TU Graz

11 - 14 September 2019

IN CO-OPERATION WITH

BOKU University of Natural Resources and Applied Life Sciences, Vienna

ETH zürich

KIT Karlsruhe Institute of Technology

SBE19 Graz

SUSTAINABLE BUILT ENVIRONMENT D-A-CH CONFERENCE 2019

Graz University of Technology, Austria

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Transition Towards a Net Zero Carbon Built Environment

Wednesday 11 September

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15.30	Coffee Break
16.00	**SDG 11 Roundtable**
17.45	
18.30	**Welcome Evening** **Mayor's Reception** Town Hall

Thursday 12 September

Conference

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09.00	**Opening Ceremony** | Aula								
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14.15		SF BWR7	2 Buildings	2 Building Design	1 Cities	2 Processes	2 Products	2 Education & Economy	SF ecoinvent	SF vinylplus
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17.45									
18.00	**Guided City Tour** From the conference venue to the Schlossberg								
19.30	**Conference Dinner** | Schlossberg Restaurant								

Friday 13 September

Conference

	Aula	HS I	HS VI	HS XII	HS V	ATEG-152	AT01-104	AT01-098
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09.00	ADOPTION OF THE "GRAZ 2019 DECLARATION" | Aula							
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15.45	**Closing Event** including ***Best Paper Award*** | Aula							
17.15	**Farewell Coffee**							

SF green.LAB Waagner-Biro-Straße

Saturday 14 September

Side Event

09.30 – 15.30 **Technical Tour**

WELCOME TO SBE19 GRAZ

Dear ladies and gentlemen,
Dear colleagues,

we would like to welcome you to the Sustainable Built Environment D-A-CH Conference 2019 (SBE19 Graz) - Transition Towards a Net Zero Carbon Built Environment. Together with other events in the SBE-series, the goal is to prepare for the World Conference in 2020 in Gothenburg (WSBE2020 - Beyond 2020).

The aim of SBE19 Graz is to enable an exchange between scientists, practitioners, politicians and the interested public on matters regarding innovative construction products, sustainable buildings, modern design methods and tools, sustainable urban neighborhoods and future-proof urban development. This includes new business models and instruments on green financing as well as national and regional strategies to implement sustainable development principles in the construction and real estate sector. For the first time, this regional conference has been jointly organized by institutions from Germany, Austria and Switzerland following the “D-A-CH” format.

The 145 international scientific committee members put a lot of effort into the double-blind peer review process of the scientific contributions and selected the best contributions for presentations, which are available as open source, indexed publications. 188 scientific presentations from more than 30 countries highlight the wide scope and complexity of international research activities that address sustainability issues for the built environment. The program is structured accordingly including the following topics organized in six parallel sessions: Buildings, Building Design, Processes, Products, Education & Economy and National Issues.

The matter of climate change has been stated clearly by the IPCC: Every degree of warming counts, every year of delay counts and every decision counts. It is now being increasingly discussed how the demands for climate protection can be translated into concrete design requirements, e.g. in terms of environmental budgets or environmental target values. Swift action is required and the advice of our colleagues in climate and environmental research is becoming ever more urgent. What is needed are general sustainability guidelines as well as practical solutions such as planning and assessment methods, innovative construction products and building solutions.

The role of the construction and real estate industry in developing answers to the current problems is crucial. The construction, maintenance and adaptation of the built environment is a basic prerequisite for social and economic development. On the one hand, these activities require significant amounts of energy and initiate material flows and green house gas emissions that impact the global and local environment not only during construction, but for a long time thereafter – typical lock-in factors. On the other hand buildings, cities and infrastructure are not only affected by climate change but are also expected to protect people from the undesirable effects of climate change. Therefore, the sector has multiple tasks, the most pressing one being to exploit the savings potential of the sector with appropriate support through setting suitable framework conditions and policies. Greenhouse gas emissions must be reduced to 50% by 2030 and industrialized nations

must achieve net zero emissions by 2050. That is an enormous challenge, but the stakes are high and the building and related industry sector must and will contribute to the effort.

From a complex analysis perspective, topics other than mitigation should not be neglected - examples are health protection, comfort, durability, adaptability, resilience, decommissioning and recyclability (circular economy) or affordability. Frequently, this not only results in synergies but also in trade-offs, sometimes conflicting goals, which only become recognizable and solvable in an integrated, systemic approach. Methodological approaches such as technology assessment or comprehensive sustainability assessment therefore remain indispensable.

The SBE19 Graz addresses questions with additional complementary formats to the regular scientific presentations. Aspects of climate change (SDG 13) and the role of sustainable cities and municipalities (SDG 11) will be discussed in roundtable events at the pre-conference. In the special fora specific topics will be discussed in a workshop character, for example regarding LEVEL(s), CPR special requirement 7, the further development of EPDs, sustainability performance of construction products (steel, concrete, wood and plastics). Last but not least, a focus will be put on how universities and research institutes can contribute to sustainable development with their own responsibility and their own building stock – where your valuable contribution would be highly appreciated.

The days of exchange and discussion at this conference at Graz University of Technology are also an important signal: inspiring cooperation and scientific exchange across all borders is not only possible but necessary - limiting global change within planetary boundaries.

Our organizing team made a special effort to make this event itself a more sustainable one following Green Events Austria suggestions.

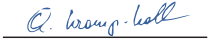
SBE19 Graz provides a special setting to refresh existing contacts and create new partnerships and friendships. We hope that your stay in Styria, the green heart of Austria, will stir active discussion and we are looking forward to hear your thoughts and views to progress the Transition Towards a Net Zero Carbon Built Environment.

With kind regards,
SBE19 Graz Chairs

Assoc. Prof. Dipl.-Ing. Dr.techn.
Alexander PASSER, MSc,
TU Graz

Prof. Dr.-Ing. habil.
Thomas LÜTZKENDORF,
KIT

Prof. Dr.
Guillaume HABERT,
ETH Zurich



Em.O.Univ.Prof. Dr.phil.
Helga KROMP-KOLB,
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Univ. -Prof. Dipl.-Ing. Dr.techn.
Michael MONSBERGER,
TU Graz

GRAZ UNIVERSITY OF TECHNOLOGY

IMPRINT

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Title: Sustainable Built Environment
D-A-CH Conference 2019

CONFERENCE CHAIRS


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Transition Towards a Net Zero Carbon Built Environment

Alexander PASSER
Graz University of Technology

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PROGRAM

Pre-Conference Workshops
The first day of the SBE19 Graz conference is reserved for discussing the UN Sustainable Development Goals (SDGs) and their implementation in the construction sector. The three workshops cover the "SDGs and Universities" (in German language), as well as the specific challenges of "SDG 11" and "SDG 13".

Keynote Speakers
Our international keynote speakers complete the scientific program of SBE19 Graz. After the Opening Ceremony and at the Closing Event, our keynote speakers will frame the conference and give their perspective on the challenges of creating a sustainable built environment.

Conference Sessions
The conference sessions take place on 12 and 13 September, and are the basis of the scientific program. Each presentation should last approximately 12 minutes followed by a short discussion. We kindly ask presenting authors to arrive at the respective room 10 minutes before the start of the session, and upload their presentations at the upload center beforehand.

Special Sessions
Special Sessions are embedded in the conference sessions, but have a more specific focus proposed by the session chairs. Through the scientific presentations, Special Sessions can provide more in-depth discussions of a certain topic. Presenting authors are also asked to upload their presentations in the upload center and to arrive at the session ahead of time.

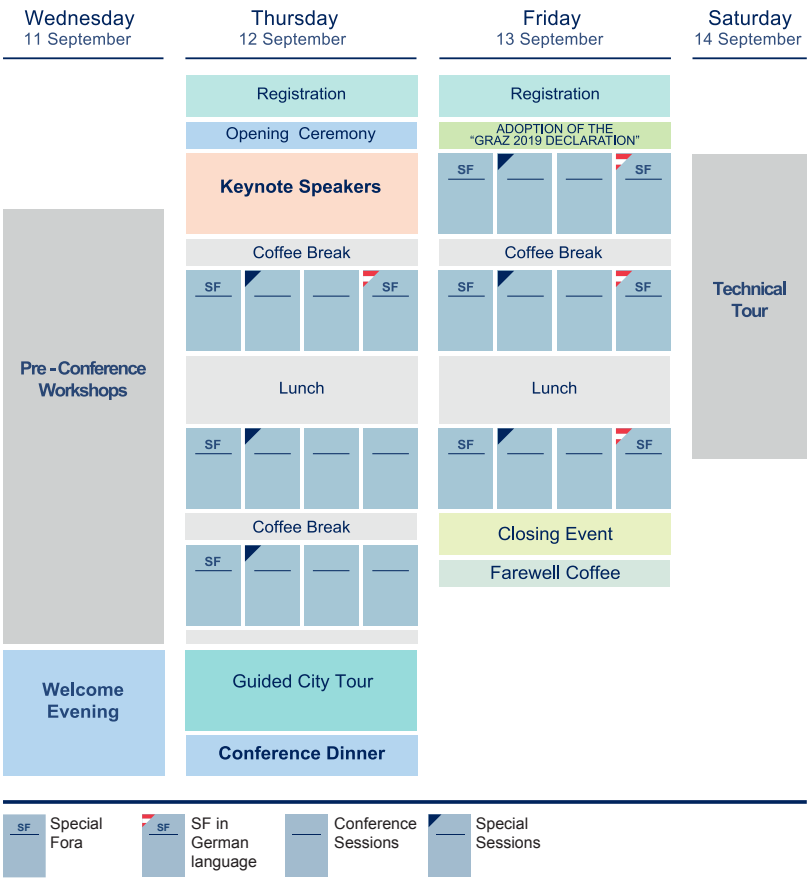
Special Fora
Stakeholders beyond academia have the opportunity to exchange their knowledge and experiences with each other and scientists in this special format. A Special Forum typically consists of a few keynote-lectures, and then focuses on a discussion with all participants.

