

HERITAGE REGENERATION

AN **ECTP** COMMITTEE

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European Construction Technology Platform

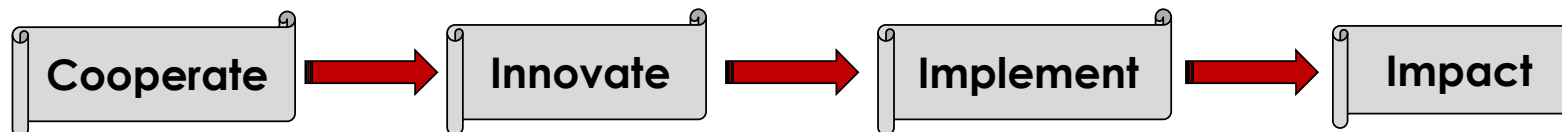
European Construction, built environment & energy-efficient buildings Technology Platform

Paramount challenges such as **energy, climate change, efficiency & more generally sustainability** prove to become of utmost importance for the **Built Environment (buildings, infrastructures, utility networks...)** and **Construction sector** and need to be tackled within an **integrated approach**

ECTP: AISBL legal entity, based in Brussels

It gathers **140+** member-organizations and **800+** individual members from the Construction sector and other sectors from the whole supply chain of the **Built Environment**.

Main mission: develop new **R&D&I** strategies to improve **competitiveness**, meet **societal needs** & take up **environmental challenges**.



European Construction Technology Platform



Influencing innovation and strategic research

- Participate in the definition of the European Strategic Research Agendas
- Interact with the B4P Partnership Board
- Close links with key representatives from the European Commission
- Take advantage of ECTP's strategic presence in the heart of Brussels



Access to knowledge, resource and expertise

- Information on upcoming European funding calls and programmes
- Access to ECTP publications and research
- Contribute to technology transfer and research exploitation
- Participate in experts and Committees meetings
- Private access to a Collaborative Workspace (CWS)
- Access to the dataset of sectorial projects funded by the EC



Opportunities for networking, training & development

- ECTP Biennial Conference to disseminate project outcomes
- Seminars and training to discuss technical challenges and facilitate networking
- Meet potential partners for your research projects



ECTP – Strategic Research & Innovation Agenda

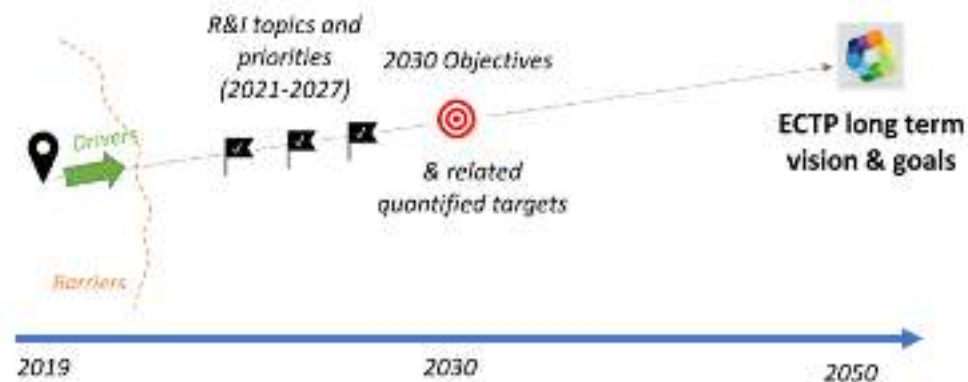


→ Objectives of the SRIA

- Propose a vision of the future built environment and **related industry sector**
- Identify trends and drivers supporting this vision
- Identify priority areas for detailed technology roadmapping

→ Specific challenges

- Coordinate with other European associations & platforms to propose an integrated approach
- Align with *Horizon Europe* approach and deliver clear messages regarding needs for future co-programmed partnerships



