

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



## SPECIAL PARTNER



The human factor affects significantly the actual energy performance over the building life cycle. The incorporation of behavioral insights into the building design and operation is starting to be recognized as a key topic. Research efforts are therefore needed for fully integrating human dimensions in the building energy performance: data on occupant behavior have to be collected and properly elaborated; drivers and motivations have to be understood; indexes describing users comfort preferences and the impact on health and productivity have to be identified; new modeling approaches and tools need to be developed; design and operating strategies centered on occupants have to be defined. This paradigm shift, based on occupants more than on advanced systems and technologies to reduce energy costs, activates a virtuous process, where not only occupants can benefit from it but also building owners, building operators and energy managers, enhancing comfort conditions and productivity and making more cost effective and energy efficient the whole process.

## ENDORSED BY



The human dimension of the energy entails also facing important cultural and social issues which are still a barrier. Novel strategies and approaches that engender efficiency has to be implemented, through policies aimed at engaging and empowering people, at reducing social and gender inequalities, at fighting fuel poverty.



PATROCINIO  
REGIONE DEL VENETO

The conference brings together researchers, professionals and practitioners to present and discuss the latest research on this topic. On behalf of the Organizing Committee, we warmly invite you to join us in Venice.



*All papers will be presented in English  
Simultaneous translation is provided only in Sala Teatro*



# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



Time	Mercoledì 20 Wednesday 20th	Giovedì 21 Thursday 21st	Venerdì 22 Friday 22nd
08:00 a.m.			
09:00 a.m.		Sala Teatro Keynote Speech: Human-Building Integration as a Principle of High Performance Buildings <i>Joon-Ho Choi - School of Architecture, University of Southern California</i>	Sala Teatro Parallel Session 1 Chair: Valentina Serra <i>Policies and social implications related to occupants and energy consumption</i>
09:30 a.m.			Room 2 Parallel Session 2 Chair: Livio Mazarella <i>Occupant modeling and digital tools</i>
10:00 a.m.			
10:30 a.m.		Coffee Break	Sala Teatro Keynote Speech: Wellbeing at the Heart of Design Process <i>Human-Centred Building Design: Wellbeing at the Heart of Alfonso Senatore - Green Building Design Consultant, Senior Lecturer in Architecture, University of East London, UK</i>
11:00 a.m.	Registration		Sala Teatro Chair: Piercarlo Romagnoni Seminar: Best practices and case studies
11:30 a.m.		Sala Teatro Parallel Session 1 Chair: Marielena De Simone <i>Occupant data, comfort and satisfaction</i>	
12:00 p.m.		Room 2 Parallel Session 2 Chair: Marco Beccali <i>Occupant-centric building operating strategies</i>	
12:30 p.m.		Networking Lunch	Closure of the Conference
1:00 p.m.			
1:30 p.m.			
2:00 p.m.			Light Lunch
2:30 p.m.	Sala Teatro - PLENARY SESSION OPENING CEREMONY Welcome addresses AICARR President Counselor City of Venice REHVA President ASHRAE Past President Keynote Speech: Sustainability: opportunities for the development of an inclusive and resilient city <i>Ilaria Caprioglio, Mayor of Savona</i>	Sala Teatro AICARR - REHVA Workshop Chairs: Francesca R. d'Ambrosio, Stefano P. Corgnati <i>Closing the quality gap: from design to real buildings</i>	TECHNICAL VISIT Scuola Grande Santa Maria della Misericordia
3:00 p.m.			
4:00 p.m.		Coffee Break	
4:30 p.m.			
5:00 p.m.	Introduction to the conference: The role of human factors and ergonomics for building energy sustainability <i>Erminia Attaiatese, University of Napoli Federico II</i>	Sala Teatro Parallel Session 1 Chair: Cesare M. Joppolo <i>Occupant data, comfort and satisfaction</i>	
5:30 p.m.		Room 2 Parallel Session 2 Chair: Vincenzo Corrado <i>Occupant modeling and digital tools</i>	
6:00 p.m.	Welcome Party		
6:30 p.m.			
7:00 p.m.			
8:30 p.m.		Gala Dinner	