Adoption of the „Graz 2019 Declaration" – Public Voting
During the public voting on Friday morning we will discuss, vote on, and pass a declaration on climate change and sustainability in the construction and real estate sector. This declaration aims at challenging policy makers, as well as academics and practitioners.

Technical Tour
The last conference day, 14 September, provides the opportunity to visit best-practice examples of sustainable buildings in Graz. The main stops include a student dormitory, a refurbished monastery and a new smart city district.

Social Events
In addition to the formal program, we offer two evening events: the welcome evening at the Town Hall on 11 September, and the conference dinner on 12 September. The conference dinner will start after the guided city tour, which will take us from the conference venue directly to the Schlossberg Restaurant, where we can spend the evening with a spectacular view over Graz.

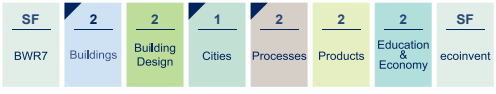
PROGRAM STRUCTURE



WEDNESDAY – 11 September

09.30 – 10.30	Welcome Coffee	
10.30 – 13.00	**Sustainable Development Goals & Universities**	*Aula*
13.00 – 14.00	Lunch & Registration	*Conference Office*
14.00 – 15.30	**Sustainable Development Goal 13** SDG 13 Roundtable Climate Change	*Aula*
15.30 – 16.00	Coffe Break	
16.00 – 17.45	**Sustainable Development Goal 11** SDG 11 Roundtable Sustainable Urban Development	*Aula*
18.30	**Welcome Evening** Alexander **PASSER** *Welcome speech:* Peter **STÖCKLER** (City of Graz)	*Town Hall* *Hauptplatz 1, 8010 Graz*

THURSDAY – 12 September

08.00 – 09.00	**Registration**	*Conference Office*	
09.00 – 09.30	**Opening Ceremony**	Michael **MONSBERGER** *Welcome speeches:* Harald **KAINZ** (Rector, Graz University of Technology), Siegfried **NAGL** (Mayor, City of Graz), Michael **AUMER** (Federal Ministry for Sustainability and Tourism), Volker **SCHAFFLER** (Austrian Ministry for Transport, Innovation and Technology), and Nils **LARSSON** (iiSBE)	*Aula*
09.30 – 11.00	**Keynotes**	Diana **ÜRGE-VORSATZ** Lothar **FEHN KRESTAS** Ursula **HARTENBERGER** Peter **HOLZER**	*Aula*
	Organisational Issues	Alexander **PASSER**	
11.00 – 11.30	Coffee Break		
11.30 – 13.00	**Conference Sessions Special Fora**		
13.00 – 14.15	Lunch		
14.15 – 15.45	**Conference Sessions Special Fora**		
15.45 – 16.15	Coffee Break		
16.15 – 17.45	**Conference Sessions Special Fora**		
18.00 – 19.30	**Guided City Tour**	*From the conference venue to the conference dinner* *Meeting point: Rechbauerstraße 12, 8010 Graz*	
19.30	**Conference Dinner**	*Schlossberg Restaurant/ Schlossberg 7, 8010 Graz*	

FRIDAY – 13 September

08.00 – 09.00	**Registration**		*Conference Office*
09.00 – 09.20	**Adoption of the “Graz 2019 Declaration”** Public Voting	Helga **KROMP-KOLB** Thomas **LÜTZKENDORF**	*Aula*
09.30 – 11.00	**Conference Sessions Special Fora**		
11.00 – 11.30	Coffee Break		
11.30 – 13.00	**Conference Sessions Special Fora**		
13.00 – 14.15	Lunch		
14.15 – 15.45	**Conference Sessions Special Fora**		
15.45 – 17.15	**Closing Event including Best Paper Award**	Guillaume **HABERT** *Keynote speakers:* Richard **LORCH** Holger **WALLBAUM**	*Aula*
17.15	**Farewell Coffee**		

SATURDAY – 14 September

09.30 – 15.30 **Technical Tour**

Meeting point: Entrance OEAD Guesthouse
Moserhofgasse 41b, 8010 Graz

Guesthouse Moserhofgasse
Guided Tour

Graz Franciscan Monastery
Guided Tour

green.LAB Graz
Presentation

Science Tower Graz
Guided Tour

OPENING **KEYNOTES**

1.5°C Climate Change - What are the Implications for the Built Environment?

Diana ÜRGE-VORSATZ
Department of Environmental Sciences and Policy at the Central European University, Budapest;
Vice Chair of Working Group III of the Intergovernmental Panel on Climate Change (IPCC)

Supporting, Challenging, Advising: Building Policy in the Light of Climate Change

Lothar FEHN KRESTAS
Head of the Department of Building, Construction Industry and Federal Buildings at the German Federal Ministry of the Interior, Building and Community

Sustainability Assessment of Buildings in the Focus of EU-Taxonomy for Sustainable Finance

Ursula HARTENBERGER
Global Head of Sustainability, RICS, Member of the Technical Expert Group on Sustainable Finance, Chair of Buildings Sector Group

Building Related Environmental Impacts - the Hidden Aspects

Peter HOLZER
Institute of Building Research & Innovation ZT GmbH


credit: Nepszava


credit: Roland Horn


credit: RICS


credit: P. Holzer

SBE19 Graz Highlights

Richard LORCH
Editor in Chief, Journal Buildings & Cities

From Challenge to Mission - Make Sustainable Cities a Reality

Holger WALLBAUM
Full Professor in Sustainable building, Dep. of Architecture & Civil Engineering, Chalmers University of Technology, Gothenburg, Sweden and host of the World Sustainable Built Environment (WSBE2020) conference in June 2020 entitled BEYOND 2020

credit: Clare Park

credit: Holger Wallbaum

NOTES

CONFERENCE SESSIONS

including Special Sessions

Transition Towards a Net Zero Carbon Built Environment

Buildings 1

Special Session nZEB I

Session Chair: **Karl Höfler**,
AEE INTEC, Austria

Stakeholder related fields of action for process optimization of nearly zero energy and plus energy buildings
Regina HÖFLER
AEE INTEC, Austria

Life cycle cost reduction and market acceleration for new nearly zero-energy buildings
Tobias WEISS
AEE INTEC, Austria

Life-Cycle Costs of a Minimally Invasive Refurbishment Approach in Comparison to a Standard Refurbishment
Daniel HEIDENTHALER
Salzburg University of Applied Sciences, Austria

Towards the definition of a nZEB cost spreadsheet as a support tool for the design
Federico GARZIA
eurac research, Italy

HS I

HS VI

Building Design 1

Design for Sustainability Calculation, Simulation, Evaluation

Session Chair: **Diana Ürge-Vorsatz**,
Central European University, Hungary

Passive house-concept apartments: sustainability evaluation in a case study of Stockholm, Sweden
Maryam KHATIBI, Politecnico di Milano, Italy

The effect of insulation thickness on lifetime CO_2 emissions
Marie TOTLAND
Norwegian University of Science and Technology

Surface-to-volume ratio: How building geometry impacts solar energy production and heat gain through envelopes
Mohamad Tarek ARAJI
University of Manitoba, Canada

Assessment System for Sustainable Buildings of the German Government (BNB): Calculation tool for the ventilation rate and the resulting carbon dioxide concentration in the ambient air
Heidemarie SCHÜTZ
Federal Institute For Research on Building, Urban Affairs and Spatial Development, Germany

Impact of dynamic CO2 emission factors for the public electricity supply on the life-cycle assessment of energy efficient residential buildings
André MÜLLER
Technische Universität Darmstadt, Germany

Implementing climate impacts in road infrastructure in the design phase by combining BIM with LCA
Reyn O'BORN
University of Agder, Norway

Processes 1

Special Session Management of Complexity in Sustainable Construction

Session Chair: **Helmuth Kreiner**,
Graz University of Technology, Austria

Towards housing sustainability: a framework for the decision-making process of tenants
Anna PAGANI
Ecole Polytechnique Fédérale de Lausanne, Switzerland

