



Rhode Island REG Program:

Research, Analysis, & Discussion in Support of
First Draft 2025 Program Year Small Solar Prices, MW
Allocation, and Adder Pilot Recommendations

October 16, 2024

Sustainable Energy Advantage, LLC

2025 Small Solar Price Development



Purpose of This Presentation

- Setting the stage:
 - During 2024 PY development process, PUC approved three-year set of ceiling prices for all classes other than Small Solar I and II → **Focus on Small I and II for this year's pricing development**
 - PUC also declined to approve a three-year MW allocation plan → **Draft 2025 MW allocation plan under development**
 - As discussed at the September 10 stakeholder session, SEA is working on a **refresh of the Adder Pilot program** proposed last year, per the PUC's directives
- Purpose of this presentation
 - To present stakeholder data responses, survey results, and supplemental research informing the development of first draft Small Solar I and II prices
 - To provide the draft 2025 MW allocation for stakeholder feedback
 - To discuss feedback received to date on the adder pilot proposal

Timeline

- Historically, SEA has presented two drafts of prices prior to the establishment of the final recommended ceiling prices
- This year, SEA will only be presenting one draft of prices prior to the finalization of recommendations due to a more targeted research process focusing on only Small Solar I and II pricing

Summary Results (¢/kWh)

- Draft 2025 prices for Small Solar I and II are provided below
- Cost reductions relative to 2024 are driven by decreases in installed cost

Class	Tariff Term	Size Range kW (Modeled Size kW)	2024 Approved Price (a)	2025 Prior Proposed Price (during 2024 PY process) (b)	2025 1 st Draft Revised Price (c)	% Change (2025 prior → updated) (c/b)-1	% Change (2024 → 2025) (c/a)-1
Small Solar I	15	≤15 (5.8)	36.45	34.65	33.85	-2.3%	-7.1%
Small Solar II	20	>15-25 (25)	33.15	31.95	32.35	+1.3%	-2.4%

Stakeholder Feedback and Modeling Implications

Installed Cost Assumptions & Methodology

- Robust data available from RI and other Northeast states for small solar, but data more limited for Medium, Commercial, and Large Solar classes
 - CT RRES and NRES program now more fully underway → data utilized for all sizes
- As in prior years, SEA filtered data to remove outliers and to remove projects with characteristics that do not reflect the proxy projects modeled through REG (e.g., no storage, canopy projects, etc.)
- **Modeling Implication (M.I.):**
 - **Small Solar I and II continue to utilize the median installed cost data from NY, CT and MA programs, Energy Sage quotes, REF quotes, REG enrollments, and Lawrence Berkeley National Laboratory (LBNL) regional data**
 - **Medium, Commercial, and Large solar set based upon average of median and 75th percentile costs for NY Sun, CT NRES, MA SMART, REG Open Enrollment Data, and regional data from LBNL**

Year-on-Year Solar Cost Adjustment Assumptions

- During the 2023 and 2024 PY Ceiling Price development process, SEA computed year-on-year (YoY) technology cost decline assumptions (i.e., learning curve) derived from the National Renewable Energy Laboratory's (NREL's) Annual Technology Baseline (ATB), to capture fundamental cost declines for solar
- To reflect that technology cost declines and inflation are independent variables, SEA has calculated the total YoY adjustment to 2023 and 2024 installed cost data as the net difference between NREL ATB cost decline assumptions and inflation assumptions provided in the 2024 EIA Annual Energy Outlook (using CPI, All-urban)
- **M.I.: SEA will use the values shown below for First Draft prices**

Metric	Category	2023 → 2025 Adjustment	2024 → 2025 Adjustment
2024 AEO CPI	N/A	4.8%	2.0%
2024 NREL ATB YoY CAPEX Cost Decline	Small	-1.7%	-0.9%
	Non-Small	-2.8%	-1.4%
Net Adjustment	Small	3.1%	1.2%
	Non-Small	2.0%	0.6%

Other Solar Capital Cost Assumptions

- **New Labor Requirements**

- **HB 7015 – An Act Relating To Businesses And Professions — Electricians** and its Senate companion bill **SB 2120 – An Act Relating to Businesses and Professions – Electricians** require a licensed electrician to perform all the installation and maintenance of solar racking, among other elements → Expected to increase labor costs
- SEA received limited feedback on these costs in its data request and survey, with one stakeholder suggesting such requirements could double labor costs
- SEA's internal analysis (informed by NREL residential solar labor inputs provided in [NREL's 2023 cost benchmark report](#)) suggests cost increases in the \$20-40/kW range
- **M.I.: For first draft prices, SEA will adopt its low-case cost estimates of \$20/kW for Small Solar I and II, but will seek additional stakeholder input regarding this impact**

Installed Cost Summary Results

- Installed cost results for all renewable energy classes are shown below
- Results for non-Small Solar renewable energy classes are for informational purposes only
- Overall, results show modest cost declines for small solar, whereas other classes show moderate cost increases relative to prior inputs
 - Potentially result of shorter sales cycle in small solar → more recent cost quotes available

