SBE21 Sustainable Built Heritage: renovating historic buildings towards a low-carbon built heritage

The SBE21 Heritage Conference was co-financed by:

International co-promoters

Under the patronage of

In collaboration with
Foreword

From small medieval towns to nineteenth-century boulevards or post-modern concrete structures, buildings reflect our culture and should be preserved for our future generations. In Europe, historic buildings account for a quarter of the existing building stock. Renovating these constructions presents many opportunities for reducing carbon emissions and for improving the comfort of the people living inside. However, this can be particularly challenging. Each building is unique and needs specific measures to enhance energy efficiency while preserving historic and aesthetic traits. In this sector, the “one-fits-all” approach hardly applies.

From the 14th to the 16th April 2021, the SBE21 Heritage Conference brought together experts working in the fields of energy efficiency and historic building conservation. The conference aimed at fostering multidisciplinary dialogues and finding new affordable and efficient retrofit approaches to save our common heritage and guarantee a sustainable future. Scholars and practitioners worldwide were invited to send their contributions and participate in the debate.

Being the event also the final conference for three research projects at Eurac Research – IEA-SHC Task 59, Interreg Alpine Space ATLAS and HyLAB –, the conference was a great opportunity for these projects to present their findings and achievements, in 34 scientific papers and oral presentations, two workshops on Balancing heritage preservation, local RES potential and BIPV technology exploitation (IEA-SHC Task59 and BiPV meets History) and Historic Buildings Retrofitting 4.0: The Potentials of Simplified Digital Twins in Low Carbon Retrofitting of Historic Buildings (ATLAS) and organizing the “Research meets Practice day” with seven best practice presentation and a round table discussion. These best practices, along with other examples of energy retrofits of historic buildings, have been thoroughly documented for the www.hiberatlas.com database and can be accessed online. The main outputs of the roundtable were summarised by Franziska Haas, moderator of the discussion and president of the ICOMOS Scientific Committee on Energy and Sustainability, and included in these proceedings.

The conference had to be organised as a virtual event due to the constraints of the global pandemic. However the decision to organize it as “like presence” virtual conference – without recording and the risk to dilute the presence – with as many direct interactions as possible (ranging from limiting parallel sessions to two, having moderated question and answer sections, providing the pre-print of papers to the audience and offering the possibility of virtual coffee breaks to catch up with colleagues and ask directly to speakers), proved to be the right one. We had around 140 registrations, and on average two thirds actively participating in the parallel sessions. More than 30 scientific papers came from complementary projects and research groups, showed that the event was able to attract the research community working on the topic and to give a comprehensive picture of the state of the art of the research on retrofit for historic buildings.

The Sustainable Development Goals, as proposed by the UN, stood at the centre of conference topics. Actually, papers related to two to three SDGs on average: SDG 11 “Sustainable cities and communities” with 33 being the most tagged one, but also SDG 13 “Climate action” with 22 tags and SDG 7 “Affordable and Clean Energy” with 24 tags not being left behind. Furthermore, SDG 3 “Good health & well-being” (15), SDG 9 “Industry, innovation and infrastructure (10), SDG 4 “Quality education” (9) and SDG 12 “Responsible consumption and production” (8) were also mentioned often highlighting the importance of historic building renovations in social implications, the
economic dimension, the need for involving the future generations, or the common responsibility of society.

Themes of the research projects mentioned above led to the three conference’s thematic tracks. Firstly, “Conservation of heritage and resources in the built environment” collected contributions ranging from climate resilient design solutions to integration of renewables solutions underpinning the hypotheses that conservation of our built heritage and natural resources will go hand in hand in the near future. Secondly, “Creating favourable framework conditions” studied the question what is needed to foster renovations of historic buildings, looking at policies and programmes, as well as education experiences and examples of best practice, that can enable a faster implementation towards a low carbon built heritage. And finally, the third track “Development, analysis, and implementation of technical solutions” showed that innovation in materials, products and systems will be key in achieving a low carbon built heritage.

After three days full of interesting presentations, motivational keynote lectures, informative workshops and a roundtable that included some of the key actors in the field of energy renovation of historic buildings, it is important to summarise some of the key messages that emerged from the conference.

The importance of dialogue and exchange was a recurring topic across all sessions, starting with the role of Heritage in achieving a sustainable built environment. As Dr Ege Yildirim pointed out during her opening keynote lecture, Heritage has been identified as a cross sectional issue in most of the Sustainable Development Goals. However, these references to heritage can only be found implicitly in the text and for those not working in the field it can be easily overlooked. This poses some interesting questions regarding the role of heritage, and more specifically the built heritage, in the European agenda. Why is it only implicitly recognised? How can it be made more explicit? The same way that the heritage significance of a post-war building might not be immediately evident, and the guidance of an expert is sometimes needed, the value and potential of heritage in achieving a better and more sustainable future for all must be highlighted. Now, we, as scholars working in the field, have the opportunity to use the results of our research to shed light on the importance of heritage in our changing climate and society so that new policies can be brought forward.

Reflecting on the significance of heritage is not only important in defining its role in the future agenda, but also in achieving a deeper understanding of what a building might represent and reasons to protect it for the future, and thus informing the adoption of the suitable interventions. Focusing only on an adaptive reuse that is strictly compatible with the elements worth of preservation might hinder potential ideas. If heritage is not seen just as a label but rather as a process, a new possibility to present heritage as a negotiated and re-negotiated cultural asset arises, as the work of Stijn Cools has shown.

