

**DOCKETED**

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<b>Description:</b>	This file is the question log comprised of all of the typed questions submitted by participants during the September 30 hearing and panel discussion on kitchen ventilation, indoor cooking and indoor air quality. Note that the majority of questions were answered live during the hearing.
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Question Report

Report Generated:

Topic 2022 Energy Code Pre-Rulemaking: Indoor Air Quality

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Question Details

#	Question	Asker Name
1	What upcoming CEC Title 24 workshops and forums will address Extreme Heat adaptation, mitigation, and resilience for health, energy, and GHG benefits? Has the CEC developed strategies to address this issue?	Tom Phillips
2	The model that the UCLA team used has many conservative assumptions, including no venting of gas appliances, significant back-drafting, use of appliances for heating, etc. For example, the report assumes short-term peak exposures can be directly compared to 1-hour AAQs, which implies that peaks last an entire hour. How long are peak exposures expected to last and wouldn't you expect 1-hour averages to be significantly lower than peaks?	Debra Kaden, PhD, ATS
3	The health rationale is partly based on the idea that gas cooking increases the risk of asthma, citing the Lin et al. (2013) meta-analysis that found a 42% higher risk of asthma. The meta-analysis depends primarily on older studies (data collected before 2000, even if studies were published after 2000). Many of the studies did not adjust for other important indoor air pollutants and exposures, such as mold, environmental tobacco and pets. These exposures are also asthma triggers. Could you speak to the relevance of these studies? Also, Lin et al. (2013) is inconsistent because they did not report a significant association between measured NO2 and asthma and did not report a significant association between gas cooking and wheeze, a hallmark symptom of asthma. If asthma is increased because of gas cooking, why isn't wheeze significantly increased because of gas cooking? If asthma is associated with gas cooking due to NO2, why isn't NO2 itself associated with asthma?	LDELL
4	Poor housing conditions disproportionately impact low income and minority populations. Replacing gas appliances with new, electric appliances will not address the broader mechanical ventilation deficits (which would improve all IAQ issues). Furthermore, modern, new appliances will add cost to the landlords, which will be passed right down to the tenants resulting in higher rents. Wouldn't it be more broadly effective to improve ventilation?	Debra Kaden, PhD, ATS
5	for the health benefits, what value did you use for electricity emissions, a fixed value or a time of use, statewide average or local	George Nesbitt
6	PM2.5 is generated by the act of cooking, whether gas appliance or electric appliance is used. Could you explain how that can impact your estimates of premature death, bronchitis, and monetized health benefits?	LDELL
7	What were the assumptions for the PM2.5 exposure-response relationship used for estimating PM2.5-related mortalities in this study?	Maninder Thind
8	The 30% usage of rangehoods presents a big opportunity for IAQ gains. However, there is also a corresponding energy usage increase assumed for better health levels. Is 100% usage of rangehoods assumed for baseline energy consumption purposes?	CAL SMACNA
9	how can we make rangehoods quieter at higher airflows? (250 cfm - 400 cfm)?	George Nesbitt
10	I've seen electrification advocates suggest that you don't need to vent to the outside. But it seems that what you are cooking matters too.	George Nesbitt
11	The CEC Mechanical Ventilation report published earlier this year and performed by LBNL, which looked at various pollutants in homes with mechanical ventilation, had lower pollutant concentrations for various cooking-related pollutants compared to the earlier 2009 report. NO2 was just slightly higher. Since the 2020 report included mostly gas ranges, while the 2009 study was almost exclusively electric ranges, doesn't this latest research show that the gas ranges are not a significant source of indoor pollution in the home?	Debra Kaden, PhD, ATS
12	My home is 700 sqft and I worry my vent isn't to code. I use it every single time. I have asthma. Any good way to find out? It also blows air back at me when I use it, is that normal?	Alexandra Nagy
13	Thanks for these great presentations. Dr. Singer mentioned that the 100 ppb/1-hour standard is not a safe level of NOx. What capture efficiency would be needed to ensure a safe level of NOx for a home with a gas stove?	Alison Seel
14	how does the capture efficiency standard account between front & back burners?	George Nesbitt
15	Would Dr. Singer agree that residences less than 1500sf are put in different danger from non-use or infrequent use of hoods, due to lack of air mixing available in 1500+sf residence?	Sean Armstrong

