built in Searsburg, Vermont[1] in 1996/1997 at a size of 6.5MW; and
- The first offshore wind plant in the world was built at a size of 4.95MW off of Vindeby, Denmark in 1991.

The recent history of commercial wind in the northeast is directly relevant here, where over the course of the last 15 years the industry has gone from the Searsburg-scale projects of about 5MW to multi 100+MW utility-scale projects that are similar in size to the offshore wind projects planned for Rhode Island Sound.

[1] The final report on a federal grant supporting this demonstration project observed some parallels to the Block Island Wind Farm context. "The total cost of the [Green Mountain Power project in Searsburg, VT] was approximately $11 million . . . This cost is higher than would be expected from a large commercial wind power plant for a number of reasons. First, the size of the project is relatively small and there is little opportunity in either the capital or operating costs to take advantage of any economies of scale or quantity discounts. The costs associated with permitting the project were also particularly high. For a larger project, these costs would likely have been the same, but the impact of the permitting costs would have been significantly less on a $/kW basis. Also, there is a learning curve associated with developing a first project, and [these costs] reflect this learning curve as well as the research nature of the project. Some of the work that was completed and included in the project development costs will benefit the parties, and others, in wind projects in the future….The estimated cost of energy for the project exceeds the projected avoided cost for several years. [Green Mountain Power] considers the long-term economics to be acceptable and believes they will benefit from the non-economic research results of the project. Their decision to proceed with the project was also based on the …. chance to mitigate future risk by gaining experience with a small project." Green Mountain Power Wind Power Project Development, US Department of Energy EPRI Wind Turbine Verification Program, TR-109061, December 1997.

In fact, I have personally witnessed the many reasons why the first wind projects built onshore were smaller - in the range of 5 to 30 MW - and not 300MW. When I started developing the first commercial projects in New York, including the 11 MW Madison Project (on-line in 2000), and the 30 MW Fenner Project (2001), along with the first commercial projects in Pennsylvania (the 6 MW Somerset project, and the 15 MW Mill Run project, both of which went on-line in 2001), the Eastern U.S. on-shore wind industry was in its infancy as characterized by:

- Limited understanding of wind resource characteristics in the region;
- Limited utility experience interconnecting intermittent generators;
- Non-existent supply chain;
- Limited agency experience with state and federal permits; and
- Insufficient investor or lender interest in large scale projects in immature markets.

The construction and early operation of these pioneering on-shore wind farms allowed the wind industry to evolve gradually, with the emergence of: local rigging contractors with the capacity to install MW-scale wind turbine generators; investors with experience operating commercial wind plants; utility system planners at the ISO level who gained experience dispatching wind projects; and permitting agency staffs who had experience with the actual impacts of both the construction and operation of MW-scale wind machines. The same evolutionary path should hold true for the offshore industry.

**Q. How do you reconcile the previous answer with the fact that larger projects are under development off the coasts of Massachusetts and Delaware?**

A. Although both the Cape Wind and Bluewater/Delaware projects were proposed before the Block Island project, neither project is at the finish line, and both face significant financial and logistical hurdles to be completed by 2012 or 2013 – if ever. Deepwater Wind's Block Island Wind Farm remains the only offshore wind project with a reasonably good chance of completion

by the end of 2012. If the Block Island Wind Farm were to be cancelled, the earliest date a utility-scale project could be under construction in Rhode Island Sound - under the existing federal Bureau of Ocean Energy (f/k/a Minerals Management Service) regulations for permitting and leasing federal waters sites - would be approximately 2020 (although government and industry efforts are underway to shorten this timeframe).

## III. THE NEW PPA: PRICE AND RETURN

**Q. Can you discuss the differences between the Docket 4111 PPA and the New PPA?**

A: As required by the New Law, and with the exception of the following three significant changes,[2] the terms of the New PPA are consistent with the Docket 4111 PPA, however, there are substantial differences in the New PPA that benefit the ratepayers:

1) The pricing provisions have been revised to reflect the provisions of the New Law. All realized cost savings are for the benefit of the ratepayer.
2) The Assignment clause has been revised to address the Commission's concern raised in the Order in Docket 4111.[3] Any assignment of the New PPA by Deepwater Wind now requires NGrid prior consent.
3) During the course of the discussions respecting the New PPA, NGrid requested, and to which Deepwater Wind agreed, certain changes that either benefit the ratepayer or clarify NGrid's rights under the New PPA.

