CONFIDENTIAL DRAFT

Economic Analysis of the Attentive Energy and Leading Light Offshore Wind Projects

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Executive Summary

The NJ Board of Public Utilities (BPU) has approved the Attentive Energy and Leading Wind projects as qualified offshore wind facilities and deemed them eligible to receive payments for Offshore Renewable Energy Credits (ORECs) for a combined 3742MW of electrical generating capacity. The BPU concluded that the projects 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 more than twice the market price for power from the Attentive and Leading Light Wind facilities. This in essence represents a ratepayer subsidy for offshore wind generation.
- The 2023 present value (PV) of these above market ratepayer costs is **$7.7 billion** for Attentive and **$8.5 billion** for Leading Light. These values are more than twice the values cited by BPU ($3.3 and $3.9 billion respectively).
- In the highly likely event that OREC prices are increased by 15% due to inflation adjustment the PV ratepayer subsidies will increase by 25-29%, to **$9.6 billion** for Attentive and **$11 billion** for Leading Light.

Increases in Retail Customer Bills

- The incremental and cumulative effect of these above market subsidies will increase retail customer bill significantly over the twenty years of operating period of these projects to a much greater extent than acknowledged by BPU.
- The combined increase due to Attentive Energy, Leading Light and Atlantic Shores 1 projects will add more than **$2 billion/yr** to customer bills by 2044.
- As a result, the average monthly bill for will increase by **17%** for residential, **23%** for commercial and **28%** for industrial customers.
- In the highly likely event that OREC prices are increased by 15% due to inflation adjustment the customer bill will increase by **19%** for residential, **26%** for commercial and **32%** for industrial customers.

Benefit-Cost Analysis

- In finding that the economic and environmental benefits of the projects 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 the commercial fishing industry as well the negative effect that the higher electric rates embedded in the OREC prices will have on the state economy in the form of lost jobs and wages.
- The BPU analysis fails to include the added cost to ratepayers of the necessary and unavoidable transmission upgrades required to bring the power from these offshore facilities to the PJM grid.
- 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 each project far outweigh their purported benefits with a net PV cost of **$15.41 and $18.7** billion and a benefit/cost ratio of no more than **0.36 and 0.38**. 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 - COMPARISON OF BENEFIT-COST ANALYSIS RESULTS

	Attentive Energy		Leading Light Wind	
	LAI	**This Report**	**LAI**	**This Report**
Benefits ($PV Billions)				
Energy and Capacity Credits	2.09	3.6	2.55	5.4
RECs	0.85	1.7	1.2	2.55
Economic Benefits	3.23	3.23	3.5	3.5
Avoided Emissions	7.64	0.02	11.37	0.03
Total Benefits	13.81	8.55	18.62	11.48
Costs ($PV Billions)				
OREC Payments	6.28	12.96	7.78	16.48
Impact on Commercial Fishing	0	?	0	?
Transmission Upgrade Costs	0	1.8	0	3.3
Impact of Higher Electric Rates	0	7.1	0	7.1
Lost RGGI Emissions Revenue	0	2.1	0	3.3
Total Costs	6.28	23.96	7.78	30.18
Net Benefits - (Costs)	**7.53**	**(15.41)**	**10.84**	**(18.70)**
Benefits/Costs Ratio	**2.2**	**0.36**	**2.39**	**0.38**

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 commercial fishing 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 these projects.

Developer's Return on Investment

- As a result of the above market rates embedded in the BPU approved OREC prices, Attentive Energy will realize a **22%** internal rate of return (IRR) on its investment which would increase to **27%** if allowed to retain an additional 10% bonus Investment Tax Credit (ITC).
- Leading Light Wind will realize a **16%** internal rate of return (IRR) on its investment which would increase to **20%** if allowed to retain an additional 10% bonus Investment Tax Credit (ITC).
- The IRRs are 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 both the Attentive Energy and Leading Light Wind projects will burden ratepayers with above market power prices, amounting to significant levels of subsidy borne by retail customers. 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 clear that the BPU approved OREC pricing schedules do not comply with the requirements of OWEDA. The approved rates would need to be reduced significantly in order to mitigate the unreasonable ratepayer burden, reduce the developer's rate of return to a reasonable value and, if at all possible, result in a net benefit-cost outcome as required by OWEDA.

Economic Analysis of the Attentive Energy and Leading Light Offshore Wind Projects

1.0 Introduction

The NJ Board of Public Utilities (BPU), in its orders of January 24, 2024[1], has approved the Attentive Energy and Invenergy (Leading Light Wind) Projects as qualified offshore wind facilities and deemed them eligible to receive payments for Offshore Renewable Energy Credits (ORECs) for 1342MW and 2400MW respectively of electrical generating capacity. The BPU concluded that the projects 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 Attentive Energy, Invenergy and competing developers[2]. 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 the same 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.

There are however several items where we disagree with the LAI methodology which significantly affect the results. These include:

- LAI has failed to analyze the ratepayer impact of BPU's new inflation adjustment factor which can automatically result in a 15% increase in ratepayer burden and have a significant additional impact on ratepayer costs.
- In determining ratepayer costs, LAI has used an inappropriately high 7% discount factor. A 7% discount factor reflects the developer's weighted

[1] BPU Orders of January 24, 2024 Docket No. Q022080481

[2] Evaluation Report New Jersey Offshore Wind Solicitation #3, January 10. 2024, Levitan and Associated Inc.

average cost of capital and is appropriate for calculating its Internal Rate of Return (IRR) in support of investment decisions and financial risk to the owners. However, ratepayers are not investors in these projects but are consumers of the power output. Their view of the present value (PV) of future costs to them is much different and they view future dollars as having more value than investors. For ratepayers, standard economic theory would dictate use of a 3% consumption discount rate which is generally used to value future dollars from their perspective[3].

