



INTEGRATING SUSTAINABILITY AND HEALTH IN BUILDINGS THROUGH RENEWABLE MATERIALS



INNORENEW CoE INTERNATIONAL CONFERENCE
2020



INNORENEW CoE

Livade 6, 6310 Izola, Slovenia

IRIC2020 SCIENTIFIC COMMITTEE

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WELCOME



As we open the second InnoRenew CoE International Conference, it's hard not to think of all that has changed in the year and a half that has passed since our debut conference.

Although the pandemic has dramatically changed our day-to-day lives, it has not changed society's need to address the rapidly changing climate, reconsider our economic priorities, and refocus our attention on important social issues. Buildings remain part of the solution to many problems, and I think it is becoming clear that we need to consider much more about buildings than the basics of shelter.

As the pandemic kept us indoors, many of us may have realised that our indoor environment plays an even more important role in our well-being and happiness than we previously acknowledged. Likewise, we may have considered more carefully how buildings affect the well-being of those who live in different circumstances. Access to safe, comfortable, and healthy living and working spaces is (and should be) a priority in a just society.

Another major change that will affect our work in the years to come is the introduction of the European Green Deal, which will be a major driver of sustainable development in Europe. The European Green Deal prioritises investment and innovation in building renovation solutions for energy performance and attempts to ensure these solutions reach all members of society. The European Green Deal recognizes the need to establish high-performance housing for all and will support renovation in social housing, schools, and other facilities that are often left behind. This is a step in the right direction for inclusive, high-performing buildings.

I rarely find proclamations of success convincing when it comes to sustainability – especially about buildings. We must continue to drive change through research, development, and innovation to make our built environment a beacon of sustainable development. We cannot be satisfied with the environmental performance of our products or buildings; we cannot allow people to be excluded from our advancements; and we cannot forget that buildings impact the well-being and happiness of their occupants.

At this year's InnoRenew CoE International Conference, we wanted to showcase how renewable materials play an integral role in sustainable construction by highlighting environmental performance, safety, and health as well as the economic, digital, and social links that bind us to the materials in the built environment. Conference presenters will discuss advances in design, material development, health research, retrofitting, environmental assessment, and many other topics that increase the efficiency and performance of the building and renewable materials sectors.

Carlo Battisti, President of Living Future Europe, will weave together these complementary threads in his keynote address, "Healthy, living transparent. The quiet revolution of materials". He works to push for change and supports researchers, architects, engineers, and other construction professionals to achieve it. His efforts have expanded knowledge and acceptance of restorative sustainability and regenerative design within Europe's construction community. We are excited and grateful for his participation in our conference.

Together, the contributions paint a hopeful picture. But we must continue to push the science forward, embed these innovations in normal construction practices, and ensure inclusion of all who can benefit from our hard work.

While I wish these matters could have been discussed in person in Izola, we must embrace new options for discourse on these topics. I hope the conference inspires you to reach out to one another and continue sharing, collaborating, and building communities that embrace the challenge of creating a sustainable and just built environment. You may also consider our new open access and peer-reviewed journal, *Interdisciplinary Perspectives on the Built Environment*, as a place to share the insights your work provides.

Thank you,

Dr Michael Burnard
Deputy Director, InnoRenew CoE
Assist. Prof., University of Primorska

SCHEDULE AT A GLANCE

MORNING

WELCOME
9:00–9:05

KEYNOTE
9:05–9:35

FLASH TALKS
9:35–10:35

COFFEE BREAK
10:35–11:00

**HUMAN HEALTH IN THE
BUILT ENVIRONMENT**
11:00–12:30

LUNCH
12:30–14:00

AFTERNOON

COMPLEMENTARY TOPICS
14:00–15:30

COFFEE BREAK
15:30–15:55

**SUSTAINABLE CONSTRUCTION
WITH RENEWABLE MATERIALS**
15:55–17:25

CLOSING
17:25–17:30

KEYNOTE ADDRESS



CARLO BATTISTI
PRESIDENT, LIVING FUTURE EUROPE

*Healthy, living, transparent.
The quiet revolution of materials.*

Carlo Battisti has a degree in civil engineering from the Politecnico of Milan, nearly twenty years of experience in construction companies and a master's in management and organizational development from MIP International Business School. His certifications include Certified Project Manager IPMA®; LEED®, Living Future and WELL Accredited Professional; GBC Home AP, GBC Historic Building AP; USGBC® and WELL Faculty™.