**Q. Can you describe the changes to the pricing provisions?**

A. Yes. The New PPA pricing approach is materially different than the pricing in the Docket 4111 PPA. It provides unprecedented ratepayer benefits and protections and negatively impacts

[2] In addition to these three significant changes, certain statutory references and dates have been changed to reflect the New Law and the fact that seven months have passed since the execution of the Power Purchase Agreement filed in Docket 4111. Several typographic errors have also been corrected and the permitting schedule has been updated to reflect Deepwater Wind's current understanding of the permitting regime.

[3] Commission Report and Order No. 19941, April 2, 2010.

Deepwater Wind's risk profile.

**Q. Can you expand on that?**

A. The Docket 4111 PPA was a traditional fixed price contract. Under that contract, any project cost savings would have been retained by Deepwater Wind and would have improved its rate of return. In the New PPA, and as required by the New Law, realized savings in the actual cost of the project result in price reductions[4] to the ratepayers. Let me repeat this very important point: all realized savings are passed along to the ratepayer. None of these savings accrue to Deepwater Wind's direct benefit.

**Q. Under the New PPA, what will the price be in the first year?**

A. The price will not exceed $235.70. The New Law requires that the bundled price in the first year of the New PPA explicitly cannot exceed $235.70.[5] So I can tell you what the price cap is, but until the project has been built, and any realized savings accounted for under the cost verification process required by the New Law, I do not know what the first year price will be, because it may be lower than $235.70.

**Q. And the price after the first year?**

A. After the first year, the price will not exceed the prices in the Docket 4111 PPA. In addition to the dependence of the New PPA price on the actual project costs, the Wind Outperformance Adjustment Credit remains unchanged from the Docket 4111 PPA.[6] The ratepayer shares in any wind outperformance through lower prices. The Wind Outperformance Adjustment Credit only works to the ratepayer's benefit, not to their detriment.

[4] R.I.G.L. § 39-26.1-7(e).
[5] New PPA, Exhibit E, Appendix X.
[6] New PPA, Exhibit E, Appendix Y.

**Q. What will Deepwater Wind's rate of return be under the New PPA?**

A. We have calculated the price table in the PPA using an unlevered return target of 10.5%. (See Exhibit 1 attached to my testimony.) However, as I discuss in this testimony, this creates an asymmetric risk profile for Deepwater Wind that has significantly more downside than upside.

While we are not required under the New Law to disclose our financial assumptions and projected rate of return, we have voluntarily disclosed this information. We know that in other states, public officials and developers are debating the propriety of requiring developers benefiting from long-term contracting policies to disclose this information. Deepwater Wind has decided to err on the side of transparency with respect to our projected rate of return.

**Q. What will Deepwater Wind's levered rate of return be for the Block Island Wind Farm?**

A. The ultimate levered rate of return cannot be known today, for a number of reasons. However, Deepwater Wind retained Mr. Martin Pasqualini, an expert in power markets and project finance, to provide his professional opinion on the range of likely levered returns for this project and the factors that can influence that return. His testimony has been submitted to the Commission, as well.

**Q: How does the new price-reduction mechanism in the New PPA work?**

A: In keeping with the New Law, the New PPA includes a price reduction table, which translates ALL capital cost savings below the level necessary to meet Deepwater Wind's target unlevered return into specific reductions in the contract-specified price while leaving Deepwater Wind's unlevered return unchanged. This table from the New PPA is reproduced below, with one addition. I have added a column that shows Deepwater Wind's projected unlevered returns at various project cost levels.

In this table the column labeled "Total Costs" refers to the total capital expenditures required to build the Block Island Wind Farm. The $205,403,512 is the "Base Amount" which reflects Deepwater Wind's best current estimate of the Total Facility Cost.

"Savings" refers to any savings realized in the construction of the facility against the Base Amount. The "Price" refers to the first year price under the New PPA as adjusted for any reduction in the cost to build the wind farm. And "IRR w/ITC" refers to the rate of return on the equity investment in the project, assuming continued eligibility of the project for the Investment Tax Credit. These return estimates are as calculated by the Deepwater Wind financial model, attached as Exhibit 1.

The purpose of this table is to translate any savings realized in the construction of this project into specific reductions in the New PPA contract price. For example, if it only costs Deepwater Wind $195,403,512 to build this project, representing $10 million in "Savings," the Price is reduced from $244.00 to $234.40 (per MWh). Similarly, a $20 million reduction in the cost to build would result in a first year price of $224.90/MWh. (For "Savings" amounts that fall in between these $5 million increments, the amount of the price reduction will be interpolated.) This mechanism caps Deepwater Wind's projected unlevered return to 10.5%, as calculated at the completion of construction.