- Levitan's Benefit-Cost analysis, upon which the BPU relied, is flawed in a number of important respects including:
    - The monetization of environmental benefits is based on avoiding hypothetical harm to future global populations from greenhouse gas (GHG) emissions rather than confining consideration of such benefits to those accruing to the state as required by the NJ Offshore Wind Economic Development Act (OWEDA)[4].
    - The factor used to value CO2 emissions of $190/ton is based on a 2% discount factor which vastly overstates this value and is inconsistent with the 7% value used to estimate ratepayer costs. The $/ton value is highly sensitive to the discount rate since it is applied to hypothetical harm to worldwide populations over several centuries in the future. A 3% discount rate reduces that value to $50/ton and the purported global benefit by a factor of 3.8.
    - Levitan has failed to include any costs associated with harm to commercial fishing or the impact of higher electric rates on the state economy in terms of lost jobs and wages.
    - No consideration is given to the added costs of transmission upgrades which are a direct result and necessary cost of the projects.
    - Levitan has not included the lost revenue from reductions in Regional Greenhouse Gas Initiative (RGGI) allowances that will be a direct result of displacing in-state fossil generation.

  In our analysis we present ratepayer impacts based on more appropriate and inclusive assumptions regarding these matters and contrast our results with those presented by LAI.

[3] Discounting for Public Benefit-Cost Analysis, Resources for the Future, Qingran Li and William A Pizer, June 2021.
[4] OWEDA, N.J.S.A. 48:3-87.1 to -87.2, L. 2010, c. 57, eff. Aug. 19, 2010; amended by 2019 c. 440, §2,

3.0 Results

The results of our analysis are presented in terms of ratepayer impacts, benefit-cost analysis and developer economics in the following sections for:

- Attentive Energy
- Leading Light Wind
- Cumulative Effects of both projects in combination with the Atlantic Shore 1 project previously approved in the BPU Second Solicitation[5].

Overall conclusions are then presented in Section 7.0.

[5] BPU Order, Dockets QO20080555 and QO21050824, June 30, 2021.

4.0 Attentive Energy Wind Project

In its January 24, 2024 order BPU approved the bid submitted by Attentive Energy for award of ORECs as a qualified offshore wind facility under OWEDA. The order authorized payment for 6,604 GWH/yr at a first year OREC price of $131.00/MWH, escalated at 3.0%/yr for 20 years beginning in 2032. In addition, it authorized a maximum 15% increase or decrease in the OREC pricing based on a specified inflation index formula. BPU approval was based in large part on the evaluation and recommendations of its consultant, Levitan Associated Inc, (LAI) as contained in its evaluation report. The following present our findings regarding the BPU order and the supporting LAI evaluation.

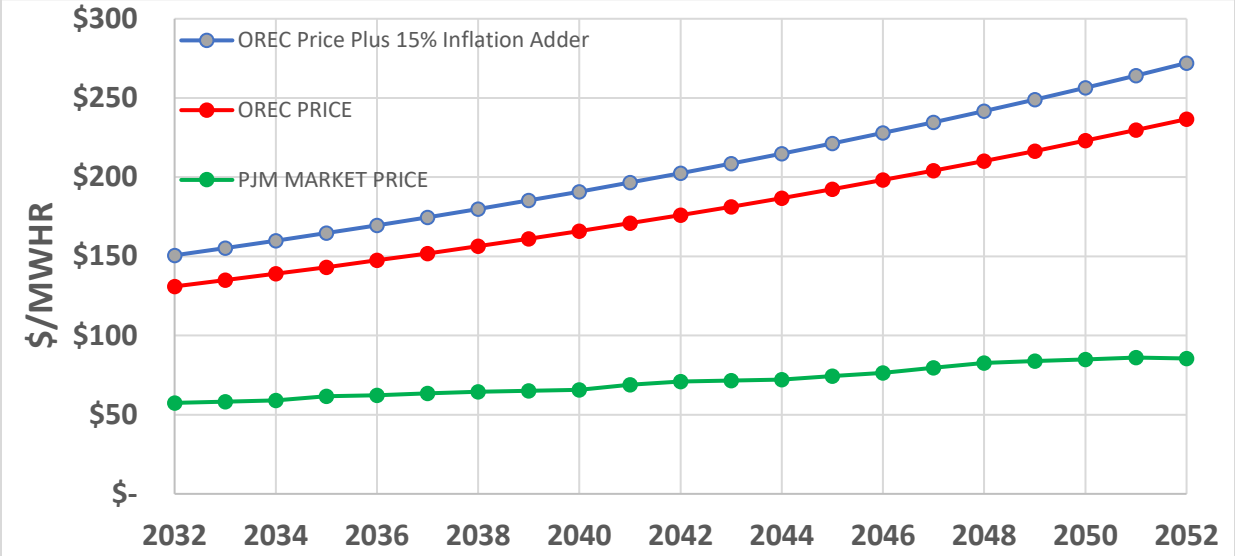
4.1 Ratepayer Impacts

An independent analysis and review of the BPU consultant's evaluation of the Attentive Energy 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 approved by the BPU in its order of January 24, 2024. (see Appendix A).

Figure 4-1 below shows the OREC prices over the 2032-2052 operating life of the project. The BPU order entitles Attentive Energy to collect fees for ORECs produced at $131/MWH beginning in 2028 and increasing to $236.60/MWH in 2052. The BPU order allows these OREC prices to be adjusted up or down by as much as 15% based on a defined inflation adjustment mechanism (see Appendix A).

The inflation adjustment is based on recognized official Federal inflation indices for labor, fabrication, steel and fuel prices and allow the base OREC price to be adjusted up or down depending on how much they deviate from the prices at time of OREC award and the Federal Board of Ocean Energy Management (BOEM) approval of the Construction and Operating Plan (COP) for the project. This time period is estimated to be 2-4 years. If the BPU approved inflation adjustment formula was calculated over the most recent available three years (2020-2022) the resulting inflation adjustment would be in excess of 35%. Given the recent and long term historical trends in these indices, it is highly likely that the adjustment calculated over such a period will exceed 15%, and result in an increased ratepayer subsidy.

