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Distributed Generation Scenarios: Inputs and Assumptions

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August 26, 2025

List of Acronyms and Initialisms

ATB – Annual Technology Baseline
BTM – Behind-the-Meter
CapEx – Capital Expenditure
CEC – California Energy Commission
CHP – Combined Heat and Power
CPUC – California Public Utilities Commission
DG – Distributed Generation
dGen – Distributed Generation Market Demand Model
DGStats – California Distributed Generation Statistics
IEPR – Integrated Energy Policy Report
ITC – Investment Tax Credit
MW – Megawatt
NEM – Net Energy Metering
NREL – National Renewable Energy Laboratory
PV – Photovoltaics
R&D – Research and Development

Forecast Framing

Technologies & Metrics

Technologies

Solar PV

Energy Storage

Other Generation

- Fuel Cell CHP
- Gas Turbine
- Wind Turbine

Metrics

Capacity

- Future technologies adoption predicted from suite of modelling tools

Energy

- Annual and hourly impacts developed from technologies performance data

Source: CEC Staff

Forecast Updates

Drivers of Forecast Uncertainties

- Investment Tax Credit (ITC)
  - Eliminated in recent federal legislation
- Tariffs
  - Not expected to be included in forecast due to significant uncertainty
- NREL's Annual Technology Baseline (ATB) for BTM PV and storage

NREL ATB CapEx Forecast Scenarios

Cost Scenario	Technology	R&D Investment Levels
Conservative	Comparable to today	Decreasing
Moderate "Expected Level"	Current innovations widespread	Constant
Advanced	Theoretical innovations successful	Increasing

Source: CEC Staff

Tariff-Related Uncertainty

- **Volatility**
  - Proposed federal tariffs on materials used in DG technologies are frequently changing, creating costs uncertainty
- **Legal Uncertainty**
  - Enforceability unclear without Congressional approval
- **Operational Adaptation Challenges**
  - Not clear how companies would adapt to new tariffs
- **Supply Chain Dependence**
  - Companies rely on raw materials from China, especially for energy storage
  - Much solar manufactured in U.S. and less likely impacted by tariffs
    - As of 2024, annual domestic solar module manufacturing capacity > 26 GW

Distributed Generation Adoption Scenarios

Scenario	CapEx Costs	Storage Retrofit	ITC
Low	Conservative	None	None
Mid	Moderate	None	None
Mid (Plus ITC)	Moderate	None	Reinstituted in 2030
High	Advanced	NEM contract turnovers	None

