Rhode Island Renewable Energy Growth Program:

Research, Analysis, & Discussion in Support of First Draft 2023 Program Year Ceiling Price Recommendations

August 30, 2022

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Draft 2023 Ceiling Prices, Categories and Modeling Parameters

Purpose

- To present stakeholder data responses, survey results, and supplemental research
- To *begin* the discussion that supports the development of Ceiling Price inputs and recommendations for the 2023 Renewable Energy Growth (REG) Program; and
- To develop Ceiling Price recommendations through an iterative, public process.

Proposed 2023 PY Ceiling Price Categories

2023 REG Program: Proposed Technology, Size & Tariff Length Parameters			
Eligible Technology	**System Size for CP Development (DC)**	**Eligible System Size Range (DC)**	**Tariff Length**
Small Solar I	5.8 kW	≤ 15 kW	15 Years
Small Solar II	25 kW	>15 to 25 kW	20 Years
Medium Solar	250 kW	>25 to 250 kW	20 Years
Commercial Solar I	500 kW	>250 to 500 kW	20 Years
Commercial Solar I – Community Remote DG (CRDG)	500 kW	>250 to 500 kW	20 Years
Commercial Solar II	1 MW	>500 kW to 1 MW	20 Years
Commercial Solar II – Community Remote DG (CRDG)	1 MW	>500 kW to 1 MW	20 Years
Large Solar	5 MW	>1 to 5 MW	20 Years
Large Solar - CRDG	5 MW	>1 to 5 MW	20 Years
Wind	3 MW	≤ 5 MW	20 Years
Anaerobic Digestion	750 kW	≤ 5 MW	20 Years
Hydropower	500 kW	≤ 5 MW	20 Years

Summary Results, Solar Classes (¢/kWh)

Technology	Tariff Term (Years)	Size Range kW (Modeled Size kW)	2022 Approved CP	2023 1st Draft Proposed CP	% Change (2022→2023)
Small Solar I	15	0-15 (5.8)	**31.05**	**29.85**	**-3.9%**
Small Solar II	20	>15-25 (25)	**27.55**	**25.95**	**-5.8%**
Medium Solar	20	>25-250 (250)	**24.25**	**23.65**	**-2.5%**
Commercial I	20	>250-500 (500)	**19.25**	**19.35**	**0.5%**
Commercial I-CRDG	20	>250-500 (500)	**22.14**	**22.25***	**0.5%**
Commercial II	20	>500-1,000 (1,000)	**15.75**	**16.45**	**4.4%**
Commercial II-CRDG	20	>500-1,000 (1,000)	**18.11**	**18.92***	**4.5%**
Large Solar	20	>1,000-5,000 (5,000)	**10.95**	**12.55**	**14.6%**
Large Solar-CRDG	20	>1,000-5,000 (5,000)	**12.59**	**14.43***	**14.6%**

*This is the maximum CRDG Ceiling Price allowed by law. The calculated 2023 values are 22.95 for Commercial CRDG 251-500, 19.95 for Commercial CRDG 500-999 and 15.15 for Large CRDG. Note, however, that this CP would allow cost-competitive projects (bidding below the CP) access to > a 15% premium compared to actual project costs.

Summary Results, Non-Solar Classes (¢/kWh)

Technology	Tariff Term (Years)	Size Range kW (Modeled Size kW)	2022 Approved CP	2023 1st Draft Proposed CP	% Change (2022 → 2023)
Wind	20	<=5,000 (3,000)	22.4	19.10*	-15%
Wind - CRDG	20	<=5,000 (3,000)	24.6	21.15*	-14%
Hydroelectric	20	<=5,000 (500)	37.15	39.85	7.3%
Anaerobic Digestion	20	<=5,000 (750)	25.55	19.65	-23%

*Average of (1) 90% bonus depreciation and (2) no bonus depreciation

Overview of Key Stakeholder Feedback and Modeling Implications

Summary of Data/Survey Response

Ceiling Price Category	# of Data Points Received (Data Request or Survey)
Solar	3
Non-Solar	1
Both Solar and Non-Solar	1
TOTAL	5

Cost & Performance Assumptions

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Installed & Interconnection Cost Assumptions & Methodology

