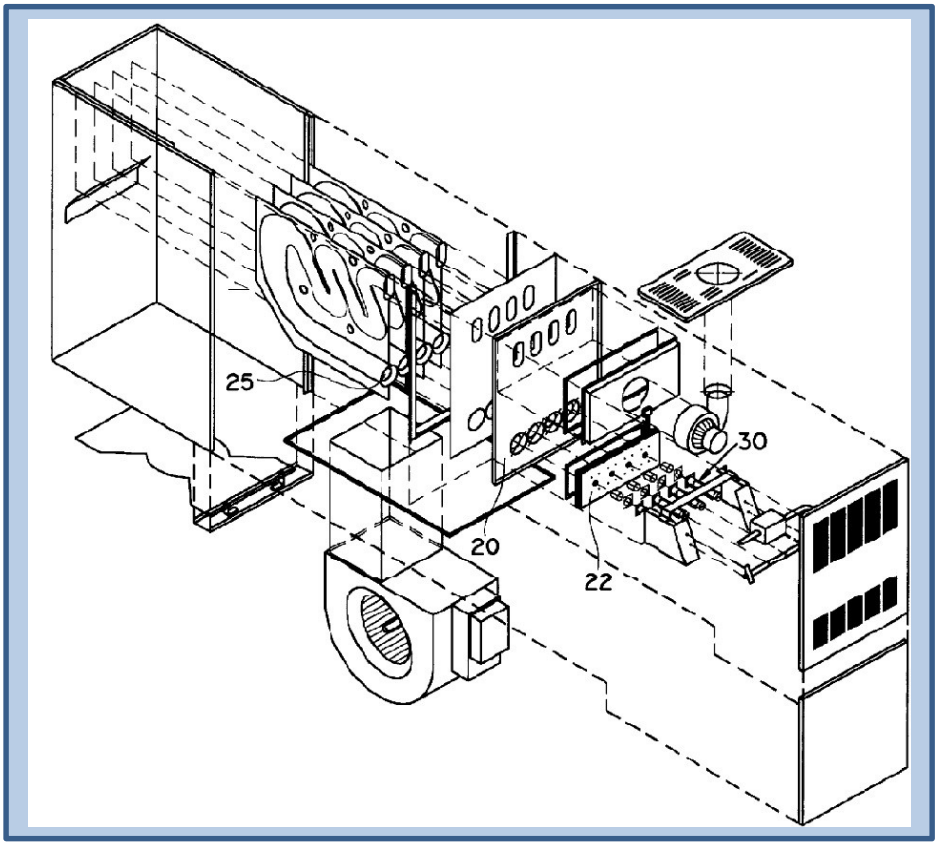
BAY AREA AIR QUALITY MANAGEMENT DISTRICT

WORKSHOP REPORT
DRAFT AMENDMENTS TO BUILDING APPLIANCE RULES – REGULATION 9, RULE 4: NITROGEN OXIDES FROM FAN TYPE RESIDENTIAL CENTRAL FURNACES AND RULE 6: NITROGEN OXIDES EMISSIONS FROM NATURAL GAS-FIRED BOILERS AND WATER HEATERS



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I. INTRODUCTION

The Bay Area Air Quality Management District ("BAAQMD" or the "Air District") staff is seeking comments on draft amendments to Regulation 9, Rule 4: *Nitrogen Oxides from Fan Type Residential Central Furnaces* ("Rule 9-4") and Regulation 9, Rule 6: *Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters* ("Rule 9-6"). Rule 9-4 currently applies to the natural gas-fired space-heating furnaces commonly found in single-family homes and Rule 9-6 applies to natural gas-fired water heaters commonly found in residential and commercial applications. These sources generate a substantial portion of nitrogen oxides emissions from sources in the Bay Area. The Air District's 2017 Clean Air Plan identifies the importance of nitrogen oxide emission reductions from residential space heating appliances in measure SS30. Note that larger boilers used in industrial, institutional and large commercial scenarios are generally subject to Regulation 9, Rule 7: *Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters* ("Rule 9-7"). Equipment subject to Rule 9-7 is not impacted by this draft rule amendment package.

Rule 9-4 currently imposes a nitrogen oxide (NOx) emission limit of 40 nanograms of NOx per joule of useful heat produced by the furnace (40 ng/joule) on central furnaces with a maximum heat input rating of 175,000 British thermal units per hour (BTU/hour) and requires that furnaces subject to this rule be certified to comply with this limit by their manufacturer. Furnaces in this size range are used in most single-family homes, some multi-unit dwellings, and some small commercial spaces in the Bay Area, but Rule 9-4 currently applies only to residential furnaces. Air District staff intends to propose a lower NOx emission limit of 14 ng/joule in the short term, prior to a zero-NOx requirement described below.[1] This technology is currently widely available, and these types of furnaces can generally be installed without making substantial upgrades. Draft amendments additionally expand the applicability of the rule to devices used in non-residential settings as well as devices that are not considered "fan-type central furnaces," including wall furnaces, direct vent units and other natural gas-fired space heating units. Rule 9-6 currently sets NOx emission standards for small boilers and water heaters, with existing standards varying based on size and equipment application. As discussed further below, Air District staff intends to propose a zero-NOx requirement for these boilers and water heaters.

