



# 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



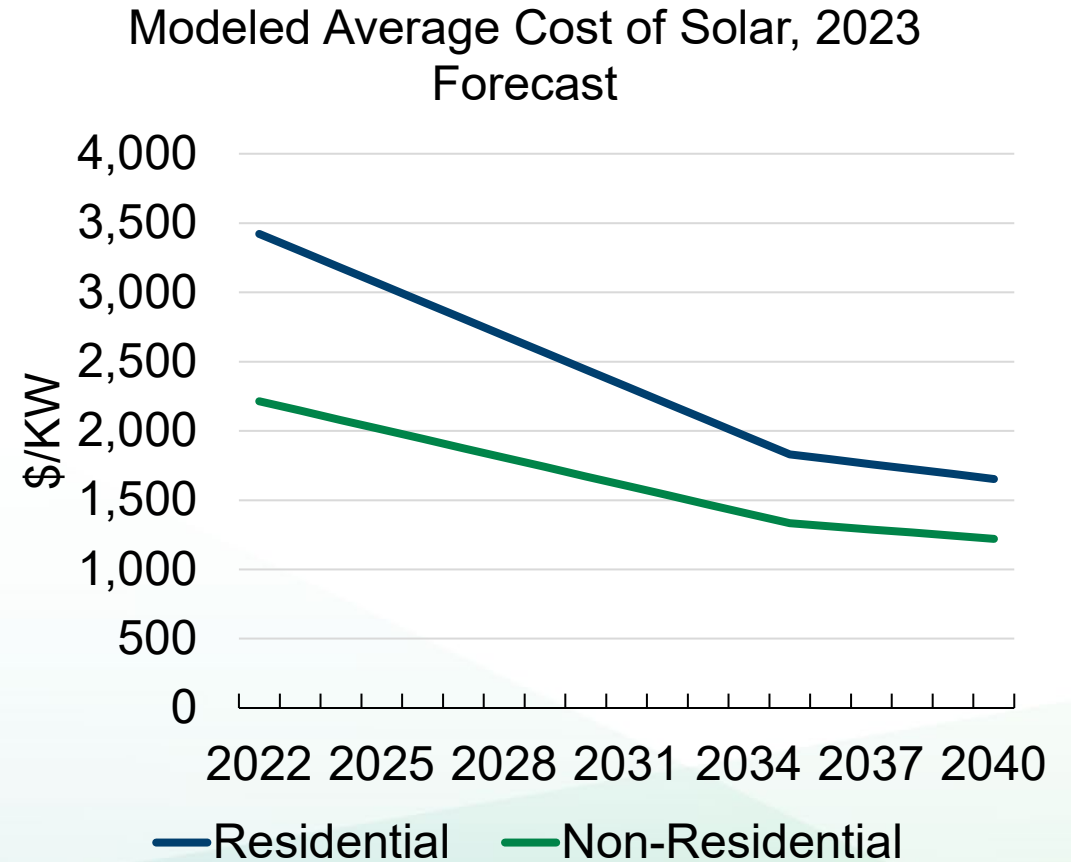
# Title 24 Requirement Updates

- 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 ft<sup>2</sup>) 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

