



California Energy Commission

Title: Behind-the-Meter Distributed Generation Forecast Updates

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List of Acronyms and Initialisms

ATB – Annual Technology Baseline

BTM – Behind-the-Meter

BAU – Business as Usual

CapEx – Capital Expenditure

CEC – California Energy Commission

CPUC – California Public Utilities Commission

dGen – Distributed Generation Market Demand Model

DGStats – California Distributed Generation Statistics

KW – Kilowatt

IEPR – Integrated Energy Policy Report

ITC – Investment Tax Credit

LBNL – Lawrence Berkeley National Laboratory

MW – Megawatt

NBT – Net Billing Tariff

NEM – Net Energy Metering

NREL – National Renewable Energy Laboratory

PG&E – Pacific Gas and Electric

PV – Photovoltaics

R&D – Research and Development



Three Proposed Distributed Generation Scenarios

Applicability to Each Model

Scenario Lever	dGen	Standalone Storage	Title 24
Total System Load	✓	x	x
CAPEX Costs	✓	✓	x
Investment Tax Credit	✓	✓	x

Source: CEC Staff

Scenario Table

Scenario	CAPEX Costs	Investment Tax Credit
Low	Conservative	Ends in 2034
Mid	Moderate	Ends in 2034
High	Advanced	Extended to 2042

Source: CEC Staff



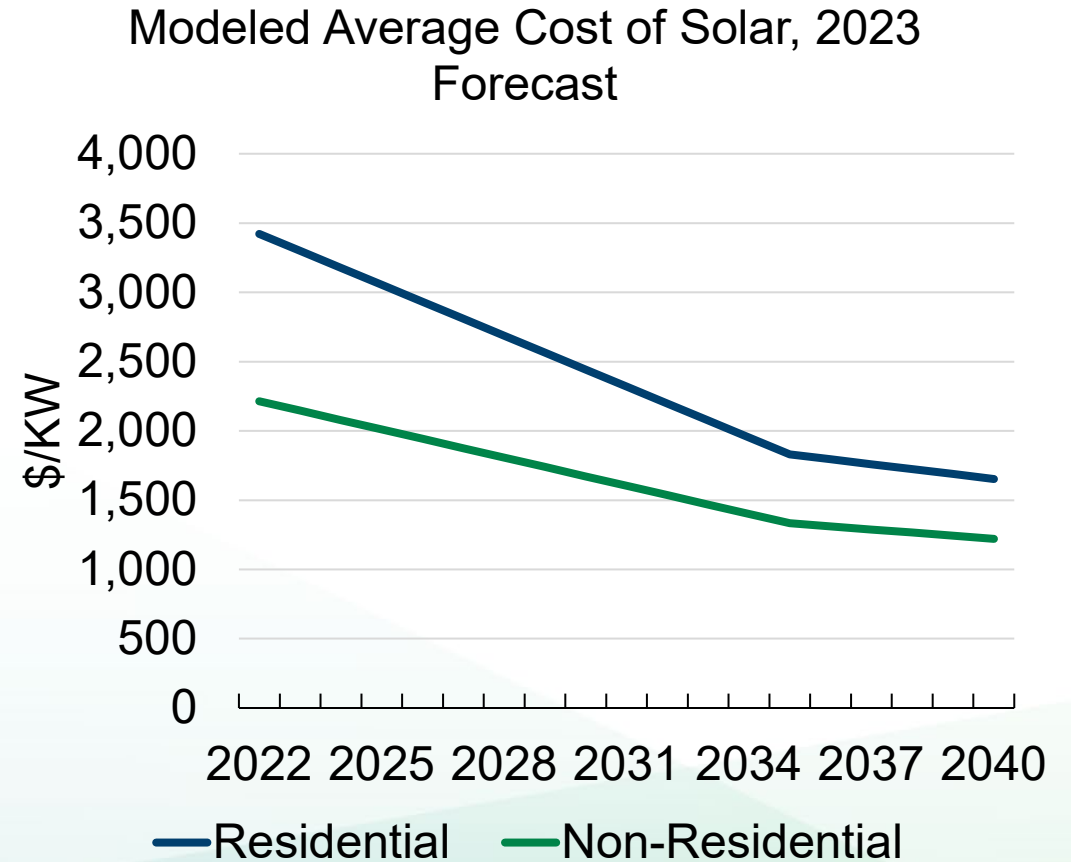
Title 24 Requirement Updates

- CEC's 2025 Building Energy Efficiency Standards are incorporated into this year's forecast
 - Updates will go into effect in 2026
- Nonresidential PV and storage requirements are based on:
 - Building type (e.g., retail, school, office, etc.)
 - Climate zone
 - Roof space
 - Conditioned floor area
- Proposed changes include:
 - Minor adjustment of building- and zone-specific constant (in watts per ft²) in calculations of requirements
 - Addition of new building types (Events & Exhibits, Sports & Recreation, Religious Worship)



