

Economic Analysis of the Proposed Attentive Energy One and Community Offshore Wind Projects

by

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Executive Summary

On March 6, 2024 the NJ Board of Public Utilities (BPU) announced a proposed Fourth Solicitation seeking bids for an additional 1200-4000 MW of offshore wind capacity. On July 10 bids were received for Attentive Energy One (AE1), a 1400 MW project, and for Community Offshore Wind (COSW), a 1300 MW project. Since new awards to the projects will undoubtedly result in higher ratepayer subsidies than those already approved, it is appropriate to estimate the ratepayer impact of any such awards and whether such an action by BPU would comply with the Offshore Wind Economic Development Act (OWEDA) which imposes mandates on the BPU meant to protect ratepayers. That is the purpose of this report.

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

Ratepayer Impacts

- At the likely OREC prices of the projects, NJ ratepayers will be required to pay more than twice the market price for power from the AE1 and COSW facilities. This in essence represents a ratepayer subsidy for offshore wind generation.
- The 2024 present value (PV) of these above market ratepayer costs is **\$8.5 billion** for AE1 and **\$7 billion** for COSW.
- In the highly likely event that OREC prices are increased by 15% due to inflation adjustment the PV ratepayer subsidies will increase by 18-24%, to **\$10 billion** for AE1 and **\$8.7 billion** for COSW.

Increases in Retail Customer Bills

- The incremental and cumulative effect of these above market subsidies will increase retail customer bills significantly over the twenty years of operating period of these projects to a much greater extent than previous BPU awards.
- The combined increase due to Attentive Energy, Community and Leading Light projects will add more than **\$2 billion/yr** to customer bills in 2032 increasing to \$4.5 billion in 2050.
- As a result, the average monthly bill for will increase by **24%** for residential, **29%** for commercial and **33%** for industrial customers.

Benefit-Cost Analysis

- The following is the benefit-cost summary for the AE1 and COSW projects:

Table 1 Benefit-Cost Analysis Results

	<u>AE1</u>	<u>COSW</u>
Benefits (\$PV Billions)		
Energy, Capacity and REC Credits	5.86	4.87
Economic Benefits	3.40	3.00
Avoided Emissions	<u>0.01</u>	<u>0.01</u>
Total Benefits	8.87	7.88
Costs (\$PV Billions)		
OREC Payments	16.49	13.61
Impact on Fishing	1.60	1.60
Impact of Higher Electric Rates	20.00	20.00
Transmission Upgrade Costs	1.80	1.70
Lost RGGI Emissions Revenue	<u>3.00</u>	<u>2.50</u>
Total Costs	42.89	39.41
Net Benefits/ (Costs) (\$PV Billions)	(34.02)	(31.61)
Benefit/Costs Ratio	0.20	0.20

- As indicated, the PV costs of the projects would each exceed any potential benefits by more than **\$30 billion** and the BCR of each is no more than 0.20 (i.e., **costs outweigh benefits by a factor of 5 to 1**). OREC payment costs alone would exceed any benefits by more than \$8.5 - 10 billion and on that basis alone, the BCR would be no more than 0.58. Thus, a BCR greater than 1.0 cannot be achieved. Furthermore, for both projects **there is neither a net economic nor a net environmental benefit as required by OWEDA.**

Developer's Return on Investment

- As a result of the above market rates embedded in the expected 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).
- Community Wind will realize a **22%** internal rate of return (IRR) on its investment which would increase to **26%** 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 One and Community Offshore Wind projects will burden ratepayers with above market power prices, amounting to significant levels of subsidy borne by retail customers. This added cost would not be reasonable or justified by any economic or environmental benefits or cost-benefit analysis. The added cost is a direct result of the expected OREC pricing proposed by the developer and approved by the BPU.

Based on the analysis contained in this report, it is clear that any new BPU OREC awards at the expected OREC pricing could not comply with the requirements of OWEDA. These likely bid OREC prices 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 Proposed Attentive Energy One and Community Offshore Wind Projects

1.0 Introduction

In response to its Fourth Offshore Wind Solicitation¹, on July 10, 2024 the NJ Board of Public Utilities (BPU) received bids from Attentive Energy Wind One (AE1) and Community Offshore Wind (COSW) projects eligible for 1400 MW and 1300 MW respectively of electrical generating capacity. These are shown in lease areas 26 and 28 on Figure 1-1 below.

Figure 1-1 New York and New Jersey Offshore Wind Lease Areas



These bids were in addition to those submitted by Atlantic Shores (AS) for its Projects 1 and 2 in its AS South lease area (33 and 34). In its Third Solicitation, BPU awarded OREC contracts for 1342MW to Attentive Energy Two (27) and 2400 MW to Leading Light Wind (31).

Both the AE1 and COSW wind projects had previously cancelled proposed OREC contracts in New York as being insufficient to meet their investment criteria² at an average price for their power of \$145/MWH. In view of that, any new awards to these projects in this BPU solicitation at higher OREC prices have the potential to significantly increase ratepayer subsidies and developer returns on investments. It is the purpose of this report to examine the magnitude of such potential increases and to determine whether they would allow BPU to make those awards in compliance with the requirements of the

¹ NJ Fourth Solicitation Guidance Document, BPU, March 6, 2024.

² NYSERDA Cancels Three Offshore Wind Projects, Offshorewind.biz, April 22, 2024.

Offshore Wind Economic Development Act (OWEDA) by which BPU is bound. This is similar to the analysis we have also performed on the AS South bids³ and on the Third Solicitation awards⁴.

2.0 Methodology

In analyzing bids in its solicitations, the BPU relies in large part on evaluations by its consultant, Levitan & Associates, Inc. (LAI) of the proposed bids as it has in the Third Solicitation⁵. In this study, we have used the same input values reported and applied in the LAI evaluations 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 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 perspective⁶.
- 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

³ Economic Analysis of the Atlantic Shores Offshore Wind Project, Whitestrand Consulting, August 2024

⁴ Economic Analysis of the Attentive and Invenergy Offshore Wind Projects, Whitestrand Consulting, August 2024.

⁵ Evaluation Report New Jersey Offshore Wind Solicitation #3, January 10, 2024, Levitan and Associated Inc.

