



# **REC Pricing Model Cost Collection Workshop**

**November 14, 2024**

# Agenda

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- **Purpose of workshop**
- **Overview of REC Pricing Model**
- **Strawman proposal for cost data collection**
- **Feedback Questions**
  
- **This meeting is being recorded and the recording and slides will be posted to: <https://ipa.illinois.gov/renewable-resources/stakeholder-engagement.html>**

# Purpose of Workshop

- **Workshop Goal**

- Improve cost inputs for the REC Pricing Model used for setting REC Prices for Illinois Shines and Illinois Solar for All by collecting Illinois-specific project cost data

- **2024 Long-Term Plan**

**“The Illinois Shines and Solar for All programs currently do not collect cost data that would be granular enough to use in the REC Pricing Model. For setting REC Prices for the 2024-25 Program Year, the Agency continues to rely on NREL data, but will convene a workshop after the approval of this 2024 Long-Term Plan to develop a standard format for the submittal of this data at the Part II application stage for Illinois Shines and Illinois Solar for All. The goal would be to begin data collection in the fall of 2024 for use in setting prices for the 2025-26 Program Year. The Agency expects that for the 2025-26 Program Year it would use a combination of NREL data and actual reported cost data in order to ensure a sufficient sample size, and in future years transition completely to the use of reported program data cost data.” [Page 190]**

- **Two ways to provide input**

- Feedback during workshop today
- Written feedback
  - See request for feedback: <https://ipa.illinois.gov/content/dam/soi/en/web/ipa/documents/20241031-rec-price-model-cost-inputs-request-for-feedback-31-oct-2024.pdf>
  - Due November 22, 2024
  - Send to: [IPA.Solar@Illinois.gov](mailto:IPA.Solar@Illinois.gov)

- **IPA Strawman approach for phasing in collection of cost data**

- Survey to collect aggregated data in January
- Part II data collection starting in June

# Overview of the REC Pricing Model

- **Base of the REC Pricing Model: NREL's Cost of Renewable Energy Spreadsheet Tool (CREST)**
  - CREST produces a revenue requirement output expressed in \$/kWh
    - Flexible cash-flow model designed to assess project economics and design cost-based incentives
    - For more background information on NREL's CREST models, see: <https://www.nrel.gov/analysis/crest.html>
- **IPA REC Pricing Model adds on top of CREST**
  - Input assumptions
    - Based on stakeholder feedback, program data, and NREL benchmark reports
  - Calculations of value of future net metering credits
  - REC prices based on the difference between the net present value of the revenue requirement from CREST and the net present value of net metering revenue
    - Prices determined for each program category, program group, and size bins
- **Current Model from 2024 Long-Term Plan**
  - [Appendix D: Renewable Energy Credit Pricing Model Description](#)
  - [Appendix E: Renewable Energy Credit Pricing Model Spreadsheet](#)

# Examples of CREST Input Tabs

Project Size and Performance	Units	Input Value
Generator Nameplate Capacity	kW dc	2,488
Net Capacity Factor: Select "State Average" or "Custom" →		Custom
Net Capacity Factor	% dc	14.82%
Production, Yr 1	kWh	3,229,222
Annual Production Degradation	%	0.5%
Project Useful Life	years	25

Capital Costs	Units	Input Value
Select Cost Level of Detail		Intermediate
Generation Equipment	\$	\$2,254,266
Balance of Plant	\$	\$1,288,601
Interconnection	\$	\$208,893
Development Costs & Fee	\$	\$876,486
Reserves & Financing Costs	\$	\$371,628

Key Inputs

Values in blue are inputs  
See tab "CREST Inputs" in REC Pricing Model

Operations & Maintenance	Units	Input Value
Select Cost Level of Detail		Intermediate
Fixed O&M Expense, Yr 1	\$/kW-yr dc	\$10.00
Variable O&M Expense, Yr 1	¢/kWh	\$0.00
O&M Cost Inflation, initial period	%	2%
Initial Period ends last day of:	year	10
O&M Cost Inflation, thereafter	%	2.0%
Insurance, Yr 1 (% of Total Cost)	%	0.2%
Insurance, Yr 1 (\$) (Provided for reference)	\$	\$9,256
Project Management Yr 1	\$/yr	\$12,440
Property Tax or PILOT, Yr 1	\$/yr	\$0
Annual Property Tax Adjustment Factor	%	-3.5%
Land Lease	\$/yr	\$0
Royalties (% of revenue)	%	0.0%
Royalties, Yr 1 (\$) (Provided for reference)	\$	\$0

