# Future European R&I for a Sustainable Transition in Construction and the Built Environment: the B4P Partnership development

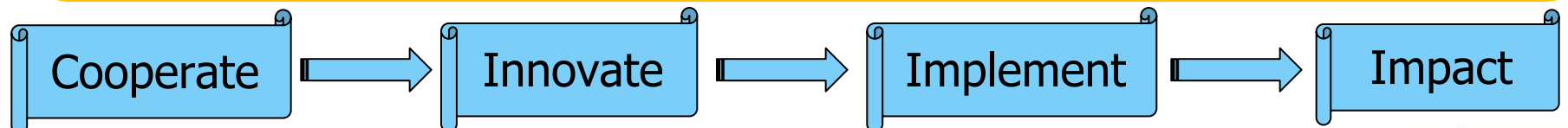*Isabel RODRIGUEZ-MARIBONA & Alain ZARLI – November 2020*
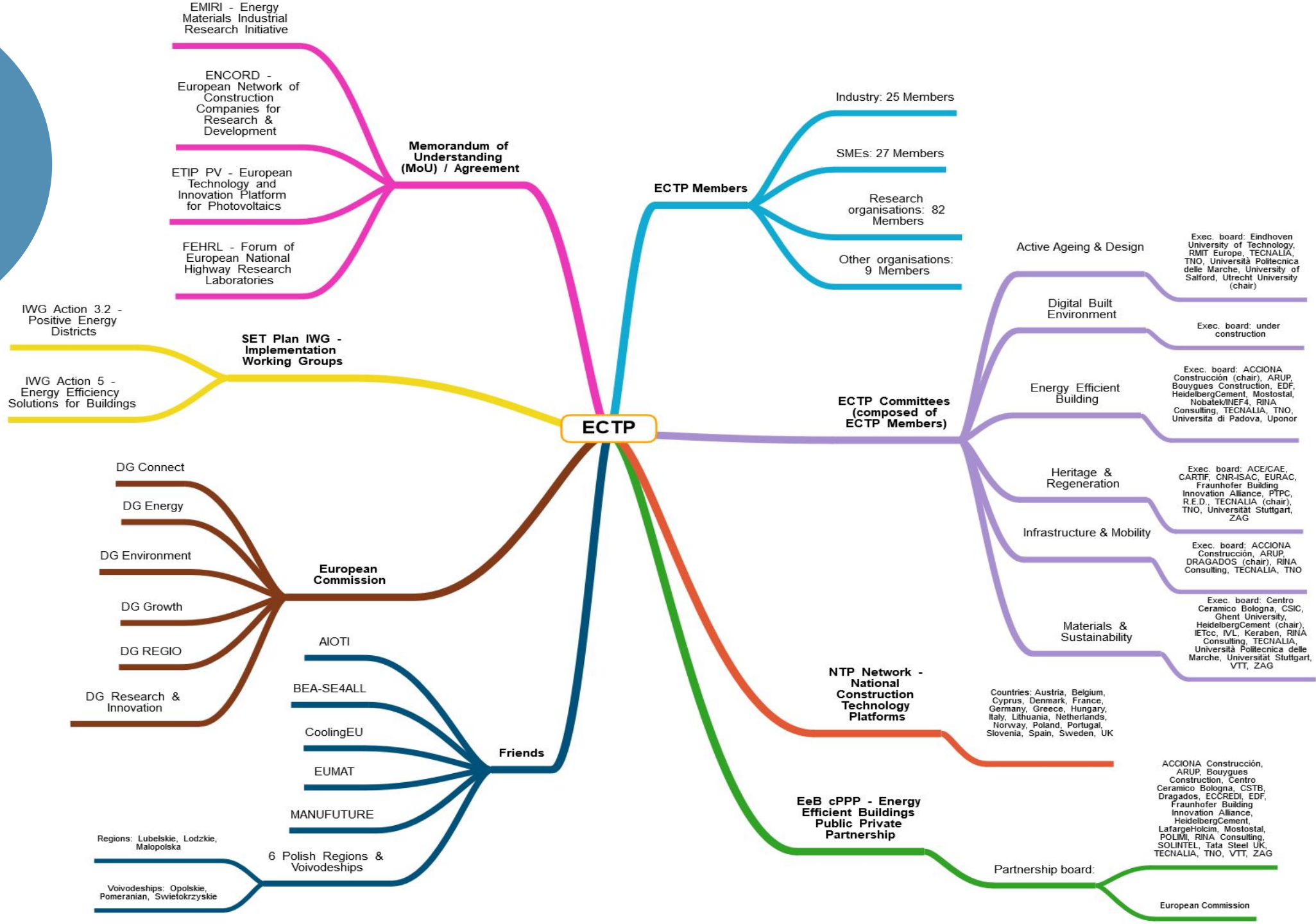
# ECTP in a nutshell

