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AAFS 6 Industrial Electrification Draft Results

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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
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

- Recap and updates
  - Rationale
  - Original AAFS 6 industrial scenario
  - Updated scenario
  - Electrification assumptions
- Results
  - Gas savings
  - Added electricity
- Plans for future forecast cycles

Recap and Updates

(For a full recap, see the 8/31 AAFS 6 IEPR Workshop Presentation)

Rationale for Industrial Fuel Sub Modeling

Status Quo

- The existing baseline forecast and AAFS scenarios model very little industrial electrification

Modeling Need

- Growing policy interest and technological development
- Stakeholder interest

Original AAFS 6 Industrial Scenario

(8/31 IEPR Workshop)

Industrial electrification framework from the **2023 Demand Scenarios Project** (published in 2026)

- Enhanced Policy Scenario
- Only the industrial sector
- Only the electrification portion
- 50% discount due to rescinded incentives

Regulatory Basis	Incentive
Federal 2022 Inflation Reduction Act	48C Manufacturing Tax Credit: $1.2 billion for industrial decarb
~~Federal 2022 Inflation Reduction Act~~	~~Advanced Industrial Facilities Deployment Program: $5.8 billion~~

Revised AAFS 6 Industrial Scenario

Industrial electrification framework from the **2023 Demand Scenarios Project** (published in 2026)

- Enhanced Policy Scenario
- Only the industrial sector
- Only the electrification portion
- ***Full adoption rate*** **(~~50% discount due to rescinded incentives~~)**

Regulatory Basis	Incentive
Federal 2022 Inflation Reduction Act	48C Manufacturing Tax Credit: $1.2 billion for industrial decarb
~~Federal 2022 Inflation Reduction Act~~	~~Advanced Industrial Facilities Deployment Program: $5.8 billion~~
CA 2025 Cap-and-Invest reauthorization	*Manufacturing Decarbonization Incentive: ~$4 billion*

Industrial AAFS 6 Steps

Split industry into 46 subsectors. For each subsector:

- Characterize % of gas used for thermal end uses[1]
- Split thermal gas usage by temperature[2]

Assume a conversion factor for each temperature range

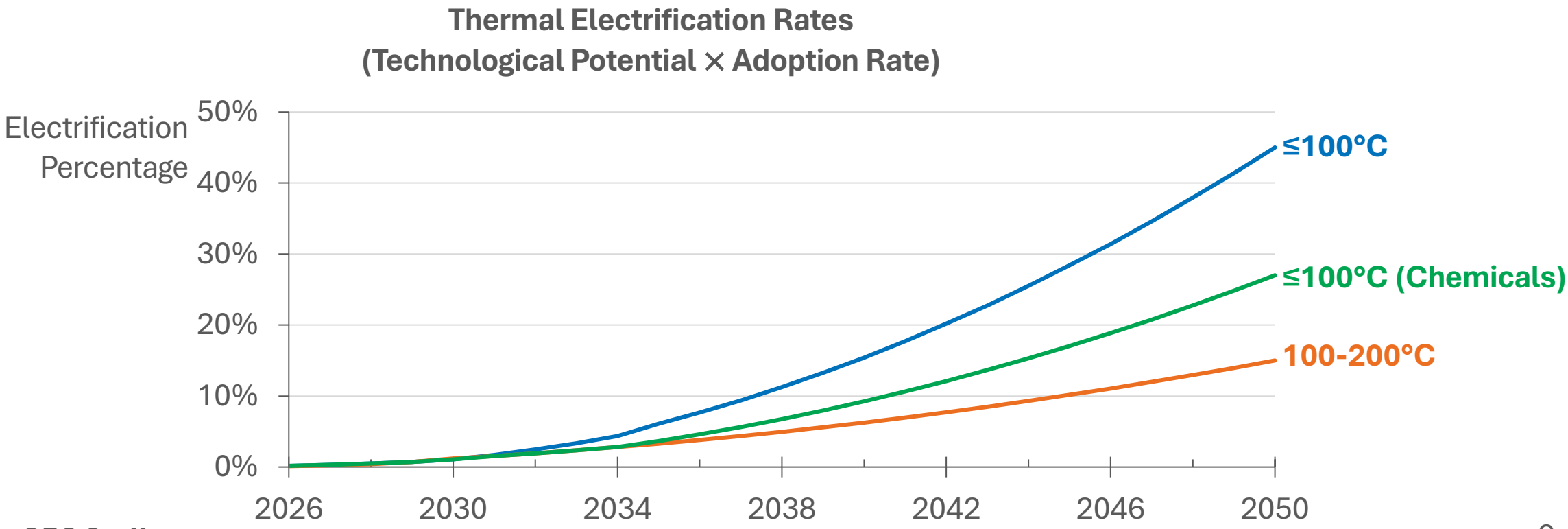
Temperature Range	≤100°C	100-200°C	≥200°C
Type of Heating Use	Water heating	Process Heat-Low	Process Heat-High
Conversion Factor (kWh/therm)	12.02	6.23	N/A
Electric coefficient of performance ÷ gas efficiency	2.44	4.70	N/A