- MA SMART program does not make total cost available until projects are complete → cost data only useful for small solar
- CT moves to successor programs and closes RSIP ➔ no updated CT data available; expected to be filed publicly in Jan 2023
- RI Renewable Energy Fund and REG Open Enrollment Results
  - No Large Solar (or Large CRDG) bids in the 1st Open Enrollment of 2022 PY;
  - REG Open Enrollment results contained some values for total project costs that do not align with bid prices. Those costs were excluded from this analysis;
  - Overall, robust data available from RI and other Northeast states for small solar, but data are very limited for Medium, Commercial, and Large Solar classes
- **Modeling Implication (M.I.):**
  - **Small Solar I and II use similar approach to previous years, based upon NY and MA data from incentive programs, Energy Sage quotes, REF data, REG enrollments, and Lawrence Berkeley National Laboratory (LBNL) data**
  - **Medium, commercial, large solar rely upon NY data, REG Open Enrollment Data, and data from LBNL. For large solar, use 75th percentile of NY data to reflect lower costs in upstate NY regions**

Cost & Performance Assumptions (Inflation Reduction Act (IRA)-Related Prevailing Wage/Apprenticeship Requirements)

- **CapEx Impact of Meeting Prevailing Wage Requirements**
  - Recently-enacted RI legislation requires projects greater than 3 MW to pay prevailing wage, along with IRA provisions requiring the same for >1 MW
  - Market participants have indicated that this cost is ***approximately \$55-\$60/kW$_{DC}$***
  - **M.I.: Add \$57.50/kW$_{DC}$ to previously-estimated installed cost values for Large Solar, Large Solar CRDG, Wind and Wind CRDG**
- **CapEx Impact of Meeting Apprenticeship Hour Requirements**
  - ***IRA provisions go further than RI law*** by requiring certified apprentices to complete successively larger proportions of project hours (10% in 2023)
  - SEA believes cost impact needs to be included (either as a specific value or percentage) but ***needs more information*** on what the incremental apprenticeship cost will likely be
  - **M.I.: No change for 1st Draft prices, but SEA will request more information from market participants to substantiate a \$/kW$_{DC}$ value (with supporting calculations) to include in the prices**

Interconnection Cost Inclusion in ITC/ILoPTC Basis (IRA-Related Upfront Cost Impacts)

- **Distribution Interconnection Cost Inclusion in ITC (and ILoPTC) Basis**
  - Prior to IRA, ***interconnection costs were excluded from ITC & ILoPTC cost basis*** (and were straight-line depreciated)
  - Including them in the ITC basis increases the share of the project the ITC can compensate for (and reduces ceiling prices)
  - **M.I.: Include interconnection cost in ITC basis for all projects >25 kW**
- **Transmission Interconnection Cost Inclusion in ITC (and ILoPTC) Basis**
  - Some DG projects (though far from a majority in RI) are beginning to be assessed transmission upgrade costs, and more may be assessed such costs as cost allocation issues are debated
  - **M.I.: No inclusion of such costs in project basis until more information is known**

Interconnection Cost Changes for Projects >25 kW

- Previously, Federal Investment Tax Credit (ITC) for solar excluded interconnection equipment & upgrades from ITC eligibility ➔ SEA assessed IC costs to differentiate their treatment from all other installed costs
- However, (as previously discussed), IRA enactment ➔ no reason to breakout IC costs from total installed costs
- Prior to IRA enactment, SEA completed IC costs analysis, provided below for illustrative purposes:

RI Average IC Cost per kW_{DC}	2021 CP ($/kW)	2022 CP ($/kW)	% Change (2021 PY to 2022 PY)	2023 1st Draft ($/kW)	% Change (2022 PY to 1st Draft 2023 PY)
Large Solar (1-5 MW)	$147	$173	18%	**$250**	**45%**
Commercial Solar (250 kW - 1 MW)	$133	$114	-14%	**$149**	**31%**
Medium Solar (25-250 kW)	$118	$187	58%	**$162**	**-14%**
Wind (0-5 MW)	$295*	$295*	0%	**$295***	**0%**
Hydro (0-5 MW)	$500*	$500*	0%	**$500***	**0%**
Anaerobic Digestion (AD, 0-5 MW)	$150*	$150*	0%	**$150***	**0%**

Notes: *Includes an 85% de-rate on costs, as a proxy for DC ➔ AC

Year-on-Year Cost Decline Assumptions (Solar)