As noted above, the draft amendments to Rules 9-4 and 9-6 also include the introduction of a proposed zero-NOx emissions standard for natural gas-fired furnaces and water heaters. Technologies do currently exist to comply with a zero-NOx standard, but they are limited in availability and can be expensive. As such, this standard would be technology and market-forcing and staff is considering proposing a longer-term compliance date of 2027 to 2031, dependent on equipment type, use and size. Staff is preparing a report that will review all currently available technologies and their respective costs and market availability. Staff welcomes comment detailing any zero-NOx technologies currently (and anticipated to be) available, as well as comments on the current proposed compliance dates. As discussed throughout this workshop report, District staff intends for this draft future-effective rule standard to provide manufacturers, suppliers, and consumers with a sufficient planning horizon for the proliferation of zero-NO_X appliances into the market while realizing emissions reductions and positive health outcomes as soon as practicable. While certain technologies are currently available to meet the proposed standards, draft amendments include a commitment from District staff to re-evaluate the availability and accessibility of zero-NOx solutions in closer

[1] SS30: Residential Fan-Type Furnaces of the 2017 Clean Air Plan addresses the context, implementation and emissions reductions associated with the introduction of the 14 ng/joule standard for Rule 9-4.

proximity to the compliance date and report to the Air District Board of Directors to ensure equitable outcomes in the implementation of the draft standards.

Both Rules 9-4 and 9-6 currently apply only to new devices and only to natural gas-fired devices, and Air District staff does not intend to change these provisions of the rules. The draft new lower and zero-NOx standards would apply to appliance manufacturers, retailers/wholesalers and installers and would affect Bay Area consumers at the point in time when they replace their existing furnaces and water heaters. Finally, the draft amendments include a number of editorial changes to improve the enforceability of the rules.

II. BACKGROUND

A. Industry Description

Draft amendments to Rules 9-4 and 9-6 would impact natural gas-fired space and water heating appliances. These include furnaces and water heaters used in single family homes, multifamily residences such as apartment buildings, and commercial spaces such as retail and office buildings. The Air District regulates these sources on a point-of-sale basis, requiring that equipment manufactured after the compliance date and installed within the geographical jurisdiction of the Air District meets the standards contained in the Rules. The draft amendments would apply to commercial as well as residential applications as well as non-central space heating configurations.

B. Regulatory History

The Air District has regulated NOx emissions from space and water heating appliances for several decades. Rule 9-4 for furnaces was first adopted in 1983, with this version of the rule still in place. Rule 9-6 was first adopted in 1992 and was most recently updated with more stringent NOx emissions standards for certain equipment in 2007. All versions of these rules have included a NOx emissions standard expressed as nanograms (ng) of NOx per joule of useful heat delivered by the appliance.

Additionally, the South Coast Air Quality Management District (SCAQMD) and the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) have adopted their own regulations that are similar in structure and standards to Rules 9-4 and 9-6. SCAQMD Rule 1111 and SJVUAPCD Rule 4905, which are similar in applicability to Rule 9-4 for furnaces, have been updated within the last 10 years and currently require a NOx emissions standard of 14 ng/J, the same initial standard that is included in the draft amendments. Rule 9-6 for water heaters and small boilers currently contain NOx emissions standards equivalent to those in SCAQMD Rules 1146.2 and 1121 and SJVUAPCD Rules 4308 and 4902 for similar equipment.

