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# ON

International Symposium  
Politecnico di Milano  
September 20-21, 2024

## **Upcycling and Architecture in Europe Towards a New Building Culture**

# **Upcycling and Architecture in Europe Towards a New Building Culture**

Edited by Alessandro Benetti, Alberto Bologna,  
Josep-Maria Garcia-Fuentes, Ilaria Giannetti, Gabriele Neri

Upcycling and Architecture in Europe  
Towards a New Building Culture

International Symposium  
Politecnico di Milano, September 20-21, 2024

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Alessandro Benetti, Alberto Bologna,  
Josep-Maria Garcia-Fuentes, Ilaria Giannetti,  
Gabriele Neri

The International Symposium is organised in the frame of  
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**Upcycling and Architecture in Europe  
Towards a New Building Culture  
Presentation**

**Organised within the frame of the Research Project of National Relevance (PRIN) “Upcycling Architecture in Italy. Forging and Promoting a Renewed Building Culture”, the symposium is a first-time Italian gathering of a significant selection of leading European experts in upcycling, reuse and circularity in the field of architecture. The event’s main goal is to map the state-of-the-art of ongoing practice and research continent-wide, focusing on a few particularly relevant construction sites and scientific advancements. Practitioners and researchers based in six countries – Belgium, Denmark, Italy, Liechtenstein, the Netherlands and Switzerland – are invited to present their experience and share their knowledge and critical perspective on the topic.**

**In keeping with the PRIN’s objectives, the symposium is understood as a key occasion to give full publicity in Italy to the most advanced European contexts and cases, and to put them in dialogue with the best national experimentations. Furthermore, it aims at strengthening and extending a**

**strategic network of experts, as the first step towards potential long-term collaborations within international research projects or other programs.**

**The symposium's program mirrors the diverse interests and multi-disciplinary approach that are needed for a comprehensive understanding of the topic. In the first session, "Italian perspectives", Giacomo Albori draws inspiration from Studio Albori's experience to reflect on the country's challenging situation, while Alessio Battistella discusses the specificities of an Italian approach in promoting upcycling in vulnerable areas. The second session, "Managing and legislating", gathers Roberta Altamura's overview on European policies and Victor Meesters's focus on Rotor's experience with the Interreg NWE FCRBE program.**

**In the "Best practices" session, two presentations by Zirkular's Christoph Müller and Parabase's Carla Ferrando and Pablo Garrido Arnaiz resonate around their contributions, in their different capacities, to Basel's Areal Walkeweg ongoing development project, and more. Niklas Nolsøe brings to the fore the one-of-a-kind case of Lendager Group, revolving around the "form follows availability" motto.**

**To conclude, scholars Corentin Fivet's, Mario Rinke's and Daniel Stockhammer's original researches dialogue in the "Theory and research" closing session. Fivet focuses on new structural design paradigms for component reuse, based on the activities of the Structural Xploration Lab at EPFL, Rinke discusses educational strategies on circularity, and Stockhammer suggests the possibility to rethink buildings as repositories of resources.**

**The four thematic sessions, to be held on September 20<sup>th</sup>, are followed by a working session, scheduled in the morning of September 21<sup>st</sup>, calling up on all the speakers, as well as the PRIN project's investigators, to discuss on the specific and crucial topic of "Post WWII Heritage and Upcycling. Ideas and Perspectives". For its pioneering character, as well as for the high profile and variety of the invited speakers, this symposium aims at establishing itself as a milestone in the ever more thriving debate on upcycling in Italy, both academic-wise, amongst practitioners and beyond the circles of experts.**

# Upcycling and Architecture Europe Towards a New Building Culture Sessions and speakers

## **\*Session 1**

### **Italian perspectives**

Giacomo Borella (Studio Albori/Accademia di Mendrisio)  
Alessio Battistella (Politecnico di Milano)

## **\*Session 2**

### **Managing and legislating**

Paola Altamura (Sapienza Università di Roma)  
Victor Meesters (Rotor)

## **\*Session 3**

### **Best Practices**

Christoph Müller (Zirkular)  
Carla Ferrando, Pablo Garrido Arnaiz (Parabase)  
Niklas Nolsøe (Lendager Group)

