

Economic Analysis of the Atlantic Shores Offshore Wind Project

by

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for



SAVELBI

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Executive Summary

The NJ Board of Public Utilities (BPU) has approved the Atlantic Shores Offshore Wind (ASOW) Project as a qualified offshore wind facility and deemed it eligible to receive payments for Offshore Renewable Energy Credits (ORECs) for 1510MW of electrical generating capacity. The BPU concluded that the project will not impose unreasonable costs on NJ ratepayers and that a cost-benefit analysis demonstrates a net positive economic and environmental outcome to the state. This report independently evaluates the basis for these conclusions to confirm or refute them and provide recommendations on changes, if any, warranted to the BPU order.

The following are the major findings and conclusions which are detailed in the report:

Ratepayer Impacts

- NJ ratepayers will be required to pay from \$50-80/MWH over and above the market price for power from the ASOW facility. This in essence represents a ratepayer subsidy for offshore wind generation.
- The ratepayer subsidy totals \$7.7 billion over the life of the facility and the 2023 present value (PV) of these above market ratepayer costs is \$2.6 billion.
- If the ratepayer subsidy is based on the value of greenhouse gases avoided, the BPU has grossly overvalued the cost of carbon emissions avoided by the renewable wind generation from this facility.

Benefit-Cost Analysis

- In finding that the economic and environmental benefits of the ASOW project outweigh the subsidized cost borne by ratepayers, the BPU has relied on a benefit-cost calculation that is highly flawed.
- The estimate of economic benefits ignores the offsetting negative economic impacts of the project on beach tourism in shore communities, which is estimated to be \$590 million/year or \$6.5 billion in PV.
- The higher electric rates embedded in the OREC prices will have a negative impact on the state economy in the form of lost jobs and wages which is estimated to be \$466 million/year or \$5.86 in PV.
- The values proposed to represent the environmental benefits are highly subjective and are intended to reflect global impacts of greenhouse gas emissions and are thus inappropriate for representing only state-wide

impacts, as required by law. Once limited to the state there is a net environmental cost associated with reduced emissions due to lost revenue from the sale of Regional Greenhouse Gas Initiative (RGGI) emissions allowances.

- As shown on Table 1 below, using the methodology employed by the BPU’s consultant, we calculate that, in contrast to their findings, the costs of the project far outweigh its purported benefits with a net PV cost of \$13.65 billion and a benefit/cost ratio of no more than 0.23. Net positive economic or environmental benefits and benefit-cost ratio of greater than 1.0 cannot be achieved, if at all, without a significant reduction in the approved OREC pricing.

Table 1 Benefit- Cost Comparison

| | <u>LAI</u> | <u>This Report</u> |
|---|--------------|--------------------|
| Benefits (\$PV Billions) | | |
| Energy and Capacity Credits | 1.98 | 1.98 |
| RECs | 0.52 | 0.52 |
| Economic Benefits | 1.46 | 1.46 |
| Avoided Emissions (per IAWG) | <u>2.47</u> | <u>0.01</u> |
| Total Net Benefits | 6.43 | 3.97 |
| | | |
| Costs (\$PV Billions) | | |
| OREC Payments | 5.16 | 5.16 |
| Impact on Tourism | 0.00 | 6.50 |
| Impact of Higher Electric Rates | 0.00 | 5.86 |
| Lost RGGI Emissions Revenue | <u>0.00</u> | <u>0.10</u> |
| Total Costs | 5.16 | 17.62 |
| | | |
| Net Benefits - (Costs) (\$PV Billions) | 1.27 | (13.65) |
| | | |
| Benefits/Costs Ratio | 1.246 | 0.23 |

It is important to note that the costs involving the direct ratepayer subsidies and the effect of those higher electric rates on NJ economy in the form of lost jobs and lower wages, as well as lost tourism dollars, all fall disproportionately on lower income residents and communities who can least afford them. This increased economic burden is in no way justified by any purported environmental benefit which would accrue instead to future generations and populations far removed in space and time from those living in NJ during the life span of the ASOW project.