⁶ Discounting for Public Benefit-Cost Analysis, Resources for the Future, Qingran Li and William A Pizer, June 2021.

those accruing to the state as required by the NJ Offshore Wind Economic Development Act (OWEDA)⁷.

- 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.

3.0 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 One
- Community Offshore Wind
- Cumulative Effects of both projects in combination with the projects previously approved in the BPU Third Solicitation⁸.

Overall conclusions are then presented in Section 7.0.

⁷ 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,

⁸ BPU Orders of January 24, 2024 Docket No. Q022080481

4.0 Attentive Energy One Project

In its Third Solicitation, on January 24, 2024 order BPU approved the bid submitted by Attentive Energy for award of ORECs as a qualified offshore wind facility under OWEDA for its 1342 MW Attentive Energy Two (AE2) project. In the Fourth Solicitation, on July 10 Attentive Energy submitted a bid for an additional 1400 MW Attentive Energy One (AE1) project. These are located in its lease area OCS-A-0538 in the Hudson South lease area about 40 miles from the NJ shore (see Figure 1-1). The following presents our evaluation of a potential new award to this project.

4.1 Ratepayer Impacts

In October 2023 the AE1 project had been selected by the New York State Energy Research and Development Authority (NYSERDA) for a provisional award of an OREC contract. Together with two other projects (Community and Excelsior Wind), the announced average OREC price was \$145/MWH⁹. All three projects proposed to use an 18 MW GE Vernova turbine. Subsequent to the awards, GE advised that this large turbine would not be developed and would be replaced by its smaller 15.5/16.5 MW turbine.

All three provision awardees cited this as a material change and requested an increase in the proposed OREC pricing due to higher costs associated with the need to utilize more of the smaller turbines. NYSERDA denied this request and in April 2024 announced that all three provisional awards had been cancelled.

While the new AE1 bid is presently confidential, it may be assumed that it will reflect the need for an OREC price higher than \$145/MWH because of the use of smaller turbines, and likely equal or exceed the awarded AE2 OREC price. The LCOE of the AE2 award, without any transmission costs, is \$165/MWH.

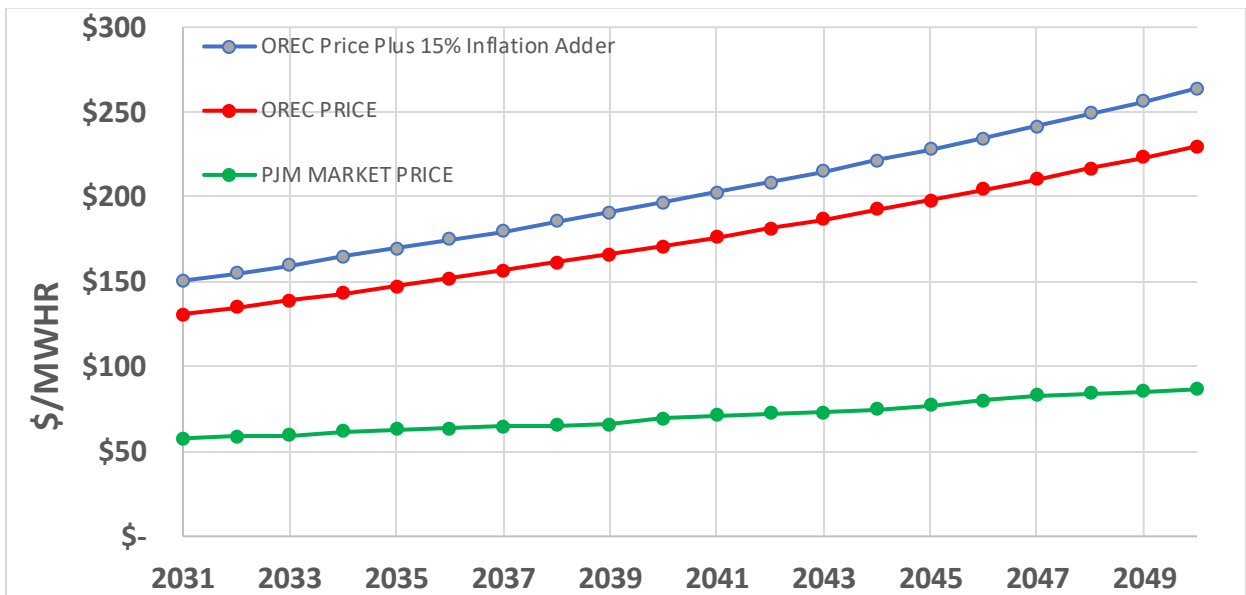
The BPU AE2 order entitles Attentive Energy to collect fees for ORECs produced at \$131/MWH beginning in its first OREC year and increasing to \$236.60/MWH in year 20 of the OREC contract. For purposes of this analysis, we assume the project will be in operation in 2031.

The BPU order also allows these OREC prices to be adjusted up or down by as much as 15% based on a defined inflation adjustment mechanism. 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

⁹ NYSERDA Third Solicitation Announcement. October 2023

adjusted up or down depending on how much they deviate from the prices at time of a bidder’s best and final offer (BAFO) and a time three years prior to commercial operation. This time period is estimated to be 2-4 years. If the BPU approved inflation adjustment formula was calculated over the most recent three years (2021-2023) the resulting inflation adjustment would be in excess of 24%. 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 OREC Price of \$190/MWH.