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



## GENERAL PROGRAMME

Wednesday 20<sup>th</sup> - Sala Teatro

### PLENARY SESSION

Chair: Francesca R. d'Ambrosio—AiCARR President

11,00 a.m. - 5,30p.m. **Registration**

#### Welcome addresses

Francesca R. d'Ambrosio, *AiCARR President*

2,30 p.m. Massimiliano Marin, *Counsilor City of Venice*

Stefano P. Corgnati, *REHVA President*

Bjarne Olesen, *ASHRAE Past President*

Keynote speech:

3,30p.m. **Sustainability: opportunities for the development of an inclusive and resilient city**

Ilaria Caprioglio, *Mayor of Savona*

4,30 p.m. **The role of human factors and ergonomics for building energy sustainability**

Erminia Attaianese, *Department of Architecture, University of Napoli Federico II, Italy*

5,30 p.m. **Welcome Cocktail**

### Thursday 21<sup>st</sup> - Sala Teatro—Room 2

8,00 a.m. - 17,30 p.m. **Registration**

Keynote speech:

9,00 a.m. **Human-Building Integration as a Principle of High Performance Buildings**

Joon-Ho Choi, *School of Architecture, University of Southern California, U.S.A.*

10,00 a.m. **Coffee break**

10,30 a.m. - 12,30 p.m. **2 Parallel Technical Sessions**

12,30 p.m. **Networking Lunch**

**AiCARR -REHVA Workshp:**

2,00 p.m. **Chair:** Francesca R. d'Ambrosio, *AiCARR President*—Stefano P. Corgnati, *REHVA President*

**Closing the quality gap: from design to real building**

3,30 p.m. **Coffee break**

4,00 - 6,00 p.m. **2 Parallel Technical Sessions**

8,30 p.m. **Gala Dinner**

### Friday 22<sup>nd</sup> - Sala Teatro—Room 2

8.00 -10.30 a.m. **Registration**

9,00—10,00 a.m. **2 Parallel Technical Sessions**

Keynote speech:

10,15 a.m. **Human-Centred Building Design: Wellbeing at the Heart of Design Process**

Alfonso Senatore, *Green Building Design Consultant - Senior Lecturer in Architecture - University of East London, UK*

**Seminar:**

11,00 a.m. **Chair:** Piercarlo Romagnoni, *Università IUAV, Venezia*

**Best practices and case studies**

1,00 p.m. **Closing Ceremony**

1,30 p.m. **Light Lunch**

3,00 p.m. **Technical Visit Scuola Grande Santa Maria della Misericordia**

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



Thursday 21<sup>st</sup>

Occupant Data, comfort and satisfaction

Sala Teatro

Parallel Session 1

Chair: *Marilena De Simone, University of Calabria*

**Exploring the use of color lights on the perception of indoor climate for energy efficiency in virtual reality**

- 10,30 a.m. Giulia Wally Scurati, Roberta Etzi, Siyuan Huang, Serena Graziosi, Francesco Ferrise, Monica Bordegoni, *Department of Mechanical Engineering, Politecnico di Milano, Italy*  
Siyuan Huang, *Department of Design, Politecnico di Milano, Italy*  
Alberto Gallace, *Department of Psychology, University of Milano-Bicocca, Italy*  
Lavinia Chiara Tagliabue, *Department of Civil, Environmental, Architectural Engineering and Mathematics, University of Brescia, Italy*

**Thermal comfort and visual interaction: a subjective survey**

- 10,45 a.m. Laura Bellia, Francesca Fragiasso, Igor Boris Palella, Giuseppe Riccio, *Department of Industrial Engineering, University of Napoli Federico II, Italy*  
Francesca R. d'Ambrosio, *Department of Industrial Engineering, University of Salerno, Italy*

**Control of dynamic glazing in heating dominated climate for office building: contrasting occupant visual comfort requirements with energy use**

- 11,00 a.m. Manuela Baracani, Luigi Giovannini, Fabio Favoino, Valentina Serra, *Department of Energy, Politecnico di Torino, Italy*

**Improvement of visual comfort through a human-centered methodology. An experience of post occupancy evaluation in hospital buildings**

- 11,15 a.m. Alessia Spirito, Federica Giuliani, *Sapienza University of Roma, Italy*

**Indoor environmental quality, individual attitudes and group dynamics in shared environments: investigation of users' behaviour in school classrooms through a multi-level holistic approach**

- 11,30 a.m. Piercarlo Romagnoni, Francesca Cappelletti, Lorenza Pistore, *Department of Architectures and Arts, University of Venezia, Italy*