Developer's Return on Investment

- As a result of the above market rates embedded in the BPU approved OREC prices, Atlantic Shores will realize an 18% internal rate of return (IRR) on its investment which would increase to 21% if allowed to retain the additional 10% bonus Investment Tax Credit (ITC) enacted after the OREC pricing was approved.
- The IRR is well in excess of that which is reasonable for its level of financial risk in the project or that allowed regulated utilities.

Conclusions

This report demonstrates that the ASOW project will burden ratepayers with above market power prices, amounting to a subsidy of \$2.6 billion in PV terms. This added cost has not been demonstrated to be reasonable or justified by any economic or environmental benefits or cost-benefit analysis. The added cost is a direct result of the OREC pricing proposed by the developer and approved by the BPU.

Based on the analysis contained in this report, it is proposed that the OREC pricing schedule be reduced significantly in order to mitigate the unreasonable ratepayer burden and reduce the developer's rate of return to a reasonable value.

Economic Analysis of the Atlantic Shores Offshore Wind Project

1.0 Introduction

The NJ Board of Public Utilities (BPU), in its order of June 30, 2021¹, has approved the Atlantic Shores Offshore Wind (ASOW) Project as a qualified offshore wind facility and deemed it eligible to receive payments for Offshore Renewable Energy Credits (ORECs) for 1510MW of electrical generating capacity. The BPU concluded that the project will not impose unreasonable costs on NJ ratepayers and that a cost-benefit analysis demonstrates a net positive economic and environmental outcome to the state.

The BPU has relied in large part on the evaluation by its consultant, Levitan & Associates, Inc. (LAI) of the proposed bids submitted by ASOW and competing developers². Given the weight placed on this evaluation, it is appropriate to attempt to independently evaluate the economic analysis and conclusions therein to confirm or refute them and provide recommendations on changes, if any, warranted to the BPU order. That is the purpose of this report.

2.0 Methodology

In this study, we have used input values reported and applied in the LAI evaluation wherever available and deemed reasonable. Where key factors and assumptions have been redacted or unstated, we have used publicly available sources for comparable projects. We would welcome the opportunity to review further the underlying data supporting the LAI analysis and to share our sources and assumptions in order to reach a common understanding and agreement on the economic costs and benefits of the project to the extent possible.

3.0 Ratepayer Impacts

An independent analysis and review of the BPU consultant's evaluation of the ASOW proposal reveals that New Jersey ratepayers will bear a substantial and inordinate burden of additional costs through the lifetime of the proposed generation facility. This additional cost is in the form of above market prices for power embedded in the guaranteed ORECs proposed by the bidder and

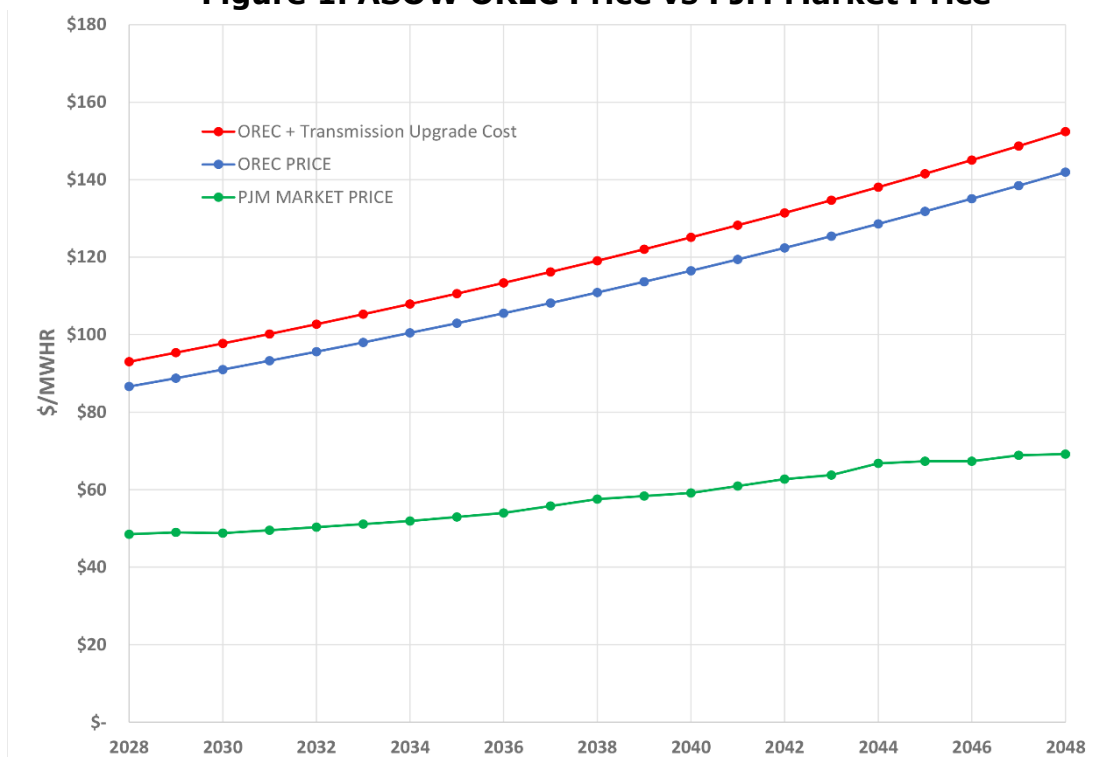
¹ BPU Order of June 30, 2021 Docket Nos. Q020080555 and Q021050824