Construction Financing	Units	Input Value
Construction Period	months	12
Interest Rate (Annual)	%	8.0%
Interest During Construction	\$	\$185,130

Permanent Financing	Units	Input Value
% Debt (% of hard costs) (mortgage-style amort.)	%	45%
Debt Term	years	15
Interest Rate on Term Debt	%	6.00%
Lender's Fee (% of total borrowing)	%	3.0%
Required Minimum Annual DSCR		1.20
Actual Minimum DSCR, occurs in →	Year 9	1.75
Minimum DSCR Check Cell (If "Fail," read note ==>)	Pass/Fail	Pass
Required Average DSCR		1.45
Actual Average DSCR		1.82
Average DSCR Check Cell (If "Fail," read note ==>)	Pass/Fail	Pass
% Equity (% hard costs) (soft costs also equity funded)	%	55%
Target After-Tax Equity IRR	%	12%
Weighted Average Cost of Capital (WACC)	%	7.83%
Other Closing Costs	\$	\$0

# NREL Benchmarking Study



Typically released between September and November  
(2024 not yet released)

<https://www.nrel.gov/solar/market-research-analysis/solar-installed-system-cost.html>

## U.S. Solar Photovoltaic System and Energy Storage Cost Benchmarks, With Minimum Sustainable Price Analysis: Q1 2022

Vignesh Ramasamy,<sup>1</sup> Jarrett Zuboy,<sup>1</sup> Eric O'Shaughnessy,<sup>2</sup> David Feldman,<sup>1</sup> Jal Desai,<sup>1</sup> Michael Woodhouse,<sup>1</sup> Paul Basore,<sup>3</sup> and Robert Margolis<sup>1</sup>

<sup>1</sup> National Renewable Energy Laboratory  
<sup>2</sup> Clean Kilowatts, LLC  
<sup>3</sup> U.S. Department of Energy Solar Energy Technologies Office

NREL is a national laboratory of the U.S. Department of Energy Office of Energy Efficiency & Renewable Energy Operated by the Alliance for Sustainable Energy, LLC  
This report is available at no cost from the National Renewable Energy Laboratory (NREL) at [www.nrel.gov/publications](http://www.nrel.gov/publications).  
Contract No. DE-AC36-08-GO28308

Technical Report  
NREL/TP-7A40-53326  
September 2022

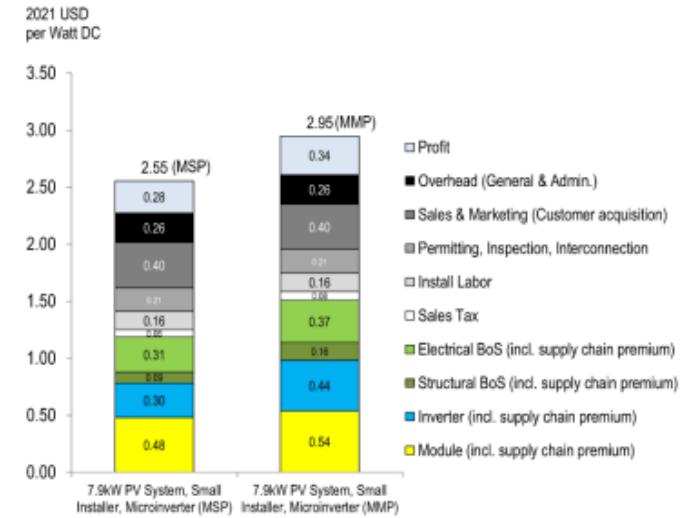
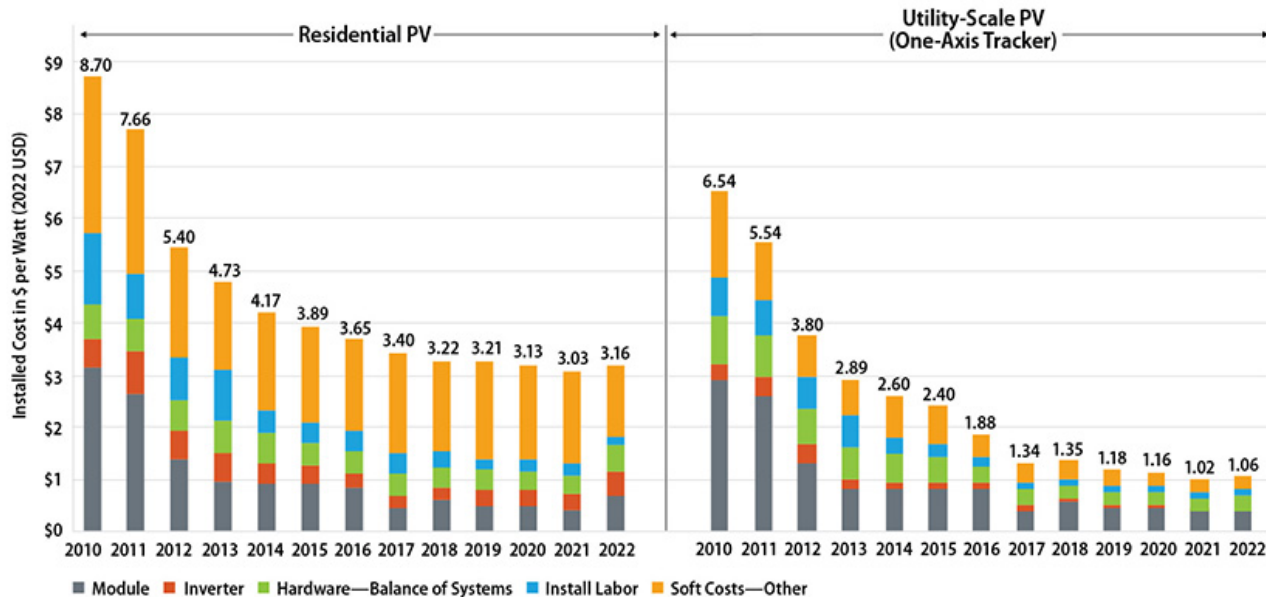


