



# ECTP

## INNOVATIVE BUILT ENVIRONMENT

# Strategic Research & Innovation Agenda 2024-2030

## Executive Summary

October 2023



# Foreword

## ECTP as the key player in driving research, innovation, and competitiveness across the construction sector, for the benefit of the built environment and its citizens

The European Construction, built environment and energy efficient building Technology Platform (ECTP) is a leading membership organisation promoting and shaping the future of the built environment and Construction sector in Europe. ECTP reconciles a collective vision for a leading edge European built environment on behalf of its members (including representatives from buildings, districts, as well as transport and utility network infrastructures domains). It gathers more than 150 Member organisations and individual members from construction and other sectors across the whole supply chain of the built environment. The main mission of ECTP is **to identify, develop and support implementing new Research and Innovation strategies (R&I)** to improve the competitiveness of the construction industry, meet the societal needs of a population that evolves towards new living patterns, and take up environmental and resources challenges through an innovative and sustainable built environment.

ECTP is also one of the European Technology and Innovation Platforms, industry-led stakeholders' fora that are recognised by the European Commission as key actors in driving innovation. As such, ECTP is co-signatory and in charge of the **Build4People co-programmed partnership** established with the European Commission in 2021, which aims to catalyse the transition to a people-centric, climate-neutral, sustainable, and smart built environment.

## ECTP Strategic Research and Innovation Agenda 2030

The built environment and construction industry has an essential role to play in the socio-economic transition towards a sustainable and climate-neutral economy and society. The way we design and build our buildings and infrastructures impacts the way we live, as individuals and communities. It also impacts the climate, resources, and biodiversity on the planet. On both dimensions, **industry must undergo some deep transformation to deliver a more sustainable, resilient, inclusive, and enriching built environment.** Research and innovation are key drivers in this transformation.

A major mission of ECTP is to develop a sectoral *Strategic Research and Innovation Agenda (SRIA)* to identify the challenges that the built environment and construction industry has to take up and propose R&I pathways to achieve them. This SRIA identifies and describes the future R&I priorities for developing and rolling-out the solutions that will help taking up the **societal, environmental, industrial, and technological challenges** faced by the industry and the built environment, in a policy and regulatory framework that constitutes a strong driver. This SRIA aims to ensure that the construction sector will, in the long-term, secure its competitiveness and sustainability, whilst the built environment will provide secure, safe, and smart living places for all citizens in Europe.



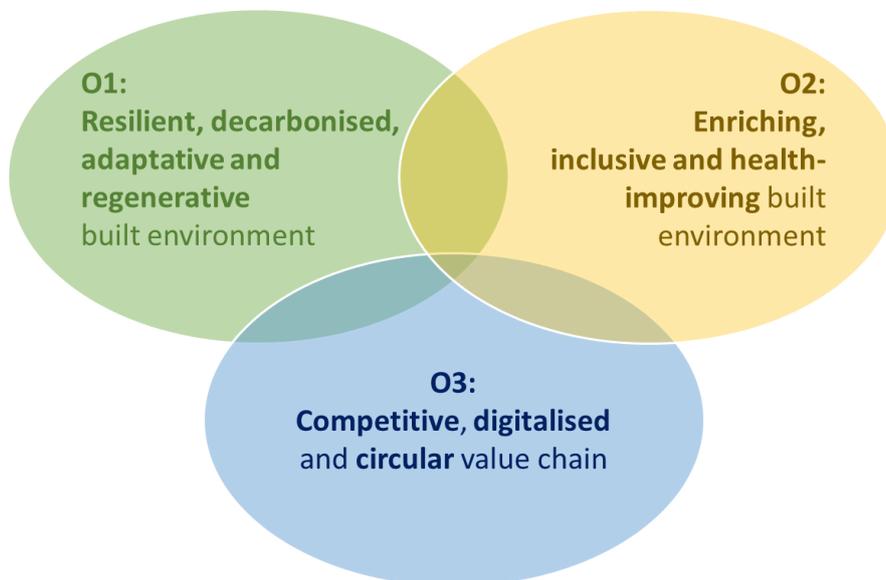
# ECTP vision and objectives 2030

The **long-term vision of ECTP** for both the built environment and the related industrial sectors involved in the value chain is formalised as follows:

**A climate neutral built environment enabling the well-being of all EU citizens, provided by a circular, digitalised, and resilient construction value chain.**

To achieve such a vision, three objectives are set by 2030:

- Objective 1: A resilient, decarbonised, adaptative and regenerative built environment,
- Objective 2: An enriching, inclusive and health-improving built environment,
- Objective 3: A competitive, digitalised, and circular value chain.



