



INTERNATIONAL SCIENTIFIC CONFERENCE

The Built Environment in Transition

**3 - 5 SEPTEMBER 2025 EPFL
LAUSANNE SWITZERLAND**

CONFERENCE DAY 1 PROGRAM

Wednesday 3 September

09:00	Welcome addresses Opening of the conference Prof. Marilyne Andersen, Conference Chair The Challenge of Decarbonising the Swiss Building Sector Andreas Eckmanns, Swiss Federal Office of Energy, Head of Research for Buildings				2 / 3 ABC
09:30	Keynotes Living in consumption corridors: housing sufficiency for sustainable wellbeing Marlyne Sahakian, Associate Professor of Sociology of Consumption and Sustainability, University of Geneva Rethinking Concrete Construction: From research to practice Philippe Block, Professor of Architecture and Structures, Block Research Group, ETHZ and director of the Swiss National Centre of Competence in Research (NCCR) on Digital Fabrication				
10:30	Coffee break				
	2 / 3 ABC	1 BC	4 BC	5 ABC	
11:00	Session A1 Heating & cooling: Heat pump systems	Session B Indoor air quality, health & productivity	Session C1 Life cycle analysis	Workshop Co-Creation Frameworks for Human-Centered Climate-Adaptive Buildings	
12:30	Lunch				
14:00	Session A2 Heating & cooling: Cooling & HVAC modelling Poster session A	Session D Daylighting & artificial lighting Poster sessions B D	Session E Regenerative planning & materials Poster sessions C E	Workshop Radical Rapid Paths to Net Zero Housing via Mutually Reinforcing Actions	
16:00	Coffee break				
16:15	Session F Predictive & adaptive control Poster session F	Session G Controls & occupant behaviour Poster session G	Session H Renewable energy Poster session H	Workshop Beyond the Start: Achieving Long- Term Personalized Environmental Control Systems Success	
18:30	End of 1st conference day - Individual transfer to evening event				
19:30	Evening networking dinner in the Olympic Museum Restaurant				

CONFERENCE DAY 2 PROGRAM

Thursday 4 September

09:00

Opening of 2nd conference day

Prof. Marilyne Andersen, Conference Chair

09:15

Keynotes

Towards a thriving economy within planetary boundaries

Jean-Pierre Danthine, Honorary Director of Enterprise for Society E4S, Switzerland

The invisible variables in a diverse world: Gender and culture in sustainable built environment research

Ronita Bardhan, Associate Professor of Sustainable Built Environment at the University of Cambridge, Director - Cambridge Sustainable Design Group

2 / 3 ABC

10:15

Coffee break

2 / 3 ABC

1 BC

4 BC

5 ABC

10:45

Session I1

Urban scale energy management 1

Session K1

Thermal comfort in buildings

Session L

Circular design, re-use & recycle

Workshop

Cumulative Multidomain Research: Progress & Future

12:30

Lunch

14:00

Session I2

Urban scale energy management 2

Session K2

Thermal comfort in urban spaces

Session M

Digital platforms for energy performance

Workshop

Decarbonise with CEA Series 4: What's Next?

Poster session I

Poster session K

Poster sessions L | M

16:30

Coffee break

2 / 3 ABC

16:45

Award ceremony

16:55

How should we live together? Exploring the economic, urban and resource dimensions of sustainable living

Panel discussion moderated by Marilyne Andersen

- Sylvain Grisot, Urban Planner, Founder of Dixit.net
- Sébastien Houde, Professor of Environmental Economics, University of Lausanne
- Dirk Hebel, Professor of Sustainable Construction, Karlsruhe Institute of Technology

18:15

Aperitif

VISITS

Friday 5 September

VISITS IN LAUSANNE | EPFL CAMPUS

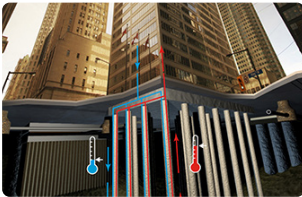
08:50 - Meeting at STCC lateral entrance
09:00 - Tours
12:30 - Light lunch in STCC hall

Lausanne Tour A - Thermal Systems



100% renewable thermal power plant

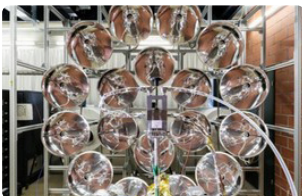
Thanks to thermal heat exchange with Lake Geneva and a thermal plant using the latest technology, heating and cooling of the whole EPFL campus is provided entirely without fossil fuels. A data center installed above the plant is cooled by the cold-water discharges from the power plant and will in turn provide heat from the servers. The building is fully clad with photovoltaic façade elements.



Digging deep: geothermal systems and CO2 sequestration

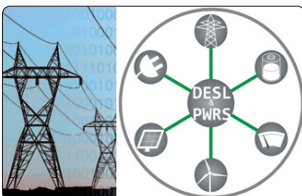
The Laboratory of Soil Mechanics (LMS) investigates geothermal systems and CO2 sequestration in deep geological formations as well as energy geostructures that can serve as structural supports as well as heating and cooling elements for buildings and infrastructures. Furthermore, it explores the potential of CO2 capture and storage in depleted oil or gas reservoirs, saline formations and coal seams based on structural, stratigraphic and chemical trapping mechanisms.

Lausanne Tour B – Smart Grid & Renewables



Levelling the seasons - promising innovations in renewable energy storage

The Laboratory of Renewable Energy Science and Engineering (LRESE) investigates the conversion of renewable energies (solar, wind, biomass, hydro and geothermal) into storable fuels, materials and commodities. A special focus lies on novel, solar driven energy conversion methods based on solar thermal, thermochemical and electrochemical processes.



Smart grid monitoring and operation

To ensure a sustainable, economic and secure electricity supply, the EPFL Distributed Electrical Systems Lab develops advanced smart grid solutions using cutting edge monitoring and operation technologies. Amongst other, it runs a time-deterministic monitoring system of the EPFL campus to control in real-time a utility-scale battery energy storage system, enabling multiple control functions.

Continued

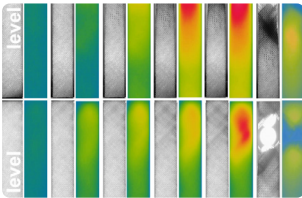
VISITS IN LAUSANNE | EPFL CAMPUS

Lausanne Tour C – Smart Grid & Renewables



The sustainability potential of robotic construction

The Lab for Creative Computation operates at the interface of design, digital technologies and construction. New construction modes combine robotics with human interventions and digital media in pursuit of more creative solutions to contemporary design and construction challenges, with a particular focus on sustainable construction approaches.



Composite material innovation for renewable energy performance

Part of the EPFL structural engineering platform GIS, the Composite Mechanics Group focuses on the performance of composite materials and their implementation for creating innovative engineering structures. The center of attention is the area of renewable energy conversion systems, wind turbine rotor blades, and offshore composite structures.



Future cement and concrete

Due to energy-intensive clinker production, concrete and cement are key contributors to global CO2 emissions. EPFL's Laboratory of Construction Materials (LMC) offers insight into cutting-edge research on low-carbon alternatives, recycled aggregates, and optimized formulations. The lab's wide range of testing facilities supports the development of durable, environmentally friendly concretes.

Lausanne Tour D – Daylighting & Solar Boat Challenge



Multiple facets of Daylighting research

Framing daylight as a driver of both occupant well-being and building performance, the Laboratory of Integrated Performance in Design (LIPID) focuses on its impact across health, comfort, perception, and energy use. Its research combines quantitative analyses with psycho-physiological experiments to inform design strategies that balance energy efficiency with visual and thermal wellbeing.



Swiss Solar Boat Challenge

Swiss Solar Boat is a student-led EPFL project focused on sustainable maritime transport. Its solar-powered hydrofoil prototype gained international recognition. In 2024, the team reached a milestone with a 26 km hydrogen-powered foiling crossing of Lake Geneva. They are now developing the Renewable Energy Foiler (REF), a hydrogen-solar hybrid for passenger use, with a 150 km range and speeds up to 35 knots.

VISITS

Friday 5 September

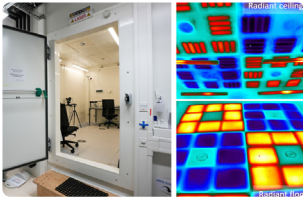
VISITS IN FRIBOURG | SMART LIVING LAB

Circular construction – IEQH – Smart Living Lab design

The EPFL campus in Fribourg is a hub for building related research focused on sustainability. Tour participants will discover research projects and facilities of labs both from EPFL and University of Applied Sciences and Architecture Fribourg as well as innovative developments led by the Building 2050 group, on the basis of which the Smart Living Lab is being built today.

- 08:50 - Meeting at STCC side entrance
- 09:00 - Departure of bus shuttle
- 10:00 - Arrival in Fribourg - start of visits
- 12:30 - Light lunch in Fribourg
- 13:30 - Departure of bus shuttle from drop-off point direction Lausanne
- 14:30 - Arrival and drop-off at Lausanne railway station

VISITS IN FRIBOURG | SMART LIVING LAB



Twin environmental and climatic chambers facility

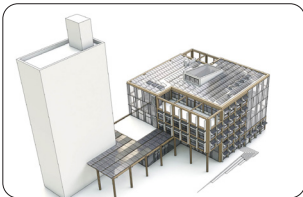
Jointly operated by Integrated Comfort Engineering Lab and Human-Oriented Built Environment Lab, state-of-the-art chambers have been designed for studying the combined impact of occupancy, HVAC systems and controls on indoor air quality, human exposure, thermal comfort and energy performance. The chamber can be modified to simulate distinct indoor environments, such as offices, classrooms, residences, hospitals and healthcare facilities, etc. Both the facilities and the experimental research they are used for are showcased.

Smart Living Lab

The Building 2050 group laid the foundation for the Smart Living Lab, currently under construction. This future research facility will host several EPFL laboratories and include a comprehensive digital twin and IEQ monitoring system, which will allow testing the newest sustainable building technologies as they are developed. A radon protection project, led by the Transform Institute (HEIA-FR), is also integrated into the infrastructure.

Other exciting research

- Alternative construction materials: The Institute of Construction and Environmental Technologies iTEC investigates and develops alternative construction materials and elements.
- Build - Unbuild – Repeat: The Structural Xploration Lab supports the construction industry in its transition towards a more circular economy. Re-use of construction elements beyond the drawing board!
- Occupant centric building design: The EPFL ETHOS Lab investigates the complex relationships between human, environmental, and built systems, spanning data science, building engineering/design, and social science.



KEYNOTE SPEAKERS

3 & 4 September



Marlyne Sahakian

As Associate Professor of Sociology at the University of Geneva, Marlyne Sahakian brings a sociological lens to consumption studies and sustainability. She coordinates research on energy, food, outdoor spaces, and wellbeing. Co-founder of SCORAI Europe, she is co-editor of the BUP journal Consumption and Society. Her books include *Keeping Cool in Southeast Asia: energy consumption and urban air-conditioning*, edited volumes *Food Consumption in the City: Practices and patterns in urban Asia and the Pacific*, and *Teaching and Learning Sustainable Consumption A Guidebook*. She has developed with colleagues the concept of “consumption corridors” for upper and lower limits to consumption, while meeting human needs.

Topic | Living in consumption corridors: housing sufficiency for sustainable wellbeing



Philippe Block

Philippe Block is Full Professor and Head of the Institute of Technology in Architecture at ETH Zurich, where he co-leads the Block Research Group with Dr Tom Van Mele. He also directs the Swiss National Centre of Competence in Research on Digital Fabrication. Philippe studied architecture and structural engineering at the Vrije Universiteit Brussel in Belgium and earned his PhD at the Massachusetts Institute of Technology in 2009. His research focuses on equilibrium analysis of unreinforced masonry vaults, computational form finding and optimization of curved surface structures. Specializing in sustainable structures, he draws on a digitally supported interdisciplinary approach.