	2024 PY Adopted (a)	2025 PY – Prior Estimate (during 2024 PY process) (b)	2025 PY – Updated Estimate (c)	% Change – Prior → Updated 2025 Input (c/b)-1	% Change – 2024 PY → 2025 PY Input (c/a)-1
Small Solar I	\$4,449	\$4,361	\$4,280	-1.9%	-3.8%
Small Solar II	\$3,946	\$3,868	\$3,960	2.4%	0.3%
Medium Solar	\$3,180	\$3,136	\$3,422	9.1%	7.6%
Commercial Solar I	\$2,923	\$2,881	\$3,169	10.0%	8.4%
Commercial Solar II	\$2,665	\$2,627	\$2,916	11.0%	9.4%
Large Solar I	\$2,450	\$2,412	\$2,508	4.0%	2.4%

Note: Installed cost figures include certain adjustments to account for added costs not contained in state databases (e.g., RI-specific labor laws) – See Appendix B for details

Operating Expense Assumptions

- **Operational cost escalation rates**

- A developer noted that O&M escalation rates for Small Solar I and II are higher than the 2% currently assumed by SEA
- SEA is unclear if current inflation rates generally inform such O&M escalation rates
- **M.I.: No change for now given a lack of documented evidence, SEA will consider revisions in final draft pricing, and specifically seeks:**
 - **Feedback on if O&M contracts generally tie escalation rates to inflation indices**
 - **Documented examples of O&M contracts containing escalation rates**

- **Insurance**

- **A developer argued that Small Solar I and II should have insurance costs included in CREST modeling, and quoted rates at 4% of total costs**
- **M.I.: No change for now given a lack of documented evidence (and lack of comments in prior program years) → continue to model zero insurance costs for Small Solar I and II**
 - **SEA currently assumes that such coverage would be part of the building's insurance**
 - **SEA will consider revisions in final draft pricing if sufficient documented evidence is provided**

Tax and Financing Assumptions

- **Domestic Content Bonus**

- SEA received mixed responses regarding if developers are currently able to utilize the 10% domestic content ITC bonus
- **M.I.: Continue to model projects as not qualifying for the bonus given that:**
 - **SEA intends for the modeled proxy project to represent a typical project, and feedback received to date suggests that projects typically struggle to qualify for the bonus**
 - **The bonus is designed to cover the added costs associated with domestically manufactured components and thus is not expected to yield significant cost savings for ratepayers if modeled**

- **Interest rates**

- Interest rates on 10 and 20-year treasury bonds have declined by over 100 basis points relative to the inputs assumed for 2025 during the 2024 ceiling price development process → expectation that small solar interest rates would fall
- However, SEA has not seen reduced rates in lenders that offer public rate quotes (e.g., UMassFive College Federal Credit Union) → unclear if rates being offered to small solar customers are changing in practice
- **M.I.: SEA to continue to use interest rates assumed during the 2024 PY development process (6.9% and 6.8% for Small Solar I and II, respectively) but will seek feedback from stakeholders regarding current offerings and update assumptions accordingly**

MW Allocation Plan Development



2025 MW Allocation Plan Development Process

- To develop the draft 2025 MW allocation plan, SEA attempted to balance the objectives of ensuring healthy program competition with providing a robust plan that would not unnecessarily constrain the deployment of DG
- SEA's research focused on evaluating the competitive dynamics of each renewable energy class, both historic and future
- In doing so, SEA (in consultation with RI Energy) considered:
 - The number of unique developers with projects in the interconnection pipeline in each class, and the relative share of capacity owned by each developer
 - The total capacity of projects expected to be able to bid into the 2025 PY, based on
 - Each project's stage in the interconnection pipeline
 - Each project's involvement in ASO studies
 - Project-specific determinations for Large Solar II and III provided by RI Energy
 - The ability for net metering projects at various interconnection stages to switch to REG

Assessment of Historic Market Concentration

- As a component of SEA's analysis, SEA assessed the degree to which prior open enrollments may or may not have been dominated by specific developers (and thus not as competitive as they could have been)
- Overall, results suggest that instead of becoming more concentrated, the REG program has become less concentrated in recent years
- As a result, SEA is confident that the market power of any given developer is not a significant concern shaping competitive dynamics
- For class-specific findings, see Appendix C

Accounting for ASO#3

- Given that a large volume of projects in Large Solar I, II, and III are implicated by the ongoing ASO#3 study, SEA proposes that all capacity in these classes is offered in the third open enrollment only, since doing so maximizes:
 - Potential time for ASO#3 to conclude; and
 - The likelihood of competitiveness in that Open Enrollment
- In addition, SEA believes it is necessary to plan for contingencies in which ASO#3 is further delayed → two MW allocation plans:
 - Plan A assumes ASO#3 concludes in time for projects to bid into the 2025 PY
 - Plan B assumes ASO#3 **does not conclude 45 days prior to the open of the third open enrollment** in the 2025 PY → reduced capacity for ASO-implicated classes
- The capacities offered in Plan A and B are based on project-specific analysis to ensure healthy competition under either scenario

Draft 2025 MW Allocation Plan

- The draft MW allocation for 2025 is provided below for **stakeholder comment, due October 23**