*The highest quality of life, for the largest number of citizens,  
with the lowest environmental impact*

Figure 1: The three Objectives 2030 of ECTP SRIA



## Objective 1: Resilient, adaptive, decarbonised, and regenerative built environment

This first objective focusses on the resiliency, adaptability, and decarbonisation of the built environment, and sets priorities for moving towards generating positive impacts on the environment.

- **Safe & resilient:** Buildings and infrastructures need to be safe and resilient, in a context of climate change and growing uncertainty.
- **Adaptive & flexible:** Beyond the adaptation to climate change, the built environment should adapt to changing behaviours and conditions (at different timescales, from near real-time to several decades) and to new technologies and new usages, so as to reduce its overall carbon footprint.
- **Decarbonised & regenerative:** to reach the EU targets, the EU building stock has to be decarbonised by 2050.

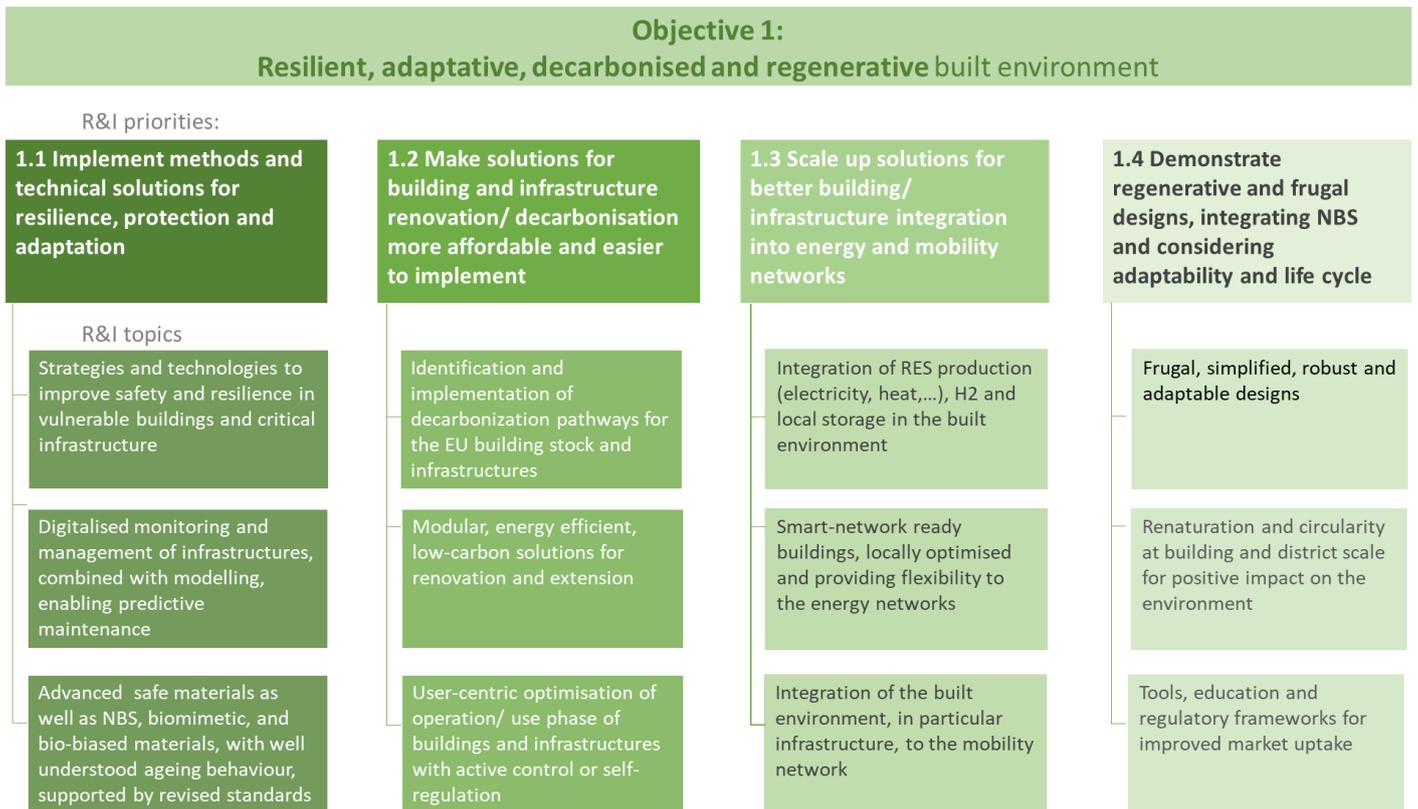


To enable the construction value chain to reach this first objective, four R&I priorities, which should be completed by 2030, have been identified, as synthetised below.

