Economic Analysis of the Empire Wind One Project Re-Bid Award

by

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for

PROTECT OUR COAST LI NY

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Executive Summary

In October 2019 the New York State Energy Research & Development Authority (NYSERDA) awarded the Empire Wind One (EW1) Project a contract to develop an offshore wind facility and deemed it eligible to receive payments for Offshore Renewable Energy Credits (ORECs) for 810 MW of electrical generating capacity.

Subsequently Equinor, the project developer, petitioned the NY Public Service Commission (PSC) for a 35% increase in the agreed upon OREC pricing, citing unforeseen increases in inflation, interest rates and supply chain issues. In October 2023 the PSC denied this request, as not being in the best interests of the state's ratepayers.

As a result, in November 2023 NYSERDA allowed Equinor to red-bid the contract and in February 2024 selected Empire Wind One for negotiation of a new contract at significantly higher OREC prices than the 2019 agreement. This award was finalized in a new contract on May 31, 2024.

Since this new contract will result in higher ratepayer subsidies than those associated with the original OREC prices, it is appropriate to estimate the ratepayer impact of this unprecedented Re-Bid award and whether such an action by NYSERDA would comply with the Climate Leadership and Community Protection Act (CLPCA) which imposes requirements on NYSERDA meant to protect ratepayers and balance costs and benefits of offshore wind awards. That is the purpose of this report.

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

Ratepayer Impacts

- As a result of the EW1 Re-Bid award NY ratepayers will be required to pay more than **2.5 times** the market price for power from the EW1 facility, from **$75-114/MWH** higher. This represents a much higher ratepayer subsidy than that associated with the 2019 EW1 OREC prices.
- The EW1 Re-Bid ratepayer subsidy will total $9 billion over the life of the facility and the 2024 present value (PV) of these above market ratepayer costs is **$6.2 billion** compared with $4.4 billion for the original EW1 contract.

Benefit-Cost Analysis

- The OREC prices in the 2019 contract already far outweigh any economic or environmental benefits of the project and the 2024 EW1 Re-Bid award increases the net costs by $6.5 billion.

Benefit-Cost Comparison

	2019 EW1	2024 EW1
Benefits ($PV Billions)		
Energy and Capacity Credits	4.05	4.05
Economic Benefits	1.40	1.40
Avoided Emissions (per IAWG)	0.02	0.02
Total Net Benefits	5.47	5.47
Costs ($PV Billions)		
OREC Payments	7.82	10.30
Impact on Tourism	8.00	8.00
Impact of Higher Electric Rates	8.00	12.00
Transmission Costs	1.20	1.20
Lost RGGI Emissions Revenue	2.70	2.70
Total Costs	27.72	34.20
Net Benefits/ (Costs) ($PV Billions)	**(22.25)**	**(28.73)**
Benefit/Costs Ratio	**0.20**	**0.16**

- As indicated the costs of an EW1 Re-Bid far outweigh its purported benefits with a benefit-cost ratio estimated to be no more than **0.16 (i.e., costs outweigh benefits by a factor of more than 6 to 1).**

Developer's Return on Investment

- As a result of Federal tax credits and NY ratepayer subsidies, the EW1 owners will realize a **21%** internal rate of return (IRR) on its investment which will increase to **25%** if they qualify for and are allowed to retain an additional 10% bonus Investment Tax Credit (ITC).
- The IRR is well in excess of that which is reasonable for its level of financial risk in the project or that allowed regulated utilities which is about 9%.
- This in no way represents a fair balance of financial risks and rewards between ratepayers and Equinor's shareholders.

Conclusions

The EW1 2019 contract as previously approved would have imposed significant ratepayer subsidies and costs which have not been demonstrated to result in a positive cost-benefit outcome nor provide a fair balance of financial risk and rewards between ratepayers and the shareholders of the developer.

This report demonstrates that allowing Equinor to re-bid the original EW1 contract has greatly exacerbated these deficiencies and burdens ratepayers with significantly higher above market power prices and subsidies.

It is important to note that the costs involving the direct ratepayer subsidies and the effect of those higher electric rates on NY economy in the form of lost jobs and lower wages, as well as lost tourism dollars, all fall disproportionately on lower income residents and communities who can least afford them.

Accordingly, it must be concluded that the 2024 EW1 contract violates the spirit and the letter of the CLPCA and the PSC mandate to ensure that costs imposed on the state's residents, businesses and institutions are "just and reasonable" as required by law.