Renewable Energy Class	2025 MW Allocation (Plan A)	2025 MW Allocation (Plan B)
Large Scale IV (15 - <39MW)	0	0
Large Scale III (10 - <15MW)	30	0
Large Scale II (5 - <10MW)	30	0
Large Scale I (1 - <5MW)	25	15
Commercial Scale II (>500 - <1000kW)	12.5	12.5
Commercial Scale I (>250 - 500kW)	10	10
Medium Scale (>25 - 250kW)	7	7
Small Scale II (>15 - 25kW)	9	9
Small Scale I (0 - 15kW)		
Total	123.5	53.5

Overview of Adder Pilot Stakeholder Comments



Overview of Stakeholder Feedback

- During SEA's September 10 Stakeholder presentation, SEA posed a number of questions regarding adder pilot design for stakeholder feedback
- SEA received comment on policy design from the Division of Public Utilities and Carriers (DPUC) and detailed questions regarding assumptions made in modeling from Rhode Island Energy
 - SEA did not receive comments from industry stakeholders
- Responses to the DPUC's recommendations are provided in subsequent slides

Adder Pilot Program Design Questions

- The DPUC recommended that data collection regarding actual project costs be a condition of adder pilot enrollment, and suggested numerous detailed cost categories
 - **SEA Response: SEA agrees that data collection will be necessary to better evaluate future incentives and understand pilot program outcomes → propose to collect data on installed cost (as is done for all REG projects) with separate data collection for remediation-specific costs unique to adder projects**
 - **SEA proposes data collection focuses on upfront costs**
 - Expected to be the largest driver of incremental costs
 - Reduces reporting burden on applicants
 - Is least speculative, as O&M costs may be incurred far into the future beyond the duration of a pilot
- The DPUC suggested that OER consider a pilot program lasting up to two program years
 - **SEA Response: SEA agrees that a pilot program spanning two program years, at minimum, is necessary to ensure sufficient lead time for developers to respond to the offering**
 - **SEA's prior reference to an 18-month pilot program was intended to reflect an offering open for two program years → SEA to clarify intent during submission to PUC**



Adder Pilot Program Design Questions (2)

- The DPUC argued that land lease costs for adder-eligible projects should be lower than those assumed for greenfield sites
 - **SEA Response: During the 2024 PY development process, SEA collected data from numerous market participants that suggested land lease costs are similar to greenfield sites – this finding has been substantiated in prior engagements**
 - **Barring no new data SEA will not revise inputs but welcomes additional data should the DPUC provide it**
- The DPUC recommended a single adder value be developed, applicable to both Large Solar I or II
 - **SEA Response: SEA agrees that a single adder value would provide simplicity and plans to adopt this recommendation**
 - **SEA plans to propose an adder equal to the maximum calculated adder value between Large Solar I and II to ensure the adder can support development at either scale**



Leveraging Other Funding Sources

- **Renewable Energy Fund (REF) (CommerceRI):** The DPUC requested more information on what it would take to modify REF program rules, or allow for exceptions for the pilot program, such that this program could provide a source of funding to the adder pilot
 - **SEA Response:** OER is not exploring this option further given the limited funds available under the REF, the REF's focus on small and commercial-scale projects, and the administrative complexity of leveraging such funds
 - SEA also notes that it is developing an adder pilot based on current policy and not yet-to-be established potential revisions to programs
- **DEM Brownfields Fund:** The DPUC posed questions for DEM regarding the alignment of RFP timings with REG open enrollments, or the development of a RFP for pilot program projects
 - **SEA Response:** SEA encourages DPUC to collaborate with DEM to explore these questions for future consideration, but is developing the adder pilot based on current policy
 - At this time, it is SEA's assessment that leveraging DEM funds is unrealistic for pilot program projects given:
 - DEM's solicitations are highly competitive (only ~one-third of applicants receive funding each year)
 - DEM scoring criteria does not favor ground-mounted solar (and historically no ground-mounted solar have been issued an award)
 - However, SEA proposes to include an attestation requirement in the pilot program such that participating projects must disclose if they were able to leverage any third-party funding, including DEM funds
 - SEA proposes that projects violating the attestation requirement would have their adder revoked



Leveraging Other Funding Sources (2)

- **“Energy Communities” Brownfields Bonus ITC:** The DPUC requested more details on what potential obstacles exist that would disqualify projects from being eligible for the bonus tax credit and requested that stakeholders present more evidence of these obstacles
 - **SEA Response: SEA welcomes additional data from stakeholders, but maintains that applying the bonus tax credit is advisable for brownfield projects**
 - The IRA provides that “Energy Communities” bonuses are eligible for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) eligible projects, and Sections 48 and 48E of the Internal Revenue Code do not create obstacles to such projects
 - RI DEM has confirmed that the vast majority of brownfield sites in RI are CERCLA-eligible
 - Given limited scale of adder pilot, it is unlikely that the availability of bonus ITC-eligible sites will be the constraining factor
 - Although it is likely some sites in RI are not eligible for the bonus ITC → pilot will target least-cost bonus-eligible sites first

Incentive Format

- **Upfront Adders** – The DPUC noted that upfront adders could reduce the total adder required, but present risks regarding achievement of benefits and front-loaded costs to ratepayers
 - **SEA determination: SEA believes that the risks of an upfront adder outweigh the benefits and favors a performance-based adder → will not explore further**
- **\$/Acre Incentive** – The DPUC noted the complexities of implementing such an adder, and that the prior program included rules to adjust adders based on partial coverage of land requiring remediation
 - **SEA determination: SEA agrees that a \$/Acre incentive offers little benefits given the adder pilot program will still include provisions adjusting the final adder value based on the percentage of the project overlapping eligible land → will not explore further**