**Subjective evaluation of indoor environmental quality in educational buildings: the case of University IUAV of Venice**

- 11,45 a.m. Iliara Pittana, Francesca Cappelletti, Piercarlo Romagnoni, *Department of Architectures and Arts, University of Venezia, Italy*

**A comprehensive human comfort assessment protocol based on multidomain measurements and surveys**

- 12,00 p.m. Iliara Pigliatile, *Department of Engineering, University of Perugia, Italy*  
Marco Arnesano, Sara Casaccia, Andrea Calvaresi, Gian Marco Revel, Nicole Morresi, *Department of Industrial Engineering, Università Politecnica delle Marche, Ancona, Italy*  
Anna Laura Pisello, *Department of Engineering, University of Perugia, Italy*

12,15 p.m. Discussion

12,30 p.m. Lunch

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



Thursday 21<sup>st</sup>

Occupant-centric building operating strategies

Room 2

Parallel Session 2

Chair: Marco Beccali, University of Palermo

**Active house and sensors' monitoring campaign towards the final user: VELLUX-lab, a smart building prototype**

10,30 a.m. Marco Imperadori, Graziano Salvalai, Andrea Vanossi, Federica Brunone, *Department of Architecture, Built Environment, Construction Engineering, Politecnico di Milano, Italy*  
Rossano Scoccia, *Department of Energy, Politecnico di Milano, Italy*

**AI applications in the building process**

10,45 a.m. Damiano Di Ciaccio, Edoardo Maroder, Sara Ambrosio, *RiLo, Roma, Italy*  
Francesco Livio Rossini, *Faculty of Civil Industrial Engineering, Sapienza University of Roma, Italy*  
Agostino Di Ciaccio, *Department of Statistics, Sapienza University of Roma, Italy*

**Model-free control of indirect evaporative cooling systems**

11,00 a.m. Alessandro Beghi, Michele Lionello, Mirco Rampazzo, *Department of Information Engineering, University of Padova, Italy*

**Experimental analysis of a new air handling unit system for residential buildings: the DemoLab case-study**

11,15 a.m. Angelo Zarrella, Giuseppe Emmi, Emanuele Lazzarini, *Department of Industrial Engineering, University of Padova, Italy*  
Enrico Biasin, *Aertesi Srl, Conselve (Padova), Italy*

**Existing building commissioning procedures as best practice for optimizing human comfort and energy performance. An extreme study case**

11,30 a.m. Ugo Lucio Benedetti, Giulia Serblin, *Tecservice srl, Mestrino (Padova), Italy*

**An IoT-based integrated tool for testing energy consumption user awareness**

11,45 a.m. Marco Dell'Isola, Giorgio Ficco, Laura Canale, *Department of Mechanical, Civil and Engineering, University of Cassino and Lazio Meridionale, Italy*  
Boris Igor Palella, *Department of Industrial Engineering, University of Napoli Federico II, Italy*  
Giovanni Puglisi, *ENEA Centro della Casaccia, Roma, Italy*

12,00 p.m. **Discussion**

12,30 p.m. **Lunch**

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



Thursday 21<sup>st</sup>

Sala Teatro

AiCARR – REHVA Workshop

**Closing the quality gap: from design to real buildings**

**Chair: Francesca R. d'Ambrosio, AiCARR President - Stefano P. Corgnati, REHVA President**

The session deals with the topic of the permeance gap between the design phase and real operation life in buildings focusing on quality and added value approaches that cover the entire Building Life Cycle. Starting from the Green Building Council experience on quality and sustainability, the session will continue on both the experience of EU projects funding under the H2020 by the European Commission that are addressing this topic.

The Basing on the research activities and real application on field performed in some international research project as Hit2Gap, Quantum BIM4REN and Built2Spec, available tools and procedures to reduce the gap will be presented. Hit2Gap offers an on-line platform which can integrate several informatic modules covering a large variety of relevant solutions to close the performance gap, as faults diagnosis and detection, load forecasting, building performance simulation and related energy models calibration, uncertainty and sensitivity analysis, user behaviour analysis and others. Quantum project has developed specific software tools to check in easier and accurate way if building systems work according to the quantitative targets and functions defined in the planning phase, a software tool to offer comprehensive and fast comfort survey to building users, and an easy and cost-effective systems of components to monitor the performance of buildings and systems. In the workshop, these solutions will be presented also focusing on application in real buildings and construction sites. The session will close with real buildings case studies where integrated design and BIM have led to high-end buildings and improved the overall process and building performance.