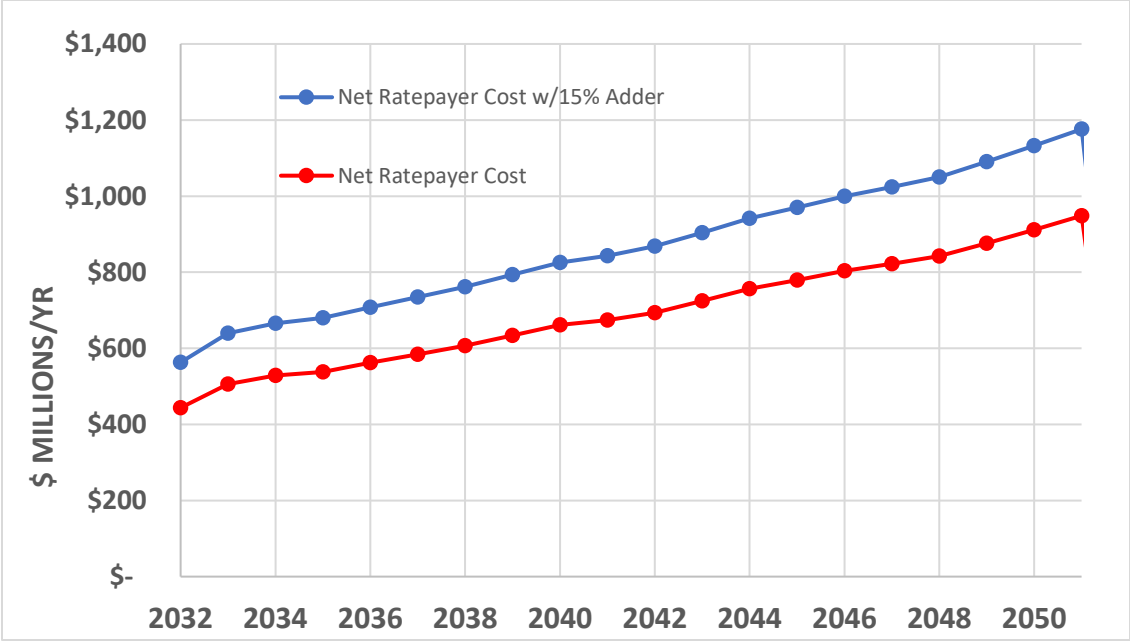
Figure 4-1 Attentive Energy OREC Price vs PJM Market Price



As can be seen from Figure 4-1 above, even after the PJM credits, ratepayers will be required to pay from $73-151/MWH over and above the market price for power from the Attentive Energy facility with ratepayers paying more than twice the market price for power from the project. If the 15% inflation adjustment is added, this increases to over three times the market price, adding $93-186/MWH.

Figure 4-2 below shows the total annual added ratepayer cost associated with the above market OREC prices.

Figure 4-2. Added Ratepayer Cost for Attentive Energy Project



The ratepayer subsidy increases from about $450 million in the first full year of operation (2032) to $950 million in the last full year of operation (2051), totaling $13 billion over the life of the facility. Using the consumer discount rate of 3%, the 2023 present value (PV) of these above market ratepayer costs is $7.7 billion. With the 15% inflation adjustment factor, the total subsidy increases to $15 billion ($9.6 billion in 2023$ PV).

Using a discount factor of 7%, LAI has calculated this value in only $3.3 billion, thereby grossly understating the PV of the above market rate subsidy by a factor of 2.3 or 2.9 with the 15% OREC adder.

4.2 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 Attentive Energy wind project has a BCR of 2.20 but has redacted the specific values for each of the factors comprising the calculation.

Per our analysis, on a PV basis OREC Costs are $13 billion and the value of Ratepayer Offsets (PJM energy, capacity and RECs) are $5.3 billion. Thus, before including the projected Economic and Environmental Benefits, the net cost is $7.7 billion and BCR is 0.4, 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 EPA's social cost of carbon[6] and Technical Support Document[7] to estimate the value of perceived benefits. In order to arrive at a value of 2.20, we estimate that LAI assigns a value of a value of $3.23 billion to the Economic Benefits and $7.64 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 the commercial and charter fishing industries along the NJ shore. The negative impact on the fishing industry, is estimated to be $____ million/year[8]. This is $____billion in

[6] "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances" U.S. Environmental Protection Agency, November 2023.

[7] U.S. EPA, "Technical Support Document Estimating the Benefit per Ton of Reducing Directly-Emitted PM2.5, PM2.5 Precursors and Ozone Precursors from 21 Sectors," January 2023

[8] Need reference to include costs

PV and would offset any Economic Benefits claimed to contribute to the net benefits or the BCR.

In addition to the negative impact on the NJ fishing 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 study[9] 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 Attentive Energy would raise rates by at least 2%, we can extrapolate these 2011 economic impacts to the 20 year period of Attentive Energy OREC costs so that the $330 million/yr becomes $500 million/yr in 2032. The Present Value in 2023 of this lost income over 20 years is $7.1 billion, a very significant additional indirect economic cost of the project.

Transmitting 1342MW of offshore wind power from more than 40 miles offshore across the state to the PJM grid will entail significant costs to install and upgrade transmission lines, substations, switchyards, HVAC/HVDC converter stations, and associated relays and other components. Attentive Energy will route its undersea cables to Sea Girt and further inland to the Larabee connector solution. To date BPU has authorized $1.2 billion for upgrading of existing transmission links but has not yet received bids for the onshore cable vaults or other elements of the Larabee connection. In fact, bids submitted by Attentive and other bidders for the cable vaults were rejected as being too costly. So at this point the total cost of transmission upgrades are unknown but likely to be substantial.

LAI has neglected to include these transmission costs in its benefit-cost analysis, but they are a necessary and direct cost of the Attentive Energy project which will be borne by ratepayers in addition to the OREC costs, and therefore must be included. Bids submitted for the Larabee solution transmission upgrades to allow 6400MW of offshore wind to utilize that transmission pathway averaged $1.3 billion/MW in 2021$[10]. If we allocate that cost index to the 1342MW of the Attentive Energy project, it represents an additional $1.8 billion of costs which must be included in the benefit-cost accounting, which we have done.

[9] "The Cost and Economic Impact of New Jersey's Offshore Wind Initiative", Beacon Hill Institute at Suffolk University, June 2011

[10] NJ State Agreement Approach for Offshore Wind Transmission: Evaluation Report, Bratelle Group, October 26, 2023.