Topic | Rethinking Concrete Construction: From research to practice



Jean-Pierre Danthine

Jean-Pierre Danthine is Honorary Professor at the EPFL College of Management of Technology and the University of Lausanne, and Honorary Director of the Enterprise of Society Center. Previously, he was President of the Paris School of Economics and member of the Board of Trustees of the Center for Economic Policy Research, London. From 2010 to 2015, he served on the Governing Board of the Swiss National Bank, following appointments as Professor at the University of Lausanne and Managing Director of the Swiss Finance Institute. His publications have appeared in *Econometrica*, the *Journal of Political Economy*, the *Review of Economic Studies*, the *Journal of Finance* and other leading international journals

Topic | Towards a thriving economy within planetary boundaries



Ronita Bardhan

Ronita Bardhan is Associate Professor of Sustainable Built Environment at the University of Cambridge, Director of Research and Deputy Head of the Department of Architecture. She leads the Cambridge Sustainable Design Group and holds faculty roles at Cambridge Public Health and Cambridge Computer Lab. Her research intersects the built environment, climate change and health, focusing on data-driven strategies for precision prevention. Her seminal work on gender-inclusive climate adaptation shapes policy in the Global South. Ranked among the top 2% scientists in her domain, she was a 2024 UK Women in Engineering finalist and advises policymakers on critical issues related to low-carbon transition and heat-health.

Topic | The invisible variables in a diverse world: Gender and culture in sustainable built environment research

WORKSHOPS

Wednesday 3 September

Workshop
3 September

CO-CREATION FRAMEWORKS FOR HUMAN-CENTERED CLIMATE-ADAPTIVE BUILDINGS

5 ABC

11:00 - 12:30

This workshop will introduce the Human-Centric Buildings (HCB) Network which aims to develop new knowledge, tools, and technologies to address the evolving role of humans—occupants, operators, and other stakeholders—in buildings amid the energy transition. Participants will work together to shape frameworks for design education that reflect CISBAT 2025's core themes, focusing on the essential elements of a human-centric pedagogical approach suited to climate-adaptive building design.

Organisation & moderation

For IEA-EBC Annex 95, Human-Centric Buildings (HCB) Network:
Sherif Goubran, Assistant Professor AUC Egypt
Mohamed Ouf, Associate Professor, Concordia University

Workshop
3 September

RADICAL RAPID PATHS TO NET ZERO HOUSING VIA MUTUALLY REINFORCING ACTIONS

5 ABC

14:00 - 16:00

Societal discourse, public policy, and academia remain centered on incremental action certain to miss climate, biodiversity and wellbeing goals. As a community, we can and must act, by exposing inconsistencies, refocusing debate and action, and ensuring our projects mutually reinforce towards such positive scenarios. This interactive workshop aims to empower the academic community to better contribute to urgently needed societal transition narratives, and by making individual contributions mutually reinforcing.

The same workshop will be held online on 4 September.

Organisation & moderation

Sascha Nick, EPFL Laboratory of Environmental and Urban Economics – LEURE

Workshop
3 September

BEYOND THE START: ACHIEVING LONG-TERM PERSONALIZED ENVIRONMENTAL CONTROL SYSTEMS SUCCESS

5 ABC

16:15 - 18:00

Personalized Environmental Control Systems (PECS) provide the advantage of tailoring the immediate surroundings of an individual instead of regulating the environment of an entire room. While PECS hold significant potential, they also pose challenges for long-term use. This highly interactive workshop will address critical questions about the long-term use and impacts of PECS, focusing on user acceptability, user adaptability and PECS adoptability.

Organisation & moderation

For IEA-EBC Task 87:
Dolaana Khovalyg, Assistant Professor, EPFL
Alireza Afshari, Full Professor, Aalborg University

With the collaboration of

Sasan Sadrizedah, Associate Professor, KTH,
Aleksandra Lipczynska, Assist Professor, The Silesian University of Technology Gliwice,
Babich Francesco, Senior researcher, Eurac Research

WORKSHOPS

Thursday 4 September

Workshop
4 September

CUMULATIVE MULTIDOMAIN RESEARCH: PROGRESS & FUTURE

5 ABC

10:45 - 12:30

In light of inconsistent methodologies and findings across multidomain research, recent efforts have proposed stricter quality standards and targeted solutions. However, persistent gaps underscore the need for collaborative innovation to strengthen the robustness and cumulative value of future research. This workshop will review recent progress, identify actionable priorities for advancing cumulative multidomain research, and develop a roadmap outlining clear next steps.

Organisation & moderation

For RWTH Aachen University (Germany) + Karlsruhe Institute of Technology (Germany) + TU Graz (Austria):

Marcel Schweiker, Professor, RWTH Aachen University

Ardeshir Mahdavi, Professor, TU Graz

With short presentations by

Jian Pan, Isabel Mino-Rodriguez, Irene Martinez-Munoz

Workshop
4 September

DECARBONISE WITH CEA SERIES 4: WHAT'S NEXT?

5 ABC

14:00 - 15:45

CEA delivers support for urban densification and regeneration, district energy system optimisation and urban photovoltaics. This workshop presents the upgraded CEA Series 4, highlighting new features that support low-carbon urban design. Through guided demonstrations, participants will explore practical applications and learn how the tool assists design professionals in making informed decarbonization decisions. The session also includes a collaborative brainstorming activity to generate ideas for future enhancements.

Participants should bring their own laptops.

Organisation & moderation

Chair of Architecture and Building Systems (A/S Chair), ETH Zurich

Dr Zhongming Shi, CEA Product lead

Reynold Mok, Chief Software Engineer of CEA

Workshop
4 September

RADICAL RAPID PATHS TO NET ZERO HOUSING VIA MUTUALLY REINFORCING ACTIONS

ONLINE

14:00 - 16:00

Societal discourse, public policy, and academia remain centered on incremental action certain to miss climate, biodiversity and wellbeing goals. As a community, we can and must act, by exposing inconsistencies, refocusing debate and action, and ensuring our projects mutually reinforce towards such positive scenarios. This interactive workshop aims to empower the academic community to better contribute to urgently needed societal transition narratives, and by making individual contributions mutually reinforcing.

The same workshop will be held on-site on 3 September.

Organisation & moderation

Dr Sascha Nick, EPFL Laboratory of Environmental and Urban Economics – LEURE

ROUNDTABLE PLENARY SESSION

4 September

16:45 - 18:15 Plenary session, Thursday 4 September

Beyond technology: tackling societal challenges on the pathway to climate neutrality

Presentations, roundtable & open discussion moderated by Marilyne Andersen

To illuminate the interplay between technical and societal changes necessary for a sustainable energy transition, we have invited three panelists from diverse backgrounds who will share their unique perspectives with the CISBAT audience.



Sylvain Grisot

Sylvain Grisot is an urban planner (a circular one) and founder of dixit.net, an agency that supports territories and organizations that make the city in their ecological redirection. Consultant, speaker, teacher and researcher, he published in 2024 "Urban redirection". He is also the author of the "Manifesto for circular urbanism" (Apogée 2021), and of "Let's repair the city!" with Christine Leconte (Apogée 2022).



Sébastien Houde

Sébastien holds a PhD from Stanford University and is an environmental and energy economist. His research lies at the intersection of energy, climate, and sustainability, with a focus on digitalization, innovation, industrial organization, and behavioral economics. He specializes in structural econometrics, Big Data, and field experiments, and is particularly interested in how data, technology, behavior, and policy interact. Before joining HEC Lausanne's Department of Economics, he held positions at GEM, ETH Zürich, the University of Maryland (AREC), and Resources for the Future.



Dirk Hebel

Dirk E. Hebel is Professor of Sustainable Construction and the Vice-Dean for Strategic Development of the Department of Architecture at the Karlsruhe Institute of Technology (KIT), Germany. Before, he taught and conducted research in Ethiopia, Singapore, the USA and Switzerland. He studied Architecture at the ETH in Zürich and at Princeton University, USA. He is the author of numerous book publications, lately *Building with Regenerative Materials* and *Building Sorted by Type*. He is co-founder and partner of 2hs Architects, practicing architecture with a focus on resource-respectful construction methods and materials. As Faculty Advisor together with Prof. Andreas Wagner, he won the first Solar Decathlon Competition 2022 held in Germany (Wuppertal) as part of the team RoofKIT.

TOPICAL SESSIONS

Wednesday 3 September

A Sessions

HEATING & COOLING

2/3 ABC

Chair A1: **Prof. Hicham Johra** Chair A2: **Prof. Luca Baldini**

11:00-12:30 **Technical session A1. Heating & Cooling : Heat pump systems**

11:00 Adaptive density-based machine learning for fault detection in heat pump systems
Lennart Heinen, Nicolas Réhault, Christof Wittwer

11:13 Experimental investigation of efficient and safe heat pump operation with model-based superheat control
Florian Will, Matthias Georg Ellinger, Tim Klebig, Christian Vering, Dirk Müllery

11:26 Renosource – Simulation and monitoring of propane heat pumps using integrated air- and ground-heat source for retrofit application
Christoph Meier, Carsten Wemhoener

11:39 Energy-efficient pumping and decarbonization in thermal grids through advanced hydraulic modeling
Mohammad-Reza Kolahi, Stefan Mennel, Jonathan Chambers, Martin K. Patel

11:52 Designing and optimizing thermally activated screw foundations for lightweight construction
Sebastian Ammann, Luca Brauchli, Reto Hendry, Judit Tomás Verde, Jörg Worlitschek

12:05 Heat pump integration in Positive Energy Districts – Interim results of IEA HPT Annex 61
Carsten Wemhoener, Fabian Ochs, Samuel Breuss, Christina Betzold, Frenziska Bockelmann, Joris Zimmermann

14:00-15:30 **Technical session A2. Heating & Cooling : Cooling & HVAC modelling**

14:00 Comparative evaluation of daytime radiative cooling films for enhancing efficiency of air conditioning systems in tropical regions
Kelly Loh, Iqbal Shah, Connor Aucremanne, Zubin Varghese, Rohith B L, Ali Ghahramani

14:13 Performance assessment of an adaptive opaque façade technology across diverse European climates: Energy efficiency and thermal comfort improvements
Mohammad Ali Qorbani, Francesco Isaia, Miren Juaristi, Jan Hensen, Roel Loonen

14:26 Balancing radiative cooling with thermal mass and buoyancy ventilation
Remy Fortin, Jyotirmoy Mandal, Salmaan Craig

14:39 Socio-technical barriers and enablers in using shutters to minimise overheating in UK homes
Sapna Halaj, Nick Hughes

14:52 Digital twin-based controls for targeted fan-assisted cooling
Iqbal Shah, Ali Ghahramani

15:05 Performance-based drift detection for active machine learning model adaption: A comparative analysis across 35 HVAC devices
Kai Derzsi, Florian Stinner, Leonardo Patrun, Jonas Klingebiel, Dirk Müller

TOPICAL SESSIONS

Wednesday 3 September

Continued

HEATING & COOLING

15:30-16:00 Poster session A. Heating & Cooling

- A1 **Automated reduced-order model generation of radiant heating terminals**
Curtis Meister, Ueli Schilt, Philipp Schuetz
- A2 **Are complex baseline energy use models needed to accurately predict retrofit savings?**
Burak Gunay, Hussein Elehwany, Ayah Hassan, Brent Huchuk, Jayson Bursill
- A3 **Data-driven energy performance certification for Danish single-family homes: a proof of concept**
Justinas Smertinas, Matthias Yvan Van Hove, Peder Bacher, Henrik Madsen
- A4 **Economic insights for residential heating and domestic hot water energy services: a comparative analysis with a focus on solar systems integration**
Paula Alejandra Pedraza Aguirre, Arnaud Jay, Monika Woloszyn, Etienne Wurtz
- A5 **Exploring the feasibility of thermochemical networks in district heating applications with high renewable fraction**
Luca Baldini, Juan Mahecha Zambrano
- A6 **Fault detection and severity classification in HVAC fan coil units using a hybrid autoencoder-based method**
Alireza Mahmoudan, Pedram Nojedehe, Burak Gunay
- A7 **How big is the potential of a Nanogrid? Case study of a site**
Esther Linder, Sarah Schneeberger, Philipp Schütz
- A8 **Mapping winter climate zoning variations in Europe under climate change scenarios**
Giacomo Chiesa, Ali Jahani Rahaei
- A9 **Measurements and simulation of a new air heating and cooling system with thermal storage and air renewal to enhance thermal autonomy and reduce CO2 emissions**
Jacques Robadey, Moncef Justin Lalou, Hans Reiss
- A10 **Optimizing borehole thermal energy storage (BTES) system integration: A platform-based design approach with mixed-integer linear programming**
Gabriele Humbert, Dennis Beermann, Mutschler Robin, Sulzer Matthias
- A11 **Temperature reduction on existing 2nd generation district heating systems: the case of Geneva's main district heating network.**
Simon Callegari, Rubén Novoa-Herzog, Stefan Schneider, Pauline Brischoux, Pierre Hollmuller
- A12 **ASPIRHAUT project. Low-pressure systems as a new archetype in tropical architectures: feedback and characterisation**
Maareva Payet, Antoine Perrau, Jacques Gandemer
- A13 **Heat exchange measurements of extended surface fins on concrete thermal mass**
Remy Fortin, Salmaan Craig
- A14 **Evaluating the potential of novel thermal storage systems for residential buildings to increase use of renewable energy sources in heating and cooling systems**
Carlos Ernesto Ochoa Morales, Samaneh Fakouriyan, Fabio Silva