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1.0 Introduction

As part of its 2018 Solicitation of offshore wind bids, the New York State Energy Research & Development Authority (NYSERDA), on October 23, 2019[1], approved a contract for the Empire Wind One (EW1) offshore wind project as a qualified offshore wind facility and deemed it eligible to receive payments for Offshore Renewable Energy Credits (ORECs) for 810 MW of electrical generating capacity.

This award entitled the project to receive Offshore Renewable Energy Certificates (ORECs) for power delivered at a Levelized Cost of Energy (LCOE) of $118/MWH for a period of 25 years.

Subsequent to the 2019 award, the project owner Equinor petitioned[2] the NY Public Service Commission (PSC) for a 35% increase in the approved OREC pricing to $159.64/MWH, citing unforeseen increases in inflation, interest rates and supply chain issues. In its order of October 12, 2023[3] the PSC denied the requested increase as not being in the best interests of the state's ratepayers.

As a result, in November 2023 NYSERDA issued a new solicitation[4], allowing projects previously awarded ORECs in the 2018 Solicitations to re-bid those same projects and potentially receive even higher OREC prices than previously approved. In February 2024 NYSERDA selected Empire Wind One for negotiation of a new contract at significantly higher OREC prices than the 2019 agreement. This award was finalized in a new contract on May 31, 2024[5], allowing EW1 to receive payments for ORECs at a new price of $155/MWH.

It is the purpose of this report to examine the magnitude of the OREC price increase and to determine whether the new EW1 award is in compliance with the requirements of the Climate Leadership and Community Protection Act (CLPCA) by which NYSERDA is bound.

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[1] NYSERDA contract with Empire One Wind project, October 23, 2019.
[2] Empire 1 Petition for increased ORECS, PSC Case 15-E-0203, June 7, 2023.
[3] PSC Order Case Numbers 15-E-0203 and 18-E-0071, October 12, 2023
[4] NYSERDA Solicitation ORECRFP23-1, November 30, 2023
[5] OREC Purchase and Sale Agreement, May 31, 2024.

2.0 Methodology

In this analysis we have used information on costs and performance of the EW1 project provided in the developer proposal and in the NYSERDA contracts and announcements. Where key factors and assumptions have been redacted or unstated, we have used publicly available sources for comparable projects. The specific assumptions and sources used are discussed in detail in each section of the report.

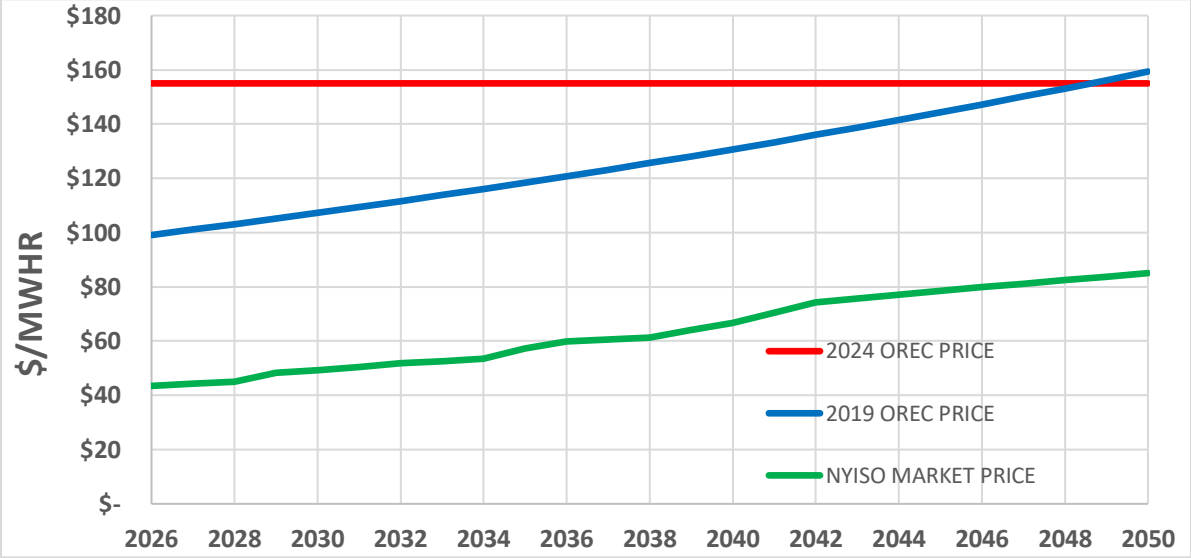
3.0 Ratepayer Impacts

An independent analysis and review of the original 2019 EW1 contract reveals that New York ratepayers already would 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 NYSERDA. In th 2024 Re-Bid award these prices are significantly higher and in this section we compare the ratepayer impacts of the original OREC prices with those which will result from the EW1 Re-Bid award.

