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Support Reach Codes

As a green building consultant trained in energy efficiency and indoor quality issues, I strongly support the proposed Reach Codes, which reduce reliance on fossil fuels and reduce gas combustion within the home. Thank you for helping move our State towards a more climate-friendly future.

Additional submitted attachment is included below.

Natural Gas Facts

Health

Burning of gas in household appliances produces harmful indoor air pollution, including carbon monoxide, nitrogen dioxide, formaldehyde, and ultrafine particles.[1]

Young children, people with asthma, and people with heart or lung disease are especially vulnerable to the toxic effects of combustion pollutants.[2] At elevated ambient concentrations, nitrogen dioxide has been associated with exacerbation of asthma[3] and an increase in daily deaths.[4] At higher concentrations, it has been associated with increased sensitivity to allergens in patients with asthma.[5] Studies have demonstrated associations between elevated indoor levels of nitrogen dioxide, often attributable directly to gas stove burners, and symptoms in children including chest tightness, shortness of breath, wheeze, and increased asthma attack frequency.[6] Children living in a home with a gas stove have a 42% increased risk of current asthma.[7] Pollution from gas stoves doubles the odds of a woman experiencing symptoms of lung disease and nearly triples the odds she will need to take asthma medication.[8]

Using a gas stove can easily cause indoor air pollution levels that would be illegal outdoors.[9] In many homes, the range hood is not used routinely; even when used, many range hoods do a poor job of removing emitted pollutants.[10]

"'Literally millions to many millions of people are routinely being exposed to air pollutants at levels that we don't allow outdoors,' says Brett Singer, a staff scientist at Lawrence Berkeley National Laboratory (LBNL) who studies indoor air quality and cooking emissions in particular. His team modeled gas stove emissions and exposures in California households and estimated that during a typical winter week—when windows are more likely to be closed and air exchange lower—1.7 million Californians could be exposed to CO levels that exceed national and state ambient air quality standards, simply by cooking on gas stoves without the use of a range hood. Twelve million could be exposed to excessive levels of [nitrogen dioxide] NO_2"[11] Even with routine use of a range hood, 30% of occupants are routinely exposed to nitrogen dioxide levels that exceed acute health-based standards and guidelines.[12]

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[1] California Air Resources Board, Combustion Pollutants (retrieved 24 Oct 2019).
[2] California Air Resources Board, *id*.
[3] Hajat S, et al., "Association of air pollution with daily GP consultations for asthma and other lower respiratory conditions in London" Thorax (1999).
[4] Touloumi G, et al., "Short-term effects of ambient oxidant exposure on mortality: a combined analysis within the APHEA project," Am J Epidemiol (1997).
[5] Tunnicliffe, WS, et al., "Effects of domestic concentrations of NO2 on airway responses to inhaled allergen in asthmatic patients," Lancet (1994).
[6] Seltenrich, Nate, "Take Care in the Kitchen: Avoiding Cooking-Related Pollutants" Environ Health Perspect (2014) (citing Belangerm K., et al., "Association of indoor nitrogen dioxide exposure with respiratory symptoms in children with asthma," Am J Respir Crit Care Med (Aug 2004); Hansel NN., et al, "A longitudinal study of indoor nitrogen dioxide levels and respiratory symptoms in inner-city children with asthma," Environ Health Perspect (2008); Lin W., et al., "Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children," Int J Epidemiology (Aug 2013); Garrett MH, et al., "Respiratory symptoms in children and indoor exposure to nitrogen dioxide and gas stoves," Am J Respir Crit Care Med (1997)). See also Krasner, A. & Jones, TS, "Cooking with Gas Can Harm Children" (2019).
[7] Lin 2013, *supra*.
[8] Jarvis et al. "Association of respiratory symptoms and lung function in young adults with use of domestic gas appliances" Lancet (1996).
[9] Gillis, J. & Nilles, B., "Your Gas Stove is Bad for You and the Planet", The New York Times (1 May 2019); Singer et al. "Pollutant Concentrations and Emission Rates from Natural Gas Cooking Burners Without and With Range Hood Exhaust in Nine California Homes," Building and Environment v. 122 (2017).
[10] Singer, Brett, Lawrence Berkeley National Laboratory, "Kitchen Ventilation Solutions to Indoor Air Pollution Hazards from Cooking" (2013); Singer, BC, et al., "Performance of installed cooking exhaust devices," Indoor Air (2012).
[11] Seltenrich 2014, *supra*; Logue, JM, et al., "Pollutant exposures from natural gas cooking burners: a simulation-based assessment for Southern California," Environ Health Perspect (2014).
[12] Logue 2014, *supra*.