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[11]. 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 $190/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, 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 Attentive Energy 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 benefits down to state-wide benefits only, by using any reasonable measure of relative impact on the state to the entire world (population, GDP, land area, shoreline miles, carbon emissions, etc.), the total averted state social cost of emissions reduced by Attentive Energy 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 0.12%[12] of global values accrue to the state of NJ. This results in an insignificant PV benefit of less than $20 million which is more than offset by lost revenue accruing to the state from auctions of RGGI allowances from the emissions displaced by Attentive Energy. Along with the social cost of direct NJ environmental emissions associated with the manufacture, construction, operation and

[11] Legal Challenges to President Biden's Social Cost of Greenhouse Gases Estimates, Harvard Law School, Abby Husselbee, Caroline Jackson, 2023

[12] The population of NJ is 9.3 million (or 0.12%) compared with over 7.9 billion worldwide.

decommissioning of the wind turbines, we estimate the PV of these environmental costs to be about $2.1 billion. There is therefore a net environmental emissions related PV cost of more than $2 billion for the project.

Table 4-1 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 4-1 Attentive Energy Benefit- Cost Comparison[13]

	LAI	This Report
Benefits ($PV Billions)		
Energy and Capacity Credits	2.09	3.60
RECs	0.85	1.70
Economic Benefits	3.23	3.23
Avoided Emissions	7.64	0.02
Total Benefits	13.81	8.55
Costs ($PV Billions)		
OREC Payments	6.28	12.96
Transmission Upgrade Costs	0.00	1.80
Impact of Higher Electric Rates	0.00	7.10
Lost RGGI Emissions Revenue	0.00	2.10
Total Costs	6.28	23.96
Net Benefits - (Costs) ($PV Billions)	**1.27**	**(15.74)**
Benefits/Costs Ratio	**2.20**	**0.36**

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 Attentive Energy project exceed any potential benefits by **$15.74 billion** on a present value basis. Instead of 2.20 as calculated by LAI, the true BCR is no more than **0.36.**

If the 15% inflation adjustment is added to the base OREC price, the net cost becomes **$17.78 billion** and the BCR is reduced to **0.33**.

Even without including the economic cost of the project, the OREC payment costs alone exceed any benefits by more than $4.4 billion and the BCR would be no more than 0.66. Thus, at the current OREC pricing, which accounts for

[13] All values are in 2023$ PV

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.

4.3 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 Attentive Energy 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 50% of the capital cost of the project (including an added 20% bonus), to be collected when the facility becomes operational.

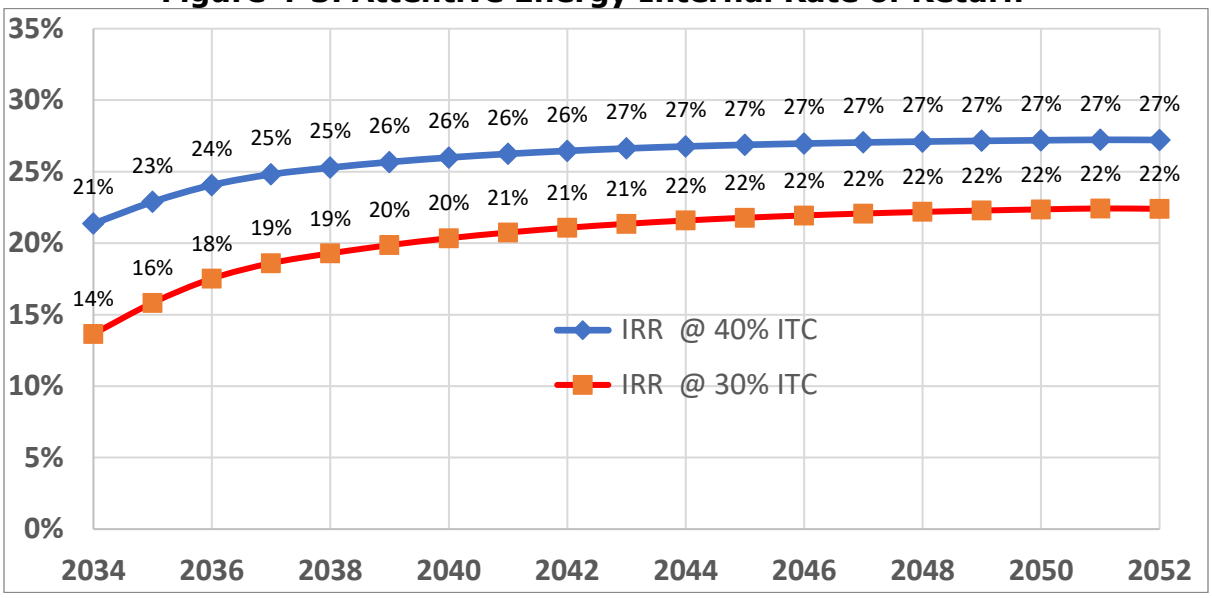
In its bid Attentive Energy was required to submit detailed information on its projected costs of the project and its resulting Internal Rate of Return (IRR) which represents its return on investment. This information is necessary to determine whether the approved OREC prices are reasonable given the 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 4-3 below.

Figure 4-3. Attentive Energy Internal Rate of Return



We have assumed, as does LAI in its bid evaluation, that available Federal tax credits have been included as on 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 base 30% Federal ITC was in effect for offshore wind project in accordance with the Federal Inflation Reduction Act (IRA) of 2022. As indicated in Figure 4 above, with a 30% ITC, Attentive Energy will realize an increasing return, rapidly approaching 22% by the end of its economic life and through decommissioning.

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 Attentive Energy does in fact qualify for the 10% bonus ITC, their IRR will increase to 27%. 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 over 22% 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 $7.7 billion in present value of added costs to support the developer's return on investment. By contrast a regulated utility is allowed a return on its invested capital of only about 9%/yr.

5.0 Leading Light Wind Project

In its January 24, 2024 order BPU approved the bid submitted by Invenergy Wind Offshore LLC (Leading Light Wind) for award of ORECs as a qualified offshore wind facility under OWEDA. The order authorized payment for 10,235 GWH/yr at a first year OREC price of $112.50/MWH, escalated at 2.5% /yr for 20 years beginning in 2032[14]. In addition, it authorized a maximum 15% increase or decrease in the OREC pricing based on a specified inflation index formula. BPU approval was based in large part on the evaluation and recommendations of its consultant, Levitan Associated Inc, (LAI) as contained in its evaluation report. The following present our findings regarding the BPU order and the supporting LAI evaluation.

