POLICY BRIEF NO. 14
MARCH 2022

Pritzker Briefs
PRITZKER ENVIRONMENTAL LAW AND POLICY BRIEFS

How Air Districts Can End NOx Pollution from Household Appliances

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Introduction

Most appliances, like furnaces and water heaters, are powered by fossil fuels and emit nitrogen oxides (NOx) and other harmful pollutants in and near our homes. These emissions have serious public health and environmental consequences for Californians, contributing to approximately five hundred premature deaths every year and hampering California's efforts to meet its ambitious climate goals. Technology to avoid the negative impacts of fossil fuel appliance emissions is already readily available. Indeed, many furnaces, residential and commercial dryers, and stoves all have zero-emission counterparts on the market that are more cost-effective over a product's lifetime. But governmental action is needed to facilitate more widespread adoption and development of these healthier alternatives. The California Air Resources Board (CARB) has taken an important step in this direction by proposing zero-greenhouse gas (GHG) space and water heating standards. California's air districts have an opportunity to build on CARB's action by adopting appliance NOx emission regulations to protect public health and the environment. Air district action is crucial, even with CARB's proposal, because air district NOx regulation may affect a broader set of sources; may support a faster move to zero emissions; and may serve as a model for other states that may not be able to emulate CARB's GHG-focused approach.

This policy brief examines air districts' legal authority to adopt standards requiring zero-NOx appliances and suggests policy mechanisms to help ensure that the transition to such appliances is equitable and affordable. First, we discuss the negative effects of fossil fuel appliances on human health, air quality, and climate change and identify zero-NOx standards as a solution to these problems. Second, we examine federal and state laws granting air districts authority to select pollution control measures of this type. Third, we present considerations for designing effective appliance emissions standards and assisting low-income communities in the shift to cleaner appliances. Lastly, we discuss ways air districts are positioned to address potential legal hurdles to standard setting. We conclude that air districts can employ their existing authority to adopt zero-NOx standards in order to reduce air pollution, mitigate health risks, and help avert the climate crisis.

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Pollution from Fossil Fuel Appliances Significantly Harms Health and Hinders Climate Progress

NOx are toxic and highly reactive gases that are emitted when fossil fuels are burned, endangering human health and the environment. NOx also react with the sun and atmosphere to become harmful smog (ozone) and particulate matter (PM2.5).

Household appliances are a hugely significant—and underappreciated—source of dangerous NOx emissions, rivaling the largest industrial sources. Currently, fossil fuel appliances emit about 65 tons of NOx statewide per day—about 4.9 times as much as power plants.[2] In the San Francisco Bay Area, which has one of the highest population densities of any metropolitan region in the United States, appliances release more NOx than light-duty passenger vehicles, and over eight times as much NOx as power plants.[3] And gas stoves expose as many as 12 million Californians to indoor pollution that exceeds outdoor NOx standards in a typical winter week, in addition to other pollutants like carbon monoxide, fine particulate matter, and the carcinogen formaldehyde.[4] As a result of this appliance pollution, buildings in California are responsible for about 515 premature deaths[5] and over $17 billion in health impact costs per year.[6]

Californians of color are exposed to 32% more outdoor particulate matter formed from residential gas appliance emissions than White Californians, with Black Californians experiencing exposures 46% higher than White Californians.

Fossil fuel appliances also exacerbate racial and other inequities. Californians of color are exposed to 32% more outdoor particulate matter formed from residential gas appliance emissions than White Californians,[7] with Black Californians experiencing exposures 46% higher than White Californians.[8] And health risks from indoor appliance pollution are greatest for low-income Californians of color, who are more likely to live in older, smaller, less ventilated, and more crowded homes, and to use gas cooking equipment for space heating.[9] Children are also especially likely to suffer from fossil fuel appliance emissions, particularly indoor emissions.[10] Children who live in homes with gas stoves are 42% more likely to experience asthma symptoms and 24% more likely to develop asthma.[11]

Decarbonization of new and existing homes and buildings in California is not only crucial to improving health and air quality,[12] but it is also critical to the state's achievement of its ambitious GHG emission reduction targets.[13] Steep reductions in gas use in buildings are necessary to achieve the state's goal of an 80 percent decrease below 1990 levels of GHG emissions by 2050.[14] Direct emissions from the combustion of fossil fuels in buildings, primarily for space and water heating, account for 10 percent of all GHG emissions in the state—more than the emissions from heavy duty vehicles, in-state electricity generation, agriculture, waste and recycling, or oil and gas extraction.[15] Eliminating emissions from fossil fuel appliances would bring the state closer to its climate targets.[16]

Setting Zero-NOx Emissions Standards for Appliances Can Be an Important Part of the Solution

Zero-emissions standards are a powerful policy tool that can drive a swift, inclusive, and equitable transition to pollution-free appliances.

Emissions standards are the legal requirements governing the permissible amount of air pollution that may be released into the atmosphere over specific timeframes from specific sources.[17] Emissions standards in California are set by both CARB and local air districts;[18] air districts may adopt even stricter emission limits than required by CARB.[19] In the arena of household appliances, zero-NOx emissions standards set by local air districts can play a critical role in advancing public health and limiting climate change.

Zero-emissions standards are a powerful policy tool that can drive a swift, inclusive, and equitable transition to pollution-free appliances. The public health benefits of such standards would be significant: If all residential gas appliances in California were replaced with electric, zero-NOx alternatives, the reduction in outdoor air pollution alone would avoid about 350 deaths, 600 cases of acute bronchitis, and 300 cases of chronic bronchitis each year, translating to about $3.5 billion in annual monetized health benefits.[20] Standard setting would also hasten the replacement of gas furnaces with zero-NOx electric heat pumps, which facilitate both air conditioning and heating of buildings. And upgrading homes with air conditioning, which cools and filters air, helps protect vulnerable populations—many of whom reside in environmental justice communities—from extreme heat events and poor air quality during wildfire season.

Establishing zero-NOx emissions standards could also spur the modernization of housing infrastructure by way of mass electrification retrofits, which will be key to ensuring universal access to all-electric homes and will lead to job creation. Because appliance emissions standards would necessarily affect appliance costs, concerns about the distributional impacts of such regulations are well-founded and deserve special consideration via coordinated efforts across air districts, utilities, and other actors. We discuss strategies for addressing the distributional effects of these policies in Section IV of this report. But it is also worth noting that overall, the costs of electrification retrofits are modest. For example, in all single-family homes and nearly half of all low-rise multi-family homes, space and water heating retrofits will typically either produce lifecycle savings or modest cost increases of less than $100 per year.[21] Where lifecycle savings occur, they can, through the use of financing tools like on-bill tariffs,[22] be translated into workable upfront and operational costs for consumers. And where retrofits lead to significant lifecycle cost increases, residential weatherization, energy efficiency installations, and bill assistance programs can provide support for low-income residents to offset increased costs.[23]

In addition to the critical role retrofits will play in bringing about equitable access to all-elec-

tric homes, they will also make up most of the roughly 64,000-104,000 net jobs that electrifying our buildings could add annually, providing key employment opportunities as California transitions to a green economy.[24] And because direct emissions from the combustion of fossil fuels in buildings accounts for 10 percent of all GHG emissions in California, zero-emissions standards would bring the state closer to its climate targets.

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Districts have already adopted NOx emissions standards for some appliances,[25] and a couple of districts are now considering strengthening their standards to require zero-emission appliances. For example, the Bay Area Air Quality Management District (BAAQMD) is planning to finalize a zero-NOx rule for residential and commercial space and water heaters in the second or third quarter of 2022.[26] The South Coast Air Quality Management District (SCAQMD) is also contemplating including zero-NOx standards in its 2022 Air Quality Management Plan (AQMP) for certain classes of water heaters, furnaces, cooking devices, and other combustion sources. The district strives to accomplish a 70 percent reduction of NOx from residential combustion equipment by 2037.[27] Meanwhile, CARB has proposed statewide zero-GHG emissions standards for all space and water heaters as a part of its 2022 State Implementation Plan (SIP) strategy.[28] CARB's proposal demonstrates the promise and value of zero-emissions standards, but it is not yet final and may not cover all end uses. For these reasons, air districts should continue and expand consideration of zero-NOx emissions standards for household appliances. Using such standards, some districts may be able to move to zero-emissions appliances faster than CARB's proposal would. Air district standards may also serve as a roadmap for regional air agencies in states that do not adopt statewide appliance GHG emissions regulations.

In sum, zero-emission appliance standards would have significant public health benefits, would help combat climate change, and could be part of an equitable shift away from fossil fuels.