Source: CEC Staff

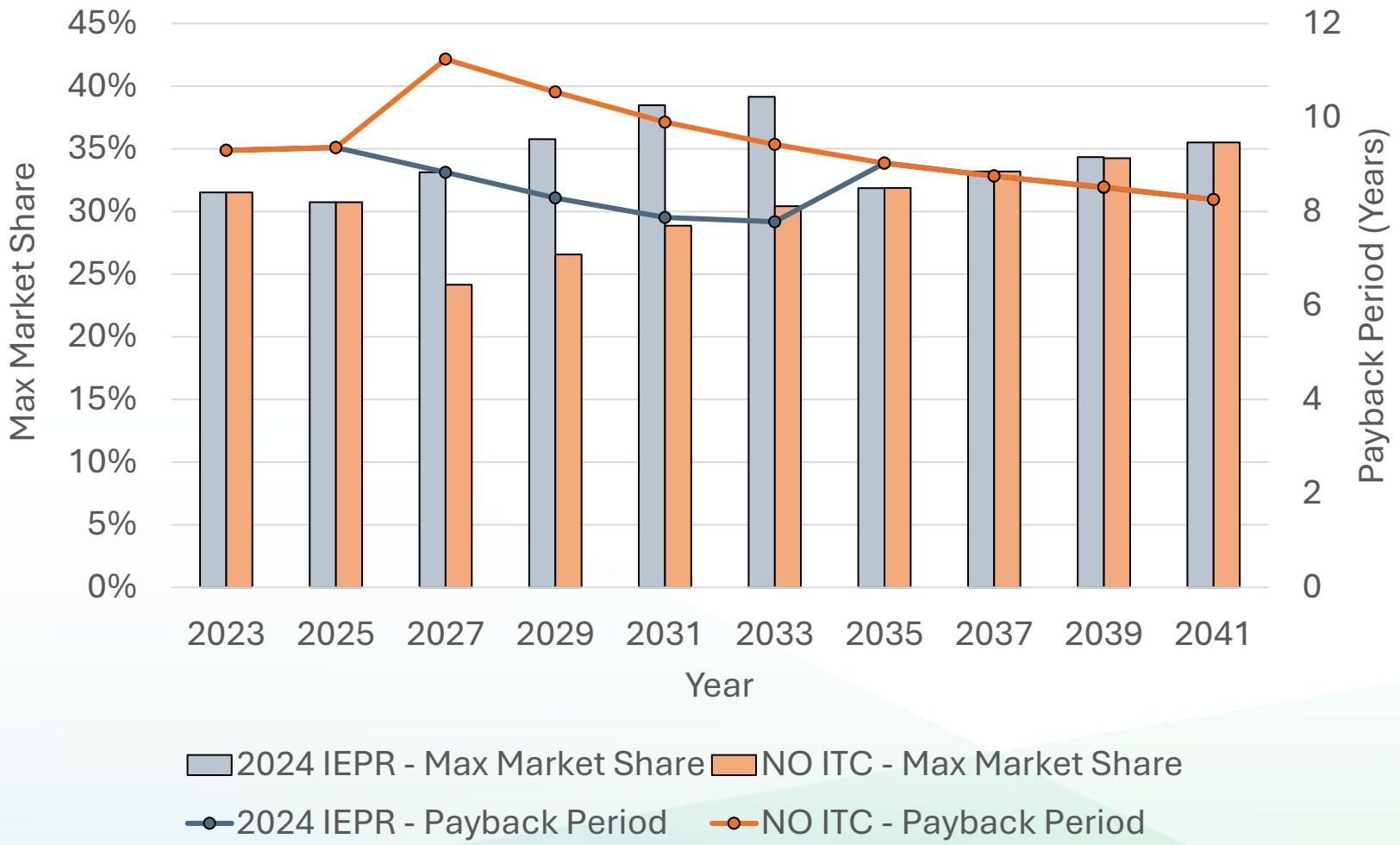
Evaluating ITC Policy Shift

ITC Testing Methodology

- Tested effect of ITC elimination using dGen model
- Model inputs unchanged from 2024 IEPR mid-case except for ITC-related inputs
  - ITC for non-residential storage included
- One of many changes for 2025 IEPR forecast
  - **Draft 2025 IEPR BTM DG forecast will be presented in October**

Residential Adoption Factors

- Max market share:
  - Nears 40% in 2024 IEPR
  - As low as 25% in No ITC run
- Discontinuation of ITC increases payback periods
  - Reduces max market shares and adopters
  - Payback period increases by ~2 years between 2025 and 2027