5.1 Ratepayer Impacts

An independent analysis and review of the BPU consultant's evaluation of the Leading Light 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 approved by the BPU in its order of January 24, 2024

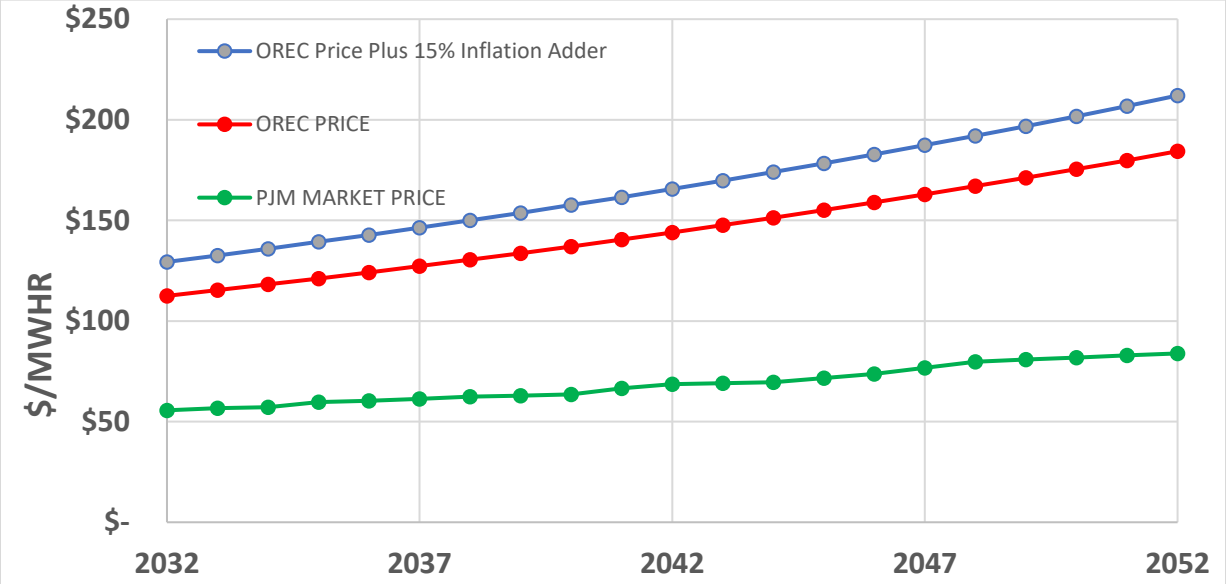
Figure 5-1 below shows the OREC prices over the 2032-2052 operating life of the project. The BPU order entitles Leading Light to collect fees for ORECs produced at $112.50/MWH beginning in 2032 and increasing to $188.95/MWH in 2053. The BPU order allows these OREC prices to be adjusted up or down by as much as 15% based on a defined inflation adjustment mechanism (see Appendix A).

The inflation adjustment is based on recognized official Federal inflation indices for labor, fabrication, steel and fuel prices and allow the base OREC price to be adjusted up or down depending on how much they deviate from the prices at time of OREC award and the Federal Board of Ocean Energy Management (BOEM) approval of the Construction and Operating Plan (COP) for the project. This time period is estimated to be 2-4 years. If the BPU approved inflation adjustment formula was calculated over the most recent available three years (2020-2022) the resulting inflation adjustment would be in excess of 35%.

[14] The initial 1200MW is scheduled to begin operation in 2032, with remaining 1200MW in 2033 as detailed in Appendix A.

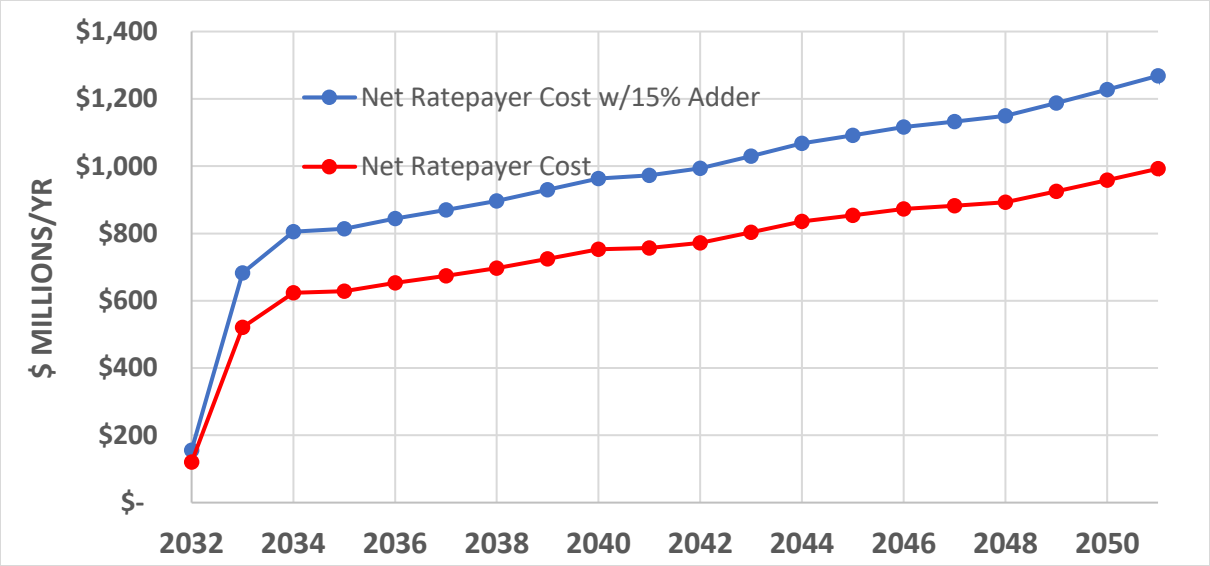
Given the recent and long term historical trends in these indices, it is highly likely that the adjustment calculated over such a period will exceed 15%, and result in an increased ratepayer subsidy.