16 Title 24 has no exemption for all-electric cooktops with regard to ventilation requirements. No one is advocating that you don't need to vent to outside with electric cooking equipment.	Avery Colter
17 Ovens used to have their own vents to the outside, should we require them too again?	George Nesbitt
18 For Prof Zhu: 1. The model that the UCLA team used has many conservative assumptions, including no venting of gas appliances, significant back-drafting, use of appliances for heating, etc. For example, the report assumes short-term peak exposures can be directly compared to 1-hour AAQSS, which implies that peaks last an entire hour. How long are peak exposures expected to last and wouldn't you expect 1-hour averages to be significantly lower than peaks?  2. Poor housing conditions disproportionately impact low income and minority populations. Replacing gas appliances with new, electric appliances will not address the broader mechanical ventilation deficits (which would improve all IAQ issues). Furthermore, modern, new appliances will add cost to the landlords, which will be passed right down to the tenants resulting in higher rents. Wouldn't it be more broadly effective to improve ventilation?	Debra Kaden, PhD, ATS
19 Dr.Zhu: re outdoor risks, how much will those be reduced as we decarbonize the grid over the next decades?	Tom Phillips
20 Apologies, need to go to a meeting. Very curious about Dr. Singer's answer to my question about disproportionate harm done to residents of homes smaller than 1500sf when the hood is not used.	Sean Armstrong
21 Regarding behaviors, there is a recent study published by Kile (2014) that showed a significantly decreased asthma risk in children in households that used gas stoves with ventilation when compared to children in households that used gas stoves for cooking without ventilation.	LDELL
22 Again, is increased usage of RHs for health reasons going to contribute to increased energy consumption. Is the baseline we are using for calculating energy savings assuming 100% usage? If not, shouldn't that be the case for funding purposes?	CAL SMACNA
23 the emission value was for the UCLA study	George Nesbitt
24 Hi Brett - Nice presentation. When determining the targeted minimum RHCE, was the model based on a single, well-mixed zone for the entire house, or did you consider the worst-case exposure (i.e., that of the person(s) in the immediate vicinity of the cooking activity)?	Mike
25 Brett, how is capture efficiency affected by other fans in the home (e.g., bath fan, dryer, etc.)?	Nehemiah
26 The CEC Mechanical Ventilation report published earlier this year and conducted by LBNL, which looked at various pollutants in homes with mechanical ventilation, had lower pollutant concentrations for various cooking-related pollutants compared to the earlier 2009 report. NO2 was just slightly higher. Since the 2020 report included mostly gas ranges, while the 2009 study was almost exclusively electric ranges, doesn't this latest research show that the gas ranges are not a significant source of indoor pollution in the home?	YI TIAN
27 Dr. s	Alison Seel
28 CEC staff: current field verification protocols require confirmation of range hood flow rate (or prescriptive duct sizing). However, Dr. Singer points out that many kitchen exhaust appliances ship in recirculation mode and installed this way even when there is a duct to the outdoors. Would it be possible to update the verification protocol to ensure that kitchen exhaust is installed to exhaust to the exterior and not in recirc mode?	Mike
29 Can you discuss physical range hood design factors- (coverage over burners etc) that affect capture efficiency? Is there opportunity to have range hoods rated on capture efficiency to inform product selection?	Amy Dryden   AEA
30 how would this be enforced, many home owners change their own hoods with out a building permit. this would not be enforcable for retro fits.	Randy Young
31 hood ducts are too small and have 90 deg bends, and minimally air sealed	George Nesbitt
32 re: range hood venting verificaiton and other issues, see ROCIS.org best practice guidelines for range hoods. E.g., check air flow at exhaust vent on the roof... I have also seen range hoods with the exhaust vent dumping into cabinet above the hood. "Assume poor desing & installation"	Tom Phillips
33 Hi Marian - what static pressure is associated with the proposed minimum flow rates?	Mike
34 So the caputure efficiency is based on the front burners?	George Nesbitt