Air Districts Possess the Legal Authority to Set Zero-NOx Standards for Appliances

Under both federal and state law, air districts enjoy significant authority to adopt standards requiring zero-NOx appliances. The federal Clean Air Act (CAA) makes states responsible for adopting and enforcing pollution control plans, called State Implementation Plans (SIPs), to achieve the national ambient air quality standards (NAAQS).[29] Section 172(c)(1) of the CAA requires states to demonstrate in their SIPs that they are implementing all "reasonably available control measures" (RACM) that could reduce the concentration of the relevant air pollutant, including any "reasonably available control technology" (RACT) to come into attainment. The RACT technology standard applies to residential fossil fuel appliances that are subject to a control measure in a SIP.[30]

The U.S. Supreme Court has recognized that this statutory scheme provides states with discretion to adopt air pollution control measures;[31] accordingly, the U.S. Environmental Protection Agency (EPA) provides states that discretion.[32] The EPA has issued guidance stating that Section 172(c)(1) requires plans to include measures that would advance the attainment date for the region and that are economically and technologically feasible.[33] Within this framework, courts typically defer to states' RACT/RACM analysis, creating ample space for adoption of zero-NOx appliance standards.[34]

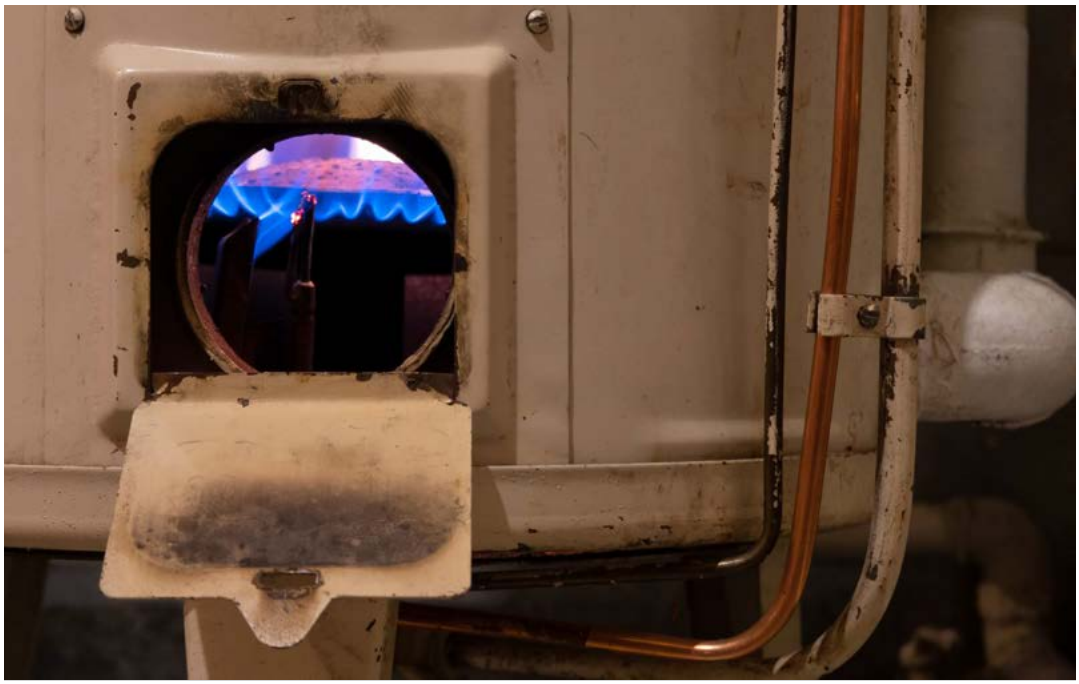
Similarly, under California law, air districts have broad authority to adopt rules to reduce air pollution from stationary sources,[35] and as stated above, they may even adopt more strin-

gent emission standards than required by CARB.[36] Consequently, air districts have the statutory authority to adopt low- or zero-NOx emissions standards.[37] Beyond their power to regulate NO2 as a criteria pollutant, air districts also have power to regulate areawide sources of NOx when they contribute to the formation of other criteria pollutants in their regions.[38] Indeed, because of the role NOx plays as a precursor to pollutants like PM2.5 and ozone, air districts in nonattainment for these pollutants also must take action to reduce NOx emissions so that they may come into attainment "as expeditiously as practicable" under CAA sections 172(a)(2) and 188(c)(1).[39] California law also mandates air districts to meet California ambient air quality standards (CAAQS), which are established for several air pollutants, including ozone and PM2.5, and are often more stringent than national standards.[40] Most air districts are in ozone nonattainment, so their efforts to address NOx as an ozone precursor are not only authorized, but in fact required.[41]

Indeed, the Health & Safety Code prioritizes control measures that promote healthful air in nonattainment areas, even when those measures result in higher socioeconomic impacts.[42] Areas already in attainment also have the option of regulating precursor pollutants. And once air districts select control measures that promote healthful air, courts typically defer to their choices and rationale.[43] A prime example of judicial deference to regulators' adoption of control measures comes from litigation over the SCAQMD's promulgation of stricter VOC emission limits for a variety of architectural and industrial maintenance paints, in 2012. There, the California Supreme Court held the air district had discretion to determine the stringency of the control technology standard required and the "class or category of sources" to which the rule applied, illustrating air districts' authority in this space.[44]

Adopting zero-NOx standards would help districts in nonattainment for PM2.5 and ozone meet their requirements under both the federal Clean Air Act and California law and come into attainment "as expeditiously as practicable" by eliminating a precursor to these pollutants.

In sum, air districts enjoy broad discretion to determine that standards requiring zero-NOx appliances are appropriate under both federal and state law. Thus, districts possess the legal authority to adopt zero-NOx emissions standards for appliances. Further, adopting such standards would help districts in nonattainment for PM2.5 and ozone meet their requirements under both the federal CAA and California law and come into attainment "as expeditiously as practicable" by eliminating a precursor to these pollutants.



Considerations for Effective and Equitable Policy Design

The escalating cost of safely maintaining the gas system in a state as large as California is causing customer gas rates to rise, prompting an increasing number of wealthy households to convert to all-electric appliances and leaving substantially fewer customers to pay for system repairs and upgrades.

The transition from pollutant-emitting appliances to zero-NOx standards must be equitable and affordable for low-income communities and communities of color. The escalating cost of safely maintaining the gas system in a state as large as California is causing customer gas rates to rise, prompting an increasing number of wealthy households to convert to all-electric appliances and leaving substantially fewer customers to pay for system repairs and upgrades.[45] Without thoughtful interventions to promote an inclusive transition, this trend will exacerbate economic pressures on the nearly one-quarter of California residents already facing energy insecurity, as they will be least able to afford the upfront costs of electrification and are most likely to live in rental housing where they have little to no say on whether to electrify.[46] Underserved and under-resourced individuals often miss out on early adoption of new technologies because they cannot afford the new technology, the technology does not fit their needs, or the technology was not built with their market in mind.[47]

An important benefit of zero-emission standards is that they can help foster a more inclusive transition than other electrification policies. Because such standards apply to existing buildings, they help to ensure that electrification reaches all communities. However, without concurrent financial and other support for low-income communities, such standards may still result in more wealthy homeowners investing in electric appliances, while penalizing low-income homeowners who cannot.[48]

Equitable residential building electrification will therefore require careful thought and coordination. Air districts should lead comprehensive planning processes that center the needs of impacted communities.[49] Throughout the policymaking process, air agencies should collaborate with community members to ensure that they are fully informed and able to participate,

with access to needed resources and support.[50] One model for this work can be found in the "Equitable Building Electrification" framework put forth by Greenlining Institute and Energy Efficiency for All.[51] The framework's recommendations include assessing community need; establishing community-led decision-making processes; developing metrics and plans for tracking implementation; ensuring reliable funding and program design; and focusing on improvement of outcomes.[52] By continually collaborating with communities, air districts are more likely to develop policies that produce equitable results.

Designing Effective Emissions Standards

Air districts can increase the stringency and breadth of appliance standards in a careful, stepwise fashion that builds on pre-existing rules limiting NOx emissions from indoor gas appliances.

Zero-emissions standards provide a strong signal to manufacturers in support of building electrification.[53] To promote a smooth transition, air districts should consider various factors when setting such standards, including the stringency of standards, the breadth of standard application, and the timing of their implementation.

Air districts can increase the stringency and breadth of appliance standards in a careful, stepwise fashion that builds on pre-existing rules limiting NOx emissions from indoor gas appliances.[54] For example, other districts could first match the "ultra-low" NOx standards currently required by the SCAQMD and San Joaquin Valley Unified Air Pollution Control District,[55] with a plan to transition from there to zero-emission standards over a relatively short timeframe.[56] Taking a somewhat similar approach, the BAAQMD is currently considering amending its rules to (1) expand the application of its NOx emissions standards to additional appliances and devices used in nonresidential settings,[57] and (2) phase in zero-NOx standards for these appliances.[58] The BAAQMD regulates certain 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 its rules.[59] The district's draft amendments include two phases of new standards: (1) a short-term ultra-low NOx emission limit for natural gas-fired furnaces; and (2) a long-term zero-NOx emissions standard for natural gas-fired furnaces and water heaters.[60] The district "intends for these future-effective rule standards to provide manufacturers, suppliers, and consumers with a sufficient planning horizon for the proliferation of zero-NOx appliances into the market" while attaining "emissions reductions and positive health outcomes as soon as practicable."[61] Other air districts could adopt a similar phase-in approach. To address concerns about affordability and equity, districts could link phase-in timelines to the availability of funding and tools to assist low-income households transition to zero-NOx appliances.[62] Like the BAAQMD does in its proposal, districts could also expand the application of zero-emissions standards to additional appliances over time.[63]

Additionally, air districts could incorporate targeted compliance flexibilities into standards, for example, by extending the compliance date if certain conditions are met or creating an exemption process. An exemption could either be triggered automatically by conditions built into a rule itself or acquired through an application process subject to set criteria. Compliance flexibilities could provide an off-ramp for difficult-to-electrify households that may face unique barriers early in the transition to zero-NOx standards. Districts could track how the flexibilities are being applied and take actions to address the circumstances that necessitate them, either at an aggregate level or by ensuring all applicable incentives are being used on a case-by-case basis. Appliance standards themselves can also be designed to generate funds that can be invested in an affordable transition. For example, the SCAQMD has developed a revenue-neutral furnace rebate program with

funds reserved for customers located in disadvantaged and low-income zip codes. The rebates are immediately available to customers at the point of sale and funded by fees that manufacturers pay if they fail to achieve the district's appliance emissions requirements.[64]

Moreover, air districts could incorporate emissions averaging and trading into its rulemaking for appliances to provide manufacturers with greater flexibility in compliance and cost allocation. Under this approach, air districts would set a rate-based performance standard that could be achieved by a manufacturer's fleet, including its zero-emission electric appliances, *on average* (or by trading across multiple manufacturers' fleets). In determining what percentage of the overall fleet could reasonably be expected to be electric in a given year, districts could take into account the lower cost of installing or operating heat pump systems in certain building types.[65] Districts could periodically tighten the average rate in new regulatory proceedings, in response to declines in the cost of manufacturing, installing, or operating relevant technologies.[66]

Air districts may consider aligning zero-NOx emissions standards with municipal government phaseouts of gas appliances and gas connections through local ordinances.