ECTP – Strategic Research & Innovation Agenda



ECTP OBJECTIVES 2030



ECTP – Strategic Research & Innovation Agenda

Objective	R&I priorities
Clean built environment and cities	<ul style="list-style-type: none"> 1.1 Energy renovation of buildings and upgrading of infrastructures 1.2 Positive energy building blocks & districts, integrated with the urban networks 1.3 Life Cycle Approach and Circular Economy
Built for and with the people	<ul style="list-style-type: none"> 2.1 Participative and dynamic built environment 2.2 Inclusive and affordable built environment 2.3 Healthy and comfortable built environment 2.4 Living cultural and historical built environment
Prosperous construction ecosystem	<ul style="list-style-type: none"> 3.1 Cleaner, faster, safer and more cost-effective construction, retrofitting & commissioning processes 3.2 Improved resilience and adaptability of the built environment 3.3 New contractual processes and partnerships for the construction sector 3.4 Educational tools increasing the attractiveness and skills of the industry's careers
Digitalisation	<ul style="list-style-type: none"> 4.1 Smart operation and maintenance of buildings & infrastructures 4.2 BIM & Digital Twins for value chain integration, with focus on SMEs 4.3 Data privacy and security 4.4 Better integration of the built environment with the urban space and mobility



Built for People Partnership



The Built4People Common Vision

A **high quality, low impact** and **highly resource efficient** built environment **for all citizens**

A **fully decarbonised** and **circular** approach that will contribute to reach EU sustainability targets

Increased **quality of life, cultural diversity, respect for heritage**, individual and collective **well-being, social justice and cohesion**, and **economic efficiency**



Built for People Partnership



European Construction Technology Platform

ACTIVE AGEING DESIGN
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ENERGY EFFICIENT BUILDINGS
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INFRASTRUCTURE MOBILITY
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MATERIALS SUSTAINABILITY
AN **ECTP** COMMITTEE

