



September 5, 2019

Dear Mayor Breed and Board of Supervisors,

The undersigned organizations submit this letter supporting adoption of aggressive ordinances effective January 1, 2020 prohibiting natural gas infrastructure in all new buildings and instituting an all-electric favored energy reach code.

We support these ordinances because they represent appropriate and timely responses, among other necessary measures, to mitigate the climate, health, safety, and housing affordability crisis in San Francisco, and across the state.

1. First, by adopting this legislation, the City of San Francisco will join and lead a wave of cities and counties across California and beyond in declaring that fossil fuels have no place in our homes, commercial buildings, or communities, and that we have a right to clean, safe, and affordable energy. While San Francisco would be the first county in the nation to prohibit gas in all new construction, it will not be alone amongst cities. The City of Berkeley passed the nation’s first natural gas prohibition ordinance in July and the city of Seattle is actively exploring a similar gas prohibition. In addition, several dozen cities and counties in the SF Bay Area, Central Valley, Central Coast, and Southern California are pursuing gas prohibitions and reach codes to shift to all-electric new construction.

According to the United Nation’s 2018 Intergovernmental Panel on Climate Change (IPCC) report, we have less than 11 years to institute “rapid, far-reaching and unprecedented changes in

all aspects of society” to sharply reduce greenhouse gas emissions.¹ As we have witnessed with rooftop solar and zero net energy policy, city and county leadership is key to raising the ambition of state policymakers. Change starts at the local level, and climate leadership is desperately needed now if we are to reduce emissions to comply with climate science.

2. The ordinances are an important step towards achieving San Francisco’s climate goals.

Supervisor Brown’s proposed ordinance prohibiting natural gas in new municipal buildings is encouraging, but the climate emergency requires much bolder action that can only be achieved through the prohibition of natural gas in all new San Francisco buildings and subsequently through the retrofit of all existing buildings.

Electrification of all buildings is essential to helping us meet our city’s ambitious emission-reduction goals. Approximately 44% of San Francisco’s greenhouse gas emissions come from the building sector, with nearly 35% of emissions arising from natural gas combustion in the residential and commercial sectors.² Many of these emissions result from uncombusted natural gas (methane), which has 84 times the global warming potential of carbon dioxide over a twenty-year period, leaking into the atmosphere throughout the gas supply chain across fracking wells, transmission and distribution pipelines and from the pipes inside homes and businesses. In fact, according to City data in 2017, methane leaks associated with San Francisco buildings were responsible for the release of greenhouse gas emissions nearly equivalent to the entire City of Berkeley’s emissions in 2016.³

Electricity in San Francisco is rapidly getting cleaner, with 89 percent of our electricity coming from carbon-free sources at a minimum.⁴ As a result, shifting to electric power and efficient electric heat pump appliances in our buildings dramatically lowers greenhouse gas emissions and represents a critical component of San Francisco’s climate action plan strategy. The first step in this process is to ensure that all new buildings are all-electric.

A recent San Francisco Department of the Environment Report suggested that under a business as usual scenario, trends in population growth and economic activity in the residential and commercial sectors will result in a 21% increase in greenhouse gas emissions, creating urgency for near-term action to reduce emissions.⁵ In order to meet the City’s climate goals, the San

¹ “Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by governments,” United Nations Intergovernmental Panel on Climate Change, October 8, 2018, <https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/>.

² “San Francisco’s Climate Storyboard,” San Francisco Department of the Environment, 2017, <https://sfenvironment.org/sf-climate-dashboard>.

³ *Id.* See also, City of Berkeley 2018 Climate Action Plan Update, Planning and Development Department, December 6, 2018, <https://www.cityofberkeley.info/recordsonline/api/Document/AS1qYEO88qcY6Ips8nwbGgL4jGxxlSquza3ESlDOTS6DL2nW1jPxxzLJVhyvQgYDIKPuJDdT3oigVB31dHEfM%3D/>.

⁴ 2018 Green Draft Product Content Label, CleanPowerSF, <https://www.cleanpowersf.org/s/2018-CleanPowerSF-PCL.pdf>.

⁵ “Focus 2030: A Pathway to Net Zero Emissions,” San Francisco Department of the Environment, July 2019, <https://sfenvironment.org/download/focus-2030-a-pathway-to-net-zero-emissions-climate-report-july-2019>, p. 33.