Lastly, districts may consider aligning zero-NOx emissions standards with municipal government phaseouts of gas appliances and gas connections through local ordinances. So far, 52 cities and counties in California have adopted building codes to reduce their reliance on gas. These "reach codes" go beyond the statewide building code.[67] For example, Solana Beach requires new construction in residential and commercial buildings to use electric appliances for space heating, water heating, dryers, pools, and spas. Santa Clara and several other cities have all-electric reach codes that apply to both new residential and commercial buildings, with minimal exemptions. And Berkeley's local ordinance phases out gas hookups in all newly constructed residential buildings and most nonresidential buildings.[68] Aligning zero-NOx standards with these municipal gas phaseouts could ensure maximum effectiveness and efficiency of policy design and application.

Complementary Policies for an Equitable Transition to Zero-Polluting Appliances

As discussed above, gas customers who face barriers to electrification will need assistance to move to cleaner, electric appliances.[69] Air districts can work with other stakeholders to combine zero-NOx standards with the following recommended policies to subsidize the overall costs of retrofitting homes and replacing appliances:

- **Create electrification incentives and build information hubs.** It will be crucial to provide not only financial support to low-income households and residents of particularly burdened communities to enable them to electrify,[70] but also the means to access information about these resources.[71] Online platforms can be created to catalog all the incentive dollars that exist so that renters and homeowners alike can easily access local, regional, and state funds to cover—partially or fully—the cost of transitioning to zero-NOx households. Various sources of incentives already exist in different air districts. For example, in the BAAQMD, financial incentives have been offered by groups of local governments, utilities, and community choice aggregators that help bring electric appliance retrofits to cost parity with gas appliances.[72] In the SCAQMD, the Clean Air Furnace Rebate Program was expanded in 2020 with an additional $3.5 million in funding to subsidize zero-emission heat pump systems installed in accord with the SCAQMD's furnace replacement requirement, funded by penalty fees paid by manufacturers who fail to comply with the district's ultra-low-NOx rule.[73] There are also nearly $400 million in state incentives available for building electrifica-

tion,[74] and there is federal funding directed to electric retrofits.[75] Air districts should consider developing their own additional incentives and working with their communities to ensure incentives will reach those who need them most. Air districts can also collaborate with other actors through inter-agency planning efforts, joint rulemakings, and memoranda of understanding to share expertise and align timelines and programs.[76]

- **Proactively upgrade electrical panels** to ensure that panels can handle the load of all electric appliances. These upgrades would make the upgrade of an appliance easier in the event of a sudden need for replacement.[77] For example, if a gas water heater breaks and a resident needs a replacement as soon as possible, an upgraded panel would allow the resident to make the swap to a heat pump water heater immediately.
- **Support renter protection policies** to ensure that the need for electric-appliance upgrades does not displace renters or over-burden homeowners, and to support housing production, housing preservation, and tenant protections. Air districts can also require landlords and affordable housing developers who receive rebates from the districts to agree not to raise rents following an electrification upgrade.[78]
- **Coordinate with equity-focused initiatives like AB 617**,[79] which has robust assessment and reporting requirements for pollutants like NOx, to help inform whether (and how) direct emissions limitations on appliances would affect these particularly burdened communities. In collaboration with CARB and through a community-driven approach, air districts can utilize AB 617 funding to reduce NOx pollution in the most impacted communities by changing out older, fossil fuel appliances for newer, electric ones.[80]

Because the cost of compliance would be borne by individual property owners, air districts should prioritize equity considerations and closely consult with community advocates over the course of the rule development process. Air districts should also engage with stakeholders throughout their districts and incorporate their communities' suggestions to ensure the transition is equitable and affordable for all residents.

Air districts should consider developing their own additional incentives and working with their communities to ensure incentives will reach those who need them most.

Overcoming Potential Legal Challenges

Opponents of appliance emissions standards may argue that such standards are preempted by the federal Energy Policy and Conservation Act (EPCA) or state-level building standards. And air districts may also face questions about the need to prepare an Environmental Impact Report (EIR) under the California Environmental Quality Act (CEQA).

With respect to EPCA, opponents of zero-emission standards may point to that statute's express preemption of state and local rules "concerning the energy efficiency, energy use, or water use of . . . covered product[s]"[81] and argue for an expansive reading of that preemption provision.[82] In their view, EPCA should preempt any state or local regulation with a tangential effect on an appliance's energy use, including emissions standards. However, air districts have compelling arguments that emissions standards are not preempted by EPCA because emissions standards do not "concern[] . . . energy efficiency, energy use, or water use." Indeed, the CAA specifies that emissions standards are concerned with the "quantity, rate, or concentration . . . of air pollutants"—in other words, with air quality, not energy use.[83] Efficiency standards, by contrast, are concerned with usable service outputs produced by energy inputs.[84] These distinct regulatory foci lend support to air districts' argument that EPCA does not preempt appliance emissions standards.

Air districts may also point out that emissions limitations for appliances are meaningfully different from the types of state-level appliance efficiency regulations Congress meant to foreclose. Congress's intent is the "ultimate touchstone" of the court's statutory analysis,[85] and when EPCA was enacted in 1975 and updated in 1987,[86] Congress was aware of the backdrop of the CAA, which requires states to regulate emissions standards for stationary sources.[87] EPCA's statutory and legislative history does not support a conclusion that Congress either intended to supplant states' powers to regulate air pollution emissions or to occupy the field of emissions regulations that "concern[]…energy efficiency."[88]

In general, controlling air pollution emissions from appliances is quite distinct from controlling their energy efficiency; at most, the two are incidentally related.[89] This may explain why NOx emissions standards for appliances set by California air districts[90] have never been challenged on EPCA preemption grounds. NOx are produced during the combustion process when nitrogen and oxygen are present at elevated temperatures. NOx may be reduced by modifying combustion conditions, burning low nitrogen-containing fuels, and undertaking other methods that in fact decrease combustion efficiency.[91] Zero-NOx standards would not necessarily impact energy efficiency even if they, in effect, required adoption of electric appliances, as even electric appliances have various levels of efficiency. Emission limits, then, are a far cry from the sorts of regulations that have been found preempted under EPCA: for example, requirements that appliances used in new construction meet specific energy efficiency requirements.[92] And in a context more similar to emissions regulations—a local ban on natural gas infrastructure for new construction—one federal court has determined there is no EPCA preemption when the regulation at issue "facially does not address any of [EPCA's standards of the 'energy efficiency' or 'energy use' of covered products], let alone mandate or require any particular energy use of a covered product."[93]

Emissions limitations for appliances are meaningfully different from the types of state-level appliance efficiency regulations Congress meant to foreclose.

An opponent of appliance emissions standards could also argue that such air district rules amount to local "building standards" and are therefore preempted by California state law. "Building standard" is defined in California's Health & Safety Code as a requirement that "specifically regulates, requires, or forbids the method of use, properties, performance, or types of materi-

In general, controlling air pollution emissions from appliances is quite distinct from controlling their energy efficiency.

als used in the construction, alteration, improvement, repair, or rehabilitation of…fixtures."[94] Because emission standards do not directly regulate the "materials" used in these processes on their face, they do not seem to be encompassed by the Code's definition of "building standards." Moreover, regulating the sale of certain appliances is considerably different than setting standards for building construction and renovation. A contrary interpretation would also be incompatible with large swaths of the Health & Safety Code, which authorize air districts to regulate emissions from buildings and appliances without amending building standards.[95]

With respect to CEQA, air district action in this space may be covered by carve-outs in the law for projects without significant adverse environmental effects. Although new air district regulations are generally subject to CEQA analysis,[96] under California Public Resources Code §21080.5, California agencies can undertake a less rigorous assessment than an EIR if the Secretary of the California Natural Resources Agency has certified their regulatory program, and the agency determines that the project will not have significant adverse environmental impacts.[97] Because zero-NOx standards would reduce NOx emissions, a determination of no significant adverse impacts may be well-supported.[98] If they conclude so, air districts could accordingly seek and receive the appropriate certification by the Secretary of the Resources Agency.[99]

In conclusion, air districts have sound legal arguments that appliance emissions standards are not preempted by EPCA or by state-level building standards. EPCA's express preemption provision does not cover emissions limitations on appliances, and these limitations are not "building standards" within the meaning of California law. Air districts may also be permitted to undertake a streamlined CEQA analysis for zero-NOx standards once the Secretary of the Resources Agency has certified the regulatory program, if such standards would reduce NOx emissions and are unlikely to have a significant adverse environmental impact. Accordingly, air districts are on strong legal footing to adopt appliance emissions standards.