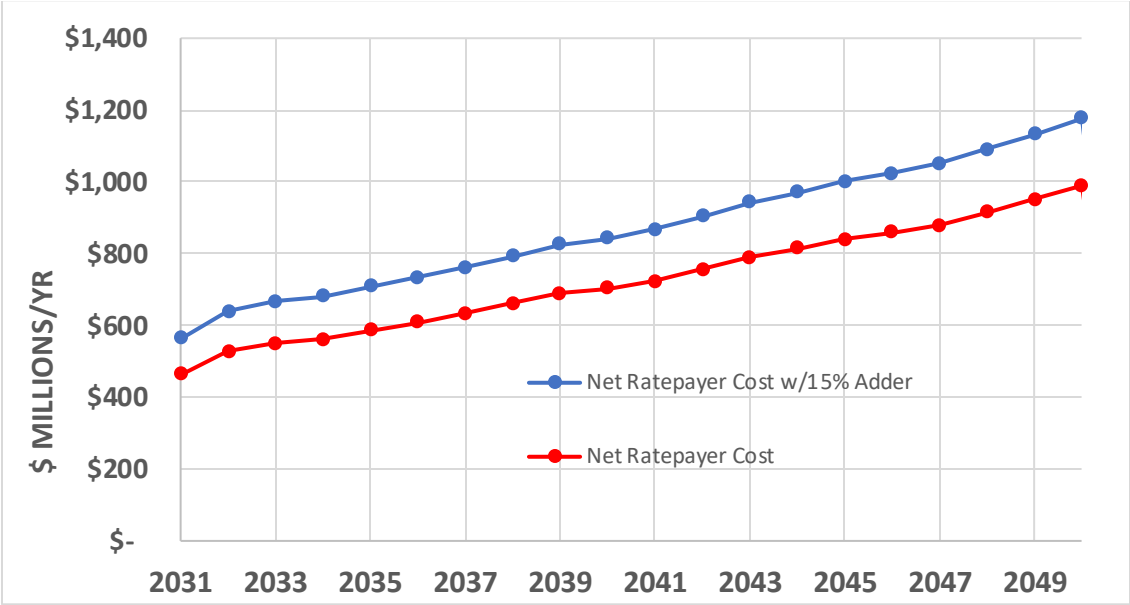
Figure 4-1 Attentive Energy One OREC Price vs PJM Market Price



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 AE1 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.

At the same 56% capacity factor used in the existing AE2 OREC contract, it is assumed that AS South would be entitled to receive OREC payments for up to 6,889,519 MWH/yr over the 20 year term of a new award. Based on this, as shown in Figure 4-2 below, the added net cost burden of the above market payments is substantial on an annualized and lifetime basis.

Figure 4-2. Added Ratepayer Cost for AE1 Project



The ratepayer subsidy increases from about \$450 million in the first full year of operation (2031) to \$1 billion in the last full year of operation (2050), totaling \$15 billion over the life of the facility. Using the consumer discount rate of 3%, the 2024 present value (PV) of these above market ratepayer costs is \$8.5 billion. With the 15% inflation adjustment factor, the total subsidy increases to \$18 billion (\$10 billion in 2024\$ PV).

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. As such it recognizes the need to achieve net positive benefits and a benefit-cost ratio (BCR) greater than 1.0.

In this section we calculate net benefits or costs and the Benefit/Cost ratio as:

$$\text{Net Benefits or Costs} = \text{Total Benefits} - \text{Total Costs}$$

$$\text{BCR} = \frac{\text{Total Benefits}}{\text{Total Costs}}$$

Benefits include: (1) Ratepayer offsets from PJM market revenues, (2) contributions to state economy from direct investment and jobs created by the project and (3) value of avoided greenhouse gas (GHG) emissions to the state.

Costs include: (1) OREC costs to ratepayers, (2) economic harm to local tourism and fishing industries, (3) negative impact on state GDP due to higher electric rates, (4) cost of associated transmission system upgrades and (5) lost Regional Greenhouse Gas Initiative (RGGI) revenue from displaced in state fossil generation.

The following is a discussion of the various elements involved in this calculation.

Benefits

For each OREC produced, the AE1 project will receive market revenues from PJM for energy, capacity and RECs supplied to the grid. Based on the projected prices for these PJM price commodities over the period 2031-2050 as shown on Figure 4-1, and the specified maximum annual ORECs produced, the estimated PV 2024 of these market offset revenue is \$5.9 billion, using the standard 3% ratepayer consumption discount rate.

The projected economic benefits proposed by Attentive Energy in terms of NJ GDP growth and jobs created in the state are presently unknown but, based on projects of similar size approved by BPU in prior solicitations, the PV of such benefits is conservatively estimated to be about \$3 billion.

With respect to the Environmental Benefits, LAI has applied the US EPA's Interagency Working Group (IAWG) social cost of carbon (SCC)¹⁰ and Technical Support Document¹¹ to estimate the value of perceived benefits. The use of these reports 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 \$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.

The factor most recently used by LAI 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 by them 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. In our benefit-cost calculations, we have consistently applied a 3% discount rate to evaluation of both costs and benefits. A 3% discount rate reduces that value to \$51/ton and the purported global benefit by a factor of 3.8.

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 AE1 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 (GDP, population,

¹⁰ “Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances” U.S. Environmental Protection Agency, November 2023.

¹¹ 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

land area, shoreline miles, carbon emissions, etc.), the total averted state social cost of emissions reduced by AE1 is far less than 1% of the global benefit. We have conservatively assumed that 0.12%¹² of global values accrue to the state of NJ. This results in a relatively insignificant 2024 present value of \$10 million for the benefit of avoided GHG emissions to the state of NJ.

Costs

The total ratepayer PV costs associated with the OREC pricing as shown on Figure 3-1 is \$16.49 billion. As with the benefits of the ratepayer offsets, these PV values are also based on the standard 3% consumption discount rate.

In LAI's analysis of OREC bids no consideration is given to the significant negative economic impacts of the project on the commercial and charter fishing industries along the NJ shore. New Jersey has the fifth largest commercial fishing industry in the US, contributing an estimated \$1 billion/yr to the state's economy¹³. Fishing activities in or near the Attentive lease area will be prohibited during construction and limited during operation. If the negative impact on the fishing industry results in even a 5% reduction in annual revenue this is estimated to be \$50 million/year. This is \$1.6 billion in 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 tourism and 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 by the Beacon Hill Institute¹⁴ 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. The Present Value in 2024 of this lost income over 20 years is \$7 billion. As discussed in Section 6.1 below, AE1 OREC prices would raise average rates by 6%, this results in a PV cost of about \$20 billion.