2023 IEPR Base Year PV Costs

- 2023 IEPR: \$3.30/Watt base year cost for residential
- Applied NREL's ATB forecast to:
 - Estimate difference in cost per watt of residential and non-residential solar
 - Determine CapEx costs in forecast years

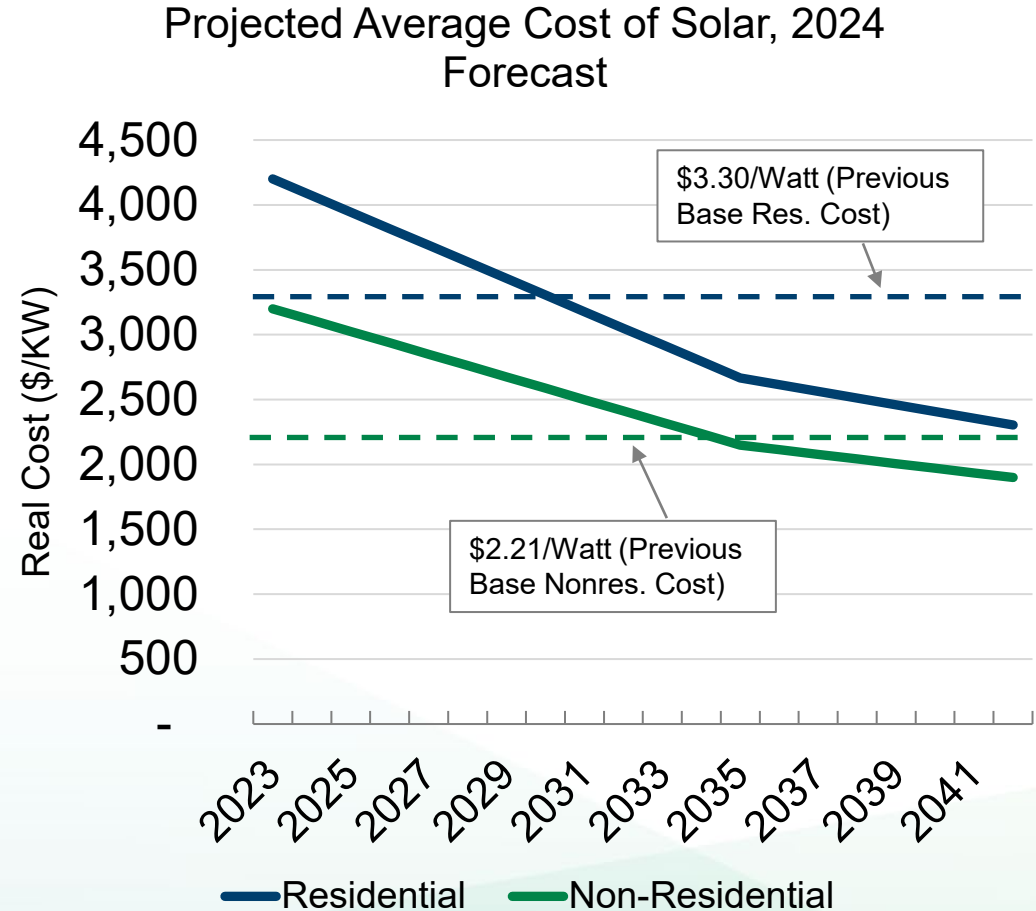


Source: CEC Staff



Updates to Base Year Technology Costs

- CPUC provided valuable input on PV costs
- 2024 base year cost derived from LBNL's Tracking the Sun data from DGStats
 - Real-world data
 - Incorporates all costs including installation and dealer markup
 - Updated annually
- IEPR base year cost (proposed)*
 - Residential: \$4.20/W
 - Nonresidential: \$3.20/W
- Only total cost is reported, meaning staff cannot isolate components of combined system cost or dealer markup
 - Data is self-reported; however, staff is confident in its accuracy at an aggregate level