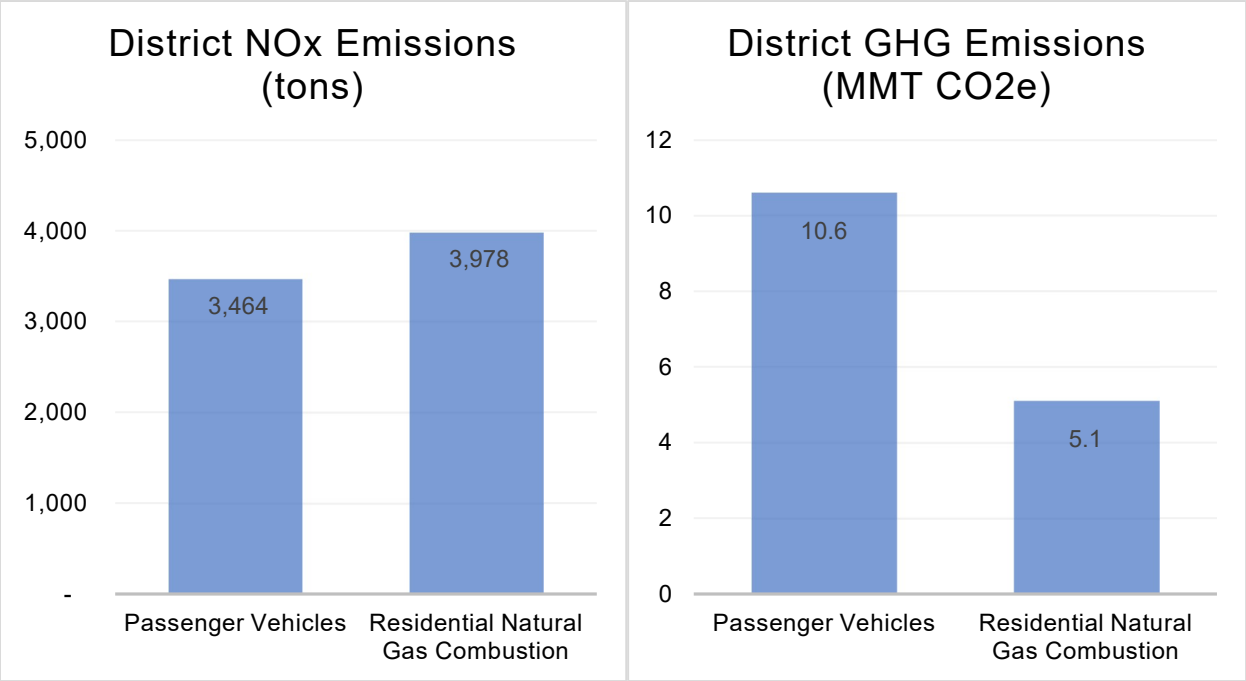
III. TECHNICAL REVIEW

A. Emissions Context

Nitrogen oxides emissions from building appliances in the Bay Area are estimated based on aggregated natural gas usage data from Pacific Gas and Electric. These data, combined with data and assumptions regarding the age of buildings and their equipment, are used to calculate criteria and greenhouse gas emissions associated with the building sector.

The buildings sector was identified as a significant Bay Area source of emissions in the Air District's 2017 Clean Air Plan and was highlighted in measures SS30, BL1 and BL2.[2] Figure 1, below, shows emissions from natural gas combustion in residential buildings in comparison to emissions from passenger vehicles, as a significant comparative source for context.

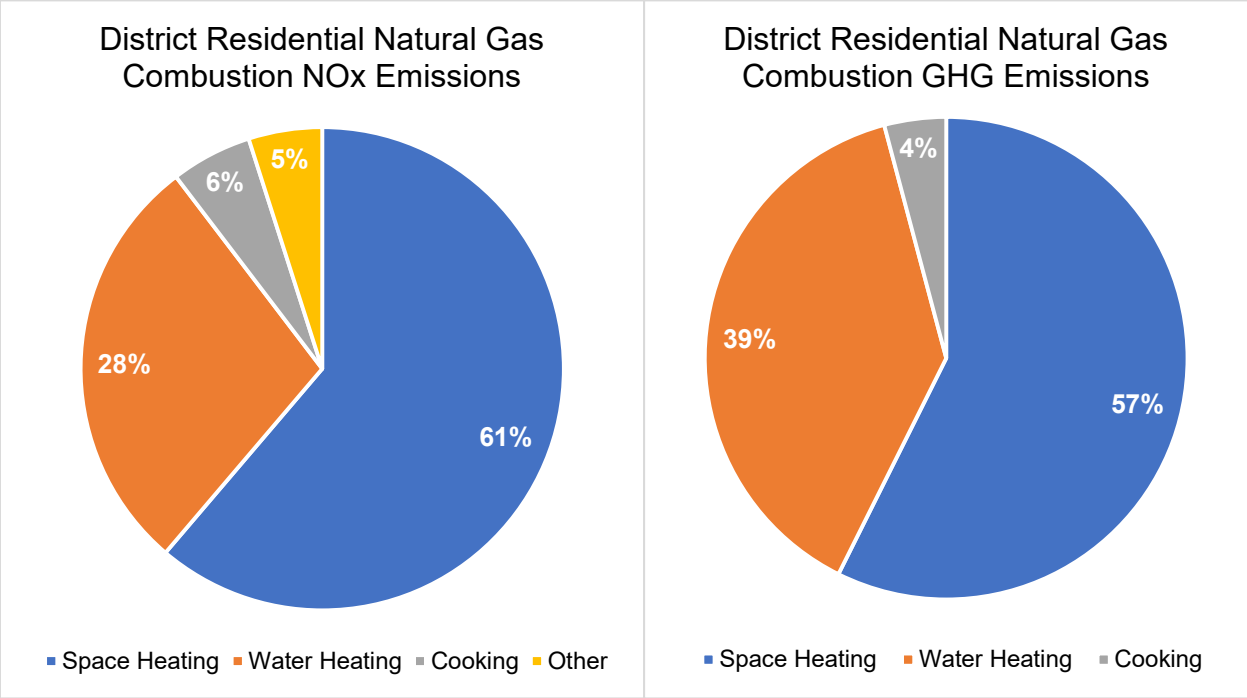
Figure 1
Passenger Vehicle Emissions vs. Residential Natural Gas Combustion (2019)[3]



The draft rule amendments focus on emissions from natural gas-fired space and water heating appliances in buildings. While space and water heating are not the only natural gas consuming appliances in buildings, they do represent the vast majority of natural gas consumption and therefore NOx emissions from the buildings sector. Additionally, unlike some other appliances, space and water heaters vent outdoors into the ambient air, impacting the local and regional air quality of the Bay Area, which is the focus of the Air District. For the purposes of this workshop report, staff also considered greenhouse gas (GHG) emissions associated with the relevant appliances and potential co-benefit GHG emission reductions. Figure 2, below, shows the emissions share by appliance type for residential natural gas combustion.[4] Represented by the blue and red sections of the charts, space and water heating represent roughly 90 percent of emissions from residential natural gas combustion for both NOx and greenhouse gases.

