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Behind-the-Meter Distributed Generation Scenarios: Inputs and Assumptions

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Abbreviations

ATB – Annual Technology Baseline

BTM – Behind-the-Meter

CEC – California Energy Commission

CHP – Combined Heat and Power

DG – Distributed Generation

dGen – Distributed Generation Market
Demand Model

DGStats – California Distributed
Generation Statistics

DoF – Department of Finance

IEPR – Integrated Energy Policy Report

ITC – Investment Tax Credit

IMD – Interval Meter Data

NEM – Net Energy Metering

NLR – National Laboratory of the Rockies

PV – Photovoltaics

SB – Senate Bill

SGIP – Self-Generation Incentive Program

TPO – Third-Party Owned



Forecast Framing



BTM Technologies & Metrics

Technologies

Solar PV

Energy Storage

Other Generation
Examples

- Fuel Cell CHP
- Gas Turbine
- Wind Turbine

Metrics

Capacity

- Future technologies adoption predicted using a suite of modelling tools

Energy

- Annual and hourly impacts developed from technologies performance data



BTM Distributed Generation Forecasts

Economics Based Adoption Forecast

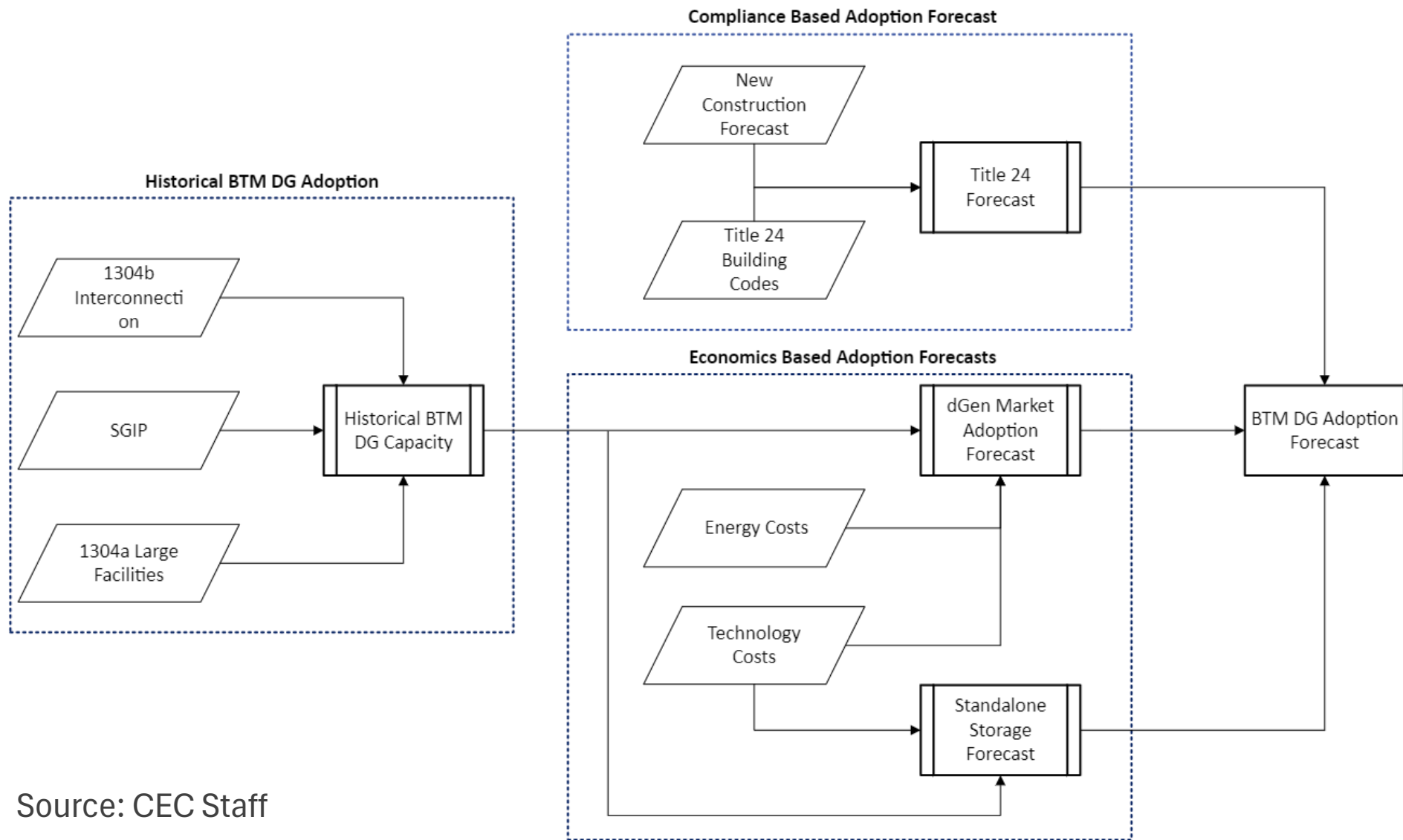
- Program requirements and economics related to BTM DG adoption are factored into the forecast