- 2,00 p.m.**      **Sustainability certification protocols to improve quality level in buildings**  
Giuliano Dall'O', *Green Building Council Italy President*
- 2,15 p.m.**      **Digitalise or Die - Innovative and replicable experience on field from UE research projects**  
**Buil2Spec, Hit2Gap and BIM4REN**  
Andrea Costa, *Co Founder and Managing Partner - R2M Solution*
- 2,30 p.m.**      **Quantum project - Quality management for building performance - improving energy**  
**performance by life cycle quality management**  
Marco Pietrobon, *EU Project Manager - R2M Solution*
- 2,45 p.m.**      **BIM solutions and integrated design as tools for quality assurance in the whole construction**  
**sector**  
Laura Rusconi Clerici, *CEO - TEKNE Spa*
- 3,00 p.m.**      **Monitoring and control of a zero energy building**  
Lorenzo Pagliano, *Director of eERG Group, Politecnico di Milano*
- 3,15 p.m.**      **Discussion**

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE

Thursday 21<sup>st</sup>



## Occupant Data, comfort and satisfaction

### Sala Teatro

#### Parallel Session 1

*Chair: Cesare M. Joppolo, Politecnico di Milano*

**Built heritage: strategies of people involvement for minimizing retrofit interventions.  
A review of documents and case studies**

4,00 p.m. Alessia Buda, Valeria Pracchi, *Department of Architecture, Built Environment and Construction Engineering, Politecnico di Milano, Italy*

**On the misleading perception by the occupants of the indoor air renewals. First experimental evidences in densely occupied lecture halls**

4,15 p.m. Vincenzo A. Spena, *Department of Astronautical Electrical and Energy, University "Tor Vergata", Roma, Italy*  
Carlo Mazzenga, Viola Laria, *Department of Enterprise Engineering, University "Tor Vergata", Roma, Italy*

**Contemporary use of historic buildings: desirable convergences between memory and adaptation**

4,30 p.m. Valentina Florio, *Department of Civil Engineering, University "Tor Vergata", Roma, Italy*

**Balancing comfort and Indoor Air Quality in high-riser buildings for social housing in Kuala Lumpur: from regulations to construction**

4,45 p.m. Cristina Gonzalez-Longo, Mohd Sahabuddin Mohd Firrdhaus, *Department of Architecture, University of Strathclyde, Glasgow, UK*

**Costs and benefits of an antibacterial filter and its effects on energy saving, human health and worker productivity**

5,00 p.m. Cristina Becchio, Stefano Paolo Corgnati, Valentina Fabi, Carola Lingua, *Department of Energy, Politecnico di Torino, Italy*  
Leonardo Prendin, Micaela Ranieri, *Rhoss spa, Arquà Polesine, Rovigo, Italy*

**Planning of monitoring and efficient use residential of buildings: a case study in L'Aquila, Italy**

5,15 p.m. Luisa Capannolo, Annalisa Taballione, Pierluigi De Berardinis, *Department of Civil Building Engineering, Environmental Architecture, University of L'Aquila, Italy*