## 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**.

Cooperate → Innovate → Implement → Impact

ECTP INNOVATIVE BUILT ENVIRONMENT

The ECTP ecosystem

# Why join ECTP?

## Influencing innovation and strategic research

- Participate in the definition of the European Strategic Research Agendas

- Interact with the EeB cPPP 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 FP7 and H2020 framework programmes

## Opportunities for networking, training & development

- Discount for participants in the ECTP Biennial Conference to disseminate project outcomes

- Seminars and training to discuss technical challenges and facilitate networking

- Meet potential partners for you research projects

ECTP
INNOVATIVE BUILT ENVIRONMENT

# Key facts on the built environment

40% of EU energy consumption

36% of $CO_2$ emissions

97% of the housing stock is inefficient

90% of our time indoor

75% of EU citizens live in cities

1% renovation rate

12% of the building stock is protected

7% to 12.5% of bridges in bad condition

34% municipalities report under-investment in infrastructures

ECTP
INNOVATIVE BUILT ENVIRONMENT

## Context, industrial and technological trends

Innovation in the sector is an absolute necessity

- **The built environment and related industries** must evolve towards carbon neutrality (resource efficiency, circularity, sobriety in usage)

- **Buildings as proactive part of the city**: interactive, re-natured **districts, infrastructures** integration, valorisation of **cultural heritage**

- **Ageing infrastructures** must evolve & adapt to new uses and hazards ☐ *Resilience*

- The **industrial (r)evolution** is still to be implemented, by integrating mature technologies (AI, automation, etc) into all processes from design to manufacturing and construction

- **Digitalisation** is to be generalised in the construction processes and in the built environment

- **Biobased and advanced materials** must be integrated to achieve more resilience, comfort, health, safety, resource efficiency, and carbon neutrality.