Incentive Format (2)

- **Actual Remediation Costs** – The DPUC recommended that the pilot program should include a mechanism to adjust the final adder value based on the actual costs of the project and effects of other sources of funding
 - **SEA Response: SEA has determined that it will not explore this option further**
 - Approach is complex/administratively burdensome – would require unique CREST model runs for each project
 - Unique incentives would be determined based on developer estimates of program costs → speculative and raises data validation concerns
 - Scaling an adder downward based on actual expenses provides no upside to a developer → reduced incentive to target sites requiring remediation that pose unique development challenges/risks
 - Competitive dynamics will already allow projects to bid based on expected costs, as an adder will enable a reduced “base” bid
- **Greenfield Subtractors** – The DPUC was potentially supportive of a greenfield subtractor, but raised numerous questions regarding the efficacy of subtractors based on project economics
 - **SEA Response: SEA and OER have determined that a greenfield subtractor will not be explored further**
 - Program performance is already struggling, further penalties can further discourage participation
 - The ban on core forests already severely restricts siting and protects high-value open space



Other Comments

- The DPUC requested more information from OER/ SEA and other stakeholders, including DEM, regarding the potential universe of candidate sites for the Landfill and Brownfield/Superfund adder program
 - **SEA Response: SEA's expectation is that DEM would utilize its inventory of sites requiring cleanup to determine eligibility for the adder program, but would defer to DEM on the specifics of eligibility criteria**
 - SEA welcomes future collaboration between DPUC and DEM to answer more detailed questions regarding potential sites eligible for the pilot program

Eligible Adder Pilot Project Sizes

- SEA is currently collaborating with DEM to determine if any existing Large Solar I or Large Solar II projects are currently in the interconnection pipeline
- Given the long interconnection timeline experienced by these projects, a pilot program lasting two years may not be sufficient to attract eligible projects if none are currently under development
- Thus, SEA is considering extending the pilot program to projects under 1 MW and **seeks stakeholder feedback on this question**

Summary Stakeholder Feedback Requested

- SEA requests data and feedback on the following issues relating to Small Solar I and II Prices:
 - Current **interest rates, tenor, and loan fees** applicable to Small Solar I and II loans
 - **Incremental labor costs** associated with the change in law requiring licensed electricians to perform all the installation and maintenance of solar racking
 - Current **escalation rates assumed through O&M contracts**
- SEA requests feedback on the draft MW allocation plan
- SEA requests feedback on extending the Adder Pilot Program to projects under 1 MW
- **Responses are due October 23**
 - Please send written comments **in a PDF attachment** (preferably on organizational letterhead if applicable) to Cal Brown (cbrown@seadvantage.com), copying Toby Armstrong (tarmstrong@seadvantage.com), Shauna Beland (shauna.beland@energy.ri.gov), and Karen Bradbury (karen.bradbury@energy.ri.gov)

Appendix A: Detailed Cost, Performance and Financing Assumptions



Summary: Solar ≤ 25 kW Financing Assumptions

	Small I (1-15 kW)		Small II (15-25 kW)	
	<i>2024 Final</i>	<i>2025 1st Draft</i>	<i>2024 Final</i>	<i>2025 1st Draft</i>
Federal Investment Tax Credit (%)	30%	30%	30%	30%
% Debt	51.0%	51.0%	45%	46.1%
Debt Term (years)	13	13	10	10
Interest Rate on Term Debt	7.63%	6.91%	7.49%	6.78%
Lender's Fee (% of total borrowing)	4.25%	4.25%	2.3%	2.3%
Target After-Tax Equity IRR	7%	7%	12.5%	12.5%

Summary: Solar Cost & Production Assumptions

	Small I	Small II
Nameplate Capacity (kW)	5.8	25
Capacity Factor	13.4%	13.4%
Annual Degradation	1.0%	1.0%
Useful Life (Years)	25	25
Total Capital Cost ^ (\$/kW)	\$4,260 [\$4,449]	\$3,940 [\$3,946]
Fixed O&M (\$/kW-yr)	\$29	\$24
O&M Escalation Factor	2.0%	2.0%
Non-O&M Escalation %	2.0%	2.0%
Insurance (% of Cost)	0.0%	0.0%
Project Management (\$/yr)	\$0	\$0
Site Lease (\$/yr)	\$0	\$0