Continued

HEATING & COOLING

- A15** **Energy performance of a smart district energy system: Measured performance of integrated heat pumps, PV, and CHP in existing multifamily buildings**
Michael Kropp, Sebastian Herkel, Andreas Velte-Schäfer
- A16** **Experimental assessment on thermal mass performance of structurally-optimized, 3D-printed concrete floor element for carbon emission reduction**
Zherui Wang, Eric Teitelbaum, Masoud Akbarzadeh, Dorit Aviv
- A17** **Boundary layer effects in dynamic insulation**
Anna Halepaska, Salmaan Craig
- A18** **Performance of natural ventilation in office buildings: impact of climate, building properties and building use**
Simon Bal-Fontaine, Arnaud Jay, Simon Rouchier
- A19** **Diffusion models for conditioned district heating network time series generation**
Frederic Montet, Benjamin Pasquier, Michal Bryxi, Beat Wolf, Philippe Cudré-Mauroux, Jean Hennebert
- A20** **Evaluation of heat pumps CO₂eq-emissions based on dynamic electricity emissions factors**
Matthieu Chaigneau, Samuel Häußler, Björn Nienborg
- A21** **Evaluating multi-zone temperature variability and adaptive HVAC control strategies in a residential-like environment**
Mohammadamin Erfanimoghaddam, Jason Konstanos
- A22** **The impact of vertical vegetation on outdoor thermal perception during current and future heatwaves in a temperate climate**
Lisa Rovetta, Sara Matoti, Pamela Vocale, Barbara Gherri
- A23** **Evaluating natural ventilation's role in heating and cooling loads of London terraced houses for climate resilience**
Kexin Jiang, Mark Barrett
- A24** **Comparative analysis of the energy consumption and resilience of HVAC system configurations under climate change**
Qi-Man Hip, Simeon Nyambaka Ingabo, Non Phichetkunbodee, Ying-Chieh Chan
- A25** **Development of an open-source cooling and heating load estimator for early building planning**
Guillaume Behem, Julian Bischof, André Müller, Patricia Winkler

TOPICAL SESSIONS

Wednesday 3 September

Session B

INDOOR AIR QUALITY, HEALTH & PRODUCTIVITY

1 BC

Chair : Prof. Dusan Licina

11:00-12:30 Technical session B. Indoor Air Quality, Health & Productivity

- 11:00 Evaluating classroom air quality: Utility of co2 monitoring and insights from multi-pollutant analysis in swiss schools**
Bowen Du, Joan Rey, Claude-Alain Roulet, Philippe Favreau, Vincent Perret, Guillaume Suarez, Corinne Hager-Joerin, Joëlle Goyette Pernot, Dusan Licina
- 11:13 Low cost tracer gas sensor for building ventilation**
Vincenzo Gentile, Marco Perino
- 11:26 Towards dynamic urban environmental exposure assessments: a case study of the Brussels Capital Region**
Yen-Shuo Huang, Maider Llaguno-Munitxa, Gabriele Manoli
- 11:39 Developing a respiring manikin setup to simulate face-to-face conversations in an indoor setting**
Arghyanir Giri, Clara García-Sánchez, Philomena Bluysen
- 11:52 Let me go semi-outside: a human-centric outdoor thermal comfort study in a hot-humid semi-outdoor environment**
Cameron Klassen, Benjamin Tamber-Rosenau, Mili Kyropoulou
- 12:05 The heat of the moment: Extending heat vulnerability mapping to indoor environments on an urban scale**
Lina Hassoun, Justin McCarty, Arno Schlueter

15:30-16:00 Poster session Ba. Indoor Air Quality

- Ba1 Audit of low-tec ventilation systems in office buildings**
Caroline Hoffmann, Claudia Hauri, Alex Primas
- Ba2 School-based citizen-science action measuring IAQ comfort levels**
Giacomo Chiesa
- Ba3 Achieving low indoor NO2 and PM2.5 concentrations: a study of indoor air quality, ventilation and filtration in a modern office building**
Emma Gibbons, Marcella Ucci, Samuel Stamp
- Ba4 Effects of extreme temperatures on spatio-temporal variations of NO2 in urban neighbourhoods in Greater London**
Zishen Bai, Nahid Mohajeri
- Ba5 Data-driven personalized thermal comfort model for Office workers in Switzerland**
Arnab Chatterjee, Philipp Heer
- Ba6 Exploring the impact of air conditioning on the indoor air quality of UK homes**
Giorgos Petrou, Amr Hamada, Minnie Ashdown, Charles Simpson, Michael Davies
- Ba7 Analysis of external and internal air quality in four schools in rural areas of Navarra, Spain. Proposals for a better environment for children and adolescents**
Anna Victoria Breeze, Ana Sánchez-Ostiz. Ph.D., Jesús Miguel Santamaría. Ph.D.
- Ba8 From indicators to actions: design and planning guidelines for built-up and green spaces to improve urban air quality**
Chenling Wu, Farah Makki, Ahmed Hazem Eldesoky, Eugenio Morello

Continued

INDOOR AIR QUALITY, HEALTH & PRODUCTIVITY

- Ba9** **Considering the presence of users while assessing indoor radon levels in public schools on short-term periods of investigation**
Joan F. Rey, Matias Cesari, Joëlle Goyette Pernot
- Ba10** **A novel approach for on-field examination of moisture buffering in buildings**
Suchi Priyadarshani, Monto Mani
- Ba11** **Comparative evaluation of predictive models for identifying radon-prone areas and buildings in Switzerland**
Joan F. Rey, Joëlle Goyette Pernot
- Ba12** **Assessing the annual representativeness of a 120-hour radon measurement methodology in Switzerland**
Joan F. Rey, Dusan Licina, Joëlle Goyette Pernot
- Ba13** **Comparing methods for aggregating indoor air pollutant concentration over space and time**
Giorgos Petrou, Yan Wang, Zaid Chalabi, Shih-Che Hsu, Emma Hutchinson, James Milner, Phil Symonds, Michael Davies
- Ba14** **Strategies for ventilation and air cleaning to control infectious respiratory particles in school classrooms**
Er Ding, Clara García-Sánchez, Philomena M. Bluysen
- Ba15** **Impact of CO2 visualization on classroom air quality**
Joan F. Rey, Bowen Du, Dusan Licina, Joëlle Goyette Pernot
- Ba16** **The effect of urban morphology and vegetation on students' exposure to air pollution. The case of Milano (Italy)**
Yukun Li, Chenling Wu, Eugenio Morello
- Ba17** **Modelling CO2 Emissions and internal gains in Sports Rooms for Optimal Indoor Environmental Quality Assessment**
Santiago Escudero, Joaquim Román, Joana Ortiz, Jaume Salom
- Ba18** **Evaluating the efficacy of air purifier and ventilation strategies in controlled environment test cells**
Roshan Raghavendra Rao, Andrea Gasparella, Giovanni Pernigotto
- Ba19** **Users well-being in university buildings: towards a research framework development**
Paola Gasbarri, Silvia Meschini, Lavinia Chiara Tagliabue, Giuseppe Martino Di Giuda

15:30-16:00 **Poster session Bb. Health & Productivity**

- Bb1** **The impact of daylight on cognitive performance: a study using HRV and pupillometry**
Shuja Rehman, Prabhjot Singh Chani, Rajasekar Elangovan, Saptarshi Kolay
- Bb2** **Do green buildings drive a better living experience? A systematic literature review of occupant-centred aspects in green building certification**
Danlun Cao, Marshal Maskarenj, Shenghan Li, Sergio Altomonte

TOPICAL SESSIONS

Wednesday 3 September

Continued

INDOOR AIR QUALITY, HEALTH & PRODUCTIVITY

- Bb3** **Cross-modal effects of environmental factors on perception and bodily responses: a pilot study**
Philomena M. Bluysen, Er Ding, Amneh B. Hamida
- Bb4** **Linking multi-domain IEQ satisfaction to perceived stress, mood, and productivity in classrooms: insights from a living laboratory experiment**
Giorgia Chinazzo, Hannah Aziz, Mila Hrustic, Diane Kao
- Bb5** **Exploring the benefits of Komorebi light patterns: A pilot study**
Zhujing Zhang, Marilyne Andersen
- Bb6** **Indoor climate challenges and potential health consequences in buildings primarily targeting energy efficiency**
Hanieh Khodaei Tehrani, Jan Wienold, Dusan Licina, Kun Lyu, Dolaana Khovalyg, Marilyne Andersen
- Bb7** **Monitoring infrastructure for occupant well-being and comfort in a Living-Lab: a focus on wearable devices**
Giuseppina Arcamone, Yingjun Luo, Valerio Roberto Maria Lo Verso, Fabio Favoino, Anna Pellegrino
- Bb8** **Enhancing human comfort and mental well-being through aquaponic green spaces: an occupant-centric assessment of Baitykool's sustainable housing in dubai's hot arid climate**
Vidya Puliparambil Mohanan, Jhanvi Sunil, Ryad Bouzouidja, Philippe Lagiere, Ferran Garcia, Axel Rochuad, Bertrand Canigiani, Jacinta D Silva, Denis Bruneau
- Bb9** **Beyond comfort, towards well-being: Using Photovoice to assess the collective dimensions of inhabitant well-being in a multi-unit residential building context**
Garrett T Morgan, J. Alstan Jakubiec, John B Robinson, Marianne F Touchie

TOPICAL SESSIONS

Wednesday 3 September

C Sessions

LIFE CYCLE ANALYSIS

4 BC

Chair : Prof. Thomas Jusselme

11:00-12:30 Technical session C. Life Cycle Analysis

- 11:00** **Comparative environmental assessment of heat pumps and gas boilers under evolving electricity mixes and climate change: A Case Study of a Residential Building in London**
[Marios Kordilas](#), Dejan Mumovic, Yair Schwartz, Rob Cooke, Smith Mordak
- 11:13** **Carbon payback time for residential building replacements in Zurich under the stock-level consequential replacement LCA**
[Jingxian Ye](#), Corentin Fivet
- 11:26** **Environmental impact of building technical installations: comparative study using Swiss and French databases and Real Case Studies**
[Violette Desplanques](#), Sergi Aguacil Moreno, Adrien Favre, Dolaana Khovalyg
- 11:39** **Incorporating vegetation into urban life cycle assessment using citygml: a case study approach**
[Jakob Spohr](#), Monica Carvajal, Cecilia Perez, Joana Ortiz, Jaume Salom
- 11:52** **Beyond buildings: Assessing the carbon footprint of outdoor spaces in construction projects**
[Lucile Schulthess](#), Sandro Trevisani, Thomas Jusselme
- 12:05** **Integrating probabilistic embodied carbon emissions estimation into urban building energy modelling - an urban planning case study in Singapore**
[Royden Soh](#), Hongyao Wong, Yu Qian Ang