Safety

Natural gas use in homes is responsible for almost half of residential house fires, each year directly causing an average of 31 deaths and 194 injuries nation-wide.[13]

Gas line ruptures caused half of the fires after the 1994 Northridge earthquake.[14]

Safety issues arise when natural gas is transported across the United States through aging pipeline infrastructure. On average since 2010, the natural gas system has annually caused 236 safety incidents, 14 fatalities, 66 injuries, and $198 million in damages.[15]

Costs

The #1 use of payday loans is paying utility bills. Using electric appliances instead of natural gas can lower home utility bills by up to $800 annually.[16]

The average newly-built single-family house in our climate zone would save over $5,000 over the lifetime of the equipment by going all-electric instead of utilizing natural gas.[17]

Initial average all-electric construction costs vary from an increase of $4,000 if installing high-end equipment to a savings of $30,000 if installing lower-cost equipment.[18]

In California, developers save an average of $3,300/unit in multi-family construction costs by avoiding natural gas use.[19]

Because it doesn't need a flue installed, the cost of purchasing and installing a heat pump for space heating and cooling is about $270 less than the cost for a furnace and air conditioning.[20] Because it doesn't need a flue installed, the cost of purchasing and installing a heat pump water heater is about the same as the cost of a gas tankless water heater.[21] These price comparisons do not include the large cost savings from not tying in to the natural gas line.

All new University of California buildings are being built all-electric. Their cost analysis found: "All-electric buildings are comparable or slightly less expensive than gas + electric buildings from a 20-year Life Cycle Cost perspective, factoring in both capital and energy costs. The average 20-year Life Cycle Cost for all-electric buildings compared to gas + electric option is $1.23/sf (about 0.7%) lower for academic buildings, $5.28/sf (about 3.5%) lower for residential buildings, and $3.09/sf (about 0.8%) lower for laboratories."[22]

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[13] Hall, John R., Jr., National Fire Protection Association, "Fires Starting with Flammable Gas or Flammable or Combustible Liquid" at ix, Table 2-A.1 at 25 (2014).
[14] California Seismic Safety Commission, "Improving Natural Gas Safety in Earthquakes" (SSC-02-03) Table 2 at 15 (2002)
[15] San Francisco Department of the Environment, "Methane Math: How Cities Can Rethink Emissions from Natural Gas" (2017). See also Landrigan, Philip J., M.D., et al., 'Perspective: The False Promise of Natural Gas," New England Journal of Medicine (2019) (Recommending new gas hookups not be permitted, new gas appliances be removed from the market, and other actions be taken to reduce extraction, transportation, and use of natural gas due to health impacts.)
[16] Levy, R. & Sledge, J., Center for Financial Services Innovation, "A Complex Portrait: An Examination of Small-Dollar Credit Consumers" at 4, 12 (2012); Hopkins et al., Synapse Energy Economics, "Decarbonization of Heating Energy Use in California Buildings" at 2, 39 (2018).
[17] Frontier Energy & Bruceri, M., 2019 Cost-effectiveness Study: Low-Rise Residential New Construction at 42 and Tables 51 & 53, pgs 84 & 86 (1 Aug 2019); see also TRC Energy Services, "City of Palo Alto 2019 Title 24 Reach Code Cost Effectiveness Analysis" (Draft 13 Sept 2018) at 22 (average life cycled cost savings of $4,851 to $8,772 for all-electric single-family new construction).
[18] Frontier Energy & Bruceri 2019, Table 6 at 16.
[19] Frontier Energy & Bruceri 2019, Table 6 at 16.
[20] TRC 2018 at 30.
[21] Frontier Energy & Bruceri 2019, Table 6 at 16.
[22] Point Energy Innovations, Final Report: UC Carbon Neutral Buildings Cost Study (2017) at 3.