

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.

Partners

42 institutes from 24 countries

Open to new partners

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, UPJV 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

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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- ST 3 and 4: application to technology
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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
- ...



AIVC April Workshop

Series of four webinars

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)

Objectives:

To address

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

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



Big data, IAQ and ventilation – part 2

webinar

2021.04.21

09:00 | Introduction

Benjamin Hanoune – Université de Lille, France



09:10 | Data analytics at Renson: from airflows to dataflows

Steven Delrue – Renson, Belgium



09:25 | CO₂ : a reference point for ventilation standards

Sandra Chochod & Marcin Mezynski – Netatmo, France

09:40 | rCloud – Geolocation and Cloud Storage of Airtightness Test results and Real-time Pressure Logging

Ben Walker – Retrotec, Canada



09:55 | Sensors and machine learning to improve HVAC control

Inouk Bourgon – Foobot, Luxemburg



10:10 | Questions and Answers

10:30 | Closing & End of webinar

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webinar

2021.04.21

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:

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NOTES:

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- 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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Q&A
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