As noted, the effect of raising electric rates has a similar impact on the state economy as an increase in taxes. The AE1 project will raise residential average

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

¹³ NJ Sea Grant Consortium, 2024

¹⁴ "The Cost and Economic Impact of New Jersey's Offshore Wind Initiative", Beacon Hill Institute at Suffolk University, June 2011

rates by \$560 million/yr which is about 0.07% of state GDP¹⁵. Studies¹⁶ show that tax increases reduce GDP by a factor of 2.5 on a percentage basis. Thus, a rate increase of 0.07% of GDP will reduce state GDP by 0.17% or \$1.4 billion/yr. The 2024 PV of such economic loss over 20 years is also \$20 billion and so confirms the estimate based on the 2011 Beacon Hill Institute study.

This is in fact a conservative estimate since it does not reflect the effect of raising commercial or industrial rates on the GDP. Thus, the economic ham caused by raising retail electric rates is a very significant additional indirect economic cost of the project.

Transmitting wind power from offshore turbine locations 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. The AE1 project will utilize the Larabee Tri-Collector (LTC) solution in which 6400 MW from four offshore wind projects will make landfall at Sea Girt and proceed inland to the Larabee substation in Howell TWP. The costs of the LTC solution will be recovered through transmission fees, not through OREC prices. Thus, they are an added cost that must be considered in the benefit-cost analysis.

To date BPU has authorized \$1.2 billion for upgrading of existing transmission links for the LTC solution but has not yet awarded contracts 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.

Bids submitted for the LTC solution transmission upgrades to allow 6400MW of offshore wind to utilize that transmission pathway averaged \$1.3 billion/MW in 2021¹⁷. If we allocate that cost index to the 1400 MW of the AE1 project, it represents an additional \$1.8 billion of costs which must be included in the benefit-cost accounting, which we have done.

Another cost which must be accounted for involves the loss of revenue accruing to the state from auctions of Regional Greenhouse Gas Initiative (RGGI) allowances from the emissions displaced by AE1. This revenue is collected from

¹⁵ In 2023 NJ personal income tax collected was \$55 billion and GDP was \$810 billion.

¹⁶ The Impact of Individual Income Tax Changes on Economic Growth, Tax Foundation. June 14, 2022.

¹⁷ NJ State Agreement Approach for Offshore Wind Transmission: Evaluation Report, Bratelle Group, October 26, 2023.

in-state fossil plants and is used to pay for NJ programs aimed at improving energy efficiency. Since PJM must take power from AE1 before such plants, less revenue will be received from in-state fossil fueled generation which will be displaced. At the projected market price for RGGI allowances, we estimate the PV of this cost to the state to be about \$3 billion which far outweighs the \$10 million benefit from avoided GHG emissions to NJ.

Net Benefits and Costs

Table 4-1 below is a comparison of the benefit-cost analysis for the AE1 project.

Table 4-1 Benefit-Cost Summary for AE1 Project

Benefits (\$PV Billions)	
Energy, Capacity and REC Credits	5.86
Economic Benefits	3.00
Avoided Emissions	<u>0.01</u>
Total Benefits	8.87
Costs (\$PV Billions)	
OREC Payments	16.49
Impact on Fishing	1.60
Impact of Higher Electric Rates	20.00
Transmission Upgrade Costs	1.80
Lost RGGI Emissions Revenue	<u>3.00</u>
Total Costs	42.89
Net Benefits/ (Costs) (\$PV Billions)	(34.02)
Benefit/Costs Ratio	0.20

As indicated, when economic costs are included and purported environmental benefits limited to the state, **the PV costs of the AE1 project exceed any potential benefits by \$34 billion and the BCR is no more than 0.20 (i.e., costs outweigh benefits by a factor 5 to 1).**

Even without including the economic cost of the project, the AE1 OREC payment costs alone exceed any benefits by more than \$7 billion and the BCR would be no more than 0.54. Thus, a BCR greater than 1.0 cannot be achieved. Furthermore, there is neither a net economic nor a net environmental benefit as required by OWEDA.

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 AE1 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 20% in bonus credits), to be collected when the facility becomes operational.

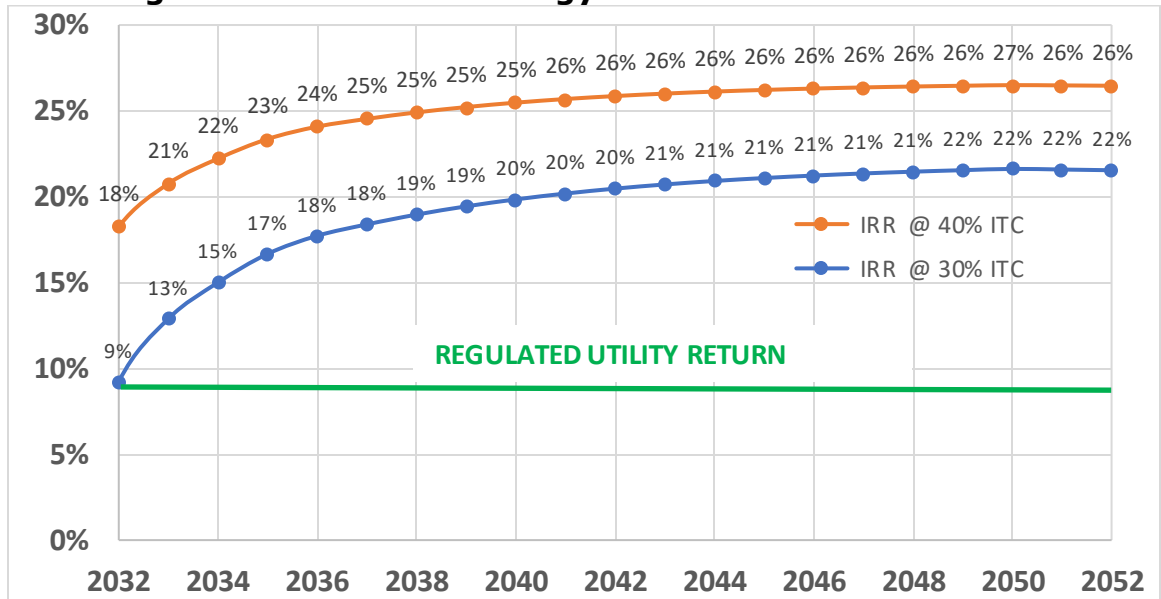
In its bid Attentive Energy was required to submit detailed information on its projected costs of the project and its resulting Internal Rate of Return (IRR) which represents its return on investment. This information is necessary to determine whether the approved OREC prices are reasonable given the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