## **\*Session 4**

### **Theory and research**

Corentin Fivet (EPFL)  
Mario Rinke (University of Antwerp)  
Daniel Stockhammer (University of Liechtenstein)

**Giacomo Borella**  
**Studio Albori, Accademia di Mendrisio**



Giacomo Borella is an architect. He founded studio Albori in Milan with some friends thirty years ago. The work of the office mixes design with manual labour, focusing on the perspective of sufficiency in the use of resources and energy. He has collaborated with various magazines, newspapers and radio stations, and some of his writings have been collected in the booklet "Per un'architettura terrestre" (Letteraventidue, 2016). He has edited and translated into Italian books by Ivan Illich, Petr Kropotkin and Colin Ward. He's currently a visiting professor at the Accademia di Architettura of Mendrisio in Switzerland

**The rejected stone**  
**Some attempts in reuse**

**The reuse of materials and components, always a common practice in architecture, was abruptly stopped in modern developed countries. Today, in the age of climate chaos and the collapse of ecological balance, we could re-write the biblical sentence in this way: "The stone the modern architects rejected has now become the cornerstone". Whoever tries to work with the "rejected stone" of reuse, faces the strange condition of having to re-start nearly from scratch, almost from the point where all this was interrupted, and putting into question modern architectural certainties.**

**Studio Albori has been trying to work with reuse for a long time, with many difficulties and some fun: this talk is a little journey through their attempts, failures, discoveries, etc... It also includes some glimpses of the constructions with leftovers which the author's pupils made at the Accademia di Architettura of Mendrisio in recent years.**

**Alessio Battistella**  
**Politecnico di Milano**

Researcher in Architectural Technology  
 at DASTU – Dipartimento di Architettura e Studi Urbani



Architect and PhD.

Assistant Professor at Politecnico di Milano (DASTU).  
 Chairperson of ARCò Architecture and Cooperation, with  
 which he carries out design and applied research  
 activities in the field of sustainable architecture.  
 Member of the Scientific Committee and professor at  
 Master "Circular architecture - Shapes and  
 methodologies of the circular architecture", Scuola di  
 Architettura e Design, Università di Camerino.  
 Member of the Advisory Board and Professor at Master  
 "Design for Development, Architecture, Urban Planning  
 and Heritage in the Global South", Politecnico di Milano.  
 Member of the Scientific Committee of IN/ARCH (Istituto  
 Nazionale di Architettura).  
 Photo © Guido Stazzoni

**Upcycling in vulnerable areas**  
**The Italian architect's perspective**

**The speech delves into the transformative potential of upcycling within architectural practice, particularly in regions vulnerable to global challenges, from the perspective of an Italian architect. It will highlight innovative approaches to sustainable design that repurpose unconventional materials, turning waste into valuable construction resources. Presentations will explore case studies from the Global South and beyond, showcasing how upcycled architecture can address social, economic, and environmental challenges. Topics will include adaptive reuse of materials, community-driven building projects, and the role of architects in promoting circular economies. The speech aims to foster a dialogue on integrating upcycling into mainstream architectural practice, with insights shaped by Italy's design approach. Attendees will explore cutting-edge methodologies, successful implementations across diverse contexts, and strategies for scaling these solutions globally.**

**Paola Altamura**  
**Sapienza University of Rome**

Researcher in Architectural Technology at the Department of Planning Design Technology of Architecture



Architect, PhD in Environmental Design, Researcher in Architectural Technology at "Sapienza" University of Rome, PDTA Department, former Research Fellow at ENEA, Dep. of Sustainability. Since 2009, she conducts research and experimentation on the built environment sustainable transformation with a life-cycle approach, focusing on material resource efficiency and circular design strategies. Author of more than 50 scientific publications. She co-coordinates the ICESP Construction & Demolition WG.