The 2019 NYSERDA award entitled EW1 to collect fees for ORECs produced at $99.08/MWH beginning in the first contract year (assumed to be 2026) and increasing to $159.36/MWH in the twenty-fifth year (2050). This equates to a LCOE price of $118/MWH over the life of the contract. In the 2024 Re-Bid award EW1 will receive a constant OREC price of $155/MWH, 31% higher than the $118/MWH of the 2019 contract.

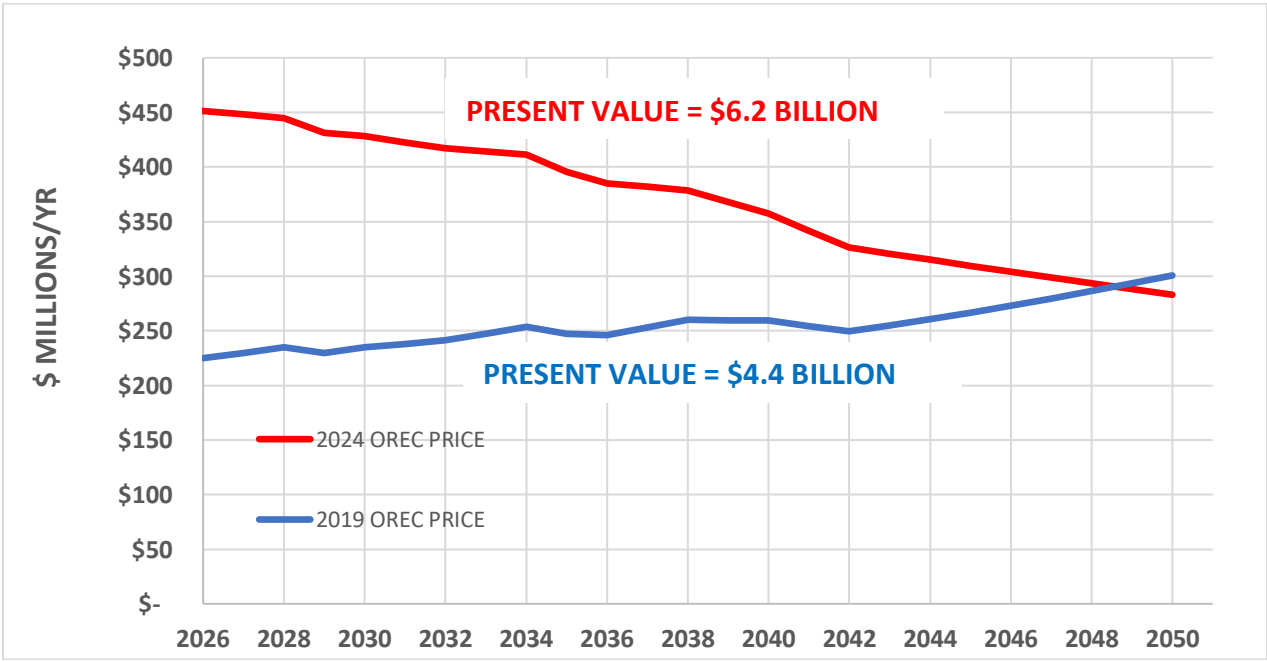
As an offset, the market revenue received from the New York State Independent System Operator (NYISO) for energy and capacity will be credited back to the ratepayers. Figure 3-1 below displays how the former and projected Re-Bid OREC prices compare with the NYISO market price of the offsets based on NYSERDA indications of NYISO market prices.

Figure 3-1. EW1 OREC Prices vs NYISO Market Price



As can be seen from Figure 3-1 above, in the 2024 EW1 Re-Bid, ratepayers will be required to pay more than **2.5 times the NYISO market price, 31% higher than even 2019 OREC prices and from $75-114/MWH over and above the market price** for power from the EW1 facility. This in essence represents a ratepayer subsidy for offshore wind generation. As shown in Figure 3-2 below, this added cost burden is substantial on an annualized and lifetime basis.

