



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT



Building Appliance Rules Zero NOx Water Heaters Implementation

Public Learning Session
October 22, 2024 • 6:00 – 7:30pm

Outline



- Why Building Appliance Rules?
- Overview of Building Appliance Rules
- Implementation Working Group
- Concerns and Key Takeaways
- Next Steps and Discussion

Welcome!



Glossary of Terms

- **BTU** – British thermal unit, measures heat and energy and indicates how powerful a water heater is
- **Heat pump** – energy-efficient technology for heating and cooling; like your refrigerator, heat pumps use electricity to *transfer* heat.
- **IWG** – Implementation Working Group
- **NOx** – Nitrogen Oxide
- **Smog** – mixture of pollutants made up mostly of ground level ozone



Why are building appliances important?

Because buildings can emit NO_x and other harmful air pollutants

What is NO_x?

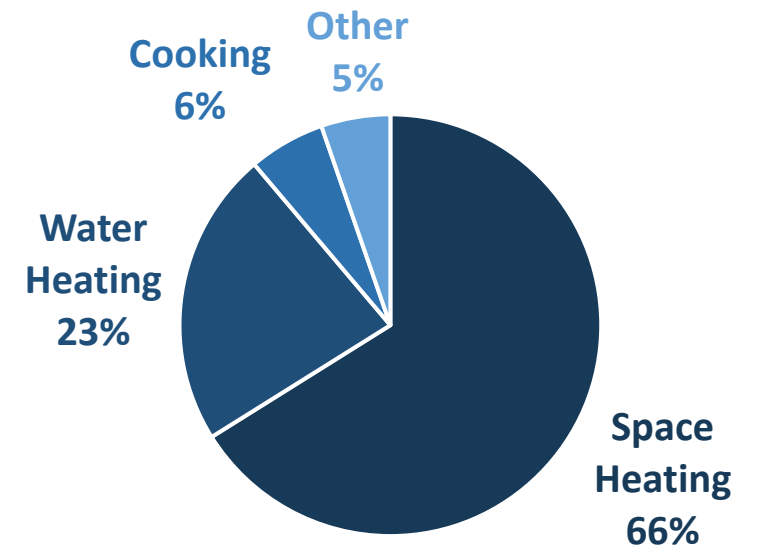
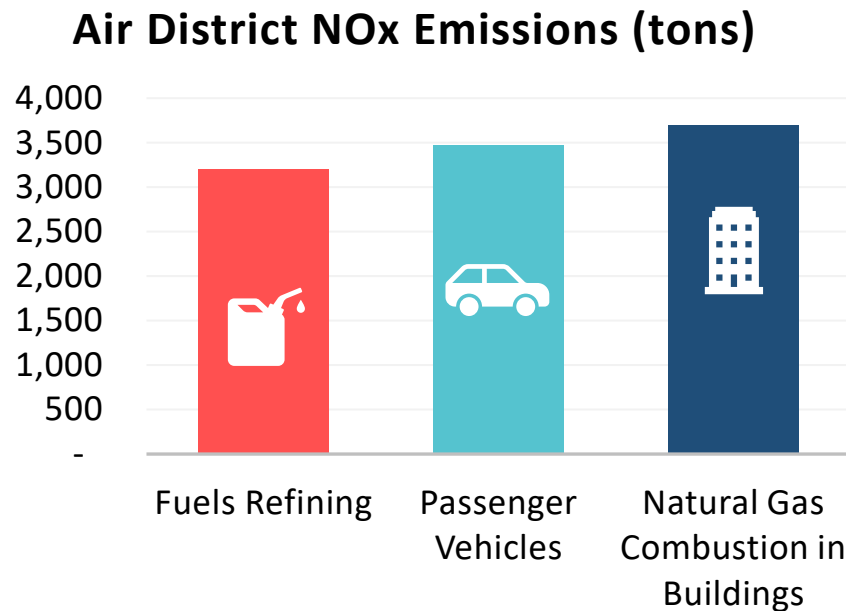
Nitrogen Oxides (or NO_x) contribute to the:

- Development or worsening of respiratory illnesses
- Formation of particulate matter (or PM) and ozone (main component of smog)



Why are building appliances important?

Natural gas combustion from space and water heating emits more NOx than either **fuels refining** or **passenger vehicles** in the Bay Area!