Compliance Based Adoption Forecast

- Adheres to Title 24 and does not account for program requirements or the economics associated with BTM DG adoption



BTM DG Adoption Modelling Architecture



Source: CEC Staff



BTM Distributed Generation Adoption Scenarios

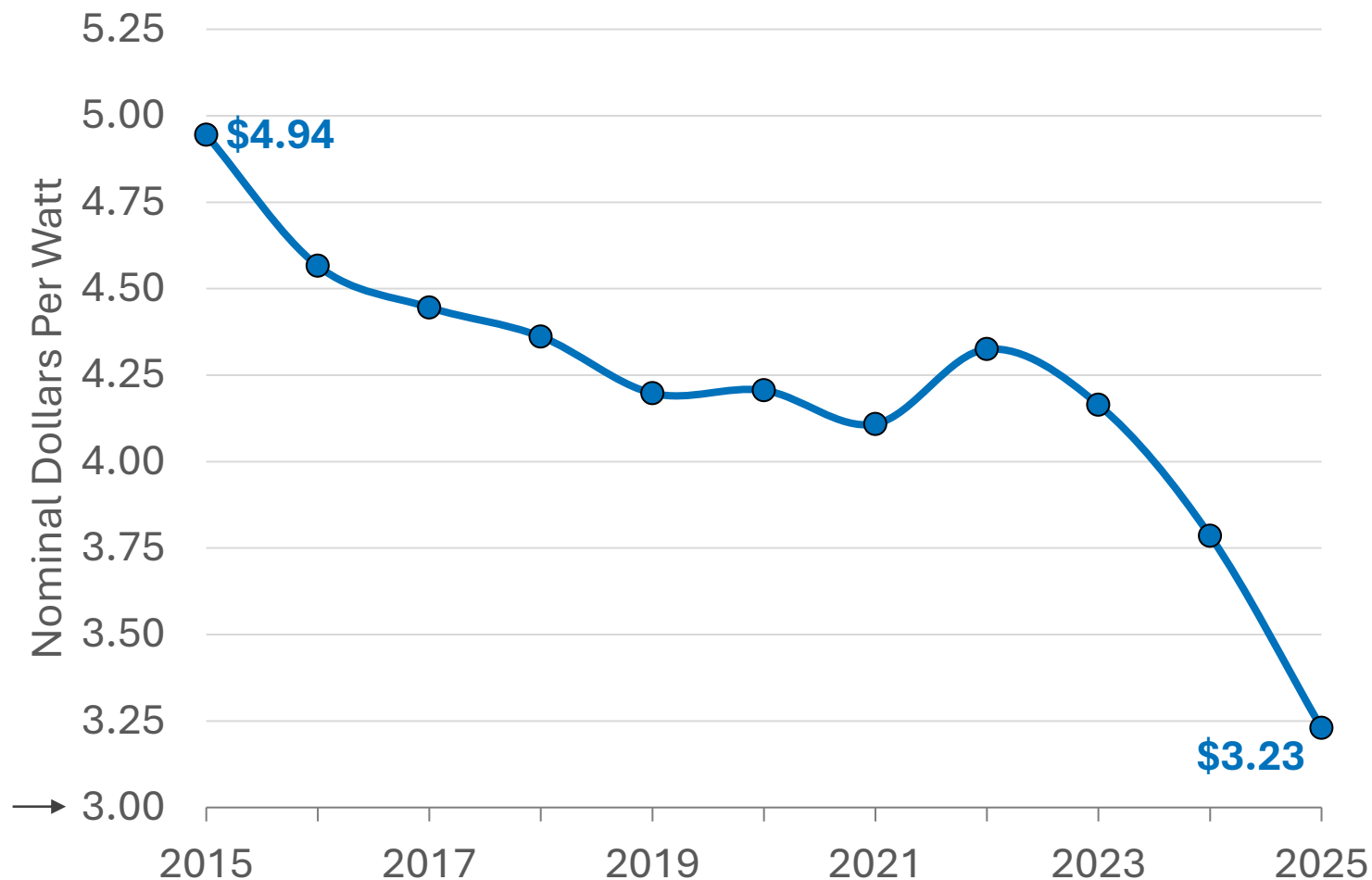
Scenario	CapEx Costs	Storage Retrofit	ITC
Low	Conservative	None	None
Mid	Moderate	None	None
Mid (Plus ITC)	Moderate	None	Reinstituted 2030-2040
High	Advanced	NEM contract turnovers	None