- During the 2022 PY Ceiling Price development process, SEA computed YoY cost decline assumptions as the balance of:
  - The Energy Information Administration (EIA's) Short Term Energy Outlook (STEO) on the producer price index (PPI) for all commodities as a proxy for inflationary pressure experienced by firms); and
  - The National Renewable Energy Laboratory's (NREL's) Annual Technology Baseline (ATB), to capture fundamental cost declines for solar
- EIA's August 2022 STEO now forecasts declining producer costs in 2023 relative to 2022 ➔ no longer makes sense to incorporate as doing so would double count cost declines with ATB
- **M.I.: SEA will use NREL ATB 2022 "moderate" case values for 1st Draft (shown below), but will also continue to conduct further desktop research to substantiate or revise inputs**

Solar Class	2022 ATB Moderate Case Cost Decline
Small Solar I & II	7.4%
Medium/Commercial Solar	4.9%
Large Solar	4.1%

Post-Tariff Project Revenue Assumptions (1)

- Per R.I.G.L. § 39-26.6-23, REG facilities are eligible to participate in net metering post tariff
- As such, during the 2022 PY CP development process, SEA assumed that REG facilities would receive net metering revenue, but at a 40% discount to account for future revenue uncertainty – a practice in line with approaches utilized by major renewable energy project financiers
- However, some stakeholders responding to the 2023 Data Request & Survey argued that no post-tariff revenue should be assumed, arguing that:
  - Net metering is not available to REG facilities;
  - Financiers do not consider revenue beyond the term of the tariff; and
  - (For rooftop facilities) uncertainty exists post-tariff regarding rooftop replacement and lease availability

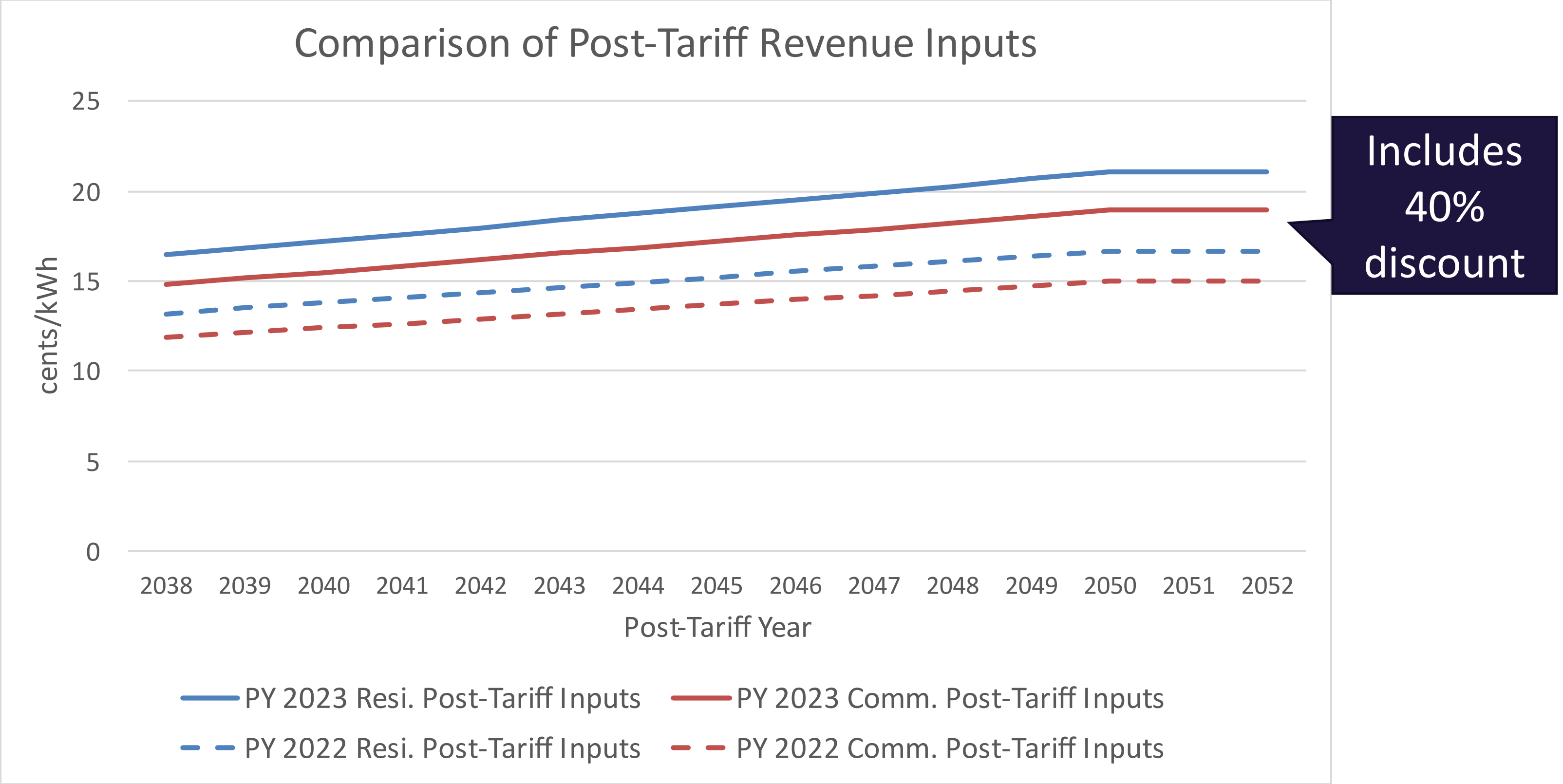
Post-Tariff Project Revenue Assumptions (2)