The idea of a “negotiation space” has been present in several presentations, especially when it came to unveiling the narratives behind some of the best practice examples of energy renovations presented during the conference. The experiences that Prof. Harald Garrecht shared during his keynote lecture showed that establishing a dialogue around a working table that includes heritage and industry views makes possible what in the beginning of a project might look impossible. Sometimes the development of new prototypes is needed (and possible), but sometimes just giving access to a broader range of solutions might be enough to overcome a barrier that otherwise felt decisive.

The SBE21 Heritage conference brought together a community of researchers, policy makers and practitioners with different backgrounds but working towards a common goal. That is without a doubt a strength in the message we are bound to bring forward.
The organising committee of the SBE21 Heritage conference, and we as chairs, would like to thank all participants for their involvement and especially of the keynote and roundtable speakers for their valuable contributions.

In Bolzano April 2021
Alexandra Troi
Daniel Herrera

Conference chairs
**Organising committee**

*Conference chairs*

**Alexandra Troi**  
*Vice Head of Institute*  
Institute for Renewable Energy  
Eurac Research, Bolzano (Italy)

**Daniel Herrera**  
*Senior researcher*  
Institute for Renewable Energy  
Eurac Research, Bolzano (Italy)

*Scientific coordinators*

**Franziska Haas**  
*Senior researcher*  
Institute for Renewable Energy  
Eurac Research, Bolzano (Italy)

**Marco Larcher**  
*Senior researcher*  
Institute for Renewable Energy  
Eurac Research, Bolzano (Italy)

*Secretariat & Communication*

**Alessandra Barbieri**  
Institute for Renewable Energy  
Eurac Research, Bolzano (Italy)

*Organisation*

**Maria Pruss**  
Meeting management  
Eurac Research, Bolzano (Italy)

**Federica Leveghi**  
Meeting management  
Eurac Research, Bolzano (Italy)

**Eliana Begal**  
Institute for Renewable Energy  
Eurac Research, Bolzano (Italy)
Advisory committee

Mrs Anete Ashton  Senior Publisher, Conference Series at IOP Publishing
Mr Wim Bakens  Coordinator SBE Conferences Series
Prof. Dr. Luís Bragança  President of iiSBE, University of Minho
Prof. Bruno Daniotti  Full Professor at Politecnico di Milano
Arch. Nils Larsson  Executive director of iiSBE
Arch. Andrea Moro  iiSBE Director for Europe, iiSBE Italia President
Mr Anders Persson  Director of public affairs Innovationsföretagen / FIDIC
Prof. Dr.-Ing. Holger Wallbaum  Full Professor in Sustainable building Chalmers University
Scientific committee

Sonia Alvarez Díaz  Architect-Researcher  CARTIF Technology Centre
Jessica Balest  Post Doc Researcher  Eurac Research
Annamaria Belleri  Senior Researcher  Eurac Research
Adriano Bisello  Senior Researcher  Eurac Research
Julien Borderon  Group Leader  Cerema
Dario Bottino Leone  Researcher  Eurac Research
Tor Broström  Professor  Uppsala Universitet
Paolo Maria Congedo  Professor  University of Salento
Peter Cox  Managing Director  Carrig Conservation International
Roger Curtis  Technical Research Manager  Historic Environmental Scotland
Michael de Bouw  Head of Laboratory  Belgian Building Research Institute
Ernst Jan de Place Hansen  Senior Researcher  Aalborg University
Antonello Durante  Researcher  Eurac Research
Aitziber Egusquiza  Senior Researcher  Tecnalia
Sabine Erber  Expert for energy efficient buildings  Energieinstitut Vorarlberg
Natalie Essig  Full Professor  Munich University of Applied Science
Dagmar Exner  Researcher  Eurac Research
Emanuela Giancola  Researcher  Ciemat
Gülden Gökcen  Professor  İzmir Institute of Technology
John Grunewald  Professor  TU Dresden
Franziska Haas  Senior Researcher  Eurac Research
Lingjun Hao  Researcher  Politecnico di Milano
Lisanne Havinga  Assistant Professor  Eindhoven University of Technology
Ralf Kilian  Senior Researcher  Fraunhofer Institute for Building Physics
Miro Kristan  Unit for environment, space and countryside  Posoški razvojni center
| Name                            | Position                      | Institution                                      |
|---------------------------------|-------------------------------|--------------------------------------------------|
| Silke Langenberg                | Professor                     | ETH Zurich                                       |
| Marco Larcher                   | Senior Researcher             | Eurac Research                                   |
| Fabrizio Leonforte              | Senior Researcher             | Politecnico di Milano                            |
| Alessandro Lo Faro              | PhD Architectural Engineer    | University of Catania/DICAR                       |
| Valentina Marincioni            | Research Fellow               | University College London                        |
| Daniel Mugnier                  | IEA SHC Chair                 | TECSOL                                           |
| Rainer Pfluger                  | Professor                     | University of Innsbruck                          |
| Cristina Silvia Polo López      | Researcher – Architect        | SUPSI, University of applied science             |
| Jørgen Rose                     | Senior Researcher             | Aalborg University                               |
| Sophie Trachte                  | Senior Researcher             | UCLouvain                                        |
| Jan Tywoniak                    | Researcher – Architect        | CTU, Prague                                      |
| Sara Van Rompaey                | Architect – Heritage Expert   | E2ARC                                            |
| Nathalie Vernimme               | Advisor Research Programme    | Flanders Heritage Agency                         |