Note also the impact of the asymmetry in risk sharing between Deepwater Wind and the ratepayer: if the "Savings" go up, the price goes down; but if "Total Costs" go up, the price remains the same. Further, Deepwater Wind will have spent more to build the project, and therefore Deepwater Wind's return will fall below the 10.5% target, with no floor.

| Total Costs (USD) | Savings (USD) | Price (USD) | IRR w/ ITC |
|---|---|---|---|
| ≥220,403,512 | ≥(15,000,000) | 235.70 | ≤9.7% |
| 215,403,512 | >(10,000,000) | 235.70 | 10.0% |
| 210,403,512 | >(5,000,000) | 235.70 | 10.2% |
| **205,403,512** | **0** | **235.70** | **10.5%** |
| 200,403,512 | 5,000,000 | 231.10 | 10.5% |
| 195,403,512 | 10,000,000 | 226.50 | 10.5% |
| 190,403,512 | 15,000,000 | 221.80 | 10.5% |
| 185,403,512 | 20,000,000 | 217.30 | 10.5% |
| 180,403,512 | 25,000,000 | 212.70 | 10.5% |
| 175,403,512 | 30,000,000 | 208.00 | 10.5% |
| 170,403,512 | 35,000,000 | 203.40 | 10.5% |
| 165,403,512 | 40,000,000 | 198.80 | 10.5% |
| 160,403,512 | 45,000,000 | 194.20 | 10.5% |
| 155,403,512 | 50,000,000 | 189.70 | 10.5% |

There are many ways for Deepwater Wind's rate of return to decrease below 10.5% but there are only two ways to improve the return and both are over the lifetime of the project. The first is savings on operations and maintenance expense projections and the second is if the wind performance exceeds projections. If the wind performance exceeds projections, then Deepwater Wind shares half of those savings with the ratepayers.

**Q. Why is "open-book pricing" appropriate for a demonstration project like the Block Island Wind Farm?**

A. The immature supply chain in the offshore wind industry in the US meant that, in NGrid's competitive solicitation last fall for the New Shoreham project, a fixed-price bidder like Deepwater Wind had no choice but to include higher than typical contingencies in its project cost estimates, given the large uncertainties surrounding:

- the cost (and availability) of installation and O&M vessels;
- the cost of jacket foundation fabrication and installation;
- the cost of wind turbine supply;
- the expected amount of energy production; and

- the impact of exchange rate risk on the price of wind turbine generators and submarine cable (50% of the total project capital cost).

And here is the critical point that must be stressed: when required to submit fixed-price bids under conditions of large cost unknowns, a wind project sponsor's bid price has to include a large contingency factor to protect against possible cost overruns. But that does not mean that cost savings may not also be realized, if the sponsor can:

- negotiate better than expected pricing from suppliers, vendors and subcontractors as the project design and schedule become better defined,
- benefit from new jacket foundation designs, or the availability of larger wind turbine generator size that reduce the total number of structures, or
- benefit from a stronger dollar in the pricing of equipment denominated in foreign currencies.

While Deepwater Wind expects that savings can be achieved in designing and building this generating facility, it's simply too early to know where these savings will be realized, and how many dollars will be saved, net of possible cost overruns in other areas.

**Q: Please explain the difference between the Base Amount of $205,403,512 under the New PPA's price reduction provision and the $219,311,412 project cost estimate under the fixed-price bid in Docket 4111?**

A: The $219,311,412, which we refer to as the Docket 4111 Estimate, was Deepwater Wind's earlier estimate of the total facility cost adopted in the context of a fixed price bid, which yielded an unlevered IRR of approximately 9.7% at the Docket 4111 PPA price (i.e., if the project were built at this cost level). As I testified in Docket 4111, with this below-market return, arranging financing for this facility could be difficult.

