

AIVC April Workshop



Jelle Laverge Operating Agent IEA-EBC Annex 86

Series of four webinars

Organised in collaboration with IEA-EBC Annex 86 'Energy efficient IAQ management'

April 1, Building ventilation: How does it affect SARS-CoV-2 transmission?

April 8, IAQ and ventilation Metrics

April 13, Big data, IAQ and ventilation -part 1

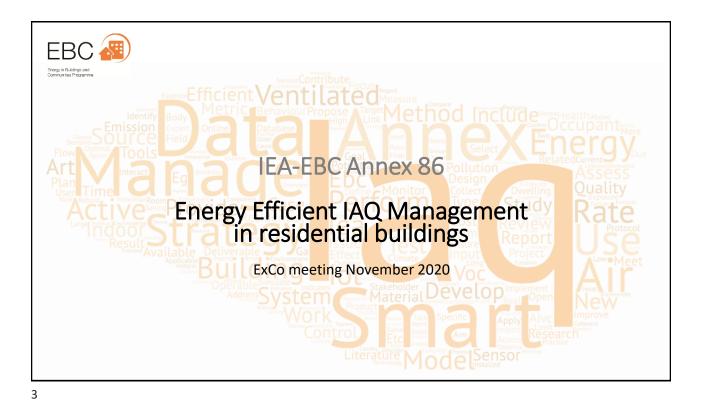
April 21, Big data, IAQ and ventilation -part 2

Register at www.aivc.org

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AVZ Introduction: context of the webinar

- The IEA-EBC ExCo approved the start of the preparation year of 'Annex 86' in June 2020
- AIVC TechNote 68 'Ventilation and Health'
- AIVC CR 17 and 19





Scope and Goals

Provide a framework to improve energy efficiency of IAQ management for

Residential buildings

both new construction and refurbishment

To select metrics to assess energy performance and indoor environmental quality of an IAQ management strategy and study their aggregation

To improve the acceptability, control, installation quality and long-term reliability of IAQ management strategies by proposing specific metrics for these quality issues

To set up a coherent rating method for IAQ management strategy that takes into account the selected metrics

metrics

To identify or further develop the tools that will be needed to assist designers and managers of buildings in assessing the performance of an IAQ management strategy using the rating method

To gather existing or provide new standardized input data for the rating method

To study the potential use of smart materials as (an integral part of) an IAQ management strategy To develop specific IAQ management solutions for retrofitting existing buildings

To benefit from recent advances in sensor technology and cloud-based data storage to systematically improve the quality of the implemented IAQ management strategies, ensure their operation and improve the quality of the rating method as well as the input data. To improve the availability of these data sources by exploring use cases for their providers

To disseminate about each of the above findings.



Partners

42 institutes from 24 countries

Active participation by companies encouraged!

List of annex participants per country:

Australia: CSIRO

Austria: University of Innsbruck

Belgium: UGent, KUL, BBRI, University of Antwerp

Brazil: Pontfical Catholic University of Parana Canada: NRC

Chile: DIII

China: Nanjing University, BUCE and Tsinghua University

Denmark: DTU and Aalborg University Copenhagen

Finland: Aalto University

France: La Rochelle University, ENS PSL, CEREMA, Université de Lille, UPJV and CETIAT

Germany: TH Rosenheim

Italy: EURAC research center

New Zealand: BRANZ

Netherlands: Technical University of Eindhoven, BBA/TUDelft and Zehnder

Norway: Oslo Metropolitan University and SINTEFF
Portugal: University of Coimbra, Polytechnic Institute of Viseu and University of Porto

Singapore: National University of Singapore

Spain: Eduardo Torroja Institute for Constructon Sciences – CSIC

Sweden: Chalmers University and KTH

Switzerland: ETH

Turkey: TTIVID

United Kingdom: University of Strathclyde, Lancaster University and University of Nottingham

USA: Syracuse University, UMD, UTexas and LBL



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Workplan

6 Subtasks

ST 1 and 2: methodology

ST 3 and 4: application to technology

ST 5: new opportunities through IoT

ST 6: dissemination and management

Subtask 1 Metrics and development of an IAQ management strategy rating method

This subtask is devoted to the development of a general rating method for the benchmarking of the performance of IAQ management systems. In addition to relevant metrics, a set of appropriate tools, consistent modeling assumptions and monitoring protocols are also proposed.