- ***"Net metering is not available to REG facilities"***
  - In fact, the General Assembly has provided explicit (and unmistakable) guidance to the contrary regarding the post-tariff period for REG projects. R.I.G.L. [§ 39-26.6-23]() states, in pertinent part:
    - *"**After the end of the term of the performance-based incentive tariff** applicable to a distributed-generation project, **net-metering credits for excess generation in any given month shall be credited to the net-metered account at the applicable rate allowed under the law (emphasis added)**."*
- ***"Financiers do not consider revenue beyond the term of the tariff"***
  - In fact, as discussed in SEA's [rebuttal testimony]() filed in RIPUC Docket 5202, financiers regularly give credit for uncontracted revenue, but at a substantial (30%-40%) discount relative to contracted revenue.
  - Furthermore, SEA accounts for post-tariff revenue not for the purpose of determining repayment of debt (which in all cases, will mature at or prior to the end of the REG tariff term), but rather to mirror the perspective of all project owners considering the economics of a project investment.
- ***"(For rooftop facilities) uncertainty exists post-tariff regarding rooftop replacement and lease availability"***
  - SEA agrees that ensuring the suitability of a customer's premises for solar PV is essential to successful C&I project development.
  - ***This is why screening and targeting host customers based upon the condition of their roof is a necessary condition for successful C&I project development***, and why market participants focus on customers that can agree ***in advance*** to own or otherwise host a project for at least 25 years - the project's assumed useful life - which includes at least 5 full post-tariff years.
- **M.I.: SEA continues to assume that post-tariff energy revenue for all technologies will be based on forecasted net metering rates (or a comparable successor policy) as opposed to wholesale rates, with a 40% discount applied**

Post-Tariff Project Revenue Assumptions (3)

- To forecast net metering rates, SEA utilizes an internal forecast of Rhode Island Energy's C-06 rate (applicable to small commercial customers), in which:
  - Wire charges are forecasted based on planned T&D investments combined with long-term expectations; and
  - Generation charges are forecasted as a function of projected energy and capacity prices

- **M.I.: Higher electricity price outlook (based on sharp rise in near-to-medium term natural gas prices) result in higher post-tariff compensation, thereby reducing ceiling prices across the board relative to 2022 estimate**



Solar >25 kW Operating Expense Assumptions (1)

- **Fixed O&M Costs:**
  - One stakeholder provided O&M cost quotes that were marginally higher than SEA's current assumed values
  - **M.I.: No change in present round, but SEA plans to collect additional information regarding the values shared by industry participants and conduct additional market research to consider revisions in future rounds**
- **O&M & Non-O&M Escalation Rates:**
  - Stakeholders provided escalation rates that were between 1-3%, within the range currently adopted by SEA
  - **M.I.: No change (both existing SEA inputs fell within the range of industry responses)**
- **Project Management costs:**
  - A stakeholder suggested that project managed costs for CRDG projects should be increased to account for the added costs of customer billing/management
  - **M.I.: No change (cost of customer billing/management is already incorporated into CRDG O&M premium)**

Solar >25 kW Operating Expense Assumptions (2)

