



2026 IEPR Additional Achievable Energy Efficiency and Fuel Substitution Load Modifiers

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Acronyms, Initialisms, and Abbreviations

- **AAEE** – Additional Achievable Energy Efficiency
- **AAFS** – Additional Achievable Fuel Substitution
- **AQMD** – Air Quality Management District
- **C** – Cooking
- **CARB** – California Air Resources Board
- **CD** – Clothes Drying
- **CEC** – California Energy Commission
- **Com** – Commercial
- **EB** – Existing Buildings
- **EE** – Energy Efficiency
- **FS** – Fuel Substitution
- **FSSAT** – Fuel Substitution Scenario Analysis Tool
- **GT** – Gradual Transformation
- **IEPR** – Integrated Energy Policy Report
- **NC** – New Construction
- **PAR** – Proposed Amended Rule
- **PG&E** – Pacific Gas and Electric
- **PiCS** – Programs and incremental Codes and Standards
- **Res** – Residential
- **ROB** – Replace on burnout
- **RP** – Residential Propane
- **SCE** – Southern California Edison
- **SDG&E** – San Diego Gas and Electric
- **SH** – Space Heating
- **SIP** – State Implementation Plan
- **SP** – Scoping Plan
- **T24** – Title 24 California Building Standards Code
- **WB** – Workbooks
- **WH** – Water Heating
- **ZE** – Zero-emission



Overview of AAEE and AAFS



What are AAEE & AAFS Load Modifiers?

Additional Achievable EE savings and FS impacts capture a range of incremental market potential impacts beyond what is included in the baseline demand forecast, but they are within the range of what is reasonably expected to occur

Label	Description
PiCS AAEE	AAEE savings from PiCS. Modeled using PiCS tool and workbooks.
PiCS AAFS	AAFS impacts from PiCS. Modeled using PiCS tool and workbooks.
ZE AAFS	AAFS impacts from zero-emission (ZE) appliance adoption above and beyond those realized in the PiCS AAFS scenarios. Modeled via Fuel Substitution Scenario Analysis Tool (FSSAT).



How Do AAEE & AAFS Modify Demand

- Both **AAEE** and **AAFS** reduce gas consumption
- While **AAEE** also reduces electricity consumption, **AAFS** increases electricity consumption
- Thus, AAEE has “savings” and AAFS has “impacts”

		Load Modifier	Modeled by	Gas Consumption	Electricity Consumption
AAFS {	PiCS AAFS	EE/FS PiCS Tool & WBs	Decreases	Increases	
	ZE AAFS	FSSAT	Decreases	Increases	
	AAEE	EE/FS PiCS Tool & WBs	Decreases	Decreases	



2026 IEPR Modeling Updates



The 2026 AAEE & AAFS scenario framework remains relatively unchanged since 2025

- According to the [Heat Pump Partnership](#), at least 2.3M heat pumps were installed in California as of April 2026
- Evolving policies since the 2025 IEPR
 - CARB [Clean Space and Water Heater Standards](#)
 - Amendments to the AQMDs' zero-NOx Standards
 - Local jurisdictions and reach codes
- For 2026 IEPR, use the 2025 AAEE & AAFS framework, which remains relatively unchanged
 - No updates to PiCS AAEE and PiCS AAFS – not updated in even years
 - Subtle assumption updates to ZE AAFS
 - FSSAT industrial electrification for AAFS Scenario 6

Summary of 2026 AAEE & AAFS Updates

No Updates

PiCS AAEE

PiCS AAFS

Minor Updates

ZE AAFS
(Res & Com)

Major Updates

FSSAT
industrial
electrification
for AAFS 6

Staff is planning major model and scenario framework updates for the 2027 IEPR



ZE AAFS: Policy Modeling Updates

South Coast AQMD: Keep PAR 1146.2 the same

- NC: 2028 Com Water Heating
- *ROB: 2031 Com Water Heating*

CEC staff made simplifying assumptions on equipment sizing impacts in FSSAT

Bay Area Air District

- Keep PAR 9-4 the same
 - NC/ROB: 2029 Res & Com Space Heating
- Revise PAR 9-6
 - NC/ROB: 2028 Res (Single-family) Water Heating
 - *NC/ROB: 2033 Com and Res (Multi-family) Water Heating*
 - Exempt Low-Income

2031 & 2033 compliance dates superseded by CARB's earlier concept of their SH & WH Standard

CARB

- 2025 IEPR adoption scheme for CARB's earlier concept of their space and water heater standard and CARB scoping plan



ZE AAFS Additional Modeling Updates

Federal

- Maintain “highly-weighted” efficiency for all residential electric water heater replacements
- Remove residential electric water heater replacements starting in 2029