Figure 5-1 Leading Light OREC Price vs PJM Market Price



As can be seen from Figure 5-1 above, even after the PJM credits, ratepayers will be required to pay from $57-105/MWH over and above the market price for power from the Leading Light facility with ratepayer paying more than twice the market price for power from the project If the 15% inflation adjustment is added, This increases to $74-133/MWH. Figure 5-2 below shows the total annual added ratepayer cost associated with the above market OREC prices,

Figure 5-2. Added Ratepayer Cost for Leading Light Project



The ratepayer subsidy increases from about $620 million in the first full year of operation (2034) to $1 billion in the last full year of operation (2051), totaling $16.5 billion over the life of the facility. Using the consumer discount rate of 3% the 2023 present value (PV) of these above market ratepayer costs is $8.5 billion. With the 15% inflation adjustment factor, the total subsidy increases to $19 billion ($11 billion in 2023$ PV).

Using a discount factor of 7%, LAI Has calculated this value to be only $3.9 billion, thereby grossly understating the PV of the above market rate subsidy by a factor of 2.2 and 2.8 with the 15% OREC adder.

5.2 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 Leading Light wind project has a BCR of 2.39 but has redacted the specific values for each of the factors comprising the calculation.

Per our analysis, on a PV basis OREC Costs are $16.5 billion and the value of Ratepayer Offsets (PJM energy, capacity and RECs) are $8 billion. Thus, before including the projected Economic and Environmental Benefits, the net cost is $8.5 billion and BCR is 0.48, 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 EPA's social cost of carbon[15] and Technical Support Document[16] to estimate the value of perceived benefits. In order to arrive at a value of 2.39, we estimate that LAI assigns a value of a value of $3.5 billion to the Economic Benefits and $11.37 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 the commercial and charter fishing industries along the NJ shore. The negative impact on the fishing industry, is estimated to be $____ million/year[17]. This is $____billion in PV and would offset any Economic Benefits claimed to contribute to the net benefits or the BCR.

[15] "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances" U.S. Environmental Protection Agency, November 2023.
[16] U.S. EPA, "Technical Support Document Estimating the Benefit per Ton of Reducing Directly-Emitted PM2.5, PM2.5 Precursors and Ozone Precursors from 21 Sectors," January 2023
[17] Fishing Impact Study

In addition to the negative impact on the NJ fishing 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 study[18] 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 Leading Light would raise rates by at least 2%, we can extrapolate these 2011 economic impacts to the 20 year period of Leading Light OREC costs so that the $330 million/yr becomes $500 million/yr in 2032. The Present Value in 2023 of this lost income over 20 years is $7.1 billion, a very significant additional indirect economic cost of the project.

Transmitting 2400MW of offshore wind power from more than 40 miles offshore across the state to the PJM grid will entail significant costs to install and upgrade transmission lines, substations, switchyards, HVAC/HVDC converter stations, and associated relays and other components. Leading Light will route its undersea cables to Sea Girt and further inland to the Larabee connector solution. BPU has authorized $1 billion for upgrading of existing transmission links but has not yet received bids for the onshore cable vaults or other elements of the Larabee connection. In fact, bids submitted by Attentive and other bidders for the cable vaults were rejected as being too costly. So the total cost of transmission upgrades are unknown but likely to be substantial.

LAI has neglected to include these transmission costs in its benefit- cost analysis, but they are a necessary and direct cost of the Leading Light project which will be borne by ratepayers in addition to the OREC costs, and therefore must be included. Bids submitted for the Larabee solution transmission upgrades to allow 6400MW of offshore wind to utilize that transmission pathway averaged $1.3 billion/MW in 2021$. If we allocate that costs index to the 2400MW of the Leading Light project, it represents an additional $3.3 billion of costs which must be included in the benefit- cost accounting, which we have done.

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

[18] "The Cost and Economic Impact of New Jersey's Offshore Wind Initiative", Beacon Hill Institute at Suffolk University, June 2011

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 $190/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 Leading Light 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 benefits down to state-wide benefits only, by using any reasonable measure of relative impact on the state to the entire world (population, GDP, land area, shoreline miles, carbon emissions, etc.), the total averted state social cost of emissions reduced by Leading Light 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 0.12%[19] of global values accrue to the state of NJ. This results in an insignificant PV benefit of less than $30 million which is more than offset by lost revenue accruing to the state from auctions of RGGI allowances from the emissions displaced by Leading Light. 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 $3.3 billion. There is therefore a net environmental emissions related PV cost of more than $3 billion for the project.

[19] The population of NJ is 9.3 million (or 0.12%) compared with over 7.9 billion worldwide.

Table 5-1 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 5-1 Leading Light Benefit-Cost Comparison[20]

	LAI	This Report
Benefits ($PV Billions)		
Energy and Capacity Credits	2.55	5.40
RECs	1.20	2.55
Economic Benefits	3.50	3.50
Avoided Emissions	11.37	0.03
Total Benefits	18.62	11.48
Costs ($PV Billions)		
OREC Payments	7.78	16.48
Transmission Upgrade Costs	0.00	3.30
Impact of Higher Electric Rates	0.00	7.10
Lost RGGI Emissions Revenue	0.00	3.30
Total Costs	7.78	30.18
Net Benefits - (Costs) ($PV Billions)	**10.84**	**(18.70)**
Benefits/Costs Ratio	**2.39**	**0.38**

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 Leading Light project exceed any potential benefits by **$18.7 billion** on a present value basis. Instead of 2.39 as calculated by LAI, **the true BCR is no more than 0.38**.

If the 15% inflation adjustment is added to the base OREC price, the net cost becomes **$21.17 billion and the BCR is reduced to 0.34.**

Even without including the economic cost of the project, the OREC payment costs alone exceed any benefits by $5 billion and the BCR would be no more than 0.7. 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.

[20] All values are in 2023$ PV

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.

5.3 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 Leading Light 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 50% of the capital cost of the project (including an added 20% bonus), to be collected when the facility becomes operational.

