

DOCKETED

Docket Number:	26-IEPR-03
Project Title:	Electricity and Gas Demand Forecast
TN #:	272221
Document Title:	Presentation - Industrial Electrification Modeling in AAFS 6
Description:	5B. Jonathan Margoliash, CEC
Filer:	Raquel Kravitz
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	8/28/2026 7:56:58 AM
Docketed Date:	8/28/2026



Industrial Electrification Modeling in AAFS 6

Jonathan Margoliash, Decarbonization and Grid Integration Specialist
Energy Assessments Division
August 31, 2026



Abbreviations

AAFS – Additional Achievable Fuel Substitution

AAFS 6 – Additional Achievable Fuel Substitution Scenario 6

Ag – Agricultural Sector

AQMD – Air Quality Management District

CEC – California Energy Commission

DS – Demand Scenarios

FS – Fuel Substitution

FSSAT – Fuel Substitution Scenario Analysis Tool

GHG – Greenhouse Gas

IEPR – Integrated Energy Policy Report

IMD – Interval Meter Data

Ind – Industrial Sector

IRA – 2022 Inflation Reduction Act

NAICS – North American Industry Classification Standards

PiCS – Programs and incremental Codes and Standards



Overview

- Background
 - Rationale
 - Relationship to existing forecast components
- Industrial AAFS 6
 - Origins in the 2023 Demand Scenarios Project
 - Policy basis
 - Modeling details
- Plans for future forecast cycles



Background



Rationale

Increasing Potential from Market and Policy Drivers

- 2025's base forecast ([State Form 1.1](#)) suggests little change in industrial gas use through 2045
- Existing AAFS scenarios model very little (<1%) industrial electrification
- Growing policy interest and technological development

Stakeholder Comments

- Growing demand for industrial electrification
- Need for AAFS scenarios to consider a broader range of plausible market and policy outcomes



Fitting the FSSAT Ag & Industrial Module into the IEPR Forecast

IEPR Ag & Ind Gas Baseline Demand Forecast



PiCS Additional Achievable Fuel Substitution Scenario
Reduces consumption of Ag & Ind gas



FSSAT Ag & Ind Fuel Substitution Module (Electricity or Hydrogen)

- Characterize and Split Ind thermal end uses
 - Process Heat-Low (electricity)
 - Process Heat-High (H₂)
 - Water Heating (electricity)
- Apply estimates from H₂ production & transport
- Calculate fuel substitution potential



PiCS Additional Achievable Energy Efficiency Scenario
Further reduces consumption of Ag & Ind gas



Hourly Outputs

Load profiles based on NAICS codes
(now based on IMD)



Annual Outputs

- Final managed forecasts
- Incremental electricity added from FS and onsite H₂ production
- Hydrogen demand
- Avoided gas consumption
- Net GHG emissions
- *Cost of substitution*



2026 IEPR: AAFS Scenario 6 Proposal



Revisiting 2023's Demand Scenarios

2023 Demand Scenarios Project (published in 2026)

- Industrial electrification framework and scenarios
- Modeling module in FSSAT

Policy Basis

Key Legislation	IRA Incentive Names and Descriptions
The 2020 Infrastructure Investment and Jobs Act	48C Manufacturing Tax Credit: \$1.2 billion for industrial decarb (<u>largely remains</u>)
The 2022 Inflation Reduction Act (IRA)	Advanced Industrial Facilities Deployment Program: \$5.8 billion (<u>rescinded</u>)

2026 Forecast: Industrial AAFS 6 to incorporate 2023 Demand Scenarios modeling

2027 Forecast: Additional updates and improvements



Industrial AAFS 6 Scenario

- AAFS 6 will emulate the 2023 Demand Scenarios Project's enhanced policy scenario using
 - Only the industrial sector
 - Only the electrification portion (no hydrogen fuel substitution)
 - With a 50% discount due to changes in federal policy since 2023



Industrial AAFS 6 Step 1

Split industry into 46 subsectors. For each subsector:

- Characterize % of gas used for thermal end uses¹
- Split thermal gas usage by temperature²
- Assume a conversion factor for each temperature range