The Base Amount represents Deepwater Wind's revised best estimate of the facility cost that gives us a chance attract the financing necessary to construct the project, by yielding a unlevered return of approximately 10.5%, which is at the low-end of what is likely to be deemed reasonable by the project finance markets. The lower Base Amount, which was adopted in the context of a very different risk/return profile, also reflects the benefit of Deepwater Wind's ongoing effort to better define and engineer this project. As we further engineer the project, finalize construction plans, and receive firm pricing on equipment, we believe we may see incremental savings but we can't be certain. Again, these savings will be passed along to ratepayers. Since our long term goal is to reduce the cost of offshore wind to make it cost competitive with other new sources of generation serving New York, Long Island and southern New England it is in our best interests to drive costs and prices lower.

The Docket 4111 PPA pricing schedule was negotiated in the context of a fixed price bid. Within the context of the Docket 4111 PPA, Deepwater Wind assumed all of the risk, and retained all of the benefit, related to the cost to construct the project. In other words, Deepwater Wind assumed that it would achieve enough construction cost savings against the $219 million estimate to bring the unlevered returns back into the range that is more viable for project financing purposes (i.e., greater than 9.7%), and it entered into the Docket 4111 PPA with such aggressive pricing solely because it expected to achieve this level of total project cost savings.

Under the terms of the New PPA, Deepwater Wind has given up this ability to improve the IRR at completion by achieving savings in the cost to build the facility (i.e., since all of those savings are passed along to the ratepayer in the form of lower power prices). With this in mind it makes no sense to lock in an unlevered return (in the range of 9.7%) that may simply be un-financeable.

As this new risk sharing mechanism is dramatically different than the risk sharing arrangement in the Docket 4111 PPA, it is inappropriate to use the same base case estimate of the cost to build. Even the lower Base Amount estimate to build the facility, however, is projected to yield a

maximum unlevered return of 10.5%, which is well below the 12% target long sought by Deepwater Wind.

**Q: Does this mean that further cost savings are unlikely?**

A: Not at all. In fact, Deepwater Wind has negotiating, but has not executed, its major procurement contracts: for the supply of turbine or other electrical components; the fabrication of jacket foundations; and the supply of construction services. Compared to the cost assumptions embodied in the Base Amount, there are numerous examples of cost categories where Deepwater Wind may achieve savings, as discussed above.

**Q. What incentives are there for Deepwater Wind to drive the actual project cost down below the Base Amount?**

A. There are strategic and reputational reasons.

As discussed above, Deepwater Wind has already identified several areas of project design and engineering where it may be possible to achieve savings against our Base Amount budget. And to actually get to our target unlevered return of 10.5% we will need to achieve savings independently on several different fronts. In practice, project definition, electrical and structural engineering, and vendor negotiations continue simultaneously, as they must since Deepwater Wind cannot know up front which cost area will yield the most savings. Even if we make progress on one front it will be necessary to press ahead in all areas at the same time, since until all cost items are locked down and we have reached commercial operation there is always the possibility that cost overruns in one area can overwhelm savings achieved elsewhere. Simply put, the fact that we have to push all costs down simultaneously to have a shot at making our target return creates a compelling incentive to minimize cost.

Deepwater Wind also has a compelling incentive to demonstrate to ratepayers, the Rhode Island's legislators, the Governor, the Commission, NGrid and our investors, that the larger

project planned by Deepwater Wind for federal waters will have a far lower average unit cost. Put another way, our credibility, and prospects for building any larger project will be enhanced with every dollar saved below the Base Amount that we can achieve. As we discuss elsewhere, delivering lower costs which demonstrate offshore energy cost competitiveness is the best way for Deepwater Wind to expand our business opportunities.

**Q. Can you please discuss the sharing of project risks between Deepwater Wind and the ratepayer?**

A. As I testified earlier in Docket 4111, an unlevered return in the range of 12% is likely appropriate for a power project like this. That return range was in the context of a fixed-price power purchase contract. However, the New PPA is different since Deepwater Wind shares cost savings and wind outperformance with ratepayers, yet still bears the significant financial risk associated with:

- Schedule delays
- Construction cost overruns
- Operating cost overruns
- Turbine underperformance
- Vessel availability
- Wind performance risk
- Marine environment

In contrast, ratepayers bear none of these risks. Under no circumstances will the ratepayers pay more than the New PPA price. In fact, if Deepwater Wind does not complete the project, neither the ratepayers nor the Rhode Island taxpayers pay anything at all.

**Q. With this whole range of construction, operating, technical and wind risks, why would Deepwater Wind accept a return target of 10.5%?**

A. Without question this is a much lower return than we would normally expect. However, this is not a one-off transaction for Deepwater Wind. Our primary interest is to get this project done right and to drive down the costs of offshore wind power in the northeast, expanding our range of opportunities for additional projects. Of course, these additional project opportunities for Deepwater Wind also present significant economic development opportunities for Rhode Island.

