

# 53<sup>rd</sup> AiCARR International Conference

12 - 13 - 14 march 2024  
Fiera Milano, Rho (MI) | MCE 2024

From NZEB to ZEB: the buildings  
of the next decades for a healthy  
and sustainable future



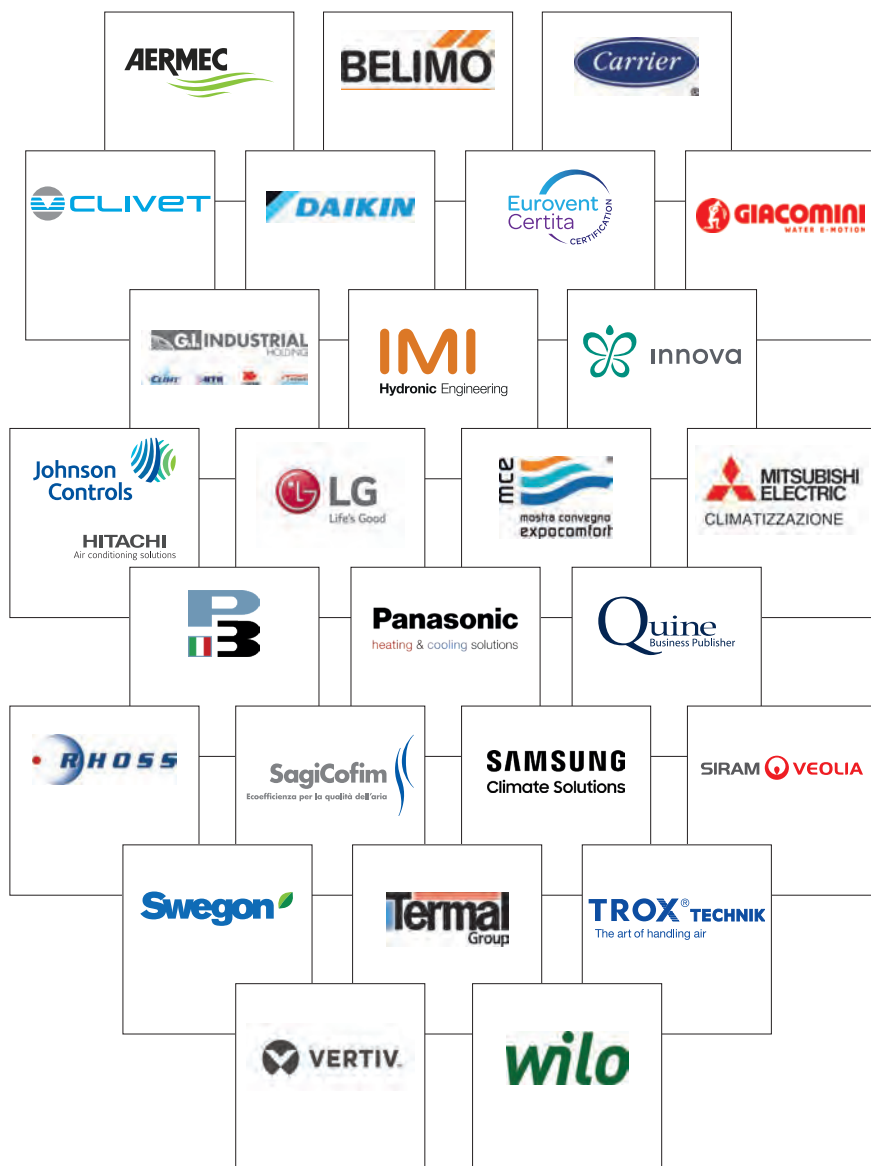
**AiCARR**

Cultura e Tecnica per Energia Uomo e Ambiente



anni di cultura

# INDUSTRY MEMBERS



# SCIENTIFIC COMMITTEE

## AiCARR PRESIDENT

*Claudio Zilio*

## PRESIDENT OF CULTURAL COMMISSION

*Marco Noro*

Francesco Asdrubali (*Università degli Studi di Roma 3*)

William Bahnfleth (*Pennsylvania State University - ASHRAE*)

Marco Beccali (*Università degli Studi di Palermo*)

Umberto Berardi (*Politecnico di Bari*)

Nicola Bianco (*Università degli Studi di Napoli Federico II*)

Livio de Santoli (*Università La Sapienza, Roma*)

Marco Dell'Isola (*Università degli Studi di Cassino e del Lazio Meridionale*)

Gianpiero Evola (*Università degli Studi di Catania*)

Enrico Fabrizio (*Politecnico di Torino*)

Giorgio Ficco (*Università degli Studi di Cassino e del Lazio Meridionale*)

Andrea Frattolillo (*Università degli Studi di Cagliari*)

Andrea Gasparella (*Università di Bolzano FRSE*)

Cătălin Lungu (*Technical University of Civil Engineering, Bucarest REHVA*)

Livio Mazzarella (*Politecnico di Milano*)

Luca Molinaroli (*Politecnico di Milano*)

Gian Luca Morini (*Università degli Studi di Bologna*)

Alessandro Prada (*Università degli Studi di Trento*)

Fabio Scurpi (*Università degli Studi di Firenze*)

Fabio Serpilli (*Università Politecnica delle Marche*)

Timothy Wentz (*University of Nebraska - ASHRAE*)

Angelo Zarrella (*Università degli Studi di Padova*)

# ORGANIZING COMMITTEE

Luca Alberto Piterà

*(AiCARR General Secretary)*

Roberto Taddia

*(AiCARR Territorial Delegate Milano, Como, Lodi, Monza e Brianza, Pavia, Varese)*

Gabriella Lichinchi

*(AiCARR Secretariat)*

Stefania Bracco, Gennaro Loperfido, Fabio Minchio, Federico Pedranzini, Mara Portoso

*(AiCARR Executive Board)*

Matteo Dongellini

*(AiCARR Cultural Commission)*

# WELCOME TO THE 53<sup>RD</sup> AiCARR INTERNATIONAL CONFERENCE



The adopted revision of the European Energy Performance of Buildings Directive (EPBD) requires that by 2028 all newly-constructed buildings will be zero emission (ZEB, Zero Emission Building), and all existing buildings will have to become zero emissions by 2050. Such obligations will concern all residential and non-residential buildings (with some exceptions) and will provide for the achievement of challenging energy classes: residential buildings will have to reach class E by 2030 and class D by 2033; the other buildings, including those owned by public bodies, class E from 2027 and class D from 2030. The directive requires the Member States to present national plans for the energy requalification of buildings, leaving 15% of the most energy-intensive ones in the lowest

---

## CONFERENCE PARTNER



# WELCOME TO THE 53<sup>RD</sup> AiCARR INTERNATIONAL CONFERENCE

energy class. According to Istat data, there are approximately 1.8 million residential buildings in Italy in class G out of a total of 12 million.