[2] Bay Area Air Quality Management District. Spare the Air – Cool the Climate: Final 2017 Clean Air Plan. https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf
[3] Bay Area Air Quality Management District. 2019 Criteria Pollutant inventories.
[4] Bay Area Air Quality Management District. 2019 Criteria Pollutant inventories.

Figure 2
Residential Natural Gas Combustion Emissions by Equipment Type in 2019



B. Nitrogen Oxide Emissions

The draft amendments seek to significantly reduce NOx emissions from space and water heating appliances. As shown above in Figures 1 and 2, these appliances emitted 2,436 and 1,130 tons of NOx per year, respectively, in residential buildings in the Bay Area in 2019.

Nitrogen oxides are a key criteria pollutant as a precursor to ozone and secondary particulate matter (PM) formation. Secondary PM is formed from the conversion of NOx to ammonium nitrate through atmospheric chemical reactions with ammonia. Particulate matter, a diverse mixture of suspended particles and liquid droplets, is the air pollutant most harmful to the health of Bay Area residents. The Bay Area is currently classified as non-attainment for $PM_{2.5}$ under California Ambient Air Quality Standards (CAAQS) and unclassifiable under National Ambient Air Quality Standards (NAAQS). Exposure to fine PM, on either a short-term or long-term basis, can cause a wide range of respiratory and cardiovascular health effects, including strokes, heart attacks, and premature deaths. Because NOx compounds in the atmosphere contribute to the formation of secondary PM, any NOx emissions reduction would also result in $PM_{2.5}$ reductions.

Ozone is a regional pollutant for which the Bay Area is also currently in non-attainment under NAAQS and CAAQS. Emissions of reactive organic gases (ROG) and NO_X throughout the Bay Area contribute to ozone formation in downwind areas. Therefore, reductions in emissions of ROG and NO_X are needed throughout the region in order to decrease ozone levels. As the air temperature rises, ground-level ozone forms at an accelerated rate. Ozone levels are usually highest on hot, windless summer afternoons, especially in inland valleys. Exceedances of state or national ozone standards in the Bay Area only occur on hot, relatively stagnant days. Because weather conditions have a strong impact on ozone formation, ozone levels can vary significantly from day-to-day or from one summer to the next. Longer and more severe heat

waves expected as a result of climate change may cause more ozone formation, resulting in more frequent exceedances of ozone standards.

IV. DRAFT RULE AMENDMENTS

Air District staff is presenting draft amendments to Rules 9-4 and 9-6 in this Workshop Report that staff believes best represents significant achievable NOx emissions reductions from the largest sources within the building sector. These draft amendments include, for Rule 9-4, introducing an "ultra-low" NOx standard with a compliance date of 2023, and for both Rules 9-4 and 9-6, setting a zero NOx standard with compliance dates ranging from 2027 to 2031 based on equipment type, use and size. The details of these amendments are discussed below.

A. Draft Amendments to Rule 9-4

1. Rule Title and Applicability

Rule 9-4 is currently titled "Nitrogen Oxides from Fan-Type Residential Central Furnaces." To expand the applicability of this rule to a larger breadth of space heating appliances, draft amendments would change the name to "Nitrogen Oxides from Residential and Commercial Furnaces." Existing requirements for residential fan-type furnaces will remain and additional units are only intended to be subject to the zero-NO_X emission standard in draft new Section 9-4-301.3. Staff differentiates this through the addition of a definition for "Residential Fan Type Central Furnace" and specifying where the standards are more broadly applicable to natural gas-fired space heating equipment.

2. Definitions

For clarity and enforceability, draft amendments include the addition of definitions for British Thermal Unit (BTU), Heat Input, Natural Gas, Nitrogen Oxides and Residential Fan Type Central Furnace.

3. Standards

The draft amendments to Section 9-4-301 would clarify emissions standards, including existing requirements for residential fan-type central furnaces in the current version of the Rule (§ 9-4-301.1). Section 9-4-301.2 is added to introduce the "ultra-low NOx" requirement (14 ng/J) in 2023 to align with SCAQMD and SJVUAPCD emissions standards and achieve short term NOx reductions and health benefits. This requirement would also only be applicable to residential fan-type central furnaces as drafted.

The draft amendments include the addition of new Section 9-4-301.3 to introduce the zero-NOx standard as well as additional applicable equipment. As drafted, the zero-NOx standard is proposed to take effect in 2029 and would apply to all residential and commercial space heating appliances. This includes wall heating and other direct-vent units. This requirement would not be applicable to furnaces used in mobile homes. The draft standard is intended to result in significant regional NOx (and therefore ozone and secondary PM) emission reductions in the long term. The draft standard is proposed to take effect in 2029 based on current understanding of available technology, accessibility and affordability of zero-NOx units and planned industry technology development to reduce these barriers. Through the release of this workshop package, the District is seeking input on the introduction of this standard and the proposed timeline for compliance.

4. Administrative Requirements

The draft amendments include updates and clarifications to certification and calculation methods. Staff intends for dual-fuel units that can demonstrate compliance with the ultra-low NOx standard, on average, to be able to meet the standards and certification requirements of these rule amendments. Rule 9-4 additionally requires the completion of a compliance statement for recordkeeping purposes and the draft amendments would add a provision to this section to allow for the submission of compliance statements issued by SCAQMD for equivalent emission standards.