Forecast Updates



Historical Residential PV Installation Cost



- Uses latest data from DGStats program for base year technology costs
 - Average residential PV costs have decreased by ~\$0.50/Watt in past year

Source: CEC Staff analysis of DGStats interconnected project sites data

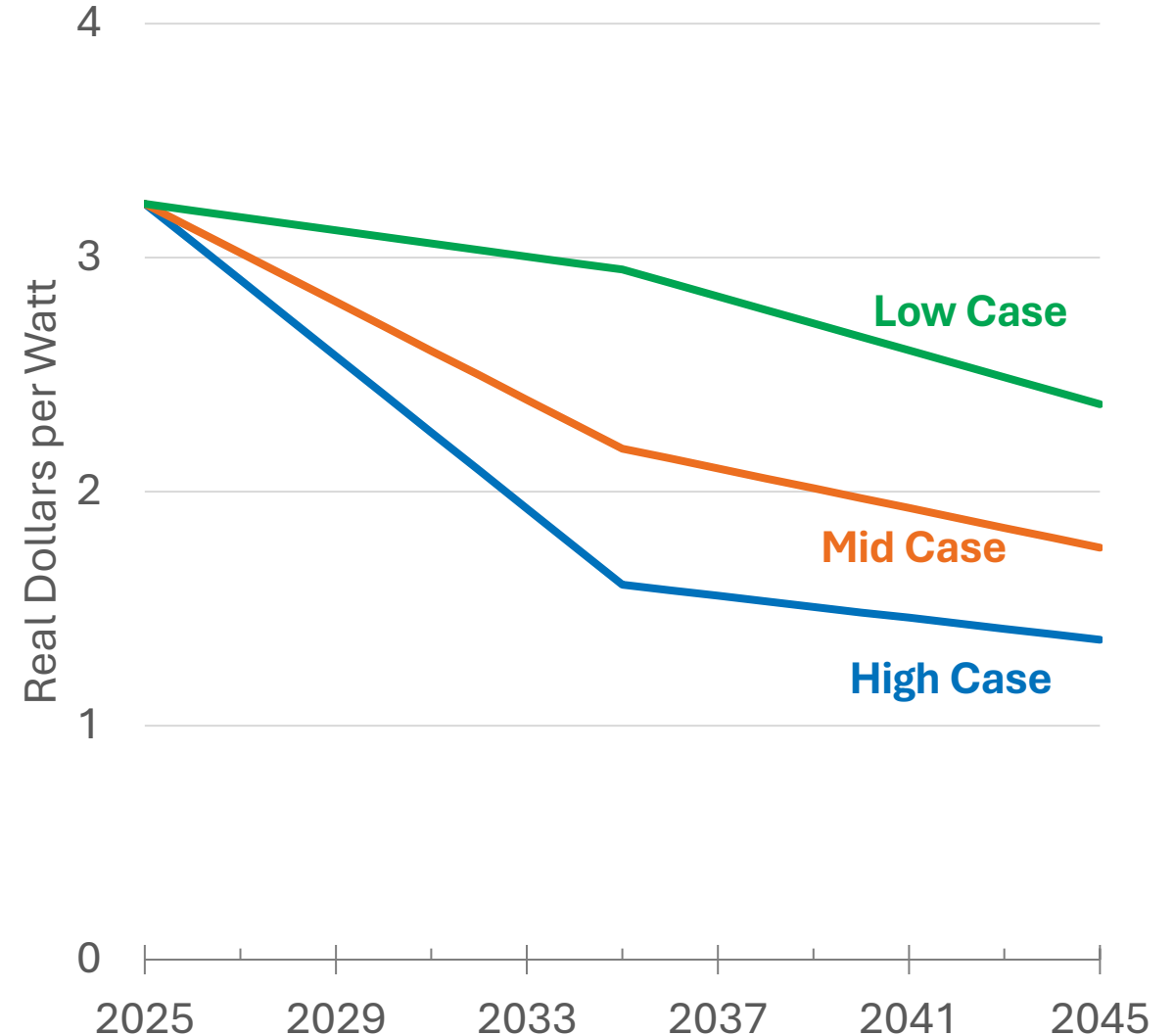


Residential PV Installation Cost Forecast

- Using NLR 2024 ATB to calculate future costs
- Mid case annual cost reductions
 - 10¢/Watt through 2035
 - 4¢/Watt after 2035

Year	Low Case	Mid Case	High Case
2035	\$2.90	\$2.20	\$1.60
2045	\$2.37	\$1.76	\$1.37