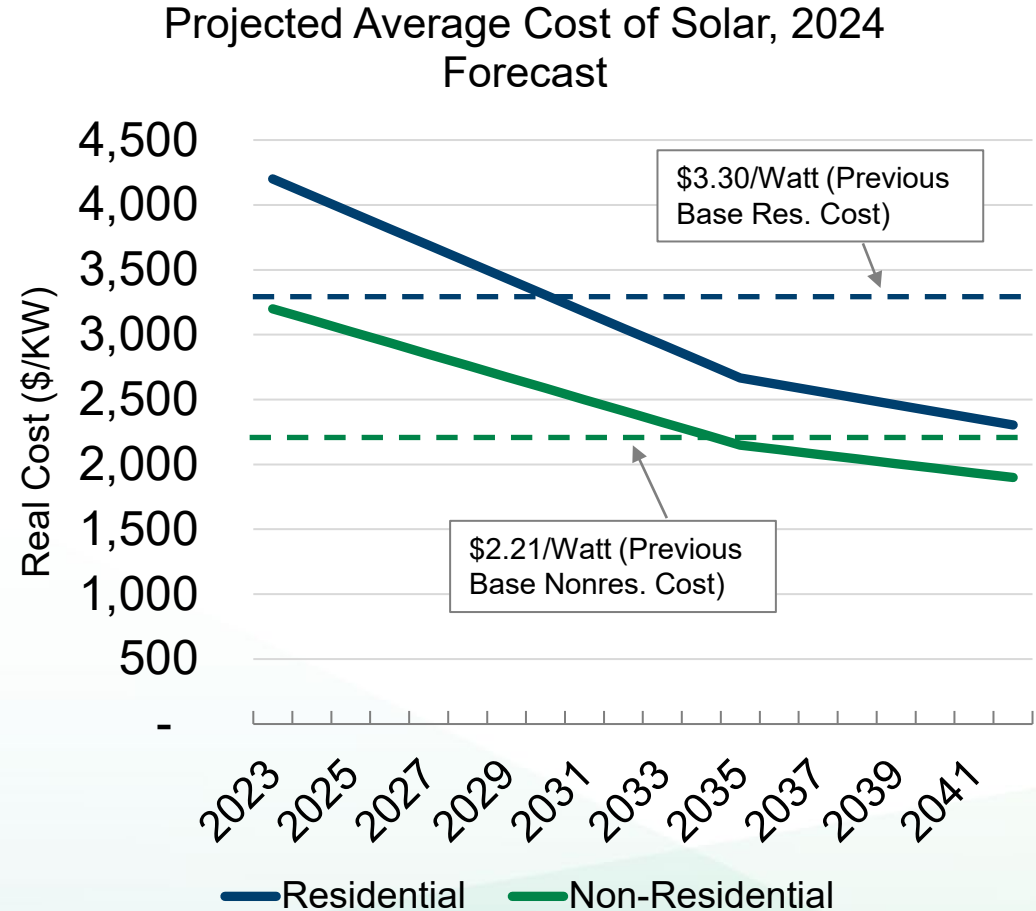


Source: CEC Staff



# 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



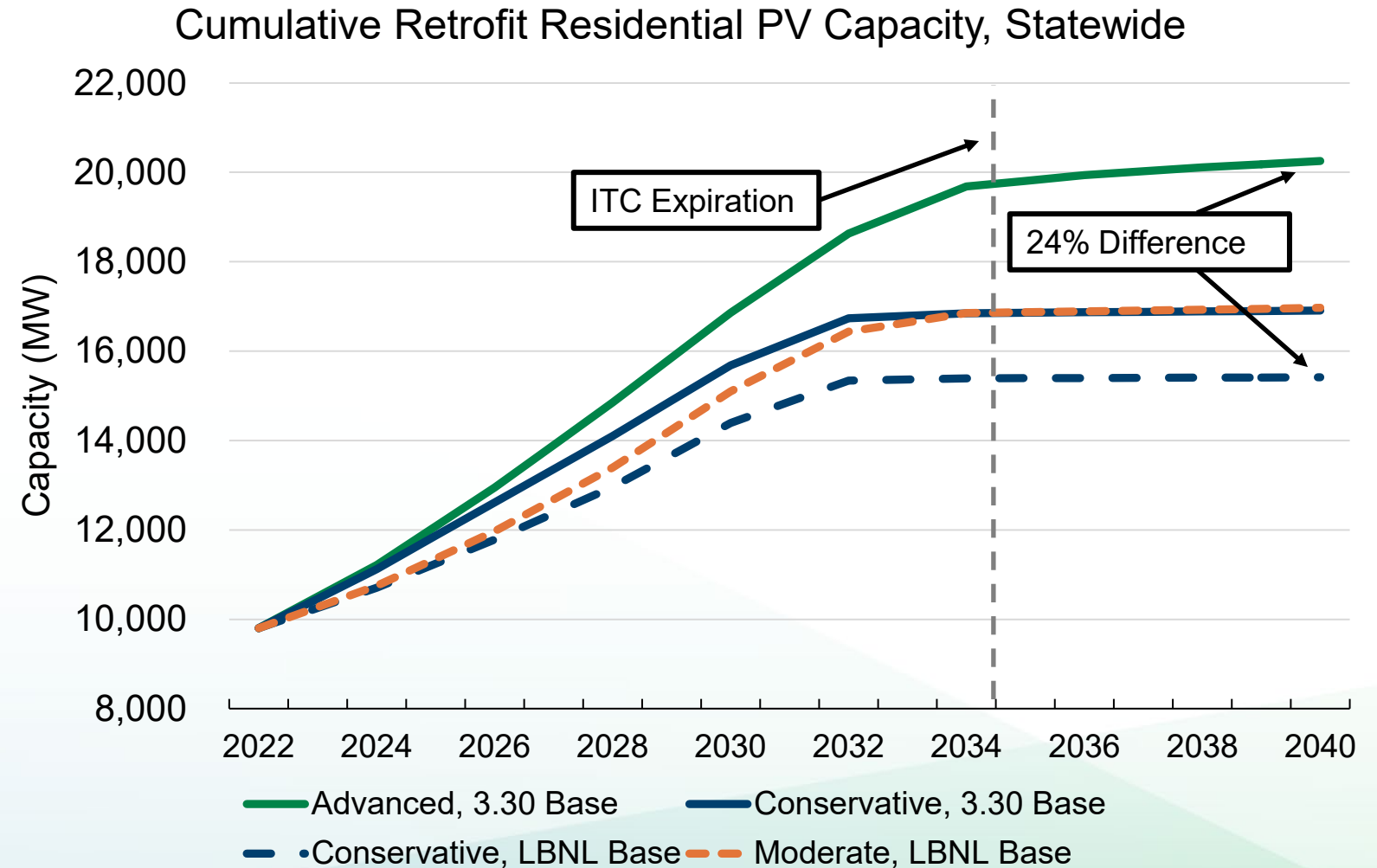
Source: CEC Staff

\*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!