² Evaluation Report New Jersey Offshore Wind Solicitation #2, May 25, 2021, Levitan and Associated Inc.

approved by the BPU in its order of June 30, 2021, together with related transmission upgrade costs.

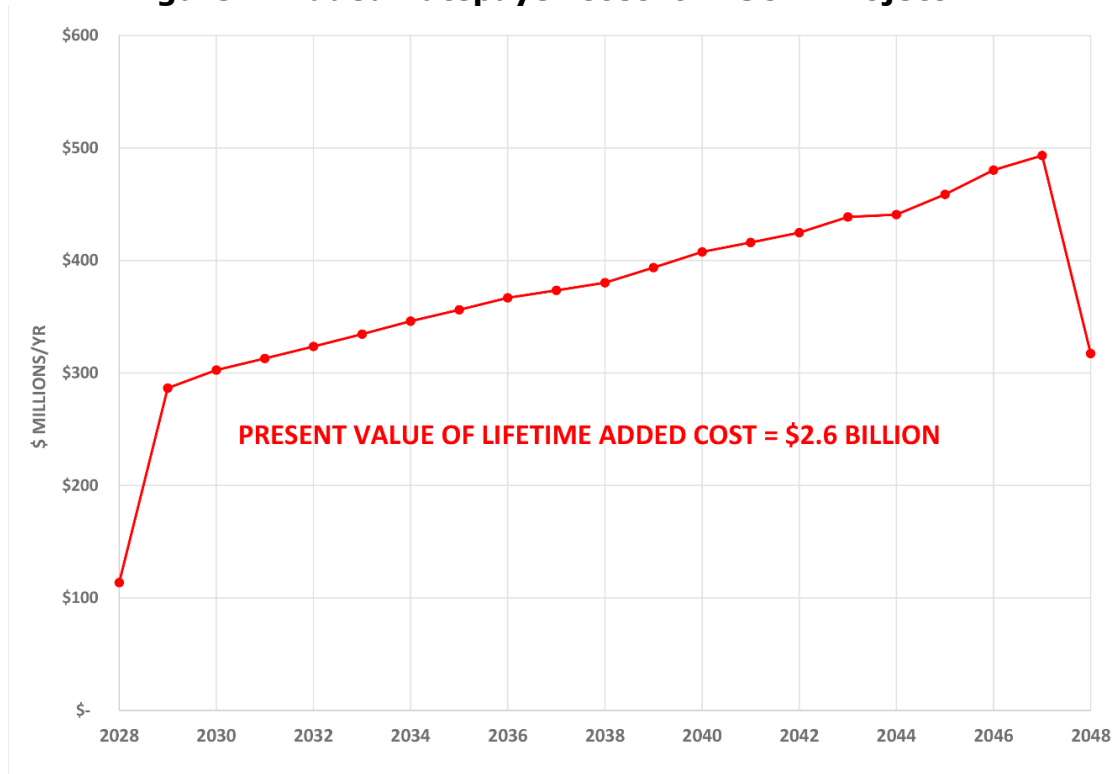
Figure 1 below shows the OREC prices and transmission upgrade costs over the 2028-2048 operating life of the project. The BPU order entitles ASOW to collect fees for ORECs produced at \$86.62/MWH beginning in 2028 and increasing to \$141.92/MWH in 2048. Transmission upgrade costs will add another \$6-10/MWH to these guaranteed prices. As an offset, the market revenue received from PJM for energy, capacity and Renewable Energy Credits (RECs) will be credited back to the ratepayers.

