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The importance of indoor air quality

Dear Commissioners,

I am an indoor air quality researcher at PSE Healthy Energy with a particular interest in the impacts of gas use on air quality. My published work includes estimates of benzene emissions from gas stoves, both from gas combustion and leakage, as well as a ZIP-code-level model of nitrogen dioxide exposure due to gas stove use.
I want to thank the Commission for taking seriously the important and difficult task of quantifying energy equity. Such an undertaking inevitably requires prioritization, and I submit the following comments to argue that indoor air quality can and should be included in the Energy Equity Indicators (EEIs).

At present, the health metrics in the EEIs rightly include air quality outdoors but do not include air quality indoors, where most people spend most of their time. In homes with substantial sources of indoor air pollution such as gas stoves, air quality indoors can be different and worse than air quality outdoors. Indeed, peer-reviewed research by myself and many others has shown that indoor air pollution from gas stoves alone is responsible for thousands of cases of pediatric asthma and premature deaths each year in the United States. Lower income households face a disproportionate burden, largely because smaller living spaces (especially those with poor ventilation) concentrate pollution.

I thus suggest that the EEIs report avoided indoor emissions separately from avoided outdoor emissions. Emissions from indoor appliances like gas stoves are tiny compared with outdoor sources, but are concentrated indoors and thus have a disproportionate impact on exposure compared with their outdoor counterparts. Grouping indoor emissions with outdoor emissions will thus underestimate health impacts and exposure disparities. Peer-reviewed methods exist to estimate indoor exposure down to the ZIP code level from housing stock characteristics, cooking fuel, climate, and other inputs, using only public data. These exposure estimates can in turn be paired with established epidemiological methods to estimate the number of cases of pediatric and adult asthma, chronic obstructive pulmonary disease (COPD), and other respiratory endpoints that could be avoided with cooking electrification.

Thank you for your work and for the opportunity to comment.

Respectfully,
Yannai Kashtan, Ph.D.
Air Quality Scientist
PSE Healthy Energy