However, these project financial details are confidential, 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 One Internal Rate of Return



We have assumed, as does LAI in its bid evaluations, 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 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 sites its onshore facilities in an economic community. If AE1, as expected, does in fact qualify for the 10% bonus ITC, their IRR will increase to 26%. Unless reflected in its bid, under current NJ law such an increase in available tax credits must 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 22% to 26% 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 \$10 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 Community Wind Project

Community Offshore Wind (COSW) had submitted a bid for a 1300 MW project in the BPU's Third Solicitation but withdrew the bid prior to awards in January 2024. It subsequently was awarded a provisional contract in NY but, as noted previously, this was cancelled in April 2024 when NYSERDA denied requests for higher OREC pricing. In the Fourth BPU Solicitation, on July 10 Community Energy submitted a bid for the same 1300 MW offshore project located in its lease area OCS-A-0539 in the Hudson South lease area about 40 miles from the NJ coast (see Figure 1-1). The following presents our evaluation of a potential new award to this project.

5.1 Ratepayer Impacts

As noted, in October 2023 the COSW project had been selected by the New York State Energy Research and Development Authority (NYSERDA) for a provisional award of an OREC contract. Together with two other projects (Attentive Energy and Excelsior Wind), the announced average OREC price was \$145/MWH¹⁸. All three projects proposed to use an 18 MW GE Vernova turbine. Subsequent to the awards, GE advised that this large turbine would not be developed and would be replaced by its smaller 15.5/16.5 MW turbine.

All three provisional awardees cited this as a material change and requested an increase in the proposed OREC pricing due to higher costs associated with the need to utilize more of the smaller turbines. NYSERDA denied this request and in April 2024 announced that all three provisional awards had been cancelled. Employing the smaller turbines would require about 15% more of them to achieve the same capacity rating, with attendant higher capital and operating costs.

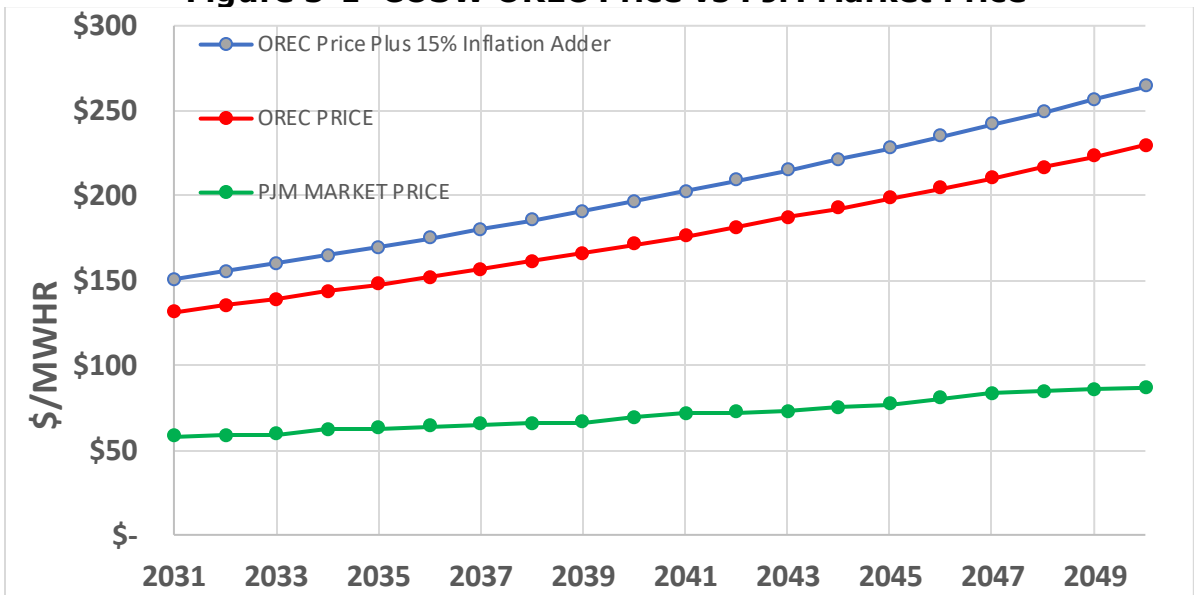
While the new COSW bid is presently confidential, it may be assumed that it will reflect the need for an OREC price about 15% higher than \$145/MWH because of the use of smaller turbines, or about \$165/MWH, the same as the assumed base OREC pricing for the Attentive projects. For purposes of this analysis, we assume the project will be in operation in 2031.

As noted, the terms of the BPU solicitation also allows these OREC prices to be adjusted up or down by as much as 15% based on a defined inflation adjustment mechanism. The inflation adjustment is based on recognized

¹⁸ NYSERDA Award announcement

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 a bidder’s best and final offer (BAFO) and a time three years prior to commercial operation. This time period is estimated to be 2-4 years. If the BPU approved inflation adjustment formula was calculated over the most recent three years (2021-2023) the resulting inflation adjustment would be in excess of 24%. 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 OREC Price of \$190/MWH.