Water and space heating account for about 90% of residential natural gas combustion NOx emissions

Significant Public Health Benefits


from 2023 Amendments to the Building Appliance Rules

**IMPROVE OVERALL
REGIONAL AIR QUALITY**




**FROM THE
OUTDOOR VENTING
OF APPLIANCES**

LOWER



PM_{2.5}

EXPOSURE




**PARTICULARLY IN
COMMUNITIES
OF COLOR**

AVOID UP TO




\$890M


**PER YEAR IN HEALTH
IMPACTS DUE TO
AIR POLLUTION
EXPOSURE**



PREVENT



UP TO



85

**PREMATURE
DEATHS
PER YEAR**



OVERVIEW OF BUILDING APPLIANCE RULES

What do the building appliance rules require?

Since 1983, Air District Rules 9-4 and 9-6 apply to natural gas-fired



FURNACES



WATER
HEATERS

Do not apply to:

- Stoves, dryers, or water heaters and boilers larger than 2 million BTU/hr, or other appliances
- Appliances that use propane or other non-natural gas fuels
- Mobile home furnaces

**governed by Rule 9-7*

What do the building appliance rules require?

 **Regulation 9, Rule 4:** Nitrogen Oxides from Fan Type Residential Central Furnaces

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

Zero NOx Compliance Dates Adopted March 2023:

Rule 9-6	1/1/2027	Residential tanked water heaters (less than 75,000 BTU/hr*)
Rule 9-4	1/1/2029	All applicable natural gas-fired furnaces
Rule 9-6	1/1/2031	Larger tanked water heaters and tankless (75,000 – 2 million BTU/hr)

**approximate size: up to 75-gallon tanked hot water heater; does not include tankless/ on-demand gas water heaters*



IMPLEMENTATION WORKING GROUP (IWG)





Advisory group helping inform periodic reporting to Air District Board on two aspects of rule implementation:

