STATE OF RHODE ISLAND
PUBLIC UTILITIES COMMISSION

IN RE: 2024-2026 RENEWABLE ENERGY GROWTH – CLASSES, CEILING PRICES, AND CAPACITY TARGETS AND 2024-2026 RENEWABLE ENERGY GROWTH PROGRAM – TARIFFS AND SOLICITATION AND ENROLLMENT PROCESS RULES	:	DOCKET NO. 23-44-REG

PUBLIC UTILITIES COMMISSION'S SECOND SET OF DATA REQUESTS
DIRECTED TO OFFICE OF ENERGY RESOURCES (OER) AND/OR DISTRIBUTED GENERATION BOARD (DG BOARD)
(Issued January 9, 2024)
(Responses submitted January 30, 2024)

SEA Response to PUC Second Data Request - Docket No. 23-44-REG

2-1. Referencing the testimony at page 54, which witness specifically conducted the literature review? What were the resources used? What is their expertise in reviewing environmental remediation costs? Please provide the data to support the range of values described in the testimony.

As noted on Bates Page 18, the portion of the Direct Testimony referenced is sponsored by Mr. Armstrong, and the literature review was conducted by Mr. Armstrong. The resources used in the analysis derived from this review can be found on page 6 of SEA Schedule 4.

Mr. Armstrong is a project manager on SEA's Distributed Energy Resources (DER) team. The DER team, including Mr. Armstrong, has directly advised or assisted public sector agencies in a number of different U.S. states – including every state in New England, and every other state in the Northeast corridor – in the development and/or changes to actual or potential statewide distributed renewable energy programs. A major issue in the development of these programs is balancing market development on disturbed sites with its cost to ratepayers.

A necessary component of the work SEA completes for public sector sponsors of distributed renewable energy programs is the synthesis of information and analysis techniques across a diverse set of disciplines and domains. These domains range across energy and environmental economics, energy and environmental engineering, accounting, finance, public policy, regulatory economics and more. SEA's DER team has built regionally- and nationally-recognized expertise valued by people and organizations espousing a variety of perspectives.

2-2. The BCA includes conservation benefits (water supply, water quality, flood and storm damage mitigation, wildlife habitat and air pollution removal provided by conserved open

space) only to projects located on landfills and brownfields (Bates page 64). What was the baseline and how does developing projects on landfills and brownfields provide ecosystems services as described on Bates page 64 as opposed to not having solar developed on those parcels.

Please see the corrected version of SEA Schedule 11, which was filed with OER and the Board's responses to the DPUC's first set of data requests.

The baseline of the analysis with regard to ecosystem services value is a counterfactual scenario in which no incentive-payment adders are approved by this Commission for use by market participants in the REG program. In this scenario, it is very likely that development would, for cost reasons, be focused almost exclusively on the types of (it is our understanding) greenfield, C&I-zoned, and non-forested sites for which continued preservation would produce the specified ecosystem services benefits.

It is possible (though uncommon, based on SEA's understanding of typical market practices) that sporadic development may occur, not at scale, on <u>already-remediated</u> brownfields and landfills in the absence of the recommended adders. On the other hand, SEA is confident that development on <u>un-remediated</u> (which Chapter 300 limits potential incentive-payment adders to) brownfield and landfill parcels will <u>only</u> occur with if an adder that accounts for the substantial incremental cost of doing so. This is especially likely not to happen in the absence of an approved adder because solar developers aim to minimize development cost relative to their compensation, so as to maximize returns to their equity investors.

In the absence of such a direct incentive to site projects on <u>un-remediated</u> landfills and brownfields, and in all but rare cases, the adder recommended for this Commission's approval is likely to be necessary for developers to develop any projects in Rhode Island that are not located on parcels that provide the ecosystem services associated with preserved open space.

2-3. Please provide as a sensitivity, the BCA results assuming the full ceiling prices is paid for each class and assuming further, full enrollment in the classes as proposed.

Please see the attached file entitled "Detailed BCA Results_23-44-REG_PUC 2-3_NoProcuredValueDisc", which supplements a file delivered to the DPUC in response to its first data request to OER and the Board.

Since the results are provided on an NPV $/MW basis, the level of enrollment (full or otherwise) has no effect on the resulting ratio.

2-4. Referencing page 68, lines 27-28, please confirm that tax incentives were excluded from the cost of projects. If so, please recalculate the BCA assuming the cost of the project before applying tax incentives.

SEA can confirm the assumed Solar capital and operating costs used to calculate the BCA do not have tax benefits subtracted from them.