Values in [Purple Brackets] represent 2024 ceiling price inputs

Appendix B: Detailed Capital Cost Data for Solar Projects



Small Solar I Installed Cost Summary Statistics

Small Solar I, Installed Costs										
0-15 kW										
Time Period		2023 (Full Year)					2024 (Partial Year)			
Dataset	Sample Size	Average (\$/kW)	Median (\$/kW)	25th Percentile (\$/kW)	75th Percentile (\$/kW)	N	Average (\$/kW)	Median (\$/kW)	25th Percentile (\$/kW)	75th Percentile (\$/kW)
MA SMART (Qualified & Operational)	3,799	\$4,053	\$3,890	\$3,442	\$4,541	136	\$4,287	\$3,949	\$3,400	\$4,651
CT Residential Renewable Energy Solutions	12,812	\$4,114	\$4,017	\$3,423	\$4,673	5,442	\$3,951	\$3,921	\$3,450	\$4,411
NY - NYSEDA Solar Electric Programs	16,095	\$4,444	\$4,165	\$3,286	\$5,250	9,357	\$4,262	\$3,870	\$3,150	\$4,955
RI REF	339	\$5,812	\$5,954	\$4,636	\$6,909	49	\$4,388	\$4,247	\$2,926	\$5,706
RI Small Scale REG	532	\$4,831	\$4,427	\$3,835	\$5,528	135	\$4,884	\$4,377	\$3,624	\$5,700
Energy Sage - RI Accepted*	N/A	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	N/A	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>
EnergySage - MA Accepted Bids*	N/A	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	N/A	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>
EnergySage - NY Accepted*	N/A	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	N/A	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>
EnergySage - CT Accepted*	N/A	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	N/A	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>
EnergySage - ME Accepted*	N/A	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	N/A	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>	<i>Withheld</i>
EnergySage Accepted Averages	N/A	\$3,330	\$3,397	\$3,207	\$3,578	N/A	\$3,056	\$3,186	\$3,017	\$3,383
LBNL Tracking the Sun Advance Dataset RI	764	\$5,185	\$4,877	\$3,900	\$6,220	N/A	No Data	No Data	No Data	No Data
LBNL TTS - All NE States	56,129	\$4,234	\$4,027	\$3,248	\$4,967	N/A	No Data	No Data	No Data	No Data

*NOTE: SEA has withheld the state-specific summary statistics, since these values represent the output of non-public datasets that are normally provided for a fee that were generously provided to SEA by EnergySage specifically for this analysis.

Small Solar II Installed Cost Summary Statistics

Small Solar II, Installed Costs										
15-25 kW										
Time Period		2023 (Full Year)					2024 (Partial Year)			
Dataset	Sample Size	Average (\$/kW)	Median (\$/kW)	25th Percentile (\$/kW)	75th Percentile (\$/kW)	N	Average (\$/kW)	Median (\$/kW)	25th Percentile (\$/kW)	75th Percentile (\$/kW)
MA SMART (Qualified & Operational)	126	\$3,413	\$3,205	\$2,894	\$3,692	35	\$3,573	\$3,448	\$3,102	\$3,709
CT Residential Renewable Energy Solutions	1,525	\$3,891	\$3,789	\$3,293	\$4,478	550	\$3,736	\$3,700	\$3,200	\$4,150
NY - NYSERDA Solar Electric Programs	1,520	\$3,651	\$3,379	\$3,000	\$4,222	898	\$3,404	\$3,209	\$2,782	\$3,742
RI REF	13	\$5,234	\$5,554	\$4,048	\$6,268	3	\$4,325	\$4,956	\$3,825	\$5,141
RI Small Scale REG	32	\$4,594	\$4,278	\$3,537	\$5,367	11	\$3,989	\$3,544	\$3,103	\$5,014
Energy Sage - RI Accepted*	N/A	Withheld	Withheld	Withheld	Withheld	N/A	Withheld	Withheld	Withheld	Withheld
EnergySage - MA Accepted Bids*	N/A	Withheld	Withheld	Withheld	Withheld	N/A	Withheld	Withheld	Withheld	Withheld
EnergySage - NY Accepted*	N/A	Withheld	Withheld	Withheld	Withheld	N/A	Withheld	Withheld	Withheld	Withheld
EnergySage - CT Accepted*	N/A	Withheld	Withheld	Withheld	Withheld	N/A	Withheld	Withheld	Withheld	Withheld
EnergySage - ME Accepted*	N/A	Withheld	Withheld	Withheld	Withheld	N/A	Withheld	Withheld	Withheld	Withheld
EnergySage Accepted Averages	N/A	\$2,966	\$3,293	\$3,131	\$3,475	N/A	\$2,857	\$3,092	\$2,914	\$3,249
LBNL Tracking the Sun Advance Dataset RI	30	\$4,746	\$4,822	\$3,657	\$5,559	N/A	No Data	No Data	No Data	No Data
LBNL TTS - All NE States	5,508	\$3,806	\$3,650	\$3,094	\$4,434	N/A	No Data	No Data	No Data	No Data

*NOTE: SEA has withheld the state-specific summary statistics, since these values represent the output of non-public datasets that are normally provided for a fee that were generously provided to SEA by EnergySage specifically for this analysis.

Small Solar II Installed Cost Summary Statistics

Medium Solar, Installed Costs										
>25-250 kW										
Time Period		2023 (Full Year)					2024 (Partial Year)			
Dataset	Sample Size	Average (\$/kW)	Median (\$/kW)	25th Percentile (\$/kW)	75th Percentile (\$/kW)	N	Average (\$/kW)	Median (\$/kW)	25th Percentile (\$/kW)	75th Percentile (\$/kW)
MA SMART (Qualified & Operational)	153	\$2,985	\$2,736	\$2,253	\$3,392	74	\$2,896	\$2,692	\$2,338	\$3,197
CT Residential Renewable Energy Solutions	73	\$3,756	\$3,906	\$3,220	\$4,190	35	\$3,501	\$3,512	\$2,912	\$3,838
NY - NYSERDA Solar Electric Programs	380	\$3,273	\$3,065	\$2,415	\$3,664	311	\$3,374	\$3,265	\$2,750	\$3,761
CT Nonresidential RES	19	\$2,912	\$2,644	\$2,526	\$2,760	N/A	No Data	No Data	No Data	No Data
RI Small Scale REG	8	\$3,011	\$2,837	\$2,392	\$3,679	15	\$2,558	\$2,554	\$2,400	\$2,904
LBNL Tracking the Sun Advance Dataset RI	8	\$3,220	\$2,987	\$2,712	\$3,607	N/A	No Data	No Data	No Data	No Data
LBNL TTS - All NE States	409	\$2,797	\$2,679	\$2,179	\$3,187	N/A	No Data	No Data	No Data	No Data