**Q. But if the New PPA guarantees a certain level of revenue, what is the risk?**

A. It is important to emphasize that the New PPA, as was the case with the Docket 4111 PPA, does *not* guarantee any actual revenue level. *Nor does it guarantee any equity return level*. This is not a "take-or-pay" contract. Deepwater Wind gets paid only for energy actually produced. If the Block Island Wind Farm never generates a single MWhr of electricity, then the Rhode Island ratepayer never pays a single dollar. Deepwater Wind bears the full range of construction, operation and wind risks as explained herein. The ratepayer bears none of these risks.

**Q. Could you please provide an update on Deepwater Wind's application to the Department of Energy's guaranteed loan program?**

A. Deepwater Wind received a rejection letter from the Department on April 21, 2010. Based on our rejection letter, and our post-rejection interview with the DOE, it is clear that only development projects in an advanced stage - including signed and approved power purchase agreements, for example - are likely to win approval under this program. Since no federally guaranteed loans for electric generation have closed, the benefits of this program remain difficult to estimate. We currently expect that the covenants for loans that are guaranteed by this DOE program will be similar to other private sector project financings, and possibly more strict - e.g., possible recourse to the equity owner. The return impacts of a federal loan guarantee are addressed by Mr. Pasqualini in his testimony.

**Q. In Docket 4111, there seemed to be an implication that Deepwater Wind was not legally bound to live by its financing assumptions. Can you address this issue?**

A. Any suggestion that Deepwater Wind is not bound to live with its financing assumptions is not accurate, because we cannot dictate bank lending practices. In theory, some lending constraints are in the form of loan covenants that are negotiable, so there may not be legal constraints *per se* that limit a borrower's range of options. However, as a practical matter, borrowers have no control over the lender's basic terms and conditions such as the total debt/equity ratio, the use of proceeds, and minimum debt service coverage requirements. Four of the key financing assumptions central to the return discussion in Docket 4111 are largely out of Deepwater Wind's control:

- Calculation of ITC grant is set by Treasury guidelines and tax law.
- Use of ITC cash grant proceeds in project finance setting is controlled by loan covenants, with lender typically requiring pro rata pay down of senior debt.
- Use of depreciation allowances is determined by loan covenants that strictly limit the borrower's use of leverage to monetize tax benefits that otherwise must be used on a carried-forward basis.
- Debt service reserve funds are always a requirement of commercial project finance lenders, which has the effect of reducing the total cost of borrowing.

A fifth key financing assumption, having to do with the timing of cash flows, is driven simply by the actual development and construction schedule.

This is also why the convention in project finance is to rely on unlevered indications of return-on-investment, given the considerable difficulty of speculating about expected financing terms. And for the project developer this significant uncertainty regarding actual financing terms is yet another form of commercial risk that is unique to the independent power industry.

Finally, it must be noted that these financing complexities, and the difficulties of evaluating these tax and return issues, are not unique to the New PPA or to wind project financings, but represent a larger regulatory issue for all project-financed independent power projects in general.

**Q. Does Deepwater Wind have additional comparative analysis of the costs of energy under the revised PPA?**

A. Yes. David Nickerson has submitted detailed testimony respecting the commercial reasonableness of the pricing in the New PPA.

## IV. OTHER BENEFITS

**Q. How will this project generate environmental and economic benefits?**

A. The approximately 105,000 MWh of electricity produced annually by the Block Island Wind Farm - equal to 1.5% of the State's total annual consumption - will displace an equivalent amount of electric energy from both (a) the inefficient diesels now supplying Block Island (equal to about 10% of the wind farm's output) and (b) the least efficient, and most costly to operate, conventional generating units operating on the margin of the regional generating system (90% of the wind farm's output). This displacement effect creates both environment and economic benefits.

*Environmental benefits:* in the form of air quality benefits, as the reduced generation in conventional plants means reduced emissions of:

- particulates (especially from the displaced diesels on Block island);
- acid rain precursors (e.g., NOx and SO2); and
- greenhouse gases (e.g., CO and CO2).

