NRDC
NATURAL RESOURCES DEFENSE COUNCIL

July 27, 2020

VIA EMAIL

Anthony E. Valdez
Commission Secretary
Commission on the Environment
City of San Francisco
1455 Market Street, Suite 1200
San Francisco, CA 94103

To the Commission on the Environment:

On behalf of our 95,000 California members who have an interest in transitioning to a thriving climate-safe society while receiving affordable energy services, we are writing to support Supervisor Mandelman's proposed ordinance requiring all-electric buildings for new construction. Local jurisdictions across the state have adopted "reach" building energy codes to decarbonize their building sectors, and San Francisco has the opportunity to be a leader in this movement by requiring that all new buildings be designed and built to use clean electricity, leading to better air quality and zero climate emissions.

We commend Supervisor Mandelman and City staff for coordinating a comprehensive and inclusive stakeholder process, leading to a robust ordinance that avoids unnecessary exemptions while providing flexibility where really needed.

The Ordinance Will Protect the Health and Safety of San Francisco Residents

Gas appliances in buildings make up a quarter of California's nitrogen oxide (NO_x) emissions from fossil gas. NO_x is a precursor to ozone and a key pollutant to curb in order to comply with state and federal ambient air quality standards. Electrifying buildings will help reduce NO_x and ground level ozone, improving *outdoor* air quality and benefiting public health. A recent study from the UCLA Fielding School of Public Health found that immediate replacement of all residential gas appliances with clean electric alternatives would result in 354 fewer deaths, 596 fewer cases of acute bronchitis, and 304 fewer cases of chronic bronchitis

annually in California due to improvements in outdoor air quality alone—the monetized equivalent of $3.5 billion in health benefits per year.[1]

Electrification of fossil fuel appliances will also immediately improve *indoor* air quality and health. On average, Californians spend 68 percent of their time indoors, making indoor air quality a key determinant of human health.[2] The combustion of gas in household appliances produces harmful indoor air pollution, specifically nitrogen dioxide, carbon monoxide, nitric oxide, formaldehyde, acetaldehyde, and ultrafine particles, often in excess of the levels set out by the California Ambient Air Quality Standards and the National Ambient Air Quality Standards.[3,4] The California Air Resources Board warns that "cooking emissions, especially from gas stoves, have been associated with increased respiratory disease."[5] Young children and people with asthma are especially vulnerable to indoor air pollution, and the negative health impacts associated with gas appliance use disproportionately affect low-income residents, who are often renters rather than homeowners and tend to live in smaller spaces, resulting in higher concentration of indoor air pollutants.[6]

The Ordinance is a Critical Step in Fighting the Climate Emergency

Stationary energy use represents a major source of greenhouse gas ("GHG") emissions, much of which comes from gas end uses, such as space and water heating. In *Residential Building Electrification in California*, E3 determined that "electrification is found to reduce total greenhouse gas emissions in single family homes by approximately 30 to 60 percent in 2020, relative to a gas-fueled home."[7] Moreover, "[a]s the carbon intensity of the grid decreases over time, these savings are estimated to increase to approximately 80 to 90 percent by 2050, including the impacts of upstream methane leakage and refrigerant gas leakage from air conditioners and heat pumps."[8]

Building electrification brings significant GHG reductions, not only due to the energy mix on the grid, which was, in PG&E's and CleanPowerSF's service territories, respectively, 85

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[1] Zhu, *et al.*, *Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California*, UCLA Fielding School of Public Health (April 2020).
[2] Klepeis *et al.*, *The National Human Activity Pattern Survey (NHAPS): A Resource for Assessing Exposure to Environmental Pollutants*, J. EXPO. ANAL. ENVIRON. EPIDEMIOL., Vol. 11(3), 231-52 (2001).
[3] *See, e.g.*, Logue *et al.*, *Pollutant Exposures from Natural Gas Cooking Burners: A Simulation-Based Assessment for Southern California*, ENVIRON. HEALTH PERSP., Vol. 122(1), 43-50 (2014); Victoria Klug & Brett Singer, *Cooking Appliance Use in California Homes—Data Collected from a Web-based Survey*, LAWRENCE BERKELEY NATIONAL LABORATORY (Aug. 2011); John Manuel, *A Healthy Home Environment?* ENVIRON. HEALTH PERSP., Vol. 107(7), 352-57 (1999); Mullen *et al.*, *Impact of Natural Gas Appliances on Pollutant Levels in California Homes*, LAWRENCE BERKELEY NATIONAL LABORATORY (2012).
[4] Zhu, *et al.*, at 12-13.
[5] California Air Resources Board, *Combustion Pollutants* (last reviewed Jan. 19, 2017), https://www.arb.ca.gov/research/indoor/combustion.htm.
[6] Zhu, *et al.*, at 10.
[7] E3, Residential Building Electrification in California at iv (Apr. 2019), https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf.
[8] *Id.*

