



# Newsletter

## Air Infiltration and Ventilation Centre

## Foreword



Welcome to the March 2018 edition of the AIVC newsletter!

In this newsletter we are very pleased to announce China as new AIVC member country.

As in previous editions, this issue provides an overview of our latest achievements and initiatives i.e. information on past and future events, new publications, feedback on on-going AIVC projects.

Please visit our website, follow us on twitter and LinkedIn and subscribe to our monthly newspaper "Energy Efficiency and Indoor Climate in Buildings" to find out more about our activities.

Also, don't forget to mark your agenda for the following upcoming major events:

- Venticool Webinar "Ventilative cooling and summer comfort: Freevent project in France" on 25 April, 2018 (10:30-12:00 CET).
- IEA-EBC Annex Definition Workshop on "Resilient Cooling for Residential and Small Office Buildings" on 27 April 2018 in Vienna, Austria
- 39<sup>th</sup> AIVC Conference on September 18-19, 2018 in Juan-les-Pins, France

We wish you a pleasant reading and look forward to seeing you in our future events.



Peter Wouters, Operating Agent AIVC



# no 13

March 2018

## 18 -19 September 2018: 39<sup>th</sup> AIVC - 7<sup>th</sup> TightVent & 5<sup>th</sup> venticool conference in Juan-les-Pins, France

The 39<sup>th</sup> AIVC- 7<sup>th</sup> TightVent & 5<sup>th</sup> venticool conference "Smart ventilation for buildings" will be held on 18 and 19 September 2018 in Juan-les-Pins, France.

The conference will consist of 3 parallel tracks largely devoted to smart ventilation, Indoor Air Quality (IAQ) and health relationships, ventilation & airtightness, ventilative cooling – resilient cooling (click here to see full list of topics). The conference will consist of a mixture of well prepared and structured sessions focused on the conference topics, presentations on invitation, and presentations arising from the call for papers.

The conference is organised by: CETIAT, the French technical centre for the heating, ventilation and air conditioning industries; ADEME, the French environment and energy management agency; and INIVE, the International Network on Ventilation and Energy Performance on behalf of the AIVC, TightVent Europe and venticool;

The abstract submission deadline has been extended to **20 March, 2018**.

Most of the topical sessions are now known. The provisional list of topical sessions is as follows:

Rationale behind ventilation requirements and regulations; Integrating uncertainties due to wind and stack effect in declared airtightness results; Ductwork airtightness: On-going work in some European countries; Smart ventilation control strategies; Sensors for smart ventilation; Utilization of heat recovery; Performances of residential cooker hoods; Indoor Air Quality metrics; French initiatives for indoor air quality; Demand controlled ventilation in French buildings – 35 years of wide scale experience; Commissioning of ventilation systems – Improving the quality of installed ventilation systems; Measurement Accuracy of air flow and pressure difference; Air cleaning as supplement for ventilation; New annex on resilient cooling; BIM and Construction 4.0 opportunities in relation to ventilation and airtightness

For more information and to submit your abstracts, please visit the conference website at: <http://www.aivc2018conference.org>

## In this issue

### Foreword

18 -19 September 2018: 39<sup>th</sup> AIVC - 7<sup>th</sup> TightVent & 5<sup>th</sup> venticool conference in Juan-les-Pins, France

AIVC-project utilization of heat recovery in residential ventilation systems

27 April 2018, Vienna – IEA-EBC Annex Definition Workshop

38<sup>th</sup> AIVC Conference 2017: Summaries of the ventilative cooling and airtightness tracks

38<sup>th</sup> AIVC Conference, 2017: Best paper, best poster awards

AIVC Ventilation Information Paper n°38: What is smart ventilation?

Recordings and slides of smart ventilation webinar now available

China joins the AIVC

NEWSPAPER 'Energy Efficiency and Indoor Climate in Buildings'

List of AIVC board members



## AIVC-project utilization of heat recovery in residential ventilation systems

Arnold Janssens, Ghent University, Belgium

The European market for residential ventilation is highly driven by energy performance regulations. In new buildings the share of balanced ventilation with heat recovery is increasing as a result of more severe energy performance requirements (NZEB). The energy labeling for residential ventilation units and the ecodesign requirements for ventilation units may be drivers for a more wide-spread application of heat recovery ventilation in new buildings.