ECTP
INNOVATIVE BUILT
ENVIRONMENT
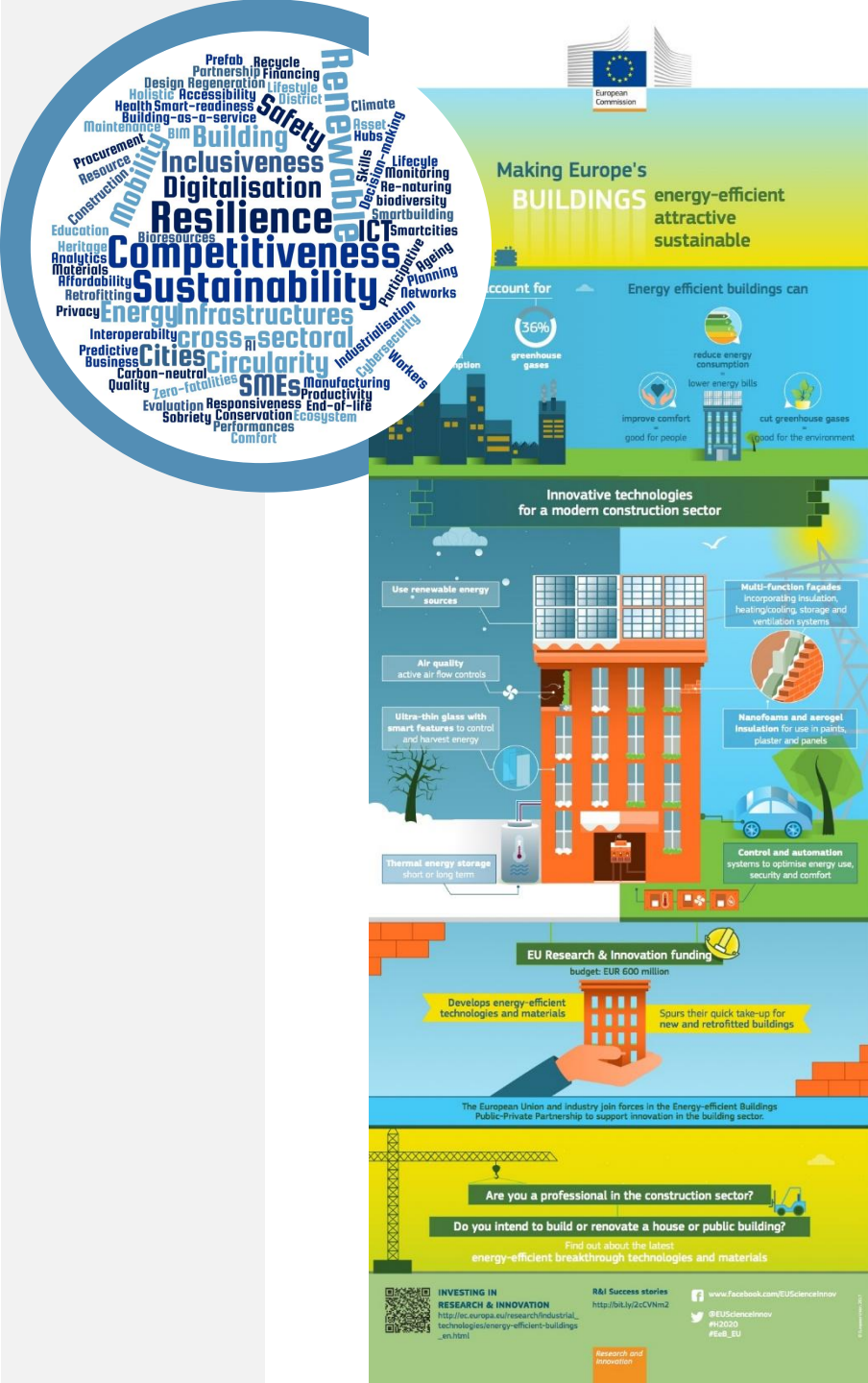
# ECTP – Strategic Research & Innovation Agenda (SRIA)

## ☐ 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 (future new PPPs)
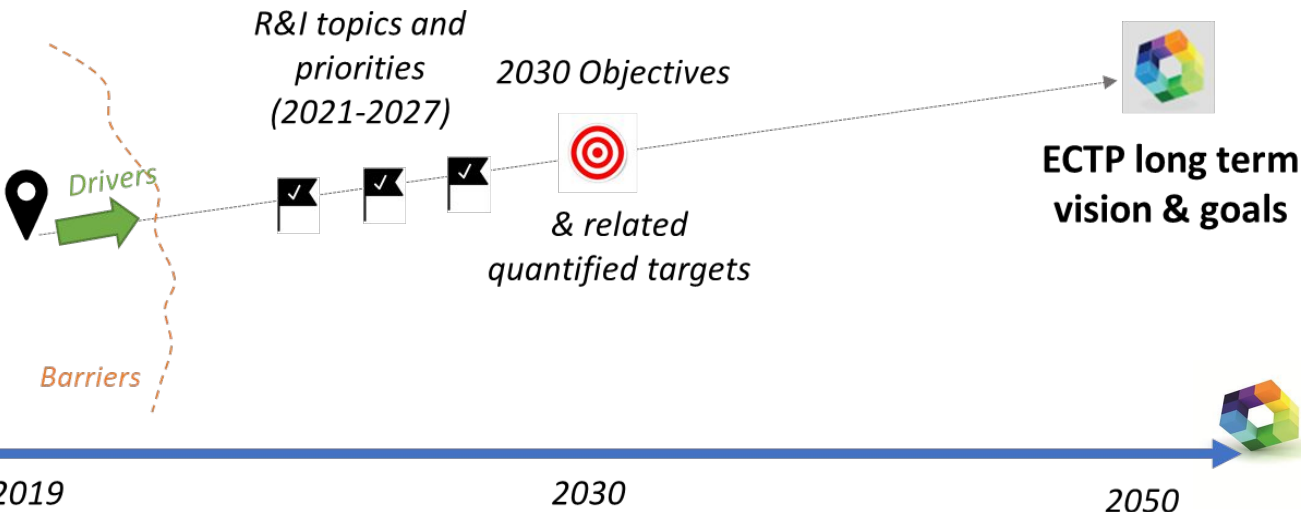
# ECTP - Four objectives by 2030