The draft amendments include the addition of an interim report to be brought to the Board of Directors by the Air Pollution Control Officer (APCO) two years prior to the compliance date for the zero-NOx standard. Staff intends for this report to provide information to the Board and the public about the accessibility of zero-NOx appliances to Bay Area residents and to allow the Board of Directors an opportunity to take any necessary action in response to this information. Contents of this report would include information on technology development, market availability of compliant units, potential costs of compliance, and availability of incentive programs to decrease these costs. Additional details regarding equity considerations to be included in the interim report are discussed in the equity analysis section of this Workshop Report.

5. Manual of Procedures

The draft amendments include the addition of a Manual of Procedures (MOP) section to add further clarity around equipment certification and determination of emissions through source tests conducted in accordance with EPA reference methods.

B. Draft Amendments to Rule 9-6

1. Standards

The draft amendments to Rule 9-6 include the introduction of a zero-NOx standard for natural gas-fired residential and commercial water heaters and boilers. The proposed compliance dates for these appliances are dependent on equipment size. Units under 75,000 BTU/hour (typically single-family residential) are required to comply by 2027 and larger units up to 2 million BTU/hour (typically used in multifamily and commercial buildings) would have a 2031 compliance date as drafted. Based on current understandings of available technologies and market development, staff anticipates that zero-NOx solutions for single-family residential applications will be available and affordable on a shorter timeframe than larger boilers used in multifamily and commercial applications. This includes the development of lower voltage heat-pump water heaters that will lower cost barriers associated with electric upgrades. Through the release of this workshop package, Air District staff is seeking input on these draft timelines.

2. Administrative Requirements

As in Rule 9-4, draft amendments include an Interim Report to be brought to the Board by the APCO at least two years prior to the compliance dates for the zero-NO_X standards. Staff intends for this report to provide information to the Board and the public about the accessibility of zero-NOx appliances to Bay Area residents and to allow the Board of Directors an opportunity to take any necessary action in response to this information. Contents of this report would include information on technology development, market availability of compliant units, potential costs of compliance, and availability of incentive programs to decrease these costs. Additional details

regarding equity considerations to be included in the interim report are discussed in the equity analysis section of this Workshop Report.

V. PRELIMINARY DISCUSSION OF POTENTIAL IMPACTS

A. Emission Control Methods

Emission control methods to meet the draft 14 ng/J standard for Rule 9-4 are well established and currently required by SCAQMD Rule 1111 and SJVUAPCD Rule 4905. Potential complications identified in other jurisdictions, such as high altitude and cold weather scenarios, are not applicable in the Bay Area. Staff intends for dual-fuel systems that are able to demonstrate compliance with this new draft standard to be eligible for certification.

Current emission control methods for the zero NOx emissions standard available on the market consist mainly of electric and electric heat pump systems. Air District staff does not intend to mandate specific technology solutions, but for the purpose of this workshop report, including emissions and cost estimates, currently available electric solutions are used to form estimates and projections. Natural gas technologies, with combustion occurring in the absence of nitrogen, could also meet the draft standards along with a variety of other technologies. The use of electric appliances serves as a conservative estimate for NOx reductions due to the additional NOx from natural gas-fired power plants for electricity generation taken into account for estimates as described below. Draft amendments include a zero NOx standard six to ten years in the future in order to encourage technology development as well as availability and accessibility throughout the Bay Area. Considerations for equitable access to zero NOx solutions are discussed further in the Equity Analysis section of this report.

B. Emission Reductions

As the applicable rules function as point-of-sale requirements, emission reductions associated with the draft rule amendments would occur over time in relation to the lifespan of currently installed equipment. Staff estimated emissions reductions from the draft amendments as equipment is phased in over time. To model these predicted emission reductions, staff made the following assumptions:

- While the draft regulatory amendments would allow for any energy source that meets the draft emissions standards, based on currently available technology, staff assumed that natural gas-fired appliances would be replaced with electric solutions. As noted above, this results in a conservative analysis of NOx reductions because other technologies that may be developed could avoid the additional NOx from electricity generation.
- For electric replacements, it is assumed that the electricity provided is from Pacific Gas and Electric with a power mix of 98 percent carbon-free electricity generation sources.[5]
- Electricity generated from natural gas-fired powerplants is assumed to result in NOx emissions of 5 ppm by dry volume at 15% oxygen. This emission limit represents best available control technology for simple-cycle gas turbine power plants over 50 megawatts.[6]

[5] PGE 2019 Power Source Disclosure Report. https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/clean-energy-solutions/clean-energy-solutions.page?WT.mc_id=Vanity_cleanenergy