The methods used to assess the influence of heat recovery ventilation on the energy use of buildings in energy labelling and certification are typically based on single zone steady-state energy balance equations. Intermittency and multi-zoning is often not considered although heating behaviour and set-points differ in different rooms of a dwelling. As a result of this the energy savings of heat recovery ventilation as assessed with single zone methods may be larger than when the variations in space and time in dwellings are taken into account. This is related to the fact that the recovered heat supplied to the dwelling through the ventilation system is not 'useful' to reduce space heating and cooling demand at all time and in every room (e.g. in unheated rooms like bedrooms).

In order to collect information to quantify

the 'utilization' of heat recovery ventilation on the energy use of buildings, the AIVC-board launched a project to study this topic. The project was launched with a topical session at the AIVC-conference in Nottingham in September 2017. During the session results of a field study were presented where the metered energy use for heating in 114 low-energy houses was compared to the design targets extracted from EPC-declaration files for the individual houses. Half of the houses had individual balanced mechanical ventilation systems with rotary heat recovery, while the other half had individual demand-controlled ventilation system with natural supply and mechanical exhaust. Apart from the differences in ventilation systems, the houses were largely identical. The monitoring results indicated that although the designed heating energy use in the houses with heat recovery was lower than in the houses without, there were no significant differences between the metered heating energy use in both types of dwellings. Furthermore a two-zone steady-state energy use analysis was conducted to investigate the relation between spatial variations in the dwellings and the utilization of heat recovery. Another presentation showed results of dynamic building energy simulations to assess the percentage of usefully recovered heat. Based on the simulations, several use factors were defined, each evaluating the ventilation system performance in a different way.

Colleagues who want to contribute to the

project may contact the author through e-mail ([arnold.janssens@ugent.be](mailto:arnold.janssens@ugent.be)). Studies based on multizone approaches in different climates are welcome:

- Results of dynamic multi-zone simulation studies and field studies
- Definition of influencing parameters
- Definition of metrics to define the 'utilization of heat recovery' to reduce energy use in dwellings considering the dynamic and spatial variations in dwellings.

## 27 April 2018, Vienna – IEA-EBC Annex Definition Workshop on 'Resilient Cooling for Residential and Small Office Buildings'

A proposal for the formation of a new IEA EBC Annex on the topic of Resilient Cooling was presented to the Executive Committee (ExCo) of the International Energy Agency's Energy in Buildings and Communities programme (IEA EBC) in November 2018. The Annex Concept has been further developed towards a draft Annex Text which will be proposed to the ExCo at its next meeting at Stockholm in June 2018.

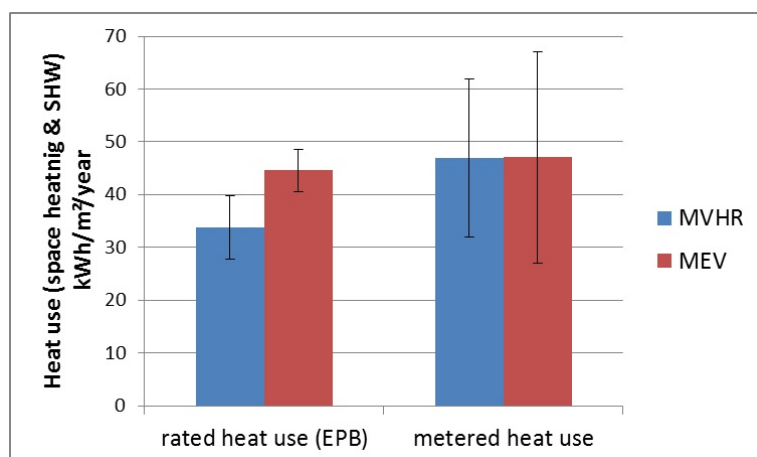
Within this process, an international Annex Definition Workshop will be hosted in Vienna, on 27 April 2018. The workshop will focus on defining the Annex's scope and structure.

Researchers who are interested in a possible attendance of this new Annex are warmly invited to join this workshop.

Please email your workshop registration to Peter Holzer: [resilient.cooling@building-research.at](mailto:resilient.cooling@building-research.at) before March 31, 2018

Further information is available on the AIVC website at:

<http://aivc.org/event/27-april-2018-workshop-vienna-ia-ebc-annex-definition-workshop-resilient-cooling-residential>.