Conclusions and Recommendations

Zero-NOx appliances would make California households more healthful; would help diminish the health disparities faced by environmental justice communities; and would advance achievement of California's climate targets. Air districts have the legal authority to set these standards and can design them to promote an equitable transition to zero-polluting appliances. Air districts can and should consider all of the following approaches:

- Building on pre-existing NOx rules to transition to zero-emissions standards over a relatively short timeframe.
- Phasing in zero-NOx standards applicable at the point of sale, and providing appropriate compliance flexibilities, timelines linked to the availability of funding, and tools to help low-income households transition to zero-NOx appliances.
- Expanding the application of NOx emissions standards to additional appliances and devices over time.
- Incorporating emissions averaging and trading in rulemaking for appliances.
- Aligning zero-NOx emissions standards with municipal governments' phaseouts of gas appliances through local ordinances.
- Implementing and supporting complementary policies—including those put forth by community groups, utilities, regional planning agencies, and other stakeholders—to minimize the financial impacts on consumers, especially low-income consumers. These policies could include producing electrification incentives and building information hubs; proactively upgrading electrical panels; backing renter protection programs; and coordinating with equity-focused initiatives like AB 617.

If implemented, zero-NOx appliance standards could accelerate the electrification of buildings throughout California by spurring the installation of accessible, consumer-ready electric appliances, with significant public health and environmental benefits.

Community stakeholders should be included throughout the rule development process to ensure that local voices are represented.

If implemented, zero-NOx appliance standards could accelerate the electrification of buildings throughout California by spurring the installation of accessible, consumer-ready electric appliances, with significant public health and environmental benefits. Air districts have substantial authority to adopt such standards and good reasons to do so.

Endnotes

1 This policy brief stems from a project undertaken on behalf of Rocky Mountain Institute (RMI) in the Frank G. Wells Environmental Law Clinic at UCLA School of Law. Clinic students Nicholas Bascom, Justin Breck, Kristen Cardenas, Simone Chung, Madison Dipman, Jake Gold, Tom Hanrahan, Andrew Klimaszewski, Kelsey Manes, Reilly Nelson, Rachel Sweetnam, and Ashley Sykora contributed to this brief with substantial legal research and analysis. All errors are our own. Heather Dadashi is an Emmett/Frankel Fellow in Environmental Law and Policy at UCLA Law. Cara Horowitz is the Co-Director of the Frank G. Wells Environmental Law Clinic and the Andrew Sabin Family Foundation Co-Executive Director of the Emmett Institute on Climate Change and the Environment at UCLA Law. Julia Stein is the Clinical Supervising Attorney of the Frank G. Wells Environmental Law Clinic and the Project Director of the Emmett Institute on Climate Change and the Environment at UCLA Law.

2 Cal. Air Res. Bd., *2022 State Strategy for the State Implementation Plan: Draft Measures Workshop,* slide 96 (Oct. 19, 2021), https://ww2.arb.ca.gov/sites/default/files/2021-10/2022_SSS_October_Workshop_Presentation.pdf.

3 Bay Area Air Quality Mgmt. Dist., *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,* p. 3, (Sept. 2021), https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-9-rule-4-nitrogen-oxides-from-fan-type-residential-central-furnaces/2021-amendments/documents/20210930_01_wsr_rules0904and0906-pdf.pdf?la=en.

4 Yifang Zhu et al., *Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California* 6, 14, UCLA Fielding Sch. Pub. Health (Apr. 2020), https://ucla.app.box.com/s/xyzt8jc1ixnetiv0269qe704wu0ihif7. The study found that emissions from gas stoves and ovens exceeded state outdoor NOx standards in 90% of the scenarios modeled.

5 Based on median estimates from the results of three reduced complexity models used in: Jonathan J. Buonocore (Harvard T.H. Chan School of Public Health) et al., *A Decade of the U.S. Energy Mix Transitioning Away from Coal: Historical Reconstruction of the Reductions in the Public Health Burden of Energy,* 2021 Environ. Res. Lett. 16 054030, https://legacy-assets.eenews.net/open_files/assets/2021/05/05/document_gw_01.pdf, as well as additional analysis from Jonathan Buonocore, Sc.D., the study's lead author.

6 *Id*.

7 Christopher W. Tessum et al., *PM2.5 Polluters Disproportionately and Systemically Affect People of Color in the United States,* 7 Sci. Adv. eabf4491, supplementary data file S2 (2021), https://www.science.org/doi/10.1126/sciadv.abf4491.

8 *Id.*

9 Zhu et al., *supra* note 4, at 16-17, 23-26.

10 *See generally* W. Lin, B. Brunekreef, & U. Gehring, *Meta-Analysis of the Effects of Indoor Nitrogen Dioxide and Gas Cooking on Asthma and Wheeze in Children,* 42(6) Int'l J. Epidemiology, 1724-37 (2013), https://doi.org/10.1093/ije/dyt150 (accessed Aug. 6, 2021).

11 *Id.* at 1728-31.

12 *See* E3, *Achieving Carbon Neutrality in California: PATHWAYS Scenarios Developed for the California Air Resources Board* 9-10, (Oct. 2020), https://ww2.arb.ca.gov/sites/default/files/2020-10/e3_cn_final_report_oct2020_0.pdf (accessed Aug. 7, 2021).

13 Cal. Air Res. Bd., *2022 Scoping Plan Update Kick-Off Workshop,* slides 6-7 (Jun. 8, 2021), https://ww2.arb.ca.gov/sites/default/files/2021-06/carb_overview_sp_kickoff_june2021.pdf; see also Exec. Order B-55-18 To Achieve Carbon Neutrality (Sept. 20, 2018), https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf.

14 Dan Aas et al., *The Challenge of Retail Gas in California's Low-Carbon Future: Technology Options, Customer Costs, and Public Health Benefits of Reducing Natural Gas Use* 69, Cal. Energy Commission (Apr. 2021), https://www.energy.ca.gov/sites/default/files/2021-06/CEC-500-2019-055-F.pdf.

15 Cal. Air Res. Bd., *California Greenhouse Gas Emissions for 2000 to 2018: Trends of Emissions and Other Indicators* 6, https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf.

16 *See* Chris Bush & Robbie Orvis, *Insights from the California Energy Policy Simulator* 27, Energy Innovation: Pol'y & Tech., LLC. (Jan. 2020), https://energyinnovation.org/wp-content/uploads/2020/01/Insights-from-the-California-Energy-Policy-Simulator_1.16.20.pdf (last accessed Jul. 26, 2021); Cal. Air Res. Bd., *supra* note 2.

17 Cal. Health & Safety Code § 39027 (West).

18 Cal. Pub. Res. Code § 30414.

19 Cal. Health & Safety Code § 41508 (West). *See* Brief for Sierra Club and Natural Resources Defense Council as Amici Curiae Supporting Respondents, American Coatings Association v. South Coast Air Quality Management District, 54 Cal. 4th 446, 278 P.3d 838 (2012) (No. S177823), 2010 WL 3415170.

20 Zhu et al., *supra* note 4, at 39.

21 E3, *Residential Building Electrification in California* 79, (Apr. 2019), https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf (accessed Aug. 8, 2021).

22 *See* Bruce Mast et al., *Towards an Accessible Financing Solution* 3-5, (Jul. 2020), https://www.buildingdecarb.org/uploads/3/0/7/3/30734489/bdc_whitepaper_final_small.pdf.

23 *See* Green & Healthy Homes Initiative, *Leading with Equity and Justice in the Clean Energy Transition: Getting to the Starting Line for Residential Building Electrification* 16-18, 22, https://www.greenandhealthyhomes.org/wp-content/uploads/2021-GHHI-Leading-with-equity_wp_Final.pdf (accessed Dec. 16, 2021).

24 Betony Jones et al., *California Building Decarbonization Workforce Needs and Recommendations*, ES-iv to ES-v, (Nov. 2019), https://innovation.luskin.ucla.edu/wp-content/uploads/2019/11/California_Building_Decarbonization.pdf (accessed Aug. 8, 2021).

25 *See, e.g.*, San Diego Cty. Air Pollution Control Dist., *Resolution 15-087: Resolution Adopting New Rule 69.5. – Natural Gas-Fired Water Heaters and Repealing rule 69.5 – Natural Gas-Fired Water Heaters, of Regulation IV of the Rules and Regulations of the San Diego County Air Pollution Control District,* A-1, (Jun. 24, 2015) (adopting a 10 ng/joule of heat output or 15 ppmv at 3% O2 NOx emission limit for natural gas-fired water heaters); South Coast Air Quality Mgmt. Dist., *December 10, 1999 Board Meeting Agenda Number 26: Amend Rule 1121 - Control of Nitrogen Oxides From Residential-Type, Natural Gas-Fired Water Heaters* (Dec. 10, 1999) (adopting a 10 ng/joule of heat output or 15 ppmv at 3% O2 NOx emission limit for natural gas-fired water heaters). *See also* Cal. Air Res. Bd., *2022 State Strategy for the State Implementation Plan: Draft Measures 54,* (Oct. 6, 2021), https://ww2.arb.ca.gov/sites/default/files/2021-10/2022_SSS_Draft_Measures.pdf ("Nine air districts regulate NOx emissions from space heaters and water heaters. Bay Area, San Joaquin Valley, South Coast, Yolo-Solano, San Diego County, and Sacramento Metro enforce the most stringent emission limit of 10 ng/J NOx for water heaters. San Joaquin Valley and South Coast enforce the most stringent emission limit of 14 ng/J NOx for space heaters.").