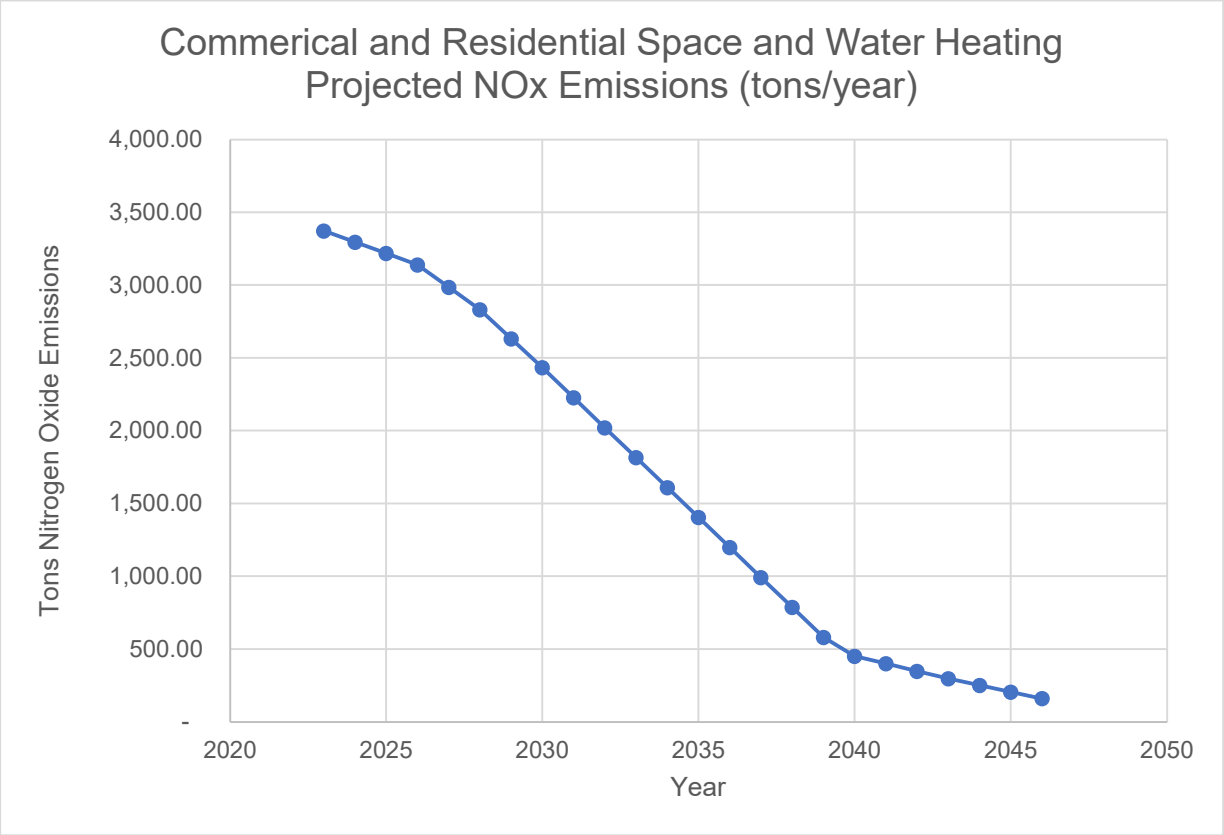
[6] California Air Resources Board, Stationary Source Division. Report to the Legislature: Gas-Fired Power Plant NOx Emission Controls and Related Environmental Impacts. May 2004. https://ww2.arb.ca.gov/sites/default/files/classic/research/apr/reports/l2069.pdf.

- While some Bay Area residents are choosing to install zero NOx solutions at this time, and this is expected to continue and increase over time, modeled emissions reductions do not assume any voluntary uptake of zero NOx technology prior to the drafted compliance dates. Staff is seeking comments on current and projected rates of voluntary uptake.
- Commercial space and water heating is frequently achieved through the use of larger boilers that are covered under the Air District's Regulation 9, Rule 7. As such, staff assumed that 50 percent of commercial space and water heating baseline emissions would not be impacted by the draft amendments.
- As the draft amendments would impact only direct emissions from two types of building appliances and do not impact natural gas distribution, staff conservatively did not assume any upstream emission reductions along the natural gas infrastructure. These reductions could have been associated with greenhouse gas co-benefits through reduced methane leakage but are not guaranteed because the technologies to be used to meet the proposed standards could rely on the natural gas grid for energy.
- Water heaters were assumed to have an average lifespan of 13 years and space heating equipment are assumed to have an average lifespan of 18 years.[7]

Figure 3, below, shows the projected NOx emissions over time based on the assumptions described above and the draft amendments to Rules 9-4 and 9-6. The 2015 Air District emissions inventory provides the baseline for this projection.

[7] Environmental Energy and Economics. April 2019. "Residential Building Electrification In California: Consumer economics, greenhouse gases and grid impacts". Page 41.

Figure 3
Projected NOx Emissions from Draft Amendments



Initial reductions would be achieved by the introduction of the ultra-low NO_X requirements (14 ng/J) for residential furnaces. For replacements under this standard between 2023 and 2029, staff estimates a 65 percent reduction in NO_X emissions on a per unit basis compared to existing standards. Additional significant emission reductions would be achieved starting in 2027 with the zero NO_X compliance date for small water heaters, and additionally in 2029 with the zero NOx compliance date for all new space heating units.

Yearly emissions reductions would continue, including as zero NOx technology is introduced for large water heaters in 2031 and units, including ultra-low NOx units, are changed out over the course of the average assumed appliance lifetimes.

Table 1, below, provides values for projected yearly emissions and projected reductions versus the baseline emissions inventory for selected years as represented by the graph in Figure 3.