$$Gas\ Usage \times Electrification\ Rate \times Conversion\ Factor = Realized\ Electrification$$

1. 2023 Demand Scenarios Table B-1 (page B-3)
2. 2023 Demand Scenarios Table B-4 (page B-8)

Electrification Rates

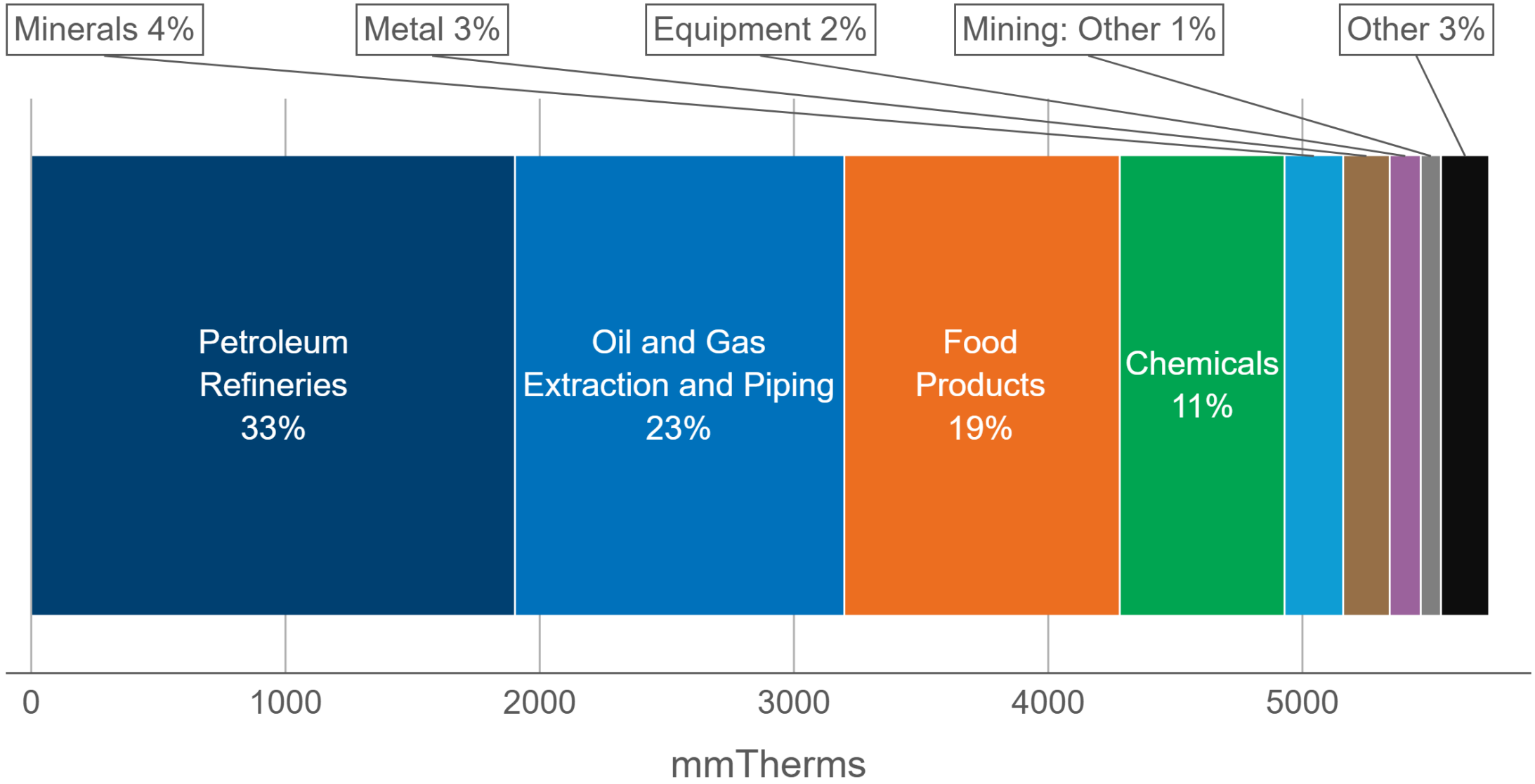
- Developed using staff judgement
- Same rate across subsectors
- No assumed electrification for thermal heating ≥200°C
  - We will revisit this in next year's scenarios