**Towards a circular, sustainable and decarbonized built environment**  
**The European framework supporting building materials circularity**

**With reference to international targets for the reduction of resource consumption and climate-altering emissions, the talk will provide an overview of the most strategic European policies and initiatives supporting the circular transition of the construction value chain, such as the New Circular Economy Action Plan, LEVEL(s), as well as recent reports and guidelines on the topic. The most relevant Italian circular building materials related initiatives will be mentioned too, such as the mandatory Minimum Environmental Criteria for Green Public Procurement in the construction sector. Considering the different and integrated innovations needed in organisational models, design strategies and technical solutions to enable a circular and sustainable use of materials in architecture, exemplified through some emblematic case studies from research and design, the talk will thus provide a framework of references within which to frame the good practices that will be illustrated in the symposium.**

## Victor Meesters Rotor



Rotor is a research group, design studio and consultancy. It aims at making the reuse of components an accessible option for building professionals. Rotor created and manages Opalis.be, a local online directory of reuse operators. In 2015, the work of Rotor was awarded the Global Award for Sustainable Architecture under the patronage of UNESCO. Rotor recently launched the spin-off RotorDC, an innovative reclamation activity focusing on interior finishings from post-war buildings. Victor is a French architect who joined Rotor in 2014, where he leads research projects, consultancy missions, supervises reclamation operations and coordinates design and build of exhibitions. Since 2018, he is involved with Rotor in European programs (Interreg FCRBE : Facilitating the Circulation of Reclaim Building Elements. Interreg PREUSE : Public Responses to Enable the Use of Salvaged building Elements).

Photo © Béryl Libault label

## Facilitating the Circulation of Reclaimed Building Elements Learning about Interreg NWE FCRBE

Today in NW-Europe, only 1% of building elements are reused following their first application. Although a large number of elements are technically reusable, they end up being recycled by crushing or melting, or disposed. The result is a high environmental impact and a net loss of economic value.

This project aims to increase by +50%, the amount of reclaimed building elements being circulated on its territory by 2032. Focusing on the northern half of France, Belgium and the UK, the project also covers, with a lesser intensity, the Netherlands, Ireland, the rest of France and Luxembourg. This area houses thousands of SMEs specialised in the reclamation and supply of reusable building elements. Despite their obvious potential for the circular economy, these operators face significant challenges: visibility, access to important projects and integration in contemporary building practices.

To respond appropriately to these challenges, the project sets up an international partnership involving specialised organisations, trade associations, research centres, an architecture school and public administrations. It is rooted in earlier initiatives that were successfully initiated, on a local level.

## Christoph Müller Zirkular GmbH



Christoph Müller is co-founder of zirkular. He consults real estate investors and architects on how to develop with existing buildings and design with reused building elements reclaimed prior to demolition.

He studied architecture at the Technical University of Vienna. Prior to his work with zirkular he was a lead architect with baubüro in situ, focusing on affordable housing for refugees. He started his career with the United Nations and international NGOs in the field of humanitarian shelter.

Photo © Julia Schöni, Zirkular GmbH

## Catch of the day Planning and building with the existing

**The presentation tries to offer a degustation menu as an introduction to re-use architecture and its principles:**

**Antipasti: The importance of existing structures as a foundation of re-use architecture and carbon emissions reduction.**

**Primi: The hierarchy of re-use.**

**Secondi: Consequences of material re-use for architecture and real estate development based on experiences from the prototype project K.118. Necessary shifts in the design process highlighted through basic design principles, changes in planning phases as well as new approaches to architecture competitions.**

**Dolci: Necessary policy measures to enable and foster an architecture of circularity.**

## Carla Ferrando, Pablo Garrido Arnaiz Parabase



Parabase is an entity created in 2020 by Carla Ferrando and Pablo Garrido Arnaiz that operates in the fields of architecture and urbanism. Parabase combines the professional practice with research and teaching at the Universities of Bern and Mendrisio in Switzerland. Parabase regularly participates in juries and lectures at various universities in Europe and America. Parabase's work has received numerous international awards and its work has been exhibited at the Venice Architecture Biennale and the Lisbon Triennale.