The expected exemptions will be able to mitigate the impact of this obligation, but the effects of the directive will be really important in countries like Italy.

Here a large part of the residential building stock was built before 1991 and the deep renovation of the older buildings would require significantly longer times than those expected at the European level, with higher costs. At the same time, the increasing diffusion of renewable energy sources and the electrification of energy uses introduce urgent issues concerning the optimization of hybrid systems, the use of multi-source heat pump systems, different types of energy storage (including the use of new

energy carriers such as hydrogen), in the context of an ever-increasing decarbonisation of buildings. In this context, it is suitable to investigate, through the contribution of wide-ranging analysis and more specialized studies, the opportunities provided by integrating technologies, systems, and building design in the transition from NZEB to ZEB, also considering a better internal environment quality. Based on these items, the 53<sup>rd</sup> AiCARR International Conference will present contributions of interest to the HVAC sector, relating to innovative design approaches, new monitoring and control systems, new components and systems, with related insights into their impact on energy consumption, comfort (thermal-hygrometric, acoustic, visual, air quality) and on the healthiness of internal environments.

---

## ENDORSED BY



# HOW TO REACH MCE



## MCE takes up 12 halls of the Fiera Milano exhibition area in the Rho Exhibition Center.

Twelve halls and a top-quality convention centre get busy over the four days of the show, hosting exhibitors and attendees from all over the world. The exhibition centre is connected by underground to the heart of

Milan and visitors can get off right inside the fairgrounds. The centre, easily reachable from Linate and from the international hub of Malpensa, is located near an important motorway intersection and has 14,000 parking lots.

In order to allow to both visitors and exhibitors a quick and easy access to the different sectors, a direct shuttle bus service between Gate Est and Gate Ovest will be activated in addition to the usual one linking all the different halls.



### By Tube

Red line M1 direction Rho-Fieramilano, East Gate entrance.

Warning: The Rho-Fieramilano Station can be reached using the Mi1 Mi3 ordinary ticket that costs 2,20€ one way or with the daily 24 hours Mi1-Mi3 ticket for 7,60€.



### By Train

Fiera Milano is served by Rho-Fiera railway station that can be reached using the Passante Ferroviario through line S5 (Varese-Gallarate-Milano Passante -Pioltello-Treviglio) and line S6 (Novara-Magenta-Milano -Passante-Treviglio) from the following stations: Milano Certosa, Villapizzzone, Lancetti, Porta Garibaldi, Repubblica, Porta Venezia, Dateo e Porta Vittoria.

**The following lines stop at Rho-Fiera Station too:**

- All Turin-Novara-Milan Fast Regional trains;
- All Regional trains for Varese, Arona, Domodossola and Luino;
- Some S11 line Chiasso-Como-Milano Porta garibaldi-Rho trains

**From Milano Centrale, Milano Porta Garibaldi and Milano Lambrate railroad stations:**

Take the green line M2 underground direction Abbiategrasso, at Cadorna station change to red line M1 underground direction Rho-Fieramilano.

**From Milano Cadorna railroad station:**

Take the red line M1 underground direction Rho-Fieramilano. You can reach Fiera Milano also using Frecciarossa, Italo Treno e Eurocity trains.

# HOW TO REACH MCE



## By Airplane

### FROM LINATE

#### ATM BUS

Public service bus no. 73 from Arrivals exit to Piazza Duomo/Via Gonzaga change to red line M1 underground direction Rho-Fieramilano.

M4 tube line is available to reach San Babila station. From San Babila station take the M1 line, direction Rho-Fieramilano to reach the fairground.

### FROM MALPENSA TERMINAL 1

#### MALPENSA EXPRESS TRAIN

To Milano Cadorna railway station every 30', then take red line M1 underground direction Rho-Fieramilano.

### FROM ORIO AL SERIO

#### SHUTTLE BUS

A paid shuttle bus service is available to reach Milano Centrale Station.

From Milano Centrale station, take the M2 tube line to Milano Cadorna, then change to M1 line, direction Rho-Fieramilano.



## By Taxi

Taxis authorized to operate at Linate and Malpensa airports, on given pre-established routes, among which FieraMilano fairground, apply pre-established rates including all costs (handling time, motorway fee, night and holiday extracharge). Requests for intermediate stops make invalid the application or fixed rates. In Milan there are 50 taxis accessible to people with physical disabilities.

**Those taxis can be booked by calling the number +39 02.7777.**

The call is free.



## By Car

From A7-Genova (Genoa), A1-Bologna and A4-Torino (Turin) motorways: drive along Tangenziale Ovest (ringroad west) direction North, exit fieramilano.

From A4 Venezia (Venice) motorway: exit Pero-fieramilano.

From A8-Varese and A9-Como motorways: at Milano Nord barrier follow direction to A4-Venezia, exit fieramilano.

From Milan: A-8 motorway direction Varese-Como: exit fieramilano; or A-4 motorway direction Torino (Turin) exit Pero-fieramilano.

# REGISTRATION FEES

PARTICIPANTS	From March 1 <sup>st</sup> and on site VAT excluded 22%
Public Session (Plenary + Workshop) March 12 <sup>th</sup> , 2024	Free
AiCARR, ASHRAE, IIR, REHVA Members	€ 100.00
AiCARR, ASHRAE, IIR, REHVA Non Members	€ 200.00
AiCARR, ASHRAE, IIR, REHVA Speaker Members	€ 60.00
AiCARR, ASHRAE, IIR, REHVA Speaker Non Members	€ 200.00
AiCARR, ASHRAE, IIR, REHVA Student Members	Free
Student Non Members	€ 30.00
Gala Dinner March 13 <sup>th</sup> , 2024 8.30 p.m.	€ 84.00

*The registration fee includes the entrance ticket to MCE*

*The registration fee includes Professional credits for the continuum training of Engineers and Industrial Specialist. The actual allocation of professional Credits are subject to approval by the CNI and CNPI*