Figure 1. ASOW OREC Price vs PJM Market Price



As can be seen from Figure 1 above, even after the PJM credits, ratepayers will be required to pay from \$50-80/MWH over and above the market price for power from the ASOW facility. This in essence represents a ratepayer subsidy for offshore wind generation. As shown in Figure 2 below, this added cost burden is substantial on an annualized and lifetime basis.

Figure 2. Added Ratepayer Cost for ASOW Project



The ratepayer subsidy increases from about \$300 million in the first full year of operation (2029) to \$500 million in 2047, totaling \$7.7 billion over the life of the facility. The 2023 present value (PV) of these above market ratepayer costs is \$2.6 billion.

Our analysis is confirmed by the independent evaluation provided by LAI, the BPU’s consultant. LAI concludes that, on a levelized cost basis, ratepayers will pay a net premium of \$58.81/MWH after the PJM credits are returned to them. LAI puts the PV of those added costs at \$2.175 billion in 2021 which is equivalent to \$2.5 billion PV in 2023, close to our estimate.

The BPU has approved this proposed OREC pricing despite the large negative impact it will have on ratepayers across the board, including those least able to afford it. In fact, the BPU selected ASOW as the preferred bidder even though competing bids had lower levelized net costs of \$40-42 MWH. At that lower cost level, the ratepayer impact would be almost \$1 billion less.

The rationale for such an extraordinary decision appears to be in large part based on the belief that the avoided carbon and related emissions from offshore wind generation justify the added ratepayer burden. However, an

analysis demonstrates that the cost borne by ratepayers for such a presumed benefit far exceed the value placed on carbon reduction by the marketplace.

New Jersey is a member of the Regional Greenhouse Gas Initiative (RGGI), along with eleven other northeast states. The RGGI is the first market-based, cap-and-invest regional initiative in the United States. Within the RGGI states, fossil-fuel-fired electric power generators with a capacity of 25 MW or greater ("regulated sources") are required to hold allowances equal to their CO₂ emissions. The price of these allowances (\$/Ton carbon equivalent) is set by periodic auctions in which operators bid for the right to emit CO₂ from their generating facility. Thus, the RGGI auction price represents the value placed by the market on avoided carbon emissions.

