CALIFORNIA AIR RESOURCES BOARD

Research Seminar

Improving Indoor Air Quality, Energy Efficiency, and Greenhouse Gas Reductions through Multifamily Unit Compartmentalization

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Background

Multifamily Housing

- > 50% of new residential housing in California
- Exchange air, pollutants, smells, and noise with those units due to common walls
- More challenging to achieve healthful indoor air quality (IAQ) as well as significant energy use and greenhouse gas (GHG) reductions

Compartmentalization

- Improve the sealing of each multifamily unit from adjacent units, other interior spaces, and the exterior, such that each unit is effectively its own compartment
- Reduce air transfer between units and thus provide improved IAQ, energy savings, and GHG reduction benefits

Current code requirements

- Title 24-2019, effective January 1, 2020, set a requirement that all new-construction multifamily units:

  either a) meet a compartmentalization requirement of 0.3 cfm at 50 Pa per square foot (cfm_{50}/ft^2) of apartment (unit) enclosure area,

  or b) provide balanced ventilation to each dwelling unit

- Is it sufficient to ensure good IAQ and to adequately promote GHG reduction?
  - New constructions can bypass compartmentalization requirements by installing balanced ventilation systems
  - 0.3 cfm_{50}/ft^2 was based on estimated air-sealing feasibility instead of evidence for specific IAQ improvements

Study objective

- Investigate IAQ, energy, and GHG impacts of different levels of compartmentalization (airtightness) and ventilation strategies in new multifamily buildings in California.
- Inform the update of compartmentalization and ventilation requirements in CA Building Codes

Today's Speakers

PI: Mark Modera, Ph.D.

- Associate Director of the Western Cooling Efficiency Center, UC Davis
- Research interests include HVAC-equipment efficiency improvement, aerosol particle production analysis and application to sealing, thermal energy distribution and air leakage, and more.

Co-PI: Deborah Hall Bennett, Ph.D.

- Professor and the Division Chief in the Department of Public Health Sciences, UC Davis
- Research focuses on organic compounds and particulate matter in the indoor environment, including direct consumer product use, within the context of both environmental epidemiology and environmental risk assessment.