## ECTP OBJECTIVES 2030

| Clean built environment and cities | Built for and with the people | Prosperous construction ecosystem |
|---|---|---|
| Reach the environmental & energy EU objectives 2030 thanks to affordable offers for construction, renovation and positive districts, and economically viable circularity of resources | Europe is a world leader in age-friendly, inclusive, well-interconnected spaces, participative planning & design, and valorisation of Cultural Heritage | Gain 20% productivity through upgraded construction processes, cross-sector partnerships and skilled workforce |

**Digitalisation** — All European construction companies including SMEs adopt digital tools in a common and open framework, to deliver smart-ready buildings & infrastructures

ECTP INNOVATIVE BUILT ENVIRONMENT

# ECTP - R&I priorities per objective

| Objective | R&I priorities |
|---|---|
| **Clean built environment and cities** | **1.1** Energy renovation of buildings and upgrading of infrastructures<br><br>**1.2** Positive energy building blocks & districts, integrated with the urban networks<br><br>**1.3** Life Cycle Approach and Circular Economy |
| **Built for and with the people** | **2.1** Participative and dynamic built environment<br><br>**2.2** Inclusive and affordable built environment<br><br>**2.3** Healthy and comfortable built environment<br><br>**2.4** Living cultural and historical built environment |
| **Prosperous construction ecosystem** | **3.1** Cleaner, faster, safer and more cost-effective construction, retrofitting & commissioning processes<br><br>**3.2** Improved resilience and adaptability of the built environment<br><br>**3.3** New contractual processes and partnerships for the construction sector<br><br>**3.4** Educational tools increasing the attractiveness and skills of the industry's careers |
| **Digitalisation** | **4.1** Smart operation and maintenance of buildings & infrastructures<br><br>**4.2** BIM & Digital Twins for value chain integration, with focus on SMEs<br><br>**4.3** Data privacy and security<br><br>**4.4** Better integration of the built environment with the urban space and mobility |

**ECTP**
**INNOVATIVE BUILT ENVIRONMENT**

The Horizon Europe Framework programme structure

**Pillar 1**
Excellent Science

- European Research Council
- Marie Skłodowska-Curie Actions
- Research Infrastructures

**Pillar 2**
Global Challenges and European Industrial Competitiveness

Clusters
- Health
- Culture, Creativity and Inclusive Society
- Civil Security for Society
- Digital, Industry and Space
- Climate, Energy and Mobility
- Food, Bioeconomy, Natural Resources, Agriculture and Environment

Joint Research Centre

**Pillar 3**
Innovative Europe

- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation and Technology

**Widening Participation and Strengthening the European Research Area**

- Widening participation and spreading excellence
- Reforming and Enhancing the European R&I system