Sustainable cities and communities - Best practices on structuring a SDG model
Kai NEUMANN
CONSIDEO GmbH, Germany

Towards a sustainable district: a streamlined Life cycle assessment applied to an Italian urban district
Elisabetta PALUMBO
RWTH Aachen University, Germany

Considering the dynamics of electricity demand and production for the environmental benchmark of Swiss residential buildings that exclusively use electricity
Didier BELOIN-SAINT-PIERRE
Empa, Switzerland

Managing Construction Projects: Developing Complexity into Complicatedness
Wolfgang EBER
Technische Universität München, Germany

HS V

Products 1

Innovation in Concrete

Session Chair: **Lisa Wastiels**,
BBRI, Belgium

Reducing water footprint of building sector: concrete with seawater and marine aggregates
Valeria AROSIO
Politecnico di Milano, Italy

Sustainability assessment in Cuban cement sector- a methodological approach
Sofia SÁNCHEZ BERRIEL
Central University of Las Villas, Cuba

Eco-efficiency assessment of conventional OPC/PPC replacement by LC3 in Cuban residential buildings
Yudiesky CANCIO DÍAZ
Central University of Las Villas, Cuba

Optimizing the economic, environmental and technical performance of concrete mixes with fly ash and recycled concrete aggregates
José Dinis SILVESTRE
Universidade de Lisboa, Portugal

Sensitivity Analysis of Life Cycle Impacts Distribution Methods Choice Applied to Silica Fume Production
Ana Carolina Badalotti PASSUELLO
Universidade Federal do Rio Grande do Sul, Brazil

Variability of environmental impact of ready-mix concrete: a case study for Brazil
Fernanda Belizario SILVA
University of São Paulo, Brazil

ATEG152

Education & Economy 1

Sustainability in Educational Campus Development

Session Chair: **Chanjief Chandrakumar**,
Massey University, New Zealand

Austrian Universities and the Sustainable Development Goals
Stephan MAIER
Graz University of Technology, Austria

Architectural Education for a Post-Fossil Future
Eike ROSWAG-KLINGE
Technische Universität Berlin, Germany;

Affordance-based Design Method: A Case Study of University Campus
Durva GUPTA
Indian Institute of Technology, Delhi, India

Hoppet - the first fossil free preschool
Maria PERZON and Hanna LJUNGSTEDT
Bengt Dahlgren AB, Sweden and The City of Gothenburg, Sweden

Passive houses for active students - Providing knowledge about eco-efficient buildings
Martina FEIRER
OeAD-Housing Office, Austria

AT01036

PROGRAM OVERVIEW IN THE INSIDE FLAP

CONFERENCE SESSIONS

including Special Sessions

Thursday
12 Sept

11.30 – 13.00

Transition Towards
a Net Zero Carbon
Built Environment

Buildings 2

Special Session nZEB II

Session Chair: **Tobias Weiß**,
AEE INTEC, Austria

Contradictions of low-emission nZEB buildings
Krisztina SEVERNYÁK
University of Debrecen, Hungary

Design transformation from standard conformity to Net Surplus Energy
Wolfram TRINIUS
Ingenieurbüro Trinius GmbH, Germany

Analysis and Cross-Comparison of Business Models for nearly Zero-Energy Buildings in Europe
Benjamin KÖHLER
Fraunhofer ISE, Germany

Energy and cost optimization in the life cycle of nearly zero energy buildings using parametric calculations
David VENUS
AEE INTEC, Austria

HS I

Building Design 2

Environmental Performance and Sustainability Assessment on Building Level

Session Chair: **Dirk Alexander Schwede**,
Stuttgart University, Germany

Comparison of the environmental assessment of an identical office building with national methods
Rolf FRISCHKNECHT
treeze Ltd., Switzerland

New Portfolio-Rating-System based on LEVEL(S)
Heinz J. BERNEGGER
ZHAW, Switzerland

The BNK Assessment Tool for the sustainability performance of small residential buildings in Germany – Lessons learnt
Natalie ESSIG
Munich University of Applied Sciences, Germany

A stakeholder- and function-based planning method for space-efficient buildings
Petra VON BOTH
Karlsruher Institute for Technology, Germany

HS VI

Cities 1

Special Session Urban Resource Management

Session Chair: **Philip Leistner**,
University of Stuttgart, Germany

Assessment of urban-scale potential for solar PV generation and consumption
Juan PEDRERO
Tecnalia Research & Innovation, Spain

Building physics design of urban surfaces
Andreas KAUFMANN
Fraunhofer Institute for Building Physics IBP, Germany

Sustainability of innovative urban surfaces – a new approach of assessment
Kristina HENZLER
University of Stuttgart, Germany

Land resource management of coastal areas in Indian cities: comparative assessment with prevailing methods
Ravinder DHIMAN
Indian Institute of Technology Bombay, India

Turning the existing building stock into a resource mine: proposal for a new method to develop building stock models
Karen ALLACKER
KU Leuven, Belgium

Seismic and solar performance of historical city. Urban form-based multicriteria analysis
Michele MORGANTI
Politecnico di Milano, Italy

HS XII

Processes 2

Special Session Building Optimization Workflows

Session Chair: **Martin Röck, Alexander Hollberg and Benedek Kiss**
Graz University of Technology, Austria, ETH Zürich, Switzerland, Budapest University of Technology and Economics, Hungary

Consistent BIM-led LCA during the entire building design process
Alexander HOLLBERG
ETH Zürich, Switzerland

BIM-integrated LCA - model analysis and implementation for practice
Kasimir FORTH
Technische Universität München, Germany

Identification and comparison of LCA-BIM integration strategies
Lisa WASTIELS
BBRI, Belgium

BIM for public authorities: Basic research for the standardized implementation of BIM in the building permit process
Daniel PLAZZA
Graz University of Technology, Austria

A cross-platform modular framework for building Life Cycle Assessment
Martin RÖCK
Graz University of Technology, Austria

HS V

Products 2

Recycled Building Materials

Session Chair: **Antonín Lupíšek**,
Czech Technical University in Prague, Czech Republic

Ecological performance and recycling options of primary structures
Alireza FADAI
TU Wien, Austria

Overview of recycled concrete research through development years (2004-2018)
Amardeep SINGH
Tongji University, China

A comparative study on nonlinear damping behaviors of precast and cast-in-situ recycled aggregate concrete frames
Chunhui WANG
Tongji University, China

Modification on Recycled Aggregates and its Influence on Recycled Concrete
Kaiwen HUANG
Tongji University, China

Parametric life cycle assessment of a reusable brick veneer
Camille VANDERVAEREN
Vrije Universiteit Brussel, Belgium

Outcomes of a Student Research Project on Circular Building Systems – Focus on the Educational Aspect
Bart JANSSENS
Hasselt University, Belgium

ATEG152

Education & Economy 2

LCC - Economic Challenges

Session Chair: **Jan Tywoniak**,
Czech Technical University in Prague, Czech Republic

Visual tool to integrate LCA and LCC in the early design stage of housing
Ayu MIYAMOTO
KU Leuven, Belgium

Life cycle environmental and cost evaluation of heating and hot water supply in social housing nZEBs
Patxi HERNANDEZ
Tecnalia Research & Innovation, Spain

A case-based study on the use of life cycle assessment and life cycle costing in the building industry
Christine COLLIN
Rambøll, Denmark

Whole-Life Costing of a French Single-Family House Refurbishment: the “Bat-Eco2” case study
Carolina COLLI
Université d’Artois, France

AT01036

PROGRAM OVERVIEW IN THE INSIDE FLAP

CONFERENCE SESSIONS

including Special Sessions

Thursday
12 Sept

14.15 – 15.45

Transition Towards
a Net Zero Carbon
Built Environment

Buildings 3

Social & Affordable Housing

Session Chair: **Frank De Troyer**,
KU Leuven, Belgium

Mobile Tiny Houses – Sustainable and Affordable?
Herbert C. LEINDECKER
University of Applied Sciences Upper Austria, Austria

Challenges of retrofitting affordable housing to net-zero carbon in the United Arab Emirates
Ahmed Hanafi MOKHTAR
American University of Sharjah, United Arab Emirates

Towards developing a building typology for Sudan
Suha Ismail Ahmed ALI
Budapest University of Technology and Economics, Hungary

Life cycle environmental impact of refurbishment of social housing
Els VAN DE MOORTEL
KU Leuven, Belgium

HS I

Building Design 3

Digitalisation in the Design Process

Session Chair: **Gerhard Zucker**,
Austrian Institute of Technology GmbH, Austria

BIM based iterative simulation - efficient building design: a case study
Martin TALLBERG
Norwegian University of Science and Technology, Norway

Application of RecyclingGraphs for the Optimisation of the Recyclability in Building Information Modelling
Dirk Alexander SCHWEDE
Stuttgart University, Germany

Process model for BIM-based MEP design
Rainer PARTL
Graz University of Technology, Austria

Criteria catalogue and analysis model to manage complexity in prefabricated timber construction
Sonja GEIER
Hochschule Luzern, Switzerland

