

Circular Economy

Fields of expertise at CSTB

Mona Nasserredine, Circular Economy Division

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CSTB brings together the multidisciplinary skills of more than 900 collaborators, with a field of expertise that covers construction products, buildings and their integration into the district and the city.



Research and Expertise

to think of products, building and cities of tomorrow



Evaluation

to verify the integrability of innovative solutions



Certification

to valorise the quality on the market



Diffusion of information

to support the skills of the project actors



Experiments

to characterize the performances

CSTB's research strategy is oriented towards facing emerging issues:

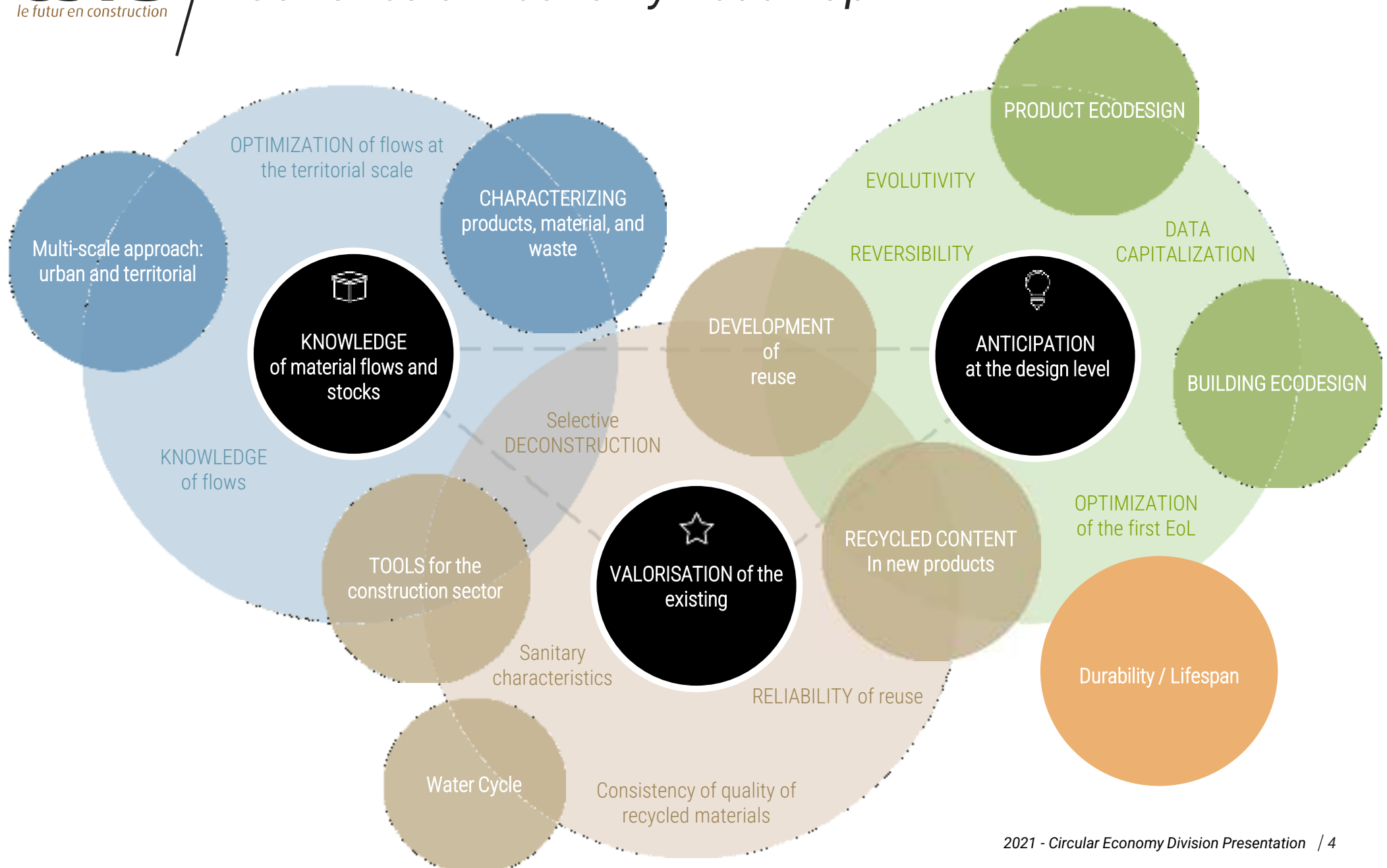
Sustainable Buildings and
Neighborhoods

Innovation and Fiabilisation in
construction and renovation processes

Buildings and Cities facing climate
change

Circular Economy and Building
Ressources

Our Circular Economy Roadmap





Our CE Strategic Axes



Axis 1 : Ameliorate the knowledge on material flows and stocks

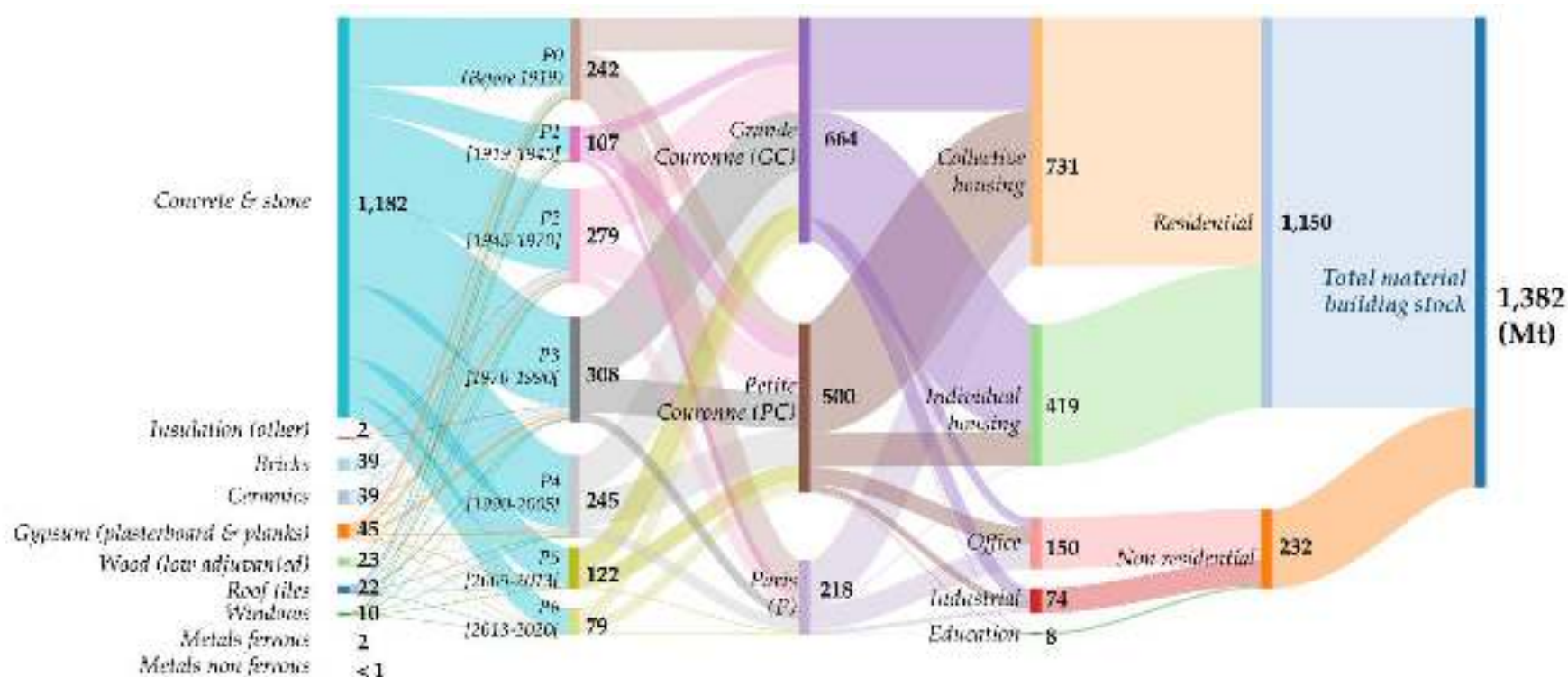
Our Strategy :