Figure 3. Cost of Carbon Emissions Reduction

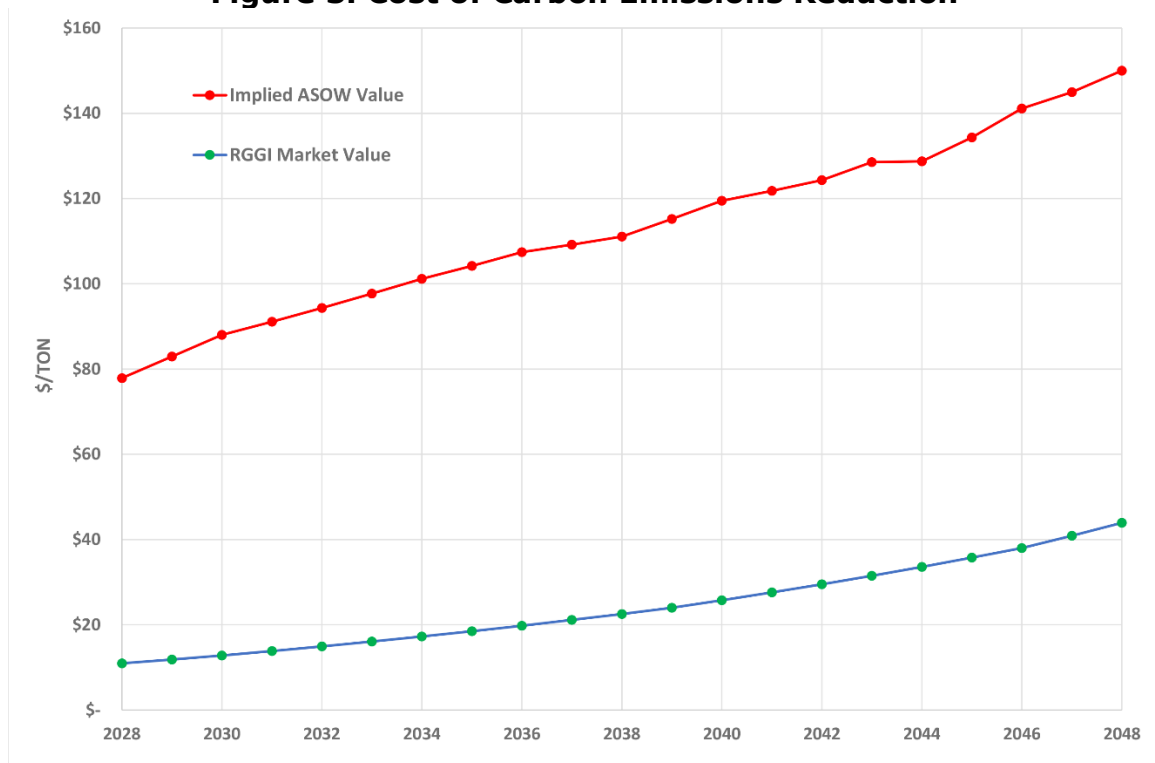


Figure 3 above compares the RGGI market price for carbon emissions as projected by LAI through the operating lifetime of the ASOW facility. As shown, this value is projected to be \$10-44 /Ton over this period. By contrast, the value of carbon emission reduction implied by the OREC price approved by the BPU ranges from \$77-150/Ton over this same period.

It thus appears that BPU has grossly overvalued the carbon emissions avoided by the renewable wind generation from this facility.

4.0 Benefit-Cost Analysis

The NJ Offshore Wind Economic Development Act (OWEDA) requires that all proposed projects demonstrate positive economic and environmental net benefits to the state to be considered for an OREC award, but the act does not provide details on how to determine net benefits and costs or the benefit-cost ratio (BCR). LAI has calculated net benefits and costs and the ratio as:

Net Benefits = (Ratepayer Offsets – OREC Costs) + Economic Impacts + Environmental Impacts

$$BCR = \frac{(Ratepayer\ Offsets + Economic\ Impacts + Environmental\ Impacts)}{OREC\ Costs}$$

LAI concludes that the ASOW wind project has a BCR of 1.246 (an unduly precise number given the enormous uncertainties involved) but has redacted the specific values for each of the factors comprising the calculation.

Per our analysis of the LAI evaluation, on a PV basis OREC Costs are \$5.16 billion and the value of Ratepayer Offsets (PJM energy, capacity and RECs) are \$2.5 billion. Thus, before including the projected Economic and Environmental Benefits, the BCR is less than 0.5, well below a positive outcome. This reflects the substantial negative impact on ratepayers previously discussed.

The project as proposed claims to have positive Economic Benefits in terms of NJ GDP growth and jobs created in the state. These are detailed in the LAI report. In calculating Environmental benefits LAI has applied the US Government's Interagency Working Group's (IAWG)³ social cost of carbon to estimate the value of perceived benefits. In order to arrive at a value of 1.246, we estimate that LAI assigns a value of a value of \$1.46 billion to the Economic Benefits and \$2.47 billion to Environmental Benefits using its methodology.

However, with respect to the economic benefits, no consideration is given to the significant negative economic impacts of the project on beach communities. The negative impact on tourism in our communities, is estimated to be \$590 million/year⁴. This is \$6.5 billion in PV and would totally offset any Economic Benefits claimed to contribute to the net benefits or the BCR.