Figure 3-2. Added Ratepayer Cost for EW1 Project



As indicated, the ratepayer subsidy is now heavily front-end loaded, exposing ratepayers to paying more for the cost of EW1 in the beginning and shifting the risk of an early shutdown for technical or economic causes from the developer to the ratepayer. The 2024 EW1 Re-Bid ratepayer subsidy will range from $450 million in the first year of operation (2026) to $283 million in 2050, totaling $9.2 billion over the life of the facility. **The 2024 present value (PV) of these above market ratepayer costs is $6.2 billion, increasing from the 2019 OREC subsidy of $4.4 billion.** These values are calculated using the standard consumption discount factor of 3% which appropriate from the ratepayer consumer perspective[6].

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

4.0 Benefit-Cost Analysis

The NY Climate Leadership and Community Protection Act (CLCPA) requires that regulations governing approval of offshore wind projects seek to "be equitable, to minimize costs and to maximize the total benefits to New York"[7] of such projects. As such it recognizes the need to achieve net positive benefits and a benefit-cost ratio (BCR) greater than 1.0.

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

Total 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.

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

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

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

Benefits

For each OREC produced, the EW1 project will receive market revenues from NYISIO for energy and capacity supplied to the grid. Based on the projected prices for theses commodities over the period 2026-2050 as shown on Figure 3-1, and the specified maximum annual ORECs produced (4,046,731 MWH/yr), the estimated PV 2024 of these market offset revenue is $4.05 billion, using the standard 3% ratepayer consumption discount rate.

The project as approved claims to have positive Economic Benefits in terms of direct investment and jobs created in the state. For the 2019 award, NYSERDA estimated the 2018 PV of those economic benefits at $1.2 billion[8]. This is equivalent to a 2024 PV of $1.4 billion. In the 2024 contract, NYSERDA requires that EW1 contribute $1.765 billion to the state economy over the course of construction and operation and $1.37 over the near term. Assuming that this

[7] CLPCA , 75-0109 3.a.

[8] NYSERDA Report "Launching New York's Offshore Wind Industry: Phase 1 Report", Table 1, October 2019.

near term amount is realized from 2024-2026, and the remainder over 2026-2050, we estimate the PV 2024 value of this total economic benefit to be about $1.4 billion.

With respect to the Environmental Benefits, the NY state Department of Conservation (DEC) recommends that the US EPA's Interagency Working Group (IAWG) social cost of carbon (SCC)[9] and Technical Support Document[10] be used to estimate the value of perceived benefits of avoided Greenhouse Gas (GHG) emissions. 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.

In these documents the $/ton value is highly sensitive to the discount rate since it is applied to hypothetical harm to future worldwide populations as far out as 2300. In applying the NYS DEC values to this benefit- cost analysis we have used a 3% discount rate which is consistent with the consumption discount rate used to estimate economic costs and benefits.

The 3% discount rate yields a SCC of $53/ton (2020$) for CO2 emissions and comparable values for other GHG emissions (NOx, SOx and particulate matter). Using these values and the estimated GHG emissions avoided by EW1 over its operating period yields a 2024$ PV benefit of $7 billion.

However, that value reflects hypothetical benefits to future world populations far removed in space and time from the NY ratepayers who will bear the real economic burden associated with the rate subsidies and other costs of the project.

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

[10] 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

As noted, the CLCPA directive requires that offshore wind projects result in equitable outcomes while minimizing costs and maximizing benefit to New York state. Therefore, any consideration of environmental benefits of the EW1 project of avoided carbon emissions must be confined to those affecting NY 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, land area, shoreline miles, carbon emissions, etc.), the total averted state social cost of emissions reduced by EW1 is far less than 1% of the global benefit. In this study we have used population to scale the $7 billion of PV hypothetical benefits down to the state. As New Yorks's population is only 0.25% of world population[11], the PV of statewide benefit of GHG reduction is reduced to only $17 million, an insignificant value compared to the real PV costs of the project as detailed below.

Costs

The total ratepayer PV costs associated with the OREC pricing is $7.8 billion under the original award and is $10.3 billion as a result of the higher red-bid OREC prices. As with the benefits of the ratepayer offsets, these PV values are also based on the standard 3% consumption discount rate.

Besides the direct above market rate costs, the project will have significant negative economic impact on beach communities. Studies have shown that the visible presence of offshore wind turbines along beachfront communities that are dependent on tourism and recreational activities will have a negative impact on those economies as fewer people are willing to visit, stay in hotels or rent accommodations during the summer season[12].