Source: European Commission
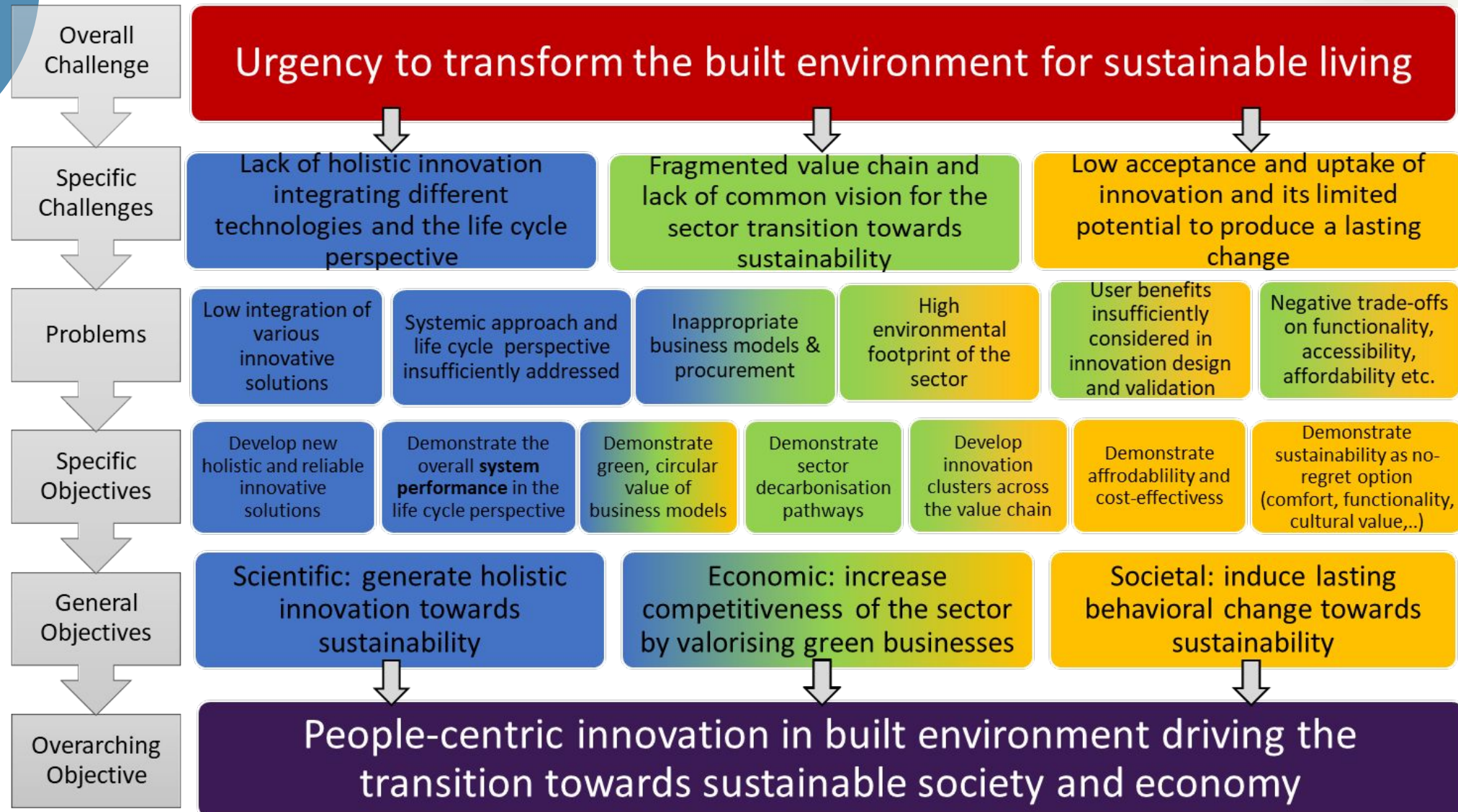
ECTP
INNOVATIVE BUILT ENVIRONMENT

# HEU partnership - "People-centric sustainable built environment" (Build4People)

## Rationale

- Address **fragmentation of challenges and value chain**

- Build a supportive and **encompassing framework** to deliver on R&I for built environment sustainability and citizens' better living.

- Requires an **integrated approach**, driven by innovation and pulled by demand for clean, safer, affordable, smarter, decarbonised and sustainable built environment.

- Build on previous initiatives (EeB cPPP) to address a **broader R&I scope**.

- Involve a **larger stakeholder community** + active **involvement of the public sector** (e.g. in relation to public procurements).

- Serve as a vehicle to **integrate R&I outputs from different parts of HEU**, in particular from Cluster Climate, Energy and Mobility, Cluster Digital, and Industry and Space - Materials – Developing Circular industry.