³ Technical Support Document: Technical Update of the Social Cost of Carbon, Methane and Nitrous Oxide Interim Estimates under Executive Order 13990, February 2021.

⁴ University of Delaware, Atlantic Offshore Wind Energy Development: Values and Implications for Recreation and Tourism, sponsored by the Bureau of Ocean Energy Management (BOEM), March, 2018

In addition to the negative impact on the NJ tourism economy, raising electric rates will have a damaging effect on the overall state economy by reducing employment and wages, similar to the effect of raising taxes. A 2011 study⁵ determined that raising electric rates by 2% as a result of offshore wind ratepayer subsidies would result in the loss of 2219 jobs and reduce average wages by \$111 per year. This in turn would reduce total disposable income in the state by \$330 million/yr. Since the ratepayer subsidies for ASOW would also raise rates by about 2%, we can extrapolate these 2011 economic impacts to the 20 year period of ASOW OREC costs so that the \$330 million/yr becomes \$466 million/yr in 2028. The Present Value in 2023 of this lost income over 20 years is \$5.86 billion, a very significant additional indirect economic cost of the project.

With respect to the Environmental Benefits, the use of the IAWG report in economic or regulatory decision-making is highly controversial and the subject of court challenges in several states. Indeed, the IAWG document provides for a wide range of values, depending on very subjective judgements of factors such as the rate at which potential social costs to future generations of present-day carbon emissions should be discounted to current dollars.

As a result, the value derived from the IAWG document as applied by the Federal Environmental Protection Agency (EPA) has varied from \$2/Ton during the Trump administration to \$191/Ton now being proposed by the current administration – a near hundred-fold increase, reflecting the reality that putting a monetary value on the social cost of carbon is a political rather than a scientific exercise.

Furthermore, and most importantly, the OWEDA mandates that, in order to approve an offshore wind project for OREC award, the BPU must find that the cost-benefit analysis for the project “demonstrates positive economic and environmental net benefits to the State” (emphasis added). Therefore, any consideration of Environmental Benefits of the ASOW project of avoided carbon emissions must be confined to those affecting NJ residents, businesses, or institutions.

The values proposed by the IAWG are intended to reflect global impacts of carbon emissions and are thus inappropriate and not suitable in any case for representing only state-wide impacts. If we scale these purported global

⁵ “The Cost and Economic Impact of New Jersey’s Offshore Wind Initiative”, Beacon Hill Institute at Suffolk University, June 2011

benefits down to state-wide benefits only, by using any reasonable measure of relative impact on the state to the entire world (GDP, population, land area, shoreline miles, carbon emissions, etc.), the total averted state social cost of emissions reduced by ASOW is far less than 1% of the global benefit.

To estimate the maximum state-wide environmental benefits as mandated by OWEDA, we have conservatively assumed that about 0.4%⁶ of global values accrue to the state of NJ. This results in an insignificant PV benefit of \$10 million which is more than offset by lost revenue accruing to the state from auctions of RGGI allowances from the emissions displaced by ASOW. Along with the social cost of direct NJ environmental emissions associated with the manufacture, construction, operation and decommissioning of the wind turbines, we estimate the PV of these environmental costs to be about \$100 million. There is therefore a net environmental emissions related PV cost of \$90 million for the project.

Table 1 below is a comparison of the benefit-cost analysis as presented by LAI with our own analysis that includes the economic and environmental cost impacts of the project.

Table 1 Benefit- Cost Comparison⁷

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⁶ NJ annual GDP is less than \$0.6 trillion (or 0.4%) compared with over \$150 trillion worldwide GDP.

⁷ All values are in 2023\$ PV which can be converted to 2020\$ PV values by dividing by 1.225.

As indicated the LAI calculation overstates the BCR by a large margin and, when economic costs are included and purported environmental benefits limited to the state, the costs of the ASOW project exceed any potential benefits by \$13.65 billion on a present value basis. Instead of 1.246 as calculated by LAI, the true BCR is no more than 0.23.