Technical Readiness

Equitable Transition

40+ members

Environmental Justice and Community-Based Organizations

Subject Matter Experts

Regional/Local Government and State Agencies

Labor and Trade Organizations

Utilities and Community Choice Aggregators

Engagement



IWG meetings

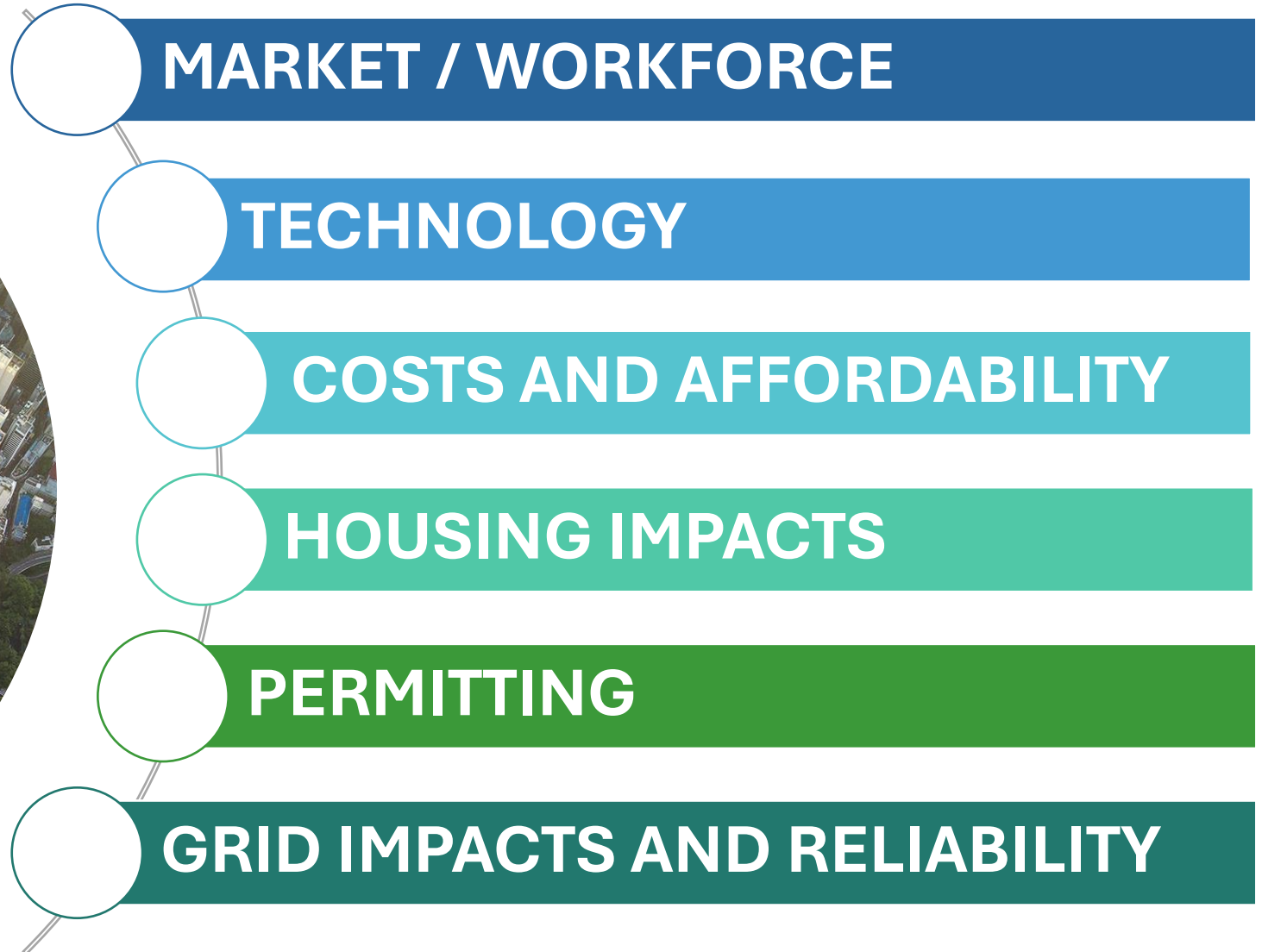


Stakeholder meetings



Public events

IWG Topics



A stack of books with various colored spines (orange, yellow, red, green, blue) is visible on the left side of the page. A large white circular graphic overlaps the right side of the books.

CONCERNS AND KEY TAKEAWAYS



MARKET / WORKFORCE

CONCERNS: *Heat pump and contractor availability*

KEY TAKEAWAYS:

- Supply chain is a decreasing concern
- [Bay Area workforce research](#) show positive numbers with need for more outreach and [training](#)





TECHNOLOGY

CONCERNS: *How to minimize electrical work*

KEY TAKEAWAYS:

- New [offerings for 120v plug-in HPWHs](#)
- Houses can [fully electrify on 100 amps](#)
- Large portion of homes will need watt diet or [panel optimization](#) strategies



Source: EPA; energystar.gov



COSTS AND AFFORDABILITY

CONCERNS: *Higher upfront and ongoing costs*

KEY TAKEAWAYS:

- Most households see savings or \$2/month increase, but [electrification-specific rates](#) and California Alternate Rates for Energy (CARE) and Federal Electric Rate Assistance (FERA) program rates for low-to-moderate income families are key to managing ongoing costs.
- Better data on project costs; **average incremental cost** is \$1.8k to \$3.5k for heat pump water heaters *before* [incentives & tax credits](#)
- Ongoing edge cases





