



Refinery Flaring Minimization Efforts

Stationary Source Committee

April 9, 2025

Robert Cave

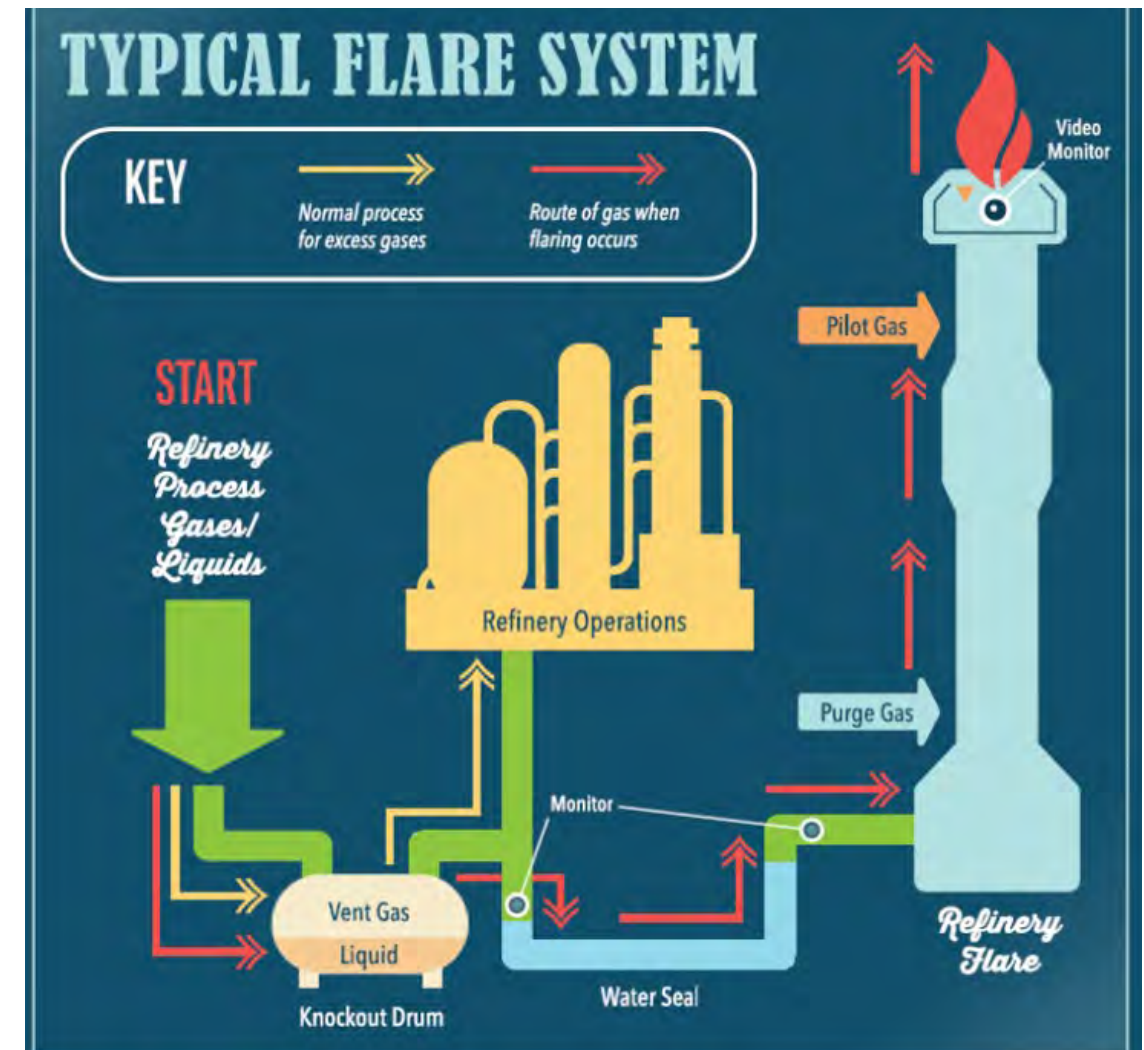
Senior Air Quality Engineer

Rules and Strategic Policy



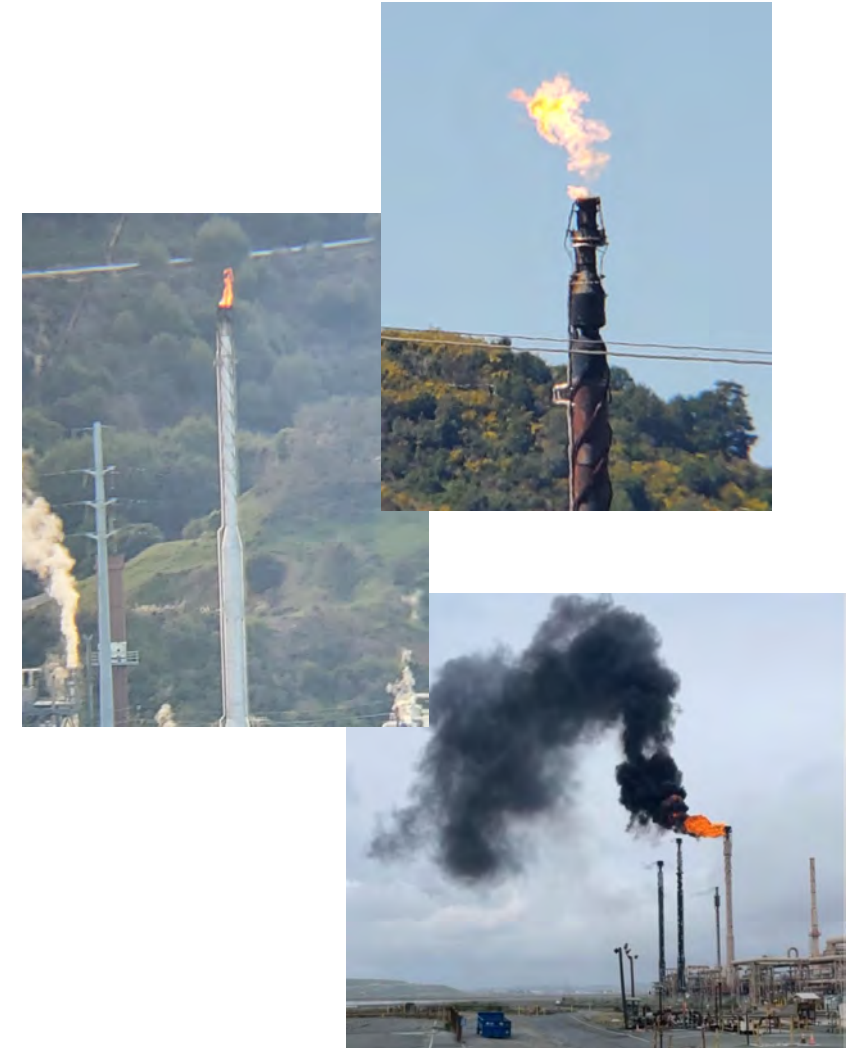
Introduction – What is a flare system?

- Flare systems are safety devices that burn hydrocarbon gases that would otherwise be released
- Flares prevent the buildup of pressure and may prevent a more catastrophic event
- Flaring may occur from startup and shutdown of refinery processes



Introduction – When do flares occur?

- Emergency – To combust gas released due to a process malfunction. Must maintain a water seal and cannot occur more than 4 times per year
- Routine – Any flaring that does not meet the definition of Emergency
- Startup or Shutdown – To conduct periodic maintenance, replacement or repair of process units



Introduction – Current Rule Requirements

Regulation 12, Rule 11: Flare Monitoring at Refineries

Monthly reporting:

1. Vent, pilot and purge gas flow
2. Vent gas composition

Regulation 12, Rule 12: Flares at Refineries

1. Requires an Air District approved flare minimization plan updated annually
2. Causal reports for reportable flaring events