Francisco Department of the Environment estimates that the City should have started last month on electric retrofits, at a rate of 3% each year, of all existing gas-based equipment in existing buildings.⁶ The retrofit target cannot be met if the City is adding new fossil fuel-powered buildings each year, and the business as usual scenario would put San Francisco's goal of meeting the U.N. IPCC greenhouse gas reduction of 45 percent from 2010 levels by 2030 perilously out of reach. In contrast, efficient, healthier, safer, and cheaper to heat and cool electric buildings are very much within reach.

3. Architects, engineers and developers are building all-electric buildings today across the Bay Area and beyond. Building science and technology have progressed such that virtually any building can be constructed with highly efficient heating and cooling systems that do not require natural gas combustion. Please find attached three presentations by San Francisco architects and engineers detailing recent all-electric construction in the Bay Area across all sectors of society. For example, the University of California (UC), with its diverse building stock including high-rise dormitories, laboratories, full service kitchens and restaurants, sports facilities etc., recently announced that all new UC buildings will not use on-site fossil fuel combustion for water and space heating.⁷

Despite the fact that California has long favored fossil fuel over all-electric buildings, the state legislature, the California Energy Commission (CEC) and the California Public Utilities Commission (CPUC) have recently committed to facilitate building decarbonization by updating and streamlining state policies to facilitate the phasing out of fossil fuel from new and existing buildings.⁸ The Chair of the CEC, David Hochschild, came out in support of the Berkeley ordinance and pledged additional resources to ensure that key CEC policies would be updated in time for implementation in 2020. The Pacific Gas & Electric Company (PG&E) also supported the ordinance, noting that “we welcome the opportunity to avoid investments in new gas assets that might later prove underutilized as local governments and the state work together to realize our long-term decarbonization objectives...PG&E supports local government policies that promote all-electric new construction.”⁹

We strongly encourage you to follow Berkeley's lead in prohibiting natural gas in *all* new buildings except for (1) those with systems that cannot yet be modeled in CEC energy compliance software and (2) those that prove to the City that the use of gas in limited systems is in the public interest. For buildings that obtain an exception or exemption, we ask that you require these buildings to install the necessary electric capacity, conduit and wiring to facilitate

⁶ *Id.*, p. 12.

⁷ “UC sets higher standards, greater goals for sustainability,” UC Office of the President, September 4, 2018, <https://www.universityofcalifornia.edu/press-room/uc-sets-higher-standards-greater-goals-sustainability>.

⁸ See e.g., Assembly Bill No. 3232: Zero-emissions buildings and sources of heat energy, California State Assembly, September 14, 2018, https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB3232; Merriam Borgeson, “CA's \$1 Billion for Efficiency Now Open to Electrification,” National Resources Defense Council, August 1, 2019, <https://www.nrdc.org/experts/merriam-borgeson/ca-billion-efficiency-now-open-electrification>; SB-1477: Low-emissions buildings and sources of heat energy, California State Senate, September 14, 2018, https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1477.

⁹ City of Berkeley Council Meeting, July 16, 2019, http://berkeley.granicus.com/MediaPlayer.php?publish_id=70986fb1-a8be-11e9-b703-0050569183fa.

future full building electrification, as well as comply with an all-electric favored reach code that levels the playing field for all-electric buildings under the energy code.

This policy approach achieves the maximum prevention of emissions that would inevitably result from new natural gas infrastructure by syncing implementation with the roll-out of state energy code system software, while also creating a pathway for certain new buildings to install gas infrastructure in extraordinary circumstances.

4. The ordinances will improve air quality and health for San Francisco residents. All-electric new construction will immediately improve indoor air quality for San Francisco residents. On average, Californians spend 68 percent of their time inside their residence, making indoor air quality a key determinant of human health.¹⁰ The combustion of gas inside our homes produces harmful indoor air pollution, specifically nitrogen dioxide, carbon monoxide, nitric oxide, formaldehyde, acetaldehyde, and ultrafine particles.¹¹ These odorless and undetectable gas combustion pollutants can cause respiratory diseases, as well as more serious conditions, including death.¹² Lawrence Berkeley National Laboratory recently found that without proper ventilation, air pollution levels in 60 percent of homes with gas stoves can exceed EPA’s definition of clean air, i.e. air pollution levels indoors in these homes would be illegal if found outdoors.¹³ A recent study found that gas stoves may be responsible for up to 12 percent of childhood asthma cases.¹⁴ Critically, tenants do not have a choice in determining which appliances they use.