HERITAGE REGENERATION
AN **ECTP** COMMITTEE

DIGITAL BUILT ENVIRONMENT
AN **ECTP** COMMITTEE FOR INNOVATIVE BUILT ENVIRONMENT

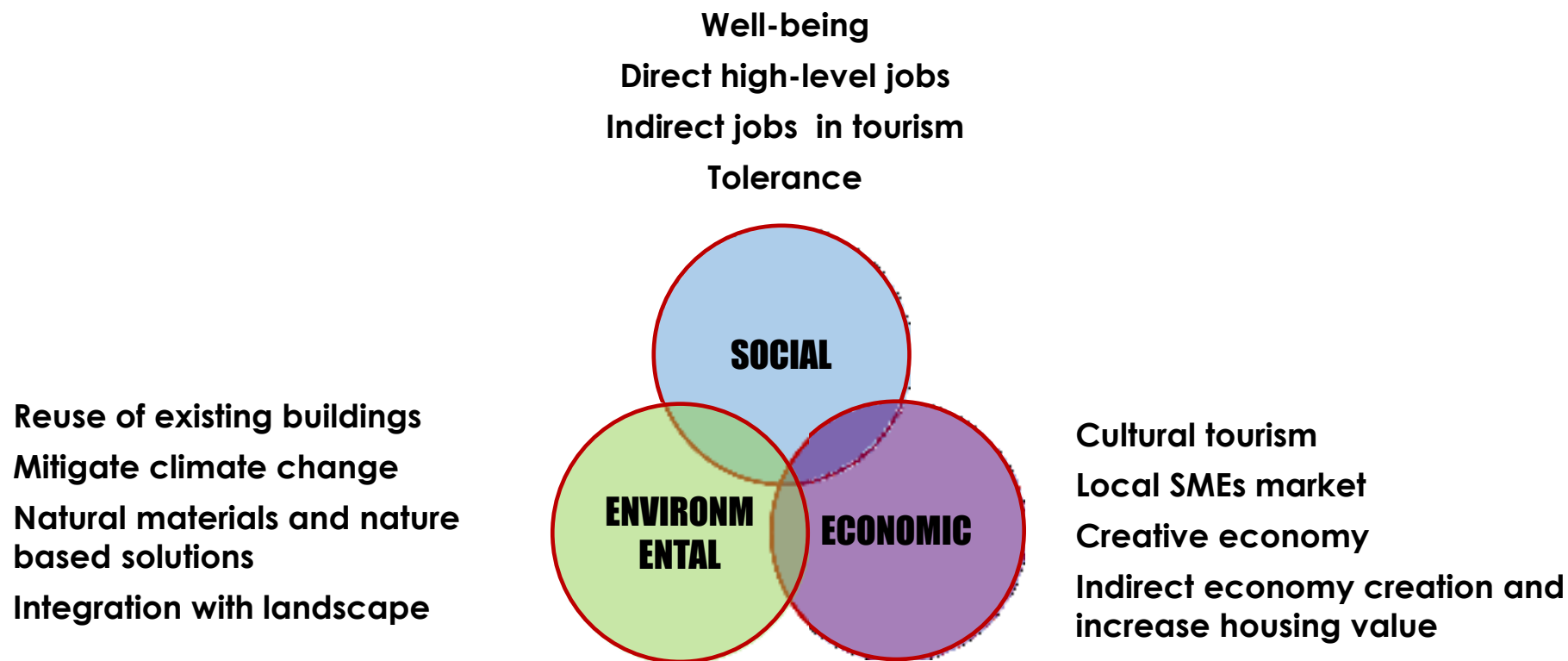


ECTP
INNOVATIVE BUILT ENVIRONMENT



HERITAGE & REGENERATION
AN **ECTP** COMMITTEE

THE IMPORTANCE OF CULTURAL HERITAGE IN SUSTAINABLE EUROPE



THE ROLE OF CULTURAL HERITAGE IN CONSTRUCTION

The market for building refurbishment represents an increasing **41 %** of all building construction works in Europe, where the **12 %** of protected buildings is a target market. Spending on conservation of Cultural Heritage by public and private bodies in Europe is worth an estimated **€ 5 billion** a year.

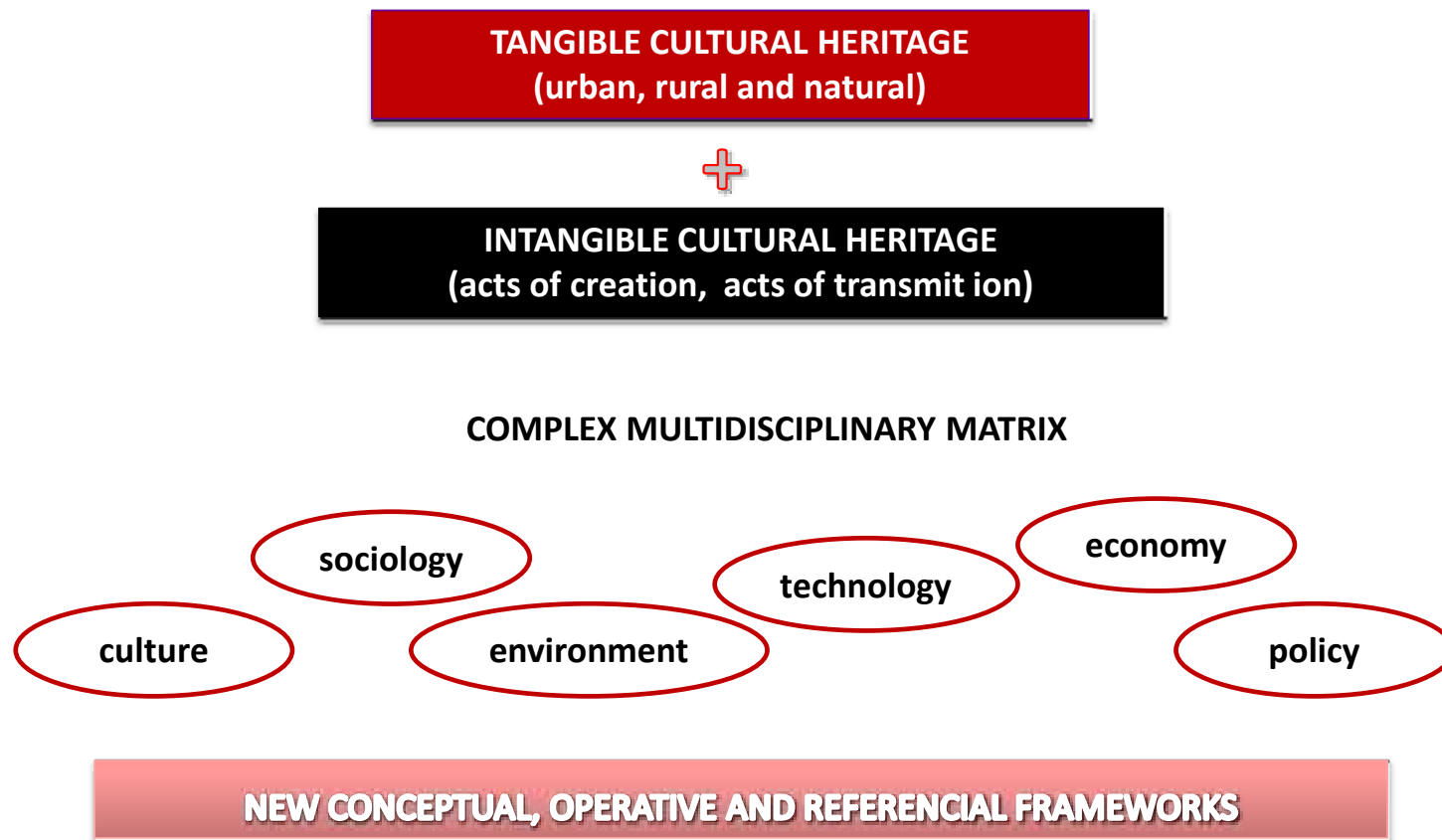
This is a typical **SME market**, where highly specialized and creative industry (including ICTs) have an important role.