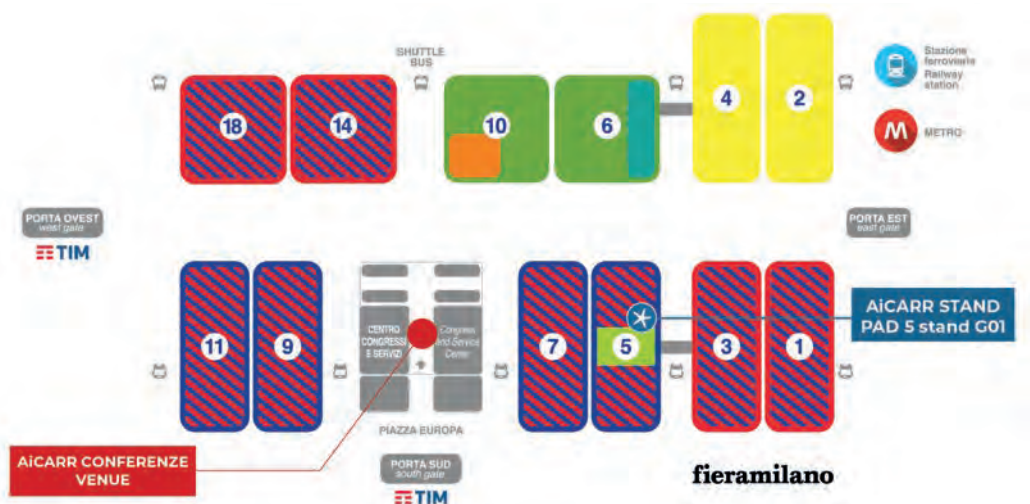


# AiCARR IN MCE



mostra convegno®  
expocomfort

Build by  
**RX** in the business of  
building businesses



## PLANIMETRIA DEL QUARTIERE - EXHIBITION FLOOR PLAN

**Padd./Halls 1-3 5-7 9-11 14-18**

### INDOOR CLIMATE:

Condizionamento/Air Conditioning  
Pompe di Calore/Heat pumps  
Refrigerazione/Refrigeration  
Riscaldamento/Heating  
Ventilazione/Ventilation

Geotermico/Geothermal  
Cogenerazione/Cogeneration  
Solare termico/Solar heating

**Padd./Halls 2-4**

Componentistica per impianti /  
HVAC Components

**Pad./Hall 5**

That's Smart

**Padd./Halls 6-10**

Tecnica sanitaria / Plumbing technology  
Ambiente bagno / Bathroom world  
Trattamento acqua / Water treatment  
Attrezzatura e utensileria /  
Implements and tools



MARCH 12<sup>th</sup>

GEMINI ROOM

Centro Congressi Stella Polare



PLATINUM SPONSOR

## Open public session



*Chair: Claudio Zilio, AiCARR President*

1.00 p.m. **Participants registration**

### **Plenary Session**

2.30 p.m. **Welcome addresses**

Zilio Claudio, *AiCARR President*, Lungu Catalin, *REHVA President*  
Pierini Massimiliano, *Managing Director RX Italy*

2.45 p.m. **Member 25 years old Award**

### **Keynote**

#### **Decarbonizing District Energy Systems: The US Perspective**

3.00 p.m. Blake Ellis, *ASHRAE Fellow, LEED AP, Principal*  
Burns & McDonnell - *ASHRAE Task Force for Building Decarbonization Executive Committee*

### **Keynote**

3.40 p.m. **Recent advancements in thermal energy storage for HVAC**

Mancin Simone, *University of Padova*

4.20 p.m. **Workshop: High quality HVAC-R systems: from R&D to delivery and what is in between**

Introduction: Courtain Sylvain,  
*Eurovent Certification President*

### **Pannel discussion:**

*Chair: Scuderi Francesco, Eurovent*  
Mastrapasqua Francesco, *Epta spa*, Covolo Mariano, *Mehits spa*  
Ranieri Micaela, *Rhoss spa*, Porto Salvatore, *Prodbim*



5.30 p.m. **Welcome Cocktail | Close to Gemini Room**



**MARCH 13<sup>th</sup>**  
morning session 1

**GEMINI ROOM**  
Centro Congressi Stella Polare



## Innovation in buildings components and technologies

SESSION THEME SPONSOR

**TROX®** TECHNIK  
The art of handling air

*Chair: Spallone Biagio, Trox Italia spa, Milano, Italy*

9.30 a.m.	<b>Participants registration</b>
10.00 a.m.	<b>Keynote</b> <b>From NZEB to ZEB: the role of buildings simulation</b> Gasparella Andrea, <i>Free University of Bozen</i>
10.40 a.m.	<b>Moving time for parallel sessions</b>
10.45 a.m.	<b>Session Sponsor introduction</b> Spallone Biagio, <i>Trox Italia spa</i>
10.50 a.m.	<b>From single tests to a test-chain: a comprehensive approach for evaluating the interaction between the building envelope and the IEQ</b> Babich Francesco, Pinotti Riccardo, Gazzin Riccardo, Visentin Chiara, Lollini Roberto, <i>Eurac Research, Bolzano, Italy</i>
11.05 a.m.	<b>The impact of placement-related effects in air-cooled cooling chillers on energy efficiency</b> Kavas Süleyman, Özel Burak, <i>Cowriter, Ankara, Turkey</i>
11.20 a.m.	<b>Evaluating the IAQ and energy performances of ventilation systems in multifamily buildings</b> Kiani Zohreh, Nour Eddine Ali, <i>Eurovent Certita Certification, Paris, France</i> , Taurines Kévin, Cordeiro Mendonça Kátia, <i>Tipee Plateforme Technologique du Bâtiment Durable, Lagord, France</i> Abadie Marc Olivier, <i>La Rochelle Université, La Rochelle, France</i>
11.35 a.m.	<b>Towards zero energy buildings: the UNIZEB case study</b> Carnieletto Laura, <i>Università Ca' Foscari, Venezia, Italy</i> Mitrovic Milica, Riccardi Beatrice, Turrini Umberto, Bignucolo Fabio, De Carli Michele, <i>Università degli Studi di Padova, Italy</i>



**MARCH 13<sup>th</sup>**  
*morning session 1*

**GEMINI ROOM**  
*Centro Congressi Stella Polare*



## **Innovation in buildings components and technologies**

SESSION THEME SPONSOR

**TROX®** **TECHNIK**  
The art of handling air

11.50 a.m.	<b>Scenarios for the energy renovation of a residential building</b> Malevolti Guglielmo, Rocchetti Andrea, Socci Luca, <i>Università degli Studi di Firenze, Italy</i>
12.05 a.m.	<b>Simulation of the energy performance of building archetypes according to italian regulations, with the identification of upgrading solutions based on cost-benefit analysis in relation to climate change</b> Carletti Cristina, Cellai Gianfranco, Sciorpi Fabio, <i>Università di Firenze, Italy</i> Pierangioli Leone, <i>Libero Professionista, Firenze, Italy</i> Riccomi Alessio, <i>Libero Professionista, Montecatini Terme, PT, Italy</i>
12.20 p.m.	<b>Retrofitting historical buildings with innovative techniques: double-skin facade and skylights for courtyard buildings</b> Aruta Giuseppe, Ascione Fabrizio, Bianco Nicola, Iaccheo Anna, Iovane Teresa, Mastellone Margherita, <i>Università degli Studi di Napoli Federico II</i>
12.35 p.m.	<b>En-solex": a novel solar exoskeleton for the energy-efficiency retrofitting of existing buildings</b> Stasi Roberto, Ruggiero Francesco, <i>Politecnico di Bari, Italy</i> Berardi Umberto, <i>Toronto Metropolitan University, Canada</i>
12.50 p.m.	<b>Discussion</b>
1.00 p.m.	<b>Networking light lunch</b>