All-electric new construction will also be key to mitigating outdoor air pollution in San Francisco. Hazardous air pollution is a particularly acute issue for low-income communities and people of color, who are exposed to higher incidences of particulate matter (PM 2.5) and other

¹⁰ Klepeis, N. E.; Nelson, W. C.; Ott, W. R.; Robinson, J. P.; Tsang, A. M.; Switzer, P.; Behar, J. V; Hern, S. C.; Engelmann, W. H. The National Human Activity Pattern Survey (NHAPS): a resource for assessing exposure to environmental pollutants. *J. Expo. Anal. Environ. Epidemiol.* 2001, 11 (3), 231–252, <https://www.nature.com/articles/7500165>.

¹¹ See, Jennifer Logue et al., “Pollutant Exposures from Natural Gas Cooking Burners: A Simulation-Based Assessment for Southern California” *Environmental Health Perspectives* Vol. 122 No. 1 pp. 43-50, (2013); Victoria Klug and Brett Singer, “Cooking Appliance Use in California Homes—Data Collected from a Web-based Survey.” Lawrence Berkeley National Laboratory, August 2011, <https://homes.lbl.gov/sites/all/files/lbnl-5028e-cooking-appliance.pdf>; John Manuel, “A Healthy Home Environment?” *Environmental Health Perspectives*, Vol. 107, No. 7 1999, pp. 352–357, https://www.jstor.org/stable/3434388?seq=1#page_scan_tab_contents; Nasim Mullen et al., “Impact of Natural Gas Appliances on Pollutant Levels in California Homes” Lawrence Berkeley National Laboratory, 2012, https://indoor.lbl.gov/sites/all/files/impact_of_natural_gas_appliances.pdf.

¹² California Air Resources Board, “Combustion Pollutants,” March 7, 2019, <https://www.arb.ca.gov/research/indoor/combustion.htm>.

¹³ Julie Chao, “Pollution in the Home: Kitchens Can Produce Hazardous Levels of Indoor Pollutants,” Lawrence Berkeley Lab, July 23, 2013, <https://newscenter.lbl.gov/2013/07/23/kitchens-can-produce-hazardous-levels-of-indoor-pollutants/>.

¹⁴ Amy Mitchell-Whittington, “Cooking with gas, damp housing may cause childhood asthma: study,” *Brisbane Times*, April 15, 2018, <https://www.brisbanetimes.com.au/national/queensland/cooking-with-gas-damp-housing-may-cause-childhood-asthma-study-20180415-p4z9pz.html>; See also, Dr. Gregory B. Diette et al., “A Longitudinal Study of Indoor Nitrogen Dioxide Levels and Respiratory Symptoms in Inner-City Children with Asthma,” *Environmental Health Perspectives*, 2008, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2569107/>

harmful pollutants.¹⁵ While most think of trucks, power plants and industry as the major culprits of air pollution, buildings have for too long gotten a free pass. Gas combustion appliances lack modern-day pollution controls and are a major source of air pollution, particularly in the winter from gas heating. Gas appliances in residential and commercial buildings produce nearly seven times more nitrogen oxide (NO_x) emissions than all of California’s gas power plants.¹⁶ Nitrogen oxide is a precursor to ozone and PM 2.5, two pollutants that cause asthma, lung cancer, respiratory diseases, and premature death.¹⁷ All-electric new construction is an essential step to improving air quality and health in San Francisco and the greater Bay Area. A 2019 CEC study found the economic health-related savings so great that statewide decarbonization, including building decarbonization, could be “justified solely on public health grounds.”¹⁸

5. The ordinances will lower the cost of new construction and support affordable housing.

All-electric homes can be cheaper to build¹⁹ than gas-heated buildings — and they can lower monthly utility bills for San Francisco residents and businesses.²⁰ Ensuring all new construction is built without gas piping will help San Francisco developers build more quickly and affordably as there will be no need for new costly gas infrastructure — an advantage in San Francisco’s ongoing housing crisis. The Rocky Mountain Institute found that not piping for gas will “save \$1,000 to more than \$24,000 per single-family home.”²¹ Similarly, a recent analysis by the Statewide Utility Codes and Standards Team found that building all-electric *reduced* construction costs on average \$5,000 for single-family homes and over \$2,000 per unit in a multi-family building.²²