2-5. Please explain how macroeconomic benefits that were included in the BCR were developed and calculated.

a. In preparing the macroeconomic analysis, did SEA or the individual who performed the calculation review the Division's Joint Testimony and Exhibits of Woolf and Havumaki in Docket 5189? Please explain how the method used by SEA addresses these concerns.

No, SEA did not review filings in this Docket. SEA is not involved in energy efficiency dockets for OER or any other party. SEA utilized the Benefit-Cost Framework in Docket 4600 and Guidance Document shared in Docket 4600A, in which no mention was made of the above-referenced filing in Docket 5189.

b. Please review the report prepared by Brattle for National Grid filed in Docket 5076 and explain, in as much detail as possible, how SEA's methodology compares.

As noted in SEA Schedule 10, SEA utilized the National Renewable Energy Laboratory (NREL) Jobs and Economic Development Impact (JEDI) model, a model that is available to the public for inspection and review at no charge to users, to calculate the macroeconomic benefits included herein. In the report referenced above, it appears that The Brattle Group (hereafter "Brattle") utilized the REMI model, a commercial model that is not open to the public, and is only accessible to paid subscribers. SEA is not a paid REMI subscriber.

SEA's approach is both similar and different to the one utilized by Brattle. For instance, SEA takes a similar approach to Brattle in determining the "net incremental" economic development impact by utilizing the "value add" output of JEDI (which is analogous to GDP and excludes the cost of intermediate inputs like the costs of purchasing equipment). In addition, SEA excludes all induced impacts to prevent double counting with the customer savings benefit stream. In terms of difference with Brattle's approach, and although SEA cannot independently confirm Brattle's specific approach beyond what is contained in the report, the firm's analysis appears to have accounted for both increases and decreases in spending (via program costs and customer savings, respectively). SEA did not consider decreases in customer spending in its analysis, and instead focused on the economic development impact of developer's capital and operating expenses.

2-6. Please provide the share of benefits (in percentages) that macroeconomic benefits comprise for each class and in each year.

The share of benefits that macroeconomic benefits comprise for each class in each program year is provided the table below:

Renewable Energy Class	2024	2025	2026
Small Solar I	57%	58%	57%
Small Solar II	51%	51%	51%
Medium Solar	42%	41%	39%
Commercial Solar I	40%	39%	38%
Commercial Solar I CRDG	44%	43%	42%
Commercial Solar II	38%	38%	36%
Commercial Solar II CRDG	43%	43%	41%
Large Solar I	36%	29%	25%
Large Solar I CRDG	37%	34%	30%
Large Solar II	27%	24%	21%
Large Solar III	26%	24%	20%
Large Solar IV	26%	23%	20%
Large Solar I + Landfill Adder (Including Capping Cost)	32%	37%	33%
Large Solar II + Landfill Adder (Including Capping Cost)	35%	32%	28%
Large Solar III + Landfill Adder (Including Capping Cost)	34%	31%	27%
Large Solar IV + Landfill Adder (Including Capping Cost)	34%	31%	27%
Large Solar I + Landfill Adder (Excluding Capping Cost)	37%	33%	29%
Large Solar II + Landfill Adder (Excluding Capping Cost)	31%	28%	24%
Large Solar III + Landfill Adder (Excluding Capping Cost)	30%	27%	24%
Large Solar IV + Landfill Adder (Excluding Capping Cost)	30%	27%	23%
Large Solar I + Brownfield Adder	36%	33%	29%
Large Solar II + Brownfield Adder	31%	28%	21%
Large Solar III + Brownfield Adder	30%	27%	22%
Large Solar IV + Brownfield Adder	29%	27%	23%

2-7. Please identify who calculated the macroeconomic benefits.

The benefits were calculated collectively by the SEA team, and were prepared under the supervision of Mr. Kennerly.

2-8. For Tables 11 through 15, please report all BCRs provided and exclude the macroeconomic benefits.

Please see the below tables.