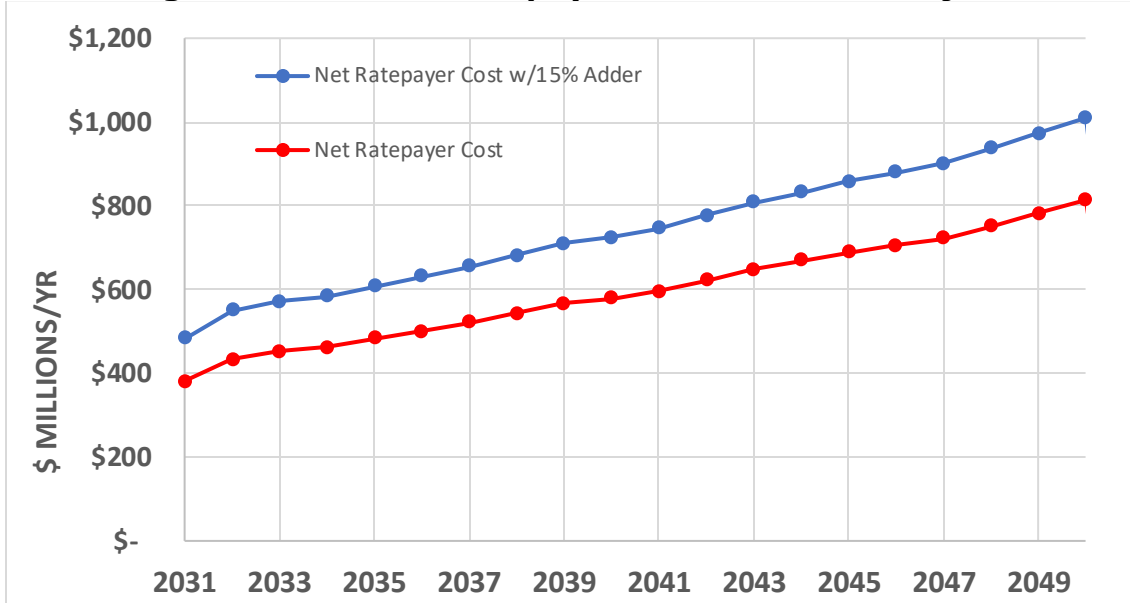
Figure 5-1 COSW OREC Price vs PJM Market Price



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 COSW 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 \$74-133/MWH.

At an assumed 50% capacity factor, COSW would be entitled to receive OREC payments for up to 5,688,306 MWH/yr over the 20 year term of a new award. Based on this, as shown in Figure 5-2 below, the added net cost burden of the above market payments is substantial on an annualized and lifetime basis.

Figure 5-2. Added Ratepayer Cost for COSW Project



The ratepayer subsidy increases from about \$400 million in the first full year of operation (2031) to \$800 million in the last full year of operation (2050), totaling \$12 billion over the life of the facility. Using the consumer discount rate of 3% the 2024 present value (PV) of these above market ratepayer costs is \$7 billion. With the 15% inflation adjustment factor, the total subsidy increases to \$15 billion (\$8.7 billion in 2024\$ PV).

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. As such it recognizes the need to achieve net positive benefits and a benefit-cost ratio (BCR) greater than 1.0.

In this section we calculate net benefits or costs and the Benefit/Cost ratio as:

$$\text{Net Benefits or Costs} = \text{Total Benefits} - \text{Total Costs}$$

$$\text{BCR} = \frac{\text{Total Benefits}}{\text{Total Costs}}$$

Benefits include: (1) Ratepayer offsets from PJM market revenues, (2) contributions to state economy from direct investment and jobs created by the project and (3) value of avoided greenhouse gas (GHG) emissions to the state.

Costs include: (1) OREC costs to ratepayers, (2) economic harm to local tourism and fishing industries, (3) negative impact on state GDP due to higher electric rates, (4) cost of associated transmission system upgrades and (5) lost Regional Greenhouse Gas Initiative (RGGI) revenue from displaced in state fossil generation.

The following is a discussion of the various elements involved in this calculation.

Benefits

For each OREC produced, the COSW project will receive market revenues from PJM for energy, capacity and RECs supplied to the grid. Based on the projected prices for these PJM price commodities over the period 2031-2050 as shown on Figure 3-1, and the specified maximum annual ORECs produced, the estimated PV 2024 of these market offset revenue is \$4.87 billion, using the standard 3% ratepayer consumption discount rate.

The projected economic benefits proposed by Community Wind in terms of NJ GDP growth and jobs created in the state are presently unknown but, based on projects of similar size approved by BPU in prior solicitations, the PV of such benefits is conservatively estimated to be about \$3 billion.

With respect to the Environmental Benefits, LAI has applied the US EPA's Interagency Working Group (IAWG) social cost of carbon (SCC)¹⁹ and Technical Support Document²⁰ to estimate the value of perceived benefits. The use of these reports 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 \$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.

The factor most recently used by LAI 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 by them 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. In our benefit-cost calculations, we have consistently applied a 3% discount rate to evaluation of both costs and benefits. A 3% discount rate reduces that value to \$51/ton and the purported global benefit by a factor of 3.8.

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 COSW 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 (GDP, population,

¹⁹ “Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances” U.S. Environmental Protection Agency, November 2023.

²⁰ U.S. EPA, “Technical Support Document Estimating the Benefit per Ton of Reducing Directly-Emitted PM_{2.5}, PM_{2.5} Precursors and Ozone Precursors from 21 Sectors,” January 2023

land area, shoreline miles, carbon emissions, etc.), the total averted state social cost of emissions reduced by COSW is far less than 1% of the global benefit. We have conservatively assumed that 0.12%²¹ of global values accrue to the state of NJ. This results in a relatively insignificant 2024 present value of \$10 million for the benefit of avoided GHG emissions to the state of NJ.

Costs

The total ratepayer PV costs associated with the OREC pricing as shown on Figure 5-1 is \$13.61 billion. As with the benefits of the ratepayer offsets, these PV values are also based on the standard 3% consumption discount rate.

In LAI's analysis of OREC bids no consideration is given to the significant negative economic impacts of the project on the commercial and charter fishing industries along the NJ shore. New Jersey has the fifth largest commercial fishing industry in the US, contributing an estimated \$1 billion/yr to the state's economy²². Fishing activities in or near the Community lease area will be prohibited during construction and limited during operation. If the negative impact on the fishing industry results in even a 5% reduction in annual revenue this is estimated to be \$50 million/year. This is \$1.6 billion in 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 tourism and 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 by the Beacon Hill Institute²³ 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. The Present Value in 2024 of this lost income over 20 years is \$7 billion. As discussed in Section 6.1 below, COSW OREC prices would raise average rates by 6%, this results in a PV cost of about \$20 billion.

As noted, the effect of raising electric rates has a similar impact on the state economy as an increase in taxes. The COSW project will raise residential average rates by \$560 million/yr which is about 0.07% of state GDP²⁴.

²¹ The population of NJ is 9.3 million (or 0.12%) compared with over 7.9 billion worldwide..

