Focus on What Matters - Improving Ventilation for Health and Productivity

September 17, 2025

National Academy of Sciences
2101 Constitution Avenue, NW, Lecture Room
Washington DC 20418

Registration: computer chair

https://www.nationalacademies.org/event/45250_09-2025_health-in-buildings-roundtable-focus-on-what-matters-improving-ventilation-for-health-and-productivity

WEDNESDAY, SEPTEMBER 17, 2025

Purpose: Six actions that matter most to Indoor Air Quality for Health and Productivity.

1. **O2 Matters** - moving beyond minimum outside air standards to increasing ventilation (with effective filtration) for human health and productivity
2. **CO2 Matters** - ongoing efficacy and value of CO2 monitoring at the air handling unit and in the zone as a measure of ventilation effectiveness
3. **Records Matter** - importance of long-term data records from BAS settings, energy and CO2 sensors towards the development of KPI to ensure effective ventilation in commercial buildings
4. **Faults Matter** - faults/alerts/sparks that may be critical to ventilation delivery, both with outside air and clean air
5. **Economizer Matter** - positive contributions of Economizer operations for both IAQ and Energy, albeit seasonal
6. **Innovations in HVAC and passive systems** that may be critical to improving ventilation in buildings

9:00–10:00 **Gathering and social time**

Coffee, tea, and pastries provided

10:00–10:15 **Introductions National Academies of Sciences, Engineering, and Medicine**

(Cameron Oskvig with Brian Gilligan)

10:15–11:00 **OA Matters!**

(Vivian Loftness)

- Minimum Outdoor Air (OA) standards around the world
- Criteria for Increasing OA vs. Equivalent Clean Air (CA)
- Research on whether OA matters to human health and productivity
- Energy effective methods to Increasing OA: Natural ventilation, Dedicated Outdoor Air Systems (Separating Ventilation and Thermal), Economizers
- Group Engagement & discussions

11:00–11:45 **CO2 Matters!**

(Vivian Loftness, Jinzhao Tian, Haipei Bie)

- The only available metric of IAQ in commercial buildings
- Literature overview of health and performance gains from managing CO2
- Comparing Zone CO2 and AHU RA CO2
- A Measure of Ventilation Delivery from AHU and in the Zone
- CO2 as a Placeholder for other IAQ concerns
- Group Engagement & Discussions

11:45–12:15 **Building a CO2 Database for Commercial Buildings (30 buildings, 17 Economizer)**

- CO2 sensor quality and accuracy, naming conventions
- Data cleaning - 5 variables
- Data/sensor calibration - 2 variables
- Descriptive statistics of available data, means and extremes
- Data findings: Drift vs cumulative CO2
- HVAC Components/BAS settings that impact CO2
- Records Matter! the importance of a national data set over time for analysis

12:15–1:00 **LUNCH (provided)**

1:00–2:00 **The IAQ Moonshot – A conversation with National thought leaders**

(ARPA-H - Jessica Green, ASHRAE – Bill Bahnfleth, HiBR – Cameron Oskvig, IWBI – Jason Hartke, USGBC – Seema Bhangar)

- What can you tell us about your current efforts to improve IAQ?
- If you were to lead a “moonshot” around which efforts to improve IAQ could rally, what would it look like? (please consider other panelists’ current efforts)
- What are the critical barriers to achieving your moonshot and other IAQ goals?
- What cooperation would you ask of your colleagues and other IAQ experts?

2:00–2:45 **Faults that matter to CO2 and other IAQ challenges**

(Vivian Loftness, Jinzhao Tian)

- Fault Impact Analysis of the CO2 Data Base
- Data Analytic Outcomes - AHU Faults that Matter to CO2
- Data Analytic Outcomes - Terminal Unit Faults that Matter to CO2
- Missing Faults for CO2 and IAQ
- Group Engagement & Discussions

2:45-3:00 **BREAK**

3:00–3:45 **Economizer Value for CO2, IAQ, and Energy**

(Vivian Loftness, Haipei Bie)

- Economizer utilization - 17 buildings, 179 of 325 AHUs
- Equipment and BAS control logics choices
- Economizer psychrometric charts
- Correlations of economizer equipment and operation on RA CO2
- Correlations of economizer equipment and operation on Zone CO2
- Literature on the Energy benefits of Economizer Use
- Group Engagement & Discussions

3:45–4:30 **Concluding Discussions**
(Vivian Loftness, Brian Gilligan, Bryan Steverson)

Outside Air and Clean Air Future Guidelines for Health, IAQ, and Energy

- Maintaining a National Database
- Engineering Minimums and Innovations
- BAS Faults/Alerts/Sparks that Matter
- The importance of Economizers (and natural ventilation, DOAS, mixed mode?)
- Group Engagement & Discussions

MEETING ADJOURNS