- **Equipment Replacement**
  - Stakeholders provided a wide range of inverter replacement costs ($15-55/kW) which were similar to SEA's assumed values ($21-50/kW, for large solar and all other classes respectively)
  - However, some (but not all) stakeholders reported that replacing inverters twice in a facility's useful life is now typical (with varying schedules for replacement depending on developer)
  - **M.I.: No change in present round, but SEA plans to collect additional information about potential emerging practice of replacing inverters more than once**
- **Decommissioning Costs:**
  - A stakeholder provided decommissioning cost estimates for various projects that were higher than SEA's currently-adopted inputs
  - In doing so, they noted that some municipalities are increasing their financial surety requirements related to decommissioning
  - **M.I.: No change in present round, but SEA plans to collect additional information regarding the basis for said estimate and the prevalence of such requirements**

Solar >25 kW Operating Expense Assumptions (3)

- **Insurance (% of Project Costs):**
  - One stakeholder provided SEA with varying insurance quotes that were both higher and lower than SEA's currently assumed insurance costs
  - **M.I.: No change in present round, but SEA plans to collect additional information regarding the values shared by industry participants**
- **Land Lease ($/year)**
  - Three stakeholders provided SEA with substantiated land lease documentation/quotes demonstrating land lease costs that are higher than SEA is currently assuming
  - **M.I.: SEA proposes to update the 2023 land lease input based on an average of industry-supplied lease quotes with existing land lease inputs for Solar >25 kW, as shown below:**

	2022 PY input	2023 Proposed
Large	$67,500	$94,530
Commercial II	$20,000	$32,458
Commercial I	$20,000	$24,500
Medium	$15,000	$18,090

Non-Solar Cost Assumptions

- **Insurance (Hydro):**
  - During the 2022 PY CP development process, SEA increased the insurance costs (expressed as a % of total costs) for hydro from 2.7% to 4%
  - In its testimony before the PUC the DPUC opposed this increase and requested that SEA further substantiate the increase
  - A stakeholder has provided SEA with documentation of insurance costs that are in excess of 4%
  - **M.I.: SEA to leave as is for 2023 PY unless quotes no longer substantiate the 4% value currently adopted**

- **Other Inputs:**
  - SEA received data from market participants regarding a number of Non-Solar cost inputs, but uncertainties regarding the scope and basis for such costs make assessment of the data difficult at this time
  - **M.I. No change in present round – SEA will seek to clarify/substantiate the data received and will consider addressing in future rounds**

Small Solar I/II Financing Assumptions

- High level of Small I/II activity thus far in 2023 PY
  - Of the 6.95 MW available for the 2023 PY, as of August 21, 2022, only 0.254 MW (254 kW) remains
- Zero Small Solar participants responded to the survey.
  - With increase in interest rates, debt service coverage was insufficient on initial runs (thus, without any new stakeholder-supplied values, debt must be reduced as a % of total capital)
- **M.I.s:**
  - **Interest rates adjusted upwards (see later slide)**
  - **Debt share commensurately reduced (60% to 52.5% for Small I, 50% to 45% for Small II), amid lack of Small I/II focused feedback and rising interest rates**

Small Solar I Taxation Assumptions

- SEA intends to update two facets of our Small Solar I modeling during the 2023 PY CP development process:
  1. The average effective tax rate applied to facility owners; and
  2. The portion of the performance-based incentive (PBI) that is taxable.
- SEA intends to address the effective tax rate in the 2nd Draft prices, based on LBNL's recently-released 2022 Residential Solar-Adopter Income and Demographics Trends report (which includes RI-specific income data for solar adopters)
- SEA has received data from Rhode Island Energy containing 1,790 months worth of billing information (representing one year of billing and crediting data from customers also selected for REG quality assurance inspections)
  - Based on this sample, the average customer received 52% of their PBI through cash payments (as opposed to bill credits) ➔ assume 52% of PBI is taxable
- **M.I.s:**
  - **No change in effective tax rate for 1st Draft, but SEA will address in 2nd Draft based on LBNL data**
  - **Revise input for % of PBI taxable from prior estimate of 65% ➔ 52%**

Interest Rate on Term Debt (1)