15:30-16:00 Poster session C. Life Cycle Analysis

- C1** **Adaptive reuse and ventilation: a novel approach for reducing embodied environmental and economic impacts**
 Sepideh Rabie, [Madeline Jo Sjöholm](#), Ilia Iarkov
- C2** **Data applications for semantic 3D neighbourhood models: challenges and opportunities in a case study in Norway**
[Galina Voitenko](#), Sahin Akin, Inger Andresen, Jaume Salom, Niki Gaitani
- C3** **Comparative environmental impact analysis of social housing in Nicaragua using textile-reinforced concrete prefabricated elements and low-carbon cement**
 Alexis Ayumi, Theodore Jacquet-Lagrece, Patricia Guaita, Beatrice Malchiodi, Sergi Aguacil Moreno, [David Fernández-Odoñez](#)
- C4** **Environmental effectiveness of energy retrofits and regulatory implications: the case of an Italian multi-family house**
[Gianluca Maracchini](#), Rocco di Filippo, Giacomo Sarti, Rossano Albatici, Rosa di Maggio, Oreste Bursi
- C5** **Impact of service life on the greenhouse gas emissions of ventilation systems**
[Arian Loli](#), Håvard Bergsdal

TOPICAL SESSIONS

Wednesday 3 September

Continued

LIFE CYCLE ANALYSIS

- C6 **Retrofit vs. replacement of multi-family houses – an energy, cost, and life cycle assessment perspective**
[Zhaniya Mukhamadiyeva](#), Emmanouil Thrampoulidis, Dietmar Gross, Kristina Orehounig, Roland Hischier, Georgios Mavromatidis
- C7 **Dynamic climate change assessment applied to structural building materials**
[Vladimir Zieger](#), Thibaut Lecompte, Simon Guihéneuf, Yann Guevel, Manuel Bazzana
- C8 **LCA in the construction process A4 and A5: insights for Germany from European best practices**
[Hongrui Chen](#), Roland Reitberger, Werner Lang
- C9 **A framework for building circularity potential: Whole-life carbon assessment for residential buildings at city-scale**
[Pradeep Alva](#), Riccardo Talami, Wanyu Pei, Clayton Miller, Rudi Stouffs
- C10 **Comparing refurbishment strategies for buildings at a city district scale using life cycle analysis**
[Nico Ehlers](#), Chujun Zong, Christina Meier-Dotzler, Werner Lang
- C11 **Holistic approaches to building retrofit optimization: fusing surrogate modeling with multi-criteria decision methods**
[Mostafa M. Saad](#), Ursula Eicker
- C12 **Reduction Roadmaps: methods of determining limit-values for climate impact in construction**
[Toivo Säwén](#), Anna Wöhler, Love Berger-Vieweg, Maria Tjäder, Alexander Hollberg, Ida Karlsson
- C13 **Embodied carbon assessment of RCC residential buildings: Impact of varying seismic zones and floor area ratio in India**
[Zoya Zakai](#), Debanjana Das, Rajan Rawal, Bhairav Patel
- C14 **LCA for optimizing the environmental impact when retrofitting historical alpine buildings – a case from the Interreg Italy-Austria SUSMAT project**
[Elena Poma](#), Gianluca Grazieschi, Dagmar Exner
- C15 **Comparative LCA of solar panel mounting systems in Norway**
[Katarzyna Ostapska](#), Arian Loli, Giovanni Scilipoti
- C16 **Circular economy in life cycle costing: a literature review in the construction sector**
[Sandra Krommes](#), Gretel Huber, Theresa Pscherer, Isabell Nemeth
- C17 **Optimizing mid-rise building facades: The role of balconies in achieving carbon reduction**
[Gulce Erincik](#), Juliana Felkner

TOPICAL SESSIONS

Wednesday 3 September

D Sessions

DAYLIGHTING & ARTIFICIAL LIGHTING

1 BC

Chair : **Dr Jan Wienold**

14:00-15:30 **Technical session D. Daylighting & Artificial Lighting**

- 14:00 Thermal VR: Assessment of complex fenestration's effects on visual and thermal comfort**
Lars Oliver Grobe, Chen Chiu, Arno Schlueter, Christoph Waibel
- 14:13 What may actually differentiate daylight from electric light in driving non-visual effects? An experimental approach to start lifting the veil**
Catherine Bratschi, Marilyne Andersen
- 14:26 Visual impact assessment of a skylight retrofit in a heritage building**
Daniel Ploerer, Lars Grobe
- 14:39 Field assessment of visual performance of a dynamic dual glazing assembly for occupants with lateral incident light**
Etienne Magri, Vincent Buhagiar, Mauro Overend
- 14:52 A computer-vision framework for assessing movement and gaze dynamics in window views**
Arnau Poletto, Yunni Cho, Christian Abbet, Jean-Philippe Thiran, Marilyne Andersen
- 15:05 Mapping street lighting: Illuminance characterization in urban squares in the Brussels Capital Region**
Elena Agudo-Sierra, Alejandro Burgueño-Díaz, Sergio Altomonte, Maider Llaguno-Munítxa

15:30-16:00 **Poster session D. Daylighting & Artificial Lighting**

- D1 Reassessing the value of window views: A review of price premiums across view variables**
Maryam Jamil, Giovanni Ciampi, Michelangelo Scorpio, Sergio Sibilio
- D2 Material optimization for future double skin facade system design**
Mustafa Serhan Unluturk, Zehra Tugce Kazanasmaz, Berk Ekici, Turkan Goksal Ozbalta
- D3 Multi-objective evolutionary optimization of bacterial cellulose-based composite glazing for thermal, daylight, and energy consideration**
Aybüke Taşer, Gozde Damla Turhan-Haskara
- D4 Optimizing visual comfort during architectural design: A tool for view and window analysis**
Melody Pak, Jung hye Shin
- D5 Illumination of barns for dairy cattle: Energy-efficiency and circadian lighting in a Swedish context**
Sheikh Rishad Ahmmad, Karl Axel Nordin, Phoo Wint Zaw, Niko Gentile, Marie-Claude Dubois
- D6 Visual and auditory dimensions of the indoor-environmental exposure: An empirical case study of cross-domain effects**
Irene Martinez Muñoz, Ardeshtir Mahdavi

TOPICAL SESSIONS

Wednesday 3 September

Continued

DAYLIGHTING & ARTIFICIAL LIGHTING

- D7** **Melanopic light exposure for bedridden patients during winter darkness: An in-situ study**
Mari Gaasemyr Hoevik, Leif Daniel Houck, Arnkell Jonas Petersen
- D8** **An international effort to standardize BSDF generation for daylight simulation**
Lars Oliver Grobe, David Geisler-Moroder, Eleanor S Lee, Gregory J Ward
- D9** **Improving psychiatric care through architectural and therapeutic interventions: insights from Klinik Hietzing in Vienna**
Yunni Cho, Milica Vujovic, Marilyne Andersen
- D10** **Simulating the light concentration of dielectric compound parabolic concentrators for deep building daylighting to enhance circadian entrainment**
Wai Qian Tham, Subhash Chandra, Brian Norton, Sarah J McCormack
- D11** **User satisfaction with the quantity and quality of window views in office buildings**
Yasuko Koga, Akito Watanabe, Yoshikane Kojima, Chikako Ohki
- D12** **The distribution of daylight with a solar tube: a monitoring campaign in Italy**
Matteo Ghellere, Alice Bellazzi, Anna Devitofrancesco, Francesco Salamone, Ludovico Danza

TOPICAL SESSIONS

Wednesday 3 September

E Sessions

REGENERATIVE PLANNING & MATERIALS

4 BC

Chair : **Dr Yair Schwartz**

14:00-15:30 Technical session E. Regenerative Planning & Materials

- 14:00 Beyond efficiency: Exploring the socio-economic and demographic drivers of sufficiency in buildings**
Til Sommer, Zuhaib Batra, Thomas Jusselme, Kristina Orehounig
- 14:13 Building a Cross-border Territorial Vision 2050: A Multidisciplinary, Multi-stakeholders Consensus Approach for Greater Geneva based on regenerative planning principles**
Igor Andersen, Ariane Widmer
- 14:26 Evaluating nature-based material choices for structural and envelope components of buildings**
Alisa M. Schneider, Eva-Maria Friedel, Anne Holsten, Chaohui Li, Felix Exton-Smith, Barbara K. Reck
- 14:39 Exploring the potential of hardwood for building construction to reduce embodied GHG emissions**
Yasmine Dominique Priore, Mattia Civatti, Sandro Trevisani, Thomas Jusselme, Daia Zwicky
- 14:52 Validation of a building material stock model using demolition record data**
Carlo Schmid, Kamila Krych, Stefanie Hellweg
- 15:05 Developing a comprehensive framework for optimal cascading use of wood: criteria and application selection**
Nadia Malinverno, Kealie Vogel, Esther Thürig, Bernd Nowack, Gustav Nyström, Claudia Som

15:30-16:00 Poster session Ea. Regenerative Planning

- Ea1 Urban metabolism framework for the regenerative design of school buildings: A data-driven approach using open-source tools**
Matteo Clementi, Elena Lucchi, Erpinio Labrozzi, Valentina Dessi
- Ea2 AI-driven tree detection for enhancing urban livability in sustainable cities**
Enrico Cassano, Paola Gasbarri, Lavinia Chiara Tagliabue, Stefano Rinaldi, Valentina Dessi
- Ea3 Developing an urban mining-oriented framework for circular construction in public procurement. The case study of Lugano**
Leidy Guante Henriquez, Carlo Antonio Gambato, Stefano Zerbi
- Ea4 Material demand and energy saving potential of renovation of Norwegian residential buildings: a bottom-up approach**
Sara Amini, Sahin Akin, Lola Rousseau, Edgar Hertwich
- Ea5 Energy-efficient urban design proposal in urban heat island formation: the case of CSA climate**
Irem Ugurlu Unluturk, Emre Yavuz, Mustafa Serhan Unluturk, Berrin Akgun

TOPICAL SESSIONS

Wednesday 3 September

Continued

REGENERATIVE PLANNING & MATERIALS

Ea6 **Circular decarbonisation? Material and waste implications of the transition to low-carbon technologies in Switzerland**

[Ankita Singhvi](#), Corentin Mottet, Léa Bitard, Claudia R Binder

Ea7 **Milano urban mine: towards a material resource cadastre**

Andrea Bortolotti, Matteo Clementi, [Elena Luongo](#), Federico Godino

15:30-16:00 **Poster session Eb. Low-Carbon Materials**

Eb1 **Thermal performance and environmental impact of a wood frame wall enhanced with clay-based plaster: an experimental and simulation analysis**

[Zineb Boutayeb](#), Matthieu Labat, Claire Oms, Stéphane Ginestet

Eb2 **Bamboo in a temperate climate: what potential for integration and application(s) in sustainable, low-carbon, and circular architecture?**

[Aline Romboux](#), Sophie Trachte

15:30-16:00 **Poster session Ec. Construction & Manufacturing Processes**

Ec1 **Multidisciplinary insights into geometric and material performance: 3d printing unfired earth for sustainable construction**

[Marina Edurne Morales Zuniga](#), Yasaman Yavaribajestani, Michael Walk, Patric Fischli-Boson, David Jenny

Ec2 **Municipal climate protection managers' knowledge of embodied emissions in construction**

[Leander Praeger](#), Jonathan Woytowicz, Werner Lang

Ec3 **Integration of regenerative building design into construction management**

Tatjana Kasina, [Stephanie Therkelsen Salling](#), Cristina Toca Pérez

TOPICAL SESSIONS

Wednesday 3 September

F Sessions

PREDICTIVE & ADAPTIVE CONTROL

2/3 ABC

Chair : **Prof. Seungjae Lee**

16:15-18:00 Technical session F. Predictive & Adaptive Control

- 16:15 Physics-informed neural network for building energy demand prediction**
Domenico Altieri, Raul Saez, Manuel Perez, Giovanni Branca
- 16:28 Grid-friendly operation of a building cluster**
Monika Hall, Achim Geissler
- 16:41 Impact of building design and temperature setpoint control on energy flexibility performance**
Meysam Akbari Paydar, Craig Robertson, Dejan Mumovic, Esfand Burman
- 16:54 Assessing flexibility offers of different building age classes utilizing thermal mass**
Felix Stegemerten, Sarah Leidolf, Martin Rätz, Dirk Müller
- 17:07 Enhancing grid flexibility through electric vehicles: the role of driver travel patterns**
Kathryn Kaspar, Mohamed Osman, Kingsley Nweye, Zoltan Nagy, Mohamed M. Ouf, Ursula Eicker
- 17:20 Performance-driven Shape Memory-based kinetic solar shading design**
Elisa Bonatti, Amirhossein Ahmadnia, Salvatore Viscuso, Alessandra Zanelli
- 17:33 On the utility of synthetic data for building energy research**
Alessandro Marco Tell, Yi Guo, Philipp Heer, Fazel Khayatian