Program Years	2024-2026
2024-2026 Capacity-Weighted Benefit-Cost Ratio (BCR) per MW Allocated REG Capacity <=1 MW	0.52
2024-2026 Capacity-Weighted BCR per MW Allocated REG Capacity >1 MW	1.11
2024-2026 Capacity-Weighted BCR per MW Allocated REG Capacity (All MW)	0.94

Program Year	2024	2025	2026
Annual Capacity-Weighted BCR per MW Allocated REG Capacity <=1 MW	0.49	0.51	0.55
Annual Capacity-Weighted BCR per MW Allocated REG Capacity >1 MW	0.87	1.04	1.28
Annual Capacity-Weighted BCR per MW Allocated REG Capacity (All Sizes)	0.75	0.88	1.09

Renewable Energy Class	Incentive-Payment Adder by Renewable Energy Class (Brownfield/Superfund, ¢/kWh)	2024 PY BCR	2025 PY BCR	2026 PY BCR
Large Solar I	3.6	0.73	0.73	0.73
Large Solar II	3.4	0.76	0.76	0.76
Large Solar III	3.2	0.75	0.75	0.75
Large Solar IV	3.2	0.76	0.76	0.76

Renewable Energy Class	Incentive-payment Adder by Renewable Energy Class (Landfill Projects Not Requiring Full Cost of Physical Capping, ¢/kWh)	2024 PY BCR	2025 PY BCR	2026 PY BCR
Large Solar I	4.3	0.72	0.72	0.72
Large Solar II	3.6	0.76	0.76	0.76
Large Solar III	3.4	0.75	0.75	0.75
Large Solar IV	3.3	0.77	0.77	0.77

Renewable Energy Class	2024 Program Year				2025 Program Year				2026 Program Year			
	Proposed MW_{DC}	*Total Benefits/ MW (NPV)*	*Total Costs/ MW (NPV)*	**Benefit-Cost Ratio (BCR)**	*Proposed MW_{DC}*	*Total Benefits/ MW (NPV)*	*Total Costs/ MW (NPV)*	**BCR**	*Proposed MW_{DC}*	*Total Benefits/ MW (NPV)*	*Total Costs/ MW (NPV)*	**BCR**
Small Solar I	9.0	$1,770,590	$4,652,107	0.38	10.0	$1,697,828	$4,293,566	**0.40**	12.0	$1,660,900	$4,084,299	**0.41**
Small Solar II		$2,111,917	$4,578,244	0.46		$2,036,522	$4,283,995	**0.48**		$1,997,162	$4,081,111	**0.49**
Medium Solar	5.0	$2,122,951	$5,060,291	0.42	7.0	$2,107,549	$4,784,182	**0.44**	9.0	$2,193,320	$4,617,065	**0.48**
Commercial Solar I	7.5	$2,131,571	$4,323,713	0.49	9.5	$2,115,899	$4,083,360	**0.52**	11.5	$2,201,439	$3,936,655	**0.56**
Commercial Solar I CRDG	0.5	$2,131,571	$4,750,929	0.45	0.5	$2,115,899	$4,498,132	**0.47**	0.5	$2,201,439	$4,339,347	**0.51**
Commercial Solar II	10.5	$2,131,571	$3,601,867	0.59	11.5	$2,115,899	$3,396,841	**0.62**	12.5	$2,201,439	$3,270,132	**0.67**
Commercial Solar II CRDG	1.0	$2,131,571	$4,029,082	0.53	1.0	$2,115,899	$3,811,613	**0.56**	1.0	$2,201,439	$3,658,937	**0.60**
Large Solar I	15.0	$2,371,525	$2,746,477	0.86	20.0	$2,647,014	$2,580,697	**1.03**	25.0	$3,135,742	$2,477,769	**1.27**
Large Solar I CRDG	5.0	$2,371,525	$3,158,448	0.75	5.0	$2,647,014	$2,966,729	**0.89**	5.0	$3,135,742	$2,849,434	**1.10**
Large Solar II	35.0	$2,371,525	$2,658,118	0.89	35.0	$2,647,014	$2,494,912	**1.06**	35.0	$3,135,742	$2,394,483	**1.31**
Large Solar III	15.0	$2,371,525	$2,717,024	0.87	30.0	$2,647,014	$2,552,102	**1.04**	30.0	$3,135,742	$2,463,888	**1.27**
Large Solar IV	0.0	$2,371,525	$2,672,845	0.89	0.0	$2,647,014	$2,509,210	**1.05**	40.0	$3,135,742	$2,422,245	**1.29**

2-9. Please provide the full macroeconomic impact data, if available including jobs, GDP, state income taxes, business income, and personal income consistent with Order No. 2440 (Docket No. 5189, conclusion).

The macroeconomic data outputs supporting the NPV per MW calculations can be found in "Economic Impact Results.xlsx". Please note (as described in the response to PUC 2-5(b) above) that only the "Value Add" values, net of "Induced Impacts" were incorporated as benefits in the BCA. Please see SEA's response to 2-5(b) for a summary of SEA's approach.