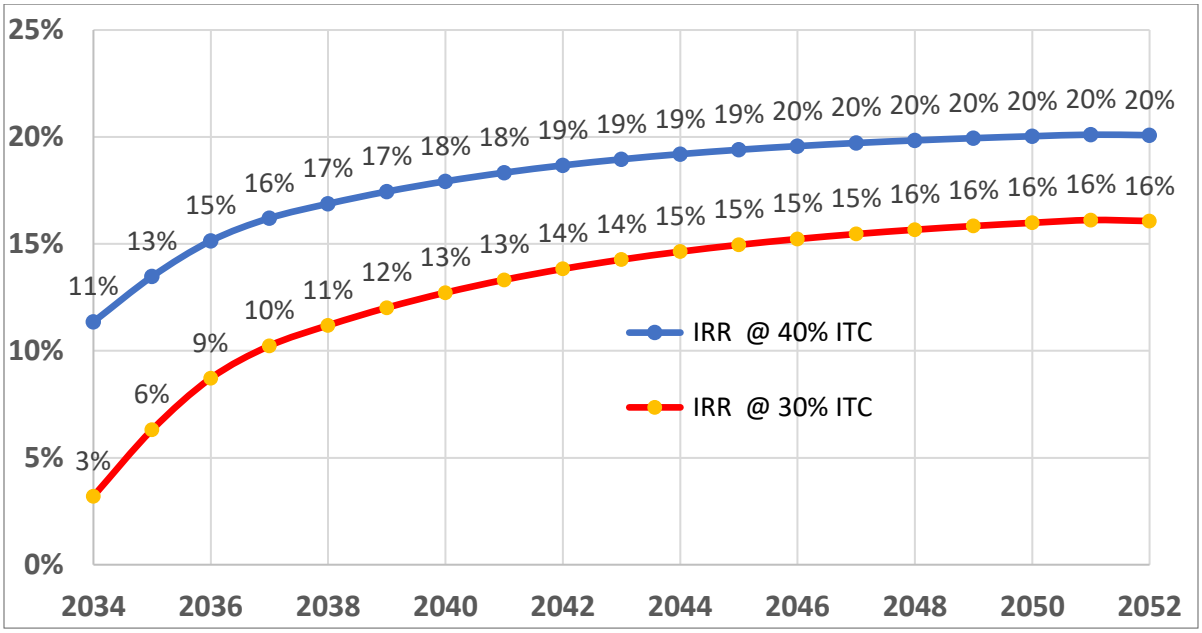
In its bid Leading Light was required to submit detailed information on its projected costs of the project and its resulting Internal Rate of Return (IRR) which represents its return on investment. This information is necessary to determine whether the approved OREC prices are reasonable given the projected 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 5-3 below.

Figure 5-3. Leading Light Wind Internal Rate of Return



We have assumed, as does LAI in its bid evaluation, that available Federal tax credits have been included as on 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 base 30% Federal ITC was in effect for offshore wind project in accordance with the Federal Inflation Reduction Act (IRS) of 2022. As indicated in Figure 4 above, with a 30% ITC, Leading Light will realize an increasing return, rapidly approaching 16% by the end of its economic life and through decommissioning.

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 Leading Light does in fact qualify for the 10% bonus ITC, their IRR will increase to 20%. 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 16% or 20% 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 $8.5 billion in present value of added costs to support the developer's return on investment.

6.0 Cumulative Impacts

Each project approved by BPU for award of ORECs involves subsidized costs that incrementally increase ratepayer costs and bills for all classes of retail customers. While BPU provides its estimate of the ratepayer impact of each project, including Attentive Energy and Leading Light Wind, it has not acknowledged or made known the cumulative impact of the combined projects together with prior wards under earlier solicitations. In this section we examine the cumulative impact of all such projects.

Of the prior awards, only the 1510 MW Atlantic Shores 1 (AS1) project has an active OREC award which entitles it to receive payment for 6.1 GWH/yr at a first year OREC price of $86.62 escalated at 2.5%/yr for 20 years beginning on 2028 (see Appendix A). We previously analyzed the impact of AS1 on rates and include the results of that study[21] in our assessment of cumulative impact of all three projects.

The following sections present the total and incremental impact of the total 5252 MW of offshore wind projects approved to date by BPU in terms of total and PV ratepayer subsidies and increases in retail electricity bills for residential, commercial and industrial customers over the period 2028-2052.

6.1 Ratepayer Subsidies

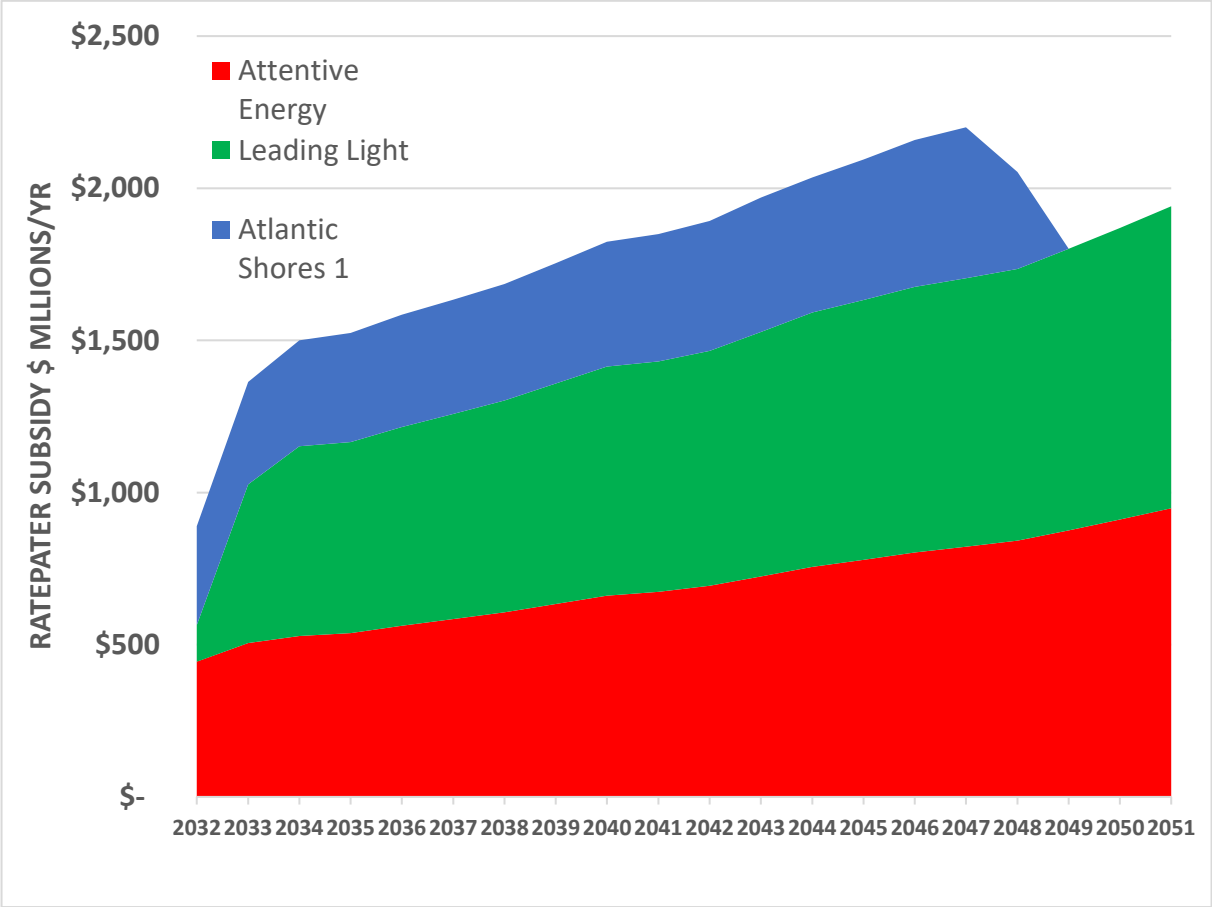
Based on the results presented in Sections 4.1 and 5.1 for Attentive Energy and Leading Light Wind Projects together with the corresponding results for the AS1 project, Figure 6-1 shows the cumulative annual ratepayer subsidy.