26 The BAAQMD's date of rule finalization depends on the need for an Environmental Impact Report (EIR) under the California Environmental Quality Act (CEQA). Bay Area Air Quality Mgmt. Dist., *Facility Risk Reduction Program Improvements*, slide 10, (Nov. 15, 2021), https://www.baaqmd.gov/~/media/files/board-of-directors/2021/sscic_presentations_111521_op-pdf.pdf?la=en&rev=c5beadddef7f4346b7bb25d27e04e96b. The district is contemplating compliance dates of January 1, 2027, for the introduction of a zero-NOx standard for boilers with a heat input capacity less than 75,000 BTU/hr, and January 1, 2031, for the introduction of a zero-NOx standard for boilers with a heat input capacity of between 75,000 BTU/hr and 2 million BTU/hr. Bay Area Air Quality Mgmt. Dist., *Public Workshop on Draft Amendments for Building Appliance Rules 9-4 and 9-6*, slide 19, (Oct. 7, 2021), https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-9-rule-4-nitrogen-oxides-from-fan-type-residential-central-furnaces/2021-amendments/documents/20211007_wsppt_rules0904and0906-pdf.pdf?la=en&rev=6c3e9a954dbe4386b85e9bef96a6bd6c.

27 The SCAQMD must submit its final AQMP to EPA by early August 2022. South Coast Air Quality Mgmt. Dist., *Agenda Item 5: South Coast AQMD's Proposed Draft NOx Stationary Source Measures*, slides 5-10, (Nov. 10, 2021), http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/am-pres-agenda-item-5-nox-measures-110621.pdf?sfvrsn=6.

28 Cal. Air Res. Bd., *supra* note 25. CARB is collaborating with local air districts on development of regional SIPs and soliciting stakeholder input on the development of the 2022 State SIP Strategy. This includes workshops and participation in local air district outreach efforts. CARB staff will finalize the 2022 State SIP Strategy and Environmental Analysis and present it to the Board for consideration in 2022. Cal. Air Res. Bd., *2022 State Strategy for the State Implementation Plan (2022 State SIP Strategy)*, https://ww2.arb.ca.gov/resources/documents/2022-state-strategy-state-implementation-plan-2022-state-sip-strategy.

29 42 U.S.C. §§ 7407, 7410 (West).

30 *See, e.g.*, Approval of California Air Plan Revisions, San Joaquin Valley Unified Air Pollution Control District and South Coast Air Quality Management District, 80 Fed. Reg. 68484, 68485 (proposed Nov. 5, 2015) (proposing to approve a revision to California's state implementation plan to include SCAQMD Rule 1111 and SJVUAPCD Rule 4905 adopting more stringent emission standards for natural gas-fired furnaces).

31 *See* Train v. Natural Resources Defense Council, 421 U.S. 60, 86-87, 95 S. Ct. 1470, 1485 (1975) ("We also believe that Congress, consistent with its declaration that '(e)ach State shall have the primary responsibility for assuring air quality' within its boundaries, § 107(a), left to the States considerable latitude in determining specifically how the standards would be met. This discretion includes the continuing authority to revise choices about the mix of emission limitations."); Union Electric Company v. Environmental Protection Agency, 427 U.S. 246, 268, 96 S. Ct. 2518, 2531 (1976) ("…even though Congress plainly left with the States, so long as the national standards were met, the power to determine which sources would be burdened by regulation and to what extent.").

32 *See* 40 C.F.R. § 51.100(n), 40 C.F.R. § 51.101(e).

33 State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 Fed. Reg. 13498, 13560 (Apr. 16, 1992); Memorandum from John Seitz, Director, Office of Air Quality Planning and Standards, U.S. EPA, to Regional Air Directors, 2, (Nov. 30, 1999), https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/19991130_seitz_racm_guide_ozone.pdf; Memorandum from John S. Seitz, Director, Office of Air Quality Planning and Standards, U.S.

EPA, to Regional Air Directors, 2, (Dec. 14, 2000), https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/20001214_seitz_additional_racm_submissions.pdf. *See also* State Implementation Plans; General Preamble for Proposed Rulemaking on Approval of Plan Revisions for Nonattainment Areas, 44 Fed. Reg. 20372, 20375 (Apr. 4, 1979).

34 Sierra Club v. U.S. E.P.A., 294 F.3d 155, 162-63 (D.C. Cir. 2002). *See also* Sierra Club v. U.S. E.P.A., 314 F.3d 735, 743 (5th Cir. 2002); BCCA Appeal Group v. U.S. E.P.A., 355 F.3d 817, 847-48 (5th Cir. 2003), as amended on denial of reh'g and reh'g en banc (Jan. 8, 2004); Natural Resources Defense Council v. E.P.A., 571 F.3d 1245, 1252-53 (D.C. Cir. 2009). EPA can use the RACM/RACT process to exert influence over the regulations that states adopt and promote zero-NOx appliances, both through the issuance of guidance documents that highlight certain regulations as particularly likely to be RACM/RACT, and by simply disapproving SIPs when they do not include RACM/RACT. *See generally* 42 U.S.C. § 7410(k) (providing for EPA review of each portion of a SIP). If a state consistently fails to provide a SIP that meets the Clean Air Act's requirements, EPA will eventually impose its own plan on the state. *Id.* § 7410(c)(1). Specifically, EPA could exercise this authority by updating the Menu of Control Measures with low-NOx technologies, which should prompt states to consider those technologies as part of their RACM/RACT (or BACM/BACT) analyses, for both ozone and PM2.5 standards. *See, e.g.,* Imperial County Ozone Attainment Plan at 6-3, Appx. C; Maricopa County Ozone Attainment Plan at 4-14 to 4-38. However, the impact of this approach is substantially limited by EPA's own definition of RACM/RACT, which excuses states from implementing any regulation that does not advance an area's attainment date by at least a year. *See, e.g.*, Clean Air Plans; 2008 8-Hour Ozone Nonattainment Area Requirements; Phoenix-Mesa, Arizona, 84 F.R. 52,838, 52,843 (Oct. 3, 2019) ("We agree with the conclusion that there are no additional reasonably available measures that would advance attainment of the 2008 ozone standards in the Phoenix area by at least one year, because advancing attainment by one year could only have been achieved through implementation of additional controls by January 1, 2016, one year before the attainment plan was due. . . . Because the plan demonstrates expeditious attainment . . . we agree that the area's rules provide for the implementation of RACM for NOx and VOC."). Any effort to implement new NOx controls through the RACM/RACT process would be substantially benefited if EPA stopped using this definition or accelerated its review process to leave more time between a state's submission deadline and its attainment date.

35 Generally, air districts have the authority to "adopt and enforce rules and regulations to achieve and maintain the state and federal ambient air quality standards in all areas affected by emission sources under their jurisdiction…" Cal. Health & Safety Code § 40001(a) (West). *See also* Cal. Health & Safety Code § 40702 (West). District plans must include the anticipated effectiveness of current and proposed control measures. Cal. Health & Safety Code § 40913 (West). Therefore, proposed NOx emission regulations must be listed in district-wide plans, including current emissions inventory data for relevant appliances and the associated NOx emissions reduction caused by the regulation. Districts in attainment may also submit plans proposing control measures, but they are not obligated to do so.

36 Cal. Health & Safety Code § 41508 (West). *See* Brief for Sierra Club and Natural Resources Defense Council as Amici Curiae Supporting Respondents, American Coatings Association v. South Coast Air Quality Management District, 54 Cal. 4th 446, 278 P.3d 838 (2012) (No. S177823), 2010 WL 3415170.

37 Theoretically, air districts could also adopt appliance emissions standards for GHGs like methane and CO_2, but as a practical matter, those are most likely to be adopted by CARB, which has historically regulated GHGs at the state level. Though preemption by California's cap-and-trade law might come into question were a district to regulate appliance GHG emissions, it is unlikely that either buildings served by gas for appliances or fossil fuel appliances themselves meet the GHG emissions thresholds to be subject to cap-and-trade regulation. *See* Cal. Health & Safety Code at §§ 95811–95812. Entities that emit fewer than 25,000 metric tons of CO2e per year are not subject to cap-and-trade regulation. Cal. Code Regs. tit. 17 § 95812(c)(1) (2021). This threshold is likely higher than what either the buildings or appliances themselves would emit—even businesses with footprints as significant as Disneyland Resort, Mission Foods Tortilla Company, and Miller-Coors USA do not meet the statutory threshold to be covered by cap-and-trade. *See* Annual Summary of 2019 Greenhouse Gas Emissions Data Reporting to the California Air Resources Board, Cal. Air Res. Bd. (Nov. 4, 2020), https://ww2.arb.ca.gov/mrr-data ("click on 2019 GHG Facility and Entity Emissions") (showing data for Sonoma Development Center). CARB's 2022 SIP strategy proposal may impact district regulation. CARB's proposal to adopt a statewide zero-GHG emission standard for space and water heaters sold in California would be more stringent than current air district rules in place. CARB could work with air districts to further tighten district rules to drive zero-emission technologies. This measure would not mandate retrofits in existing buildings, but some buildings would require retrofits to be able to use the new technology that this measure would require. Under CARB's proposal, beginning in 2030, 100 percent of sales of new space and water heaters (for either new construction or replacement of burned-out equipment in existing buildings) would need to meet zero-emission standards. Cal. Air Res. Bd., *supra* note 25, at 54-56.

38 Sherwin-Williams Co. v. S. Coast Air Quality Mgmt. Dist., 86 Cal. App. 4th 1258 (2001). Both EPA and CARB have recognized the need to control NOx emissions in order to achieve ozone and particulate matter NAAQS. Envtl. Prot. Agency, *Technical Bulletin: Nitrogen Oxides (NOx), Why and How They Are Controlled* 6-7, (Nov. 1999), https://www3.epa.gov/ttn/catc/dir1/fnoxdoc.pdf ("It now appears that the communities that failed to meet their ozone goals may not be completely at fault, for they appear to be affected by NOx and VOC emissions in the air coming to them. To meet the ozone NAAQS, EPA must now regulate emissions of NOx regionally"); Cal. Air Res. Bd., Stationary Source Division & Mobile Source Division, *Sources and Control of Oxides of Nitrogen Emissions* 3-5, (Aug. 1997), https://ww3.arb.ca.gov/mandrpts/noxdoc/noxdoc.pdf. *See also* South Coast Air Quality Mgmt. Dist., *Authority*, https://www.aqmd.gov/nav/about/authority ("Among the numerous other CAA requirements are: a mandate that the region achieve a three percent annual reduction in emissions of ozone precursors (VOC and NOx)").