Source: CEC Staff

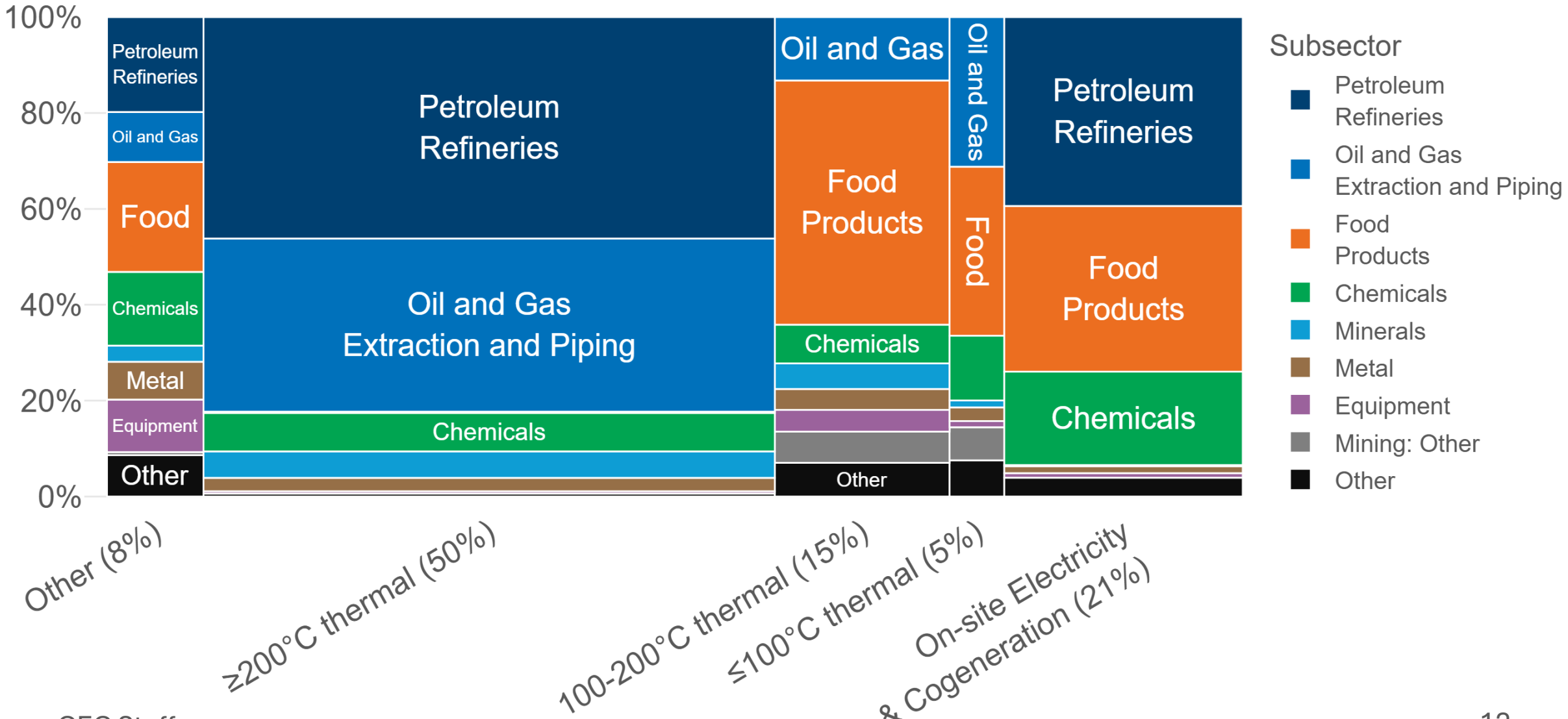
Gas Results

2025 Industrial Gas Use: 5735 mmTherms (1 of 2)



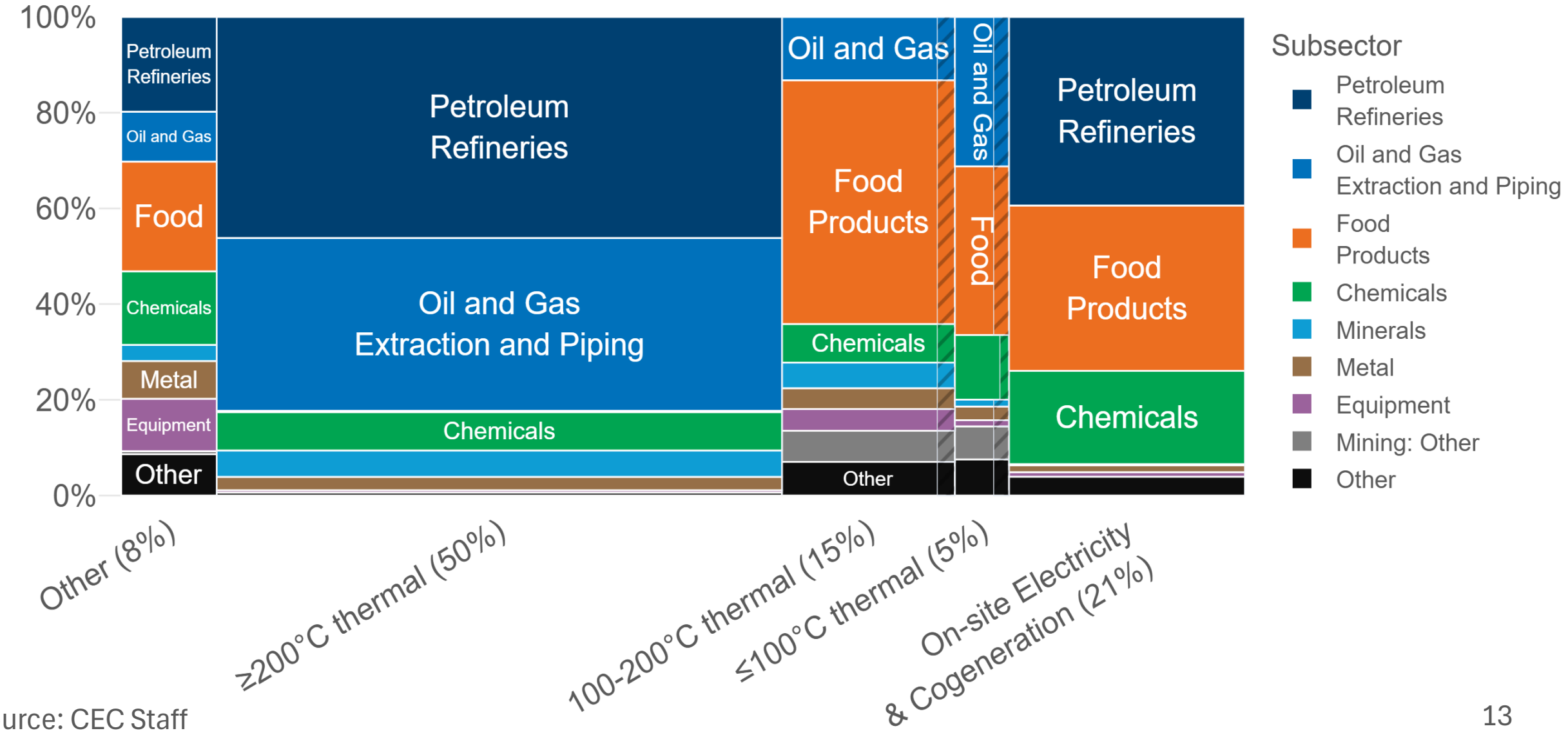
Source: CEC Staff

2025 Industrial Gas Use: 5735 mmTherms (2 of 2)



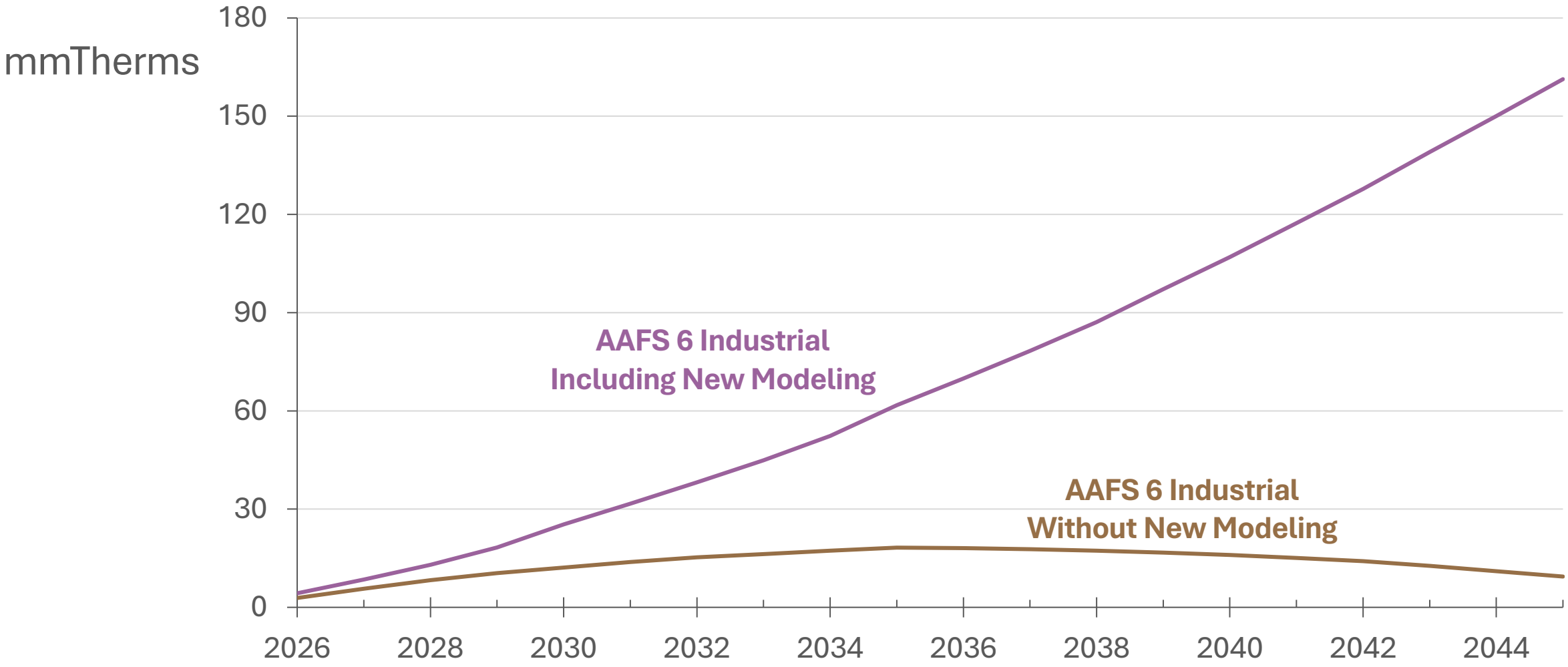