²² NJ Sea Grant Consortium, 2024

²³ "The Cost and Economic Impact of New Jersey's Offshore Wind Initiative", Beacon Hill Institute at Suffolk University, June 2011

²⁴ In 2023 NJ personal income tax collected was \$55 billion and GDP was \$810 billion.

Studies²⁵ show that tax increases reduce GDP by a factor of 2.5 on a percentage basis. Thus, a rate increase of 0.07% of GDP will reduce state GDP by 0.17% or \$1.4 billion/yr. The 2024 PV of such economic loss over 20 years is also \$20 billion and so confirms the estimate based on the 2011 Beacon Hill Institute study.

This is in fact a conservative estimate since it does not reflect the effect of raising commercial or industrial rates on the GDP. Thus, the economic ham caused by raising retail electric rates is a very significant additional indirect economic cost of the project.

Transmitting wind power from offshore turbine locations 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. The COSW project will utilize the Larabee Tri-Collector (LTC) solution in which 6400 MW from four offshore wind projects will make landfall at Sea Girt and proceed inland to the Larabee substation in Howell TWP. The costs of the LTC solution will be recovered through transmission fees, not through OREC prices. Thus, they are an added cost that must be considered in the benefit-cost analysis.

To date BPU has authorized \$1.2 billion for upgrading of existing transmission links for the LTC solution but has not yet awarded contracts 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.

Bids submitted for the LTC solution transmission upgrades to allow 6400MW of offshore wind to utilize that transmission pathway averaged \$1.3 billion/MW in 2021²⁶. If we allocate that cost index to the 1300 MW of the COSW project, it represents an additional \$1.7 billion of costs which must be included in the benefit-cost accounting, which we have done.

Another cost which must be accounted for involves the loss of revenue accruing to the state from auctions of Regional Greenhouse Gas Initiative (RGGI) allowances from the emissions displaced by COSW. This revenue is collected from in-state fossil plants and is used to pay for NJ programs aimed at

²⁵ The Impact of Individual Income Tax Changes on Economic Growth, Tax Foundation. June 14, 2022.

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

improving energy efficiency. Since PJM must take power from COSW before such plants, less revenue will be received from in-state fossil fueled generation which will be displaced. At the projected market price for RGGI allowances, we estimate the PV of this cost to the state to be about \$2.5 billion which far outweighs the \$10 million benefit from avoided GHG emissions to NJ.

Net Benefits and Costs

Table 5-1 below is a comparison of the benefit-cost analysis for the COSW project.

Table 5-1 Benefit-Cost Summary for COSW Project

Benefits (\$PV Billions)	
Energy, Capacity and REC Credits	4.87
Economic Benefits	3.00
Avoided Emissions	<u>0.01</u>
Total Benefits	7.88
Costs (\$PV Billions)	
OREC Payments	13.61
Impact on Fishing	1.60
Impact of Higher Electric Rates	20.00
Transmission Upgrade Costs	1.70
Lost RGGI Emissions Revenue	<u>2.50</u>
Total Costs	39.41
Net Benefits/ (Costs) (\$PV Billions)	(31.61)
Benefit/Costs Ratio	0.20

As indicated, when economic costs are included and purported environmental benefits limited to the state, **the PV costs of the COSW project exceed any potential benefits by \$32 billion and the BCR is no more than 0.20 (i.e., costs outweigh benefits by a factor of 5 to 1).**

Even without including the economic cost of the project, the COSW OREC payment costs alone exceed any benefits by more than \$5.7 billion and the BCR would be no more than 0.58. Thus, a BCR greater than 1.0 cannot be achieved. Furthermore, there is neither a net economic nor a net environmental benefit as required by OWEDA.

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 Community 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.

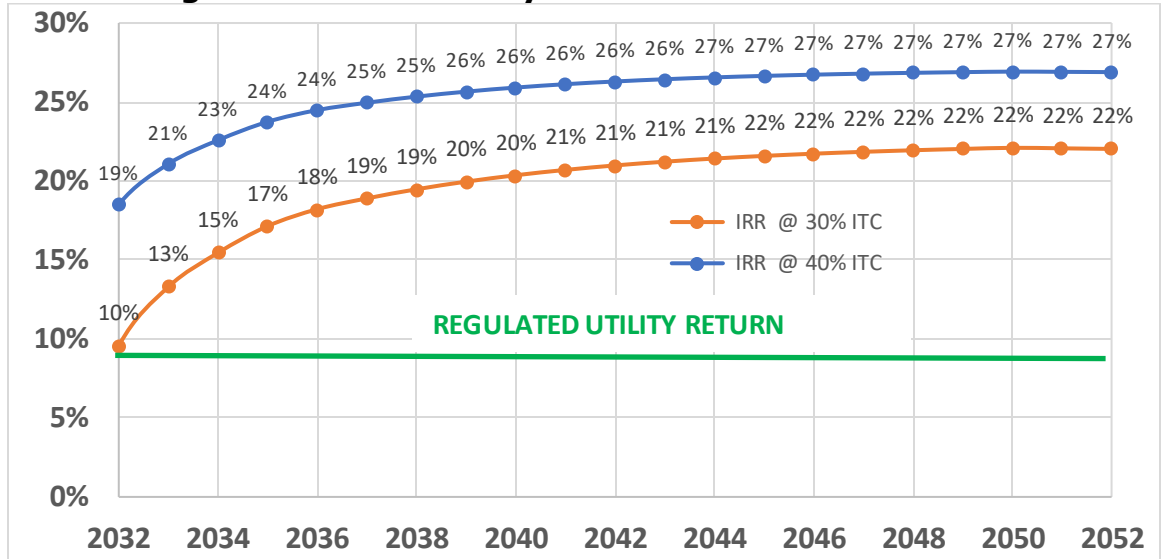
In its bid Community was required to submit detailed information on its projected costs of the project and its resulting Internal Rate of Return (IRR) which represents its return on investment. This information is necessary to determine whether the approved OREC prices are reasonable given the projected 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. Community Wind 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 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, Community 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 sites its onshore facilities in an economic community. If Community, as expected, does qualify for an additional bonus ITC of 10%, their IRR will increase to 27%. Unless reflected in its bid, under current NJ law such an increase in available tax credits must 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 22% or 27% 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 \$8.7 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.