Switching to a holistic perspective on semantic component models in building automation - tapping the full potential of automated design approaches
Bastian WOLLSCHLAEGER
Technische Universität Dresden, Germany

HS VI

Cities 2

Net Zero Cities & Neighborhoods

Session Chair: **Gerhard Zucker**,
KU Leuven, Belgium

2 DEGREES – understanding the contribution of cities to a carbon neutral society
Bastian WITTSTOCK
thinkstep AG, Germany

On net zero GHG emission targets for climate protection in cities: More questions than answers?
Thomas Lützkendorf
Karlsruhe Institute of Technology, Germany

Visualisation of KPIs in zero emission neighbourhoods for improved stakeholder participation using Virtual Reality
Aoife Anne Marie HOULIHAN WIBERG
Norwegian University of Science and Technology, Norway

Crafting local climate action plans: An action prioritisation framework using multi-criteria decision analysis
Maria BALOUKTSI
Karlsruhe Institute of Technology, Germany

A systematic review of the international assessment systems for urban sustainability
Joana M.J.S. PEDRO
Instituto Superior Tecnico Universidade de Lisboa, Portugal

Optimization-based planning of local energy systems - bridging the research-practice gap
Andrew BOLLINGER
Empa, Switzerland

HS XII

Processes 3

Building Information Modeling

Session Chair: **Petra von Both**,
Karlsruhe Institute for Technology, Germany

6D BIM–Terminal: Missing Link for the design of CO_2-neutral buildings
Hildegund FIGL
Austrian Institute for Building and Ecology, Austria

Step-by-step implementation of BIM-LCA: A case study analysis associating defined construction phases with their respective environmental impacts
Roberta DI BARI, University of Stuttgart, Germany

Connecting BIM and LCA: The Case Study of an Experimental Residential Building
Jakub VESELKA
Czech Technical University in Prague, Czech Republic

Towards a Life Cycle Sustainability Assessment method for the quantification and reduction of impacts of buildings life cycle
Bernardette SOUST-VERDAGUER
Universidad de Sevilla, Spain

Digitalization of building LCA and international activities – in the context of German assessment system for sustainable building
Tanja BROCKMANN
Federal Institute For Research on Building, Urban Affairs and Spatial Development, Germany

Computer-aided supporting tool for LCA evaluation of energy efficiency of the buildings – assessment method and case studies
Sašo MEDVED, University of Ljubljana, Slovenia

HS V

Products 3

Low Carbon Building Materials

Session Chair: **Adélaïde Feraille**,
Ecole des Ponts ParisTech, France

Integrating Earthen Building Materials and Methods into Mainstream Construction Using Environmental Performance Assessment and Building Policy
Lola BEN-ALON
Carnegie Mellon University, United States of America

Comparative analysis of an existing public building made from natural building materials and reference buildings designed from common building materials
Peter MEDGYASSZAY
Budapest University of Technology and Economics, Hungary

Environmental impact of timber frame walls
Marijke STEEMAN
Ghent University, Belgium

Linking construction timber carbon storage with land use and forestry management practices
Eilidh J FORSTER
Bangor University, United Kingdom

Life cycle assessment of rammed earth made using alkaline activated industrial by-products
Alexandra MEEK
University of Western Australia, Australia

Butt-joint bonding of timber as a key technology for point-supported, biaxial load bearing flat slabs made of cross-laminated timber
Adam Maximilian THEMESSL
BFH Berner Fachhochschule, Switzerland

ATEG152

Education & Economy 3

Actors, Markets & Business Models

Session Chair: **Morten Birkved**,
Danish Building Research Institute, Denmark

A survey of private landlords in Karlsruhe and their perception of deep energy retrofit
Elias NABER
Karlsruhe Institute of Technology, Germany

New business models to support sustainable development: The case of energy-efficiency measures in buildings
Anika HONOLD
Karlsruhe Institute of Technology, Germany

Social housing energy retrofitting: Business model and supporting tools for public administration
Paola PENNA
Fraunhofer Italia Research, Italy

Effects of the tenants electricity law on energy system layout and landlord-tenant relationship in a multi-family building in Germany
Fritz BRAEUER
Karlsruhe Institute of Technology, Germany

Implementing sustainable sourcing in construction: Results of a current analysis of the Austrian market
Johannes WALL
Ed. Züblin AG, Germany

Business-models of gravel, cement and concrete producers in Switzerland and their relevance for resource management and economic development on regional a scale
Ronny MEGLIN
HSR University of Applied Sciences Rapperswil, Switzerland

AT01036

PROGRAM OVERVIEW IN THE INSIDE FLAP

CONFERENCE SESSIONS

including Special Sessions

Thursday
12 Sept
16.15 – 17.45

Transition Towards
a Net Zero Carbon
Built Environment

National Issues 1

Strategies for Retrofitting the Building Stock

Session Chair: **York Ostermeyer**,
Chalmers University of Technology, Sweden

Possible strategies and obstacles in the pathway towards energy transition of residential building stocks in Switzerland
Flourentzos FLOURENTZOU
Estia SA, Switzerland

Fleet-based LCA applied to the building sector – Environmental and economic analysis of retrofit strategies
Verena GÖSWEIN
Universidade de Lisboa, Portugal

Potential for energy savings in Czech residential building stock by application of a prefabricated mass retrofitting system
Antonín LUPÍŠEK
Czech Technical University in Prague, Czech Republic

ENERFUND - Identifying and rating deep renovation opportunities
Susanne GEISSLER
SERA energy & resources e.U., Austria

Defining a framework to apply retrofitting optimisation models for long-term and step-by-step renovation approaches
Iná MAIA
TU Wien, Austria

Towards a model for circular renovation of the existing building stock: a preliminary study on the potential for CO2 reduction of bio-based insulation materials
Francesco Pittau
ETH Zürich, Switzerland

AULA

Buildings 4

Low Carbon Construction

Session Chair: **Annette Hafner**,
Ruhr University Bochum, Germany

Improving Construction Efficiency with Digital Fabrication. An Environmental Insight
Kateryna KUZMENKO
Ecole des Ponts ParisTech / Kardham Cardete&Huet Architecture, France

A holistic approach for industrializing timber construction
Aída SANTANA SOSA
TU Wien, Austria

Massive timber building vs. conventional masonry building. A comparative life cycle assessment of an Italian case study
Giuliana IANNACCONE
Politecnico di Milano, Italy

Comparative LCA of a concrete and steel apartment building and a cross laminated timber apartment building
Rolf André BOHNE
Norwegian University of Science and Technology, Norway

Potential of contemporary earth architecture for low impact building in Belgium
Jasper VAN DER LINDEN
Hasselt University, Belgium

HS I

Building Design 4

Special Session End-of-Life Information

Session Chair: **Wolfram Trinius**,
Ingenieurbüro Trinius GmbH, Germany

The practical use of module D in a building case study: assumptions, limitations and methodological issues
Laetitia DELEM
BBRI, Belgium

Reconciling recycling at production stage and end of life stage in EN 15804: the case of metal construction products
Christian LEROY
METALS FOR BUILDINGS alliance, Belgium

Declaration of the End-of-Life for Building Products
Wolfram TRINIUS
Ingenieurbüro Trinius GmbH, Germany

The Reporting of End of Life and Module D Data and Scenarios in EPD for Building level Life Cycle Assessment
Jane ANDERSON
The Open University, United Kingdom

Modelling options for module C and D: Experiences from 50 EPD for wood-based products in Norway
Lars Gunnar F. TELLNES
Ostfold Research, Norway

A typology of digital building technologies: Implications for policy and industry
Johannes Meuer
ETH Zurich, Switzerland

HS VI

Cities 3

Special Session Urban Green Infrastructure and Re-naturing Cities

Session Chair:
Vera Enzi and Susanne Formanek,
GRÜNSTATTGRAU GmbH, Austria

Integration of multiple methodologies to evaluate effects of Nature Based Solutions on urban climate mitigation and adaptation
Arantza LÓPEZ
Tecnalia, Spain

Fostering the implementation of green solutions through a Living Lab approach – experiences from the LiLa4Green project
Tanja TÖTZER
Austrian Institute of Technology GmbH, Vienna, Austria

The Potential of Greenable Area in the Urban Building Stock
Rosemarie STANGL
University of Natural Resources and Life Science, Austria

Mapping of innovative governance models to overcome barriers for nature based urban regeneration
Aitziber EGUSQUIZA
TECNALIA, Spain

Green Resilient City - A framework to integrate the Green and Open Space Factor and climate simulations into everyday planning to support a green and climate-sensitive landscape and urban development
Florian REINWALD, University of Natural Resources and Life Sciences, Austria

HS XII

Processes 4

Data & Information in LCA

Session Chair: **Marcella Ruschi Mendes Saade**,
Université de Sherbrooke, Canada

Information management throughout the life cycle of buildings – Basics and new approaches like blockchain
Manuel GANTER
Karlruhe Institute of Technology, Germany

Context-dependent information space for construction information processes
Frank HILBERT
Technische Universität Dresden, Germany