Comparison between the rated and metered heat use in identical low-energy houses with mechanical ventilation with heat recovery (MVHR,  $n = 41$ ) and with mechanical exhaust ventilation (MEV,  $n = 49$ ).





## 38<sup>th</sup> AIVC Conference 2017: Summaries of the ventilative cooling and airtightness tracks

More than 170 participants attended the joint 38<sup>th</sup> AIVC – 6<sup>th</sup> TightVent – 4<sup>th</sup> venticool conference: “Ventilating Healthy Low-energy Buildings” held in Nottingham, UK on 13-14 September 2017.

The programme consisted of over 120 presentations grouped in 3 parallel tracks (ventilative cooling, airtightness issues, ventilation in relation to IAQ and health) with contributions from 25 countries and international organisations.

The airtightness track of the conference consisted of 5 sessions with 23 presentations. Specific topical sessions included:

- Durability of building and ductwork airtightness
- Energy impact of envelope and ductwork leakage
- Field data and case studies
- Infiltration measurement techniques
- Design and construction approaches for airtight buildings

The article available at:

<http://tightvent.eu/archives/2983>

summarises the main trends and conclusions addressed during the presentations and discussions at the airtightness track of the conference.

The ventilative cooling track of the conference consisted of four sessions (20 presentations) and 17 presentations in poster sessions. Specific topical sessions dealing with ventilative cooling included:

- Natural and hybrid ventilative cooling
- IEA-EBC Annex 62: Ventilative Cooling: Lessons learnt from case-studies
- IEA-EBC Annex 62: Ventilative Cooling: Strategies and components
- Smart Overheating Prevention & Resilient Cooling in Changing Urban Climate

The paper available at:

[http://venticool.eu/wp-content/uploads/2017/11/AIVC2017\\_VC-track\\_Summary.pdf](http://venticool.eu/wp-content/uploads/2017/11/AIVC2017_VC-track_Summary.pdf) provides an overview of the ventilative cooling track of the conference.

## 38<sup>th</sup> AIVC Conference, 2017: Best paper, best poster awards

Paper and poster awards were given during the closing session of the joint 38<sup>th</sup> AIVC – 6<sup>th</sup> TightVent – 4<sup>th</sup> venticool conference: “Ventilating Healthy Low-energy Buildings” held in Nottingham, UK on 13-14 September 2017.

### 1. Best paper award:

**Title:** “Durability of building airtightness, review and analysis of existing studies”

**Authors:** Valerie Leprince (PLEIAQ, France), Bassam Moujalled (CEREMA, France), Andrés Litvak (CEREMA, France)

Download the paper from:

<http://aivc.org/resource/durability-building-airtightness-review-and-analysis-existing-studies>

### 2. Best poster award

**Title:** “Towards the definition of an indoor air quality index for residential buildings based on long- and short-term exposure limit values”

**Authors:** Louis Cony Renaud-Salis (University of La Rochelle, France), Olivier Ramalho (CSTB, France), Marc Abadie (University of La Rochelle, France)

Download the paper from:

<http://aivc.org/resource/towards-definition-indoor-air-quality-index-residential-buildings-based-long-and-short-term>



Best paper award, Valérie Leprince et al. 38<sup>th</sup> AIVC- 6<sup>th</sup> TightVent – 4<sup>th</sup> venticool joint conference



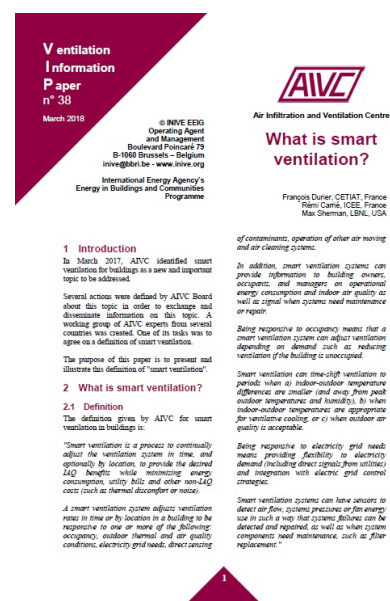
Best poster award, Louis Cony Renaud-Salis (right) and Marc Abadie (left). 38<sup>th</sup> AIVC- 6<sup>th</sup> TightVent – 4<sup>th</sup> venticool joint conference

## New release! AIVC Ventilation Information Paper n°38: What is smart ventilation?

In March 2017, AIVC identified smart ventilation for buildings as a new and important topic to be addressed. Several actions were defined by the AIVC Board about this topic in order to exchange and disseminate information on this topic. A working group of AIVC experts from several countries was created. One of its tasks was to agree on a definition of smart ventilation.