SEA did not prepare a macroeconomic analysis consistent with Order 24440 in Docket No. 5189, because no information from that order was contained in the Docket 4600 Benefit-Cost Framework or the Docket 4600A Guidance Document, upon which the analysis discussed in the Direct Testimony is based.

2-10. Please provide copies and/or links to the DG Board meeting agenda and minutes where the classes, targets, and ceiling prices were discussed, considered, and/or voted on.

Please see the following links:

- **Mar 27 2023**
  - **Agenda**
  - **Minutes**
- **September 20 2023**
  - **Agenda**
  - **Minutes**
- **October 23 2023**
  - **Agenda**
  - **Minutes**
- **November 14 2023**
  - **Agenda**
  - **Minutes**

2-11. Did the DG Board make any adjustments or changes to proposals made by SEA and/or OER to the classes, targets, and/or ceiling prices?

No, the Board made no adjustments.

2-12. If one of the triggers is met for recalculating the ceiling prices, will SEA recalculate the ceiling prices by only changing that one input into the CREST model or will it recalculate the ceiling prices based on all then-current information for all major inputs?

OER, the DG Board, and Rhode Island Energy are suggesting that SEA would adjust only the input associated with the trigger threshold deemed to have been reached (e.g., interest rates on term debt, installed capital cost, or any other adder

deemed to have changed as a result of a <u>direct, material and mandatory</u> impact of state or federal policy).

2-13. For Large Solar 1, please assume a 10% increase in installed capital cost and the proposed Program Year 2025 ceiling price. What would the resulting IRR be under that scenario? What was the target IRR in the filed ceiling price?

The levered (read: net of repayment of debt) Target After-Tax Equity IRR in the ceiling price (read: the IRR threshold necessary for investors to close financing) is 10.3%. The levered Target After-Tax Equity IRR under the PUC's proposed hypothetical scenario is 8%.

2-14. For Large Solar 1, please assume a 50 basis point increase in the interest rate on the term debt input and the proposed Program Year 2025 ceiling price. What would the resulting IRR be under that scenario? What was the target IRR in the filed ceiling price?

The levered (again, net of repayment of debt) resulting Target After-Tax Equity IRR under this scenario is 9.3%, while the Target After-Tax Equity IRR in the ceiling price (again, the IRR threshold necessary for investors to close financing) is 10.3%.

2-15. Please provide Tables 14, 15, and 16 with three additional columns to include the Program Year BCR absent the adder (the relevant BCR columns from Table 13).

The requested tables are below.

Renewable Energy Class	Incentive-Payment Adder by Renewable Energy Class (Brownfield/ Superfund, ¢/kWh)	2024 PY BCR		2025 PY BCR		2026 PY BCR	
		Including Adder	Not Including Adder	Including Adder	Not Including Adder	Including Adder	Not Including Adder
Large Solar I	3.6	1.14	1.28	1.29	1.45	1.50	1.70
Large Solar II	3.4	1.09	1.22	1.24	1.40	1.41	1.66
Large Solar III	3.2	1.07	1.19	1.22	1.36	1.40	1.60
Large Solar IV	3.2	1.08	1.20	1.23	1.38	1.43	1.62

Renewable Energy Class	Incentive-payment Adder by Renewable Energy Class (Landfill Projects Not Requiring Full Cost of Physical Capping, ¢/kWh)	2024 PY BCR		2025 PY BCR		2026 PY BCR	
		Including Adder	Not Including Adder	Including Adder	Not Including Adder	Including Adder	Not Including Adder
Large Solar I	4.3	1.13	1.28	1.27	1.45	1.47	1.70
Large Solar II	3.6	1.10	1.22	1.25	1.40	1.46	1.66
Large Solar III	3.4	1.08	1.19	1.23	1.36	1.44	1.60
Large Solar IV	3.3	1.09	1.20	1.25	1.38	1.45	1.62

Renewable Energy Class	Incentive-payment Adder by Renewable Energy Class (Landfill Projects Requiring Full Cost of Physical Capping, ¢/kWh)	2024 PY BCR		2025 PY BCR		2026 PY BCR	
		Including Adder	Not Including Adder	Including Adder	Not Including Adder	Including Adder	Not Including Adder
Large Solar I	8.0	0.92	1.28	1.14	1.45	1.31	1.70
Large Solar II	7.8	0.96	1.22	1.08	1.40	1.26	1.66
Large Solar III	7.5	0.95	1.19	1.07	1.36	1.24	1.60
Large Solar IV	7.4	0.96	1.20	1.08	1.38	1.25	1.62