**MARCH 13<sup>th</sup>**  
*morning session 2*

**ARIES ROOM**  
*Centro Congressi Stella Polare*



## Integration of control and building automation systems

SESSION THEME SPONSOR



*Chair: Noro Marco, Università degli Studi di Padova*

10.45 a.m. **Session Sponsor introduction**  
Zordan Luca, *Swegon Operation srl*

10.50 a.m. **Artificial intelligence-based algorithms applied to HVAC systems for the optimal control in buildings**  
Bernardello Filippo, Astolfi Giacomo, Alessio Giulia, Andreoli Michele, Lovato Riccardo, Nicastro Alessandra, *Alperia Green Future Srl, Bolzano, Italy*

11.05 a.m. **Energy, economic and environmental benefits of demand response for improving building energy flexibility**  
Dal Cin Enrico, *Università degli Studi di Padova, Italy*  
Rech Sergio, *Centro studi di economia e tecnica dell'energia*  
Giorgio Levi Cases, *Università degli studi di Padova, Italy*  
Benetti Marianna, *Veil Energy Srl Società Benefit, Bolzano, Italy*

11.20 a.m. **A data-driven model for the analysis of energy consumption in buildings**  
Borgato Nicola, Zarrella Angelo, Enrico Prativiera, Bordignon Sara, *Università di Padova, Italy*  
Garay -Martinez Roberto, *Universidad de Deusto, Spain*

11.35 a.m. **Energetic advantages and wellbeing improvement for buildings occupants, connected to dynamic building envelop solutions, with special focus on intelligent solar shading and ventilative cooling of NZEB and ZEB buildings**  
Gandini Jacques, *Studio Gandini, Verona, Italy*

11.50 a.m. **Towards sustainable indoor environment: optimizing NZEB and ZEB through advanced ventilation strategies**  
Pagan Andrea, Simonetti Raul, Di Dia Davide, Poppi Alessandro, *CAREL Industries s.p.a, Padova, Italy*



**MARCH 13<sup>th</sup>**  
morning session 2

**ARIES ROOM**  
Centro Congressi Stella Polare



## Integration of control and building automation systems

SESSION THEME SPONSOR



12.05 p.m.	<p><b>Govern complex systems in the design of an innovative, safe and sustainable Hospital</b></p> <p>Prete Daniele, Elia Gianluca, <i>Università del Salento, Lecce, Italy</i> Piscitelli Prisco, <i>Local Health Authority ASL Lecce, Italy, Italian Society of Environmental Medicine (SIMA), Milan, Italy</i></p>
12.20 p.m.	<p><b>A novel tool to detect abnormal thermal energy consumptions in buildings equipped with limited metering infrastructure</b></p> <p>Canale Laura, Ficco Giorgio, <i>Dell'Isola Marco, Università degli Studi di Cassino e del Lazio Meridionale, Cassino, Italy</i> Di Pietra Biagio, Puglisi Giovanni, Bertini Ilaria, <i>ENEA, Palermo, Italy</i></p>
12.35 p.m.	<p><b>One-year operation performances of a decentralised all-air HVAC system for a school room</b></p> <p>Noro Marco, <i>Università degli Studi di Padova, Italy</i> Busato Filippo, <i>Universitas Mercatorum, Roma, Italy</i> Piterà Luca Alberto, <i>AiCARR, Milano, Italy</i></p>
12.50 p.m.	<p><b>A pilot project for energy retrofit of educational buildings -The engineering campus of the University of L'Aquila</b></p> <p>De Rubeis Tullio, De Berardinis Pierluigi, <i>Department of Civil, Construction- Architectural and Environmental Engineering University of L'Aquila</i>, Smarra Francesco, Franchi Fabio, D'Innocenzo Alessandro, <i>Department of Information Engineering, Computer Science and Mathematics, University of L'Aquila</i>, Di Battista Davide, Ambrosini Dario, <i>Department of Industrial and Information Engineering and Economics, University of L'Aquila</i></p>
1.05 p.m.	<b>Discussion</b>
1.15 p.m.	<b>Networking light lunch</b>



**MARCH 13<sup>th</sup>**  
afternoon session 3

**GEMINI ROOM**  
Centro Congressi Stella Polare



## Innovation in plants components and technologies

SESSION THEME SPONSOR



*Chair: Ragni Antonio, Carrier Distribution Italy srl*

2.05 p.m. **Session Sponsor introduction**  
Ragni Antonio, *Carrier Distribution Italy srl*

2.10 p.m. **Experimental assessment of a 18 kWh latent thermal energy storage coupled with a heat pump for residential air conditioning**  
Righetti Giulia, Mancin Simone, *Università di Padova, Italy*  
Campidelli Matteo, Bottaro Oreste, *Innova Engineering srl, Trento, Italy*  
Feo Domenico, *Sunservice srl, Castelfranco Veneto, Treviso, Italy*

2.25 p.m. **Assessment of the energy performance of a solar/biomass hybrid system for the climatization of small- and medium-scale buildings**  
Dongellini Matteo, Naldi Claudia, Morini Gian Luca, *Alma Mater Studiorum, Università di Bologna, Italy*  
Moser Christoph, *Institute of Thermal Engineering, Graz University of Technology, Graz, Austria*  
Varga Szabolcs, Soares João, *Institute of Science and Innovation in Mechanical and Industrial Engineering, Porto, Portugal*

2.40 p.m. **Design optimization for energy efficiency in heat pumps with refrigerant R-454C**  
Codella Fabrizio, *Chemours Italy, Agrate Brianza, Italy*  
Küpper Hans-Dieter, *Chemours Deutschland, Neu-Isenburg, Germany*

2.55 p.m. **M-cycle based sub-wet bulb adiabatic cooling systems: an overview of the technology and possible applications for European climates**  
Peli Samuele, Belli Luca, *Seeley International, Arezzo, Italy*

3.10 p.m. **Eliturbo air-mixer: CFD modelling of a technology for the reduction of thermal stratification in large spaces**  
Polito Antonio, *Liberio Professionista, Castelfranco Veneto TV, Italy*  
Mistè Gianluigi, De Betta Stefano, *NablaWave s.r.l, Padova, Italy*  
Campolmi Paolo, *Impresind s.r.l., Gorgonzola, Milano, Italy*