Figure 9. Q1 2022 U.S. benchmark: 7.9-kW<sub>dc</sub> residential PV system cost (2021 USD/W<sub>dc</sub>)

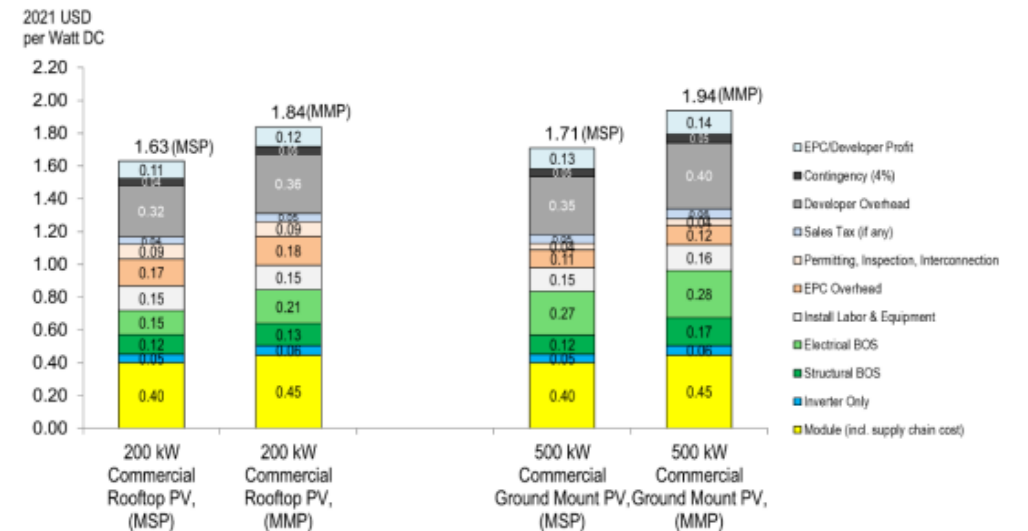


Figure 11. Q1 2022 U.S. benchmark: commercial PV system cost (2021 USD/W<sub>dc</sub>)

- **Phase I: The Agency will conduct a survey of Approved Vendors and Designees**
  - **January 6-24: Online survey to collect information on costs of projects completed and energized in calendar year 2024 and forecast information for projects expected to be completed and energized in calendar year 2025.**
  - **Aggregated project data by program category and size range. Individual project data will not be collected.**
  - **Survey data will be used in conjunction with NREL benchmark report data to develop REC prices for the 2025-2026 Program Year.**
  - **Survey will also ask about certain financial assumption inputs not otherwise available from the NREL benchmark report.**
  - **Draft 2025-2026 Program Year REC prices expected to be released in mid-February 2025 with a two-week feedback period. Final REC prices are expected to be issued by the end of March 2025.**
- **Phase II: New cost data fields to be included in the Part II applications**
  - **Potential soft-launch in June 2025 as optional fields**
  - **Required fields starting in the fall of 2025**
  - **Goal is to give Approved Vendors and Designees time to implement internal processes to collect data**
- **Part II data will be used for setting REC prices starting with the 2026-2027 program year**
- **In both phases, Approved Vendors and Designees will be allowed to request confidential treatment of the data provided**