*Economic benefits:*

- direct benefits from the creation of new jobs, both in Deepwater Wind's development and construction activities, and in the activities of new "supply

chain" businesses, many of whom have started looking into locating at Quonset Point (manufacturers of turbine components; constructors; vessel suppliers; operation and maintenance suppliers);

- indirect benefits from the multiplier effects of employment and local purchases related to Deepwater Wind's development and construction activities, and
- indirect benefits in the form of wholesale electric price suppression effects. As detailed in Deepwater Wind's testimony in 4111, these price suppression effects could be substantial, offsetting a significant amount of the "overmarket" impact of the New PPA.

## V. CONCLUSION

**Q. Do you have any concluding statements?**

A. Despite the tremendous amount of uncertainty that persists in markets around the world, and in particular for these types of pioneering projects, this is a demonstration facility that Deepwater Wind wants to build in partnership with Rhode Island, its residents, and its University. Deepwater Wind was selected nearly two years ago by the State after a thorough review of the eight companies which competed for the right to be the state's preferred developer. After winning that competition and gaining the appointment as the state's preferred developer we signed the resulting Joint Development Agreement. The written post-mortem from the selection committee asserts that a key evaluation criterion was our history in building companies to execute on ambitious business plans. Since that time, we have added development expertise, transmission expertise, permitting expertise, and offshore construction expertise to our team. We have spent several million dollars on biological surveys, geophysical and geotechnical studies, and engineering plans. Deepwater Wind has assembled the world-class set of resources required to build the Block Island Wind Farm - and the larger projects in Rhode Island Sound and elsewhere.

We recognize that the price for power under the New PPA is higher than current market prices and that questions were raised in Docket 4111 regarding Deepwater Wind's returns and the reasonableness of the Docket 4111 PPA. That is why we have accepted an unprecedented, asymmetrical risk profile that is premised on transparency.

The New PPA represents a very real, and immediate, opportunity not only for Deepwater Wind, but also for Rhode Island, and this Commission's approval of the New PPA will have many positive effects. It will be the first step toward the creation of a whole new platform for economic growth in Rhode Island. It serves to chart the course to larger projects, and the jobs that will ensue. I believe that this is the underlying policy directive that is the basis for the New Law.

But none of this is possible unless this Commission approves the New PPA. I believe that we have provided testimony that addresses the requirements of the statute. The price in the New PPA can never be higher than the price in the Docket 4111 PPA. The New PPA provides for Deepwater Wind to give up all the benefits of capital cost savings, and to bear the entire burden of cost overruns. Concerns respecting the reasonableness of the non-price terms have been addressed. It is likely to provide economic development benefits, and it is likely to provide environmental benefits as well. And we have provided testimony and evidence that establishes that the pricing is commercially reasonable in light of the size, location and technology of the Block Island Wind Farm.

This Docket commenced with NGrid's filing of the New PPA. Deepwater Wind supports this New PPA because we agree with the General Assembly and Governor that this project will maintain Rhode Island's leadership position in the nascent offshore wind industry and is in the long-term best interest of Rhode Islanders. Much has changed from Docket 4111. This is a new power purchase agreement. This is a new law. This is a new pricing structure and this is a new risk profile for Deepwater Wind. The New PPA satisfies the requirements of the New Law and provides significant ratepayer benefits.

And this is a new opportunity for the Commission to secure a place for Rhode Island in the fastest growing sector of the world's most vibrant energy industry, commercial wind power.