39 *See* 42 U.S.C. §§ 7502, 7513 (2018) (CAA provisions requiring nonattainment areas to demonstrate NAAQS attainment "as expeditiously as practicable"). The CAA's definition of "air pollutant" includes precursors to the formation of any such pollutant. 42 U.S.C. § 7602(g) (2018). And the CAA obligates states to limit precursor emissions "that contribute significantly to nonattainment or interfere with maintenance downwind." *Id*. at 916. Several CAA cases explicitly acknowledge the relationship between ozone and its scientific precursors in assessing ozone regulations. For example, in *Mississippi Commission on Environmental Quality v. EPA*, the court held that EPA's regulation of NOx emissions under ozone NAAQS did not exceed Congress's power to regulate interstate commerce. 790 F.3d 138, 180 (D.C. Cir. 2015). NAAQS compliance largely depends on reducing emissions from sources producing ozone precursors. *Id.* at 181. *See also* PM2.5 NAAQS SIP Requirements, 81 Fed. Reg. 58,010, 58,018 (Aug. 24, 2016) (requiring the regulation of direct and indirect sources of PM2.5, including all sources of precursor pollutants).

40 Cal. Air Res. Bd., *California Ambient Air Quality Standards*, https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards.

41 In nonattainment areas, NOx emissions standards can be incorporated into California's SIP, which can provide benefits like federal enforceability and priority in CARB's review and approval process for new rules. Both the San Joaquin Valley Air Pollution Control District (SJVAPCD) and SCAQMD fall within the "extreme" nonattainment classification for the 8-hour ozone standard and could be prime candidates for a zero-NOx emission standard. Envtl. Prot. Agency, Current Nonattainment Counties for All Criteria Pollutants (Jul. 31, 2021), https://www3.epa.gov/airquality/greenbook/ancl.html (accessed Aug. 6, 2021). SJVAPCD experiences 4,109 tons of appliance NOx pollution per year on average (excluding counties partially within the district, such as Kern County, to avoid the risk of overstating emissions or double-counting), while the SCAQMD experiences at least 19.2 tons of total appliance NOx emissions per day. Envtl. Prot. Agency, 2017 National Emissions Inventory (NEI) Data, https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data; South Coast Air Quality Mgmt. Dist., 2022 AQMP: Residential and Commercial Buildings, Working Group Meeting #5, slides 16, 19, 22 & 25 (Sept. 9, 2021), http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/2022-aqmp-residential-and-commercial-buildings-working-group/2022-aqmp-rcb-wg-5---final.pdf?sfvrsn=4. Other strong candidates would include the Antelope Valley Air Quality Management District (AVAQMD), the Mojave Desert Air Quality Management District (MDAQMD), and the San Diego County Air Pollution Control District (SDAQMD) (which all fall within the "severe" classification), as well as Ventura County Air Pollution Control District (VCAPCD) (which falls within the "serious" nonattainment classification). Envtl. Prot. Agency, Current Nonattainment Counties for All Criteria Pollutants (Jul. 31, 2021), https://www3.epa.gov/airquality/greenbook/ancl.html (accessed Aug. 6, 2021). SDAQMD experiences about 964 tons of NOx appliance pollution per year and VCAPCD experiences about 623 tons per year. Most of these emissions counts are based on RMI's analysis of data from EPA's 2017 National Emissions Inventory, which does not provide reliable estimates for appliance NOx emissions in AVAQMD and MDAQMD. This emissions data is at the county level, and it is worth noting that county and air district boundaries do not line up perfectly.

42 Cal. Health & Safety Code § 40910 (West). Districts must analyze and attempt to minimize the socioeconomic impact of their regulations when they exceed state or federal requirements, considering how the proposed regulation impacts relevant businesses, local employment, local economies, as well as the actual emission reduction potential of the regulation, overall cost of implementation, relevant emission reducing alternatives, and current regional attainment status. Cal. Health & Safety Code § 40728.5 (West) ("The district board shall actively consider the socioeconomic impact of regulations and make a good faith effort to minimize adverse socioeconomic impacts"). Historically, air district assessments of socioeconomic impacts have been shown considerable deference. Sherwin-Williams Co. v. S. Coast Air Quality Mgmt. Dist., 86 Cal. App. 4th 1258, 104 Cal. Rptr. 2d 288 (2001), as modified (Feb. 15, 2001); see also California Bldg. Indus. Assn. v. San Joaquin Valley Air Pollution Control Dist., 178 Cal. App. 4th 120, 100 Cal. Rptr. 3d 204 (2009); W. States Petroleum Assn. v. S. Coast Air Quality Mgmt. Dist., 136 Cal. App. 4th 1012, 39 Cal. Rptr. 3d 354 (2006) (district properly evaluated socioeconomic costs of refinery emissions regulation and supplied sufficient evidence showing that the regulation was feasible).

43 *See, e.g.*, Sherwin-Williams Co. v. S. Coast Air Quality Mgmt. Dist., 86 Cal. App. 4th 1258, 104 Cal. Rptr. 2d 288 (2001), as modified (Feb. 15, 2001).

44 *See* American Coatings Association v. South Coast Air Quality Management District, 54 Cal. 4th 446, 465, 278 P.3d 838, 851 (2012) ("BARCT is therefore a technology-forcing standard designed to compel the development of new technologies to meet public health goals. The technology-forcing character of BARCT reflects the long-standing approach of federal air pollution control legislation").

45 The Greenlining Inst. & Energy Efficiency for All, *Equitable Building Electrification: A Framework for Powering Resilient Communities* 9, https://greenlining.org/wp-content/uploads/2019/10/Greenlining_EquitableElectrification_Report_2019_WEB.pdf (accessed Oct. 25, 2021).

46 *Id.* at 22.

47 Green & Healthy Homes Initiative, *supra* note 23, at 10.

48 *Id.* at 15.

49 Rocky Mountain Inst., *How Air Agencies Can Help End Fossil Fuel Pollution from Buildings* 16-17, (Nov. 2021), https://rmi.org/insight/outdoor-air-quality-brief.

50 *Id.* at 16-17.

51 The Greenlining Inst. & Energy Efficiency for All, *supra* note 45.

52 *Id.* at 46.

53 Phased-in zero-NOx standards also provide more certainty than low-NOx standards.

54 For example, the SCAQMD currently regulates NOx emissions from natural gas-fired, fan-type central furnaces, residential natural gas-fired water heaters, and commercial fryers and ovens. SCAQMD Regulation XI, Rule 1111: Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1111.pdf?sfvrsn=4 (accessed Aug. 8, 2021); SCAQMD Regulation XI, Rule 1121: Control of Nitrogen Oxides from Residential Type, Natural Gas-Fired Water Heaters, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1121.pdf?sfvrsn=4 (accessed Aug. 8, 2021); SCAQMD Regulation XI, Rule 1147: NOx Reductions from Miscellaneous Sources, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1147.pdf?sfvrsn=4 (accessed Aug. 8, 2021); SCAQMD Regulation XI, Rule 1153.1: Emissions of Oxides of Nitrogen From Commercial Food Ovens, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1153-1-emissions-of-oxides-of-nitrogen-from-commercial-food-ovens.pdf?sfvrsn=2 (accessed Aug. 8, 2021). The SCAQMD has also identified NOx emissions from residential gas cooking appliances (e.g., stoves and ranges) as being higher than those from residential water heaters, highlighting the importance of controlling NOx emissions from those sources. Further, the SCAQMD is funding research and demonstration projects of various technologies to better understand the effects of reducing NOx emissions from residential gas-fueled cooking appliances. South Coast Air Quality Mgmt. Dist., 2022 AQMP: Residential and Commercial Buildings, Working Group Meeting #2, p. 6 (Feb. 26, 2021). This information will be used by the SCAQMD to inform further decision-making regarding low-NOx and zero-NOx emissions standards. *See also* South Coast Air Quality Mgmt. Dist., 2022 AQMP: Residential and Commercial Buildings, Working Group Meeting #1, p. 4 (Dec. 15, 2020).

55 *See* SCAQMD Regulation XI – Source Specific Standards, Rules 1111 and 1121, and San Joaquin Valley APCD Regulation IV – Prohibitions, Rules 4902 and 4905 (limiting NOx emissions from natural-gas-fired, fan-type central furnaces to no more than 14 nanograms/Joule and limiting NOx emissions from residential natural gas-fired water heaters to no more than 10 nanograms/Joule).

56 Ultra-low-NOx standards may help reduce emissions in the near term and make electric appliances even more cost-competitive with gas, but to the extent they involve investing in developing better gas appliances rather than accelerating adoption of electric ones, they may not be optimal. A dual fuel approach, which would pair an electric heat pump with a gas furnace and alternate between the two fuel sources, would help develop the heat pump market, but it is a partial solution at best.

57 The BAAQMD's draft amendments will expand the applicability of its NOx-emissions rule to devices used in nonresidential 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. The BAAQMD intends to propose a zero-NOx requirement for these boilers and water heaters. 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. Bay Area Air Quality Mgmt. Dist., 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, p. 1 (Sept. 2021), https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-9-rule-4-nitrogen-oxides-from-fan-type-residential-central-furnaces/2021-amendments/documents/20210930_01_wsr_rules0904and0906-pdf.pdf?la=en.