A design integrated parametric tool for real-time Life Cycle Assessment – Bombyx project
Saso BASIC
ETH Zürich, Switzerland

Sustainable building information modeling in the context of model-based integral planning
Sebastian EBERTSHÄUSER
Karlsruher Institute of Technology, Germany

IBPSA Project 1 : BIM/GIS and Modelica framework for building and community energy system design and operation -- ongoing developments, lessons learned and challenges
Gerald SCHWEIGER
Graz University of Technology, Austria

HS V

Products 4

Sustainable Construction Products I - EPD and Labels

Session Chair: **Dimitra Ioannidou**,
ecoinvent, Switzerland

Environmental Product Declarations (EPDs) as a competitive parameter within sustainable buildings and building materials
Sarah C. ANDERSEN
EPD Danmark, Denmark

Roles of the reference service life (RSL) of buildings and the RSL of building components in the environmental impacts of buildings
Tajda OBRECHT
Slovenian Building and Civil Engineering Institute, Slovenia

Economic valuation of life cycle environmental impacts of construction products – A critical analysis
Vera DURÃO
Universidade de Lisboa, Portugal

VinylPlus® and the VinylPlus Product Label. Could the industry label be integrated into independent sustainability certification schemes?
Heinz G. SCHRATT
PlasticsEurope Austria, Austria

PolyStyreneLoop – The circular economy in action
Clemens DEMACSEK
Güteschutzgemeinschaft Polystyrol-Hartschaum, Austria

ATEG152

PROGRAM OVERVIEW IN THE INSIDE FLAP

CONFERENCE SESSIONS

including Special Sessions

Friday
13 Sept

09.30 – 11.00

Transition Towards
a Net Zero Carbon
Built Environment

National Issues 2

Strategies for Transition on National & Sector Level I

Session Chair: **Rosemarie Stangl**,
University of Natural Resources and Life Sciences, Austria

Implementation of Sustainable Development Goals in construction industry - a systemic consideration of synergies and trade-offs
Antonija Ana WIESER
University of Graz, Austria

Retrofitting strata property - a tool supporting long-term retrofit strategy
Thomas HEIM
Lucerne University of Applied Sciences and Arts, Switzerland

Mobilizing Low Carbon Transition: Transnational Practice of Energy Efficiency in the Urban Building Sector
Keru FENG
University of Duisburg-Essen, Germany

Strategies for a sustainable energy transition: the case of the housing sector in Graz, Austria
Bernhard HOHMANN
University of Graz, Austria

Energy transition and technical energy regulations in the building sector
Christof KNOERI
ETH Zürich, Switzerland

AULA

Buildings 5

Special Session Circularity in Nature and in Buildings

Session Chair: **Flora E. Szkordilisz**,
Hungarian Urban Knowledge Centre, Hungary

Construction, deconstruction, reuse of the structural elements: the circular economy to reach zero carbon
Ingrid BERTIN
Ecole des Ponts ParisTech, France

Sustainable design of vegetated structures: Building freshness
Julien CRAVERO
Ecole des Ponts ParisTech, France

Design concept for prefabricated elements from CDW timber for a circurlar building
Andrea KLINGE
ZRS Architekten Ingenieure, Germany

Prototypology for a circular building industry: the potential of re-used and recycled building materials
Felix HEISEL
Karlsruhe Institute of Technology, Germany

The secret ingredient – the role of governance in green infrastructure development: through the examples of European cities
Flora E. SZKORDILISZ
Hungarian Urban Knowledge Centre, Hungary

HS I

Building Design 5

LCA challenges:
Consequential LCA and Uncertainty

Session Chair: **Ben Amor**,
LIRIDE Sherbrooke University, Canada

Consequential life cycle assessment of Brazilian cement industry technology projections for 2050
Marcella SAADE
UNICAMP, Brazil;
Université de Sherbrooke, Canada

Enhancing consistency in consequential life cycle inventory through material flow analysis
Sylvain CORDIER
Université de Sherbrooke, Canada

Consequential LCA of demountable and reusable internal wall assemblies: a case study in a Belgian context
Matthias BUYLE
University of Antwerp, Belgium

Probabilistic LCA and LCC to identify robust and reliable renovation strategies
Alina GALIMSHINA
ETH Zürich, Switzerland

Scenario uncertainties assessment within whole building LCA
Vanessa GOMES DA SILVA
UNICAMP, Brazil

Diagnosis of uncertainty treatment in neighbourhood life cycle assessments
Olivia ZARA
UNICAMP, Brazil

HS VI

Cities 4

Spatial Planning in the Context of Sustainable Development

Session Chair: **Zsuzsa Szalay**,
Budapest University of Technology and Economics, Hungary

Implementation of a sustainability monitoring tool into the dynamics of an urban brownfield regeneration project
Martine LAPRISE
Ecole Polytechnique Fédérale de Lausanne, Switzerland

Pocket Mannerhatten – city renewal on the basis of spatial sharing strategies, bottom-up participation and common good-based incentives.
Florian NIEDWOROK
Arch. DI Florian Niedworok - Studio Mannerhatten, Austria

Modelling of a sanitary landfill for developing countries to improve the reliability of Life Cycle Assessment studies
Matheus Augusto De Oliveira FERNANDES
Federal University of Minas Gerais, Brazil

Bike model district “Alte Neustadt” in Bremen
Michaela HOPPE
City University of Applied Sciences Bremen, Germany

Climate-resilient urban planning and architecture with GREENPASS illustrated by the case study ‘FLAIR in the City’ in Vienna
Florian KRAUS
GREENPASS GmbH, Vienna, Austria

HS XII

Processes 5

Methods and Tools Supporting Early Design Decisions

Session Chair: **Bernardette Soust-Verdaguer**,
Universidad de Sevilla, Spain

Sustainability Assessment in Architectural Competitions in Switzerland
Massimo MOBIGLIA
University of Applied Science and Arts of Southern Switzerland, Switzerland

Multi-objective optimization of building’s life cycle performance in early design stages
Hanze YU
Tianjin University, China

Early design stage building LCA using the LCA-byg tool: New strategies for bridging the data gap
Kai KANAFANI
Aalborg University, Denmark

Early design stage building LCA using the LCA-byg tool: Comparing cases for early stage and detailed LCA approaches
Regitze Kjær ZIMMERMANN
Aalborg University, Denmark

Evaluation of BIM based LCA in early design phase (low LOD) of buildings
Mats Nilsen
Norwegian University of Science and Technology, Norway

Lessons learned from assessing life cycle impacts for an environmental product declaration: Examples for run-of-river power plant
Christoph Samuel MEILI
ESU-services, Switzerland

HS V

Products 5

Sustainable Construction Products II

Session Chair: **Tajda Obrecht**,
Slovenian Building and Civil Engineering Institute, Slovenia

Building Physics as a Tool for Development of New Components: Roof Window
Jan TYWONIAK
Czech Technical University in Prague, Czech Republic

Environmental performance of window systems in patient rooms: a case study in the Belgian context
Nazanin EISAZADEH
KU Leuven, Belgium

Partially dynamic life cycle assessment of windows indicates potential thermal over-optimization
Morten BIRKVED
University of Southern Denmark, Denmark

Perimeter blocks in different forms – aspects of daylight and view
Bengt SUNDBORG
Norwegian University of Science and Technology, Norway

Lifecycle analysis of finishing products enhanced with phase changing materials
Petr ZHUK
Moscow Institute of Architecture, Russian Federation

Designing a smart factory for mass retrofit of houses
Kerstin LANGE and Ulla-Britt KRAEMER
Jade University of Applied Sciences, Germany; Province of Overijssel, Zwolle, Netherlands

ATEG152

PROGRAM OVERVIEW IN THE INSIDE FLAP

CONFERENCE SESSIONS

including Special Sessions

Friday
13 Sept

11.30 – 13.00

Transition Towards
a Net Zero Carbon
Built Environment

National Issues 3

Strategies for Transition on National & Sector Level II

Session Chair: **Christof Knoeri**,
ETH Zürich, Switzerland

Achieving net zero status in South Africa
Rolien TERBLANCHE
University of Witwatersrand, South Africa

A top-down approach for setting climate targets for buildings: the case of a New Zealand detached house
Chanjief CHANDRAKUMAR
Massey University, New Zealand

Analysing the impact of retrofitting and new construction through probabilistic life cycle assessment. A method applied to the environmental-economic payoff value of an intervention case in the Albanian building sector
Olivia JORGJI
Fraunhofer Institute for Building Physics, Germany

Towards conceptual understanding for the adoption of building environmental sustainability assessment methods in the UAE built environment
Amna Izzeldin SHIBEIKA
United Arab Emirates University, United Arab Emirates

AULA

Buildings 6

Special Session Environmental Benchmarking of Buildings

Session Chair: **Damien Trigaux**,
KU Leuven, Belgium

Using a budget approach for decision-support in the design process
Guillaume HABERT
ETH Zurich, Switzerland