18:00-18:30 Poster session F. Predictive & Adaptive Control

- F1 Impact of peak power fees on the design and operation of energy systems**
Gabriele Humbert, Matthias Brandes, Loris Pellaz, Christian Peter, Philipp Heer
- F2 Insightful settings of indoor environmental sensors implementation for effective building data analysis: a case study of university classrooms**
Irina Andriamandimbihana, Sandra Gallego, Berangere Lartigue
- F3 Free-running control logic via a 24-hour forecasting platform: self-actuation testing in a Turin demo building**
Giacomo Chiesa, Paolo Carrisi
- F4 Evaluation of AI-driven adaptive control algorithms for optimizing heat pump efficiency in building heating and hot water supply: First practical insights**
Lilli Frison, Simon Götzhäuser, Manon Dampfthoffer, Marina Reyboz, Aurore Lomet, Etienne Ouss, Hugues Bosche, Malte Vahlenkamp, Nicolas Réhault, Martial Mermillod
- F5 Flexibility potential estimation of new commercial and residential buildings in Norway**
Italo Aldo Campodonico Avendano, Andreas Aamodt, Åse Lekang Sørensen, Aileen Yang
- F6 Assessing electricity price spreads for effective load shifting in the German building stock**
Sarah Leidolf, Felix Stegemerten, Martin Rätz, Dirk Müller
- F7 Impact of control strategies on thermal comfort in a single-family house under grid-constrained air-to-water heat pump operation using a high-fidelity building model**
Tobias Spratte, Fabian Wüllhorst, Laura Maier, Dirk Müller

TOPICAL SESSIONS

Wednesday 3 September

Continued

PREDICTIVE & ADAPTIVE CONTROL

- F8** **Impact of operative temperature on the performance of control system: Field application in a grid-interactive building**
[Navid Morovat](#), [Andreas Athienitis](#)
- F9** **Influence of occupancy data on heating and electricity load forecasting using machine learning**
[Alexander Neubauer](#), [Mengbo Yu](#), [Fariborz Bagherzadeh](#), [Max Krüger](#), [Pedram Babakhan](#), [Stefan Brandt](#), [Martin Kriegel](#)
- F10** **Leveraging hourly emission factors of electric grids to evaluate the operational performance of Canadian buildings**
[Etienne Saloux](#), [Kun Zhang](#)
- F11** **Model predictive control for load shifting in supermarket refrigeration**
[Patrick Henkel](#), [Martin Rätz](#), [Dirk Müller](#)
- F12** **Rapid assessment of building operational strategies using control-oriented archetypes: a case-study with dual-energy heating and thermal storage**
[Navid Morovat](#), [José A. Candanedo](#), [Etienne Saloux](#)
- F13** **Designing efficient hybrid controls for high-performance buildings with multiple energy systems**
[Juhyun Bak](#), [Xiaoqi Liu](#), [Mohannad Alkhalil](#), [Kevin James](#), [Sulaiman Mohaidat](#), [Fadi Alsaleem](#), [Michael Hempel](#), [Hamid Sharif-Kashani](#), [Mahmoud Alahmad](#)
- F14** **The reliability of energy class labels in building renovation decision making: A Norwegian case study with implications for European NZEB goals**
[Solvor Mathiesen Gjerde](#), [Thomas Kringelbotn Thiis](#), [Arnkell Jonas Petersen](#)
- F15** **Neural controlled differential equations for residential heating load prediction**
[Gabriel Sabbagh](#), [Massimo Cimmino](#), [Benoit Delcroix](#)
- F16** **Dynamic building simulation with statistical machine learning models as a basis for model predictive control and reinforcement learning**
[Jo Beermann](#), [Jochen Müller](#)
- F17** **Machine learning model for predicting hourly energy consumption in non-residential buildings based on meteorological data**
[Enes Gusinjac](#), [Zorana Petojevic](#), [Radovan Gospavic](#), [Dusan Isailovic](#), [Goran Todorovic](#)
- F18** **Optimizing differential pressure setpoints in commercial building HVAC systems for enhanced energy efficiency**
[Samaneh Nadali](#), [Tsi Hao Yong](#)
- F19** **Implementation of predictive modelling-empowered HVAC-driven PV self-consumption enhancement strategies in a warehouse**
[Farzad Dadras Javan](#), [Jose Luis Pineda Solis](#), [Sara Perotti](#), [Fabio Rinaldi](#), [Behzad Najafi](#)
- F20** **Active current limiting control of residential appliances for breaker panel protection across the US: a parametric study**
[Elias N. Pergantis](#), [Levi D. Reyes Premer](#), [Arash J. Khabbazi](#), [Priyadarshan Priyadarshan](#), [Feng Wu](#), [Davide Ziviani](#), [Kevin J. Kircher](#)

TOPICAL SESSIONS

Wednesday 3 September

G Sessions

CONTROLS & OCCUPANT BEHAVIOUR

1 BC

Chair : **Prof. Andrew Sonta**

16:15-18:00 Technical session G. Controls & Occupant Behaviour

16:15 Enhancing occupant window use through behaviour nudging algorithms

[Ayah Hassan](#), Burak Gunay, Mohamed Ouf, Andre Markus, Jayson Bursill

16:28 High-resolution measurement of domestic hot water: Exploring individual tap patterns and preferences in single-family houses

[Christopher Graf](#), Anna Cadenbach, Tim David Lenz, Martin Frandsen, Anna Marszal-Pomianowska

16:41 Lessons from user experience with automated load flexibility

Angela Sanguinetti, Eli Alston-Stepnitz, [Sarah Outcault](#)

16:54 Observed vs. simulated occupant behavior: Exploring the summer comfort gap induced by occupants in the French building energy code

[Kevin Campagna](#), Aurélie Fouquier, Anaïs Machard, Dorothée Charlier, Monika Woloszyn

17:07 COOLIBRI project. Lowering cooling energy use by coupling ceiling fans to air conditioners: an adaptive user perspective

[Maareva Payet](#), Valentin Fargeas, Maxime Boulinguez

17:20 Hedonic migration in naturally-ventilated temperature cascades

[Anna Halepaska](#), Salmaan Craig

17:33 Exploration of automated multi-domain optimal sensor placement for living laboratory development

[Nan Wang](#), Giorgia Chinazzo

18:00-18:30 Poster session G. Controls & Occupant Behaviour

G1 Impact of flat size on thermal comfort in Hong Kong's public rental housing under future climate conditions

[Yilin Lee](#), Kai Gao, Edward Ng

G2 Indoor spatial distribution of CO2 and effect of sensor location on the performance of data-driven presence detection in a naturally ventilated school building

[Qirui Huang](#), Shujiao He, Clara-Larissa Lorenz, Marc Syndicus, Jérôme Frisch, Christoph van Treeck

G3 Advancing indoor environmental monitoring: A machine learning approach for post-data collection activity validation

[Hannah Routledge](#), Rui Tang, Samuel Stamp

G4 Window opening behaviour in summer: evidence from urban bedrooms and implications for UK overheating modelling

[Marzieh Fallahpour](#), Arash Beizaei, Matthew Li

G5 Balancing comfort and energy use in heritage buildings: insights from occupant behavior models

[Nmesomachukwu Egwuekwe](#), Chaoqun Zhuang, Ruchi Choudhary

TOPICAL SESSIONS

Wednesday 3 September

Continued

CONTROLS & OCCUPANT BEHAVIOUR

- G6 Granularity level exploration: an analysis on correlations between presence and energy loads**
[Marion Schoenenweid](#), Moreno Colombo, Michael Papinutto, Jean-Philippe Bacher, Julien Nembrini
- G7 The Cool, Quiet City machine learning competition: Overview and results**
Clayton Miller, Michael Ibrahim, Iqbal Syah Akbar, Bianca Picchetti, Yun Xuan Chua, [Mario Frej](#), Filip Biljecki, Adrian Chong, Matias Quintana, Chun Fu
- G8 Integrating sufficiency in a design process: trans-disciplinarity between Co-design and Performance simulation**
[Peter-Willem Vermeersch](#), Jo Van Hees, Joost Declercq
- G9 Inferring Swiss residential occupancy patterns through smart meter analysis**
[Fatih Topak](#), Kristina Orehoung
- G10 Comparing the performance of electrochromic glazing and fabric blinds under automated and manual control schemes in office buildings**
[Mojdeh Sabeti](#), Hanieh Khodaei Tehrani, Valerio Roberto Maria Lo Verso, Jan Wienold
- G11 A multidisciplinary methodology to detect changes in energy-consuming practices: an application on the dishwashing use**
[Minh Phuong Huynh](#), Enzo Cabezas-Rivière, Maxime Robillart, Thomas Recht, Laurent Mora
- G12 Adaptive blind control using deep learning methods**
[Ghadeer Derbas](#), Andre Xhonneux, Dirk Müller
- G13 Energy sufficiency and efficiency measures in the buildings of the City of Lausanne. A collaborative approach combining technical and behavioral aspects**
[Vincent Luyet](#), Tristan Loloum, Alexane Dubois
- G14 Occupant thermostat override behaviour in HVAC optimal control**
[Jinyoung Ko](#), Linbo Wang, Seungjae Lee
- G15 The citylearn challenge: evolution and lessons learned from machine learning competitions in building energy management (2020-2023)**
Kingsley Nweye, [Zoltan Nagy](#)
- G16 The relationship between energy use & household income**
[Jamal Russell Black](#)
- G17 Working with the ALS community to advance innovative housing and technology solutions**
Shelby Ruiz, [Julia Day](#)

TOPICAL SESSIONS

Wednesday 3 September

H Sessions

RENEWABLE ENERGY

4 BC

Chair : **Prof. Gabriele Lobaccaro**

16:15-18:00 Technical session H. Renewable Energy

- 16:15 A framework for assessing the potential of community solar microgrids in urban areas using partially measured data**
Aisyah Zakiah, Chengzhi Peng, Tsung-Hsien Wang
- 16:28 Clustering-based machine learning algorithm to detect shadows and solar reflections in urban environments**
Nesrin Irmak Koker, Gabriele Lobaccaro, Desthieux Gilles, Peter Gallinelli, Mattia Manni
- 16:41 Higher-order decomposition of the urban solar resource variability in space and time**
Guillaume F.J. Le Gall, Martin Thebault, Julien Ramousse
- 16:54 The 35-35 energy equation: understanding Switzerland's goal of 35 TWh renewable energy in 2035 through the lens of cumulative energy demand**
Jair Campfens, Pablo Martinez-Alcaraz, Marc Roca-Musach, Gloria Serra-Coch
- 17:07 Watt's the Limit? Establishing regional solar thresholds for BIPV facades from multiple perspectives**
Justin McCarty, Christoph Waibel, Arno Schlueter
- 17:20 Technical challenges in transitioning vulnerable neighborhoods to solar photovoltaic driven positive energy districts with integrated heat pumps**
Mitali Yeshwant Joshi, Britta Ricker, Luis Ramirez Camargo
- 17:33 Investigating occupant behavior and energy renovation through virtual-physical experiments: Results from Intelligent Human-Buildings Interaction lab**
Weizhuo Lu, Kailun Feng, Chanachok Chokwitthaya