- **Project Debt Outlook:**
  - Financiers have been shifting to the Secured Overnight Financing Rate (SOFR), and moving deal volume away from being priced over LIBOR
    - Therefore, SEA has moved to using SOFR as the baseline “risk free” index
  - Regardless of use of LIBOR or SOFR, as Fed has moved to control inflation, ***baseline rates have increased***
    - Relative to a year ago, debt financiers report premiums above LIBOR/SOFR unchanged for “vanilla” loans
  - For typical term loans, ***swap values (priced using US Treasuries) have risen with yields***, resulting in increases in 15- and 20-year term debt cost
- **12-month change in SOFR 90-day rate**
  - Rose **from 0.02% to 0.71%** (as of 7/1/22, ~**+70 bps**)

Interest Rate on Term Debt (2)

- **SOFR Swap/US Treasury Yield Value**
  - 10-year swap value (on 7/1/22): **+288 bps**
  - 20-year swap value (on 7/1/22): **+335 bps**
    - Based on this, tentative assumption of **+311 bps** for a 15-year swap (representing average of 10- and 20-year Treasury yields on 7/1/22, as proxy for 15-year SOFR swap rate)
  - Previous 15-year swap value on 7/1/21 (proxy for non-Hydro projects): **+175 bps**
  - Previous 20-year swap value on 7/1/21 (proxy for non-Hydro projects): **+201 bps**
  - ***15-year swap premium over 7/1/21 value (proxy for non-Hydro): +136 bps***
  - ***20-year swap premium over 7/1/21 value(proxy for Hydro): +134 bps***
  - ***PLUS: +70 bps (12-month change in 90-day SOFR basis)***
- **M.I.: Net increase = ~+207 bps for non-Hydro (rounded <u>up</u> to +210 bps) and +204 bps for Hydro (rounded <u>down</u> to +200 bps)**

Impact of Interest in Term Debt Increases on Debt/Equity Shares

- Norton Rose Fulbright Cost of Capital participants indicate P50 debt service coverage ratios (DSCRs) for contracted solar and wind remain ***unchanged at 1.25 and 1.35***, respectively
  - SEA assumes Hydro & AD DSCRs are 1.35 and 1.5, respectively, based on a market participant feedback and term sheet(s) from prior years
- With interest rates increasing +200-210 bps, debt service payments are modeled to rise accordingly
  - Thus, in the initial CREST runs, DSCRs associated with 2022 PY debt shares ***fell substantially short of minimum required coverage***
- When debt service coverage is insufficient, lenders ***reduce the amount of debt offered***
- **M.I.s:**
  - **For Solar projects >25 kW: reduce debt share by 7.5% for Medium and Commercial projects, and 10% for Large projects**
  - **For Non-Solar projects: Reduce Wind, Hydro and AD debt shares (and concurrently increase equity shares) by 17.5%, 4%, and 5%, respectively**

Inflation Reduction Act (IRA) Financing Impact: Tax Credit Selection (ITC vs. PTC) for Solar Classes

- Previous REG ceiling price modeling has confirmed that the PTC's 10-year duration results in NPV benefits that are less than the ITC (and thus result in less economic benefit, and higher CPs, when applying)
- However, given the IRA makes solar PV eligible, some market participants have indicated that ***at ~$1/W, PTC confers more value than the ITC for large-scale solar (and paired solar/storage)***
- After expected cost increases that our team forecasted last year, only Large and Large CRDG are in the vicinity of this price point
- **M.I.: Out of an abundance of caution, SEA to undertake supplementary Large/Large CRDG modeling <u>for 2nd Draft prices</u> to determine if switching to PTC confers more value to ratepayers**

Inflation Reduction Act (IRA) Financing Impact: ITC (Solar) and ILoPTC (Wind & AD) Value

- For projects <=1 MW, ITC/ILoPTC value increases to 30% ***without*** min. labor standards
- SEA is certain ***the labor requirements' added cost (in exchange for full credit rates) is substantially less than the benefit*** of the full 30% ITC (and is unaware of a broad trend of non-hydro projects being unable to monetize the credit fully)
- **M.I.: Set ITC and ILoPTC values at 30% for all projects except hydro (which remain unable to safe-harbor due to FERC licensing delays)**

Inflation Reduction Act (IRA) Financing Impact: Sponsor & Tax Equity Share/Impact on After-Tax Equity IRR

- Starting in 2022 PY, PTC (and ILoPTC) expired, which reduced the assumed share of tax equity and increased the share of sponsor equity, thereby increasing consolidated IRRs
- In addition, ITC values had been scheduled to downshift from 26% to 22%, which would have reduced sponsor/tax splits (from 25%/75% to 40%/60%, respectively)
- With IRA enactment, ***sponsor/tax splits corresponding to full value are restored*** for all credits
- **M.I.: Restore sponsor/tax splits to 25%/75% for Solar, Wind and AD classes, but maintain existing splits for hydro (given assumption of no tax credit monetization)**