Introduction – Other Jurisdictions

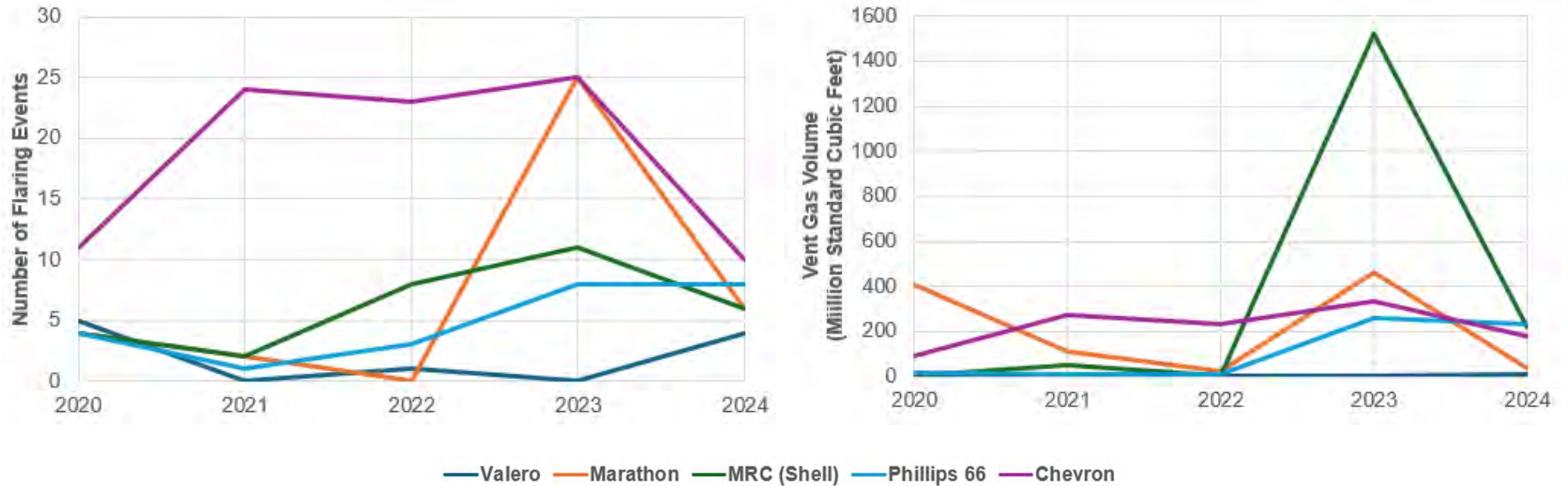
United States Environmental Protection Agency

- New Source Performance Standards
- National Emissions Standards for Hazardous Air Pollutants

South Coast Air Quality Management District

- Rule 1118: Control of Emissions from Refinery Flares
- Rule 1118.1: Control of Emissions from Non-Refinery Flares

Bay Area Flaring Trends



Impetus

Strategic Plan Strategy 1.3 Minimize Flaring

- Explore ways to minimize flaring
- Increase public engagement on flaring
- Share timely, accessible information
- Increase inspections and air pollution monitoring

Richmond-North Richmond-San Pablo Community Path to Clean Air Strategy FR 2.6

Evaluate potential updates to Rules 12-11 and 12-12 incorporating health impact analyses, enhanced enforceability, and more stringent limits

FR = Fuel Refining

Potential Rule Concepts

- Sulfur Dioxide limits tied to processing capacity
- Nitrogen Oxides limits for hydrogen plant flares
- Progressive compliance requirements
- Improved flare monitoring
- Improved notification and reporting
- Categorization of types of flaring events
- More detailed causal reports

Current Status of Rule Development Efforts

- Analysis of last 10 years of flare emissions and causal reports
- Refinery Technical Working Group composed of Industry, Labor, Community, local Government, and Air District
- Public Outreach efforts
 - Board Committee Presentations
 - Community Steering Committee Briefings
 - Updates to community groups (e.g., Refinery Communities Workgroup)

Next Steps

- Richmond-North Richmond-San Pablo Community Steering Committee April Meeting
- Public Workshop Kickoff this Summer
- Concept Paper on potential rule amendments Quarter (Q)3 2025
- Completion of educational materials ("Flaring 101") Q3 2025

Questions?

For more information:

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Potential Amendments to Rule 9-6