Since 2009, he has been working with IDM South Tyrol (Italy) as an innovation manager in the Business Development department, Construction. From 2010 to 2011, he worked with the Energy and Environment Cluster of Trentino as manager of the business unit for sustainable products. From 2015 to 2016, he was the co-owner of a startup focused on LEED consulting. In 2015, he co-founded the Living Future Italy Collaborative.

Since 2017, he has been working with Eurac Research as Chair and Project Manager of COST Action 16114 RESTORE (REthinking Sustainability TOwards a Regenerative Economy). The RESTORE COST Action (2017–2021) will affect a paradigm shift towards restorative sustainability for new and existing buildings and space design across Europe through the collaboration of 160+ researchers from 40 European countries.

Since 2018, he is European Executive Director for the International Living Future Institute and current President of Living Future Europe. The Institute's mission will hasten the change and provide needed direction towards a regenerative design transition in Europe. It is actively pursuing European market alignment and adaptations of the Living Building Challenge (LBC).

AGENDA

WELCOME | 9:00-9:05

Dr Michael Burnard, InnoRenew CoE

KEYNOTE | 9:05-9:35

Carlo Battisti, Living Future Europe

FLASH TALKS | 9:35-10:35

Balázs Dávid, InnoRenew CoE / UP FAMNIT
Using discrete optimization methods in decision support for structural design

.....10

Dóra Zetz, Breuer Marcell Doctoral School, Faculty of Engineering and Information Technology, University of Pécs
Office Building Optimisation Using the Energia Design Synthesis Method

.....11

Eva Prelovšek Niemelä, InnoRenew CoE
Developing temporary housing solutions for displaced persons – a study of user needs

.....12

Faksawat Poohphajai, InnoRenew CoE
Evaluation of Biofinish for Wood Protection

.....13

Hajnalka Juhász, University of Pécs, Faculty of Engineering and Information Technology
*HUNGARIAN NEST+ New type energy spaces in sustainable architecture**

.....14

Hana Remešová, InnoRenew CoE
Testing the Thermal Properties of Loose-Fill Straw Insulation

.....15

Jaka Pečnik, InnoRenew CoE
Thermo-Hydro-Mechanical Treatment of Australian Sawlog and Pulplog Hardwood Resources

.....16

Marko Kovačević, Kompetenzzentrum Holz GmbH
VOC-emission optimized Cross Laminated Timber
.....17

Nežka Sajinčič, InnoRenew CoE
Sustainability, health, and renewable materials – Trends in scientific publications
.....18

Olena Myronycheva, Luleå University of Technology
The Influence of Four Commercial Wood-surface Treatments on Mould-fungi Growth in a Pure Culture
.....19

René Herrera, InnoRenew CoE / University of the Basque Country
Improving hydrophobicity and thermal stability of wood by esterification with fatty acids
.....20

Urška Smrke, University of Ljubljana, Faculty of Arts / University of Maribor, Faculty of Electrical Engineering and Computer Science
Aspects of Residential Environment Included in Residential Satisfaction Questionnaires: A Systematic Review
.....21

Veerapandian Ponnuchamy, InnoRenew CoE
Molecular Dynamics Investigation of Capturing Paracrystalline Cellulose Phase from mixed Crystalline and Amorphous Cellulose under Constant Load
.....22

Zsolt Benkó, University of Szeged, Department of Technology
Practical education of Smart Home Systems emphasizing sustainability
.....23

COFFEE BREAK | 10:35-11:00

*Unable to present



HUMAN HEALTH IN THE BUILT ENVIRONMENT | 11:00-12:30

Aarne Johannes Niemelä, InnoRenew CoE <i>Development of outdoor environment in schools with natural materials – a response of future users</i>	26
Anja Jutraz, National Institute of Public Health <i>Ensuring the health of users with the integrated approach to the renovation of school buildings</i>	27
Anna Sandak, InnoRenew CoE <i>Bioinspired building materials – lesson from nature</i>	28
Dean Lipovac, InnoRenew CoE / UP IAM <i>Psychophysiological and attention restoration in a wooden office: A pilot study</i>	29
Nastja Podrekar, InnoRenew CoE / UP <i>School Furniture as a Risk Factor for Musculoskeletal Pain among Slovenian Students</i>	30
Veronika Kotradyová, Faculty of Architecture, Slovak University of Technology in Bratislava <i>Appreciation/acceptance of traditional and modern appearance of materials and products by users</i>	31