18:00-18:30 Poster session H. Renewable Energy

- H1 Advances and challenges in P2P energy trading: A review of renewable integration and decarbonisation in Ireland**
Handy Borges Schiavon, Dayanne Peretti, Paulo Lissa, Marcus Keane
- H2 Implementation of an AI-driven dynamic control system to optimize excess photovoltaic energy management in grid-connected sustainable BIPV**
Mame Cheikh Sow, Youssef Jouane, Mourad Zghal
- H3 Influence of PV system orientation and design on energy self-consumption and cost savings: A Norwegian case study**
Åse Lekang Sørensen, Hicham Johra, Nicola Lolli, Harald Taxt Walnum, Ingeborg Eriksdatter Høiaas, Inger Andresen
- H4 Optimization of Photovoltaic (PV) Integration on Building Envelope: a case study in France**
Farzaneh Changizi, Martin Thebault, Christophe Menezo
- H5 A comparison of machine learning and calibrated physical models for solar energy analysis in snowy regions**
Mattia Manni, Alessandro Nocente, Gabriele Lobaccaro

TOPICAL SESSIONS

Wednesday 3 September

Continued

RENEWABLE ENERGY

- H6 **Predictive maintenance for PV systems in island communities: Ensuring energy reliability and efficiency**
Niall McGrath, Natalia Pereira Menezes, Luciana Michelotto Iantorno, Dayanne Peretti Correa, Paulo Lissa, Rodrigo Jardim Riella, Marcus Keane
- H7 **Energy impact of vertical agrivoltaic system on building facade**
Yijun Lu, Chun Liang Tan, Marcel Ignatius, Shanshan Tong
- H8 **Advanced thermal management in metal hydride hydrogen storage systems: Integration of conical heat exchangers and phase change materials**
Amir Hossein Eisapour, Alan S. Fung, Amirhossein Shafaghat, Koorosh Khosravi
- H9 **Evaluation of energy generation and economic sustainability of solar panels in urban environments utilizing GIS and PV*SOL Premium: A case study in Bologna, Italy**
Mahdiyeh Tabatabaei, Ernesto Antonini, Jacopo Gaspari
- H10 **Modeling and comparative analysis of floating and ground-mounted photovoltaic plants on the Xingu River, Brazil**
Kissilla Guedes, Domisley Dutra, Joao Pereira, Antonio Turra, Luan Santos, Elaine Cardoso
- H11 **Assessment of urban-scale building photovoltaic potential: a case study in Matera, Italy**
Matteo Ghellere, Lorenzo Belussi, Chiara Romanengo, Tommaso Sorgente, Daniela Cabiddu, Francesco Salamone, Michela Mortara, Alice Bellazzi, Ludovico Danza
- H12 **Governance and policy gaps for positive energy districts: an assessment of European, national, and local frameworks with a case study on community-based energy solutions**
Codruț Lucian Papina, Adelin-Costin Lazăr, Ana-Maria Dragomir, Pietro Elisei, Alberto Brunetti, Francesco Guarino, Fabio Giussani, Lucian Veresciaghin
- H13 **Mapping Switzerland's energy potential, a data-driven geo-analysis of energy technologies**
Simon In-Albon, Emma Schmitt, Malin Siegwart, Jörg Worlitschek

I Sessions

URBAN SCALE ENERGY MANAGEMENT

2/3 ABC

Chair I1: **Prof. Aysegul Demir** Chair I2: **Prof. Kristina Orehounig**

10:45-12:30 **Technical session I1. Urban Scale Energy Management**

- 10:45** **Evaluating the impact of thermal energy storage on grid flexibility in district thermal source networks**
Alireza Etemad, Arthur Trouseau, Donal Finn, John O'Shea, Alessandro Maccarini, Alireza Afshari, James O'Donnell
- 10:58** **How can a geothermal storage system be optimally integrated into a local district? A case study**
Ueli Schilt, Somesh Vijayananda, Sarah Schneeberger, Manuel Meyer, Santhosh Iyyakkunel, Pascal Marc Vecsei, Philipp Schuetz
- 11:11** **Enhancing Urban Building Energy Management through MILP Optimization for building renovation**
Enora Garreau, Martin Rit, Ilias Arab, Mathieu Thorel
- 11:24** **Harnessing energy forecasting in local area energy mapping for high-density heat pump deployment in the UK**
Rajat Gupta, Matt Gregg
- 11:37** **Beyond the rooftop: Infrastructure-scale urban photovoltaics in Zurich**
Maximilian Gester, Justin McCarty, Ilias Hischer, Arno Schlueter
- 11:50** **Dynamic shifts in building energy demand: an activity-based analysis of post-COVID work and lifestyle changes**
Qian-Cheng Wang, Zhao-Rong Feng, Xuan Liu
- 12:03** **Building legislation vs. performance in Switzerland: Navigating trade-offs between energy efficiency and indoor environmental quality**
Hanieh Khodaei Tehrani, Jan Wienold, Kun Lyu, Dolaana Khovalyg, Dusan Licina, Mari-lyne Andersen
- 14:00-16:00** **Technical session I2. Urban Scale Energy Management**
- 14:00** **Deep learning-based WWR and floor count extraction from façade images to improve UBEM**
Ayca Duran, Panagiotis Karapiperis, Christoph Waibel, Arno Schlueter
- 14:13** **Electric control strategies in an Urban Building Energy Modeling tool - case study on a french neighbourhood**
Enora Garreau, Eunice Herrera, Etta Grover-Silva, Vincent Partenay, Werner Keilholz, Peter Riederer
- 14:26** **Integrated workflow for optimizing urban energy communities: A case study in Karviná, Czechia**
Sofiane Kichou, Nikolaos Skandalos
- 14:39** **Integrating building performance simulation in agent-based models to support demand-side management strategies**
Yuxin Lu, William O'Brien, Elie Azar
- 14:52** **Optimized workflow for Drone-Assisted quantitative thermography in urban scale energy management**
Xiaojia Zhang, Andrea Garzulino, Elena Lucchi

TOPICAL SESSIONS

Thursday 4 September

Continued

URBAN SCALE ENERGY MANAGEMENT

- 15:05** **Simulation-based analysis of the effects of sector coupling and operational optimisation on the district heating and electricity grid**
Lina Wett, Frank Marten, Colin Jacob Waschner, Anna Cadenbach
- 15:18** **Impact of trees on the heating energy demand of buildings: Statistical investigation with in situ and earth observation data**
Roland Reitberger, Tobias Leichtle, Herbert Palm, Fatma Deghim, Carolin Rempfer, Dominic Mutzhas, Werner Lang
- 15:31** **Future-proofing positive energy districts: climate change impacts on cooling demand in Jättesten, Gothenburg**
Sara Abouebeid, Elena Malakhatkha, Liane Thuvander

16:00-16:30 **Poster session I. Urban Scale Energy Management**

- I1** **A generalizable framework for urban building energy model archetype generation using k-prototypes mixed-data clustering**
Kirk Richard Newton, Shi Zhongming
- I2** **Estimating the effect of heating and transport electrification on self-sufficiency and self-consumption for residential buildings in rural settings**
Arbogast Nyandwi, Arven Syla, Francesco Sasso, Martin K. Patel
- I3** **Assessing the reliability of archetype-based Urban Building Energy Simulations: A case study analysis in Turin (Italy)**
Matteo Piro, Jérôme Kämpf, Ilaria Ballarini, Vincenzo Corrado
- I4** **Combined impacts of extreme climate events and pandemic on the energy demand in low-income housing in Greater London**
Nahid Mohajeri, Kavan Javanroodi, Vahid Nik, Jingfeng Zhou, Agust Gudmundsson, Lauren Ferguson, Ehsan Arab Anvari, Jonathon Taylor, Phil Symonds, Michael Davies
- I5** **Waste heat utilisation from integrated edge data centres in tertiary buildings**
Jenny Hansson, Gabriele Humbert, Simon Pommerencke Melgaard, Binod Koirala, Rasmus Lund Jensen
- I6** **Non-intrusive energy state monitoring for occupancy driven load management of residential units**
Vasantha Ramani, Yufei Zhang, Andrew Sonta
- I7** **Should we construct more skyscrapers? Scenario-based energy performance assessment of plausible future urban densifications**
Bernadino Bernadino, Zhongming Shi
- I8** **Geneva's solution to bridge the performance gap in energy retrofit**
Lionel Rinquet, Sarah Delmenico, Grit Fowler, Denis Iglesias, Caroline Cacheiro
- I9** **Realistic assessment of forward local energy markets using the PHOENAIX simulation framework**
Joel Schoelzel, Michel Seyffart, Thilo Mandelartz, Jonathan Kriwet, Junsong Du, Carla Wüller, Rita Streblov, Dirk Müller

Continued

URBAN SCALE ENERGY MANAGEMENT

- I10 **What type of climate correction is most accurate for monitoring the thermal demand of buildings? The case of the IDC data base (Geneva)**
Stefan Schneider, Basile Grandjean, [Simon Callegari](#), Pierre Hollmuller
- I11 **Energy master planning framework for positive energy districts using digital tools**
[Amin Kouti](#), Mohsen Sharifi, Abel Magyari, Matthias Haase
- I12 **5th Generation District Heating and Cooling with TESSA – pilot project in a UNESCO world heritage site**
[Jonathan David Chambers](#), Max Boegli, Thomas Soderstrom
- I13 **Bridging data silos in electric vehicle charging: developing the evca ontology to enhance interoperability**
[Xuan Liu](#), Dujuan Yang, Bauke de Vries, Zhaorong Feng, Qian-Cheng Wang
- I14 **Holistic decision-making approach for re-defining positive energy districts: a framework for neighbourhood renovation**
Alberto Brunetti, Maurizio Cellura, Salvatore Cellura, Lorenza Di Pilla, [Francesco Guarino](#), Saghar Hosseinalizadeh, Lorenzo Ilardi, Sonia Longo, Roberta Rincione
- I15 **Solutions for transition to Positive Energy and Climate-Neutral Districts in the Mediterranean area**
[Vanesa Celina Saez](#), Louise-Nour Sassenou, Martina Dell'Unto, Paolo Civiero, Francesca Olivieri
- I16 **An integrated platform for energy planning in efficient and sustainable Danish urban communities**
[Muhyiddine Jradi](#)
- I17 **A computational workflow to analyze simplified metrics of environmental building performance in a northern climate**
[Francesco De Luca](#), Payam Madelat, Elisa Ilite, Ergo Pikas
- I18 **Cost-effective decarbonization of multifamily buildings using UDEM**
Saba Abdolshahi, [Juliana Felkner](#)

TOPICAL SESSIONS

Thursday 4 September

K Sessions

THERMAL COMFORT

1 BC

Chair: **Prof. Dolaana Khovalyg**

10:45-12:30 Technical session K1. Thermal Comfort in Buildings

- 10:45 Integrative evaluation of indoor-environmental quality: A critical investigation of weighting-based approaches**
Ardeshir Mahdavi, Irene Martínez-Muñoz
- 10:58 Energy and thermal comfort performance of occupant-centric radiant cooling systems: Linking CFD, thermoregulation, and building performance simulations**
Juan Mahecha Zambrano, Luca Baldini
- 11:11 Beyond skin temperature: Body heat generation and dissipation as predictors for local thermal sensation**
Jaafar Younes, Dolaana Khovalyg
- 11:24 Characterizing human thermal exposure using a multi-sensor passive manikin in personal comfort systems**
Zhuqiang Hu, Agnes Psikuta, René M. Rossi
- 11:37 Wrist to Rest: A pilot study to characterize sleep habits and bedroom environments using scalable watch-based microsurveys**
 Clayton Miller, Yun Xuan Chua, Mario Frei, Wenhao Zhang, Gabriel May Moe Kyaw, Toby Jia Xu Seah, Xiaojun Fan, Tom Parkinson, Hui Zhang, June Lo, Jason Lee, Stefano Schiavon
- 11:50 From static to adaptive: limitations of off-the-shelf machine learning algorithms in predicting preferred temperature setpoints and the potential of adaptive algorithms**
Chen Kai, Ali Ghahramani
- 12:03 Predicting thermal environment metrics using surrogates of physics-based building models**
Seif Qiblawi, Marianne Touchie, Elie Azar