**MARCH 13<sup>th</sup>**  
afternoon session 3

**GEMINI ROOM**  
Centro Congressi Stella Polare



## Innovation in plants components and technologies

SESSION THEME SPONSOR



- |           |   |
|-----------|---|
| 3.25 p.m. | <p><b>Technical-economic and financial feasibility of new technologies in the energy refurbishment of residential buildings</b></p> <p>Paduos Simona, Chiappero Marco, Iunco Alberto, Romano Roberto, <i>C2R Energy Consulting, Torino, Italy</i></p> <p>Corrado Vincenzo, Santarelli Massimo, <i>Politecnico di Torino, Italy</i></p>  |
| 3.40 p.m. | <p><b>Potential of Energy Saving of Propane Heat Pump as replacement of gas boilers with low and high temperature emitters</b></p> <p>Morini Gianluca, Camponeschi Corrado, Goni Maurizio, Cioffi Francesca, Dongellini Matteo, Naldi Claudia, <i>Alma Mater Studiorum, University of Bologna, Italy</i></p> <p>Germano Luca, Genovese Filippo, Cervellati Andrea, Casolari Alessandro, <i>GALLETTI s.p.a., Bentivoglio, Bologna, Italy</i></p> <p>Corsaro Federico, Ciancamerla Matteo, Ballotta Luca, <i>DANFOSS srl, Torino, Italy</i></p> |
| 3.55 p.m. | <p><b>Emerging technologies for air cleaning and their integration in HVAC systems: which role in the increasing quest for healthy and sustainable buildings?</b></p> <p>Joppolo Cesare Maria, <i>Politecnico di Milano, Italy</i></p> <p>Gandini Jacques, <i>Studio Gandini, Verona, Italy</i></p>   |
| 4.10 p.m. | <p><b>EPBD 2023, F-GAS 2024, Eco-design and safety standards: which design margins to be compliant with? At what cost?</b></p> <p>Ascione Fabrizio, de Rossi Filippo, Iovane Teresa, Mastrullo Rita, Mauro Alfonso William, Palella Francesco <i>Università degli Studi di Napoli Federico II, Italy</i></p>  |
| 4.25 p.m. | <p><b>Discussion and closing of the day</b></p>   |
| 8.30 p.m. | <p><b>Gala Dinner “Ristorante Al Fresco”</b></p> <p>Via Savona, 50, Milano</p>  |





**MARCH 13<sup>th</sup>**  
afternoon session 4

**ARIES ROOM**  
Centro Congressi Stella Polare



## Regulations and legislation

SESSION THEME SPONSOR



*Chair: Capezzuto Pasquale, Associazione Energy Managers*

- |           |   |
|-----------|---|
| 2.05 p.m. | <b>Session Sponsor introduction</b><br>Salmaso Massimo, <i>Mitsubishi Electric Europe BV</i>  |
| 2.10 p.m. | <b>Towards the zero emission building: a dynamic, holistic methodology for targeting Europe's zero-emissions buildings</b><br>Bilardo Matteo, Fabrizio Enrico, <i>Politecnico di Torino, Italy</i>  |
| 2.25 p.m. | <b>Proper definitions and comparable test methods for new heaters to tackle the challenge of a sustainable decarbonisation of existing residential buildings</b><br>Zambrelli Cristian, D'Acunti Valentina, Tomasi Roberta, Bronzoni Cristiana, <i>Immergas, Brescello, Reggio Emilia, Italy</i>  |
| 2.40 p.m. | <b>The energy renovation pathway to ZEB in Italy: analysis of typical buildings and methodological aspects</b><br>Di Turi Silvia, Ronchetti Laura, Sannino Raniero, Calabrese Nicolandrea, Iatauro Domenico, <i>ENEA, Roma, Italy</i>   |
| 2.55 p.m. | <b>Enhancing sustainability in construction: analysis of high-efficiency solutions for NZEBs in the Marche region</b><br>Serpilli Fabio, Di Perna Costanzo, Lori Valter, <i>Università Politecnica delle Marche, Ancona, Italy</i><br>Di Loreto Samantha, <i>Università "D'Annunzio", Chieti-Pescara, Italy</i>   |
| 3.10 p.m. | <b>Energy performance and thermal comfort assessment of an educational building in northern Italy: the importance of climatic files in energy simulations</b><br>Serpilli Fabio, <i>Università Politecnica delle Marche, Ancona, Italy</i><br>Lops Camilla, Montelpare Sergio, Pierantozzi Mariano, <i>Università "D'Annunzio", Chieti-Pescara, Italy</i> |



**MARCH 13<sup>th</sup>**  
afternoon session 4

**ARIES ROOM**  
Centro Congressi Stella Polare



## Regulations and legislation

SESSION THEME SPONSOR



3.25 p.m.	<p>The impact of the new EPBD “green houses” in the italian building context: technical-economic analysis on improving the energy class of existing buildings</p> <p>D'Agostino Diana, Minelli Federico, Minichiello Francesco, <i>Università degli Studi di Napoli Federico II, Italy</i></p> <p>Russo Nicola, <i>Ingegnere libero professionista, Napoli, Italy</i></p>
3.40 p.m.	<p><b>Analysis of the Physical Phenomena and Modelling Procedures of Building Heating and Cooling Emission System Energy Losses</b></p> <p>Bianco Mauthe Degerfeld Franz, Ballarini Ilaria, Corrado Vincenzo, <i>Politecnico di Torino, Italy</i></p>
3.55 p.m.	<p><b>CO<sub>2</sub> emission reduction, loads analysis, and strategies for new healthcare facilities design – application on a case study</b></p> <p>Mantua Francesco, Bo Elena, Turco Margherita, <i>Prodim srl, Torino, Italy</i></p> <p>Ferrara Maria, <i>Politecnico di Torino, Italy</i></p> <p>Rossi Prodi Fabrizio, <i>Rossi Prodi Associati srl, Firenze, Italy</i></p>
4.10 p.m.	<p><b>Evolution of energy diagnoses and energy management systems: regulations, tools and professionals serving energy efficiency</b></p> <p>La Mura Sergio, <i>Studio Ingegneria La Mura, Milano, Italy</i></p> <p>Piterà Luca Alberto, <i>AiCARR, Milano, Italy</i></p>
4.25 p.m.	<p><b>Readiness of zero-emission buildings (ZEBS) implementation in European Union</b></p> <p>Maduta Carmen, D'Agostino Delia, <i>Joint Research Centre, European Commission, Ispra (VA), Italy</i></p>
4.40 p.m.	<p><b>Discussion and closing of the day</b></p>
8.30 p.m.	<p><b>Gala Dinner “Ristorante Al Fresco”</b></p> <p>Via Savona, 50, Milano</p>