58 BAAQMD Regulation 9, Rule 4: Nitrogen Oxides from Fan Type Residential Central Furnaces, https://www.baaqmd.gov/rules-and-compliance/rules/reg-9-rule-4-nitrogen-oxides-from-fan-type-residential-central-furnaces (accessed Jul. 27, 2021); BAAQD Regulation 9, Rule 6: Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters, https://www.baaqmd.gov/rules-and-compliance/rules/reg-9-rule-6-nitrogen-oxides-emissions-from-natural-gasfired-water-heaters (accessed Jul. 27, 2021).

59 *Id.* at 2.

60 Bay Area Air Quality Mgmt. Dist., Workshop Notice (Sept. 7, 2021), https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-9-rule-6-nitrogen-oxides-emissions-from-natural-gasfired-water-heaters/2021-amendment/documents/20210907_wsn_rules0904and0906-pdf.pdf?la=en.

61 *Id.*

62 Rocky Mountain Inst., *supra* note 49, at 16-18. Air districts could set standards that ramp up toward requiring zero-pollution appliances across the board on a pre-determined timeline as investments and programs for equitable electrification are scaled. This would chart a course toward full electrification while allowing equity investments and protections to expand alongside the standards. In addition to encouraging other entities to make coordinated investments in an equitable and affordable transition to zero-polluting appliances, air districts should also make direct investments themselves wherever funds and authority exist.

63 An air district might design standards to initially require zero emissions for a relatively small percentage of the appliances sold by each manufacturer. The standards could then ramp up toward requiring 100% zero-pollution appliances over time. Rocky Mountain Inst., *supra* note 49, at 18.

64 South Coast Air Quality Mgmt. Dist., *Clean Air Furnace Rebate Program*, https://www.cleanairfurnacerebate.com; South Coast Air Quality Mgmt. Dist., *Clean Air Rebate Furnace Program*, https://www.cleanairfurnacerebate.com/contractor-resources/.

65 In calculating an achievable average rate, the agency could also assume the use of ultra-low-NOx combustion technology and/or condensing technology on the non-electric portion of the fleet. Inst. for Policy Integrity, *Regulating New Fossil-Fuel Appliances Under Section 111(b) of the Clean Air Act* 11, (Oct. 2021), https://policyintegrity.org/files/publications/Gas_Appliances_Report_v3.pdf.

66 *Id.* A potential concern with this approach is that if standards initially apply to only a percentage of a manufacturer's fleet, manufacturers will focus on electrifying higher-end appliance models, which would allow wealthier households to be the first to electrify. Air districts should take proactive measures, such as those outlined in subsection B., to ensure that low-income households are among the early adopters of electric appliances.

67 Matt Gough, *California's Cities Lead the Way to a Gas-Free Future*, Sierra Club (Nov. 11, 2021), https://www.sierraclub.org/articles/2021/07/californias-cities-lead-way-gas-free-future.

68 *Id.*

69 The Greenlining Inst. & Energy Efficiency for All, *supra* note 45, at 9.

70 Aside from creating financial incentives, air districts could also provide robust financial support to low-income households by implementing cash-for-clunkers programs. A cash-for-clunkers program would pay residents to swap out gas appliances for electric appliances. This would be similar to how government programs pay people to take their older, more polluting cars off the roads. For example, a household would trade in its gas water heater for a new heat pump water heater. The U.S. Department of Energy developed such a program, called the State Energy Efficient Appliance Rebate Program (SEEARP), to spur economic activity and invest in long-term energy savings by helping consumers replace older, inefficient appliances with new, efficient models. SEEARP provided almost $300 million to the 56 U.S. states and territories to support state-level consumer rebate programs for efficient appliances from December 2009 until February 2012. Office of Energy Efficiency & Renewable Energy, State Energy-Efficient Appliance Rebate Program, energy.gov, https://www.energy.gov/eere/buildings/state-energy-efficient-appliance-rebate-program (accessed Dec. 1, 2021).

71 California's Low-Income Weatherization Program is an example of a "one-stop shop" that has made whole-home retrofit programs accessible to low-income communities by aligning funding and retrofit program delivery. It allows for residents and building owners to determine their retrofit needs, access contractors, and leverage multiple funding sources. In effect, the program has provided over 24,000 households (single and multi-family) with energy efficiency retrofits and solar PV upgrades over 5 years. *See* Cal. Dep't of Cmty. Services & Dev., Low-Income Weatherization Program, CA.Gov, https://www.csd.ca.gov/Pages/Low-Income-Weatherization-Program.aspx.

72 Rocky Mountain Inst., Memorandum to Bay Area Air Quality Management District, "Re: Zero-NOx Emission Standards for Building Appliances," p. 2 (Apr. 12, 2021). Using a BAAQMD Grant, Bay Regional Energy Network (BayREN) (led by StopWaste and in partnership with the City of Palo Alto and Sonoma Clean Power) is working to establish a uniform program design that can be supported by local energy providers and demonstrate the Bay Area's commitment to scaling up the Heat Pump Water Heater (HPWH) market. This work includes designing a midstream incentive for HPWHs, engaging local energy providers (CCAs and Publicly Owned Utilities), involving HPWH supply chain actors, supporting workforce education, and cross-promoting with other complementary programs. *BayREN Core Value and Proposed Value Metrics (Descriptive)* 9, (Jul. 6, 2020), https://pda.energydataweb.com/api/view/2399/Overview%20of%20BayREN%20Value%20Metrics_070620.pdf (posted to PDA for comment).

73 South Coast Air Quality Mgmt. Dist., 2022 AQMP: Residential and Commercial Buildings, Working Group Meeting #2, p. 10 (Feb. 26, 2021), http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/2022-aqmp-residential-and-commercial-buildings-working-group/2022-aqmd-residential-and-commercial-building-wgm-2.pdf?sfvrsn=6.

74 Rocky Mountain Inst., *supra* note 72.

75 For example, through the 2009 American Recovery and Reinvestment Act (Recovery Act), the U.S. Department of Energy's (DOE) Energy Efficiency and Conservation Block Grant (EECBG) Program provided $3.2 billion in block grants to cities, communities, states, U.S. territories, and Indian tribes to develop, promote, implement, and manage energy efficiency and conservation projects. Office of Energy Efficiency & Renewable Energy, *About the Energy Efficiency and Conservation Block Grant Program*, ENERGY.GOV, https://www.energy.gov/eere/wipo/about-energy-efficiency-and-conservation-block-grant-program. More money went to building retrofits, including equipment installations (over $1.5 billion of the nearly $3.1 billion State Energy Program grants and most of the EECBG funds) than for any other purpose. Charles A. Goldman et al., *Interactions Between Energy Efficiency Programs Funded Under the Recovery Act and Utility Customer-Funded Energy Efficiency Programs* 10, ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY (Mar. 2020), https://www.osti.gov/servlets/purl/1008331. *See also* Cong. Research Serv., *Renewable Energy and Energy Efficiency Incentives: A Summary of Federal Programs*, (Aug. 9, 2021), https://sgp.fas.org/crs/misc/R40913.pdf.

76 The BAAQMD's building decarbonization strategy entails developing resources to help local governments implement building decarbonization policies and strengthening collaborations with the Building Decarbonization Coalition, BayREN, and other regional partners. *See* Axum Teferra, Update on Heat Pump Water Heater Grants, Climate Protection Committee Meeting, slide 6, Bay Area Air Quality Mgmt. Dist., (Jun. 18, 2020), https://www.baaqmd.gov/~/media/files/board-of-directors/2020/cpc_presentations_061820-pdf.pdf?la=en.

77 For customers in eleven small, underserved communities in the San Joaquin Valley (SJV), the SJV Affordable Energy Pilot offers panel upgrades, along with free advanced electric appliances for space and water heating, cooking, and clothes drying and up to $5,000 per household for other building remediation measures needed to enable electrification. D. Shields, *Lessons Learned (So Far) In Targeted Building Electrification*, Gridworks (Sept. 21, 2021), https://gridworks.org/2021/09/lessons-learned-so-far-in-targeted-building-electrification/?author=3.

78 Air districts can also support and encourage policies that require landlords to pay the full cost of decarbonization; make public subsidies available to providers of affordable housing; focus on COVID-19 recovery for tenants; and prioritize the decarbonization of new buildings, publicly owned buildings, and the largest buildings and largest emitters. Targeting publicly owned buildings removes the concern over landlord harassment of tenants. And by prioritizing the largest buildings, policymakers will have more time to identify funding and technical assistance for smaller landlords and subsidized housing providers who may need the most support. Chelsea Kirk, *Los Angeles Building Decarbonization: Tenant Impact and Recommendations* 30-37, STRATEGIC ACTIONS FOR A JUST ECON. (Dec. 2021), https://www.saje.net/resources/reports/building-decarbonization/.

79 AB 617 established air monitoring, assessment, and reporting requirements. It also created community emissions reduction programs for emissions of toxic air contaminants and criteria pollutants from stationary sources in communities affected by a high cumulative exposure burden. The law requires air districts in nonattainment for one or more air pollutants to adopt expedited schedules for the implementation of best available retrofit control technology (BARCT), giving highest priority to those permitted sources of pollution that have not modified their emissions-related permit conditions for the greatest period of time. AB 617 also requires CARB to establish and maintain a statewide clearinghouse that identifies the best available control technology (BACT), BARCT for criteria air pollutants, and related technologies for the control of toxic air contaminants. California Assembly Bill No. 617, Chapter 136, AB-617 Nonvehicular air pollution: criteria air pollutants and toxic air contaminations, https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB617 (last accessed Jul. 26, 2021).