14:00-16:00 Technical session K2. Thermal Comfort in Urban Spaces

- 14:00 The 4K difference due to radiative trapping: A numerical study of overheating in urban canyon dwellings**
Valentin Lahaye, Marion Bonhomme, Claire Oms, Nicolas Duport, Stéphane Ginestet
- 14:13 Assessing future overheating risk in the Swiss building stock**
Francesco Sasso, Martin K. Patel
- 14:26 Digital twin-driven insights into microclimate in tropical urban environments**
Ruohan Xu, Shisheng Chen, Marcel Ignatius, Joie Lim, Nyuk Hien Wong
- 14:39 UTCI vs. human perception: assessing thermal comfort for the aging population**
Jean You, Ben Gottfried Gottkehas Kamp, Rudi Stouffs, Mario Frei, Desai Wang, Clayton Miller
- 14:52 Assessment of solar radiation flux on the human body in the built environment: numerical model and validation**
Stanislaw Wojciech Kocik, Joanna Ferdyn-Grygierek, Agnes Psikuta, Krzysztof Grygierek, Aleksandra Lipczynska

TOPICAL SESSIONS

Thursday 4 September

Continued

THERMAL COMFORT

15:05 Assessing dynamic outdoor thermal comfort along pedestrian pathways: a simulation-based methodology

Carlos Lopez-Ordoñez, Agnese Salvati, [Judit Lopez-Besora](#), Elena Garcia-Nevado

15:18 Metabolic variation without movement: The role of cognitive load

[Fariza Sabit](#), Dolaana Khovalyg

15:31 Walking the heat: why thermal walks matter for high resolution microclimate mapping

[Ben Gottfried Gottkehaskamp](#), Marcel Ignatius, Joie Lim, Kunihiro Fujiwara, Christian Hepf, Filip Biljecki, Clayton Miller

16:00-16:30 Poster session Ka. Thermal Comfort in Buildings

Ka1 Design of adaptive shading device with rigid origami technique: improving outdoor thermal comfort on pathways of university campus

[Yigit Daglier](#), Berk Ekici, Koray Korkmaz

Ka2 Cooling buildings and growing food: performance evaluation of a hydroponic roof system in a Mediterranean climate

Francesco Nocera, [Vincenzo Costanzo](#), Gianpiero Evola, Maurizio Detommaso, Antonio Gagliano, Maurizio Cellura, Marina Mistretta, Sonia Longo

Ka3 Enhancing urban digital twin interfaces to support thermal comfort planning

Desai Wang, Joie Lim, Marcel Ignatius, Kunihiro Fujiwara, [Ben Gottfried Gottkehaskamp](#), Filip Biljecki, Nyuk Hien Wong, Clayton Miller

Ka4 Including thermal sensation into accuracy criteria for building simulation models

[Cheng Gao](#), Agnes Psikuta, René M. Rossi

Ka5 Insights into personalized thermal comfort through innovative data collection: case study from HSB Living Lab

[Elena Malakhatka](#), Taz Lodder, Despoina Teli, David Sindelar, Clayton Miller, Holger Wallbaum

Ka6 Assessing thermal resilience and life cycle carbon impacts of adaptation measures in a net-zero residential building

[Yingyue Li](#), Eirini Tsouknida, Ashley Bateson, Rui Tang, Esfandiar Burman

Ka7 A three-phase conceptual framework for vision-based personal thermal comfort assessment

[Salma ElBahy](#), Amit Kant Kaushik, Roziana Ramli, Wai Lok Woo

Ka8 Winter thermal performance assessment of the UK's first Passivhaus-certified extra care home

[Bhargav Macha](#), Anna Mavrogianni, Rokia Raslan, Seb Laan Lomas, Mark Lumley

Ka9 Advanced 3D temperature distribution analysis in office rooms using CFD and sensor-based robotics

Pascal Sutter, Arnab Chatterjee, [Philipp Heer](#)

TOPICAL SESSIONS

Thursday 4 September

Continued

THERMAL COMFORT

- Ka10 Exploring summer thermal discomfort in vulnerable households with children through citizen science**
Joana Ortiz, [Carlos Chang](#), Elena Lacort, Elena Domene, Mar Satorras
- Ka11 Energy savings through PECS: case study in educational building**
[Mohi Saxena](#), Siddhi Vashi
- Ka12 Optimizing thermal comfort and energy performance for sustainable living in residential villa in hot arid climates: a case study of Baitykool Living Lab , Dubai, UAE**
[Vidya Puliparambil Mohanan](#), Janvi Sunil, Denis Bruneau, Philippe Lagiere, Ryad Bouzoudja, SyedIbrahim Ali, Jacinta D Silva, Abraham Samuel
- Ka13 The improvement of the learning environment comfort, the primary school classroom in the Casamance region, Senegal**
[Ksawery Krzysztof Marszalek](#), Paula Cadima
- Ka14 Elaboration of a methodology for estimating angle-dependant solar transmittance of static complex shading device**
[Asmae Moutaoukil](#), Tingting Vogt Wu, Thomas Recht, Antoine Dugué, Laurent Mora, Christian Inard
- Ka15 Thermophysical analyses and experimental characterisation of Villa Manganelli's building envelope**
[Antonio Gagliano](#), Stefano Aneli, Vincenzo Sapienza
- Ka16 Adaptability and thermal well-being with dynamic screens: buildings also change their wardrobe**
[Marc Roca-Musach](#), Gloria Serra-Coch, Carlos Alonso-Montolio, Isabel Crespo Cabillo, Helena Coch
- Ka17 Low-cost infrared sensor array and open-source hardware for monitoring mean radiant temperature**
[Francesco Salamone](#), Lorenzo Belussi, Ludovico Danza, Sergio Sibilio, Massimiliano Masullo
- Ka18 Climate-adaptive cooling strategies for thermal resilience in Mediterranean dwellings**
Diego Garcia-Honores, [Carlos Alonso-Montolio](#), Helena Coch Roura

16:00-16:30 Poster session Kb. Thermal Comfort in Urban Spaces

- Kb1 The effect of urban densification on summer outdoor thermal comfort: a numerical approach**
[Anna Codemo](#), Gianluca Maracchini, Sara Favargiotti, Rossano Albatici
- Kb2 Designing urban form based on daylight and shade access claims of urban surfaces - A geometry-based solar control strategy for the climate adaptation of cities**
[Julian Raffetseder](#), Dr. Federico Bertagna
- Kb3 Impact of urban vegetation on thermal comfort indices in the city of Burgos, Spain**
[Elena Garrachón-Gómez](#), Benoit Beckers, Ignacio García, Cristina Alonso-Tristán

Continued

THERMAL COMFORT IN BUILDINGS

- Kb4** **Balancing acoustic and thermal comfort: How urban noise limits natural ventilation potential in Mediterranean cities**
Alvaro Guerra-Jovane, Elena García-Nevado
- Kb5** **Assessing microclimatic variation in urban parks of Chennai**
Nuthana Manoharan, Padmanaban Gopalakrishnan
- Kb6** **A Data-Driven framework for optimizing outdoor thermal comfort**
Parisa Najafian, Arman Nikkhah Dehnavi, Farzad Hashemi
- Kb7** **Building envelopes and outdoor comfort. Analysis and simulations to evaluate the contribution of opaque facades on outdoor comfort**
Matteo Iommi, Angelo Figliola, Roberto Cognoli
- Kb8** **Climate scenarios and energy demand projections for enhancing urban resilience and efficiency**
Victor Ivan Serna Gonzalez, Carla Rodriguez Alonso, Iván Ramos Diez, Estefanía Vallejo Ortega
- Kb9** **A method for simplifying annual wind simulation for pedestrian comfort analysis in consideration of local climate**
Jelena Kazak, Francesco De Luca

TOPICAL SESSIONS

Thursday 4 September

L Sessions

CIRCULAR DESIGN, RE-USE & RECYCLE

4 BC

Chair : Prof. Malena Bastien-Masse

10:45-12:30 Technical session L. Circular Design, Re-use & Recycle

10:45 Operationalizing Switzerland-wide democratic transformation to functional resilient 8-minute neighborhoods
[Sascha Nick](#), Esha Sharma

10:58 Swedish clients' views on certification of reused building products and reuse actors
[Filip Ericsson](#)

11:11 Adaptive reuse and ventilation: a novel approach for reducing embodied environmental and economic impacts
[Ilija Iarkov](#), Madeline Jo Sjöholm, Sepideh Rabie

11:24 Towards a standardized procedure in deconstruction: Introducing DARE (Deconstruction And Reuse Evaluation)
[Barbara Lambec](#), Corentin Fivet

11:37 Prestressed segmental slabs in reclaimed concrete or stone: a systemic and effective solution for sustainable floors
[Julien Pathe](#), Pierre-Louis Gilbert, Roman Schirmer, Sébastien Lasvaux, Arnaud Paquier

11:50 IFC Whisperer: Querying Building Information Models with Large Language Models and IFC-based knowledge graphs
[Yu Hsiu Tung](#), Samaneh Rezvani, Fatemeh Asgharzadeh, Maurijn Neumann, Timo Hartmann

12:03 Exploring legal frameworks for climate action: a network analysis of Green Deal, EU Directives and environmental assessment indicators
[Andreea Nita](#), Montserrat Zamorano, Laurentiu Rozylowicz

16:00-16:30 Poster session L. Circular Design, Re-use & Recycle

L1 Experimental analysis of X-shaped hardwood shear connectors for sustainable adhesive-free timber beams
[Yasaman Yavaribajestani](#), Ismael Kagny, Carsten Erchinger, Patric Fischli-Boson

L2 Circularity metrics and indicators for construction: gaps in current assessment methodologies and recommendations towards a standardized approach
[Loïs Lozach](#), Stefanie Hellweg

L3 Unlocking the Circular Economy: The Reuse Viability Index (RVI) for predicting building component reusability
[Maria Sivers](#), Corentin Fivet

L4 "Atlas of Reused Concrete" (ARC), an online platform to gather, visualise, and explore a growing international case-study database
[Célia Küpfer](#), Malena Bastien-Masse, Pierre Guilbert, Charlotte Weil, Lise Courtin, Corentin Fivet

L5 The climate impact of adaptive reuse: Case study of a Swedish office adapted for residential purposes
[Oscar Bálint Palmgren](#), Kristina Mjörnell

Continued

DIGITAL PLATFORMS FOR ENERGY PERFORMANCE

- L6 **A methodology for stock assessment and traceability at the component level: the case of structural steel reuse**
Chloé Ruda, Myriam Saade, Edouard Sorin, Cyril Douthe, François Lecompte, Olivier Baverel
- L7 **REMCO – Overview of reuse practices in the construction industry in French speaking Switzerland**
Lionel Rinquet, Benoit Seraphin, Almir Delfieu, Mija Frossard, Stephane Citherlet
- L8 **Towards sustainable heat pump (re-)cycles: Integration of circular strategies into the life cycle assessment of heat pumps**
Christian Vering, Carina Knieps, Moritz Beckschulte, Dirk Müller
- L9 **URMIBALI project: How can digital documentation technologies be a support for urban mining and reuse of building materials? A new method for data acquisition on traditional residential buildings in Liège.**
Sophie Trachte, Ophelie Noel, Astrid Schreurs, Aline Romboux, Pierre Hallot, Philippe Sosnowska
- L10 **Re-Use of timber construction elements for new houses: Approaches and a case study from Austria**
Peter Schober, Alexander Ladentrog, Gideon Riedel, Ulrich Pont, Sigrun Swoboda, Irmgard Matzinger
- L11 **Correlation of enhanced circularity and customized prefabrication**
Jutta Albus, Kirsten Elisabeth Hollmann-Schroeter, Gavin Hope, Nurcan Akca