- **Support the mission on Climate Neutral and Smart Cities** + connections with other partnerships, e.g. Carbon Neutral and Circular Industry; Made in Europe; AI, data and robotics; Clean Energy Transition; EIT InnoEnergy

**ECTP**
**INNOVATIVE BUILT ENVIRONMENT**

# B4P Partnership – Objective Tree

**Built4People Partnership**

**Overall Challenge**

Urgency to transform the built environment for sustainable living

**Specific Challenges**

- Lack of holistic innovation integrating different technologies and the life cycle perspective
- Fragmented value chain and lack of common vision for the sector transition towards sustainability
- Low acceptance and uptake of innovation and its limited potential to produce a lasting change

**Problems**

- Low integration of various innovative solutions
- Systemic approach and life cycle perspective insufficiently addressed
- Inappropriate business models & procurement
- High environmental footprint of the sector
- User benefits insufficiently considered in innovation design and validation
- Negative trade-offs on functionality, accessibility, affordability etc.

**Specific Objectives**

- Develop new holistic and reliable innovative solutions
- Demonstrate the overall **system performance** in the life cycle perspective
- Demonstrate green, circular value of business models
- Demonstrate sector decarbonisation pathways
- Develop innovation clusters across the value chain
- Demonstrate affrodablility and cost-effectivess
- Demonstrate sustainability as no-regret option (comfort, functionality, cultural value,..)

**General Objectives**

- Scientific: generate holistic innovation towards sustainability
- Economic: increase competitiveness of the sector by valorising green businesses
- Societal: induce lasting behavioral change towards sustainability

**Overarching Objective**

People-centric innovation in built environment driving the transition towards sustainable society and economy

# B4P – Matrix

**Built4People Partnership**

**European Green Deal**

Circular & Climate-neutral Construction & Renovation

**People-centric Built Environment**

Behavioural change towards sustainable living

**B4P Partnership**
**2021-2027**

Built Environment as an Active component for a

**Clean Energy & Resource-efficient Transition**

**Europe fit for the Digital Age**

Digital transformation of the Construction Industry & Built environment

**ECTP**
**INNOVATIVE BUILT ENVIRONMENT**

# Built4People Partnership

**"The involvement and commitment of the public and of all stakeholders is crucial to the success of the European Green Deal"**

Mobilising research and fostering innovation

Building and renovating in an energy and resource efficient way

Mobilising industry for a clean and circular economy

A zero pollution ambition for a toxic-free environment

Preserving and restoring ecosystems and biodiversity

Leave no one behind (Just Transition)

Financing the transition

## European Green Deal
Circular & Climate-neutral Construction & Renovation

## People-centric Built Environment
Behavioural change towards sustainable living

**B4P Partnership**
**2021-2027**

Built Environment as an Active component for a

## Clean Energy & Resource-efficient Transition
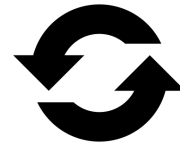
## Europe fit for the Digital Age
Digital transformation of the Construction Industry & Built environment

**ECTP**
**INNOVATIVE BUILT ENVIRONMENT**

## Built4People Partnership

CET* Partnership
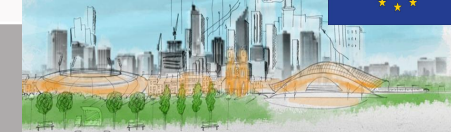
*Clean Energy Transition*

### European Green Deal
Circular & Climate-neutral Construction & Renovation

### People-centric Built Environment
Behavioural change towards sustainable living

**B4P Partnership 2021-2027**

Built Environment as an Active component for a

### Clean Energy & Resource-efficient Transition

### Europe fit for the Digital Age
Digital transformation of the Construction Industry & Built environment

**Smart PEBs**

- Positive-energy Buildings / Blocks
- Producing on a **yearly basis** more primary energy than used.
- Bioclimatic architecture, advanced materials, ICT…

**Energy-Community (EC) nodes**

- EC & Renewable – UE Directive 2018/2001
- EC & internal market - UE Directive 2019/944