6.0 Cumulative Impacts

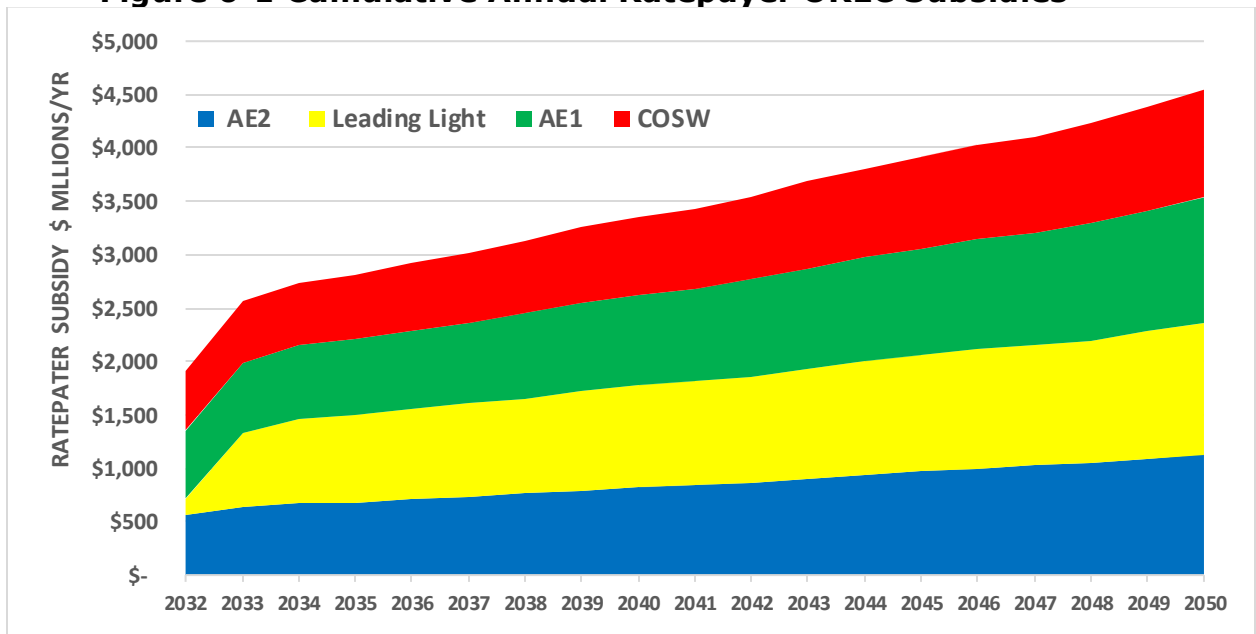
Each project approved by BPU for award of ORECs involves subsidized costs that incrementally increase ratepayer costs and bills for all classes of retail customers. While BPU provides an estimate of the ratepayer impact of each individual project, it has not acknowledged or made known the cumulative impact of the combined projects together with prior awards under earlier solicitations. In this section we examine the cumulative impact of all such projects awarded to date, and of potential OREC awards for AE1 And COSW.

In January 2024 the Third Solicitation awarded an additional 3742 MW to AE2 (1342 MW) and Leading Light Wind (2400 MW). New awards AE1 and COSW would add another 2700 MW to the approved projects. The following sections present the combined impact of the total 6442 MW of offshore wind projects in terms of total and PV ratepayer subsidies and increases in retail electricity bills for residential, commercial and industrial customers over the period 2032-2050.

6.1 Ratepayer Subsidies

Based on our analysis of the BPU approved OREC prices for AE2 and Leading Light Wind Projects together with the corresponding results for the AE1 and COSW projects, including inflation adders, Figure 6-1 shows the cumulative annual ratepayer subsidy.

Figure 6-1 Cumulative Annual Ratepayer OREC Subsidies



As indicated, the combined ratepayer cost embedded in the OREC prices for these four projects increases from \$2 billion in 2032 to over \$4.5 billion by 2050. The total subsidy over the operating period of these projects is over **\$54 billion**, which has a 2024\$ PV of **\$32 billion**.

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 2031. In its previous solicitations, BPU has estimated the increase in average monthly customer bills for residential, commercial and industrial customer for the three approved projects, but has not provided any estimate of the cumulative bill impact.

Applying the higher subsidy costs we have discussed and provided in the previous sections, including the inflation adjustment, we have estimated the average bill increase for each of the projects during their OREC subsidy period. Table 6-1 below presents the results of our analysis. We have displayed the increase in annual bills in \$/yr and on a percentage increase basis.

Table 6-1 Economic Impact of NJ Offshore Wind Project Costs on Retail Customer Bills

	<u>Attentive Energy Two</u>	<u>Leading Light Wind</u>	<u>Attentive Energy One</u>	<u>Community Offshore Wind</u>	<u>Combined</u>
Ratepayer Bill Impact (\$/yr)					
Residential	\$107	\$111	\$110	\$91	\$419
Commercial	\$908	\$945	\$935	\$772	\$3,560
Industrial	\$7,613	\$7,923	\$7,846	\$6,478	\$29,860
Ratepayer Bill Impact (% Increase)					
Residential	6.3%	6.4%	6.4%	5.3%	24.4%
Commercial	7.4%	7.7%	7.6%	6.3%	29.0%
Industrial	8.3%	8.6%	8.6%	7.1%	32.6%

As shown, the cumulative impact of these three projects results in significant increases in customer bills, averaging **27%**. AE1 and COSW each alone will raise

bills by 7%. These combined values are above that permitted by NJ law²⁷ for other renewable energy generation sources which are limited to no more than a total 7% increase in customer rates. The combined impact of these four projects will raise electric bills by **24%** for residential, **29%** for commercial and **33%** for industrial customers.

7.0 Conclusions

This report demonstrates that both the Attentive Energy One and Community Offshore Wind projects will burden ratepayers with above market power prices, amounting to significant levels of subsidy borne by retail customers. This added cost would not 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 developers if they are approved by the BPU.

Based on the analysis contained in this report, it is clear that any new BPU OREC awards at the expected OREC pricing could not comply with the requirements of OWEDA. The expected bid OREC prices 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.

²⁷ NJS 48:3 – 18.d(2)



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.