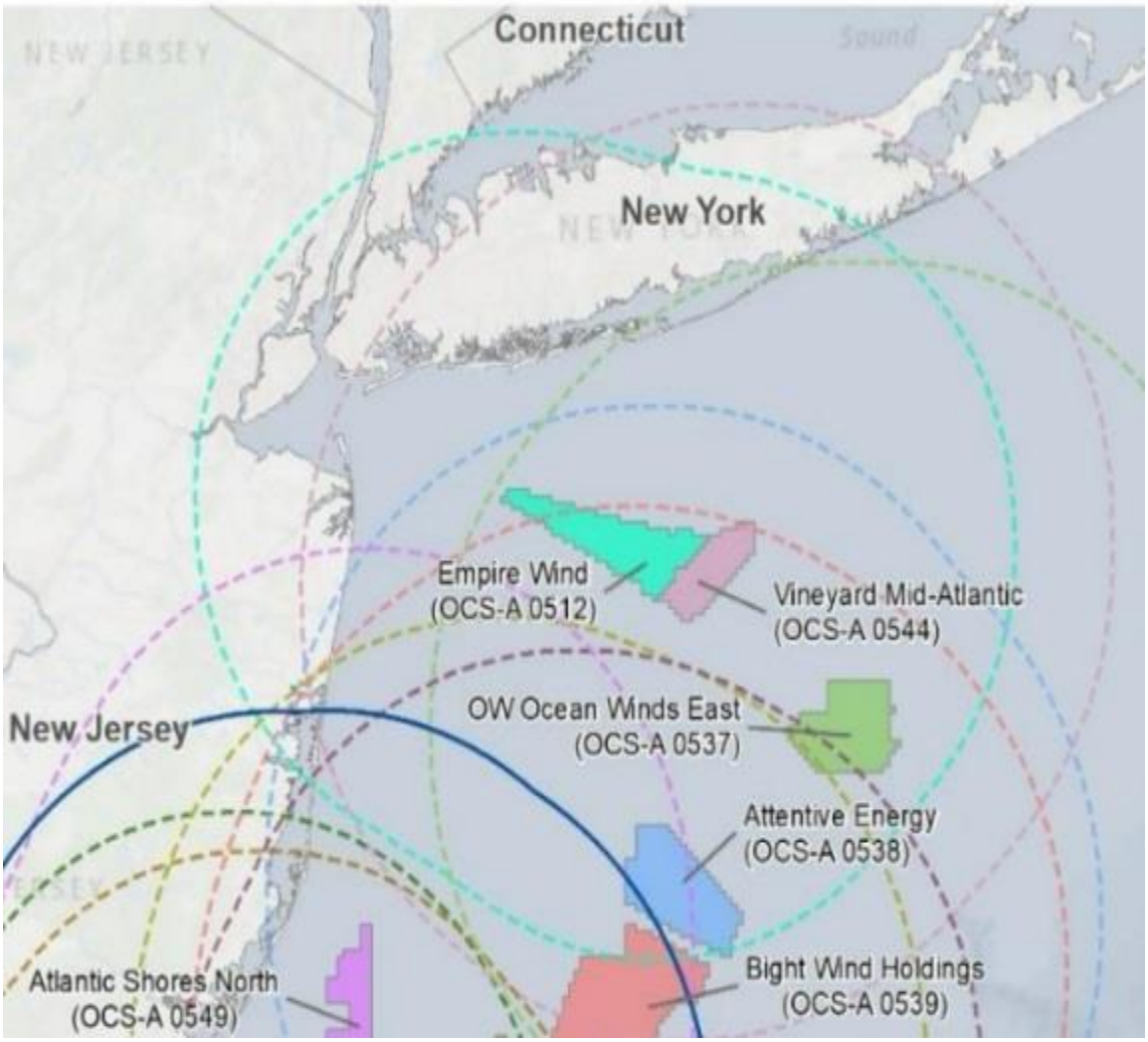
The following figure from the BOEM[13] displays the extent to which the turbines from the Empire Wind project (aqua line) will be visible to observers in large parts of New York and New Jersey. As indicated the 1000 ft tall turbines will be visible for a distance of 40 miles. At 14 miles off the Long Island (LI) shore they will dominate the view along the horizon for much of the shoreline.

[11] NY state population is 19.7 million (or 0.25%) compared with worldwide population of 8 billion.