**Energy-driven Urban renovation**
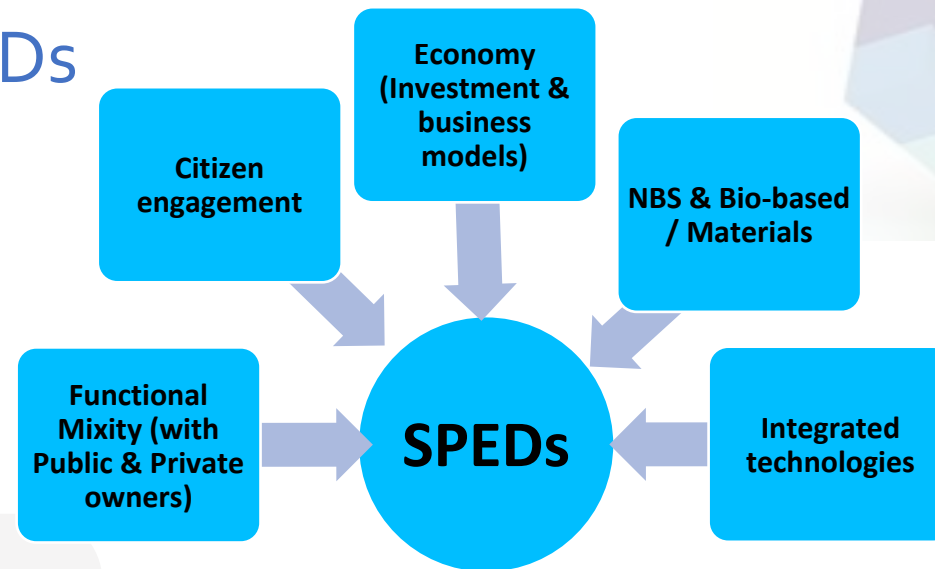
- Renovation wave
- Building Retrofitting

*SET-Plan IWG 5 Energy Efficiency in Buildings*

17

# B4P – Matrix & link to SPEDs
*Smart Positive-Energy Districts*

**Built4People Partnership**

*SET-Plan IWG 3.2*
*PED – Positive Energy Districts*

**Citizen engagement**

**Economy (Investment & business models)**

**NBS & Bio-based / Materials**

**Functional Mixity (with Public & Private owners)**

**SPEDs**

**Integrated technologies**

**European Green Deal**
Circular & Climate-neutral Construction & Renovation

**People-centric Built Environment**
Behavioural change towards sustainable living
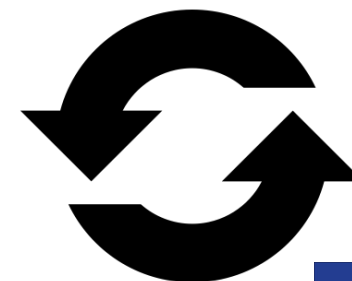
**B4P Partnership 2021-2027**