5,30 p.m. **Discussion**

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



Thursday 21<sup>st</sup>

Occupant modeling and digital tools

Room 2

Parallel Session 2

Chair: Vincenzo Corrado, Politecnico di Torino

- Activity and occupancy profiling based on data collected by questionnaire. Pilot study on a residential buildings sample**  
4,00 p.m. Cristina Carpino, Gianmarco Fajilla, Marilena De Simone, *Department of Mechanical, Energy and Management, University of Calabria, Italy*
- The influence of the building energy retrofit on the occupant behavior: results of a survey in a pilot case in Torino**  
4,15 p.m. Elisa Primo, Ilaria Ballarini, Vincenzo Corrado, *Department of Energy, Politecnico di Torino, Italy*
- Influence of building use on the definition of energy retrofitting strategies. An expository public building case study**  
4,30 p.m. Stefano Pili, Francesca Poggi, Eusebio Loria, Caterina Frau, *Sotarbo spa, Carbonia, Cagliari, Italy*
- Assessing actual building performance in social housing. Results from two years of monitoring**  
4,45 p.m. Elisa Sirombo, Marco Filippi, *Department of Energy, Politecnico di Torino, Italy*
- The role of occupant's behaviors in high performance social houses**  
5,00 p.m. Alessandro Prada, Paolo Baggio, *Department of Civil, Environment and Mechanical Engineering, University of Trento, Italy*
- Data-driven anomaly detection in HVAC chillers**  
5,15 p.m. Alessandro Beghi, Mirco Rampazzo, Francesco Simmini, *Department of Information, University of Padova, Italy*  
Fabio Peterle, *Ever\_est srl, Pordenone, Italy*
- Measurements and energy simulations of a solar combi-system for space heating and DHW production**  
5,30 p.m. Michele De Carli, Giuseppe Emmi, Samantha Graci, Sara Bordignon, Giulia Alessio, Laura Carnieletto, *Department of Industrial Engineering, University of Padova, Italy*  
Stefano Faganello, *EXRG srl, Mareno di Piave (Treviso), Italy*
- 5,45 p.m. **Discussion**

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE

Friday 22<sup>nd</sup>



Policies and social implications related to occupant and energy consumption

**Sala Teatro**

**Parallel Session 1**

**Chair: Valentina Serra, Politecnico di Torino**

- 9,00 a.m. **The perceived value of energy-efficient dwellings in the European housing market**  
Maarja Meitern, *Bax & Company, Barcelona, Spain*
- 9,15 a.m. **Fighting against energy poverty in Piemonte (Italy)**  
Pietro Florio, *Solar Energy Building Physics Laboratory LESO-PB, EPFI, Switzerland*  
Enrico Fabrizio, Marco Filippi, *Department of Energy, Politecnico di Torino, Italy*
- 9,30 a.m. **Do international standards take into account diversity when specifying requirements for thermal comfort?**  
Bjarne W. Olesen, *Department of Civil Engineering, Technical University of Denmark, Lyngby, Denmark*  
Dolaana Khovalyg, *Civil Engineering Institute, Ecole Polytechnique Federale de Lausanne, Switzerland*
- 9,45 a.m. **Mitigation of energy poverty in Europe through the set-up of networks and the implementation of pilot actions**  
Anna Realini, Simone Maggiore, *Ricerca sul Sistema Energetico - RSE spa, Milano, Italy*  
Marina Varvesi, Valentina Castello, *AISFOR srl, Roma, Italy*
10. a.m. **Discussion**

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE

Friday 22<sup>nd</sup>



## Occupant modeling and digital tools

Room 2

Parallel Session 2

Chair: *Livio Mazzarella, Politecnico di Milano*

### **Strategies to integrate human behavior and energy efficiency: a case study**

9,00 a.m. Blake Wentz, *Milwaukee School of Engineering, Wisconsin, USA*  
Timothy Wentz, *University of Nebraska—Lincoln, Nebraska, USA*

### **On the relationship between residential energy expenditure and building factors, socio-demographic variables and appliances**

9,15 a.m. Giorgio Besagni, Marco Borgarello, *Ricerca sul Sistema Energetico - RSE Spa, Milano, Italy*

### **Sensitivity analysis of energy demand and indoor comfort indexes on the occupant behaviour in a single-zone office**

9,30 a.m. Jean Pierre Campana, Gian Luca Morini, *Department of Industrial Engineering, Alma Mater Studiorum, University of Bologna, Italy*

### **The human action on building envelope: application of hourly dynamic calculation engine on real cases**

9,45 a.m. Alberto Boriani, Annachiara Castagna, *Logical Soft, Desio (Milano), Italy*