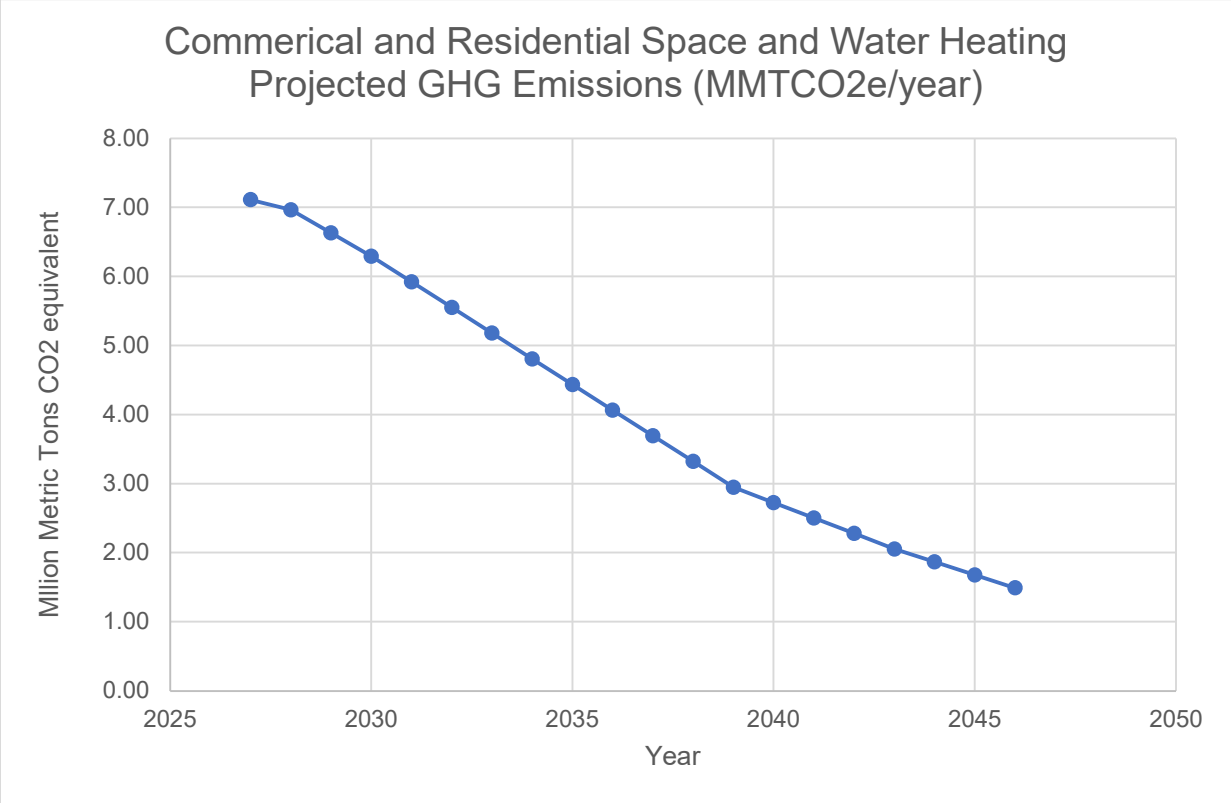
Table 1
Projected NOx Emissions from Draft Amendments

Year	Projected Yearly NOx Emissions (tons/year)	Projected NOx Reduction vs. Baseline (tons/year)
2015	3,450	-
2030	2,433	1,017
2035	1,404	2,046
2040	452	2.998
2046	161	3,290

These NOx emission reductions over time are significant, with a 95 percent reduction of emissions from the baseline by the projected date of complete equipment changeout in 2046. This date could be realized sooner with voluntary uptake and replacements before burnout both prior to and throughout the compliance period. NOx emissions are a criteria pollutant of concern for the Bay Area and impact overall regional air quality and ozone formation, as well as secondary particulate matter (PM) formation. Staff anticipates that the significant NOx reduction expected from the draft amendments to the rules would result in meaningful local health benefits through reduced PM formation. Air District staff will work to quantify these outcomes throughout the remainder of the rule development process.

Staff additionally estimated greenhouse gas emission co-benefits that may result from the draft amendments. Figure 4, below, shows the projected GHG emissions reductions over time based on the same set of assumptions listed at the beginning of this section. These assumptions include the proliferation of electric technologies in the absence of other new technology development but do not include potential greenhouse gas savings along the natural gas infrastructure that could result from widespread electric appliance usage. Should zero-NOx natural gas-fired technologies be developed and adopted, the projected greenhouse gas savings depicted below would not occur at the scale projected in Figure 4 and Table 2. For greenhouse gases, 2019 District emissions data serves as the baseline.

Figure 4
Projected GHG Emissions under Draft Amendments



GHG co-benefits are achieved in a fashion similar to the emission reductions described for NOx. While the replacement of older appliances with natural gas-fired ultra-low NOx furnaces between 2023 and 2029 may result in some efficiency savings, these are not estimated. Projected greenhouse gas co-benefits are based largely on the assumption of in-kind electric replacements and low-carbon content power provided by Pacific Gas and Electric as described above.

Table 2, below, provides values for projected yearly emissions and projected reductions versus the baseline emissions inventory for selected years as represented by the graph in Figure 4.