HOUSING IMPACTS



CONCERNS: *What impacts could appliance rules have on housing and renters?*

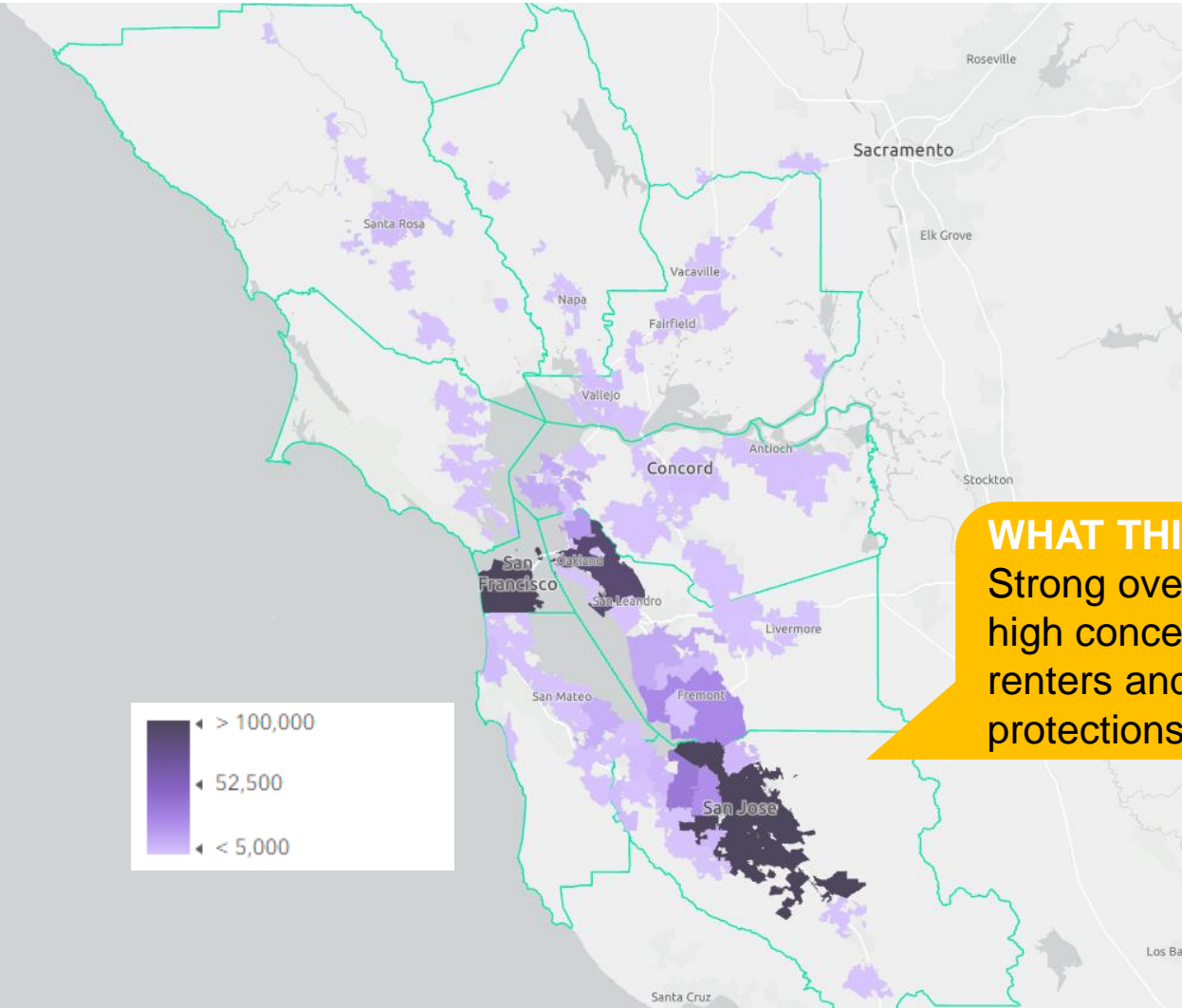
KEY TAKEAWAYS:

- Potential for capital cost pass throughs or potential rent increases (cost recovery)
- Potential for temporary evictions due to construction activities required to make zero NOx replacements (“substantial repair and remodel” clause)