LUNCH | 12:30-14:00

COMPLEMENTARY TOPICS | 14:00-15:30

Benedikt Neyses, Luleå University of Technology <i>Continuous densification of solid wood – the band press approach</i>	34
Dennis Jones, Luleå University of Technology <i>A Review of Wood Modification globally – Findings from COST FP1407 and 2019 updates</i>	35
Gregor Lavrič, Pulp and Paper Institute <i>Optical and abrasion properties of plasma treated and UV LED printed wood samples</i>	36
Laetitia Marrot, InnoRenew CoE <i>Towards Smart Textiles for Civil Engineering Application</i>	37
Marco Fellin, CNR-IVALSA (former) <i>Cross Laminated Timber furniture providing shelter during earthquakes. Lifeshell public domain release.</i>	38
Michael Mrissa, InnoRenew CoE <i>Distributed Ledgers and Decentralized WoT Architectures</i>	39
Stefania Fortino, VTT Technical Research Centre of Finland LTD <i>Numerical simulation of moisture transport in thermally modified wood exposed to rain</i>	40

COFFEE BREAK | 15:30-15:55

IRIC2020 AGENDA CONTINUES ON THE NEXT PAGE

AGENDA

SUSTAINABLE CONSTRUCTION WITH RENEWABLE MATERIALS | 15:55-17:25

Erwin M. Schau, InnoRenew CoE
*A European reference house for Life Cycle
Assessment of wooden residential buildings*
.....42

Giulia Pelliccia, Università degli Studi di
Perugia, Dipartimento di Ingegneria Civile ed
Ambientale (DICA)
*HYGROSCOPIC COFFER. Digital parametrization
and realization of timber bilayer composites for
passive dehumidification in built environments*
.....43

Kristóf Roland Horváth, Marcel Breuer
Doctoral School, University of Pécs, Faculty
of Engineering and Information Technology
*Residential Building Optimisation Using Passive
Design Strategies*
.....44

Tim Mavrič, InnoRenew CoE
*Energy Efficient Retrofitting – A comparative
analysis of implemented strategies in Bosnia-
Herzegovina and Slovenia*
.....45

CLOSING | 17:25-17:30

THANK YOU FOR ATTENDING IRIC2020!

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Complementary Topics

Optical and abrasion properties of plasma treated and UV LED printed wood samples

Gregor Lavrič¹, Jure Žigon², Sebastian Dahle³, Igor Karlovits⁴, Urška Kavčič⁵

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UV LED printing technology can be used for printing directly on wood, which enables new options for unique printed wooden elements in the interior and exterior design. With appropriate design and processing technology, all kinds of wood samples and end products (doors, furniture elements) can be enriched and their added value can be raised. Depending on the application's end use, a pre- or post-treatment may be required to improve ink adhesion and durability. Plasma treatments are a common procedure to improve the performance of coatings and adhesives on various substrate materials. Particularly on wood, air plasma treatments are known to improve adhesion strength and durability of many types of lacquers and varnishes (Žigon et al., 2018). In some cases, air plasmas were even found to be a suitable replacement for parts of the conventional pretreatments, such as the last step of sanding before applying the coating (Wolkenhauer et al., 2009). In other cases, chemical primers could be excluded altogether on plasma pretreated substrates (Viöl et al., 2012).

In this research, Common beech (*Fagus sylvatica* L.) wood samples were printed using flatbed UV LED inkjet system (Apex 1610) with Nazdar UV inks. Half of the specimens were pretreated using a dielectric barrier discharge (DBD) plasma in atmospheric air (Žigon et al., 2019). To determine the influence of the DBD pretreatment print gloss, print sharpness and abrasion resistance of the printed samples were measured. Print gloss was measured on the 100 % covered printed black area with Novo Gloss Trigloss Gloss Meter (RHOPOINT) at 20, 65 and 85 ° gloss angles. The results indicate no significant changes regarding specular reflections after the DBD pretreatment. Print sharpness as a surface quality factor was determined with modulation transfer function (MTF) using ImageJ, an open source image processing program. The results of abrasion resistance obtained with Taber Abraser didn't show significant difference, either. Based on these results, it can be concluded that DBD pretreatment did not have a significant impact on printing properties of Common beech wood samples printed with UV inkjet.

Keywords: UV LED, printing, plasma treatment, gloss, abrasion resistance

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