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

[13] BOEM Draft Environmental Impact Statement (DEIS) for Atlantic Shores Offshore Wind Project, May 2023

Figure 4-1 Extent of Wind Turbine Visibility for NY/NJ Projects



Based on studies of similar negative impact on other oceanside communities[14], we estimated the impact to tourism on LI to be on the order $500 million/year or a PV 2024$ cost impact of $8 billion over the 25 year operating period of the project.[15].

In addition to the negative impact on the LI tourism economy, raising electric rates will have a damaging effect on the overall state economy by reducing

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

[15] Potential Economic Losses of Reduced Tourism Attributable to Proposed Wind Turbines in Long Beach Island, NJ, Tourism Economics, March 2024.

employment and wages, similar to the effect of raising taxes. A 2011 study[16] determined that raising NJ state 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.

Extrapolated to the NY state economy which is more than three times larger[17], the comparable value of this lost income would be $1 billion/yr for a 2% increase in rates. The Present Value in 2024 of this lost income over 25 years is $16 billion. Since the ratepayer subsidies for the 2019 EW1 OREC prices would raise rates by 1%, the PV of that cost impact is $8 billion. The EW1 Re-Bid will raise rates by 1.5% for a PV cost of $12 billion. Thus, the economic harm caused by raising retail electric rates is a very significant additional indirect economic cost of the project.

Another unavoidable and necessary cost of the project is the cost of transmitting the 810 MW of power from EW1 to the grid. This involves installing and upgrading transmission lines, substations, switchyards, HVAC/HVDC converter stations, and associated relays and other components. Studies show that the cost of such transmission upgrades average $1.3 million/MW in 2021$[18]. Applying that value to EW1 indicates that connecting it to the grid will cost about $1.2 billion in 2024$.

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 EW1. This revenue is collected from in state fossil plants and is used to pay for NYS programs aimed at improving energy efficiency. Since NYISO must take power from EW1 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 $2.7 billion.

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

[17] In 2022 NY's GDP was $2.053 trillion compare with $581 billion for NJ.

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

Cost-Benefit Comparison

Table 4-1 below is a comparison of the benefit-cost analysis for EW1 for both the previous 2019 contract and the 2024 EW1 Re-Bid award.

Table 4-1 Benefit-Cost Comparison

	2019 EW1	2024 EW1
Benefits ($PV Billions)		
Energy and Capacity Credits	4.05	4.05
Economic Benefits	1.40	1.40
Avoided Emissions (per IAWG)	0.02	0.02
Total Net Benefits	5.47	5.47
Costs ($PV Billions)		
OREC Payments	7.82	10.30
Impact on Tourism	8.00	8.00
Impact of Higher Electric Rates	8.00	12.00
Transmission Costs	1.20	1.20
Lost RGGI Emissions Revenue	2.70	2.70
Total Costs	27.72	34.20
Net Benefits/ (Costs) ($PV Billions)	**(22.25)**	**(28.73)**
Benefit/Costs Ratio	**0.20**	**0.16**

As indicated, when all economic costs are included and purported environmental benefits are limited to the state**,** the costs of a the original 2019 EW1 award exceed any potential benefits by $22.25 billion on a present value basis and the BCR is no more than 0.20. **When the costs and benefits of the 2024 Re-Bid award at the higher OREC prices are tabulated, the net cost increases by almost $6.5 billion to $28.73 billion and the BCR is reduced to 0.16 (costs outweigh benefits by a factor of more than 6 to 1.**

Even without including the economic cost of the project, the EW1 Re-Bid OREC payment costs alone exceed any benefits by almost $5 billion and the BCR would be no more than 0.53. Thus, a BCR less than 1.0 cannot be achieved. Furthermore, there is neither a net economic nor a net environmental benefit.

5.0 Project Developer Economics

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

The NY 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 NYSERDA for the EW1 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 30% of the capital cost of the project to be collected when the facility becomes operational. In addition, a developer may qualify for additional ITC bonuses of 10% each for using domestically sourced materials and siting onshore facilities in economically disadvantaged communities.