- ▶ **Priority 1.1:** Implement methods and technical solutions for resilience, protection, and adaptation,
- ▶ **Priority 1.2:** Make solutions for building and infrastructure renovation and decarbonisation more affordable and easier to implement,
- ▶ **Priority 1.3:** Scale up solutions for better building/infrastructure integration into energy and mobility networks,
- ▶ **R&I priority 1.4:** Demonstrate regenerative and frugal designs, integrating NBS and considering adaptability and life cycle.

The diagram below provides an overview of each priority detailed into topics.

Figure 2 : Overview of R&I priorities for Objective 1

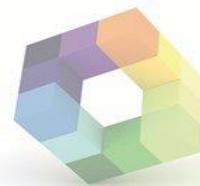




## Objective 2: Enriching, inclusive and health-improving built environment

The second objective focuses on built environments that are enriching, inclusive and that have a positive impact on health, and sets priorities for moving towards the creation of a societal added value for all European citizens by 2030.

- **Enriching:** To make the built environment truly sustainable through spaces that not only meet functional needs but also contribute positively to people's lives are needed. 'Enriching' refers to designing and creating physical spaces, infrastructures and surroundings in a manner that enhances the quality of life, contributes positively to the experiences of the people who interact with those spaces, enables climate mitigation, and finally generates societal value.
- **Inclusive:** The built environment has to be built *for* and *with* the people, leaving no one behind. An inclusive built environment recognises and accommodates differences in the way people use the built environment and along their whole life. It prioritises accessibility, affordability,



diversity, and equal participation for all individuals, regardless of their abilities, age, gender, ethnicity, culture, socio-economic status, or any other characteristic.

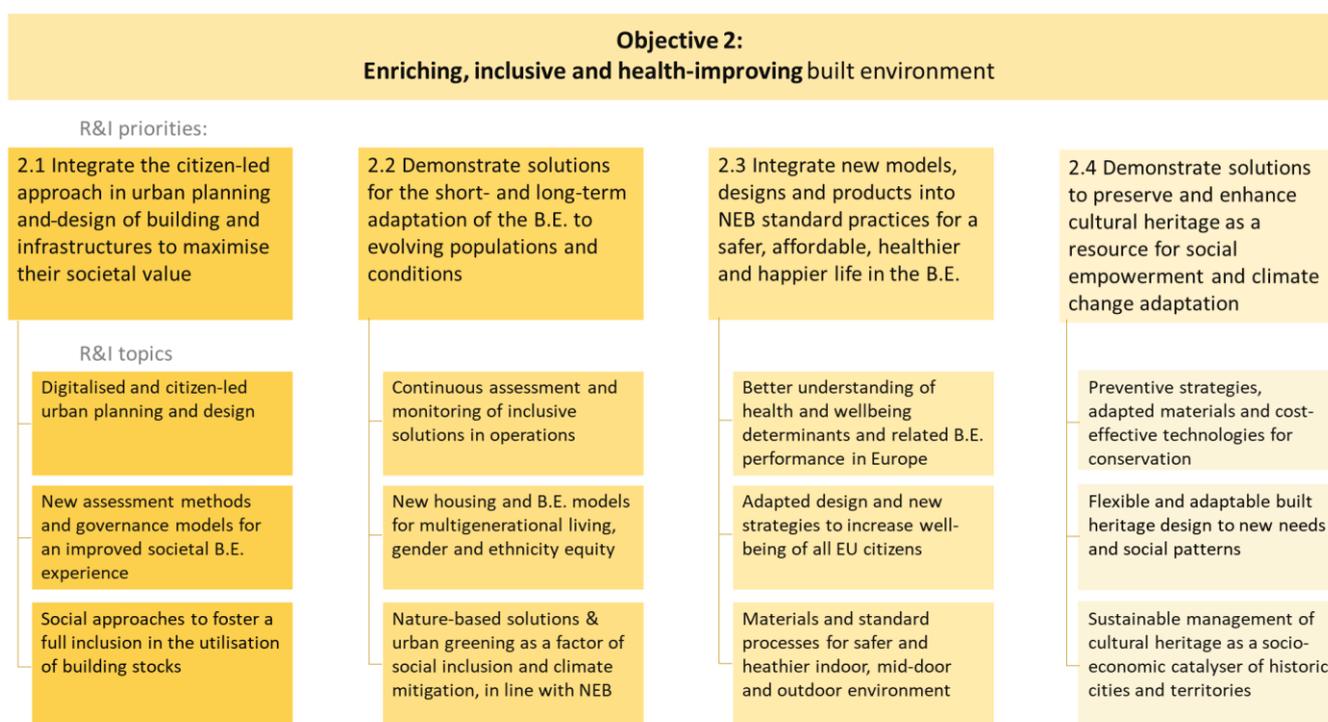
- **Health-improving:** The design of our built environment and the areas where people live, work, travel and play are directly related to the amount of time people spend outdoors, meaning that our health and wellbeing strongly depends on how and with which materials our buildings and infrastructures are built, maintained, and renovated. The built environment has then a huge role to play in improving health, well-being, and human performance