Baseline Demand Forecast

- Incorporate final version of the 2025 IEPR baseline demand forecast

Industrial Fuel Substitution – discussed separately

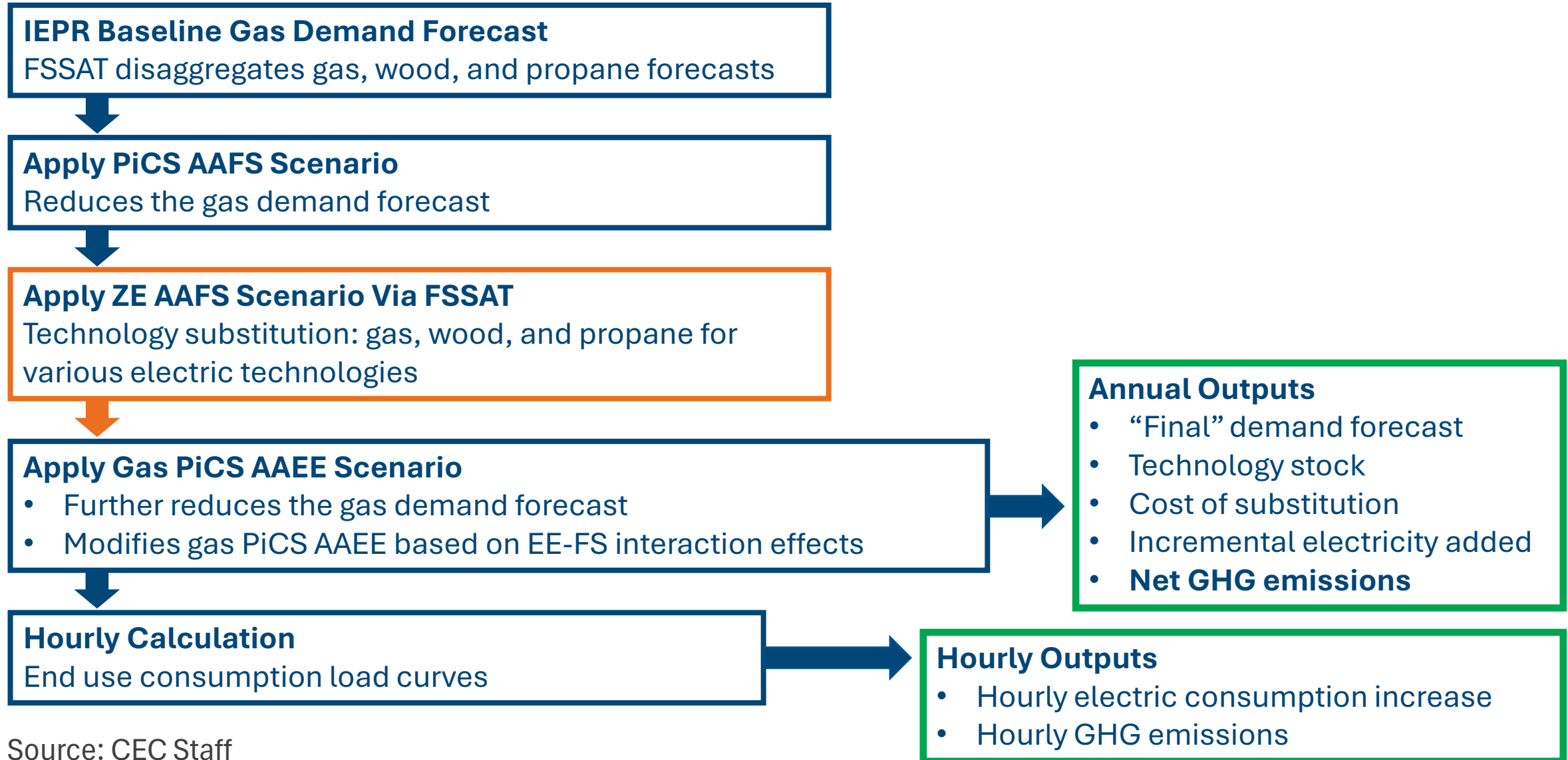
- Use FSSAT’s improved Industrial & Agricultural module
- Include in AAFS scenario 6



Residential and Commercial ZE AAFS Modeling



FSSAT main processes flow chart





2026 AAFS Proposed Scenario Characterizations (Same as 2025)

AAFS Component	AAFS 1	AAFS 2	AAFS 3	AAFS 4	AAFS 5	AAFS 6
PiCS AAFS	1	2	3	4	5	6
ZE AAFS	1	2	3	4	5	6
End Uses	SH & WH	SH & WH	SH & WH	SH & WH	SH, WH, C, CD	SH, WH, C, CD
Substituted Fuel Types	Gas	Gas	Gas	Gas	Gas	Gas & RP
NC (Beyond PiCS T24)	No	No	No	100% in 2029	100% in 2029	100% in 2029
Statewide EB	GT 50% by 2040	GT 100% by 2040	CARB SP 100% Targets	SIP linear to 100% by 2030	SIP linear to 100% by 2030	SIP linear to 100% by 2030
Bay Area PAR 9-4 & 9-6	No	No	Yes	Yes	Yes	Yes
South Coast PAR 1146.2	No	No	Yes	Yes	Yes	Yes