Temperature Range	≤100°C	100-200°C	≥200°C
Name in the report	Water heating	Process Heat-Low	Process Heat-High
Conversion Factor (kWh/therm)	12.02	6.23	N/A
Electric coefficient of performance ÷ gas efficiency	2.44	4.70	N/A

1. 2023 Demand Scenarios Table B-1 (page B-3)

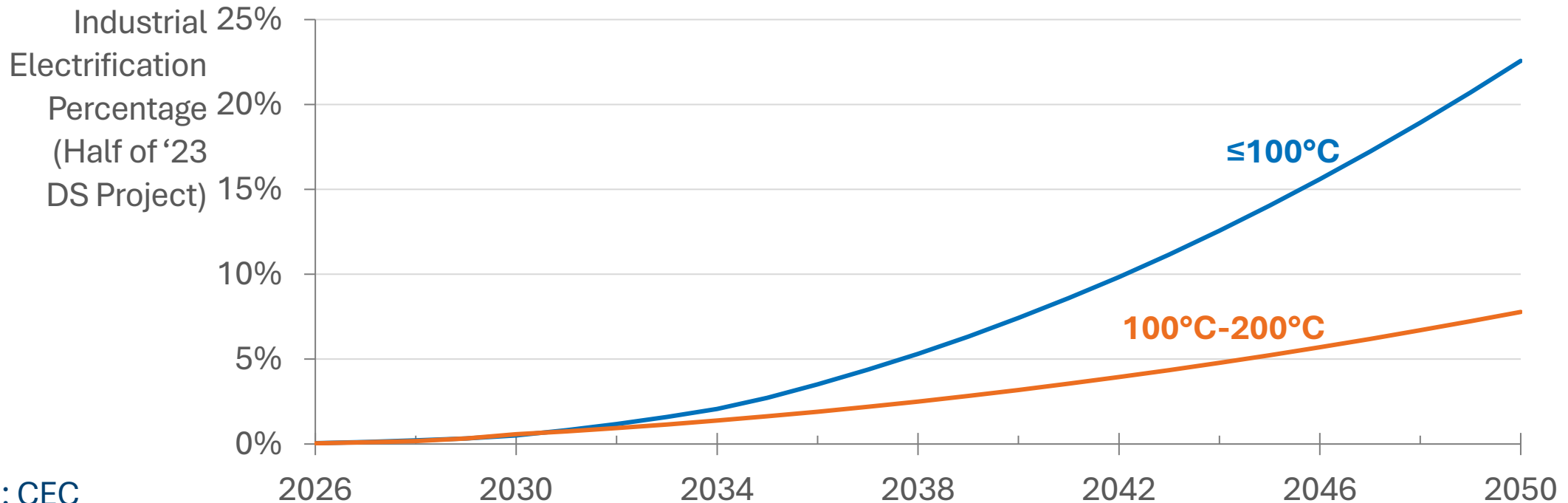
2. 2023 Demand Scenarios Table B-4 (page B-8)



Industrial AAFS 6 Step 2

- Staff judgement for electrification rates for each temperature range
- Same rate across subsectors
- Assumptions are conservative
- Assume thermal energy $\geq 200^{\circ}\text{C}$ does not electrify

Thermal Electrification Rates
(Technological Potential $\times$ Adoption Rate)





Industrial AAFS 6 Details: Conclusion

For each subsector and temperature range:

Gas Usage

× Electrification Rate

× Conversion Factor

= Realized Electrification



Plans for Future Forecast Cycles



Future steps



Continued Research

- Industrial heat pump readiness assumptions for different temperatures
- The economics of electrification for different subsectors and/or facilities
- Agricultural fuel substitution



Improved Data

- Characterizing % gas used by temperature range
- Tracking electrification progress



Model Current Industrial Electrification Trends

- South Coast AQMD – proposed and recent regulations for boilers/heaters
- Concentrated solar thermal for medium+ temperature heating in Searles Valley
- Existing CEC-sponsored industrial electrification projects



Potentially expanding modeling to additional AAFS scenarios



Feedback Request

If you have insights or data that can help our industrial electrification modeling, please share!



Thank You! Questions?

Jonathan Margoliash, Decarbonization and Grid Integration Specialist
Energy Assessments Division
jonathan.margoliash@energy.ca.gov