# Questions

- **Feedback Request #1: The Agency is interested in stakeholder feedback on the proposed two-phase approach to cost data collection.**
  - a) **Do stakeholders believe this approach will provide the Agency the sought after data on Illinois-specific costs that will improve the precision of the REC pricing model?**
  - b) **Do stakeholders feel the timeframes described are feasible for Approved Vendors and Designees to provide the requested data?**
  - c) **Are there additional considerations that stakeholders wish to convey to the Agency related to cost inputs to the REC Pricing Model?**
  
- **Feedback Request #2: The Agency is requesting stakeholder feedback that provides any potential advantages and/or disadvantages of having Approved Vendors provide cost data for projects on a per watt DC versus a per watt AC basis.**
  - **CREST Model use per watt DC costs**
  - **IPA Programs have generally collected data on an AC size basis**



# Questions

- **Feedback Request #3: The Agency is requesting stakeholder feedback on the following proposal for cost data to be collected, specifically if cost data should be collected utilizing the NREL Cost Categories or only the CREST Cost Categories.**
  - **The Agency is also requesting input on whether the explanations of categories are sufficient or if additional guidance is required to provide clear and accurate data.**

NREL Cost Category	CREST Cost Category	CREST Explanation of Category
A, B, I	Generation Equipment	"Generation Equipment" should include all hardware, such as panels and inverters.
C, D, E	Balance of Plant	Balance of Plant (also known as Balance of System) represents all infrastructure, site prep and labor supporting the installation of the generation equipment. BOP costs include foundations, mounting devices, other hardware, and labor not already accounted for in the "Generation Equipment" row.
F	Interconnection	The "Interconnection" row should account for all project costs relating to connecting to the grid, such as the construction of transmission lines, permitting costs with the utility, and start-up costs. This category will also include the cost of a new substation, if necessary.
G, H, J	Development Costs & Fee	The "Development Costs" row should include all costs relating to project management, studies, engineering, permitting, contingencies, success fees, and other soft costs not accounted for elsewhere in the "Intermediate" cost breakdown

NREL Benchmark Report Categories	
A	Module
B	Inverter
C	Structural Balance of System
D	Electrical Balance of System
E	Installation Labor
F	Permitting, Installation and Interconnection
G	Sales Tax
H	Sales & Marketing (Customer Acquisition)
I	Overhead (General and Administration)
J	Net Profit

# Additional Financial Assumptions

- **Additional assumptions used in CREST Model**
  1. **Target After-Tax Equity IRR(%) of 12% for distributed generation, 14% for community solar**
  2. **Project Management Costs of \$5/kWdc-yr**
  3. **Fixed O&M Expense, Year 1 of \$10/ kWdc-yr**
  4. **Percent Debt Financed set at 45% (0% for Illinois Solar for All Distributed Generation sub-programs and 35% for Illinois Solar for All Low-Income Community Solar sub-program)**
  5. **Construction Financing**
    - a. Construction period of 6 months for residential, 12 months for non-residential distributed generation and community solar
    - b. Interest rate for construction debt of 8%
  6. **Community Solar specific assumptions**
    - a. Land Lease Cost of \$5/kWdc-yr
    - b. Property Tax Cost \$6,000/MWac-yr
  7. **Investment Tax Credit utilization rate currently set at 100%**
  
- **Feedback Request #4: Are there input assumptions important to the REC Price Modeling process not listed which should be collected for use in the 2025-2026 Program Year REC price update?**
  
- **Phase I survey will ask for input on how these values should be updated**
  - **Recommendations for how to collect this information?**

# Questions/Comments?

- **Request for feedback**

- <https://ipa.illinois.gov/content/dam/soi/en/web/ipa/documents/20241031-rec-price-model-cost-inputs-request-for-feedback-31-oct-2024.pdf>
- Due November 22, 2024
- Send to: [IPA.Solar@Illinois.gov](mailto:IPA.Solar@Illinois.gov)