Building all-electric will also save costs for San Francisco residents and businesses in the long term as we transition to a carbon-neutral economy. Gas distribution pipeline extensions to new homes are expected to become stranded assets well before the end of their useful life as more

¹⁵ Christopher W. Tessum et al., “Inequity in consumption of goods and services adds to racial–ethnic disparities in air pollution exposure,” PNAS, March 11, 2019, <https://www.pnas.org/content/116/13/6001>.

¹⁶ California Air Resources Board, “Emission Inventory Data,” 2012, <https://www.arb.ca.gov/ei/emissiondata.htm>.

¹⁷ “Health Effects of Ozone and Particle Pollution,” American Lung Association, <https://www.lung.org/our-initiatives/healthy-air/sota/health-risks/>.

¹⁸ “Exploring Economic Impacts in Long-Term California Energy Scenarios,” California Energy Commission, Docket 18-IEPR-09, June 11, 2018, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=223754&DocumentContentId=53936>.

¹⁹ Asa S. Hopkins et al., “Decarbonization of Heating Energy Use in California Buildings,” 2018, <https://www.synapse-energy.com/sites/default/files/Decarbonization-Heating-CA-Buildings-17-092-1.pdf>

²⁰ Sherri Billimoria, Mike Hennen, Leia Guccione, and Leah Louis-Prescott, “The Economics of Electrifying Buildings: How Electric Space and Water Heating Supports Decarbonization of Residential Buildings,” Rocky Mountain Institute, June 14, 2018, https://rmi.org/wp-content/uploads/2018/06/RMI_Economics_of_Electrifying_Buildings_2018.pdf; See also, Asa S. Hopkins, PhD, Kenji Takahashi, Devi Glick, Melissa Whited, “Decarbonization of Heating Energy Use in California Buildings: Technology, Markets, Impacts, and Policy Solutions,” Synapse Energy Economics, Inc., October 16, 2018, <http://www.synapse-energy.com/sites/default/files/Decarbonization-Heating-CA-Buildings-17-092-1.pdf>.

²¹ *Id.*

²² 2019 Local Energy Ordinances Cost Effectiveness Studies, California Codes and Standards Reach Codes Program, 2019, <https://localenergycodes.com/content/2019-local-energy-ordinances/>.

buildings electrify over the coming years.²³ Stopping investments in new gas infrastructure is a fiscally prudent strategy to avoid saddling ratepayers, renters, property owners and taxpayers with the costs of maintaining and ultimately decommissioning stranded gas infrastructure. In addition, gas prices are on the rise, and are historically subject to natural disasters and other events. PG&E recently requested a gas rate hike at the CPUC of 18.1% between 2020-2022 to pay for safety upgrades, and significant future increases are expected as safety investments continue to 2030, as gas customers continue to transition to electricity, shrinking the rate base available to recover fixed gas infrastructure costs.²⁴ Notwithstanding local and statewide electrification efforts, a recent study sponsored by the CEC predicted that gas rates will likely escalate as demand declines due to energy efficiency efforts and state laws mandating greenhouse gas-free electricity.²⁵ Electrifying new construction will shield ratepayers from volatile and escalating gas rates.

6. The ordinances will make San Francisco's homes and businesses safer and more resilient in the face of climate change, earthquakes and gas leaks. California is experiencing an increasing occurrence of extreme heat waves, with practically each summer breaking previously held record temperatures.²⁶ Most San Francisco residents, particularly low-income families, do not have air conditioning and are not prepared to adapt to these heat waves, which poses new health and safety risks. The air conditioning that comes with replacing gas furnaces with electric heat pump space heaters is an important bonus. All heat pumps can operate in reverse and provide high efficiency cooling when needed. Electrification offers greater comfort, safety, and climate resiliency when temperatures peak.