Even without including the economic cost of the project, the OREC payment costs alone exceed any benefits by more than \$1 billion and the BCR would be no more than 0.77. Thus, at the current OREC pricing, which accounts for the major element of cost, a BCR less than 1.0 cannot be achieved. Furthermore, there is neither a net economic nor a net environmental benefit as required by OWEDA.

In summary, no weight should be given a BCR which is so uncertain and subjective as to be meaningless, or which relies upon estimates of environmental benefits which are inappropriate for those accruing to the state. Given the large magnitude of the net ratepayer impact of the OREC pricing, a net positive BCR cannot be achieved, if at all, without a significant reduction in the approved OREC pricing. If the BPU is relying on the LAI calculation to demonstrate compliance with the legislative mandate to show in-state positive net benefit of the project to obtain award of ORECs, the details of the calculation should be released, and the public allowed to provide comment on this critical element of the decision-making process.

5.0 Project Developer Economics

A developer of a power generation project is entitled to realize a reasonable rate of return on its investment. However, the magnitude of the return is a function of the risk assumed by the developer. The greater the risk, the higher the expected return, and vice versa – the lower the risk, the lower a return expected or allowed.

The NJ legislature has recognized that the financial risk of offshore wind projects must be limited, in order to attract developers to bid on such projects. A key feature of this risk mitigation is the guarantee of revenue for power delivered through the establishment of OREC prices throughout the operating life of the facility. We have previously shown that the OREC prices approved by the BPU for the ASOW project are well in excess of market prices. Thus, they substantially reduce the risk to the developer. This price guarantee allows the developer to secure equity investors and project financing at a reduced cost of capital, lowering their up front and debt service costs throughout the life of the project.

In addition to this, the Federal government has provided financial incentives through tax credits which greatly enhance the potential for positive returns on investment for such projects. The Inflation Reduction Act (IRA) enacted in 2022 offers offshore wind projects an Investment Tax Credit (ITC) of up to 40% of the capital cost of the project (including an added 10% bonus), to be collected when the facility becomes operational.

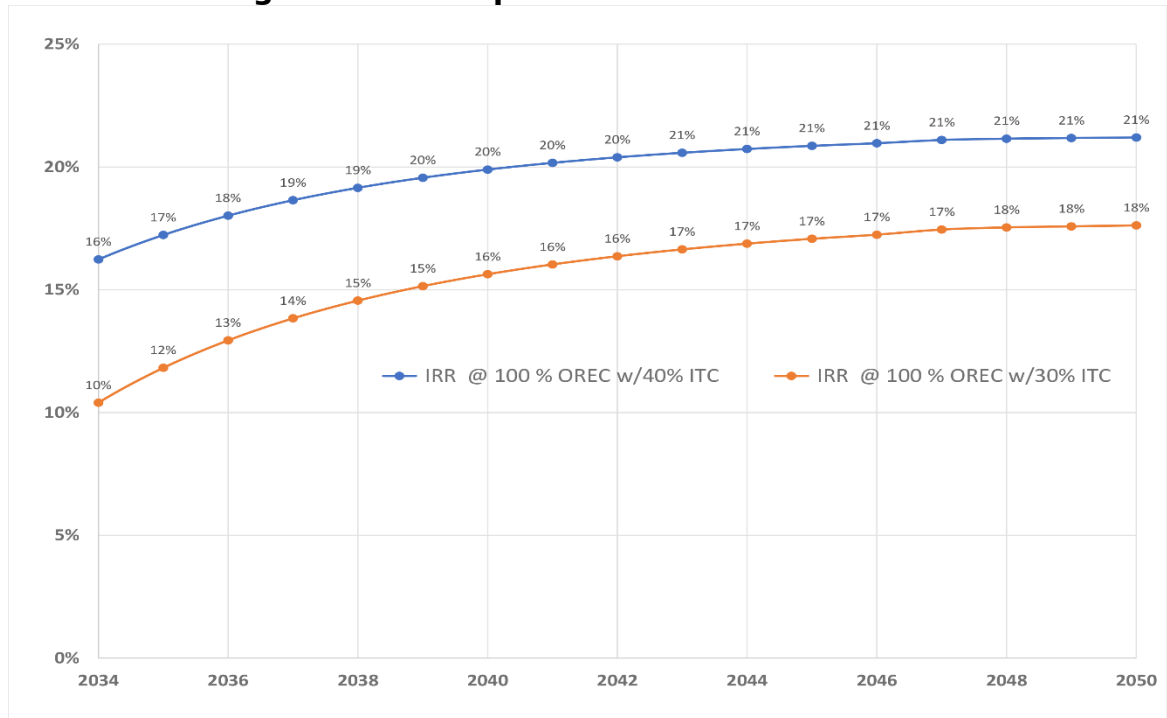
In its bid ASOW was required to submit detailed information on its projected costs of the project and its resulting Internal Rate of Return (IRR) which represents its return on investment. This information is necessary to determine whether the approved OREC prices are reasonable given the projected developer's costs and assumed financial risks.