## Some notes on ELEMENTA

**ELEMENTA is the winning proposal of an open international architectural competition organized by the city of Basel for the construction of 20'000 sqm of public housing and a Migrants Center. The load-bearing structural system of the project consists mainly on the reuse of prefab concrete pieces coming from the nearby Lysbüchel car park. The reused concrete columns and slabs are not altered at all and in order to serve a new program they are reconfigured in a different way, connected entirely with new mechanical joints, so they can be again disassembled and reused in the future. The load-bearing structure is kept independent from the façade and the interior construction, which are also partly built with reused components. This condition not only allows a good separation of components for the next life cycle of the buildings, but also allows a high degree of flexibility. Thanks to these set of strategies, the building complex achieves to reuse 2.680 building components, saving the equivalent of 1'088'082 kg CO<sup>2</sup>.**

## Niklas Nolsøe Lendager Group



Niklas Nolsøe is Business Development Director at the Danish architectural company Lendager. He is an architect from the Royal Danish Academy of Fine Arts in Copenhagen and a construction architect from the Copenhagen School of Technology. Niklas has been working at Lendager for almost 10 years and has been a key person in establishing the company as a front runner and one of the most influential architecture studios and strategic consultancies working within the realm of sustainability and circular economy. Niklas is responsible for the company's growth and ensuring that the latest and most innovative knowledge on sustainability and circularity is implemented within a wide range of typologies, scales, and consultancy services.

## Form follows availability

**At Lendager, we have rewritten the “form follows function” tradition to a “form follows availability” process.**

**The firm was founded with the purpose of accelerating sustainable architecture. We enable the green transition in and around the built environment through architecture, urban planning, strategic and material innovation.**

**Our approach is founded on traditional virtues of aesthetics and functional quality supported by our pioneering work on sustainable building life-cycles and explicit focus on value retention, emission reduction and operational excellence.**

**Enabling the green transition requires us to rethink our behaviour, processes, materials and regulatory guidelines and this is why innovation is found at the very core of Lendager.**

**Pr. Dr. Corentin Fivet**  
**EPFL**

Structural Xploration Lab



Trained as an architect and architectural engineer, Corentin Fivet holds a PhD in engineering sciences from UCLouvain, Belgium. From 2014 to 2016 he was a postdoc researcher and lecturer at MIT, Boston. He joined EPFL in 2016 where he leads the Structural Xploration Lab, a front-runner in developing optimization algorithms, construction methods, and groundbreaking full-scale prototypes that pioneer the reuse of discarded load-bearing components in new building structures. Since April 2024, he is also the Academic Director of the Smart Living Lab, a cross-disciplinary research centre for the future of the built environment.

Photo © Chloé Lambert

## New structural design paradigms for component reuse

**More and more buildings are being demolished even though their load-bearing components are in excellent physical condition. Urban mining and reusing them to transform the built environment is a circular strategy with unprecedented environmental benefits, reducing greenhouse gas emissions, waste, and material extraction. While the approach has not yet reached its full industrial potential, it redefines designers' workflows and calls for new computational methods and construction processes. In this talk, Corentin Fivet will review recent research outputs and teaching activities from the Structural Xploration Lab, EPFL, aimed at empowering the reuse of obsolete pieces in new building structures.**

**Pr. Dr. Mario Rinke**  
**University of Antwerp**



Mario Rinke is a Professor at the University of Antwerp. Trained as a structural engineer, he teaches structures and construction in architecture and is interested in materials, making and adaptability. Mario Rinke holds a Diploma in civil engineering from the Bauhaus University Weimar and a PhD from ETH Zurich. He was a senior researcher and lecturer at ETH Zurich and the Lucerne University of Applied Sciences and Arts after working as a design engineer for major offices in London and Zurich.

**Reassembling worlds**  
**Embedding circular design through making in**  
**architecture education**

**Can we build with what is already there?**

**Yes, but how can we possibly teach that?**

**Architects have a vital role in the development of sustainable design practices. Future architects will encounter uncertainties related to a new role of design and production within a closed loop of resources. Even if we can imagine a world of circular construction, how can we establish the education for architects that prepares graduates for a fundamentally different approach: designing with resources based on existing components and buildings.**

**Constructive thinking and design can only be learned by working with materials and working with reclaimed components can only be understood by practising with them. An availability-based design methodology starts from those constraints, shaping questions of actual needs, capacities, knowledge, permanence, or future life cycles of what is used. The talk will discuss educational strategies of availability-based design using international design & build workshops.**