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Jennifer Lam

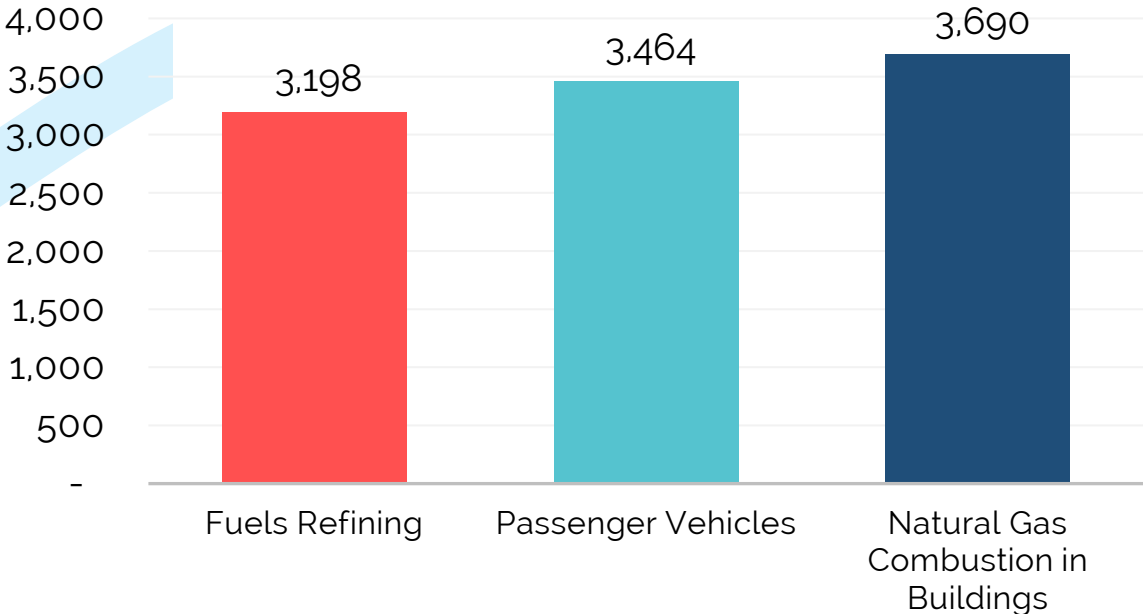
Assistant Manager

Rules and Strategic Policy Division

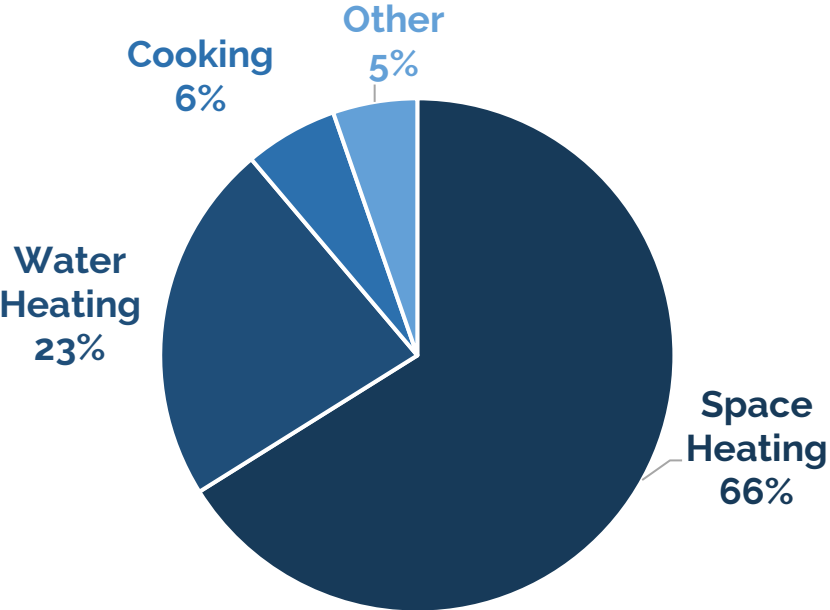
AGENDA: 5

Building Nitrogen Oxides (NOx) Emissions Overview

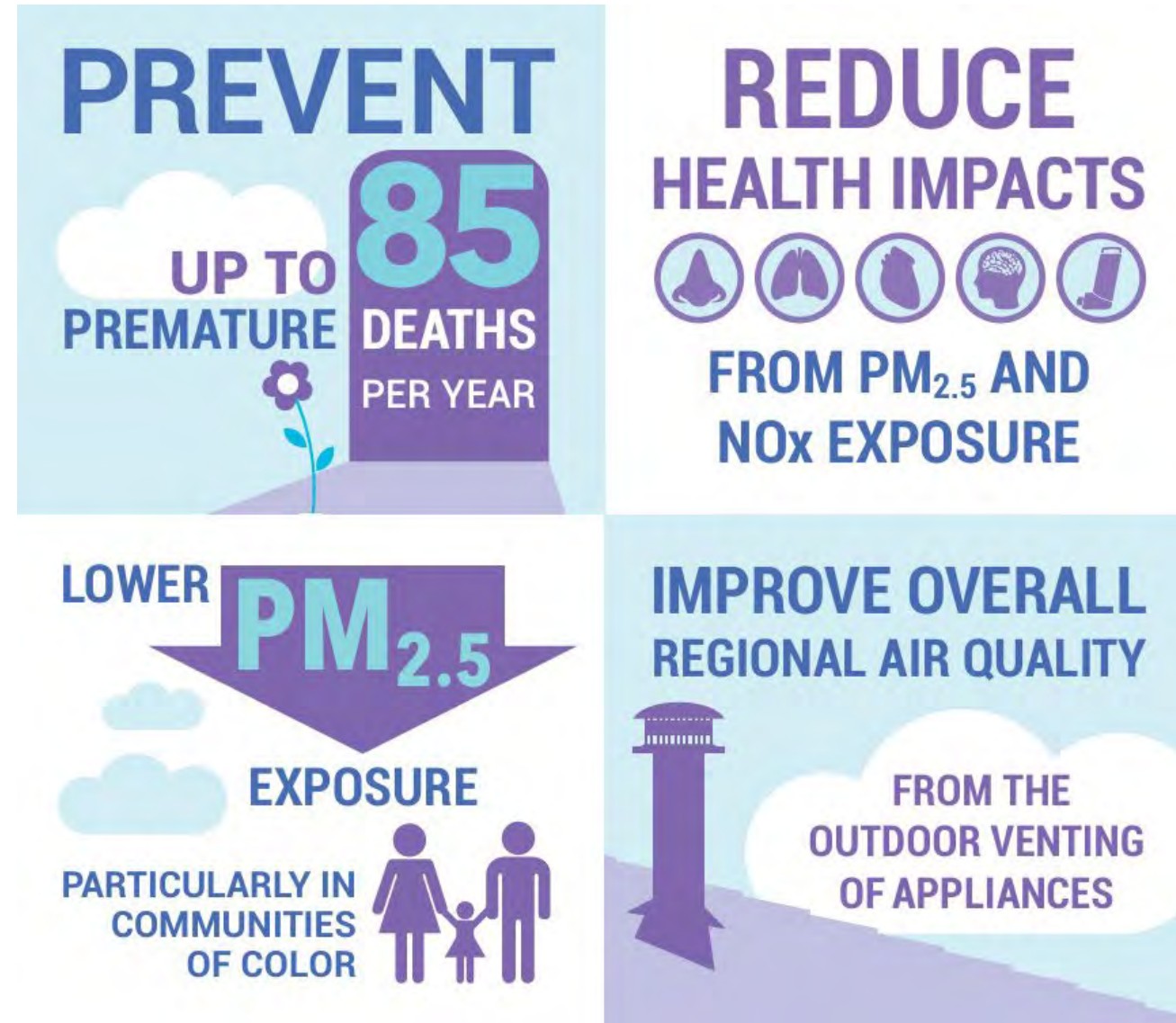
2019 Air District NOx Emissions (tons)



Air District Residential Natural Gas Combustion NOx Emissions (2019)



Health Benefits Overview



PM: Particulate Matter

Upcoming Implementation Timelines

- **Regulation 9, Rule 4:** NOx from Fan Type Residential Central Furnaces

- **Regulation 9, Rule 6:** NOx from Natural Gas-Fired Boilers and Water Heaters

- **Zero NOx amendments** adopted on March 15, 2023, with future implementation dates

1/1/2027	Water heaters less than 75,000 BTU/hr*
1/1/2029	All applicable natural gas-fired furnaces (e.g., residential and commercial; including direct-vent units)
1/1/2031	Water heaters 75,000 to 2 million BTU/hr

**BTU/hr = British thermal units per hour*

Interim Board Requirements

Section 9-6-404: Interim Report:

- Required two years before the compliance deadline
- Delivered to Board of Directors in December 2024

Key Components:

- Technology Options: Available and upcoming compliant technologies
- Cost Analysis: Projected purchase, installation, and ancillary costs
- Market readiness: Feasibility and necessary infrastructure upgrades
- Incentives: Available programs to reduce costs and support adoption
- Workforce & Installation: Labor needs, training requirements, and barriers