**MARCH 14<sup>th</sup>**  
*morning session 5*

**GEMINI ROOM**  
*Centro Congressi Stella Polare*



## Buildings in an urban scale

*Chair: Fabrizio Enrico, Politecnico di Torino*

9.30 a.m.	<b>Registration open</b>
10.05 a.m.	<b>Mixed-use neighbourhood to maximise urban energy community potential</b> Vecchi Francesca, <i>Politecnico di Bari, Italy</i> Berardi Umberto, <i>Toronto Metropolitan University, Canada</i>
10.20 a.m.	<b>Shallow geothermal systems in dense urban areas: the issue of thermal interference and long-term sustainability</b> Angelotti Adriana, Sterpi Donatella, <i>Politecnico di Milano, Italy</i>
10.35. a.m.	<b>Zero emission buildings in urban areas</b> Filippi Marco, <i>Politecnico di Torino, Italy</i> Sirombo Elisa, <i>GET srl, Torino, Italy</i>
11.50 a.m.	<b>Energy and economic simulation of a renewable energy community applied to a new generation ultra-low temperature district heating and cooling network</b> Romagnosi Michela, Aprile Marcello, Denarie Alice, <i>Politecnico di Milano, Italy</i>
11.05 a.m.	<b>Geothermal district heating: energy, environmental and economic analysis of a case study in northern Italy</b> Di Nunzio Nicola, Angelotti Adriana, Denarie Alice, <i>Politecnico di Milano, Italy</i>
11.20 a.m.	<b>Dynamic evaluation of the electrical primary energy factor for building energy performance: insights from 2022 Italian data</b> Oldini Riccardo, Bilardo Matteo, Fabrizio Enrico, <i>Politecnico di Torino, Italy</i>
11.35 p.m.	<b>Decarbonising the built environment within a whole-life cycle perspective</b> Maiorano Teodoro, Borello Davide, Sirombo Elisa, <i>GET srl, Torino, Italy</i>



**MARCH 14<sup>th</sup>**  
*morning session 5*

**GEMINI ROOM**  
*Centro Congressi Stella Polare*



## Buildings in an urban scale

11.50 p.m.

**Virtual energy sharing and energy communities for the municipality of Milan: strategy and technical analyses. the case of the Chiaravalle area**  
Causone Francesco, Ferroni Sibilla, *Politecnico di Milano, Italy*  
Minchio Fabio, *Studio 3F Engineering, Creazzo (VI), Italy*  
Sordi Giuseppina, Giuliani Iliaria, Cremascoli Elena, Paci Christina, *Comune di Milano, Italy*

12.05 p.m.

**Exploiting geographic open data to improve urban building energy simulations: the Padova city center case study**  
Khajedehi Mohamad, Prativiera Enrico, Bordignon Sara, De Carli Michele, *University of Padova, Italy*

12.20 p.m.

**Discussion**

12.55 p.m.

**Closing Ceremony**



## Interaction between people and buildings

*Chair: Mauro Alfonso William,  
Università degli Studi di Napoli Federico II*

10.05 a.m.	<b>New generation energy performance certificate: development and application in an Italian case study as an EU proof of concept</b> Salvalai Graziano, Isacco Ilaria, <i>Politecnico di Milano, Italy</i> Sesana Marta Maria, <i>Università degli studi di Brescia, Italy</i>
10.20 a.m.	<b>Cross-modal effects of indoor air quality and acoustic conditions in classrooms on students' comfort and performance</b> Pellegatti Matteo, <i>Università degli studi di Ferrara, Eurac Research, Ferrara, Bolzano, Italy</i> Prodi Nicola, Visentin Chiara, <i>Università degli studi di Ferrara, Italy</i> Torresin Simone, <i>Università di Trento, Italy</i> Babich Francesco, <i>Eurac Research, Bolzano, Italy</i>
10.35 a.m.	<b>UVC-mirror for effective pathogens inactivation in air ducts</b> Treccani Laura, Rovetta Daniele, <i>CSMT Innovative Contamination Hub, Brescia, Italy</i> Gobbi Emanuela, <i>Università degli Studi di Brescia, Italy</i> Turina Massimo, <i>Istituto per la Protezione Sostenibile delle Piante (IPSP), CNR, Torino, Italy</i> Lombini Matteo, Cortecchia Fausto, Diolaiti Emiliano, Malaguti Giuseppe, <i>INAF - Osservatorio di Astrofisica e Scienza dello Spazio, Bologna, Italy</i> Bianco Andrea, Pareschi Giovanni, <i>Istituto Nazionale di Astrofisica - Osservatorio Astronomico di Brera, Merate (Lc), Italy</i> Mongelluzzo Giuseppe, <i>INAF - Osservatorio Astronomico di Capodimonte, Napoli, Italy</i> Lessio Luigi, <i>INAF - Osservatorio Astronomico di Padova, Italy</i>
10.50 a.m.	<b>Liquid air filtration and continuous monitoring: customized IAQ</b> Capulli Domenico, Regazzi Rogerio, <i>Veltha Air pollution Control, Rio de Janeiro, Brazil</i>
11.05 a.m.	<b>Assessment of indoor environmental comfort in a recently renovated office building in Messina city</b> Savoca Ludovica Maria Sofia, <i>Università degli Studi di Messina, Italy</i>



**MARCH 14<sup>th</sup>**  
*morning session 6*

**ARIES ROOM**

*Centro Congressi Stella Polare*



## Interaction between people and buildings

11.20 a.m.

**Analysis of the relevant technical characteristics in indoor comfort terminal units for the purpose of satisfying the demanding energy, functional, hygienic and sustainability requirements of NZEB and ZEB buildings**

*Gandini Jacques, Studio Gandini srl, Verona, Italy*

11.35 a.m.

**Thermal comfort monitoring in office buildings: a case study**

*Sannino Raniero, Iatauro Domenico, Lavinia Carmen, Nardi Iole, ENEA, Roma, Italy*

11.50 a.m.

**Enhancing indoor air quality in office buildings: insights from a field study**

*Torriani Giulia, Institute for Renewable Energy, Eurac Research, Department of Civil Environmental and Mechanical Engineering, University of Trento, Bolzano, Trento, Italy*

*Lara-Ibeas Irene, Babich Francesco, Institute for Renewable Energy, Eurac Research, Bolzano, Italy*

12.05 p.m.

**Towards environmental sustainability of non-residential buildings: an integrated approach to combine thermal comfort of people with energy saving strategies for heating system management**

*Proietti Maria Giulia, Elefante Marco, Moretti Elisa, Università degli Studi di Perugia, Italy*

*Proietti Luca, Longhi Francesco, ARPA Umbria, Terni, Italy*

12.20 p.m.

**Cascina Oremo: a renovation of a building for people with disabilities, where we all learn to achieve efficiency together**

*Riva Gabriele, Favero Engineering, Milano, Italy*

*Magri Massimiliano, Catone Marco, Coster Group, Milano, Italy*

12.35 p.m.

