

'Eye on 2030':

14th REHVA HVAC World Congress CLIMA 2022

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Eye on 2030

The 14th REHVA HVAC World Congress CLIMA 2022 (22-25 May 2022, Rotterdam, The Netherlands) challenges advances in technologies and standards for a smart energy transition, digitization, circularity and, most important, people's well-being and health in buildings.

- How can we create circular buildings, fully heated, cooled and powered by renewable energy?
- How can we design human-centered indoor environments while mastering life-cycle costs?
- Systems and techniques are changing rapidly, and more people must be educated to realize this transition. How can we accelerate the uptake and sharing of knowledge in our sector?

The focus is on buildings, the occupants, and the energy and comfort & indoor climate systems. It also includes integration into infrastructures for energy, health, data and education.

The challenges relating to energy transition, healthy buildings, digitization, circularity and learning are enormous and we need new perspectives, and integration of perspectives. This REHVA World Congress is yours, let's build the future together!

Call for abstracts

The call for abstracts, which was open until June 18, has been extended until September 15 2021, to answer the demand of many academics and professionals. Contributions may be scientific and technical papers,

interactive sessions (discussion forums, seminars/webinars and courses) and invited sponsored CLIMA workshops. Submit your abstract as soon as possible on: www.clima2022.org/submit/abstract-submission/

All accepted papers will be compiled into the Digital Conference Proceedings. Agreements are also being made for additional publications in indexed journals.

Exciting mix

Building on a long and fruitful tradition of REHVA World congresses bringing professionals, policy makers and researchers together in an enthusiastic and energizing environment, CLIMA 2022 will enable you to discuss the latest insights in science, technology and standardization and find answers to the questions society and our sector are dealing with. The congress will consist of a mixture of keynote speakers, scientific and technical sessions as well as interactive sessions, student activities, technical tours and sponsored REHVA workshops. Executive Scientific Committee members Marcel Loomans (TU/e), Martin Tenpierik (TUD), Froukje van Dijken (bba- binnenmilieu) and Lada Hensen Centnerová (TU/e) are working on an exciting mix of COVID-19-proof sessions – both in-person and online, with a lot of attention to interaction in discussion forums, webinars & seminars and courses, for which you can also submit an abstract.

For each of the congress themes, the executive scientific organization is in hands of a tandem representing both academia and HVAC professionals.

Upcoming events

Theme 1: Energy

Prof. **Jan Hensen** (TU/e) & **Jan Jaap Blüm** (CEO at Alba Concept):

“CLIMA 2022 considers **fossil-free energy use** in the built environment of vital importance. Development of building services systems using heat, cold and electricity from **renewable resources** is accelerating, creating a need for **flexibility** and therefore for **energy storage** and inter-building energy exchanges. Following this there is also a need for **innovative HVAC products** and for **performance optimization** via improved **design, operation** and **maintenance** of the various **integrated** mechanical and electrical sub-systems. This typically includes reduction and balancing of the **energy demands** for **heating, cooling** and **ventilation**. While this is not exactly trivial in new buildings, it poses huge technical, social, economic and political challenges for **existing buildings**. Obviously, the solutions will vary across countries. Exchanging experiences and learning from each other are the main objectives of CLIMA 2022. This is not limited to the technical aspects, but also includes **economic, cultural, juridical** and **organizational aspects**. The overall energy system is becoming more dynamic and is influenced by additional actors with non-traditional roles. When homes become small energy plants, or when large building complexes start to exchange

energy, or when **smart data** companies control **energy consumption**, then the government, grid operators, energy companies, financial institutions and our sector need to respond.”

CLIMA 2022 therefore welcomes original contributions that introduce, share, broaden and improve scientific and practical knowledge and experiences in these areas:

- Renewable and smart energy solutions for buildings and sites
- Design of Innovative HVAC systems for optimized operational performances
- Reduction and balancing of building energy demand
- Legislation, business models and shifting responsibilities

Theme 2: Digitization

Associate Prof. **Pieter Pauwels** (TU/e) & **Jan Kerdèl** (Senior consultant Building Automation at Kerdèl Business Development):

“CLIMA 2022 considers digital solutions that encourage the **energy transition** in the built environment as a very important theme. Solutions are expected in the areas of **(predictive) digital twinning**,



The new AHoy Conference Centre, Rotterdam.

data-driven smart buildings, data management, and continuous commissioning. Nowadays digital solutions must be capable of handling a wide variety of HVAC systems and even be **self-learning** in detecting trends and process anomalies. Stand-alone (add-on) or embedded solutions are possible, but system architectures must include large scale deployment (wired and wireless solutions, IoT, cloud solutions, blockchain technologies). **Monitoring strategies** are needed that also bridge the gap between **Building Automation and Control Systems (BACS)** and **Building Information Modeling (BIM)**, and enable lifetime-cost control using system and building-contextual data. Large-scale **monitoring** of energy, comfort and life-cycle cost performances **at an affordable cost level** are needed in support of business cases and policies. Finally, the recent COVID pandemic has triggered research on digital-focused **design, monitoring and control** of ventilation systems, in relation to overall **comfort and health**. This includes AI algorithms for **fault detection and diagnosis, pattern recognition and anomaly detection.**”

CLIMA 2022 therefore welcomes original contributions on digital solutions supporting the building upgrading process and building (energy) management.