Source: CEC Staff

2025 Industrial Gas Use with Electrification by 2045 Shaded



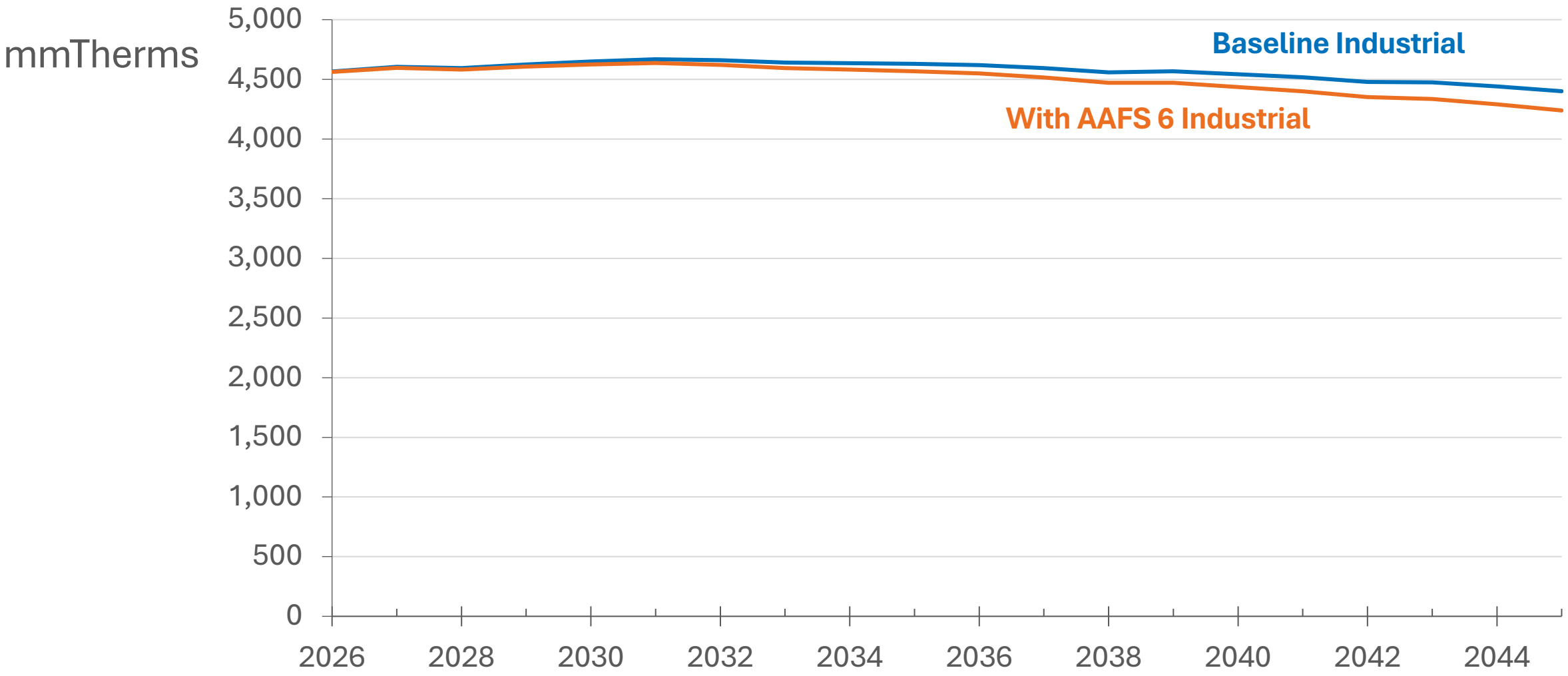
Source: CEC Staff

AAFS 6 Industrial Annual Gas Savings



Source: CEC Staff

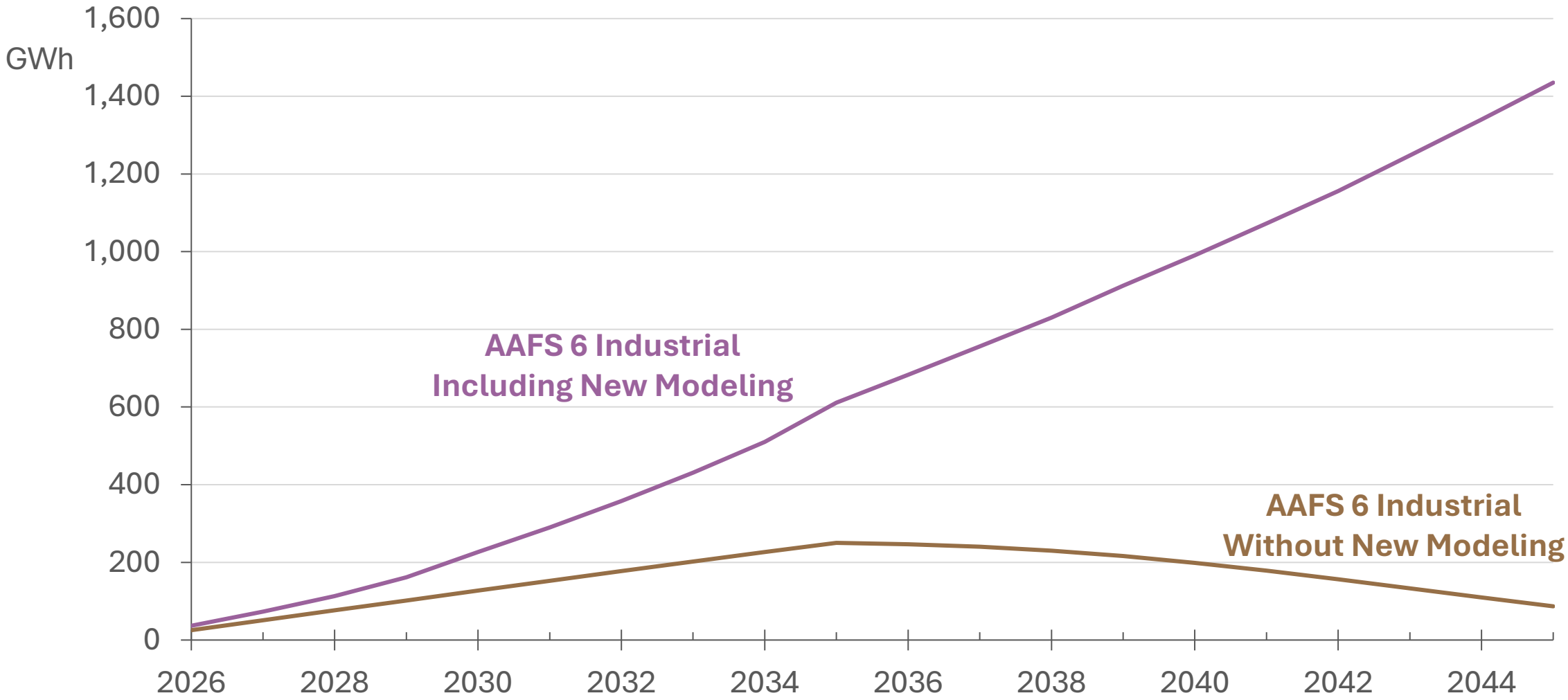
AAFS 6 Industrial Annual Gas Results