Dynamic Benchmarking of Building Strategies for a Circular Economy
Leonora Charlotte Malabi EBERHARDT
Aalborg University, Denmark

Carbon Heroes Benchmark Program – whole building embodied carbon profiling
Rodrigo CASTRO
Bionova Ltd., Finland

Inventory of the existing residential building stock for the purpose of environmental benchmarking
Evelien VERELLEN
KU Leuven, Belgium

Life-Cycle Assessment as a decision-support tool for early phases of urban planning: evaluating applicability through a comparative approach
Katarina SLAVKOVIC
Ecole polytechnique fédérale de Lausanne, Switzerland

Critical analysis of existing environmental benchmarks for buildings
Damien Trigaux
KU Leuven, Belgium

HS I

Building Design 6

Regenerative Strategies for Improving Resilience

Session Chair: **Anna Braune**,
DGNB e.V., Germany

The regenerative building: A concept of total sustainability
Carlo GAMBATO
University of Applied Sciences and Arts of Southern Switzerland, Switzerland

HYBRIDisation – a resilient strategy in times of change and transformation
Peter SCHWEHR
Lucerne University of Applied Sciences and Arts, Switzerland

Hydrological and thermal response of green roofs in different climatic conditions
Ciril ARKAR
University of Ljubljana, Slovenia

Integrating climate change in life cycle assessment of buildings: literature review
Delphine RAMON
KU Leuven, Belgium

HS VI

Cities 5

Greening the Infrastructure

Session Chair: **Eike Roswag-Klinge**,
Technische Universität Berlin, Germany;
ZRS Architekten Ingenieure

Public procurement for carbon reduction in infrastructure projects – an international overview
Sofia LINGEGÅRD
KTH Royal Institute of Technology, Sweden

Influence of cross passages temperatures on the life-cycle cost of technical equipment in a railway tunnel
Marco SCHERZ
Graz University of Technology, Austria

Integrated evaluation of energy and emission reduction potential and management strategies for urban road systems
Sara ANASTASIO
Norwegian University of Science and Technology, Norway

Life Cycle Assessment of Alternative Road Base Materials: the Case of Phosphogypsum
Myriam SAADÉ-SBEIH
Ecole des Ponts ParisTech, France

HS XII

Processes 6

Monitoring & Data Analysis

Session Chair: **Natalie Essig**,
Munich University of Applied Sciences, Germany

Large scale smart meter data assessment for energy benchmarking and occupant behaviour profile development
Zsuzsa SZALAY
Budapest University of Technology and Economics, Hungary

Monitoring results of innovative energy-efficient buildings in Austria
Martin BEERMANN
JOANNEUM RESEARCH Forschungsgesellschaft mbH, Austria

An innovative user feedback system for sustainable buildings
Michael MONSBERGER
Graz University of Technology, Austria

Hook-and-Loop fastener-application for the technical building equipment
Ferdinand OSWALD
University of Auckland, New Zealand

Image-obfuscation as a means for privacy-conscious visual data acquisition from building systems
Sarith SUBRAMANIAM
TU Kaiserslautern, Germany

The Three Sisters, klimaaktiv object of the month 12/2018
Mario KRANZL
DR. PFEILER GmbH, Austria

HS V

PROGRAM OVERVIEW IN THE INSIDE FLAP

CONFERENCE SESSIONS

including Special Sessions

Friday
13 Sept

14.15 – 15.45

Transition Towards
a Net Zero Carbon
Built Environment

NOTES

SPECIAL FORA

Transition Towards a Net Zero Carbon Built Environment

SPECIAL FORA OVERVIEW

Level(s) and its Place in the Tool Box for Sustainable Construction

Andreas **Rietz**
Federal Institute for Research on Building, Urban Affairs and Spatial Development, Germany

Moderation: Thomas **Lützkendorf**
Karlsruhe Institute of Technology

AULA

„Die 3 Schwestern in der Seestadt Aspern Bauplatz D22" – Paradebeispiel für nachhaltiges Wohnen
Natürlicher Baustoff Ziegel als ideale Voraussetzung für wohngesundes Bauen und Wohnen

Wienerberger Österreich GmbH

In German Language

HS XII

CONDEREFF - European project regarding construction & demolition waste
Improve environment and resource efficiency and enhance reuse

Land Steiermark - A14 Abfallwirtschaft und Nachhaltigkeit

AT01104

Implementing BWR 7 „Sustainable Use of Natural Resources" in Europe

Peter **Maydl**, Graz University of Technology, Consulting Engineer "Sustainable Engineering"

Thomas **Lützkendorf**, Karlsruhe Institute of Technology

Alexander **Passer**, Graz University of Technology

AULA

The Role of Background Databases in the Environmental Assessments of Buildings: what is the way forward?

ecoinvent Association

Dimitra **Ioannidou**, ecoinvent
Gregor **Wernet**, ecoinvent
Marisa **Vieira**, PRé Sustainability

AT01104

Certified Sustainability: Should the VinylPlus® Product Label be Integrated in Existing Sustainability Label Schemes for Buildings?

Heinz G. **Schratt**
PlasticsEurope Austria, industry spokesperson for all plastics, representative of VinylPlus®

AT01098

EPD thought through to the end?

Eva **Schmincke**, Thinkstep AG Tübingen
Thomas **Lützkendorf**, Karlsruher Institut für Technologie

AT01104

Was leistet grüne Infrastruktur in stark verdichteten Städten und wie lässt sie sich weiter ausbauen? *Handlungsspielräume zur Erhaltung lebenswerter und kooperativ genutzter Städte*

green.LAB Graz Projektkonsortium

In German Language

WAAGNER-BIRO-STRASSE

Beton als Baustoff - wieviel ist uns Nachhaltigkeit wert?
Bewertung, Kosten und Mehrwert von Stahlbeton für Infrastrukturbauleistungen

Joachim **Juhart**
Graz University of Technology, Institute of Technology and Testing of Construction Materials

In German Language

AT01104

Holzbau im urbanen Raum – eine Chance für Städte?

Holzcluster Steiermark
In German Language

AT01104

Plastics in Sustainable Building & Living: Protection of Health and the Environment

International Sustainable Chemistry Collaborative Centre **(ISC3)**

AT01098

Realising Smart City Graz
Implementation of Innovative Urban Demonstration Projects at City and District Level

Kai-Uwe **Hoffer**
Smart City Coordinator, City of Graz

AT01098

SPECIAL FORA

Level(s) and its Place in the Tool Box for Sustainable Construction

Josefina **Lindblom**, DG Environment, European Commission
Martin **Röck** & Alexander **Passer**, Graz University of Technology
Harpa **Birgisdottir** & Kai **Kanafani**, Danish Building Research Institute
Ursula **Hartenberger**, Head of Sustainability, RICS
Andreas **Rietz**, Head of Division Sustainable Building, BBSR

Moderation: Thomas **Lützkendorf**, Karlsruhe Institute of Technology

12 Sept 2019, 11.30 – 13.00 | Aula, Rechbauerstraße 12, 8010 Graz

Level(s) is a voluntary reporting framework for describing and documenting relevant building features with respect to their sustainability related characteristics. The Special Forum will discuss the role of Level(s) in the overall system of instruments and tools to promote sustainable design, construction and operation, and how interdependencies with other approaches can be shaped.

„Die 3 Schwestern in der Seestadt Aspern Bauplatz D22" – Paradebeispiel für nachhaltiges Wohnen

Natürlicher Baustoff Ziegel als ideale Voraussetzung für wohngesundes Bauen und Wohnen

Wienerberger Österreich GmbH

Moderation: Fachjournalistin Sabine **Müller-Hofstetter**

12 Sept 2019, 11.30 – 13.00 | HS XII, Rechbauerstraße 12, 8010 Graz

In der Seestadt Aspern wurde die Wohnhausanlage „Die Drei Schwestern" errichtet. Aufgrund der durchgängig in mineralischer und einschaliger Bauweise als Niedrigstenergiehaus errichteten Baukörper, wurde ein wesentlicher Beitrag zum Verzicht auf erdölbasierten Vollwärmeschutz geleistet. Im Zuge des Special Forums sollen die hohen ökologischen, ökonomischen und soziokulturellen Qualitätsansprüche der Planung diskutiert werden. Aspekte der Nachhaltigkeit spiegeln sich beispielsweise in der ökologischen Materialauswahl, Langlebigkeit, Wertbeständigkeit, wider.

CONDEREFF - European project regarding construction & demolition waste

Improve environment and resource efficiency and enhance reuse

Land Steiermark - A14 Abfallwirtschaft und Nachhaltigkeit

12 Sept 2019, 11.30 – 13.00 | AT01104, Rechbauerstraße 12, 8010 Graz

In 2015, 10 million tons of construction and demolition waste have been generated in Austria. To foster a move towards circular economy and minimize this high amount, Styria is part of the EU project CONDEREFF. CONDEREFF is an interregional cooperation project, which brings together 8 partners from 7 countries to accelerate their policy work on improving resource efficiency at territorial level. Furthermore, Styria has developed a guideline for the deconstruction of buildings to enhance the amount of recycled materials. The country aims to increase the volume of reused construction materials.

