<table>
<thead>
<tr>
<th><strong>DOCKETED</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Docket Number:</strong></td>
<td>19-BSTD-03</td>
</tr>
<tr>
<td><strong>Project Title:</strong></td>
<td>2022 Energy Code Pre-Rulemaking</td>
</tr>
<tr>
<td><strong>TN #:</strong></td>
<td>234934-3</td>
</tr>
<tr>
<td><strong>Document Title:</strong></td>
<td>Appendix B to RMI, Redwood Energy, Guttmann and Blaevooet, Mothers Out Front, NRDC, Sierra Club Comments</td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Appendix B to Rocky Mountain Institute (RMI), Redwood Energy, Guttmann &amp; Blaevooet Consulting Engineers, Mothers Out Front, Natural Resources Defense Council (NRDC), and Sierra Club Response to SoCalGas’s Comments on Indoor Air Quality</td>
</tr>
<tr>
<td><strong>Filer:</strong></td>
<td>Brady Seals</td>
</tr>
<tr>
<td><strong>Organization:</strong></td>
<td>Rocky Mountain Institute</td>
</tr>
<tr>
<td><strong>Submitter Role:</strong></td>
<td>Public</td>
</tr>
<tr>
<td><strong>Submission Date:</strong></td>
<td>9/28/2020 4:39:37 PM</td>
</tr>
<tr>
<td><strong>Docketed Date:</strong></td>
<td>9/28/2020</td>
</tr>
</tbody>
</table>
June 12, 2020

California Codes and Standards Enhancement ("CASE") Team
info@title24stakeholders.com


Dear Statewide CASE Team:

Mothers Out Front, Rocky Mountain Institute ("RMI"), and Guttmann & Blaevoet respectfully submit the following comments on the Statewide Utility Codes and Standards Enhancement ("CASE") Team’s Multifamily Indoor Air Quality draft report prepared for the California Energy Commission’s ("CEC") 2022 Energy Code Pre-Rulemaking.

RMI is an independent, nonpartisan nonprofit whose mission is to transform global energy use to create a clean, prosperous, and secure low-carbon future. Mothers Out Front is a growing national movement of mothers, grandmothers, and other caregivers who are working together to address the systemic causes of the climate crisis, advocate for bold climate action and environmental justice, and protect children and communities from the damaging impacts of fossil fuel extraction and use.

The stated goal of the report is to recommend a code change for multifamily indoor air quality,1 and submeasure B in the draft report “addresses kitchen ventilation to reduce pollution from cooking and kitchen appliances, and primarily provides indoor air quality benefits.”2 Yet, the current ventilation proposal falls short of ensuring that indoor air quality benefits will be achieved.

An increasing amount of scientific research is raising concerns that the indoor air quality guidelines being used to set ventilation standards are outdated and fail to protect the health of Californians. Additionally, the current proposal assumes the user will turn on the fan while using the stovetop, which has been found to be untrue in most cases.

In order to achieve the goal of promoting healthy indoor air quality for all Californians, the final CASE report should recommend that the CEC:

2 Id. at 11
• Strengthen the indoor air quality guidelines used to model ventilation standards to reflect the latest science
• Require automatic control and hood capture design for gas kitchen appliances

Mounting Evidence of Harm Due to Indoor Air Pollution from Gas Stoves

A recent report from Rocky Mountain Institute, Physicians for Social Responsibility, Mothers Out Front, and the Sierra Club synthesized decades of evidence on the health impacts of gas stoves and found that gas stoves release toxic pollutants at levels that can damage human health.3

Unvented gas combustion in homes can release more nitrogen dioxide ("NO₂") and carbon monoxide indoors than the U.S. Environmental Protection Agency allows outdoors.4 Meanwhile, we spend the vast majority—nearly 90%—of our time indoors.5 According to a study by the Lawrence Berkeley National Laboratory, 12 million Californians in homes with gas stoves are breathing levels of NO₂ that would be illegal outdoors, while 1.7 million Californians are breathing levels of carbon monoxide that exceed outdoor limits.6 Recent research from the University of California, Los Angeles reinforced these troubling findings.7

Children and low-income communities are particularly susceptible to the harmful effects of indoor air pollution from unvented or poorly vented gas stoves. The EPA found that short term exposure to NO₂ from sources including gas stove cooking directly contributes to respiratory health effects, such as asthma.8 Children living in homes with gas stoves are 42% more at risk of experiencing asthma symptoms.

compared to children living in homes with electric stoves. Meanwhile, having a gas stove increases the risk of being diagnosed with asthma by a doctor by 24%.

One in eight Californians—5 million people—have asthma. Asthma rates are even higher in low-income communities and communities of color; consequently, these communities may be at higher risk of harms resulting from exposure to pollution from gas appliances in the kitchen, as some of the most susceptible populations are those with existing asthma.

Additionally, multifamily households, which are commonly low-income, are at higher risk of exposure to gas stove pollution in the first place, as factors that contribute to higher levels of NO$_2$ in homes are most common in multifamily housing. These factors include smaller unit size, more people per home, and inadequate ventilation.

