# DOCKETED

| | |
|---|---|
| **Docket Number:** | 17-BSTD-01 |
| **Project Title:** | 2019 Building Energy Efficiency Standards PreRulemaking |
| **TN #:** | 220241 |
| **Document Title:** | Comment Addressing IAQ Concerns Raised by CBIA |
| **Description:** | Email comment from Iain Walker with LBNL docketed by Energy Commission staff. |
| **Filer:** | Adrian Ownby |
| **Organization:** | Lawrence Berkeley National Laboratory |
| **Submitter Role:** | Public Agency |
| **Submission Date:** | 7/17/2017 2:59:16 PM |
| **Docketed Date:** | 7/17/2017 |

July 6th 2017
Iain Walker, LBNL, Berkeley, CA. 94720
iswalker@lbl.gov
(510) 486 4692

**To: California Energy Commission – Docket No. 17-BTSD-01**

**Re: Addressing concerns raised by CBIA comments on 2019 Residential Standards (TN219885_20170623T152116).**

## HCHO in homes with ventilation systems

The HENGH study results show lower Formaldehyde (HCHO) in the 16 homes surveyed so far compared to the previous California new home survey (CNHS) (CEC Report Number CEC-500-2009-085, Offerman (2009)). This is clearly stated in the draft paper referenced by CBIA.

The mean HCHO is 28.5 µg/m$^3$compared to 44 µg/m$^3$ (median values are 28.5 and 36 µg/m$^3$) in the previous CNHS study. The peak HCHO is also considerably lower at 52 µg/m$^3$ compared to 135 µg/m$^3$.

Note that this is with homes that are the same average tightness (5 ACH50) as in the CNHS.

Offermann, F.J. (2009) Ventilation and Indoor Air Quality in New Homes. California Air Resources Board and California Energy Commission, PIER Energy -Related Environmental Research Program, CEC Report Number CEC-500-2009-085

## MERV 13 proposal

Studies have shown very small (1%) increases or decreases in energy use using higher MERV filters (M11/12/13) and no significant system performance issues at the MERV 13 level.

1. A study by LBNL for the Commission (Energy Implications of In-Line Filtration in California CEC-500-2013-081) showed that system performance changes were minimal (typically less than 1% in energy use) going to MERV 13 and there were no other system performance issues. However, going to MERV 16 would cause problems unless additional requirements for deep filters and pressure drop were also specified. This study was for 10 homes in CA.

2. A study of 17 homes in ASHRAE RP 1299 Energy Implications of Filtration in Residential and Light-Commercial Construction (2010) showed that air flow reductions were 7-11% going from M2 to M11/12 (and about half this relative to

mid-MERV (5-9) which is more relevant for the current discussion) with 1 to 4% fan power reductions, and "Differences in energy use associated with different filters were much smaller than differences that could be ascribed to climatic variation (particularly outdoor temperature) and changes in operation."

Overall the study found very little effect of high efficiency filters on system performance: "The median change in daily energy consumption at the test sites was a decrease of 0.26 kWh ton-1 day-1 (0.07 kWh kW-1 day-1) with high-MERV filters installed, suggesting potential small energy savings associated with higher-efficiency filters. However, the large standard deviation suggests that filters had a small impact on these systems in comparison with other factors."