**Pr. Dr. Daniel Stockhammer**  
**University of Liechtenstein**



Daniel Stockhammer graduated from schools of architecture in Vienna, Winterthur and Zurich. After studying with Wolf Prix and Zaha Hadid and completing his master's thesis with Jacques Herzog and Pierre de Meuron, he worked in their Basel office. He earned his doctorate at the Institute of Conservation and Historic Building Research at ETH Zurich, taught at the School of Architecture in St. Gallen and became an assistant professor in 2018. Since 2021 he is full professor and head of the unit „Built Heritage & Upcycling" at the University of Liechtenstein.

Photo © Ethan Oelman

**Entrepot Building**  
**From recycling to principles of reuse**

**The conditions for architecture have changed. Building became the main cause of global pollution, resource depletion and energy consumption from non-renewable sources. Architecture in the 21st century can no longer be created at the cost of the environment and future generations. A sustainable construction industry and architecture must be extended by the preservation and recycling of tangible and intangible resources. At the centre of our investigations is the reformulation of a moral question into an architectural one, the formative power of reused building materials and the design potential for a new architecture. It is not the primacy of form, but the responsible and sustainable use of resources and values that boosts building culture and, according to our thesis, makes architecture formally binding and socially relevant (again). From this perspective, the building becomes a repository for resources, a material bank and entrepot of knowledge for the time of its function and form.**

# **Upcycling Architecture in Italy Forging and Promoting a Renewed Building Culture**

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Upcycling Architecture in Italy  
Forging and Promoting a Renewed Building Culture  
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Politecnico di Torino  
Gabriele Neri (Principal Investigator-Associate  
Investigator), Tenure-Track Assistant Professor (RTDb)  
in Architectural History  
Lorenzo Savio, Associate Professor in Architectural  
Technology  
Alessandro Benetti, Research Fellow

Università degli Studi di Roma Tor Vergata  
Ilaria Giannetti (Associate Investigator), Associate Professor  
in Architectural Engineering  
Antonella Falzetti, Full Professor in Architectural  
and Urban Design

Sapienza Università di Roma  
Alberto Bologna (Associate Investigator),  
Associate Professor in Architectural and Urban Design  
Viola Bertini, Tenure-Track Assistant Professor (RTDb)  
in Architectural and Urban Design  
Roberto Germanò, Research Fellow

Politecnico di Milano  
Josep-Maria Garcia-Fuentes (Associate Investigator),  
Associate Professor in Architectural and Urban Design

**“Upcycling Architecture in Italy. Forging and Promoting a Renewed Building Culture” aims to contextualize, analyze, re-elaborate, and disseminate the theory and practice of the Upcycling of building materials at the architectural scale. The research project revolves around the concept of Upcycling, and the related principle of Design for Disassembly (DfD), applied to the scale of architectural design and understood as the critical reuse of building materials, capable of avoiding a new entry into the production cycle. On the one hand, the project undertakes a thorough historical survey on the topic from a theoretical and design angle, throughout Europe and with specific attention to Italy, from 1945 onwards. The goal is to gain new knowledge on the European culture of construction from the last seven decades, observing it through this specific lens. In order to do so, the outlining of a historical and theoretical framework goes alongside the filing of best practices across the continent. On the other hand, the project intends to**

**encourage the application of Upcycling practices in the regeneration of the existing post WWII built heritage in Italy, and more generally to foster a global update of the Italian contemporary construction culture. It has a strong drive towards dissemination outside the academic circles, and aims to actively contribute to the public debate on these themes, particularly topical in a historical moment marked by momentous technological and energy rethinking. The research frame, in fact, is defined in reaction to a few crucial issues of our times, many of which relate to contemporary energy and environmental crises, exacerbated by the current geopolitical situation. Considerations on the EU policies on the rational use of building materials, the aging of the Italian built heritage, and the rise in the prices of building materials further contributed to specify the research topic. From this perspective, the project wishes to bring a specific and significant contribution to the strategies of the European Green Deal, and related initiatives.**