To enable the construction value chain to reach this second objective, four R&I priorities, which should be completed by 2030, have been identified, as synthesised below.

- ▶ **R&I priority 2.1:** Integrate the citizen-led approach in urban planning and design of building and infrastructures to maximise their societal value,
- ▶ **R&I priority 2.2:** Demonstrate solutions for the short- and long-term adaptation of the built environment to evolving populations and conditions,
- ▶ **R&I priority 2.3:** Integrate new models, designs, and products into standard NEB practices for a safer, affordable, healthier, and happier life in the built environment,
- ▶ **R&I priority 2.4:** Demonstrate solutions to preserve and enhance cultural heritage as a resource for social empowerment and climate change adaptation.

The diagram below provides an overview each priority detailed into topics.

Figure 3 : Overview of R&I priorities for Objective 2



ECTP draft Strategic Research and Innovation Agenda 2023



## Objective 3: Competitive, digitalised, and circular value chain

This third objective focusses on the construction value chain, and its transition towards more competitiveness, full digitalisation, and circularity, in view of minimising its environmental impact while maximising its social and economic benefits<sup>1</sup>.

- **Competitive:** in a context of geopolitical uncertainty, skills shortage and supply chain disruptions, the European construction industry must reinforce its attractiveness, building upon its capacity to produce in a more sustainable manner.
- **Digitalised:** the sector needs to pursue its efforts towards digitalisation as a driver for knowledge sharing, high quality, and sustainability. A seamless data integration will enable to better share information between industrial stakeholders, optimise interactions within the value chain, and improve final services to end users.

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<sup>1</sup> Note that the dimension of construction logistics is considered to be already addressed by the roadmaps developed by ERTRAC (see <https://www.ertrac.org/documents/>)



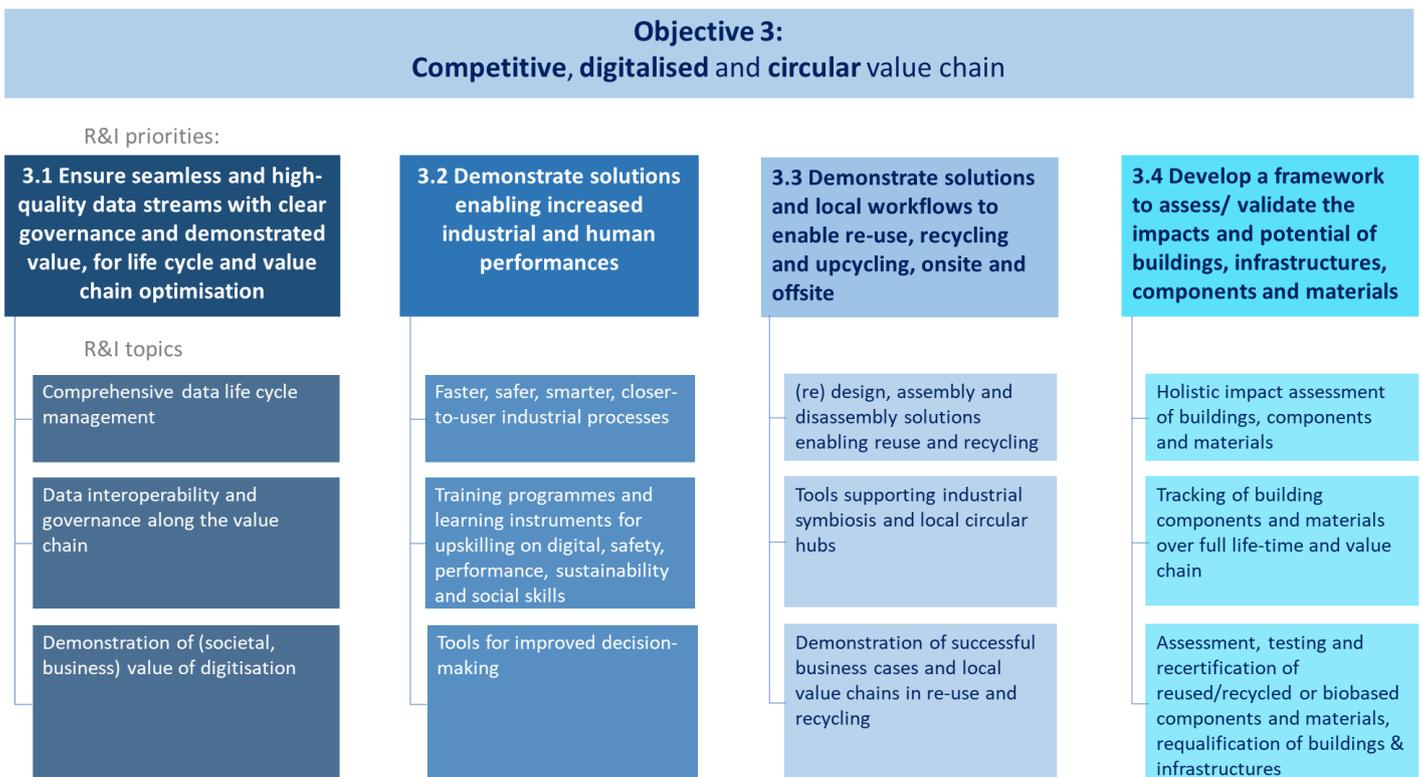
- **Circular:** increasing the circularity of the construction industry will enable to reduce its environmental impact, support local employment and skills, and will contribute to strengthen the supply chains by making the best of local primary and secondary resources.