**Indoor Air Quality Guidelines Used in CASE Modeling Should Be Strengthened to Reflect the Latest Science**

The indoor air quality guidelines that the CASE team relies upon in modeling its ventilation standards are outdated, and there is reason to believe that they may not sufficiently protect the public, especially vulnerable communities. The CASE team should run its modeling scenarios using indoor air quality guidelines that are based on the latest science and protect all members of the public, including sensitive populations.

---

10 See id.
The California Air Resources Board (“CARB”) recently began a process to revise indoor air quality guidelines for NO₂ emissions that date back to 1994. Meanwhile, the CASE team is proposing to apply the U.S. Environmental Protection Agency’s (“EPA”) 2010 outdoor NO₂ standards for use indoors. Numerous scientific studies have found that EPA’s 2010 outdoor NO₂ standard is not sufficiently protective of health indoors, especially for the most sensitive populations. As a result, government officials in Canada and at the World Health Organization have adopted significantly more stringent guidelines for indoor air quality than EPA’s outdoor standards.

In setting ventilation standards, the CASE team and the CEC should apply indoor air quality guidelines that reflect the latest science and protect all Californians, including the most sensitive populations. CEC should work with public health and indoor air quality experts—including CARB staff and academic researchers—to review the best available science on indoor air pollution and health. This work is urgently needed, in order to ensure that the ventilation requirements in the 2022 Title 24 Standards are providing indoor air quality benefits in multifamily homes.

CEC Should Implement Control Measures that Ensure Public Health and Safety

The current ventilation proposals for hood capture and other methods do not ensure the sought-after indoor air quality benefits because they do nothing to ensure that the fans are actually turned on during the use of the stovetop. We recommend the CEC implement automatic control and hood capture design, especially for gas appliances.

---

While all stoves produce emissions, only gas stoves (not electric) emit NO$_2$ and carbon monoxide. It is true that properly designed ventilation, when used, can reduce exposure to pollution from gas stoves. However, survey results have shown that fewer than half of Californians use their range hoods when cooking.\textsuperscript{19} NO$_2$ and carbon monoxide are odorless and colorless,\textsuperscript{20} and so can be emitted at levels that cause respiratory harm while cooking with a gas stove or oven, without visible evidence of pollution. Most occupants do not understand that the purpose of the exhaust hood is to ventilate the space to evacuate these invisible and harmful emissions and not just smoke or heat from cooking surfaces that they can readily see and feel.

In addition, the continuous kitchen exhaust requirement only in enclosed or semi enclosed kitchens exacerbates wasted energy on a 24/7/365 basis even when the home is completely unoccupied. This strategy does nothing to improve air quality in other kitchens when cooking is occurring.

In order to maintain indoor air quality and protect residents’ health, the CEC should require automatic control and hood capture design, particularly for gas appliances emitting NO$_2$ and carbon monoxide. While current laws requiring carbon monoxide alarms are enforced, there are no direct requirements to place them near cooking devices or to trigger controls for exhaust air to remedy the alarm. Pairing an automatic control for cooking devices with occupant or heat sensing technology would be the optimal approach to ensure that residents are always protected from harmful pollutants while cooking. While there are currently no integrated sensors on residential exhaust hoods, there are already stringent requirements on commercial kitchens in Title 24, Part 6. Control of the residential kitchen exhaust hood could be accomplished with an off the shelf thermal occupancy sensor located beneath the exhaust hood over the cooking surface to automatically control the fan. Both motion and infrared (heat sensing) occupancy sensors on the market for lighting, mechanical, and even receptacle loads are common in the California market and could be employed for this purpose with minimal cost and disruption to existing technologies. A similar approach has been used with humidistat controls for bathroom exhaust required under Title 24, Part 11, CALGreen for residential buildings.

Mounting scientific research finds that millions of Californians are living in buildings where the indoor air pollution threatens their families’ health, and those in multifamily housing are particularly susceptible to negative health effects. It is essential that the CEC implement protective control measures for ventilation that

\textsuperscript{19} See UCLA Fielding School, \textit{supra} note 7, at 16 (and citations therein).
\textsuperscript{20} See U.S. Envt’l Prot. Agency, Care for Your Air: A Guide to Indoor Air Quality, \url{https://www.epa.gov/indoor-air-quality-iaq/care-your-air-guide-indoor-air-quality} (June 1, 2020) (“Carbon monoxide . . . is a colorless, odorless gas that interferes with the delivery of oxygen throughout the body [and] causes headaches, dizziness, weakness, nausea and even death. . . . Nitrogen dioxide (NO$_2$) . . . is a colorless, odorless gas that causes eye, nose and throat irritation, shortness of breath, and an increased risk of respiratory infection.”).
are rooted in the latest science on indoor air quality in order to ensure that all Californians are able to live in safe and healthy buildings.

Respectfully submitted,

[Name Redacted]

Rocky Mountain Institute