Table 2
Projected GHG emissions under Draft Amendments

Year	**Projected Yearly GHG Emissions** ($MMTCO_2e/yr$)	**Projected Reduction vs. Baseline** ($MMTCO_2e/yr$)
2019	7.26	-
2030	6.35	0.91
2035	4.33	2.93
2040	2.46	4.80
2045	1.29	5.97

VI. EQUITY ANALYSIS

In cases such as this, where the cost of compliance is borne by individual property owners, equity considerations must be kept at the forefront. The impact of these rule amendments on interest groups such as renters, affordable housing administrators, and others must also be adequately considered. Staff has discussed equity and cost concerns with stakeholders throughout the rule development process. Assuming significant fuel-switching to electric appliances, significant additional costs associated with complicating factors beyond the capital cost of equipment such as electric service or panel updates could occur. However, improvements in available technology may lessen the cost of equipment as well as related upgrades. For example, heat pump water heaters that are compatible with 120-volt electric systems are currently entering the market, removing the need for upgrading electric service in older homes.

Numerous municipalities in the Bay Area are instituting "reach codes" under which new construction must be all electric or electric-ready. State building codes, effective in 2023, that encourage the proliferation of zero emissions solutions, were passed by the California Energy Commission in the summer of 2021. These standards have greatly increased the proliferation of electric solutions over the past five years, a trend that is only expected to accelerate. Air District staff intends to continue to coordinate with stakeholders including the Air Resources Board, the California Energy Commission, the California Public Utilities Commission, Pacific Gas and Electric and other air districts throughout the remainder of the rule development process and leading up to the zero-NO_X standard effective date.

A. Considerations to Ensure Equitable Outcomes

The draft rule amendments for both Rules 9-4 and 9-6 include the requirement that an interim report be brought to the Board of Directors by the APCO two years prior to the compliance date for the zero-NO_X standard. Staff discussed guiding principles and factors that should be included in this analysis with stakeholders throughout the rule development process as well as specifically during the most recent stakeholder working group meeting. The following guiding questions have served Air District staff throughout the course of this rule amendment process:

- Who stands to benefit most from the implementation of this policy? Who may be disproportionately burdened by this policy?
- Who is missing from this process and how can we ensure their concerns are represented and addressed?
- What unintended consequences could result from these draft amendments if they were adopted as envisioned/intended? What steps can be taken to mitigate these adverse impacts?
- What additional barriers might prevent individuals in certain racial/ethnic/socioeconomic groups from benefitting fully from this policy? Are their further ways to maximize equitable outcomes?
- How will impacts and performance be documented and evaluated? What methodologies will be used? How will results be used?

Staff will continue to consider these questions throughout the remainder of the rule development process as well as throughout the time frame between rule adoption and the future effective date of the zero-NO_X standard. These questions will additionally serve to guide the interim

report included in the draft amendments. Further, staff will report on the status of the following factors at the time of the interim report:

- Access to economic benefits, including robust market availability and affordability
- Ease of installation and coordination with local requirements
- Assurance that policy promotes affordable housing and anti-displacement outcomes
- Access to health and safety benefits, including resiliency during climate events

Air District staff hopes to gain additional input on these outcome conditions from the public workshop, board committee meeting, and additional public engagement prior to proposal of final rule amendments.

VII. RULE DEVELOPMENT / PUBLIC PARTICIPATION PROCESS

Air District staff has reached out to and met with regulatory, community and industry experts in the space and water heating and building sectors. This includes manufacturers, advocates, community organizers, research organizations, utilities, community choice aggregators, and other regulatory bodies such as Bay Area cities, SCAQMD, the California Air Resources Board and the California Energy Commission. Staff has presented as requested at existing industry working groups convened by groups such as the Building Decarbonization Coalition and Stop Waste.

In addition, staff convened a stakeholder working group to discuss specific issues relating to Rules 9-4 and 9-6 and drafting amendments. This working group included community and environmental advocates, equipment manufacturers, local city staff and representatives from the SCAQMD, the California Air Resources Board, the California Energy Commission and Pacific Gas and Electric, among others. At the time of this report, staff has convened four meetings of this group. These meetings consisted of:

- A "kickoff" meeting to discuss general direction of the rule amendments and equity concerns
- Two meetings to discuss technical issues specifically related to space and water heating issues, respectively
- An equity focused working group meeting

All meetings of the group were held as interactive webinars including discussion questions for stakeholder response and use of Google JamBoards. Depending on interest in the specific topic, these meetings were attended by approximately 20-40 stakeholders.

Air District staff has additionally received feedback from the public and the Air District Board of Directors at a November 2020 presentation to the Climate Protection Committee and at an April 2021 presentation to the Stationary Source and Climate Impacts Committee. Staff plans to bring proposed amendments to the Air District's Board of Directors for adoption, following changes based on additional stakeholder input, in 2022.

As part of the rule development process, staff also evaluates potential environmental impacts as required by the California Environmental Quality Act, Public Resources Code Section 21000 et seq. In evaluating potential environmental impacts related to the amendments to Rule 9-4 and Rule 9-6, staff will perform an analysis of impacts from the draft amendments as required by the California Environmental Quality Act.

Staff will prepare a final proposal and staff report, along with other supporting documents, for further review and comment prior to a Public Hearing.

VIII. CONCLUSION

Air District staff developed amendments to Rules 9-4 and 9-6 to minimize emissions of NOx and secondary PM formation from buildings in the Bay Area. Staff has provided these draft amendments and workshop report for public review in hopes of receiving feedback to inform subsequent development in advance of proposing adoption of the rule amendments for the Air District Board of Directors consideration in the first quarter of 2022.