Gabriele Neri  
Tenure-Track Assistant Professor,  
Politecnico di Torino (Principal  
Investigator-Associate Investigator)

Gabriele Neri (Milan, 1982) currently is Tenure-Track Assistant Professor in Architectural History at Politecnico di Torino. He was Weinberg Fellow at the Italian Academy for Advanced Studies in America, Columbia University, NY (Spring 2022); Maître d'enseignement et de recherche at the Academy of Architecture, Mendrisio, CH (2019-22), and Adjunct Professor at Politecnico di Milano (2011-22). In 2018-21 he was member of the Board of Directors of the Triennale Design Museum, Milan.



Alberto Bologna  
Associate Professor, Sapienza Università  
di Roma (Associate Investigator)

Alberto Bologna is an architect, PhD, and an Associate Professor in architectural and urban design at the Faculty of Architecture / Department of Architecture and Design, Sapienza University of Rome. He has been a tenure-track Assistant Professor at Sapienza University of Rome, a fixed-term Assistant Professor at Politecnico di Torino and a post-doc scientist at EPFL Lausanne, as well as Adjunct Professor at several universities (Politecnico di Milano, Universities of Genoa and Ferrara, SUPSI).



Josep Maria Garcia Fuentes  
Associate Professor, Politecnico di Milano  
(Associate Investigator)

Architect and associate professor at the Politecnico di Milano (2022). He has been an associate professor at the School of Architecture, Planning and Landscape of Newcastle University (2013-2022) and assistant professor and vice-dean at the Escola Tècnica Superior d'Arquitectura del Vallès-Barcelona of the Universitat Politècnica de Catalunya (2010-2013). He researches on the connections between architecture, the idea of nature, ecology and the environment, and experimental preservation.



Ilaria Giannetti  
Associate Professor, Università degli Studi  
di Roma Tor Vergata (Associate  
Investigator)

Ilaria Giannetti, architect, is associate professor of Technical Architecture at the university of Rome Tor Vergata. Her research activity, conducted within national and international projects, regards Construction History, focusing on engineering history, the relationship between construction techniques and architectural languages in the twentieth century, and the experimental valorization of historical archives related to the built heritage.



Lorenzo Savio  
Associate Professor, Politecnico di Torino

Lorenzo Savio, is an architect, PhD, and Associate Professor of Architectural Technology at the Department of Architecture and Design at Politecnico di Torino. His research interests extend to inclusive design, low environmental impact materials for sustainable architecture in a circular economy context, and the conservation and refurbishment of rural and modern architectural heritage, with a specific interest in building envelope retrofit and integrating renewable energy systems in buildings.



Viola Bertini  
Tenure-track Assistant Professor,  
Sapienza Università di Roma

Viola Bertini, PhD architect, is a tenure-track Assistant Professor in Architecture and Urban Design at Sapienza University of Rome, Department of Architecture and Design. She has been a research fellow at luav, a research consultant at AUB, a visiting researcher at the University of Évora, and a visiting researcher/professor at the University of Seville. She coordinates the scientific secretariat of the international network of schools of architecture Designing Heritage Tourism Landscapes



Alessandro Benetti  
Research Fellow, Politecnico di Torino

Alessandro Benetti is an architect, PhD in history of modern and contemporary architecture and Postdoctoral Researcher at Politecnico di Torino, Department of Architecture and Design (DAD). He has been an Adjunct Professor at Université Rennes 2 and ENSA Nantes. He collaborates with Domus and has contributed to leading European architecture magazines (Abitare, Arch+, Area, D'Architectures). He is a member of the Board of Directors of ANCSA, the Italian Association for Historic-Artistic Centers.



Roberto Germanò  
Research Fellow, Sapienza Università  
di Roma

Roberto Germanò is an architect, PhD in Architecture - Theories and Design and Postdoctoral Researcher at Sapienza University of Rome, Department of Architecture and Design (DiAP). He has been a subject expert in Interior and Exhibition Design since 2022. In 2022, he started his own professional studio in Rome. Since 2023 he has been an Adjunct Professor at the University of Naples "Federico II" for courses in "Temporary spaces design" and "Layout interior design".







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