To enable the construction value chain to reach this third objective, four R&I priorities, which should be completed by 2030, have been identified, as synthetised below:

- ▶ **Priority 3.1:** Ensure seamless and high-quality data streams with clear governance and demonstrated value, for life cycle and value chain optimisation,
- ▶ **Priority 3.2:** Demonstrate solutions enabling increased industrial and human performances,
- ▶ **Priority 3.3:** Demonstrate solutions and local workflows to enable re-use, recycling, and upcycling in both onsite and offsite processes,
- ▶ **Priority 3.4:** Develop a framework to assess/ validate the impacts and potential of buildings, infrastructures, components, and materials.

The diagram below provides an overview each priority detailed into topics.

Figure 4 : Overview of R&I priorities for Objective 3





## Interfaces with other R&I agendas

A consultation phase towards key associations of the sector in order to align and interface at best this SRIA with other industrial roadmaps and strategic research agendas at EU level contributed to improve **the coverage of this SRIA and its interfacing with other R&I agendas:**

- Interactions with representatives of **EMIRI** (*Energy Materials Industrial Research Initiative*) allowed for the alignment and complementarity with **the 2030 Agenda of the Advance Material Initiative** and the related upcoming European partnership,
- Interactions with **Housing Europe** enabled a cross-checking all R&I topics related to Objective 2 in terms of social housing considerations,
- Interactions with **ERTRAC** (*European Road Transport Research Advisory Council*), more specifically with representatives of their Urban Mobility Working Group, also belonging to **POLIS** (*network of cities and regions for transport innovation*) contributed to the alignment and complementarity with the **ERTRAC roadmap**, the agenda of the **2ZERO** (*Towards zero emission road transport*) **partnership** in which ERTRAC is involved, and the agenda of the **CCAM** (*connected cooperative and automated mobility*) **partnership** in which POLIS is involved,
- Interactions with representative of the **DUT** (*Driving Urban Transition Partnership*) ensured the complementary in topics between this SRIA and the '**Circular Urban Economies Transition Pathway**' of the DUT roadmap,
- Interactions with representatives of **BDTA** (*Building Digital Twin Association*) allowed for a thorough review of all R&I topics related to data and part of Objective 3,
- The feedback from **A.SPIRE** (*Association for Sustainable Process Industry through Resource and Energy Efficiency*) allowed to review and adjust the alignment and complementarity of this SRIA with the **Processes4Planet Partnership agenda**, in particular on the questions safety and performance of recycling processes, and efficiency of industrial symbiosis,
- The feedback from **FIEC** (*European Construction Industry Federation*) highlighted the criticality and emergency of addressing the objectives of resilience, sustainability and decarbonation.

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