Implementing BWR 7 „Sustainable Use of Natural Resources“ in Europe

Peter **Maydl**, Graz University of Technology, Consulting Engineer “Sustainable Engineering”
Thomas **Lützkendorf**, Karlsruhe Institute of Technology
Alexander **Passer**, Graz University of Technology

12 Sept 2019, 14.15 – 15.45 | Aula, Rechbauerstraße 12, 8010 Graz

In 2013, Construction Products Regulation (CPR) has come into force including the new Basic Requirement for Construction Work (BWR) 7 “Sustainable use of natural resources”. Although CPR is well established and BWR 7 is in this context a legal demand, it is not yet common practice to take it into account in most of the member states. In 2020 CPR will be modified by the EC. This Special Form gives the opportunity to analyze EC´s intentions and expectations in terms of implementing BWR 7 in the context of the new CPR, to share experiences made in the member states so far, to discuss proposals for an amended BWR 7, to assess the need for action and to develop recommendations for a change of the current BWR 7.

SPECIAL FORA

The Role of Background Databases in the Environmental Assessments of Buildings: What is the Way forward?

ecoinvent Association

12 Sept 2019, 14.15 – 15.45 | AT01104, Rechbauerstraße 12, 8010 Graz

The availability of accurate and up to date life cycle inventory (LCI) data is important to support environmental decision making in the construction sector. However, as the data needs of life cycle assessment (LCA) practitioners (including those working in Environmental Product Declaration (EPD)), continuously evolve, the role and structure of background LCI databases must also develop to ensure that the needs of users are met. The ecoinvent Association, which publishes and manages one of the largest global LCI databases, organises this forum to provide information on and discuss the role of background databases in environmental decision making and EPD creation.

Certified Sustainability: Should the VinylPlus® Product Label be Integrated in Existing Sustainability Label Schemes for Buildings?

Heinz G. **Schratt**, PlasticsEurope Austria, industry spokesperson for all plastics, representative of VinylPlus®

12 Sept 2019, 14.15 – 17.45 | AT01098, Rechbauerstraße 12, 8010 Graz

Sustainability and PVC may go together well—admittedly not all PVC, and not all applications. Hence, it is the goal of the industry to provide a tool for the specifier to discriminate between PVC that fits and supports a sustainable built environment. The PVC value chain demonstrates the thinking and the science behind their new VinylPlus® Product Label and invites participants to discuss the potential of that very label, which is being applied to qualified window frames from May 2018.

EPD Thought through to the End?

Eva **Schmincke**, Thinkstep AG Tübingen
Thomas **Lützkendorf**, Karlsruhe Institute of Technology

12 Sept 2019, 16.15 – 17.45 | AT01098, Rechbauerstraße 12, 8010 Graz

A pre-requisite to achieving circular economy as contribution to resource efficiency and environmental relieve is the provision of appropriate information. The amended EN 15804+A2 requires the calculation of environmental impacts during modules C (End-of-Life) and D (recycling potential). Questions resulting from such requirements will be discussed in this forum. We will show the results of a project funded by the German federal EPA, which essentially describes the involvement of the waste management industry (recycling, recovery, incineration) with the calculation of the environmental performance of construction products.

Beton als Baustoff - wieviel ist uns Nachhaltigkeit wert?

Bewertung, Kosten und Mehrwert von Stahlbeton für Infrastrukturbauleistungen

Joachim **Juhart**, Graz University of Technology, Institute of Technology and Testing of Construction Materials

13 Sept 2019, 09.30 – 13.00 | AT01104, Rechbauerstraße 12, 8010 Graz

Beton bzw. Stahlbeton ist aufgrund seiner hervorragenden Eigenschaften der für Infrastrukturbauwerke weltweit meist verwendete Baustoff. Diesen Baustoff nachhaltig herzustellen – also ressourceneffizient, umweltfreundlich, dauerhaft und wiederverwertbar – ist ein erstrebenswertes Ziel in Zeiten des Klimawandels. Im Forum werden in diesem Zusammenhang Themen wie Nachhaltigkeitskriterien, Kosten für einen solchen alternativen Beton oder die Monetarisierung der Umweltauswirkungen diskutiert.

SPECIAL FORA

Plastics in Sustainable Building & Living: Protection of Health and the Environment

International Sustainable Chemistry Collaborative Centre **(ISC3)**

13 Sept 2019, 09.30 – 13.00 | AT01098, Rechbauerstraße 12, 8010 Graz

The International Sustainable Chemistry Collaborative Centre (ISC3) is a new international organisation founded by the German environmental ministry. It is aiming at sustainable solutions for chemicals. Among other topics the ISC3 has a workstream Plastics in Sustainable Building & Living. The fundamental questions in the workstream are: How to drive construction products towards sustainability in sense of SDGs? And, what are the most relevant innovative areas and potentials for Sustainable Chemistry in the field of Building, Living and Plastics? The current workshop is devoted to the topic protection of Human Health and the Environment aiming at polymers in Building and Living area.

Was leistet grüne Infrastruktur in stark verdichteten Städten und wie lässt sie sich weiter ausbauen?

Handlungsspielräume zur Erhaltung lebenswerter und kooperativ genutzter Städte

green.LAB Graz Projektkonsortium

13 Sept 2019, 12:00 – 15.00 | Waagner-Biro-Straße, 8020 Graz

Green.LAB Graz ist ein aktuell stattfindendes angewandtes Forschungsprojekt im Smart City Stadtteil in der Waagner-Biro-Straße in Graz. Das green.LAB Graz verfolgt das Ziel, Erkenntnisse über grüne Infrastruktur als eine zentrale Klimawandelanpassungsmaßnahme in Städten zu gewinnen und zu vermitteln.
Grüne Infrastruktur kennen lernen, erleben sowie selbst umsetzen und mitgestalten findet innerhalb drei verschiedener Schwerpunkte und Herangehensweisen statt. Das Special Forum beinhaltet eine Begehung des Projektgebiets Smart City.

Holzbau im urbanen Raum – eine Chance für Städte?

Holzcluster Steiermark

13 Sept 2019, 13.30 – 15.45 | AT01104, Rechbauerstraße 12, 8010 Graz

Die Zukunft der Städte stellt uns vor große Herausforderungen und offenbart gleichzeitig enorme Potentiale für die Stadtentwicklung. Nur wenige Referenz- und Leuchtturmprojekte wurden bislang im mehrgeschossigen Wohnbau bzw. im Nichtwohnbau in Holz errichtet. Der moderne Holzbau zeichnet sich durch die Produktion von Bauelementen in der Werkstatt mit hohem Vorfertigungsgrad aus.W Diskutiert werden soll u.a. warum der Holzbau eine Schlüsselfunktion in der wachsenden Urbanisierung einnimmt und wie die Leistungsfähigkeit des Holzbaus weiter verbessert und der Einsatz forciert werden kann.

Realising Smart City Graz

Implementation of Innovative Urban Demonstration Projects at City and District Level

Kai-Uwe **Hoffer**
Smart City Coordinator, City of Graz

13 Sept 2019, 14.15 – 15.45 | AT01098, Rechbauerstraße 12, 8010 Graz

Since 2013 the Smart City Graz Strategy is legally effective as an integral part of the Urban Development Concept 4.0. The strategy paves the way to develop Graz into a „Smart City“ and to become an energy-efficient, resource-conserving and low-emission city of the highest quality of life.
At the SBE19, the City of Graz and its development partners of the first Smart City projects invite all participants to discuss experiences, insights and possible needs for adapting this strategy.

TECHNICAL TOUR

TIME	PROGRAM ITEM
09.30	Meeting Point: Entrance Guesthouse, **Moserhofgasse 41b**
09.30 – 10.30	**Guesthouse Moserhofgasse** Guided Tour
10.30 – 11.00	By tram to Franciscan Monastery
11.00 – 12.30	**Graz Franciscan Monastery** Guided Tour
12.30 – 13.00	By tram to Smart City Graz
13.00 – 14.00	**green.LAB Graz** Presentation
14.00 – 15.30	**Science Tower Graz** Guided Tour
15.30	End of Technical Tour

credit: Ernst Rainer

Science Tower Graz

Office building that demonstrates several technological innovations and therefore acts as a „lighthouse building“ for this future sustainable urban district.

Graz Franciscan Monastery

credit: Ernst Rainer

A monastery located in the middle of the historic center of Graz, which has been innovatively renovated and refurbished for the future.

green.LAB Graz

An innovative demo building and an open (learning, production, exhibition, work) space that focuses on greening the city.

credit: GrünStattGrau

credit: OeAD-WW

Guesthouse Moserhofgasse

The first multi-storey student residence house in passive house building method in Austria.

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Das Land Steiermark Wissenschaft und Forschung

FFG Promoting Innovation.