Lastly, gas pipelines are vulnerable to methane leakage, over-pressurization, and earthquakes. Aliso Canyon (2015/16), Bakersfield (2015), Carmel (2014), San Bruno (2010), and Rancho Cordova (2008), and the recent fires in North Carolina, Massachusetts, and San Francisco's Richmond District are but a few of the important and unfortunate reminders of the gas system's inherent risks. Given the earthquake faults in San Francisco's proximity, fires exacerbated by gas pipelines after earthquakes are of significant concern. Communities with gas pipelines in earthquake-prone areas of San Francisco face increased risks of fires since vibration and changes in pipeline tension during seismic events can result in gas leaks that fuel fires. Aging pipelines and associated equipment, and inflexible pipeline materials are vulnerable to shifts in the earth and buildings, creating the likelihood of pipeline cracks and methane leaks.

7. Prohibiting natural gas infrastructure represents a tipping point. As recently stated by the president of the Western States Petroleum Association, representing BP, Chevron Corporation,

²³ Jeff McMahon, "The 'Rush To Gas' Will Strand Billions As Renewables Get Cheaper, Study Says," Forbes, May 21, 2018, <https://www.forbes.com/sites/jeffmcmahon/2018/05/21/the-rush-to-gas-will-cost-billions-in-stranded-assets-as-renewables-get-cheaper-institute-says/#52a7065c3a0d>

²⁴ PG&E's General Rate Case 2020-2022, Pacific Gas and Electric Company, December 13, 2018, https://www.pge.com/en_US/about-pge/company-information/regulation/general-rate-case/materials.page

²⁵ See "Draft Results: Future of Natural Gas Distribution in California," E3 Economics, CEC Staff Workshop for CEC PIER-16-011, June 6, 2019, <https://www.nrdc.org/sites/default/files/future-natural-gas-distribution-california-06062019.pdf>.

²⁶ Daniel Swain, "2017 hottest summer in California history," Climate Signals, September 9, 2017, <https://www.climatesignals.org/headlines/2017-hottest-summer-california-history>.

ConocoPhillips, ExxonMobil, and Shell, the move to prohibit gas locally in all new buildings is “a tipping point in California.”²⁷

The next step will be to rapidly develop and implement a plan to electrify the existing building stock. This is will be a complex challenge involving a range of social justice, engineering and financial issues. We appreciate the Mayor’s announcement in April directing the Department of the Environment to convene a public-private task force to examine how best to electrify San Francisco’s buildings. We request that its meetings be open to the public and that its members include frontline communities, labor, renters, and environmental groups.

By mandating gas-free construction for new buildings and establishing a broad-based task force for existing buildings, San Francisco will protect the health of its residents and the affordability of its housing, and will commit to a just transition towards dramatically reducing greenhouse gas emissions.

Sincerely,

SF Climate Emergency Coalition

350 San Francisco

Sunrise Movement Bay Area

Earthjustice - Sasan Saadat, Research and Policy Analyst

Physicians for Social Responsibility - Robert M. Gould, MD, President, San Francisco Bay Chapter

350 Bay Area

Citizens' Climate Lobby, San Francisco Chapter

Sunflower Alliance

San Francisco Democratic Socialists of America - Ecosocialist Committee

Climate Reality Project Bay Area

²⁷ Brandon Evans, “Berkeley gas hook-up ban appears likely to spread to other California cities: WSPA head,” August 7, 2019, S&P Global, <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/080719-berkeley-gas-hook-up-ban-appears-likely-to-spread-to-other-california-cities-wspa-head>.

Mothers Out Front San Francisco

Union of Concerned Scientists - Mark Specht, Energy Analyst, Climate & Energy Program

San Francisco Tomorrow

Climate Emergency Mobilization Task Force

Elders Climate Action - Northern California Chapter

Mithun Architecture - San Francisco, Seattle, Los Angeles

EHDD Architecture - San Francisco

CREDO Action

North American Passive House Network - Bronwyn Barry, Board President

Guttman & Blaevoet Consulting Engineers - Ted Tiffany, Principal and Director of Sustainability

Alter Consulting Engineers - Stefan Gracik, Co-Founder

Redwood Energy - Sean Armstrong, Co-founder, Managing Principal and Multifamily Zero Net Energy Designer

Association for Energy Affordability - Andrew Brooks, Director of West Coast Operations

Ecotope - Shawn Oram, P.E., Principal, Director of Design and Engineering