**Moving time to Plenary Session Gemini Room**

12.55 p.m.

**Closing Ceremony**

# SAVE THE DATE

4 - 6 June 2025 | Milan | Italy



Decarbonized, healthy and energy - conscious  
buildings in future climates

**REHVA 15<sup>th</sup> HVAC World Congress**



Associazione Italiana Condizionamento dell'Aria  
Riscaldamento e Refrigerazione

MORE INFO: [www.climaworldcongress.org](http://www.climaworldcongress.org)  
[info@climaworldcongress.org](mailto:info@climaworldcongress.org) | [info@aicarr.org](mailto:info@aicarr.org)

## PLATINUM SPONSOR



### **EUROVENT CERTIFICATION COMPANY**

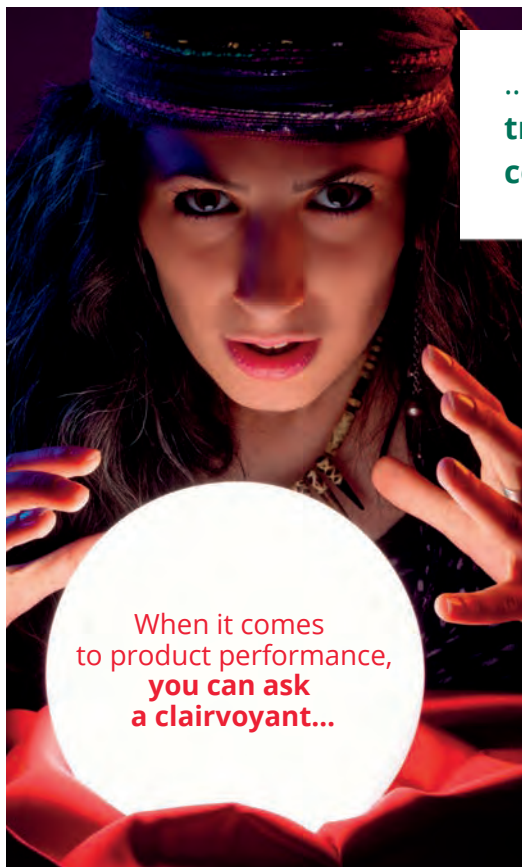
Rue de La Victoire 48-50

75003 PARIS

Tel. + 0039 33630499146







...But to be sure,  
**trust Eurovent  
certification instead.**



## We build trust

**With Eurovent certification, you can be sure  
you're making an eco-friendly choice for reliable,  
sustainable HVAC-R products.**

Reduce your carbon footprint with confidence,  
opt for Eurovent certification.



[www.eurovent-certification.com](http://www.eurovent-certification.com)

Eurovent Certita Certification is recognised as a world leader in third-party product performance certification in the Heating, Ventilation, Air Conditioning, and Refrigeration fields.

## SESSION THEME SPONSOR



### **CARRIER DISTRIBUTION ITALY SRL**

Via Sempione, 247 C/D

20016 PERÒ (MI )

Tel. 02 868071

Fax 02 86807499

[carrier\\_hvac\\_ne\\_ita@carrier.com](mailto:carrier_hvac_ne_ita@carrier.com)





# A FORCE FOR EFFICIENCY SUSTAINABILITY RELIABILITY CONNECTIVITY THE FUTURE.

**The newest additions to our AquaForce® line of chillers and heat pumps are coming soon!**

With features purposefully designed to support your operational efficiency and environmental impact reduction goals, our latest solutions are so much more than a move forward. **They are a force for the future.**

**AQUA**greenspeed®**FORCE**



## SESSION THEME SPONSOR



### **MITSUBISHI ELECTRIC EUROPE BV**

Via Energy Park, 14

20871 VIMERCATE (MB)

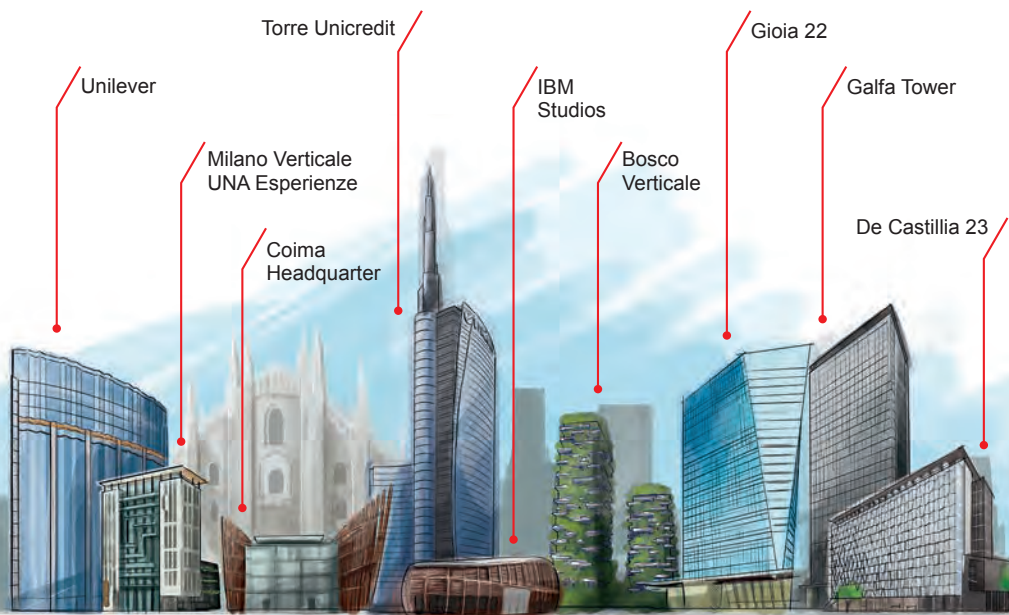
Tel. 039 6053370

Fax 039 6053211

[donatella.scova@it.mee.com](mailto:donatella.scova@it.mee.com)



# LET'S GIVE MILAN SKYLINE THE EXCELLENCE IT DESERVES



We are closer and closer to the market leaders of real estate industry  
with a wide range of pre and post-sale services.

We are committed to guarantee quality, energy efficiency  
and respect for the environment.

