



Addressing Health and Inequity Through Clean Appliances

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Presentation Outline

- Building energy use, emissions and health
- Regulating pollution from indoor appliances
 - Health and equity impacts
 - Ongoing challenges and next steps

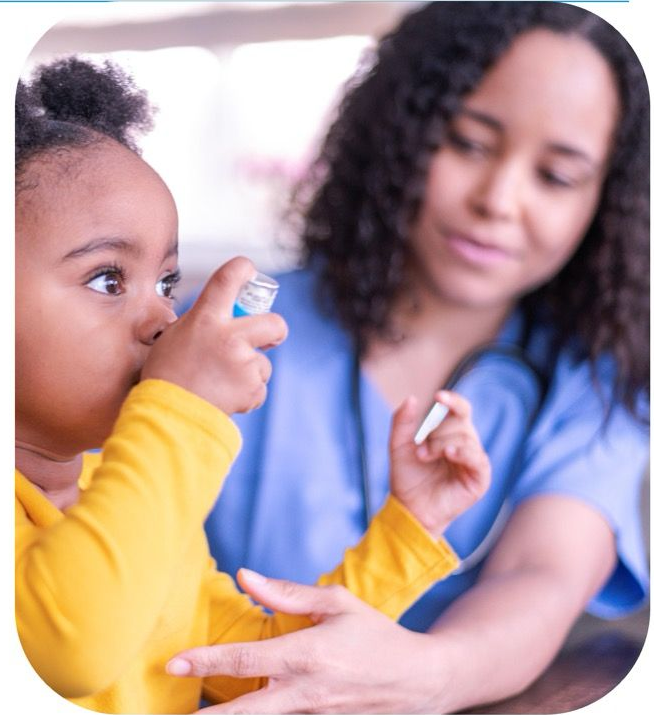
How do building emissions impact health?

Because building appliances can emit NOx and other harmful air pollutants

What is NOx?

Nitrogen Oxides (or NOx) contribute to the:

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

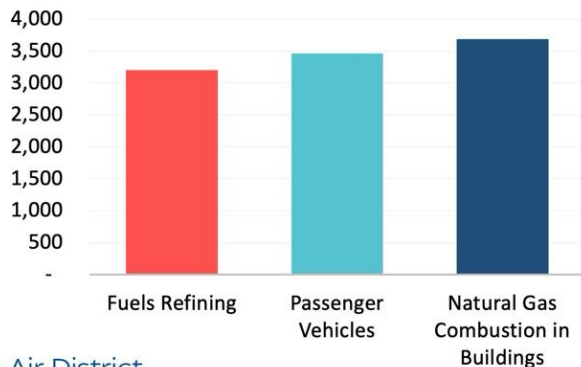


Source: Stock photo owned by Air District

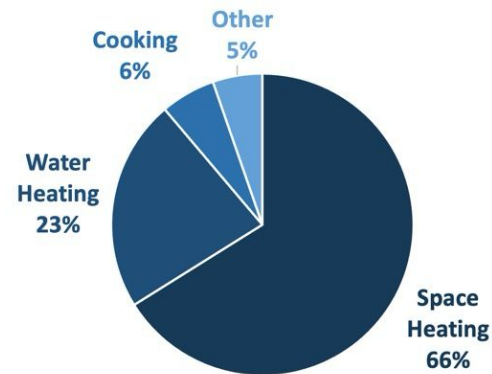
Why are building appliances important?

