An update on IEA-EBC Annex 86: energy efficient smart IAQ management in residential buildings

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ABSTRACT

A central boundary condition in constructing energy efficient buildings is doing so while maintaining a healthy, acceptable and desirable indoor environment. While ventilation is the main strategy that is adopted for IAQ management, other technologies influencing IAQ (e.g. air filtration) are available as well and a large number of ventilation strategies exist. There is, however, no coherent assessment framework to rate and compare the performance of IAQ management strategies. In Annex 86 we work towards an integrated rating method for the performance assessment and optimization of energy efficient strategies of managing the indoor air quality (IAQ) in new and existing residential buildings.

To achieve this, we gather the existing scientific knowledge and data on pollution sources in buildings, look at the opportunities that spring from the rise of IoT connected sensors, study current and innovative use cases of IAQ management strategies and develop road maps to ensure the continuous performance of the proposed solutions over their lifetime. The main challenge is connecting the knowledge in the different scientific fields that are involved in this assessment and bridging the gaps that exist between the existing methods and the requirements for a comprehensive performance assessment method.

In this presentation, I will give an overview of the work by the different groups active within Annex 86 structured around the 5 content-related “subtasks” or topics that we are addressing. This will include 1) a proposal for a new monetised and dynamic rating metric based on updated harm estimates expressed in DALYs, 2) an open source model and emission rate registry developed based on the PANDORA database, 3) new metal-oxide framework based materials for IAQ management, 4) a common exercise addressing the challenges of applying the new metric in existing assessment schemes and 5) an example of the use of IoT based data gathering and processing to better inform IAQ management decisions.

Based on this overview of the work and the outcome of the two-day annex meeting that will take place in Tokyo in the days leading up to the AIVC workshop, I will then outline the perspectives of the work towards a new paradigm of assessing IAQ management strategies and the challenges, both in terms of implementation and in terms of research, that lay ahead.

KEYWORDS

IAQ, Health, Smart Ventilation, Assessment