Due to the **singularity** of these old buildings and urban patterns, historic materials, buildings and districts have a singular behaviour and need specific approaches.



Heritage & Regeneration Committee

MULTIDISCIPLINARY APPROACH



H & R – Research topics & impact



H & R – Research topics & impact

Low carbon buildings: resource efficiency in cultural heritage maintenance and use

- Promotion of sustainable local, traditional, recycled and/or natural **materials, with reduced CO₂ footprint** and grey energy saving, and improved durability for long lasting solutions
- Improvement of new technologies, products and systems, simulation and modelling, intelligent monitoring and control to rise **energy efficiency, and integration of RES**
- Advanced/innovative eco-compatible and sustainable conservation materials with improved **durability** for long lasting solutions, with significantly lower need for replacement
- Implementation of **life cycle approach strategies** to evaluate the environmental impact of heritage maintenance and use
- Product surveillance technologies and open-source **data base** of heritage relevant **materials**
- Cost-efficient **retrofitting solutions** for historic buildings to reduce the risk of loss
- Development of a monitoring campaigns to measure the influence of the **massive tourism** in the interior climate of built heritages



H & R – Research topics & impact

Low carbon buildings: resource efficiency in cultural heritage maintenance and use

Expected impact by 2040:

27 % reduction of energy consumption of maintenance and use of Heritage buildings and cities.

27 % additional integration of **RES** in heritage buildings.

40 % reduction of CO₂ emissions, through the incorporation of sustainable and local materials.

10 % increase of the renovation rate of historic buildings thanks to compatible retrofit solutions



H & R – Research topics & impact



Resiliency and climate change: preventive conservation and innovative maintenance

- Predictive models and simulation, permanent monitoring and evaluation techniques to determine the **evolution of damage**, assess the conservation and evaluate the service life
- Recovering and adaptation of **ancient construction techniques** and materials for sustainable restoration
- **Low impact restoration processes** to reduce the disturbance of building works caused to the citizens
- Novel materials, techniques and design codes to improve **structural safety**, proper conservation and permanent maintenance of cultural heritage, with minimal intervention
- Fast and cost-effective restoration techniques to be used in **post disaster phase**, with limited impact on heritage value
- Strategies, protocols and tools for integrated management and predictive maintenance of various assets, for reducing vulnerability and improving **resilience of heritage to natural disasters**
- More extensive protection and preservation strategies of cultural heritage, including the **prevention of illicit trade and loss**



H & R – Research topics & impact

Resiliency and climate change: preventive conservation and innovative maintenance

Expected impact by 2040:

30 % reduction of heritage loss in Europe, by the improvement of the conservation conditions.

30 % reduction of repair works.

20 % cost reduction in conservation of cultural heritage.

30% reduction of aggressions to worldwide cultural heritage due to vandalism, violent attacks and illicit trade.



H & R – Research topics & impact

Smart Cities: recovering the importance of the historic city

- Diagnostic methodologies and tools to **understand the historic city and its environment as a whole**, to allow the prioritization of interventions
- **Socioeconomic regeneration** of the historic city, based on the potentialities of Cultural Heritage, and dynamic assessment criteria and tools facilitating citizen's interaction
- Improving **interaction with/for citizens**, through implementation of the smart city concept in historic areas
- **Inclusive & accessible** historic cities for all citizens and visitors
- Promotion of **sustainable tourism strategies**, compatible with authenticity and identity
- **Integration** of the historic city in its **natural landscape** and contemporary urban areas, with special attention to buffer areas



H & R – Research topics & impact

Smart Cities: recovering the importance of the historic city

Expected impact by 2040:

50 % of the historic city and dwellings are **accessible** for all.
Economic revitalization of the historic city up to **10 %** through creation of new business.