**Mitsubishi Electric, discover  
the pleasure of the perfect comfort.**

 **MITSUBISHI  
ELECTRIC**  
LIVING ENVIRONMENTAL SYSTEMS

## SESSION THEME SPONSOR



### **SWEGON OPERATIONS SRL**

Via Valletta 5

30010 CANTARANA DI CONA (VE)

Tel. 0426 302511

[filialeitalia@swegon.it](mailto:filialeitalia@swegon.it)





**Ready to tackle the  
climate challenge?**

We have the  
sustainability toolbox

## SESSION THEME SPONSOR



### **TROX ITALIA SPA**

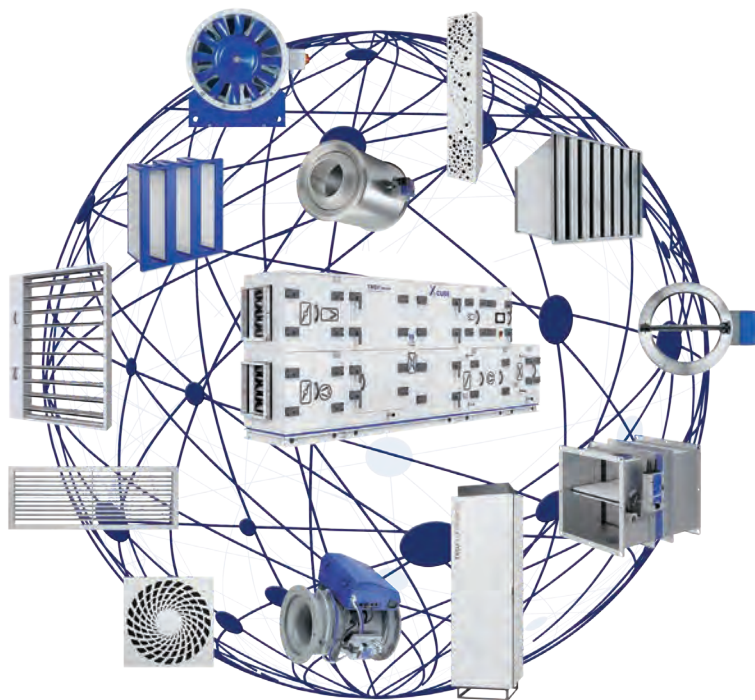
Via Mecenate, 90  
20138 MILANO (MI)  
Tel. 02 9829741  
[trox-it@troxgroup.com](mailto:trox-it@troxgroup.com)





# TROX<sup>®</sup> TECHNIK

The art of handling air



► **Garantiamo un elevato comfort.**  
**In tutto il mondo. ►►**

TROX occupa una posizione leader nello sviluppo, nella produzione e nella commercializzazione di componenti e sistemi per la climatizzazione e la ventilazione degli ambienti. Ricerche specializzate hanno reso TROX un leader dell'innovazione in questi ambiti.



**TROX<sup>®</sup> TECHNIK**  
The art of handling air  
[www.trox.it](http://www.trox.it)

**TROX Italia S.p.A.**  
Sede di Milano:  
via Mecenate, 90  
20138 Milano - Italia  
tel. +39 02 982974-1

Sede di Roma:  
via Carlo Arturo Jemolo, 69  
00156 Roma - Italia  
tel. +39 06 97859046

[illegible]

## SILVER SPONSOR



### RHOSS SPA

Via Oltre Ferrovia 32  
33033 CODROIPO (UD)  
Tel. 0432 911611  
Fax 0432 911600  
[monica.rossit@rhoss.it](mailto:monica.rossit@rhoss.it)



# New air for the future.



Siamo partner nella costruzione di **soluzioni** per la **climatizzazione** e il **trattamento dell'aria**. Pompe di calore, refrigeratori, unità polivalenti, ventilconvettori e centrali trattamento aria, progettate per funzionare in edifici votati al benessere delle persone e alla sostenibilità.



NOTE

## SILVER SPONSOR



### VISSMANN SRL

Via Brennero 56  
37026 BALCONI DI PESCANTINA (VR)  
Tel. 045 6768999  
Fax 045 6700412  
[info@viessmann.it](mailto:info@viessmann.it)



L'efficienza energetica  
dal 1917.



Soluzioni complete per **riscaldamento**,  
**climatizzazione** e **fotovoltaico**.  
Realizzate con i **migliori Partner installatori**.  
Scopri di più su [viessmann.it](http://viessmann.it)

[illegible]

# GENERATING IDEAS FOR SUSTAINABLE ENERGY

AiCARR, the cultural network for energy efficiency in HVAC, creates and promotes the culture and technology for sustainable well-being, and contributes to the advancement of HVAC technology and to the definition of regulations for the production, distribution and use of energy for heating, cooling and air conditioning in buildings.

Founded in 1960 by Italian ASHRAE Members, AiCARR has more than 2000 members, including designers, professors, installers and maintainers, manufacturing companies, government agencies, local, national and international institutions, students and researchers.

The authoritative presence in all academic and institutional bodies where the Country's energy future is designed makes AiCARR an essential reference point for the development of energy strategies and policies and an indispensable interlocutor for all those who deal with energy efficiency, environmental quality, renewable sources, conscious use of energy.

## SHARED COMPETENCES ARE BEHIND EVERY PROGRESS

Increasing the technical culture of the industry and the professionalism of Members, sharing the technological and scientific knowledge, preparing and spreading guidelines that help Members in their professional practice, giving solid support to the business world that deals with energy issues are the main commitments that AiCARR carries out through:

- National and International conferences, webinars, seminars, workshops and round tables
- Technical meetings and visits to facilities and cutting-edge plants
- Study commissions and coordination of technical, cultural and regulatory activities
- Technical committees active on specific issues
- Joint activities with Italian and international Associations, Universities, Italian and European authorities, both public and private

- Work groups created to give operational support to Institutions
- Participation in the definition of regulations, laws, guidelines and collaboration in the drafting of technical standards with the most important organizations for standardization.

## UPDATING AND TRAINING: A MUST

Keeping pace with technological development and the evolution of regulations it is today a condition of survival for professionals and companies in the industry. AiCARR offers high standard theory and practical courses through AiCARR Formazione, business unit of AiCARR Educational srl-SB, a ISO 9001:2015 certified company. AiCARR Formazione is a provider of CNL and of CNPI (national councils for engineers and technical experts) for continuing professional education credits. The courses are aimed at designers, maintenance technicians, technical and sales staff of organizations and industries, students and researchers. Teachers are academics and professionals selected among the best experts in the field of HVAC&R.

## WHEN IDEAS GO AROUND, THEY BECOME MORE POWERFUL

AiCARR publishes the records of all conferences and the AiCARR technical book series which includes Volumes, Guides, Manuals and Vademecums, sends the fortnightly newsletter on associative, editorial, regulatory, legislative and training news and is the exclusive distributors for Italy of ASHRAE publications and standards, applying to Members favorable conditions for the purchase of the CEI (Italian electro-technical committee) regulations and discounts on publications by important technical publishers. The Association's library offers a wide selection of technical and scientific texts in free consultation.

Moreover, on website [www.aicarr.org](http://www.aicarr.org), and through the App downloadable from website, it is possible to find technical articles and news.

Members also receive AiCARR Journal, official magazine of the Association, for free.

## PLATINUM SPONSOR



---

## SESSION THEME SPONSOR



---

## SILVER SPONSOR