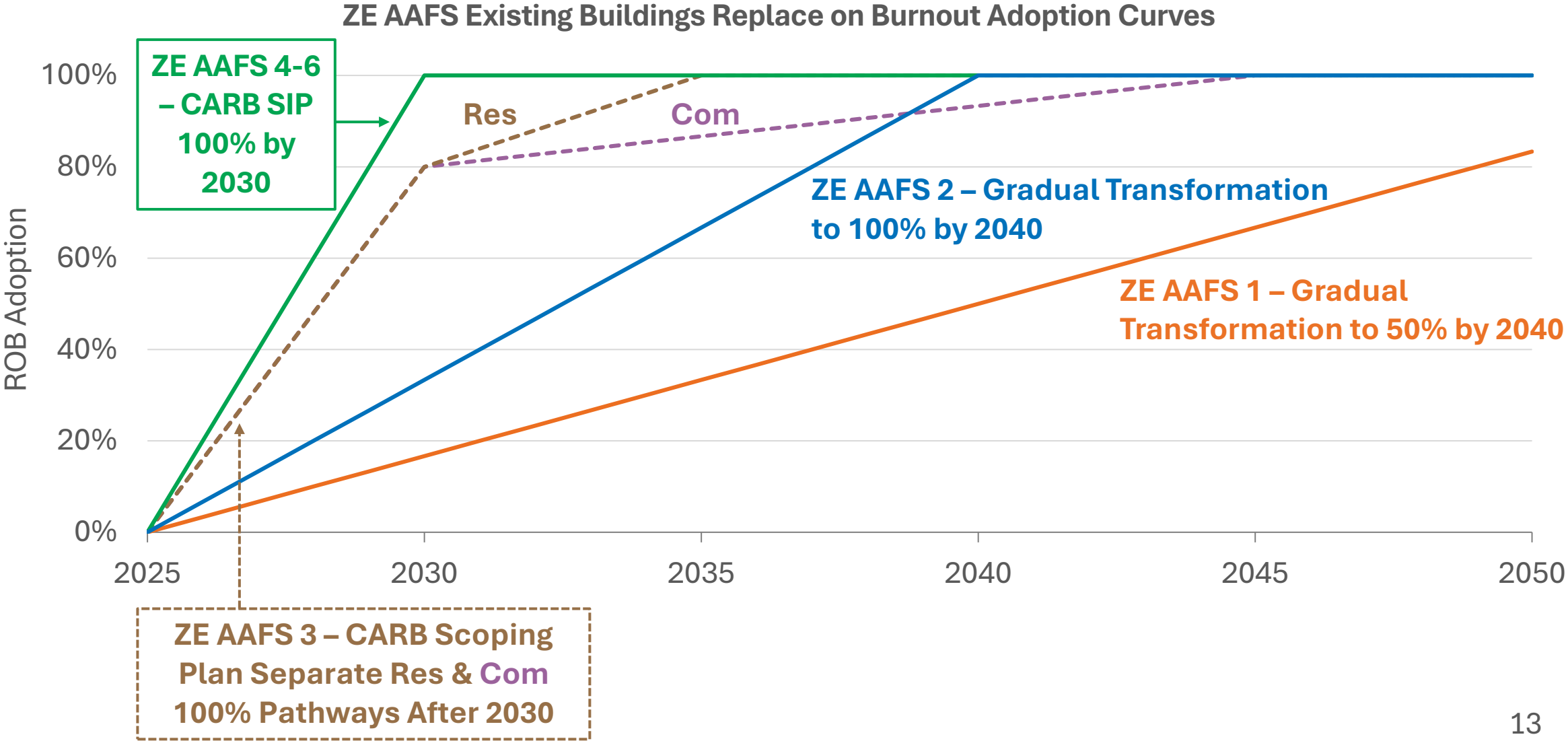
Table Abbreviations

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- **T24** – Title 24
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Note: AAFS scenario impacts are the sum of the PiCS AAFS and ZE AAFS Scenario impacts modeled by FSSAT. FSSAT finalizes gas AAEE savings based on the AAFS effect on available gas in AAEE.



Proposed 2026 AAFS Scenario Replace-on-Burnout Adoption Curves





Future Modeling



Considerations for 2027 IEPR

Overhaul of Scenario Characterizations

- Model CARBs revised clean space and water heater standards
- Review new or revised local air district rules
- Expand Industrial and Agricultural modeling into additional AAFS scenarios

FSSAT Structural Improvements

- Improve FSSAT's appliance stock accounting
- Refine tool's annual adoption methodology

Refresh Data Inputs

- 2027 IEPR Demand and Building Forecasts



Thank You!

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Appendix



How Can AAEE & AAFS Coordinate

- Need to consider which combinations of AAEE and AAFS scenarios are compatible with each other given total gas displacement potential and program funding sources
- **AAEE scenarios** can be separated by fuel (electricity vs. gas)
- **AAFS scenarios** are necessarily coupled

					AAFS {
Order of Operations	Load Modifier	Gas Consumption	Electricity Consumption	Dual or Separate Impacts?	
1	PiCS AAFS	Decreases	Increases	Dual Gas and Electric Impacts	
2	ZE AAFS	Decreases	Increases	Dual Gas and Electric Impacts	
3	AAEE	Decreases	Decreases	Savings can be Separated	