Subtask 2 Source characterization and typical exposure in residential buildings

This ST creates consistent input values for the assessment method developed in ST 1 and control strategies in ST 4. It starts from information available in literature, adding new experimental results where needed and reviewing and developing models (empirical, semi-empirical or physical models) for characterizing relevant residential sources.

Subtask 3 Smart materials as an IAQ management strategy

This ST identifies opportunities to use the building structure and (bio-based) building materials (focussing on hemp concrete) and the novel functional materials inside it to actively/passively manage the IAQ, for example, through active paint, wallboards, textiles coated with advanced sorbents or hemp concrete, and quantifies their potential based on the assessment framework developed in ST 1.

Subtask 4 Ensuring performance of smart ventilation

This subtask focuses on practical conditions that assure reliable, cost effective and robust implementation of smart ventilation. This includes both installation and operation. A poor performance of smart ventilation systems can not only lead to waste of energy and aggravated IAQ. It can also create a bad reputation of smart ventilation among relevant stakeholders - designers, installers as well as occupants. This, in the end, can lead to adoption of more primitive, less efficient (in terms of energy use) and less effective (in terms of IAQ) forms of IAQ management. The subtask defines a smart ventilation according to the AIVC

<u>Subtask 5 Energy savings and IAQ: improvements and validation through cloud data and IoT connected devices</u>

This subtask is exploring the potential of the new generation of IoT connected devices (both standalone and embedded in eg. AHU's) for smart IAQ management. What can we learn from big data? Can we benchmark system energy and IAQ performance based on this data? How can we make sure that the data is available and can be accessed? Can we update what we think we know about what happens in dwellings based on what we see in big data rollouts? What are the best protocols and ontologies? How to create viable services out of the data/business plans? How can we integrate data with smart grids?

Subtask 6 Dissemination, management and interaction

The final subtask assures the close alignment of the activities within the annex and the interaction with the AIVC. This subtask includes the outreach of the annex, eg. by managing the dedicated section of the IEA EBC webpage. It uses the different platforms that the AIVC provides to interact with the broader target audience. This task will also ensure the continuation of the link with (the results from) other ongoing and ended annexes, especially annex 68.



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IAQ and **Ventilation** Metrics



Objectives:

- To discuss the road towards a robust comprehensive IAQ metric for the assessment of the performance of ventilation
- To set the starting stage for subtask 1 of IEA EBC Annex 86
 - 09:00 | Introduction, Jelle Laverge EBC Annex 86 Operating Agent, Ghent University, Belgium
 - 09:10 | Annex 68 IAQ metrics: what was proposed, what works, what not, what are the remaining questions? *Marc Abadie University of La Rochelle, France*
 - 09:30 | DALY as an integrated IAQ metric: methodological updates, *Benjamin Jones University of Nottingham, UK*
 - 09:50 | TAIL a new rating scheme of indoor environmental quality, Pawel Wargocki DTU, Denmark
 - 10:10 | Questions and Answers
 - 10:30 | Closing & End of webinar



IAQ and Ventilation Metrics

webinar

2021.04.08



Marc Abadie La Rochelle Université, France



Benjamin Jones University of Nottingham, UK



Pawel Wargocki Danmarks Tekniske Universitet, Denmark

Webinar management



Maria Kapsalaki (INIVE, BE)



Valérie Leprince (INIVE, BE)

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webinar

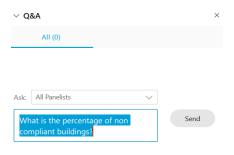
2020.04.08

How to ask questions during the webinar

Locate the Q&A box

Note: Please DO NOT use the chat box to ask your questions!

Select All Panelists | Type your question | Click on Send





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2020.04.08

NOTES:

- The webinar will be **recorded and published** at www.aivc.org within a few days, along with the presentation slides.
- After the end of the webinar you will be redirected to our **post event survey**. Your feedback is valuable so take some minutes of your time ti fill it in.

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