After-Tax Equity IRR (Tax Equity): Inflation Reduction Act (IRA)-Related Financing Impact

- Overall, ***higher tax credit values will likely drive more tax equity supply***, and drive more competition for deals
- New credit transferability rules ***could reduce need for complex lease and flip deals***
- However, it is unclear at this time 1) ***what the TE supply/demand balance will be*** and 2) if ***new transferability rules reduce financing risks*** (and thus TE IRRs)
- **M.I.: No change at this time, but SEA reserves the right to adjust tax equity assumptions as more facts and ramifications regarding the IRA become known and understood**

Appendix

Summary: Solar <=25 kW Financing Assumptions

	Small I (1-15 kW)		Small II (15-25 kW)	
	2022 Final	***2023 Proposed***	***2022 Final***	***2023 Proposed***
Federal Investment Tax Credit (%)	26%	**30%**	26%	**30%**
% Debt	60%	**52.5%**	50%	**45%**
Debt Term (years)	13	**13**	10	**10**
Interest Rate on Term Debt	6.3%	**8.4%**	7.0%	**9.1%**
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 >25 kW Financing Assumptions

	Medium (>25-250 kW)		Comm'l & Comm'l CRDG (>250-1 MW)		Large & Large CRDG (>1 MW-5 MW)	
Assumption Set	***2022 Final***	***2023 Proposed***	***2022 Final***	***2023 Proposed***	***2022 Final***	***2023 Proposed***
Federal Investment Tax Credit (%)	26%	**30%**	26%	**30%**	26%	**30%**
% Debt	55%	**47.5%**	55%	**47.5%**	52.5%	**42.5%**
Debt Term (years)	15	**15**	15	**15**	15	**15**
Interest Rate on Term Debt	6.6%	**8.7%**	5.85%	**7.95%**	5.85%	**7.95%**
Lender's Fee (% of total borrowing)	1.0%	**1.0%**	1.0%	**1.0%**	2.0%	**2.0%**
% Equity Share of Sponsor Equity	25%	**25%**	25%	**25%**	25%	**25%**
Target After-Tax Equity IRR (Sponsor Equity, Levered Return)	13.0%	**13.0%**	12.0%	**12.0%**	11.0%	**11.0%**
% Equity Share of Tax Equity	75%	**75%**	75%	**75%**	75%	**75%**
Target After-Tax Equity IRR (Tax Equity, Levered Return)	9.5%	**9.5%**	9.5%	**9.5%**	9.5%	**9.5%**
Depreciation Approach	5-Year MACRS	**5-Year MACRS**	5-Year MACRS	**5-Year MACRS**	5-Year MACRS	**5-Year MACRS**

Summary: Non-Solar Financing Assumptions

	Wind & Wind CRDG		Hydroelectric		Anaerobic Digestion	
Assumption Set	***2022 Final***	***2023 Preliminary***	***2022 Final***	***2023 Preliminary***	***2022 Final***	***2023 Preliminary***
Federal Investment Tax Credit	0%	**30%**	0%	**0%**	0%	**30%**
% Debt	60%	**42.5%**	70%	**66%**	45%	**45%**
Debt Term (years)	15	**15**	20	**20**	15	**15**
Interest Rate on Term Debt	6.6%	**8.7%**	7.15%	**9.15%**	6.85%	**8.95%**
Lender's Fee (% of total borrowing)	1.0%	**1.0%**	1.88%	**1.88%**	1.5%	**1.5%**
% Equity Share of Sponsor Equity	60%	**25%**	80%	**80%**	60%	**25%**
Target After-Tax Equity IRR (Sponsor Equity, Levered Return)	12.0%	**12.0%**	12.0%	**12.0%**	12.0%	**12.0%**
% Equity Share of Tax Equity	40%	**75%**	20%	**20%**	40%	**75%**
Target After-Tax Equity IRR (Tax Equity, Levered Return)	9.5%	**9.5%**	9.5%	**9.5%**	9.5%	**9.5%**
Depreciation	Average of 100% bonus and 5-Year MACRS	**5-Year MACRS**	7-year MACRS	**7-year MACRS**	5-year MACRS	**5-year MACRS**