As indicated, the combined ratepayer costs embedded in the OREC prices for these three approved projects increases from $890 million in 2032 to over $2 billion/yr by 2044. The total subsidy over the twenty years period is over **$36 billion**, which has a 2023$ PV of **$26 billion**.

With the 15% inflation adjustment factor, the total subsidy increases to **$44 billion ($32 billion in 2023$ PV).**

[21] Economic Analysis of Atlantic Shore Offshore Wind Project, Whitestrand Consulting, August 2023.

Figure 6-1 Cumulative Annual Ratepayer OREC Subsidies



6.2 Customer Bill Impacts

The rate subsidies embodied in the above market OREC prices will progressively impact retail customers bills as the offshore wind projects begin operation in 2028 and 2032. In its evaluation of bid proposals for the second and third BPU solicitations, LAI has estimated the increase in average monthly customer bills for residential, commercial and industrial customer.

Using the same methodology as LAI, but applying the higher subsidy costs we have discussed and provided in the previous sections, we have also estimated the monthly bill increase for each of the approved projects. Table 6-1 below presents the results of our analysis as compared with that of LAI. We have also displayed the combined increase in monthly bill in $/mo and on a percentage increase basis.

Table 6-1 ECONOMIC IMPACT OF NJ WIND PROJECT AWARDS ON RETAIL CUSTOMER BILLS

	Attentive	Leading Light Wind	Atlantic Shores 1	Combined	Percent Bill Increase
LAI Analysis (Base OREC Prices)					
Ratepayer Bill Impact ($/mo)					
Residential	$ 3.71	$ 3.13	$ 2.21	$ 9.05	**8.1%**
Commercial	$ 31.86	$ 26.87	$ 20.18	$ 78.91	**10.9%**
Industrial	$ 278.42	$ 234.80	$ 172.25	$ 685.47	**13.4%**
This Report (Base OREC Prices)					
Ratepayer Bill Impact ($/mo)					
Residential	$ 7.87	$ 6.64	$ 4.69	$ 19.20	**17.1%**
Commercial	$ 67.58	$ 57.00	$ 42.81	$ 167.38	**23.2%**
Industrial	$ 590.59	$ 498.06	$ 365.38	$ 1,454.03	**28.5%**
This Report (Base OREC Prices Plus 15% Inflation Adder)					
Ratepayer Bill Impact ($/mo)					
Residential	$ 9.05	$ 7.64	$ 4.69	$ 21.37	**19.0%**
Commercial	$ 77.72	$ 65.55	$ 42.81	$ 186.07	**25.8%**
Industrial	$ 679.18	$ 572.77	$ 365.38	$ 1,617.32	**31.6%**

As shown, even without adjustment, the estimates provided by LAI demonstrate that the cumulative impact of theses three projects result in significant increases in customer bills ranging from 8% for residential, 11% for commercial and over 13% for industrial customers.

However, because LAI has significantly undervalued the OREC subsidies for all projects, these values also significantly understate the actual customer bill increases. As shown, at the Base OREC prices the increase will be more than twice the LAI estimates, and reach **17%** for residential, 23% for commercial and **28%** for industrial customers.

In the highly likely event that the 15% inflation adjustment is added to the Base OREC prices (for Attentive and Leading Light), these values increase further to **19%** for residential**, 26%** for commercial and **32%** for industrial customers.

7.0 Conclusions

As demonstrated in the foregoing sections, the Attentive Energy and Leading Light Wind projects will burden ratepayers with above market rates, amounting to subsidies more than twice as great as cited by the BPU in its orders approving the OREC prices. This is a direct result of errors in the evaluation of the bids by LAI which are detailed previously in this report.

The BPU and its consultant have also failed to analyze and present the added ratepayer burden associated with the inflation adjustmention increase which would raise the subsidies by more than 20%.

The BPU has also relied on a highly flawed benefit-cost analysis performed by LAI which greatly overstates benefits while understating and omitting costs associated with the projects. As a result, the projects cannot be shown to result in net economic or net environmental benefits as required by OWEDA.

In assessing the ratepayer impact of these projects, BPU and its consultant have failed to acknowledge or analyze the cumulative increase in retail customer bills which is substantially greater than that presented in the BPU orders and which can results in **increases of up to 19-36% in average monthly bills**.

The forgoing analysis demonstrates that, at the approved OREC prices, the developers will realize **internal returns in investment of at least 16-22%** per year, well in excess of that allowed to regulated utilities. This excessive return does not represent a fair balance of financial risk and rewards between ratepayers and shareholders, as required by OWEDA.

In conclusion, based on the analysis contained in this report, it is clear that the BPU approved OREC pricing schedules do not comply with the requirements of OWEDA. The approved rates would need to be reduced significantly in order to mitigate the unreasonable ratepayer burden, reduce the developer's rate of return to a reasonable value and, if at all possible, result in a net benefit-cost outcome as required by OWEDA.

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The Author

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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.