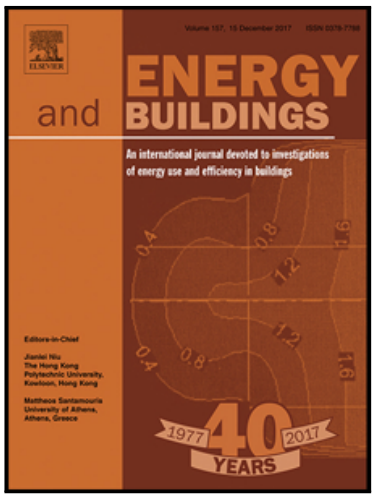

Smart ventilation energy and indoor air quality performance in residential buildings: a review

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Highlights:

- We reviewed the literature based on energy and indoor air quality performance of smart ventilation strategies used in residential buildings
- We performed a meta-analysis of 38 studies of various smart ventilation systems with control based on CO_2, humidity, combined CO_2 and Total Volatile Organic Compounds, occupancy, or outdoor temperature.
- We highlighted that Demand Controlled Ventilation is a well-established method for saving energy through ventilation system control – with energy savings up to the 50% range for some systems, and that there is still the potential to improve indoor air quality appropriate sensors and controls.
- We also identified issues that require more understanding in future smart ventilation, with strategies taking into account: pollutants from building materials and contents when homes are unoccupied, outdoor pollutants concentrations, the reliability of sensors, the relevance of surrogate of indoor pollutants like CO_2 and air cleaning issues.