TOPICAL SESSIONS

Thursday 4 September

M Sessions

DIGITAL PLATFORMS FOR ENERGY PERFORMANCE

4 BC

Chair : **Dr Christoph Waibel**

14:00-16:00 Technical session M. Digital Platforms for Energy Performance

- 14:00 Integrating IoT, large language models, and knowledge graphs for future smart districts: A semantic approach for energy performance assessment**
[Payam Fatehi Karjou](#), Max Berkold, Sina Khodadad Saryazdi, Martin Rätz, Dirk Müller
- 14:13 Integrating digital building logbooks with the Solid specification for enhanced data privacy and management**
[Ando Andriamamonjy](#), Yixiao Ma
- 14:26 Metadata-enhanced NILM for appliance-level disaggregation across diverse residential buildings**
[Raj Shekhar Srivastava](#), Stephen Watson, Vanda Dimitriou
- 14:39 Real-Time visualization to optimize stakeholder decision-making in heating planning on a district level**
[Alwina Kaiser](#), Linda Voigtländer, Anna Marie Cadenbach
- 14:52 Thermoxels: a voxel-based method to generate simulation-ready 3D thermal models**
Etienne Chassaing, Florent Forest, Olga Fink, [Malcolm Mielle](#)
- 15:05 Impact of LoRaWAN wireless communication on reliability of cloud-based building automation systems**
Junsong Du, Jun Jiang, Bowen Yuan, [Rita Streblov](#), Dirk Müller
- 15:18 Automated BEM generation from faulty BIM enabling robust creation of PEN digital twins**
[Raul Ciria](#), Sergio Diaz de Garayoa
- 15:31 Urban building energy modeling for zero-emission goals: A case study of Fornebu district's digital twin in Baerum, Norway**
[Alexandra Monika Bulla](#), Niki Gaitani, Arild Gustavsen

16:00-16:30 Poster session M. Digital Platforms for Energy Performance

- M1 OpenBEERS: A digital platform for urban scale simulation of building energy efficiency**
[David Geissbühler](#), Alejandro Pena Bello, Jérôme Kämpf, Jakob Rager
- M2 StromGT: A planning tool for reducing electricity consumption in building automation and control systems**
[Philipp Kraeuchi](#), Steiger Olivier
- M3 Procedural urban modeling for accurate thermal analysis in contemporary cities**
[Nayely B. Capetillo-Ordaz](#), Benoit Beckers, Cristina Alonso-Tristán
- M4 Energy monitoring retrofit in a multi-building complex**
Valentin Baudin, Frédéric Montet, Harald Peter, Sébastien Reynaud, [Sébastien Rumley](#)
- M5 Digital twinning of a novel cattle enclosure for control of methane emissions**
[Nick Kelly](#), Graeme Flett, Gavin Lavery, Carol-Anne Duthie, John Farquhar
- M6 A data-driven multivariate estimation of building heat demand: the case of the canton of Vaud**
[Giulio Romanelli](#), Roberto Castello

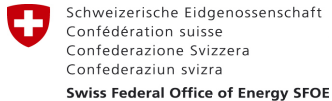
Continued

DIGITAL PLATFORMS FOR ENERGY PERFORMANCE

- M7 **Automated performance evaluation of buildings based on a taxonomy of building functions with NLP-supported exploration in building information networks**
Michael Kruettgen, Nouman Ahmad, Tariq Hussain Magsi, Prof. Dr. Jochen Müller
- M8 **Validation of two distinct simulation models of district heating networks: application to efficient looping analysis**
Dubon Rodrigue, Roberto Boggetti, Jérôme H. Kämpf, Bastien Padeloup, Mohamed Tahar Mabrouk, Patrick Meyer, Bruno Lacarrière
- M9 **Time series based metadata extraction for the creation of semantic digital twins of building systems**
Rebekka Benfer, Chen Hongrui, Nicolas Réhault, Jochen Müller, Werner Lang
- M10 **Thermal insulation performance investigation of an experimental low-tech yurt building envelope**
Liangang Tong, Gian Luca Brunetti, Alessandra Zanelli
- M11 **Exploiting digital twins for occupancy and energy optimisation for office buildings**
Sebastiano Maltese, Domenico Altieri, Nicolò Molinari, Giovanni Branca
- M12 **Energy implications of hybrid work: Insights from a large-scale employee survey**
Aybüke Taşer, Marshal Maskarenj, Hervé Jeanmart, Sergio Altomonte
- M13 **DiMASH: Towards an AI-based digitization tool for technical building system diagrams**
Simon Goelzhaeuser, Antonia Hain, Theresa Troetschler, Jumshaid Khan, Nicolas Réhault, Matthias Demant
- M14 **Data-driven modeling for occupant-centric and energy-flexible buildings: Integrating occupancy inference and ventilation modeling**
Yufei Zhang, Bowen Du, Wei Jia, Dusan Licina, Andrew Sonta
- M15 **CEA's solar radiation analysis empowered with CRAX: CityRadiation Accelerator**
Zhongming Shi, Xiaoyu Wang, Reynold Mok, Xing Shi, Yi Wang, Arno Schlueter
- M16 **IFC-based digital twin for real-time building data integration and its case study**
Mohammadamin Sedigh, Jochen Müller
- M17 **Energy planning in Sirmach: a case study of a Swiss-wide support tool**
Santhosh Iyyakkunel, Manuel Meyer, Pascal Marc Vecsei, Ueli Schilt, Somesh Vijayananda, Sarah Schneeberger, Esther Linder, Thomas Etter, Mike Portmann, Philipp Schuetz
- M18 **Shaping behavioral communication strategies to drive user engagement in dynamic electricity markets**
Connor Aucremanne, Deon Goh, Ali Ghahramani
- M19 **BIM interoperable digital Twin for building energy simulations and predictive studies**
Rithesh Kumar Vijay Kumar Chajed, Bruno Daniotti
- M20 **Evaluation of window frame modelling methods in Energy plus**
Rithesh Kumar Vijay Kumar Chajed, Giuseppe De Michele, Andrea Zani, Karin Lamberts
- M21 **A test environment for evaluating the cybersecurity of building automation**
Reto Marek, Nicolas Oberli, Sebastian Obermeier, Raphael Bolfig, Daniel Wolfensberger, Bernhard Tellenbach, Olivier Steiger
- M22 **An easy-to-use and affordable monitoring solution for buildings**
Olivier Steiger, Reto Marek

ACKNOWLEDGEMENTS

CISBAT can only exist thanks to the patronage and financial support of the Swiss Federal Office of Energy, the Ecole Polytechnique Fédérale de Lausanne (EPFL) and the partners involved in Smart Living Lab. We are very grateful for their support.



Our scientific partners from Cambridge University, and the Massachusetts Institute of Technology as well as the members of the CISBAT 2025 scientific and programming committee and all workshops organisers enthusiastically supported the conference and ensured its quality. We would like to express our sincere thanks for the time and effort they have spent to make it a success.

Our thanks also go to the authors and presenters for sharing their research, and to the numerous scientists who have kindly contributed to the review process. We address particular thanks to the Associate Editors, for the many hours invested in curating more than 340 papers.

Behind the scenes, we have received much competent support from the EPFL administration, the Swiss Tech Convention Center staff as well as from our diverse suppliers. We herewith express our sincere thanks for their efficient and friendly collaboration.

To make a hybrid conference work also for remote participants is always a challenge, met thanks to the expertise of the filming team and the and immense commitment of the team of the EPFL Data Acquisition, Measurement, and Technical Computing Platform (PL-MTI), whose professional support has been essential at every stage of preparation and during the conference.

We are honored that IOP has once again agreed to publish a CISBAT special issue in the Journal of Physics: Conference Series, a testament to the quality and strong interest generated by the research presented.

Finally, we cordially thank all our speakers, authors and participants who are bringing CISBAT to life.

CONFERENCE HOSTS

The EPFL campus in Fribourg was set up with the aim to build a hub for building related research focused on sustainability. The Smart Living Lab currently under construction has evolved as a joint venture of EPFL, Fribourg University and University of Applied Sciences and Architecture Fribourg, with the Building2050 group developing highly innovative features for this future R&D platform focused on the energy transition. While EPFL coordinates and financially supports the Conference, the partners are actively involved.

CONFERENCE CHAIR



Marilyne Andersen, Director General of the Geneva Science and Diplomacy Anticipator (GESDA), is also a Full Professor at EPFL and Head of the LIPID lab. A leading expert on daylight and its impact on human health and perception, she explores the intersections of science, design, and society. From 2013 to 2018, she served as Dean of the EPFL School of Architecture, Civil and Environmental Engineering (ENAC) and led the development of EPFL's Smart Living Lab in Fribourg. Since 2022, she has directed a nationwide Swiss research consortium on the energy transition, involving 10 universities and 30 public and private partners. Previously, Andersen was a professor at MIT and held visiting positions at LBNL (California) and SUTD (Singapore). She served on the boards of the Holcim Foundation for Sustainable Construction and InnoSuisse's Innovation Council, as well as the ArtTech and Culture du Bâti Foundations. She co-founded OCULIGHT dynamics, a consulting start-up focused on daylight and human well-being. Active at the interface of art and science, Andersen co-curated Lighten Up! On Biology and Time and created the immersive installation Circa Diem and policy-fiction Droit au Jour, presented at venues including the MIT Museum, EPFL Pavilions, mudac, and the Seoul Biennale.

CISBAT CONFERENCE CYCLE

CISBAT – the International Conference on the Built Environment in Transition – has been held biennially by EPFL since 1991, bringing together researchers from around the world to advance sustainability and energy efficiency in the built environment. Long hosted by the Solar Energy and Building Physics Laboratory, the conference entered a new phase in 2023 under the leadership of EPFL Campus Fribourg and its Smart Living Lab partners, the University of Fribourg and HEIA Fribourg. Renowned for its strong interdisciplinary character, CISBAT fosters exchange across science, engineering, architecture, and the social sciences. Its focus on innovation and integrated thinking makes it a unique platform for exploring how building and urban systems can better support occupant well-being, circularity, and climate-responsive design.

EVENING EVENT

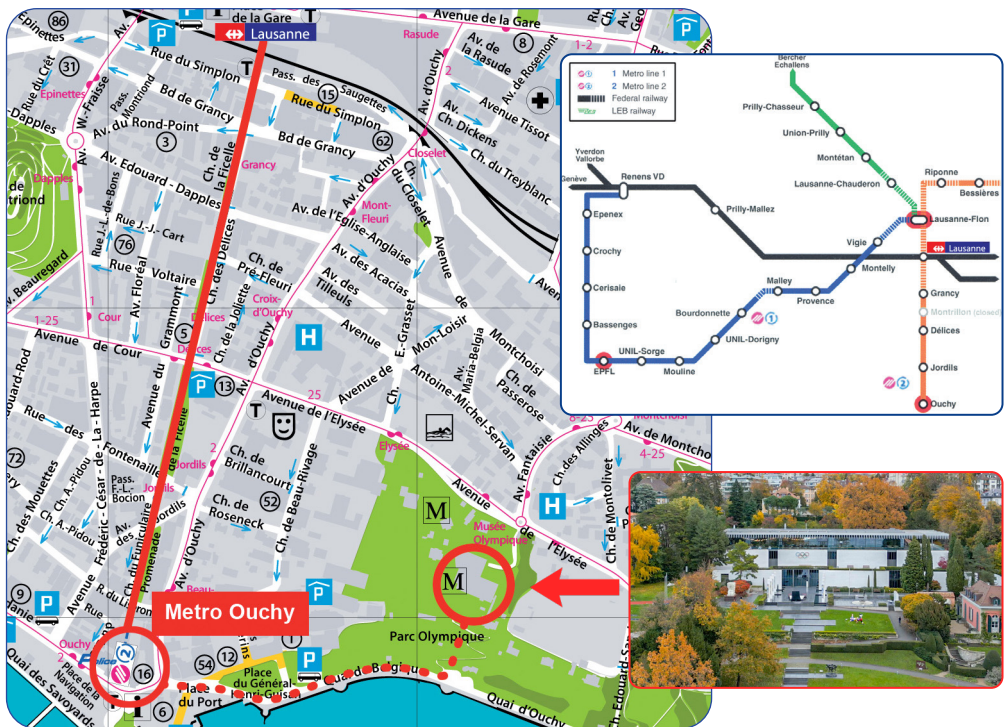
Wednesday 3 September

NETWORKING DINNER AT OLYMPIC MUSEUM RESTAURANT

Wednesday 3 September, 19:30-23:00 – separate registration

Individual transfer: Metro M1 EPFL to Lausanne “Flon” / Metro M2 “Flon” to “Ouchy Olympique”

10' walk to Olympic Museum Restaurant (please allow 45' to get there)



Conference Organisation

Conference Chair: Prof. Marilynne Andersen

Conference Manager: Barbara Smith

MC: Martin Gonzenbach

EPFL | Smart Living Lab

Passage du Cardinal 13b

1700 Fribourg / Switzerland

cisbat@epfl.ch / <http://cisbat.org>

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