Summary: Solar Cost & Production Assumptions

	Small I	Small II	Medium	Comm'l I	Comm'l I (CRDG)	Comm'l II	Comm'l II (CRDG)	Large	Large CRDG
Nameplate Capacity (kW)	5.8	25	250	500	500	1,000	1,000	5,000	5,000
Capacity Factor	13.4%	13.4%	14.5%	14.6%	14.6%	14.6%	14.6%	15.10%	15.10%
Annual Degradation	1.0%	1.0%	0.8%	0.8%	0.8%	0.8%	0.8%	0.5%	0.5%
Useful Life (Years)	25	25	25	25	25	25	25	30	30
Total Capital Cost ^ ($/kW)	$3,355 [$3,377]	$2,878 [$3,103]	$2,085 [$2,408]	$1,953 [$2,108]	$2,053 [$2,208]	$1,821 [$1,938]	$1,921 [$2,038]	$1,677 [$1,444]	$1,777 [$1,544]
Fixed O&M ($/kW-yr)	$29	$24	$14.57	$12.03	$34.03	$12.03	$34.03	$8.00	$30.00
O&M Escalation Factor	2.0%	2.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Non-O&M Escalation %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Insurance (% of Cost)	0.0%	0.0%	0.34%	0.57%	0.57%	0.57%	0.57%	0.57%	0.57%
Project Management ($/yr)	$0	$0	$3,000	$4,000	$4,000	$4,000	$4,000	$20,000	$20,000
Site Lease ($/yr)	$0	$0	$18,090 [$15,000]	$24,500 [$20,000]	$24,500 [$20,000]	$32,458 [$20,000]	$32,458 [$20,000]	$94,530 [$67,500]	$94,530 [$67,500]

Values in [Brackets] represent 2022 ceiling price inputs
* Reflects installed cost of non-CRDG project from same category, plus estimated cost of customer acquisition ($100/kW)
^ Total cost includes interconnection cost

Summary: Non-Solar Cost & Production Assumptions

	Wind	Wind - CRDG	Hydroelectric	Anaerobic Digestion
Nameplate Capacity (kW)	3,000	3,000	500	725
Capacity Factor	21.00%	21.00%	55.00%	92%[1]
Annual Degradation	0.5%	0.5%	0.0%	0.0%
Total Cost ($/kW)	$3,158	$3,258	$11,918	$11,200
Fixed O&M ($/kW-yr)	$26.50	$48.50	$2.00	$600
O&M Inflation	2.0%	2.0%	2.0%	2.0%
Insurance (% of Cost)	0.29%	0.29%	4.0%	1.5%
Project Management ($/yr)	$18,000	$18,000	$3,000	$75,000
Site Lease ($/yr)	$162,000	$162,000	$8,750	$35,000

1. *Note: For Anaerobic Digestion we use an Availability Factor*

Interest Rate on Term Debt Derivation

Rate Type	Applicable Rate
July 2021 SOFR (90-Day Average)	0.02%
July 2022 SOFR (90-Day Average)	0.71%
12-Month 90-Day SOFR Δ	***0.70%***
10-Year Treasury Yield (July 1, 2021)	1.48%
10-Year Treasury Yield (July 1, 2022)	2.88%
12-Month 10-Year Treasury Yield Δ	***1.40%***
20-Year Treasury Yield (July 1, 2021)	2.01%
20-Year Treasury Yield (July 1, 2022)	3.35%
12-Month 20-Year Treasury Yield Δ	***1.34%***
Assumed 13-Year Swap Value Δ	1.39%
Assumed 15-Year Swap Value Δ	1.37%
Assumed 20-Year Swap Value Δ	1.34%
Total Interest Rate on Term Debt Δ (12-month Treasury Swap Δ + 12-month SOFR Δ, 10 and 13-Year Debt Term)	***2.10%***
Total Interest Rate on Term Debt Δ (12-month Treasury Swap Δ + 12-month SOFR Δ, 15-Year Debt Term)	***2.07%***
Total Interest Rate on Term Debt Δ (12-month Treasury Swap Δ + 12-month SOFR Δ, 20-Year Debt Term)	***2.04%***

Sources: U.S. Department of the Treasury Daily Treasury Par Yield Curves, Federal Reserve Bank of New York (for SOFR Values)

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