35 Brett mentioned that electric resistance cooking still emits significant fine particulate pollution, whereas induction does not. Is there enough differential between the risk posed by electric resistance vs. induction that the Commission should consider different range hood exhaust requirements based on electric range type? That is, homes designed (and verified) to include only induction stove could get by with a lower CE and CFM?	Garth Torvestad
36 Marina & Brett: what are the noise limits, and what % of range hoods, OTRs and downdrafts meet the limit?	Tom Phillips
37 (Marian)	Tom Phillips
38 Marian: I suggest that Ti. 24 also address inline exhaust fans. This may be best practice for low noise, fan energy & durability. I had one installed in the attic, using just the hood shell sans fans. Net cost increase was under \$100, as I recall.	Tom Phillips
39 Please disregard the prior question, which was answered toward the end of the presentation.	Mike
40 I should point out that the convergence of system curves and fan curves for common range hood products generally occur above the rating point of 0.1" static pressure. Therefore, airflow and capture efficiency are unlikely to be as high as required by the proposed code change.	David Springer
41 What is "PAH"?	Nehemiah
42 Another consideration, especially for smaller units requiring higher airflows that negative pressurization can impact compartmentalization and reduce range hood airflow capacity due to higher differential pressures. A source of makeup air may be required to maintain ventilation rates.	David Springer
43 Did you conduct a literature search and literature review to identify literature published since the 2013 Lin study? The studies cited in the Lin et al. (2013) (source of the 42% / 24% increased risk of asthma symptoms and asthma diagnosis are very old). The data were largely collected before 2000. Are these studies relevant to the effectiveness of ventilation in newer building codes?	LDELL
44 Since Lin et al. was published in 2013, several studies have been published that observed no increased risk of asthma in children exposed to gas cooking. One of these studies (Wong et al. 2013) included more than 250,000 children in 31 countries, which dwarfed the study populations in Lin et al. The Wong et al study found no association between gas cooking and asthma. How do you reconcile the lack of an association in this powerful study with the conclusions of Lin et al.?	LDELL
45 @LDELL the most comprehensive study on this is the 2016 EPA Integrated Science Assessment on NO2 which reviewed the Lin studies and many others. This massive review found a causal relationship between short term NO2 and respiratory effects, including evidence of asthma exacerbation. Strong evidence was from indoor exposures to gas stoves. Another one from 2015/2016 is Health Canada's extensive review on residential air quality and NO2/gas cooking in particular.	Brady Seals
46 Dave: re: make up air, I agree. See written comments I submitted today, and ROCIS.org best practice guide.	Tom Phillips
47 CARB stated that buildings represent 25% of CA GHG emissions. Is this all buildings not just residential?  They also stated that 10% of emissions are associated with natural gas use in buildings. What are the emission sources of the other 15%?	YI TIAN
48 Is there any data correlating the presence of mold in sealed envelope dwelling units and verified mechanical ventilation rates?	CAL SMACNA
49 re: GHG sources, check CA Building Decarbonization Coalition website and CEC bldg decarb proceeding., and Redwood ZNE Retreat webinar, Sep 2020. Caveat: embedded carbon has a big impact time-wise but is not always factored in. It is now on most green bldg.radars tho.	Tom Phillips
50 If the capture efficiency is the best metric than we need to require it as soon as possible. The added cost is very small for great benefit	George Nesbitt
51 I had to drop for a moment, but is there a proposal to interlock the range controls to the hood fan?	Wayne Alldredge
52 What is the magnitude of the differences in risk of range/cooktop fires, injuries and deaths for electric versus gas? Which is greater? And by how much?	LDELL
53 NFPA does a fire report	Randy Cooper
54 Has there been research on emissions differences between gas and induction ?	Eric Reynolds
55 That fire data is also based off of electric resistance cooking not induction	Scott Blunk
56 Of the range hoods available that exceed the minimum airflow rate required to meet the CE requirement, how many of them would also require makeup air due to exceeding the 400 cfm limit?	Steve Gatz@Whirlpool

57 Would smoothtop electric stoves or induction stoves present the same fire risk, or less than gas & coil electric?	Denise Grab
58 Can hood fans be triggered by PM concentration rather than motion, range controls, or humidity, since PM correlates with need and with need for higher setting of fan?	Ann Harvey
59 One of the results on NOx emissions was only peak and not averages, we would hope that kind of skewed data is not used to drive policy.	Kevin Messner@AHAM
60 Re: Cal Green, how do we use it to do better than Title 24 kitchen specs. Range hood CE and noise performance should increase soon once HVI publishes CE ratings. We should not have to wait every 3 years for better products. See my written comments re: need to use Cal Green, training, Compliance Manual, outreach, marketing etc.	Tom Phillips
61 Providing PM and NO2 detectors to be attached to range hoods that light up when specific levels are reached, especially in homes of vulnerable people (low income, multi-family, small size) to alert them to turn on their fan would be good.	Ann Harvey
62 Why not just allow automatic turn on for the ventilation as an option so manufacturers and look into solutions.	Scott Blunk
63 Excuse me if this topic was address earlier... I joined only ~20 minutes ago. What PM2.5 detection technologies, at what cost at high production volume, could be integrated into induction or election stoves?	Eric Reynolds
64 Or to turn up the fan, if they have it on as soon as they start cooking, as recommended. And to advise when they can turn them off.	Ann Harvey
65 Hard wired interlock is cheaper and more reliable long term	Wayne Alldredge
66 re: DOE smart hood sensors: based on MikeMoore's slide, it looks like they are using several sensors types... Also at least one new low cost NO2 sensor with good sensitivity and accuracy has been reported recently.	Tom Phillips
67 If possible a quick answer to my question would be very appreciated as it is 9:40pm here in Kigali	Eric Reynolds
68 "Perfection is achieved, not when there is nothing more to add, but when there is nothing left to take away." — Antoine de Saint-Exupéry	Wayne Alldredge
69 I apologize for my late entry to the discussion. As the topic of PM2.5 detection technologies was addressed before I arrived is there is recording or some sort of documentation for me to benefit from. thanks, Eric eric.inyenyeri@gmail.com	Eric Reynolds
70 are we back in session?	Tom Phillips
71 CEC Staff: ASHRAE 62.2 has makeup air requirements that are currently adopted by the state. There doesn't seem to be much awareness of this on the call.	Mike
72 just want to clarify the due date for comments. the workshop notice said Oct 12th. the current slide says Oct 16th.	Allison Smith
73 CEC Staff: Can you please clarify when written comments are due? At the beginning of the workshop, Staff stated comments are due Oct. 12. Thank you in advance.	Evelyn Loya
74 thank you for the clarification.	Allison Smith