Ventilation Information Paper n°38: “What is smart ventilation?” presents and illustrates this definition of “smart ventilation”.

The document is now available for download at: <http://aivc.org/resources/collection-papers/aivc-publications>





# Air Infiltration and Ventilation Centre

## China joins the AIVC

The AIVC is very pleased to welcome China as new participating country! China will be represented in the AIVC board by Guoqiang Zhang, Dean of Institute of Sustainable Urbanization and Construction Innovation, Hunan University and Weijun Chen from Hunan Shinilion Energy Saving Sci. and Tech. Corp. Ltd.

## Recordings and slides of smart ventilation webinar now available

The recordings and the slides of our latest webinar "IAQ sensors for smart ventilation of buildings" held on 6 March, 2018 are now available online at:

<http://aivc.org/event/6-march-2018-webinar-iaq-sensors-smart-ventilation-buildings>

A collection of past events' recordings and slides can also be found at:

<http://aivc.org/resources/collection-publications/events-recordings>

Check them out and subscribe to our YouTube channel to receive our latest video updates!

## NEWSPAPER: "Energy Efficiency and Indoor Climate in Buildings"

The monthly online newspaper "Energy Efficiency and Indoor Climate in Buildings" contains relevant information on the Air Infiltration and Ventilation Centre (AIVC), the international platform on ventilative cooling (venticool) & IEA EBC annex 62-ventilative cooling, the building and ductwork airtightness platform (TightVent Europe), the Indoor Environmental Quality – Global Alliance (IEQ-GA), the Dynastee network & EU relevant information.

The paper is available at the first of every month at: <http://news.inive.org/>

## AIVC • List of board members

Belgium: Arnold Janssens, University of Ghent • Samuel Caillou, BBRI

China: Guoqiang Zhang, Hunan University • Weijun Chen, Hunan Shinilion Energy Saving Sci. and Tech. Corp. Ltd

Denmark: Bjarne Olesen, Technical University of Denmark • Alireza Afshari, Danish Building Research Institute, Aalborg University

France: François Durier, CETIAT • Nicolas Doré, ADEME

Italy: Lorenzo Pagliano, Politecnico di Milano

Japan: Takao Sawachi, Building Research Institute • Yoshihiko Akamine, NILIM

Netherlands: Wouter Borsboom, TNO

New Zealand: Manfred Plagmann, BRANZ

Norway: Kari Thunshelle, SINTEF Byggforsk

Republic of Korea: Yun Gyu Lee, Korea Institute of Construction Technology • Jae-Weon Jeong, Hanyang University

Spain: Pilar Linares Alemparte, The Eduardo Torroja Institute for Construction Science - CSIC • Sonia García Ortega, The Eduardo Torroja Institute for Construction Science - CSIC

Sweden: Paula Wahlgren, Chalmers University of Technology

UK: Benjamin Jones, University of Nottingham • Maria Kolokotroni, Brunel University London

USA: Andrew Persily, NIST • Max Sherman, LBNL

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### Operating agent

INIVE EEIG, [www.inive.org](http://www.inive.org), [info@aivc.org](mailto:info@aivc.org)

Peter Wouters, operating agent • Rémi Carrié, senior consultant • Maria Kapsalaki, consultant • Stéphane Degauquier

### AIVC board guests

Francis Allard • Willem de Gids • Laszlo Fulop • Zoltan Magyar • Pawel Wargocki • Hiroshi Yoshino

### Representatives of organisations

Takao Sawachi, IEA EBC, [www.iea-ebc.org](http://www.iea-ebc.org)

Jaap Hogeling, REHVA, [www.rehva.eu](http://www.rehva.eu)

Jan Hensen, IBPSA, [www.ibpsa.org](http://www.ibpsa.org)

Ben Hughes, IJV, <https://www.tandfonline.com/loi/tjov20>

Carsten Rode, IEA EBC Annex 68, <http://www.iea-ebc-annex68.org/>