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

Air District NOx Emissions (tons)



Air District NOx emissions



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

The Air District's building appliance rules

- Disallow sale of appliances that emit NOx (currently only electric technologies meet this standard)
- Implemented at point of sale of the appliance
- Phased-in compliance dates:

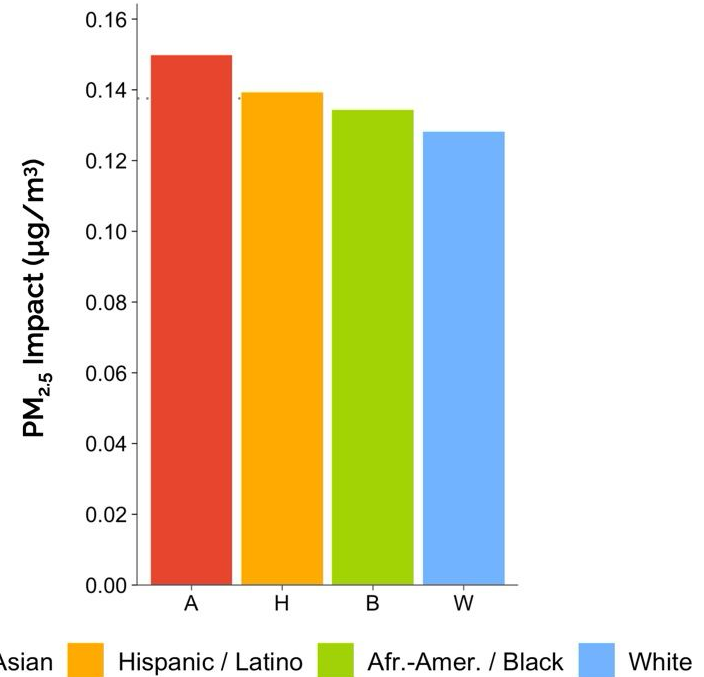
Rule 9-6	1/1/2027	Residential tanked water heaters (approx. up to 75 gallon tanked water heater)
Rule 9-4	1/1/2029	All applicable natural gas-fired furnaces
Rule 9-6	1/1/2031	Larger tanked water heaters and tankless (75,000 – 2 million BTU/hr)

These rules do NOT cover:

- Tankless water heaters
- Stoves or clothes dryers
- Appliances that use propane
- Mobile home furnaces

Equity Impacts

- The counties most affected by these sources, like Santa Clara, tend to be higher % Asian / Pacific Islander. This explains most of the regional pattern (shown at right).
- Within every county, the most-impacted residents tend also to be people of color: primarily Hispanic and African-American/Black.



Modeled Health Benefits

Health Impacts	Annual Health Benefits (Incidence Avoided)	
	Zero-NOx Appliances	Electric Appliances
Premature mortality	23-52	37-85
Non-fatal heart attack	2.6-24	4.2-39
Hospital admission, neurological	7.7	13
Out of hospital cardiac arrest	0.45	0.73
Stroke	1.5	2.4
Lung cancer	1.9	3.1
Hospital admission, respiratory	2.4	3.9
Hospital admission, cardiovascular	3.0	4.9
ER visit, respiratory	13	20
ER visits, cardiovascular	6.2	10
Restricted activity days	24,000	39,000
Work loss days	4,100	6,700
Hay fever/allergic rhinitis	440	710
Asthma symptoms/albuterol use	9,200	15,000
Asthma onset	71	110

Health Benefits Summary

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
PREMATURE

85

DEATHS
PER YEAR



Remaining Needs and Challenges to be Addressed

- Stable, long-term, easily accessible incentives for most vulnerable households, low-income residents and smaller contractors
- Affordable electricity rates with cost savings relative to gas
- Cost supports for small- and medium-sized businesses
- Landlord hesitancy to make upgrades and tenant protections

Remaining Needs and Challenges to be Addressed

- Manufacturers, retailers and energy providers to help educate and train design, install and O&M professionals
- 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 for similar pilots and efforts for furnaces
- Work to align with upcoming rules from other agencies

Potential Amendments to Water Heater Rule

Air District is considering further flexibility, such as:

- Allow for implementation delays on a project-by-project basis to account for compliance concerns
- Changes to requirements for specific installation types (e.g., temporary emergency replacements, hydronic systems, high heat applications)
- Allow manufacturers to sell a certain percentage of NOx-emitting units for a “mitigation fee”, BUT...
- Require manufacturers to achieve certain market share of zero NOx units, increasing over time

Questions?