10,00 a.m. **Discussion**

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE

Friday 22<sup>nd</sup>



Sala Teatro

**SEMINAR: Best practices and case studies**  
*Chair: Piercarlo Romagnoni, University of Venice*

- Comfort, satisfaction and productivity of employees in the University of Calabria. Preliminary results of an interdisciplinary survey on the human-building interaction**  
11,00 a.m. Gianmarco Fajilla, Marilena De Simone, *Department of Mechanical, Energy and Management, University of Calabria, Italy*
- Energy conservation opportunities in historic buildings. A methodology focused on building operation and occupants' engagement**  
11,15 a.m. Giorgia Spigliantini, Valentina Fabi, Chiara Aghemo, Stefano Paolo Corgnati, *Department of Energy, Politecnico di Torino, Italy*  
Marcel Schweiker, *Department of Architecture, Karlsruhe Institute of Technology, Karlsruhe, Germany*
- A methodological framework to motivate and assess behavioural change: insights into an interdisciplinary user awareness campaign**  
11,30 a.m. Verena Marie Barthelmes, Cristina Becchio, Giulia Vergerio, Stefano Paolo Corgnati, *Department of Energy, Politecnico di Torino, Italy*  
Simona Oca, Ana Tisov, *Huygen Engineers and Consultants, Maastricht, Netherlands*  
Andrei L. Litiu, *Division of Building Services and Energy Systems, KTH Royal Institute of Technology, Stockholm, Sweden*
- Case study: Province of Treviso best practices and experiences about energy management**  
11,45 a.m. Antonio Zonta, Maurizio Tufaro, Marina Coghetto, *Settore Edilizia, Provincia di Treviso, Italy*  
Alessandro Festuccia, Elisabetta Baldi, Pasquale Soleo, Guglielmo Ela Oyana, *BEC'S srl, Roma, Italy*  
Massimo Davanzo, Andrea Bianco, *Aceagas Aps Amga, Servizi Energetici spa, Udine, Italy*
- Strategies to promote the employees' participation in improving the energy performance of their company**  
12,00 a.m. Vincenzo Delle Site, *Department of Engineering, National Research Council of Italy*  
Salvatore Di Cristofalo, *Institute of Biosciences, National Research Council of Italy*
- Energy efficiency and occupants' behavior: analysis of a public housing case study**  
12,15 p.m. Andrea Sangalli, Lorenzo Pagliano, Francesco Causone, *end-use Efficiency Research Group, Department of Energy, Politecnico di Milano, Italy*  
Giuseppe Salvia, Eugenio Morello, *Department of Architecture and Urban Studies, Politecnico di Milano, Italy*
- Best practices in listed public historic buildings**  
12,30 p.m. Francesca R. d'Ambrosio, *Department of Industrial Engineering, University of Salerno, Italy*  
Filippo De Rossi, Giuseppe Peter Vanoli, Rosa Francesca De Masi, *University of Sannio, Benevento,*
- 12,45 p.m. **Discussion**
- 1,00 p.m. **Closing Ceremony**
- 1,30 p.m. **Light Lunch**

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



## SCIENTIFIC COMMITTEE

**President:** Francesca R. d'Ambrosio - AiCARR President

**President of Cultural Commission:** Valentina Serra - Politecnico di Torino

- Erminia Attaianese - Università degli studi di Napoli Federico II
- Marco Beccali - Università degli Studi di Palermo
- Jolanda Colda - Technical University of Civil Engineering of Bucarest
- Stefano P. Corgnati - Politecnico di Torino
- Livio de Santoli - Università La Sapienza Roma
- Marilena De Simone - Università della Calabria
- Marco Filippi - Politecnico di Torino
- Cesare M. Joppolo - Politecnico di Milano
- Ivo Martinac - KTH Royal Institut of Technology Sweden
- Livio Mazzarella - Politecnico di Milano
- Bjarne Olesen - ASHRAE
- Federico Pedranzini - Politecnico di Milano
- Piercarlo Romagnoni - Università IUAV Venezia
- Jorn Toftum - Technical University of Denmark
- Michele Vio - Studio Associato Vio

## ORGANIZING COMMITTEE

**Coordinator:** Luca A. Piterà - AiCARR General Secretary

- Filippo Busato - AiCARR Veneto Territorial Delegate
- Alessandra Vio - Studio Associato Vio
- AiCARR Secretariat

*Registration on site: Ground Floor c/o Auditorium Centro Congressi San Servolo*

◆ *February 20<sup>th</sup>: 11.00 a.m. - 5.30 p.m.*

◆ *February 21<sup>st</sup>: 8.00 a.m. - 5.30 p.m.*

◆ *February 22<sup>nd</sup>: 8.00 - 10.30 a.m.*

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



## CONSULTA INDUSTRIALE



## CONFERENCE TOPICS

### Occupant Data, comfort and satisfaction

Indoor environmental parameters (thermal, visual, aural, and olfactory comfort) in the context of energy-related occupant actions and preferences