Small Solar II Installed Cost Summary Statistics

Commercial Solar, Installed Costs										
>250-1 MW										
Time Period		2023 (Full Year)					2024 (Partial Year)			
Dataset	Sample Size	Average (\$/kW)	Median (\$/kW)	25th Percentile (\$/kW)	75th Percentile (\$/kW)	N	Average (\$/kW)	Median (\$/kW)	25th Percentile (\$/kW)	75th Percentile (\$/kW)
MA SMART (Qualified & Operational)	17	\$3,341	\$3,164	\$2,573	\$3,931	15	\$2,853	\$2,287	\$2,102	\$3,821
NY - NYSEDA Solar Electric Programs	69	\$2,204	\$2,201	\$1,720	\$2,610	28	\$2,157	\$2,171	\$1,711	\$2,494
CT Nonresidential RES	5	\$2,216	\$2,179	\$1,890	\$2,443	N/A	No Data	No Data	No Data	No Data
RI Small Scale REG	1	\$4,807	\$4,807	\$4,807	\$4,807	5	\$3,625	\$3,602	\$3,255	\$4,006
LBNL Tracking the Sun Advance Dataset RI	1	\$2,342	\$2,342	\$2,342	\$2,342	N/A	No Data	No Data	No Data	No Data
LBNL TTS - All NE States	135	\$2,420	\$2,218	\$1,750	\$2,818	N/A	No Data	No Data	No Data	No Data

Small Solar II Installed Cost Summary Statistics

Large Solar, Installed Costs											
1-5+ MW											
Time Period		2023 (Full Year)						2024 (Partial Year)			
Dataset	Sample Size	Average (\$/kW)	Median (\$/kW)	25th Percentile (\$/kW)	75th Percentile (\$/kW)	N	Average (\$/kW)	Median (\$/kW)	25th Percentile (\$/kW)	75th Percentile (\$/kW)	
MA SMART (Qualified & Operational)	6	\$2,225	\$1,907	\$1,480	\$2,432	2	\$3,004	\$3,004	\$2,322	\$3,686	
NY - NYSEDA Solar Electric Programs	31	\$1,473	\$1,390	\$1,225	\$1,505	32	\$1,676	\$1,547	\$1,323	\$1,841	
CT Nonresidential RES	3	\$1,640	\$1,810	\$1,502	\$1,863	N/A	N/A	N/A	N/A	N/A	
RI Small Scale REG	1	\$3,001	\$3,001	\$3,001	\$3,001	1	\$2,275	\$2,275	\$2,275	\$2,275	
LBNL Tracking the Sun Advance Dataset RI	1	\$2,763	\$2,763	\$2,763	\$2,763	N/A	N/A	N/A	N/A	N/A	
LBNL TTS - All NE States	33	\$2,105	\$1,750	\$1,536	\$2,656	N/A	N/A	N/A	N/A	N/A	

Solar Cost Adjustments

- The following costs are added onto the “base” costs derived through state databases