**Q. Does this conclude your testimony?**

A. Yes.

| | Total | 1/1/10 | 12/31/10 | 12/31/11 | 10/1/12 | 11/30/12 | 12/31/12 | 12/31/13 | 12/31/14 | 12/31/15 | 12/31/16 | 12/31/17 | 12/31/18 | 12/31/19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Revenue** | | | | | | | | | | | | | | |
| PPA Power sales (MWH) | | | | | | | 17,660 | 85,778 | 95,869 | 100,915 | 100,915 | 100,915 | 100,915 | 100,915 |
| Bundled Power Price ($/MWH) | | $ 212.63 | $ 220.07 | $ 227.78 | $ 235.75 | $ 235.75 | $ 235.75 | $ 244.00 | $ 252.54 | $ 261.38 | $ 270.53 | $ 280.00 | $ 289.80 | $ 299.94 |
| **Total Revenue** | | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ 4,163,361** | **$ 20,929,812** | **$ 24,210,868** | **$ 26,377,104** | **$ 27,300,303** | **$ 28,255,813** | **$ 29,244,767** | **$ 30,268,333** |
| **O&M expenses** | | | | | | | $ (2,005,698) | $ (7,068,059) | $ (7,607,084) | $ (7,446,219) | $ (7,603,106) | $ (8,124,280) | $ (7,608,664) | $ (7,769,665) |
| **EBITDA** | | | | | | | $ 2,157,664 | $ 13,861,753 | $ 16,603,784 | $ 18,930,885 | $ 19,697,197 | $ 20,131,533 | $ 21,636,103 | $ 22,498,668 |
| **Capital Expenditure** | (205,403,512) | $ (6,463,000) | $ (15,761,089) | $ (85,698,287) | $ (97,481,136) | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **Depreciation** | | | | | | | $ (8,083,778) | $ (61,442,902) | $ (37,488,822) | $ (23,057,124) | $ (18,620,965) | $ (16,338,895) | $ (1,257,433) | $ (1,257,433) |
| **Taxable income (EBIT)** | | | | | | | $ (5,926,114) | $ (47,581,148) | $ (20,885,038) | $ (4,126,239) | $ 1,076,232 | $ 3,792,638 | $ 20,378,670 | $ 21,241,235 |
| **Tax benefits/(liability)** | | | | | | | $ 2,074,140 | $ 16,653,402 | $ 7,309,763 | $ 1,444,184 | $ (376,681) | $ (1,327,423) | $ (7,132,534) | $ (7,434,432) |
| **ITC** | | $ - | $ - | $ - | $ - | $ 55,162,336 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **Project Cash Flow (w/ MACRS monetization)** | | | | | | | | | | | | | | |
| EBITDA | | $ - | $ - | $ - | $ - | $ - | $ 2,157,664 | $ 13,861,753 | $ 16,603,784 | $ 18,930,885 | $ 19,697,197 | $ 20,131,533 | $ 21,636,103 | $ 22,498,668 |
| (+) Tax benefits(liability) | | $ - | $ - | $ - | $ - | $ - | $ 2,074,140 | $ 16,653,402 | $ 7,309,763 | $ 1,444,184 | $ (376,681) | $ (1,327,423) | $ (7,132,534) | $ (7,434,432) |
| (+) ITC | | $ - | $ - | $ - | $ - | $ 55,162,336 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| (-) Capital expenditure | | $ (6,463,000) | $ (15,761,089) | $ (85,698,287) | $ (97,481,136) | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **Project free cash flow** | | $ (6,463,000) | $ (15,761,089) | $ (85,698,287) | $ (97,481,136) | $ 55,162,336 | $ 4,231,804 | $ 30,515,155 | $ 23,913,547 | $ 20,375,069 | $ 19,320,516 | $ 18,804,110 | $ 14,503,568 | $ 15,064,236 |
| **Project IRR** | **10.50%** | | | | | | | | | | | | | |
| **Project free cash flow (Carryfoward loss)** | | | | | | | | | | | | | | |
| EBITDA | | $ - | $ - | $ - | $ - | $ - | $ 2,157,664 | $ 13,861,753 | $ 16,603,784 | $ 18,930,885 | $ 19,697,197 | $ 20,131,533 | $ 21,636,103 | $ 22,498,668 |
| (-) Cash Tax | | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| (+) ITC | | $ - | $ - | $ - | $ - | $ 55,162,336 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| (-) Capital expenditure | | $ (6,463,000) | $ (15,761,089) | $ (85,698,287) | $ (97,481,136) | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **Project free cash flow** | | $ (6,463,000) | $ (15,761,089) | $ (85,698,287) | $ (97,481,136) | $ 55,162,336 | $ 2,157,664 | $ 13,861,753 | $ 16,603,784 | $ 18,930,885 | $ 19,697,197 | $ 20,131,533 | $ 21,636,103 | $ 22,498,668 |
| **Project IRR** | **9.66%** | | | | | | | | | | | | | |