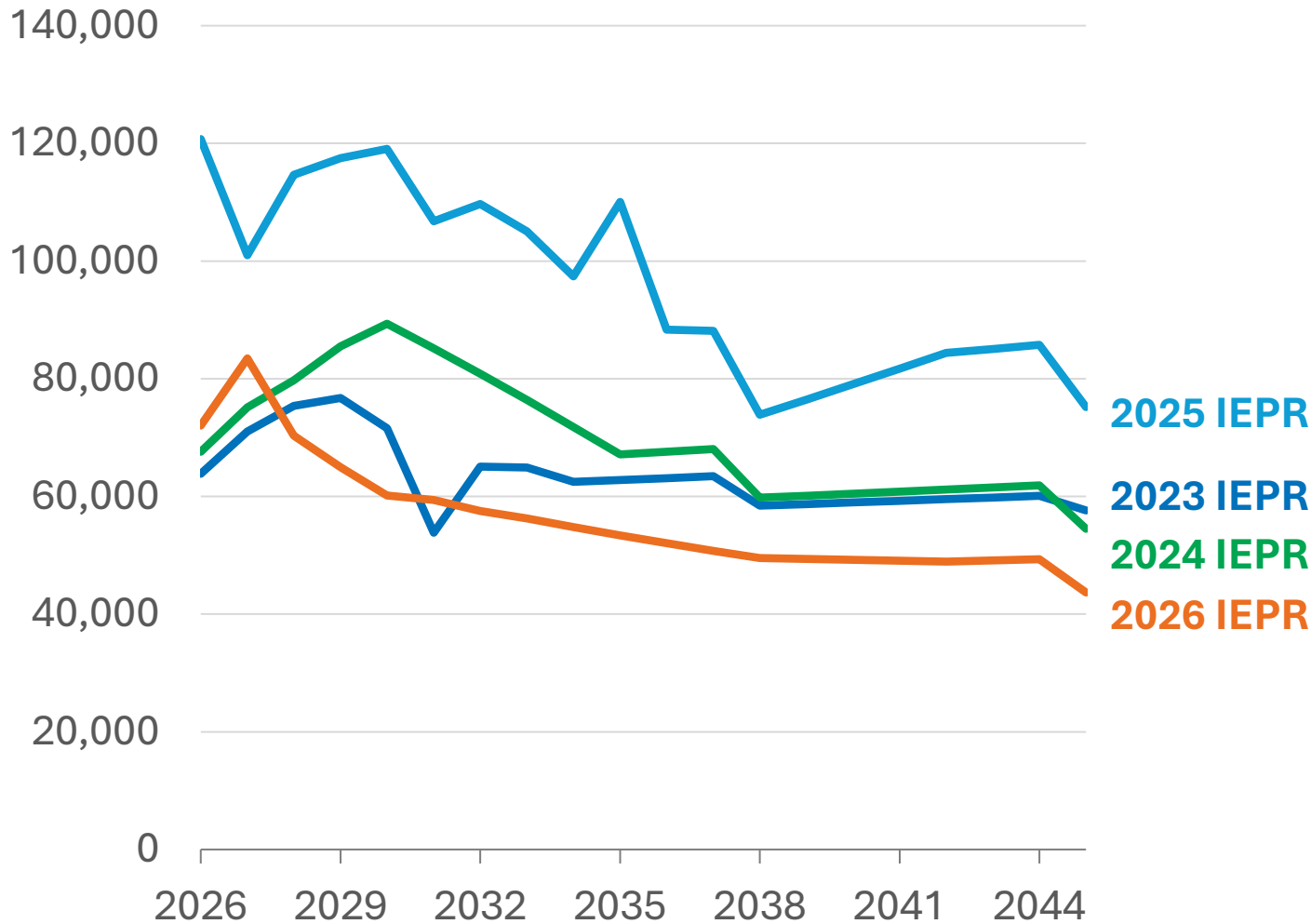
Source: CEC Staff



Source: CEC Staff



Housing Completions Forecast



- 42% reduction in single-family housing compared to 2025 IEPR
 - Equates to 800,000 fewer homes by 2045
 - Decrease due to lower growth rate in DoF households
- Downward adjustment in Title 24 PV installations for 2026 IEPR



Policy Landscape – BTM PV and Energy Storage

- Removal of ITC for residential-owned PV in 2025 IEPR led to substantial reduction in BTM PV and storage adoption forecast
 - Congress has introduced multiple bills (Energy Bills Relief Act, American Energy Dominance Act) proposing to reinstate energy incentives such as ITC
 - Not expected to pass during current administration
 - Indicates policymakers' interest in reviving ITC
- SB 868, currently in state legislature
 - Would create a pathway for renters and multi-family households to reduce their energy bills with PV by:
 - Streamlining approvals for plug-in solar systems
 - Allowing customers without existing NEM agreements to install plug-in solar
 - Plug-in solar not currently part of IEPR forecast
- Tariffs not currently part of forecast due to uncertainty



Future Model Enhancements

- Ongoing contract with Verdant Associates, LLC to improve capabilities of dGen
 - Specific to economics-based retrofit adoption forecast
- Planned improvements include:
 - dGen Agent Refinement
 - Use IMD to enhance representation of diverse electricity customers
 - Market Dynamics Assessment
 - Assess effectiveness of parameters that determine adoption rates within model, including bass diffusion coefficients and maximum market shares
 - Enable Modeling of Leased vs. Customer-Owned Systems
 - Technology Cost Refinements
 - Capture regional diversity in BTM PV and energy storage costs
 - Predicting Storage Attachment Rates
 - Enhance attachment rate forecasting to reflect observed data more accurately



Thank You!

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