Source: CEC Staff

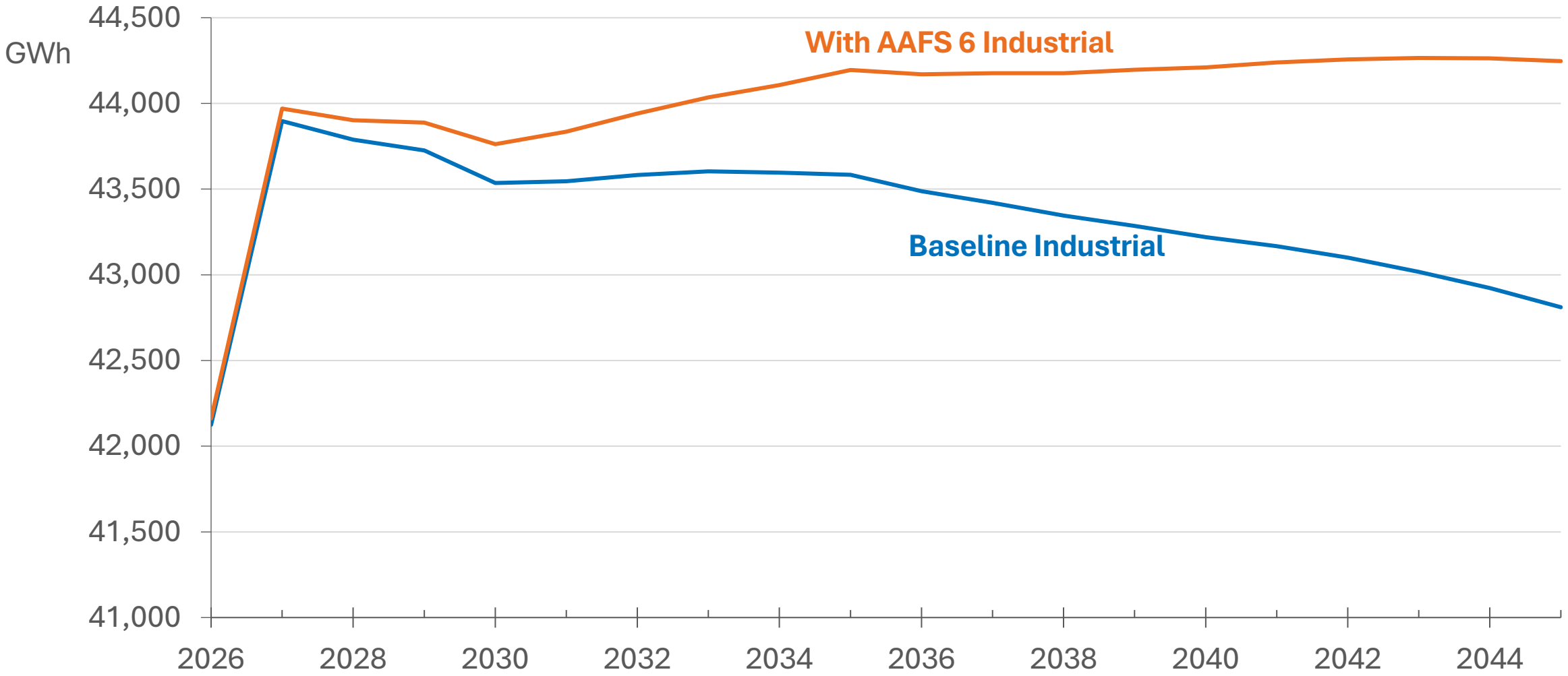
Electricity Results

AAFS 6 Industrial Annual Added Electricity



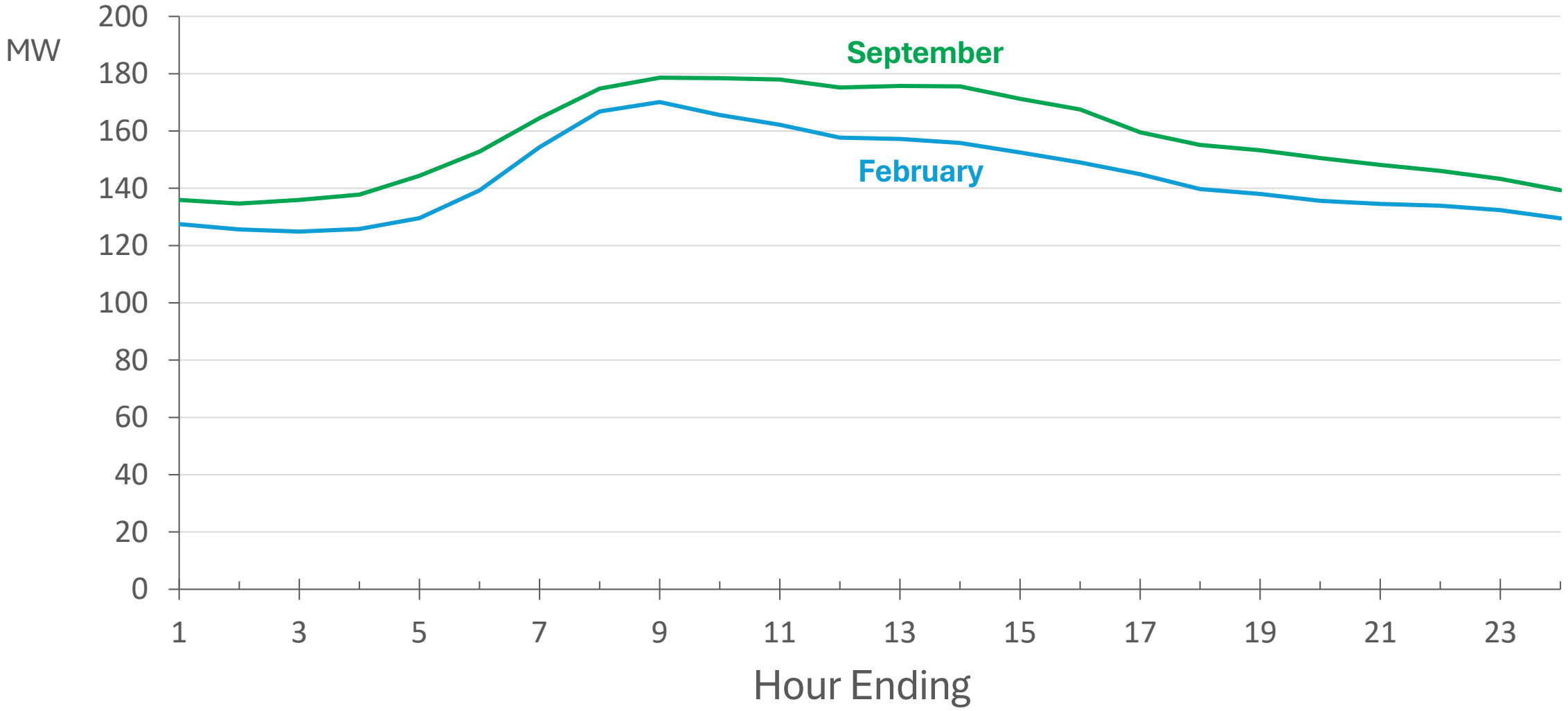
Source: CEC Staff

AAFS 6 Industrial Annual Electricity Results



Source: CEC Staff

AAFS 6 Industrial Results
2045 Average Day Added Electricity



Source: CEC Staff

Plans for Future Forecast Cycles

Future steps

Technoeconomic Assessment of Industrial Electrification

- Thermal storage
- Industrial heat pumps – multiple temperatures categories
- Economics across subsectors and facilities

Improved Data

- Gas usage by temperature range and subsector
- Tracking electrification progress

Current Trends

- South Coast & Bay Area AQMDs: proposed and recent regulations for boilers/heaters
- CEC-sponsored industrial electrification projects

Expanded Modeling

- Cogeneration & on-site electricity
- HVAC
- Agriculture

Potentially Expand to Additional AAFS Scenarios

Feedback Request

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

Thank You!
Questions?

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