| | 12/31/20 | 12/31/21 | 12/31/22 | 12/31/23 | 12/31/24 | 12/31/25 | 12/31/26 | 12/31/27 | 12/31/28 | 12/31/29 | 12/31/30 | 12/31/31 | 12/31/32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 100,915 | 100,915 | 100,915 | 100,915 | 100,915 | 100,915 | 100,915 | 100,915 | 100,915 | 100,915 | 100,915 | 100,915 | 75,686 |
| $ | 310.44 | $ 321.30 | $ 332.55 | $ 344.19 | $ 356.23 | $ 368.70 | $ 381.61 | $ 394.96 | $ 408.79 | $ 423.09 | $ 437.90 | $ 453.23 | $ 469.09 |
| **$** | **31,327,725** | **$ 32,424,196** | **$ 33,559,042** | **$ 34,733,609** | **$ 35,949,285** | **$ 37,207,510** | **$ 38,509,773** | **$ 39,857,615** | **$ 41,252,632** | **$ 42,696,474** | **$ 44,190,850** | **$ 45,737,530** | **$ 35,503,758** |
| $ | (8,317,155) | $ (8,995,179) | $ (8,274,172) | $ (9,406,933) | $ (9,191,030) | $ (9,385,703) | $ (10,015,923) | $ (9,787,967) | $ (10,603,829) | $ (11,286,030) | $ (11,057,815) | $ (12,380,681) | $ (10,191,369) |
| $ | 23,010,570 | $ 23,429,016 | $ 25,284,871 | $ 25,326,675 | $ 26,758,255 | $ 27,821,807 | $ 28,493,850 | $ 30,069,648 | $ 30,648,803 | $ 31,410,443 | $ 33,133,036 | $ 33,356,849 | $ 15,312,389 |
| $ | - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| $ | (1,257,433) | $ (1,257,433) | $ (1,257,433) | $ (1,257,433) | $ (1,257,433) | $ (1,257,433) | $ (1,257,433) | $ (1,109,810) | $ (76,453) | $ (76,453) | $ (76,453) | $ (76,453) | $ (57,340) |
| $ | 21,753,137 | $ 22,171,583 | $ 24,027,438 | $ 24,069,242 | $ 25,500,822 | $ 26,564,375 | $ 27,236,417 | $ 28,959,838 | $ 30,572,350 | $ 31,333,991 | $ 33,056,583 | $ 33,280,396 | $ 15,255,049 |
| $ | (7,613,598) | $ (7,760,054) | $ (8,409,603) | $ (8,424,235) | $ (8,925,288) | $ (9,297,531) | $ (9,532,746) | $ (10,135,943) | $ (10,700,322) | $ (10,966,897) | $ (11,569,804) | $ (11,648,139) | $ (5,339,267) |
| $ | - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| $ | 23,010,570 | $ 23,429,016 | $ 25,284,871 | $ 25,326,675 | $ 26,758,255 | $ 27,821,807 | $ 28,493,850 | $ 30,069,648 | $ 30,648,803 | $ 31,410,443 | $ 33,133,036 | $ 33,356,849 | $ 15,312,389 |
| $ | (7,613,598) | $ (7,760,054) | $ (8,409,603) | $ (8,424,235) | $ (8,925,288) | $ (9,297,531) | $ (9,532,746) | $ (10,135,943) | $ (10,700,322) | $ (10,966,897) | $ (11,569,804) | $ (11,648,139) | $ (5,339,267) |
| $ | - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| $ | - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| $ | 15,396,972 | $ 15,668,962 | $ 16,875,267 | $ 16,902,441 | $ 17,832,967 | $ 18,524,276 | $ 18,961,104 | $ 19,933,705 | $ 19,948,480 | $ 20,443,547 | $ 21,563,232 | $ 21,708,711 | $ 9,973,122 |
| $ | 23,010,570 | $ 23,429,016 | $ 25,284,871 | $ 25,326,675 | $ 26,758,255 | $ 27,821,807 | $ 28,493,850 | $ 30,069,648 | $ 30,648,803 | $ 31,410,443 | $ 33,133,036 | $ 33,356,849 | $ 15,312,389 |
| $ | - | $ (4,163,234) | $ (8,409,603) | $ (8,424,235) | $ (8,925,288) | $ (9,297,531) | $ (9,532,746) | $ (10,135,943) | $ (10,700,322) | $ (10,966,897) | $ (11,569,804) | $ (11,648,139) | $ (5,339,267) |
| $ | - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| $ | - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| $ | 23,010,570 | $ 19,265,782 | $ 16,875,267 | $ 16,902,441 | $ 17,832,967 | $ 18,524,276 | $ 18,961,104 | $ 19,933,705 | $ 19,948,480 | $ 20,443,547 | $ 21,563,232 | $ 21,708,711 | $ 9,973,122 |

**CERTIFICATION**

I hereby certify that on July 15, 2010, a copy of the within was sent to all parties set forth on the attached Service List by electronic mail and copies were sent to Luly Massaro, Commission Clerk, by electronic mail and hand delivery.

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