

Baseline Indoor Air Quality (IAQ) Field Study in Occupied New US Homes: Cold and Marine Climates

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Western Area
Power Administration

Bonneville
POWER ADMINISTRATION



SOUTHWEST ENERGY
EFFICIENCY PROJECT



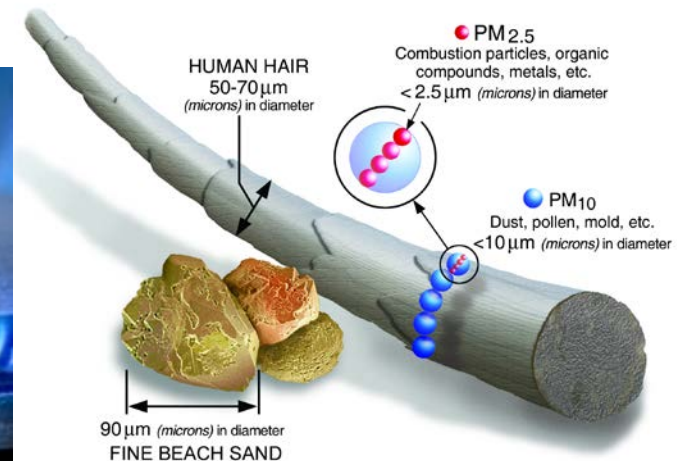
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The Problem (The Need/Challenge)

Problem Definition:

We all assume that the air we are breathing in our homes is safe and healthy. One goal of residential ventilation standards is to help design ventilation to provide acceptable indoor air quality (IAQ). However, as new homes are getting tighter and tighter to reduce the loss of conditioned air to the outside, the interaction between ventilation and indoor air quality becomes more and more exaggerated.

Research Question to be answered by this study: “How much does the air flow, and specifically, mechanical ventilation, affect the indoor air quality in new homes in the cold and marine climate zones?”



Images from epa.gov and medlineplus.gov

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The Solution

- Measure humidity and indoor air pollutants in 64 new homes (1-2 weeks each), monitor use and performance of ventilation equipment, and track activities that can impact pollutant emission and removal.
- Investigate associations of indoor humidity and air pollutant concentrations with variations in house characteristics, including: ASHRAE-62.2 compliant mechanical ventilation, envelope air tightness and equipment location.



Images from nrel.gov

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Advantage, Differentiation, and Impact

Goal: Inform future codes, standards and technology development about the interaction between indoor air quality and ventilation in homes with low infiltration.

Timeline:

| Activity | Lead | Timeline |
|------------------------------------|-----------|-----------|
| Finalize data collection protocols | LBNL | Nov 2017 |
| Begin data collection | PNNL/FSEC | June 2018 |
| End data collection | PNNL/FSEC | Sept 2019 |
| Regional and national analysis | All | Mar 2020 |

Impact: Representative data for researchers to use to determine the relationships between air flows in homes and indoor air quality in the cold and marine climates (**42% of the country's housing stock**).

Thank You

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