Remaining Challenges to be Addressed

- **Challenging installations** due to space constraints and/or building configurations that may result in increased installation costs
- Limited options for **specific equipment types** or applications
- Need to ensure **equity for low-income** residents
- Uncertainty of sustainable **incentive solutions**
- Work to align with **upcoming rules from other agencies**

Potential Amendments to Address Remaining Challenges

Alternative Compliance Plans by Installation

Option 1:

Example Concepts:

- Allowance for implementation delays on a project-by-project basis to account for compliance concerns such as:
 - Utility upsizing delay
 - Additional construction requirements
 - Emergency replacement
 - Significant cost burden
- Original South Coast Air Quality Management District (SCAQMD) Proposal
 - Rules 1111 and 1121
 - Recently changed, no longer proposed direction

Alternative Compliance Plans by Installation (cont.)

Option 1:

Benefits

- Allows project by project consideration of impact
- Protect some renters from rent pass-through due to expensive upgrades
- Provides relief to property owners with buildings that cannot be easily transitioned to zero NOx units

Alternative Compliance Plans by Installation (cont.)

Option 1:

Considerations

- Significant resource/staffing increase might be needed for the Air District
- Difficult to enforce at point of sale of equipment
- Could result in delays which effect consumers
- Burden of proof on building/project owner
- Air District determining what is significant/burdensome might be difficult
- Delays increase demand for equipment rentals
- Slower transition to zero NOx emissions and delayed health and equity improvements
- Not aligned with other agencies

Outlining Specific Installation Types

Option 2:

Example Concepts:

- Rule 9-6 currently has two equipment categories distinguished only by size
 - Less than 75,000 BTU/hr, and between 75,000 and 2 million BTU/hr
- Changes to requirements for categories such as:
 - Smallest units (typically used in multifamily or space constrained situations)
 - Hydronic systems (typically used in multifamily or space constrained situations)
 - Food service/high heat applications
 - Temporary emergency replacements

Outlining Specific Installation Types (cont.)

Option 2:

Benefits

- Protect some renters from rent pass-throughs due to expensive upgrades
- Provides relief to property owners with buildings that cannot be easily transitioned to zero NOx units
- Allows diverse technology options
- May protect some small businesses
- Potential allowance for temporary emergency replacement installations

Outlining Specific Installation Types (cont.)

Option 2:

Considerations

- Slower transition to zero NOx emissions and delayed health and equity improvements, particularly in commercial and multifamily buildings
- Potential for allowed natural gas units to be chosen over previous size/unit type further slowing transition to zero NOx and associated health and equity improvements

Fee Structure for Manufacturer Sales

Option 3:

Example Concepts:

- Allow manufacturers to sell a certain percentage of NOx-emitting units instead of zero NOx units for a “mitigation fee”
- Require manufacturers to achieve certain market share of zero NOx units, increasing over time
 - SCAQMD proposal: Manufacturer Sales Target of 30% zero NOx unit by 2027; ramping up to 90% zero NOx units by 2036
 - California Energy Commission considering state-wide reporting rule

Fee Structure for Manufacturer Sales (cont.)

Option 3:

Benefits

- Provides flexibility with market and technology transformation
- Compliance requirements are not enforced on individual consumers
- Creates potential funding opportunity due to mitigation fee
- Facilitates alignment and coordination with other California government agencies

Fee Structure for Manufacturer Sales (cont.)

Option 3:

Considerations

- Slower transition to zero NOx emissions and delayed health and equity improvements
- Setting mitigation fee at level that drives the market but does not unduly burden consumers
- Difficult for manufacturers to control sales levels of zero NOx units



Discussion and Next Steps

Combination of Solutions

Example:

- Retain existing dates and requirements for traditional units between 30,000-75,000 BTU/hr
- Introduce ramping sales requirements and mitigation fee structure for units under 30,000 BTU and hydronic units with 100% sales target in future year
- Allow for registered contractors to participate in temporary emergency replacement program

Additional Considerations



Communicating intended path as soon as possible



Alignment with other agencies



Ease of compliance for reporting requirements

Next Steps



Consider Board feedback and direction on staff's potential flexibility options



Conduct Public Workshop(s) to discuss potential amendments with stakeholders to better inform staff on strategy development



Report back to the board with updates and recommendations

Questions/Feedback

For more information:

<https://www.baaqmd.gov/rules-and-compliance/rule-development/building-appliances>

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Jennifer Lam

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