Reversal of the present trend to pull out the historic city and **population raise over 10 %.**

Reduction of **vehicle mobility by 20 %**, through the recovering of the historic city socioeconomic dynamism



H & R – Research topics & impact



Digitization: Cultural Heritage in the digital era

- **Use of satellite**, ICTs and standard data infrastructure for a complex management of cultural assets, with a **territorial perspective**
- New technologies, modelling, simulation and **robots** for detection, diagnosis, management, access and representation of cultural heritage assets, including **inaccessible** and **underwater** heritage sites
- Adaptation of **BIM protocols** from the design of solutions to the long-term maintenance and management
- **3D digital reconstructions** to make vulnerable heritage accessible for the public.
- Use of digital systems to **involve stakeholders** and citizens in CH intervention
- Creation of **new cultural content in digital** form and service industries
- Technologies for the **smart heritage city management**, compatible with cultural values



H & R – Research topics & impact

Digitization: Cultural Heritage in the digital era

Expected impact by 2040:

Zero loss of EU heritage assets towards the improvement of conservation conditions at territorial level.

50 % increase of conservation works of **inaccessible** sites.

3D modelling and BIM technologies **fully** incorporated in restoration, maintenance and management projects.

Higher **interaction of citizens** with the city parameters and cultural assets, using novel technologies.



H & R – Research topics & impact

Socioeconomic challenges:

Integrated management and promotion of natural and cultural assets

Priorities:

- Strategies and tools for **integrated management** of natural & cultural heritage
- Promotion and recognition of **vernacular architecture**, as inspiration for new architecture
- **Nature based solutions** for Cultural Heritage
- Sustainable **tourism strategies** at local, regional, national and transnational level, to avoid gentrification and negative impacts

Expected impact by 2040:

Increased **quality of life**.

10 % rise of GDP and population in **rural areas** with high cultural and natural value.

Economic rebound at local level, through new activities based on traditional skills.

10 % increase of cultural tourism.

70 % reduction of **vernacular** architecture loss.



H & R – Research topics & impact

Socioeconomic challenges:

Enhancement of local and European identity and Cultural Heritage as a vehicle for multicultural tolerance

Priorities:

- Harmonized models for the **assessment of heritage values**
- Cultural Heritage as vehicle to mitigate social pressures in **multicultural environments and conflict areas**
- Cost effective technologies and devices for **widespread dissemination** of Cultural Heritage to the citizens
- “**Open sites**” to citizens/tourists enabling the perception of the preservation interventions in monuments
- Involvement of **new generations** in the knowledge, conservation, valuation, use and economic activities of Cultural Heritage

Expected impact by 2040:

Improved tolerance of multicultural societies through recognition of mutual Cultural Heritage.
50 % increasing of social awareness and **dissemination** of citizens and young generations.
Highly **aware society** to respect and protect Cultural Heritage.



H & R – Research topics & impact



Socioeconomic challenges: The economic value of Cultural Heritage

Priorities:

- Universal tools and models to **assess socioeconomic values** of Cultural Heritage
- Economic models and legal instruments for the **private involvement** in Cultural Heritage management and exploitation
- Novel strategies to increase **well-being and economic prosperity** of citizens living in cities or rural environment with high cultural values
- **Creative economy** and new sustainable business models based on Cultural Heritage
- Promotion of a **global market** for heritage-led sustainable innovation,
- Creation of new **specialized professionals and SME's**, for the restoration/conservation market
- Strategies and tools for the **adaptation of cultural heritage to new uses** when no longer serving the original functions

Expected impact by 2040:

New business models industries, allowing **15 % additional job creation** in specific fields.
15 % raise of new market niches for European **SMEs**.
20 % increase of **private** investment in Cultural Heritage.



H & R – Research topics & impact

Socioeconomic challenges: From research to practice

Priorities:

- Compilation and clustering of **previous research results**, including validation and industrial uptake into the market
- Identify specific domains and priorities where **further research and innovation** is needed, accounting also for the gender dimension
- **Pre-normative research**, additional standardisation and regulation activities
- New **procurement** mechanisms enabling incorporation of innovation into practice
- **Education and training** to incorporate innovation, as well as recovering traditional methods, specially addressed to SMEs

Expected impact by 2040:

40 % additional exploitation and real application of innovations arising from research in Cultural Heritage.
Better skills and technical knowledge of Cultural Heritage professionals, reinforcing EU leadership.
Improvement of **European SMEs competitiveness** and **20 %** increase of international activities.



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