- Building Management Systems for Energy, Carbon, Comfort and Cost Performance:
- Design for Automation: From BIM Models to BACS
- Digitization in HVAC control & Health Monitoring
- Digitization for integration & Building upgrading

Theme 3: Health & Comfort

Prof. **Philomena Bluysen** (TUD) & **AnneMarie Eijkelenboom** (EGM Architects):

“The achievement of **health and comfort** of people in the **built environment**, whether at home, at work, at school, or enjoying free time, is a **complex** subject that involves **physics, behaviour, physiology**, energy conservation, **climate change**, architecture, engineering and technology. The way people feel, experience and behave in their environment is related to the quality of their environment, described by the **thermal, air, lighting and sound qualities**, but also to the ability of the buildings and systems to respond to people’s changing needs and **preferences** and the ability of people to respond to new buildings and systems. As shown by the outbreak of the Covid-19 **pandemic**, building systems have to provide a **resilient** environment not only on the long term (as climate change is evolving) but also in the short term (for example during a pandemic). CLIMA 2022 challenges advances in **intelligent interfaces and interaction** between building, indoor climate systems and humans and welcomes contributions seeking to new approaches to health & comfort in relation to low-energy buildings and energy-efficient retrofit”:

- Ventilation to reduce infectious diseases
- Indoor Environmental Quality for well-being in energy-efficient & retrofitted buildings:
- Thermal comfort in energy-efficient buildings & retrofitted buildings
- Resilience and climate change



View on the Erasmus Bridge and the new high-rise development at the south bank of the New Meuse River in Rotterdam.

Upcoming events

Theme 4: Circularity

Prof. **Tillmann Klein** (TUD), **Bob Geldermans** (TUD) & **Olaf Oosting** (Managing director at Valstar-Simonis):

“As a result of a growing population worldwide and the need for comfortable and healthy indoor environments, a massive building challenge lies ahead with the development of new building projects as well as the need to upgrade the existing building stock. To ensure a **future-proof**, sustainable economy for future generations, the reduction of the use of **primary resources** is essential. **Circularity** aims at closing and connecting material, water and energy flows while eliminating waste and reducing the demand for primary resources. The HVAC sector has a particularly high potential to contribute to circularity. Cycling energy, air and water flows is its core business. Components are frequently subject to upgrades and change. The **retention and reuse of valuable materials** and components offer business opportunities. However, the associated benefits have not yet translated into a **large-scale market breakthrough**. The sector needs a clear **vision** on how to achieve **circularity goals**, based on **innovative strategies** and an integrated approach with regard to **circular design**, product technology, business models, and management. CLIMA 2022 considers circularity as a primary challenge for the coming decade. It is therefore inviting contributions that initiate, share, and improve scientific and practical knowledge and best practice examples in the following areas”:

- Circular Design
- Product Technology
- Business Models
- Management

Theme 5: Learning & Education

Prof. **Christian Struck** (Saxion University) & Prof. **Laure Itard** (TUD):

“The European targets around the energy transition in the built environment are huge. To realize the **transition** towards an energy-efficient, circular, digitized and healthy built environment, an **upscaling** of solutions is urgently needed. **Dissemination** of technical **innovations and proven knowledge** and approaches is needed. The building services sector is essential for realizing this transition: next to delivering the **workforce** for designing, placing and maintaining all energy and indoor climate equipment in buildings and neighbourhoods, the sector also acts as **innovator** and is the axis between the **construction, energy, IT and health** sectors, **integrating knowledge** from these fields. Rapid changes in energy and HVAC engineering techniques and systems and in contracts and processes make it necessary to accelerate the uptake of knowledge in these areas. This means that **continuous professional development** of the current workforce and the education of new employees is necessary. There is a growing need for **in-company, sectoral and cross-sectoral learning communities**. CLIMA 2022 considers advances in Learning & Education as being essential to the sector and therefore welcomes original contributions demonstrating novel approaches and good practices in developing learning communities and curricula to attract and educate young professionals as well as train experienced practitioners digitally and on the job”.

- Learning communities
- Digital education
- Development of curricula
- Business models for Learning & Education



Important dates:

- Abstract submission opens: **1 April, 2021**
- Abstract Submission deadline: **18 June, 2021**
- Extended abstract submission deadline: **15 Sept, 2021**
- Notification of abstract acceptance: **5 September, 2021**
- Paper submission deadline: **28 November, 2021**
- Notification of acceptance: **15 January 2022**

We are very curious about your contributions and hope to see you in May 2022 in Rotterdam or online! ■