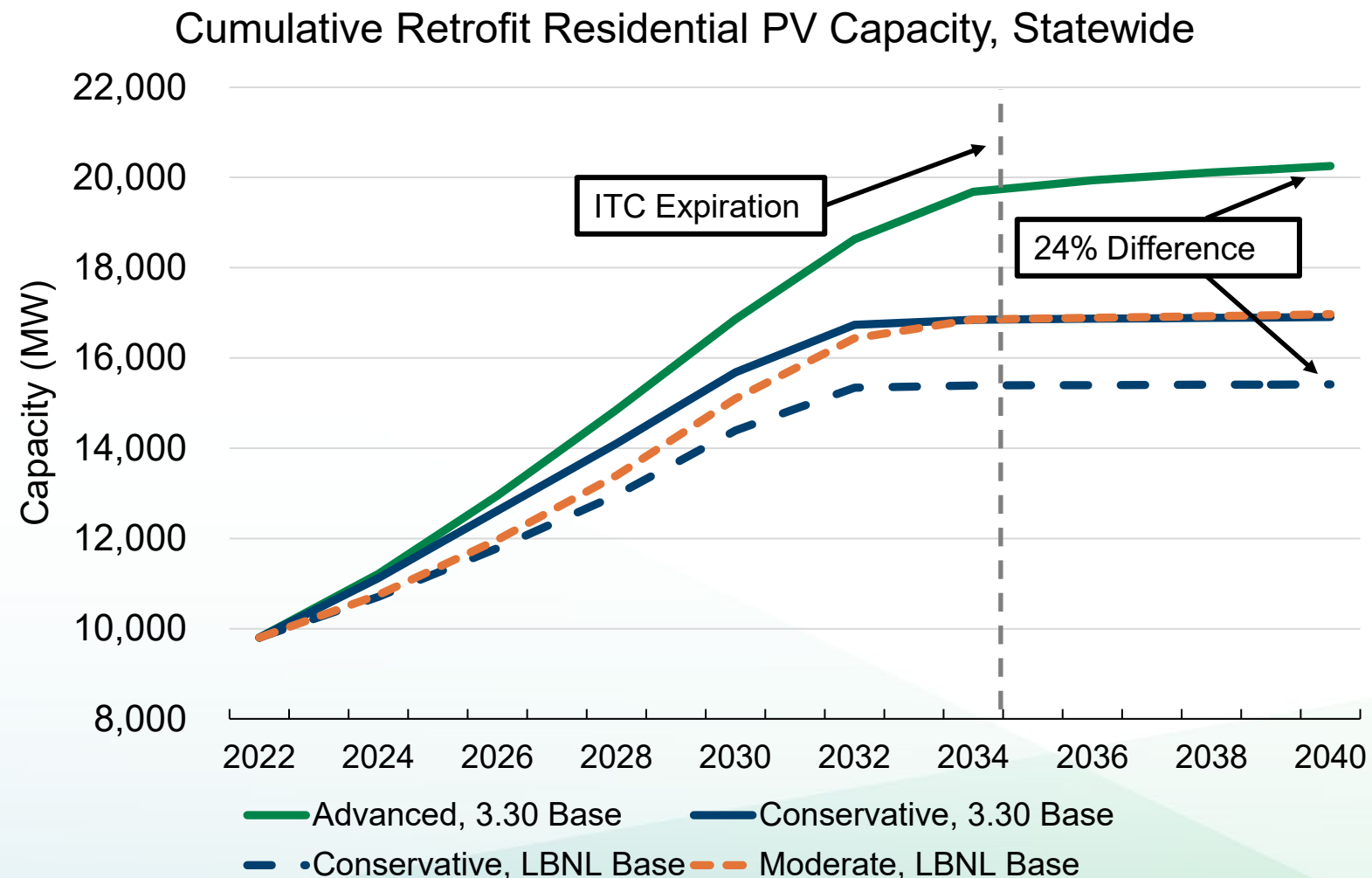
Source: CEC Staff

*Final values depend on Final Tracking the Sun report



Residential PV Cost Sensitivity Tests

- Forecast scenarios come from NREL's ATB forecast
- LBNL base scenarios use \$4.20/Watt



Source: CEC Staff



Cost Sensitivity Test Conclusions

- Base and future costs impact cumulative adoption
 - Conservative forecast is 9% lower than the moderate forecast in 2040
 - Moderate forecast is 9% lower than the advanced forecast in 2040
- Highlights importance of:
 - Soliciting input on cost assumptions
 - Inclusion of scenarios to capture uncertainty in future distributed generation costs



Questions and Next Steps

- Questions:
 - What PV and storage cost assumptions do you use?
 - Do you develop low and high adoption scenarios?
 - How do they compare to those shared by staff?
 - Are any additional modifiers considered?
- Next steps:
 - Please provide feedback on proposed changes to inputs and new scenarios
 - CEC staff will finalize new inputs and scenarios
 - Staff will develop
 - Draft forecast for review
 - Final forecast
 - Timeline for presenting results
 - DAWG Meeting (TBD)
 - IEPR Workshop (November)



Thank You!