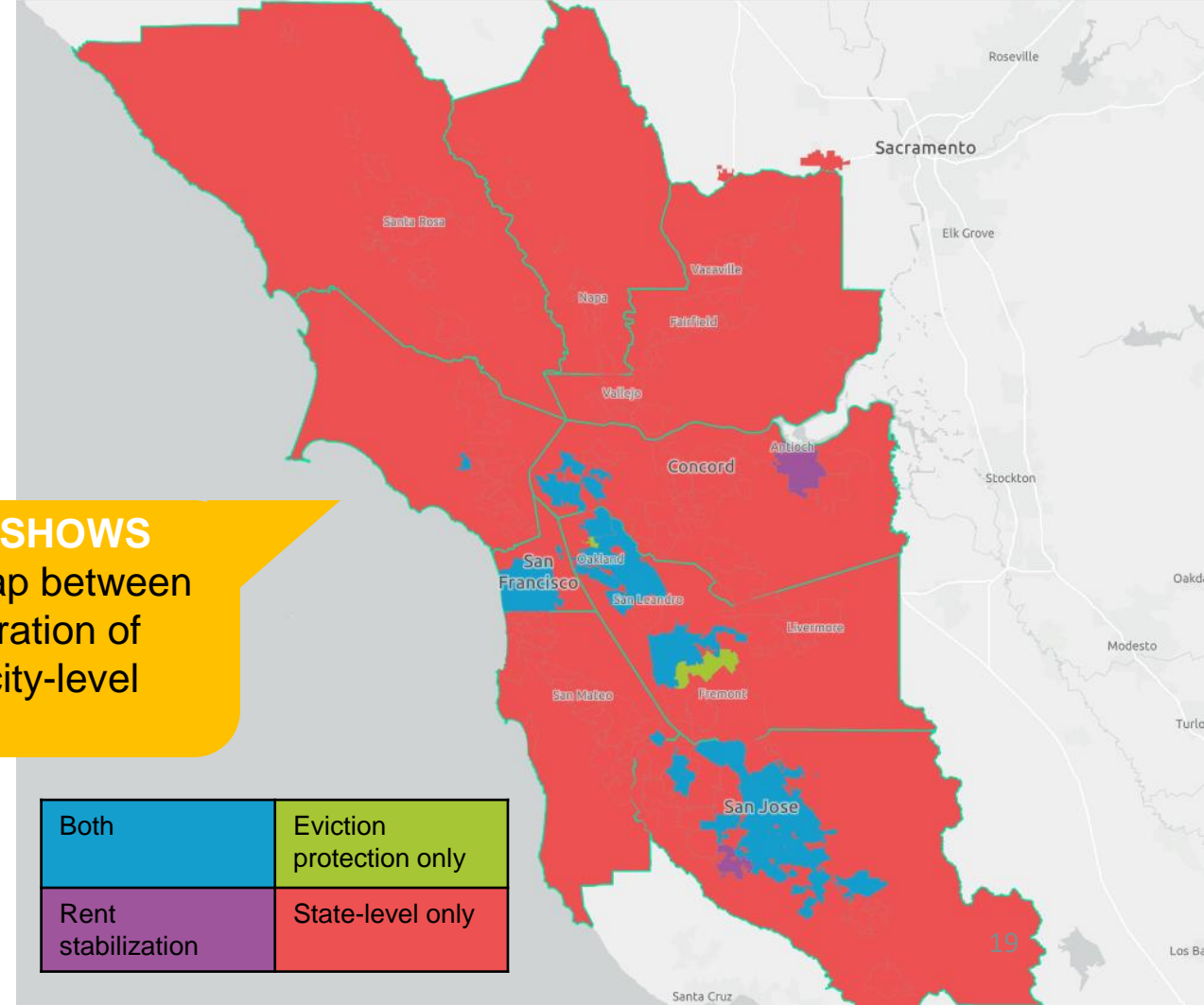


Key finding: cities with the highest percentage of renters have the strongest protections

Total Rented Households (Census Data)



Types of Protections in Place by Jurisdiction



WHAT THIS SHOWS
Strong overlap between high concentration of renters and city-level protections



Recommendations: Pass throughs

- 1 Local agencies should consider ways to **prohibit or limit pass through costs** for zero NOx appliance upgrades.
- 2 **Conduct strategic outreach to landlords** to increase participation in financial incentive programs **to reduce overall implementation costs and tenant pass through amounts.**
- 3 Explore if **end-of-life equipment replacements** for services provided to make units habitable (i.e. heat and hot water) could be treated as **regular operations & maintenance costs, not capital improvements.**



Recommendations: Eviction Protections

- 1 Explore ways to **limit the application of “substantial repair”** for zero NOx appliance replacements.
- 2 Under a no-fault eviction, **expand relocation assistance** for affected tenants.
- 3 Develop specific local and/or state policies **to address and prevent “renovictions”** (a term used to describe when construction-related activities are used to harass and/or evict tenants from their units).





PERMITTING and EMERGENCY FAILURE

CONCERNS	Takeaways
<p>PERMITS: <i>longer timeline and more effort</i></p>	<ul style="list-style-type: none">Local government interviews and surveys show growing numbers of cities adopted/are considering improved HPWH permit processes
<p>EMERGENCY REPLACEMENTS: <i>service gaps</i></p>	<ul style="list-style-type: none">New and upcoming loaner pilots/programs from Palo Alto, SVCE, PCE and MCEPotential to speed up installations





GRID IMPACTS

CONCERNS	Takeaways
GRID CAPACITY AND RELIABILITY: <i>power outages</i>	<ul style="list-style-type: none">• Most power outages are from physical impacts or power safety shutoffs (PSPS), not capacity.• Zero NOx and new NOx-emitting water heaters have similar reliability
RESIDENTIAL INTERCONNECTION: <i>high cost and long timeline</i>	<ul style="list-style-type: none">• CPUC proceeding on cost-sharing for service upgrades• New legislation/policy to improve interconnection timeline...but current targets could still lead to service gaps

Next Steps



Interim report on market and technology readiness for small water heaters for 2027 implementation date



December public presentation to Bay Area Air Quality Management District Board of Directors



Anticipated administrative amendments to building appliance rules in 2025



Further outreach and expanded public communication on upcoming requirements

THANK YOU!



Learn more about the Building Appliance Rules:

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

Follow rule implementation:

<https://www.baaqmd.gov/en/community-health/building-appliances-rule-implementation>

Contact Us:

ruleddevelopment@baaqmd.gov