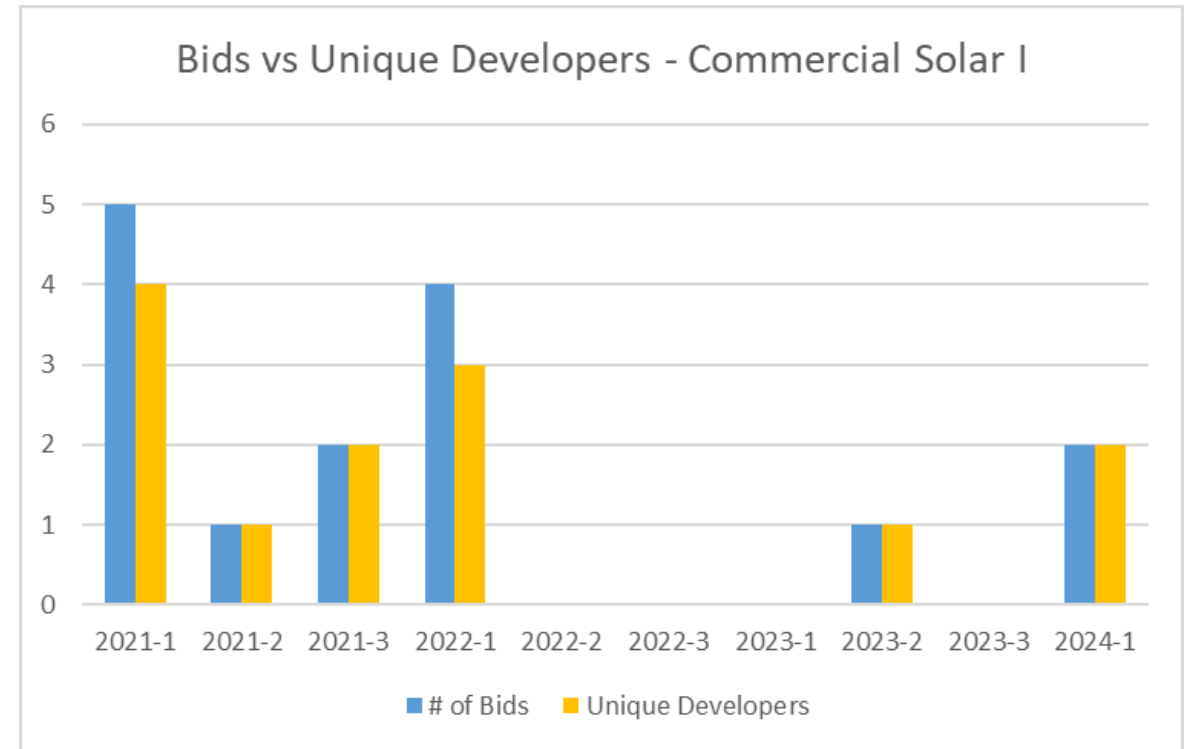
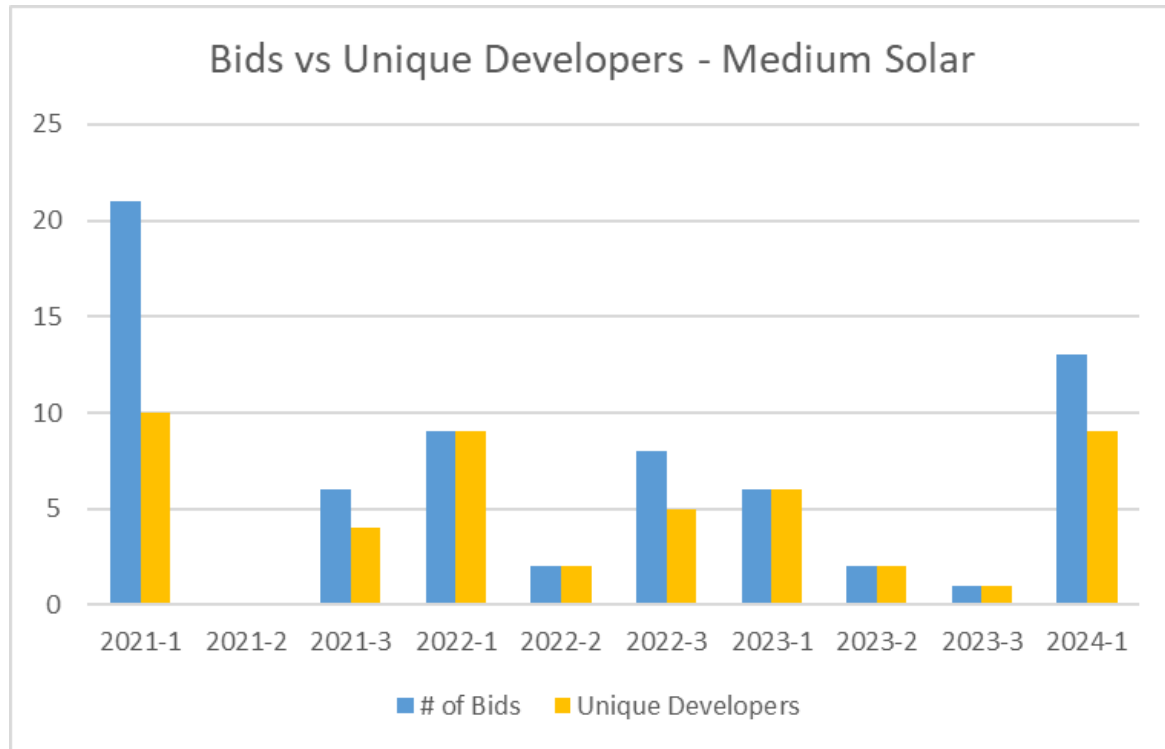
IC Cost Adder	IC Cost Adj.	Meter Relocation Adj.	Prevailing Wage Adj.	Electrician Labor Adj.
Small Solar I	N/A	N/A	N/A	\$20
Small Solar II	N/A	N/A	N/A	\$20
Medium Solar	N/A	\$120	N/A	\$25
Commercial Solar I	N/A	\$60	N/A	\$25
Commercial Solar II	N/A	N/A	N/A	\$25
Large Solar I	\$263	N/A	\$28.75	\$25