Health, human performance and productivity in the built environment

Ergonomics of built environment, and design of flexible spaces

Demand based comfort, adaptive comfort

### Occupant-centric building operating strategies

Building automation systems, Internet of Things, BIM

Controls usability and O&M of building energy systems

Integration of advanced techniques and tools for HVAC system design and operation

Demand-response and smart technologies for high performing buildings

Personalised comfort

### Occupant modelling and digital tools

Tracking and Data analysis (data mining, machine learning, artificial intelligence, statistical modelling)

Applications of occupant behaviour models in design, evaluation and operation optimization

Time-related factors, activity profiling and occupancy patterns

Building energy dynamic simulations, real time simulations

Simulated and actual energy consumption

### Policies and social implications related to occupants and energy consumption

Engagement, exploration and empowerment strategies

Occupants Inter- and Intra-Individual differences for reducing inequalities

Fuel poverty

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



## REGISTRATION FEES

Participants	Early bird within January 30 <sup>th</sup> 2019 (+VAT 22%)	After January 30 <sup>th</sup> 2019 (+VAT 22%)
AiCARR Members	450,00	500,00
ASHRAE, REHVA Members	500,00	550,00
* Non Members	600,00	650,00
Speakers Members (free papers)	400,00	450,00
Speakers Members (free papers) ASHRAE, REHVA	450,00	500,00
Speakers Non Members (free papers)	550,00	600,00
AiCARR Student Members (max 30 years old)	100,00	120,00
Student Non Members	120,00	140,00
***Accompanying persons	175,00	175,00
** Gala Dinner	80,00	80,00

The registration fee includes Entrance to the Scientific Meeting, welcome Cocktail, Coffee Break and business Lunch and proceedings on USB key.

\* The AiCARR Membership fee is euro 135,00 plus VAT of euro 5 and euro 20 for students.

\*\* Gala dinner is not included in the conference fee

\*\*\* The accompanying fee includes participation to: Plenary Session, Technical Sessions, Coffee Breaks, Welcome Party and Business Lunch.

It is also possible to attend specific days of the conference

## REGISTRATION FEES FOR THE HALF-DAY ATTENDANCE

Participants	Benefits included in the fee	Early bird within January 30 <sup>th</sup> 2019 (+VAT 22%)	After January 30 <sup>th</sup> 2019 (+VAT 22%)
AiCARR, ASHRAE, REHVA Members February 20th from 2 a.m. to 5,30 p.m.	Welcome Cocktail	120,00	130,00
AiCARR, ASHRAE, REHVA Members February 21th from 9.00 a.m. to 12,30 p.m.	Coffee Break and Lunch	120,00	130,00
AiCARR, ASHRAE, REHVA Members February 21th from 2.00 p.m. to 6.00 p.m.	Lunch and Coffee Break	120,00	130,00
AiCARR, ASHRAE, REHVA Members February 22th from 9.00 a.m. to 12,30 p.m.	Light Lunch	120,00	130,00
Non Members February 20th from 2 a.m. to 5,30 p.m.	Welcome Cocktail	150,00	170,00
Non Members February 21th from 9.00 a.m. to 12,30 p.m.	Coffee Break and Lunch	150,00	170,00
Non Members February 21th from 2.00 p.m. to 6.00 p.m.	Lunch and Coffee Break	150,00	170,00
Non Members February 22th from 9.00 a.m. to 12,30 p.m.	Light Lunch	150,00	170,00

# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



The 51st AiCARR International Conference will be hosted in San Servolo, a little island just a few minutes away by ferry from Piazza San Marco, where an ancient Benedictine convent once stood. The redevelopment of existing structures has made San Servolo one of the main congress centers in Venice.



For those who want to stay overnight on the island of San Servolo, an hotel is available adjacent to the conference rooms. Reservations at the email address [reception@servizimetropolitani.ve.it](mailto:reception@servizimetropolitani.ve.it)



The Gala Dinner will be held on the evening of February 21 at the Taverna La Fenice, the restaurant next to the homonymous theater. The central location of the restaurant will allow participants to know the heart of the city and to enjoy the charm of Venice.



# THE HUMAN DIMENSION OF BUILDING ENERGY PERFORMANCE



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**AICARR** 51<sup>st</sup> INTERNATIONAL  
CONFERENCE

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