and 89 percent carbon-free in 2018,[9] but also because heat pump technology is extraordinarily efficient. Rather than needing to generate heat through the combustion of fossil gas, heat pumps extract existing heat from the surrounding environment. Because electricity is used to move heat around rather than to create it, heat pump efficiency is far greater than 100 percent (energy services delivered are much greater than energy input). Accordingly, heat pumps use much less energy to heat water,[10] and generate significantly less GHGs than even the most efficient gas water heating.[11]

The Ordinance Will Develop the Local Workforce

Building electrification will also spur development of the local workforce for jobs that will be critical in California's broader energy transition. For example, in Sacramento Municipal Utility District territory, where all-electric buildings are quickly becoming the default for new developments, demand for specialized plumbers and HVAC technicians is expected to grow enormously. The region expects to install more than 300,000 heat pump space heaters in the next 15 to 20 years.[12] Additionally, a 2019 study from the UCLA Luskin Center for Innovation found that electrification of 100 percent of California's existing and new buildings by 2045 would generate new jobs for more than 100,000 full time construction workers and up to 4,900 full time manufacturing workers.[13] While gas distribution jobs would decrease, they are projected to be replaced by almost double the amount of full time jobs in electricity generation and distribution.[14]

Further, because California imports 90 percent of its gas from out of state, it can reduce gas imports first while preserving in-state gas industry jobs, which will ease the strain of industry transition on gas industry workers.[15] The UCLA study stresses that planning—including implementing and enforcing clear building codes and standards—will be crucial in protecting workers through an industry transition that is already underway.[16] Recognizing the widespread energy transition already underway statewide, San Francisco has an opportunity to lead California's major urban centers by developing a robust, comprehensive local legal framework to support electrification and generate thousands of good, green jobs for its residents.

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[9] PG&E, Corporate Responsibility and Sustainability Report: 2019, at 38. Available at: http://www.pgecorp.com/corp_responsibility/reports/2019/assets/PGE_CRSR_2019.pdf; CleanPowerSF Power Draft Power Content Label: 2018. Available at: https://www.cleanpowersf.org/s/2018-CleanPowerSF-PCL.pdf.
[10] See Pub. Util. Code § 397.6(k)(3) (a measure of SGIP success and impact is the "amount of energy reductions measured in energy value.").
[11] See Pub. Util. Code § 379.6(k)(1) (a measure of SGIP success and impact is the "amount of reductions of emissions of greenhouse gases.").
[12] Justin Gerdes, *Experts Discuss the Biggest Barriers Holding Back Building Electrification*, Greentech Media (Sept. 19. 2018), https://www.greentechmedia.com/articles/read/here-are-some-of-the-biggest-barriers-holding-back-building-electrification#gs.fBEBKJy2.
[13] UCLA Luskin Center for Innovation, *California Building Decarbonization: Workforce Needs and Recommendations*, at ES-iv (Nov. 2019).
[14] *Id.*
[15] *Id.* at 24-25.
[16] *Id.* at 27-28.

In light of this, we support the all-electric construction ordinance, not only as a response to the climate emergency, but also in support of new jobs and the health and safety of the people of San Francisco. To fully realize these benefits, avoid unnecessary stranded asset consequences of continued buildout of gas infrastructure, and ensure the City's actions are commensurate with the urgency of the climate crisis, it is critical that any exemptions to all-electric new construction be as narrowly tailored as possible and avoid the potential for loopholes. We therefore urge staff to implement the ordinance in a way that ensures exemptions are in legitimately exceptional circumstances.

Thank you for your leadership in moving San Francisco forward in realizing the many benefits of clean energy homes and buildings.

Sincerely,

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