80 See "Background" and "AB 617 Program Components" on AB 617 truck incentives in South Coast AQMD. South Coast Air Quality Mgmt. Dist., *AB 617 Community Air Initiatives*, http://www.aqmd.gov/nav/about/initiatives/environmental-justice/ab617-134 ("Examples of projects that have been funded include replacement of heavy-duty trucks and buses, construction equipment, agricultural equipment, cargo handling equipment, marine vessels and infrastructure needed to support zero- and near-zero-emission vehicles and equipment.")

81 42 U.S.C. § 6297(b).

82 *See* Air Conditioning, Heating & Refrigeration Inst. v. City of Albuquerque, No. 08-633, 2008 WL 5586316, at *7 (D.N.M. Oct. 3, 2008) (holding that certain portions of three City of Albuquerque ordinances that impose minimum energy efficiency standards for commercial and residential buildings are preempted by EPCA).

83 42 U.S.C. § 7602 (West, Westlaw Current through P.L. 116-259).

84 *See* Jianfeng Yu, Ting Zhang, & Jianming Qian, *Energy-Efficiency Technical Measures System for Electrical Motor Products, in* ELECTRICAL MOTOR PRODUCTS 37 (2011). Further undermining any argument that EPCA preempts state emissions limitations, the CAA provides that emissions standards are "established by the [s]tate or the [EPA] Administrator," not the DOE, which sets efficiency standards for EPCA-covered products. 42 U.S. Code § 7602 (West, Westlaw Current through P.L. 116-259) (emphasis added). The CAA has operated this way for decades, with air districts submitting their emissions limitations for stationary sources to states for inclusion in SIPs, which are then approved by EPA. Nothing in EPCA's history or text suggests that it was intended to upend these air pollution control regimes. *See* Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie, 508 F. Supp. 2d 295, 354 (D. Vt. 2007) (noting that Congress enacted EPCA in 1975 against the backdrop of the CAA's SIP provisions—passed in 1970—so while Congress surely intended EPCA to control efficiency standards, it could not have also intended this to swallow emissions state controls over pollutants).

85 Wyeth v. Levine, 555 U.S. 555, 565 (2009).

86 *See* Alexandra B. Klass, *State Standards for Nationwide Products Revisited*, 34 HARV. ENVT'L. L. REV. 335, 346-48 (2010).

87 ENVTL. PROT. AGENCY, THE CLEAN AIR ACT IN A NUTSHELL: HOW IT WORKS 4 (2013).

88 42 U.S.C. § 6297(c) (West, Westlaw Current through P.L. 116-259) (residential appliances). There is also a provision similarly constructed for certain kinds of commercial appliances. 42 U.S.C. § 6316(b)(2)(A) (West, Westlaw Current through P.L. 116-259).

89 N.Y. State Conf. of Blue Cross & Blue Shield Plans v. Travelers Ins. Co., 514 U.S. 645, 657, 660-62 (1995) (holding that the federal retirement benefits statute's broad preemption clause using "relating to" language did not preempt state retirement

benefit requirements because the state regulations would only have an indirect effect on the preemption clause's purpose of avoiding a patchwork of state regulations with which insurance companies must comply and the limitations were "almost certainly not an object of preemption"); *see also* Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie, 508 F. Supp. 2d 295, 351-52 (D. Vt. 2007) (holding in the vehicle emissions context that state "GHG regulations embrace[d] much more than a simple requirement to improve fuel economy, cloaked in the rhetoric of reducing carbon dioxide emissions . . . [because the GHG regulation] encompasse[d] emissions which do not correlate with fuel economy").

90 *See, e.g.,* S. Coast Air Quality Mgmt. Dist., Cal. Rule 1111, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1111.pdf?sfvrsn=4 (emissions limits to reduce NOx emissions from fan-type central furnaces, both residential and commercial). *See also* 30 Texas Admin Code Chapter 117, Subchapter E, Division 3. There are routine state and local requirements that regulate equipment "covered" by EPCA that nevertheless are not preempted by the statute. State safety regulations, for example, set emergency egress requirements for cold-storage units, even though freezers are regulated by EPCA. Similarly, some local requirements in California restrict new swimming pools as a drought mitigation measure; EPCA does not, however, preempt these restrictions as impermissible energy efficiency standards for pool heaters. Defendant's Motion to Dismiss at 19, Cal. Rest. Ass'n v. City of Berkeley, No. 4:19-CV-07668-YGR (N.D. Cal. Sept. 14, 2020).

91 Marc Karell & Amit Chattopadhyay, *NOx Emission Reduction Strategies*, Pollution Online (Jun. 16, 2000), https://www.pollutiononline.com/doc/nox-emission-reduction-strategies-0001.

92 Air Conditioning, Heating & Refrigeration Inst. v. City of Albuquerque, 835 F. Supp. 2d 1133 (D.N.M. 2010).

93 Cal. Rest. Ass'n v. City of Berkeley, 4:19-cv-07668-YGR 10 (N.D. Cal. Jul. 6, 2021).

94 Cal. Health & Safety Code § 18909(a). *See* Reply Brief of Defendant at 14-15, Cal. Rest. Ass'n v. City of Berkeley, No. 4:19-CV-07668-YGR (N.D. Cal. Oct. 27, 2020).

95 *See* Cal. Health & Safety Code § 39002 (stating generally that "local and regional authorities may establish stricter [emissions] standards than those set by law or by the state board for nonvehicular sources"); *see also* Cal. Health & Safety Code § 41508 (stating, specific to the control of nonvehicular air pollution, that "any local or regional authority may establish additional, stricter standards than those set forth by law or by the state board for nonvehicular sources"); Cal. Health & Safety Code § 40001 (stating that "districts shall adopt and enforce rules and regulations to achieve and maintain the state and federal ambient air quality standards in all areas affected by emission sources under their jurisdiction," and that "district rules and regulations may…provide for the prevention and abatement of air pollution episodes which…cause discomfort or health risks to, or damage to the property of, a significant number of persons or class of persons"). Further still, air districts' actual appliance emission limits have so far not been adopted as modifications to building standards in any local jurisdiction, indicating that the local amendment process to the Building Standards Code likely is irrelevant to such standards.

96 Ass'n of Envtl. Professionals, *2021 California Environmental Quality Act (CEQA) Statute and Guidelines* 251, https://www.califaep.org/docs/CEQA_Handbook_2021.pdf.

97 Cal. Pub. Res. Code § 21080.5.

98 The SCAQMD relied on a similar rationale to support its decision to prepare an Environmental Assessment, rather than an EIR, for its 2009 amendments to Rule 1111 covering water heaters. South Coast Air Quality Mgmt. Dist., *Final Environmental Assessment for Proposed Amended Rule 1111 – NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces*, p. 1-2 to 1-3, (Nov. 2009), http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2009/final-environmental-assessment-for-proposed-amended-rule-1111.pdf. It is worth noting, though, that the SCAQMD prepared a longer, seemingly more involved Subsequent Environmental Assessment for a later revision to Rule 1111 that would increase NOx emissions somewhat by extending compliance flexibilities. South Coast Air Quality Mgmt. Dist., *Final Subsequent Environmental Assessment to the September 2014 Final Environmental Assessment for Proposed Amended Rule 1111 – Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces*, (Feb. 2018), http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2018/par-1111---final-sea.pdf?sfvrsn=4.

99 CEQA requires agencies with Certified Regulatory Programs to file Notices of Decision with the California Natural Resources Agency. The California Natural Resources Agency website contains a bulletin of Certified Regulatory Program Notices of Decision. Several of the SCAQMD's projects are contained on the bulletin, including the "Final Subsequent Environmental Assessment (SEA) for Proposed Rule (PR) 1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations, PR 429.1 – Startup and Shutdown Provisions at Petroleum Refineries and Related Operations, Proposed Amended Rule (PAR) 1304 – Exemptions, PAR 2005 – New Source Review for RECLAIM, and Proposed Rescinded Rule 1109 – Emissions of Oxides of Nitrogen from Boilers and Process Heaters in Petroleum Refineries," dated November 2021. Cal. Nat. Res. Agency, *Certified Regulatory Programs – Notices of Determination*, https://resources.ca.gov/admin/Legal/CRP-NOD. Section 15251(l) of the California Code of Regulations also lists "that portion of the regulatory program of the South Coast Air Quality Management District which involves the adoption, amendment, and repeal of regulations pursuant to the provisions of the Health and Safety Code" as a program of state regulatory agencies have been certified by the Secretary for Resources as meeting the requirements of Section 21080.5. 14 Cal. Code of Regs., tit. 14 § 15251(l) (2021).

Pritzker Briefs

PRITZKER ENVIRONMENTAL LAW AND POLICY BRIEFS

POLICY BRIEF NO. 14 | MARCH 2022

This policy paper is the fourteenth of the Pritzker Environmental Law and Policy Briefs. The Pritzker Briefs are published by UCLA School of Law and the Emmett Institute on Climate Change and the Environment in conjunction with researchers from a wide range of academic disciplines and the broader environmental law community. They are intended to provide expert analysis to further public dialogue on important issues impacting the environment.

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ACKNOWLEDGMENTS

The authors wish to thank Jim Dennison for his input and reflections as the concepts in this paper were being developed and for his thoughtful review of this paper in its earliest stages. We also thank the following students in the Frank G. Wells Environmental Law Clinic at UCLA Law, each of whom contributed significant research to this report: Nicholas Bascom, Justin Breck, Kristen Cardenas, Simone Chung, Madison Dipman, Jake Gold, Tom Hanrahan, Andrew Klimaszewski, Kelsey Manes, Reilly Nelson, Rachel Sweetnam, and Ashley Sykora. All errors remain our own.

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