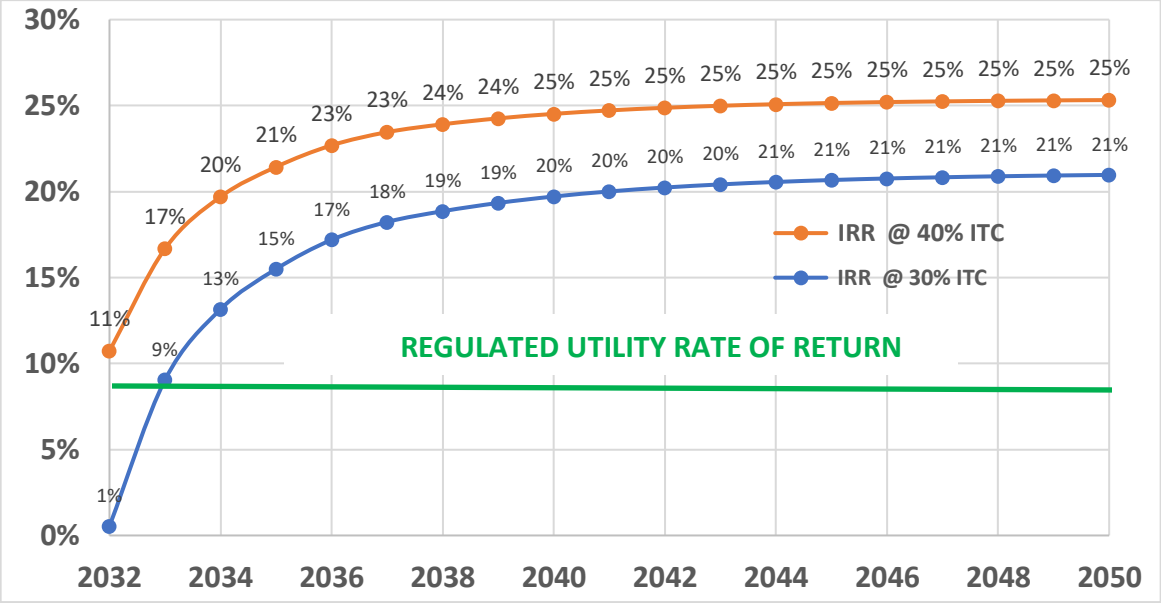
In its bid EW1 was required to submit detailed information on its projected costs of the project and its resulting Internal Rate of Return (IRR) which represents its return on investment. This information is necessary to determine whether the approved OREC prices are reasonable given the projected developer's costs and assumed financial risks.

However, these project financial details detailed have been redacted, 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 expected current 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 5-1 below for a the EW1 Re-Bid award.

Figure 5-1. Developer's EW1 Re-Bid Internal Rate of Return



We have assumed that available Federal tax credits have been reflected as an offset to capital costs of the project. With the passage of the Inflation Reduction Act (IRA) in 2022, a 30% Federal ITC is in effect for offshore wind projects. As indicated in Figure 5-1 above, with a 30% ITC, the developer of **EW1 Re-Bid will realize an increasing return, rapidly approaching 21%** by the end of its economic life and through decommissioning.

The IRA provides for an additional bonus ITC of 10%, for meeting domestic content requirements or having onshore facilities in an energy community. In March 2024 the IRS released new rules for qualifying for the 10% energy community bonus credit. Now the developer merely has to locate data centers supporting construction or operation in a nearby port facility. This will make it relatively easy for EW1 to receive the 10% bonus ITC. **If EW1 as expected does in fact qualify for the 10% bonus ITC, their IRR will increase to 25%**.

In NY the Public Service Commission (PSC) limits returns to regulated utilities for similar projects to about 9%. In view of the OREC price guarantees and tax credits available, we believe that a return of over 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 billions in present value of added costs to support the developer's return on investment.

6. 0 Conclusions

The EW1 project as currently approved imposes significant ratepayer subsidies and costs which have not been demonstrated to result in a positive cost-benefit outcome nor provide a fair balance of financial risk and rewards between ratepayers and the shareholders of the developer.

This report demonstrates that allowing Equinor to re-bid the original 2019 EW1 contract has greatly exacerbated these deficiencies and burden ratepayers with significantly higher above market power prices and subsidies.

It is important to note that the costs involving the direct ratepayer subsidies and the effect of those higher electric rates on NY economy in the form of lost jobs and lower wages, as well as lost tourism dollars, all fall disproportionately on lower income residents and communities who can least afford them.

Accordingly, it must be concluded that the 2024 EW1 contract violates the spirit and the letter of the CLPCA and the PSC mandate to ensure that costs imposed on the state's residents, businesses and institutions are "just and reasonable" as required by law.

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The Author

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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.