However, these project financial details detailed have been redacted from the LAI evaluation, so we are unable to review and comment on whether they are in fact reasonable and justify the large ratepayer subsidy built into the OREC pricing. We therefore have no alternative than to conduct an independent financial analysis, based on available information for similar projects.

Using reasonably expected capital costs, financing terms, operating, maintenance and decommissioning costs and the revenue streams resulting from OREC production and tax credits, we calculated the IRR based on the

expected cash flow over the life of the project. The result of our analysis is presented in Figure 4 below.

Figure 4. Developer’s Internal Rate of Return



We have assumed, as does LAI in its bid evaluation, that available Federal tax credits have been included as an offset to capital costs of the project, and thus passed through to ratepayers as reflected in the proposed all-in OREC prices for the project. At the time of the bid evaluation, a 30% Federal ITC was in effect for offshore wind projects and this is the value cited by BPU as being included in the approved OREC pricing schedule. As indicated in Figure 4 above, with a 30% ITC, ASOW will realize an increasing return, rapidly approaching 18% by the end of its economic life and through decommissioning.

The ASOW bid was submitted in 2020, well before the IRA was enacted. As noted, the IRA provides for an additional bonus ITC of 10%, provided the project meets certain domestic content requirements on manufactured components used in the project. If ASOW does in fact qualify for the 10% bonus ITC, their IRR will increase to 21%. Under current NJ law such an increase in available tax credits must also be passed through to ratepayers and not contribute to greater return to the developer.

In view of the OREC price guarantees and tax credits available, we believe that a return of 18% or 21% is unduly generous and that the developer is being too

richly rewarded for the level of risk assumed at expense of ratepayers who are bearing \$2.6 billion in present value of added costs to support the developer's return on investment.

6.0 Conclusions

As discussed above, the ASOW project will burden ratepayers with above market rates, amounting to a subsidy of \$2.6 billion in PV terms. This added cost has not been demonstrated to be reasonable or justified by any economic or environmental benefits or cost-benefit analysis. The added cost is a direct result of the OREC pricing proposed by the developer and approved by the BPU.

The evaluation supporting that approval does not provide the details necessary to allow the public to assess and challenge the validity of the decision. In the absence of this information, and based on this analysis, it is therefore proposed that the OREC pricing schedule be reduced significantly in order to mitigate the unreasonable ratepayer burden and reduce the developer's return on investment to a reasonable value.



The Author

Edward P. O'Donnell is a principal in Whitestrand Consulting LLC. He has spent 35 years in the nuclear power industry as an engineer, manager and executive with responsibilities for design and licensing of numerous plants in the US and abroad. He was also responsible for corporate planning and rate matters for a NJ nuclear utility and has testified in utility rate proceedings before the NJ BPU.

He was responsible for managing the successful sale of nuclear units in NJ and PA and as a consultant for advising clients on the sale and purchase of nuclear plants. In this role he forecasted future costs and performance of plants for re-financing as merchant power suppliers in a de-regulated electrical energy market and performed analyses of the economic viability of nuclear plants in comparison with alternative fossil and renewable energy facilities.

Mr. O'Donnell holds an M.S. in Nuclear Engineering from Columbia University and has been a licensed Professional Engineer in NJ. He is also a registered Enrolled Agent, authorized to represent individual and business entities before the IRS on tax matters.