

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
 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.

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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: Pontifical Catholic University of Parana
 Canada: NRC
 Chile: PUC
 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, UPIV and CETIAT
 Germany: TH Rosenheim
 Ireland: NUIG
 Italy: EURAC research center
 New Zealand: BRANZ
 Netherlands: Technical University of Eindhoven, BBA/TU Delft 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 Construction Sciences – CSIC
 Sweden: Chalmers University and KTH
 Switzerland: ETH
 Turkey: TTMD
 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

Subtask 5 Energy savings and IAQ: improvements and validation through cloud data and IoT connected devices

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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Energy savings and IAQ: improvements and validation through cloud data and IoT connected devices

- **Smartness**

(e.g. smart ventilation incl. continuous commissioning & optimization, use of remote data, ST4)

- **Knowledge & data-sets**

(e.g. for defining metrics (ST1), typical exposures (ST2))

applications

real-time & delayed, on-line & off-line, new business cases?

challenges

- real-life, uncontrolled environments (cause/effect?)
- data quality: often limited number and lower cost sensors
- GDPR
- IT
- ...

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AIVC April Workshop

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 (academics)

April 21, Big data, IAQ and ventilation - part 2 (industry)

Register at www.aivc.org

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Big data, IAQ and ventilation – part 1

webinar
2021.04.13



Wouter Borsboom
TNO
The Netherlands



Benjamin Hanoune
University of Lille
France



Pieter Pauwels
TU Eindhoven
The Netherlands

Webinar management



Maria Kapsalaki
(INIVE, BE)



Valérie Leprince
(INIVE, BE)

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Big data, IAQ and ventilation – part 1

webinar
2021.04.13

Objectives:

To address

- **the applications** of IoT devices and big data in IAQ and ventilation and
- discuss **the possibilities** they provide **for research**.

To set the starting stage for subtask 5 of IEA-EBC Annex 86

17:00 | Introduction

Marc Delghust – Ghent University, Belgium

17:10 | Improving IAQ with BIM based Predictive Twins

Wouter Borsboom – TNO, Netherlands

17:30 | Online personal IAQ monitoring,

Benjamin Hanoune – University of Lille, France

17:50 | Brains for buildings: where to find all the relevant smart building data?

Pieter Pauwels – Eindhoven University of Technology, Netherlands

18:10 | Questions and Answers

18:30 | Closing & End of webinar

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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

Q&A

All (0)

Ask: All Panelists

What is the percentage of non compliant buildings?

Send

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NOTES:

- The webinar will be **recorded and published** at www.aivc.org in 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 to fill it in.

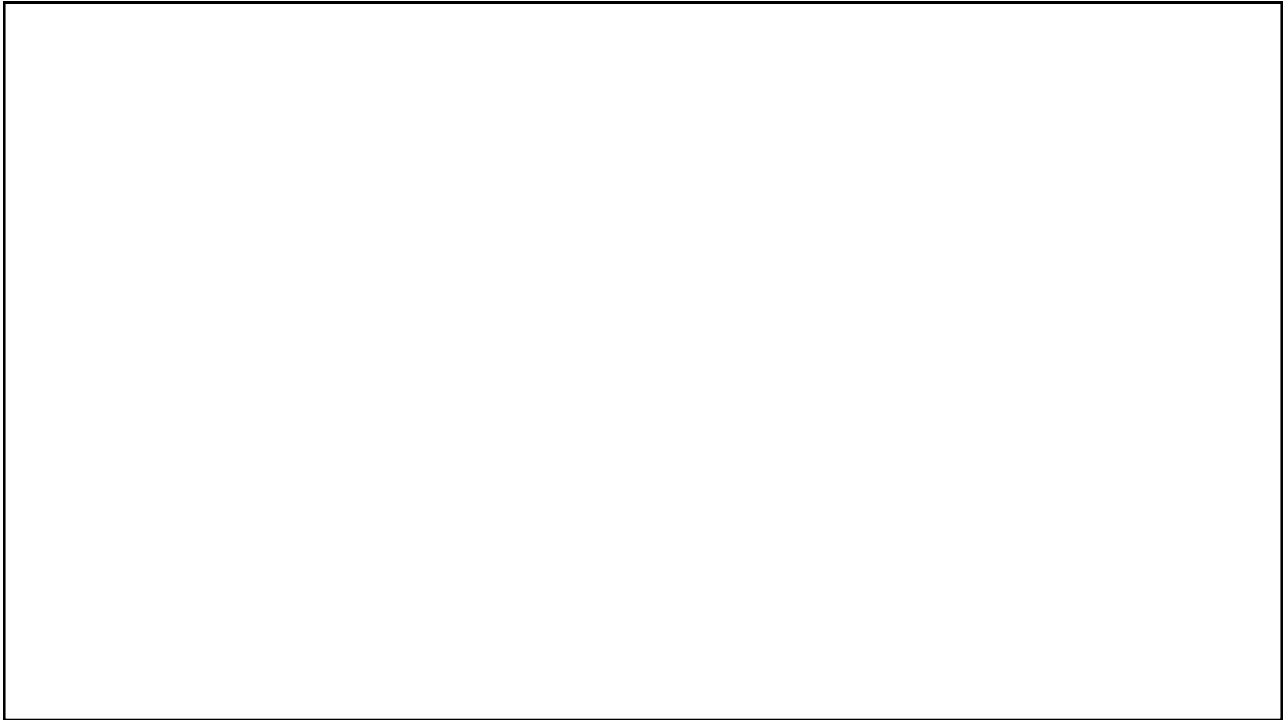
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Big data, IAQ and ventilation – part 1

webinar
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Q&A
?

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