**Built Environment as an Active component for a Clean Energy & Resource-efficient Transition**

**Europe fit for the Digital Age**
Digital transformation of the Construction Industry & Built environment

DUT* Partnership

*Driving Urban Transition*

**ECTP**
**INNOVATIVE BUILT ENVIRONMENT**

# B4P – Matrix & link to Digital Europe

**Built4People Partnership**

**European Green Deal**
Circular & Climate-neutral Construction & Renovation

**People-centric Built Environment**
Behavioural change towards sustainable living

**B4P Partnership 2021-2027**

Built Environment as an Active component for a
**Clean Energy & Resource-efficient Transition**
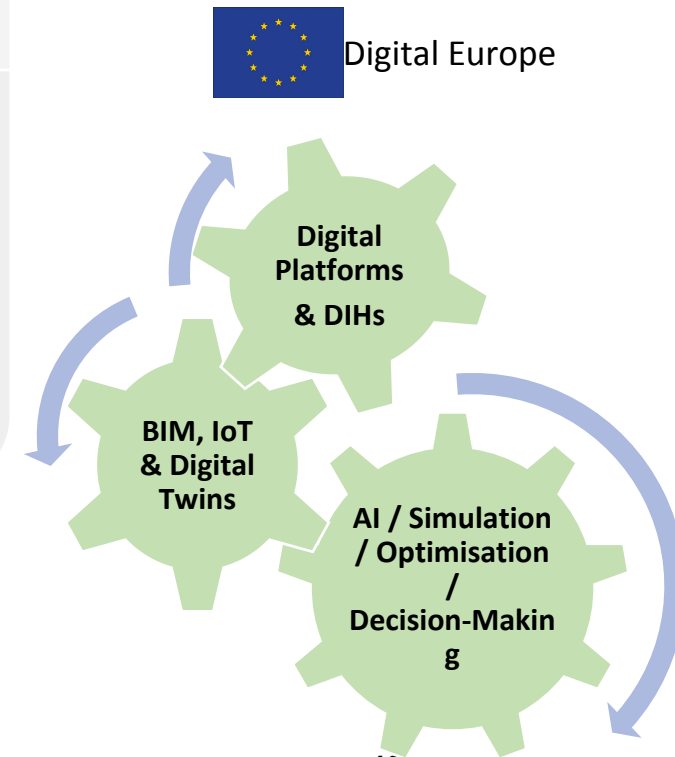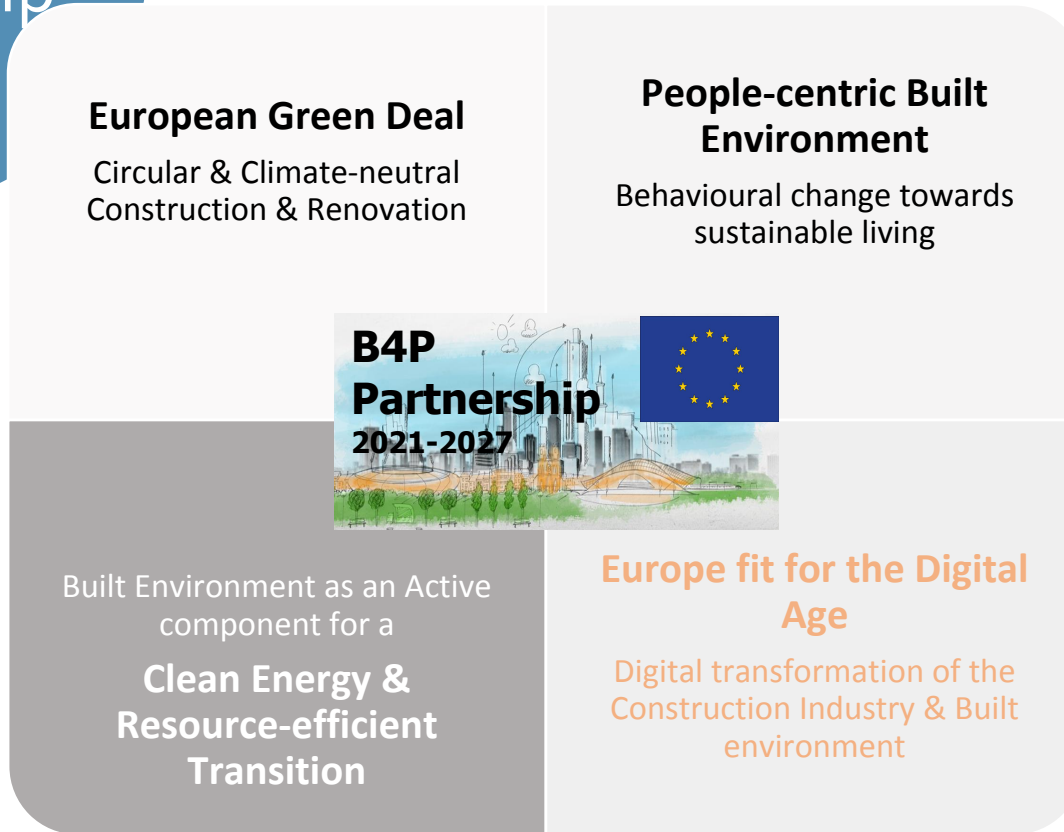
**Europe fit for the Digital Age**
Digital transformation of the Construction Industry & Built environment

Digital Europe

**Digital Platforms & DIHs**

**BIM, IoT & Digital Twins**

**AI / Simulation / Optimisation / Decision-Making**

ECTP
INNOVATIVE BUILT ENVIRONMENT

ECTP
-
More
information

# www.ectp.org

**Alain Zarli**
**ECTP Secretary General**
**secretariat@ectp.org**

**Alexis David**
**Project & Policy Officer**
**alexis.david@ectp.org**