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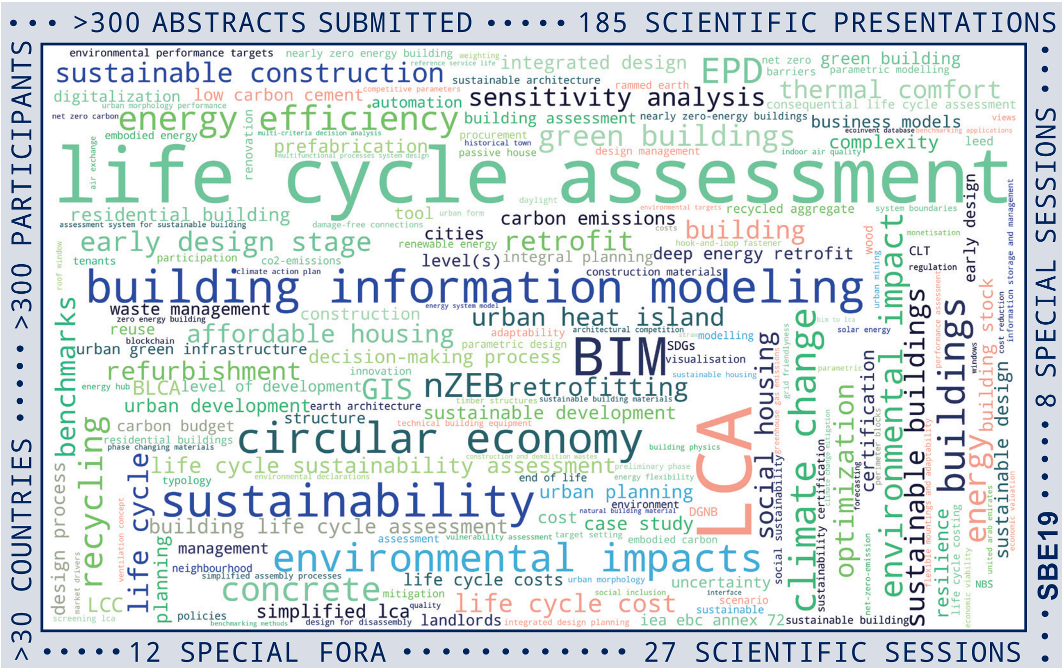
• • • >300 ABSTRACTS SUBMITTED • • • • • 185 SCIENTIFIC PRESENTATIONS
• • • 8 SPECIAL SESSIONS • • • • • SBE19 •
>30 • • • • • 12 SPECIAL FORA • • • • • • • • • • • • • 27 SCIENTIFIC SESSIONS •
>30 COUNTRIES • • • • • >300 PARTICIPANTS
life cycle assessment
building information modeling
BIM
LCA
circular economy
sustainability
environmental impacts
energy efficiency
sustainable construction
sensitivity analysis
green buildings
climate change
sustainable buildings
environmental impact
urban heat island
nZEB
retrofitting
affordable housing
early design stage
retrofit
refurbishment
concrete
life cycle cost
recycling
benchmarks
life cycle
thermal comfort
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EPD
social housing
optimization
buildings
energy
carbon emissions
building
deep energy retrofit
GIS
sustainable development
life cycle sustainability assessment
building life cycle assessment
urban planning
case study
simplified lca
life cycle costs
prefabrication
residential building
decision-making process
urban green infrastructure
waste management
urban development
digitalization
low carbon cement
green building
business models
complexity
certification
sustainable design
building stock
resilience

NOTES

NOTES

VENUES

CONFERENCE VENUE
Graz University of Technology, Rechbauerstraße 12, 8010 Graz

The conference is held in the main building of Graz University of Technology, at the campus „Alte Technik“. The venue can be reached by public transport. The tram lines 3, 1 and 7 pass the venue, all coming from the train station via the city center. Tram line 3 stops at “Rechbauerstraße”, lines 1 and 7 at “Maiffredygasse”.
We offer reduced tickets for public transport in Graz (3- or 4-day-tickets) at the conference office.

TOWN HALL: WELCOME EVENING
Hauptplatz 1, 8010 Graz

The Welcome Evening takes place in the town hall, in the heart of the city center. All tram lines in Graz stop at “Hauptplatz/Grazer Congress”, directly at the main square with the town hall.

SCHLOSSBERG RESTAURANT: CONFERENCE DINNER
Schlossberg 7, 8010 Graz

The conference dinner will be held at the restaurant with the best view in Graz, on top of the “Schlossberg”. The easiest way to reach the restaurant is with the cable car “Schlossbergbahn”, which starts at the tram station “Schlossbergbahn” (lines 4 and 5) and takes you up directly to the restaurant. The Schlossbergbahn goes on a 15-minute schedule, starting at full hours (with the public transport ticket the „Schlossbergbahn“ is for free). Alternatively, you can walk up or take the elevator from “Schlossbergplatz” (the single ticket for the elevator is 1,70€).

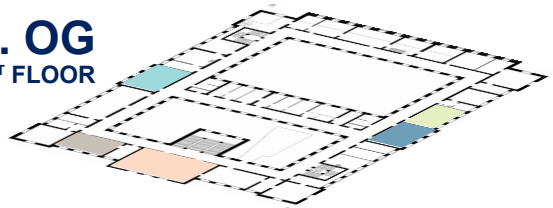
GREEN.LAB: SPECIAL FORUM
Waagner-Biro-Straße 99, 8020 Graz

The Green.LAB Graz hosts the Special Forum “Was leistet grüne Infrastruktur in stark verdichteten Städten und wie lässt sie sich weiter ausbauen?“ (Friday, 13 September, 12.00). The venue is best reached by trams 1, 3, 6 or 7 to „Waagner-Biro Straße“ and then with bus 85 to „Dreierschützengasse/Helmut-List-Halle“.

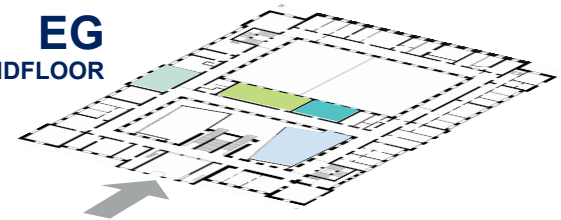
OEAD-GUESTHOUSE MOSERHOFGASSE: TECHNICAL TOUR
Moserhofgasse 41b, 8010 Graz

The OeAD-guesthouse is the first stop and the meeting point of the technical tour on Saturday, 14 September. It is close to the tram stop “Moserhofgasse” (line 6).

1. OG
1ST FLOOR



EG
GROUNDFLOOR



RECHBAUERSTRASSE

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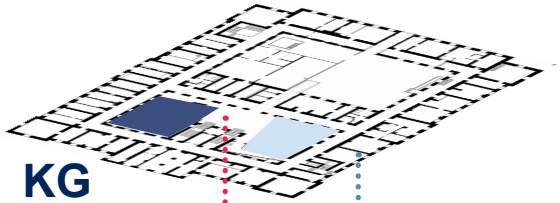
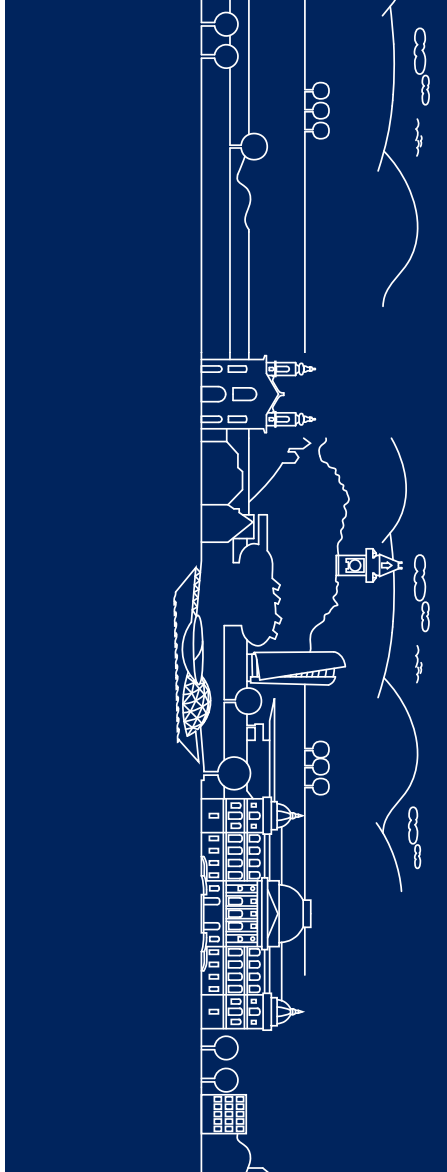
BASEMENT



- **AULA**
- **HS V** AT01012
- **AT01 036**
- **AT01 098**
- **AT01 104**
- **HS VI** ATEG142
- **HS XII** ATEG036
- **ATEG 152**
- **HS I** ATK1120H
- **HS II** ATK1008H
- ENTRANCE
- Meetingpoint Technical Tour **Moserhofgasse 41b**
- TOWN HALL **Hauptplatz 1**

Conference Office/ Registration

Cloakroom/ Upload Center ATK1114



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