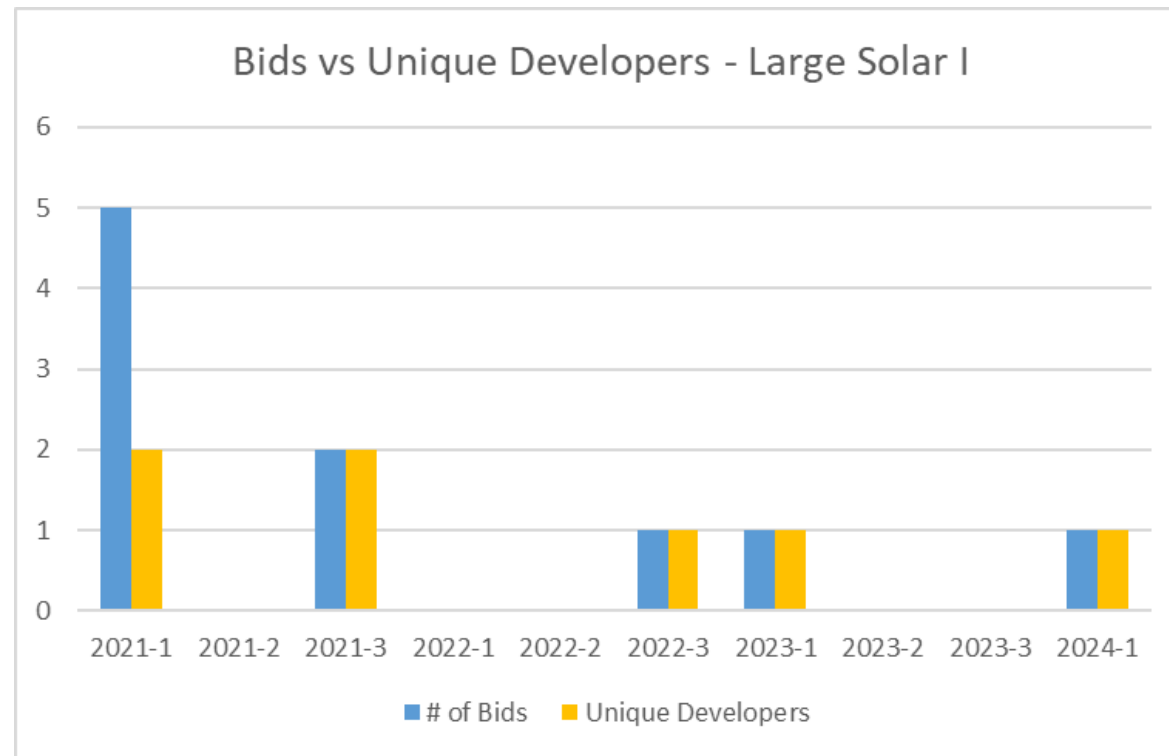
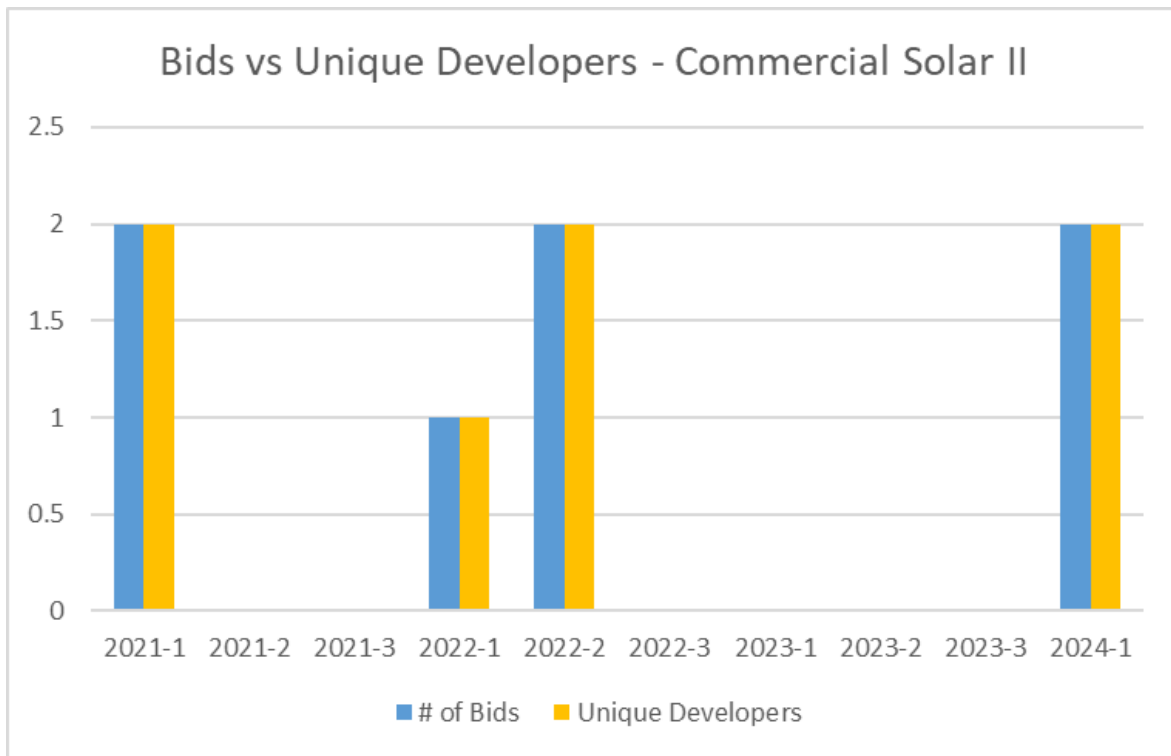
Appendix C: Assessment of Historic Market Concentration



Bids vs Unique Developers



Bids vs Unique Developers (2)



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