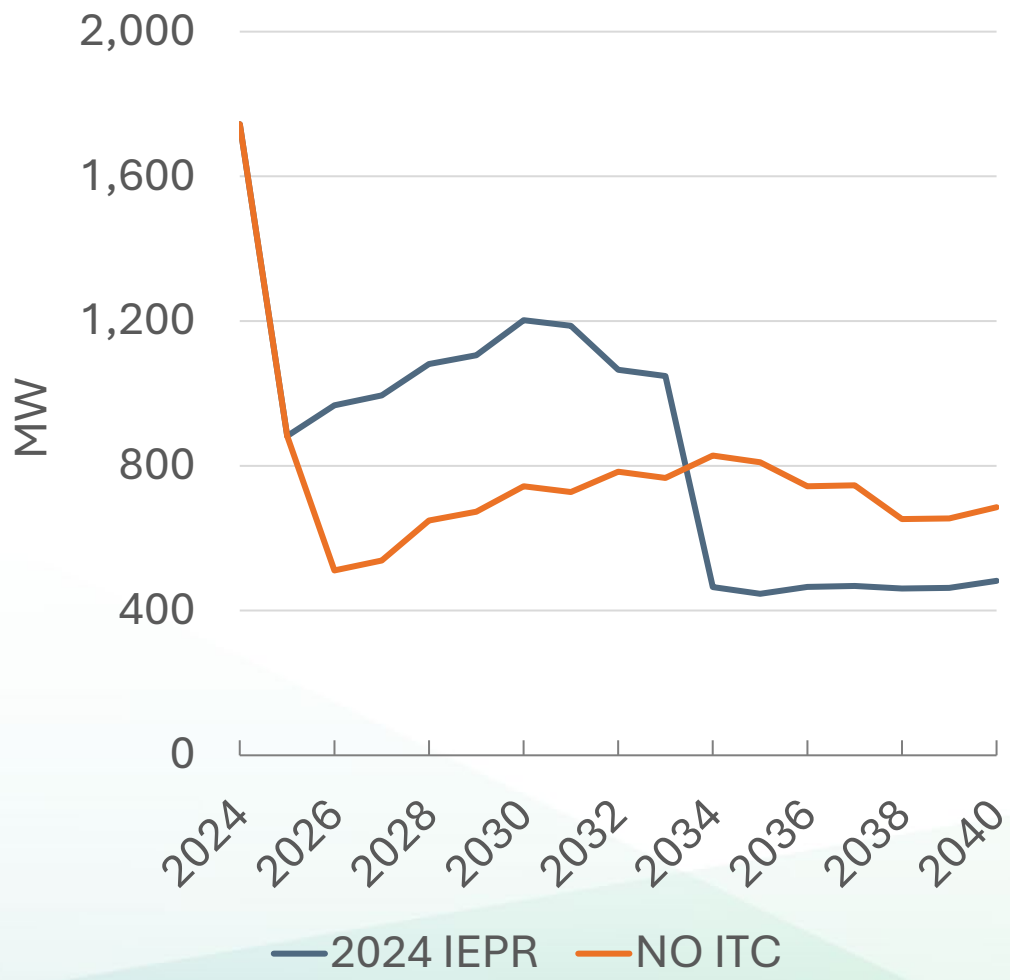


Source: CEC Staff

Statewide Annual PV Capacity Additions

Installations drop by 40% of 2024 IEPR until 2030

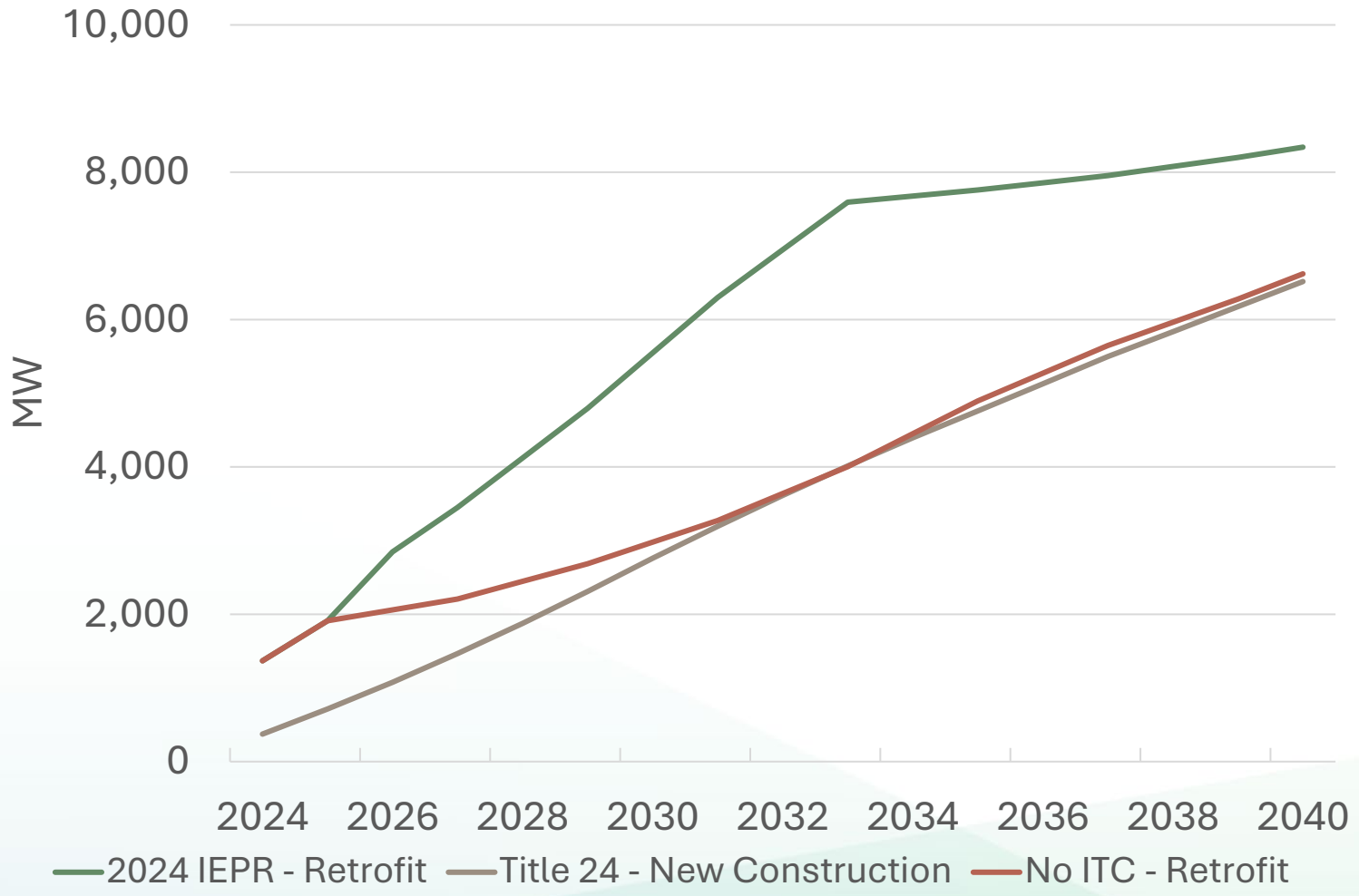
- Decrease from retrofit installations
- Title 24 installations remain constant



Source: CEC Staff

Statewide Cumulative PV Capacity Forecast

- In 2024 IEPR forecast, 55% of PV capacity attributed to retrofits
  - ➢ Without ITC, retrofit share drops to 50%
- Tests effect of ITC change
- **Not the 2025 IEPR forecast**



Source: CEC Staff

PV Adoption Comparison

Capacity Reduction in No ITC Scenario

Year	Cumulative Capacity Reduction	Cumulative Forecast Capacity Reduction
2028	7.3%	27.9%
2034	11.1%	26.7%
2040	5.4%	11.6%

Note: Left column includes hist. capacity; right does not

Source: CEC Staff

Annual PV Growth Rate

Time Frame	2024 IEPR	No ITC
2025-2033	4.8%	3.1%
2034-2040	1.2%	2.6%

Source: CEC Staff

Thank You!