- *Developing waste and resource management tools that characterize the materials contained in buildings in an existing territory by manipulating spatial data with data from national databases that describe building components;*
- *Quantifying and locating the flow of waste and materials issued from future renovation and the demolition operations*
- *Characterizing the valorisation potential of material flows*
- *Integrating the modelisation of social and economic impacts associated with the management of flows of products, materials and waste from buildings*
- *Accompanying territories in the development of their recycling and reuse operational strategies while projecting the needs in order to develop the valorisation industry*
- *Develop a prospective vision of materiality in the building sector*



Axis 1 : Ameliorate the knowledge on material flows and stocks:

Project story: BTPFlux – Material Flow Analysis Model – An urban mining tool



Ile-de-France building material stock by waste categories (quantities/year)



Axis 2 : Valorisation of the existing building stock

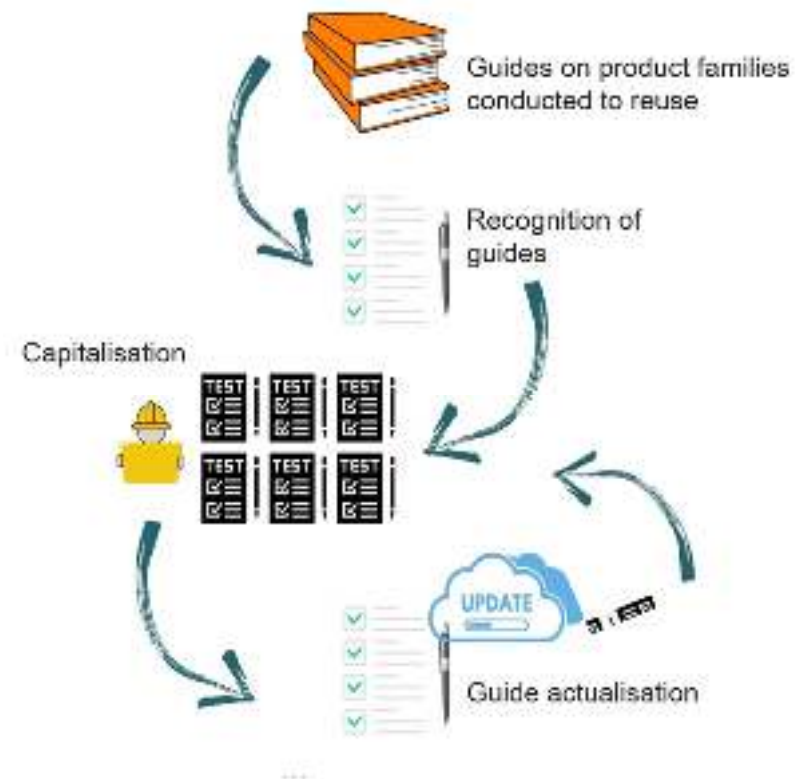
Our strategy : Contribution to the development of Selective Deconstruction practices

- *Setting up a strategic action plan for the development of selective deconstruction practices*
- *Analysis of current practices and their development in line with new requirements to achieve circularity*
- *Development of a methodological guide integrating recommendations on roles and responsibilities of actors involved in each step*
- *Identification of environmental and economic indicators for the evaluation of the deconstruction process*
- *Development of operational tools for selective deconstruction like the use of BIM models*
- *Development of a national platform to capitalise Product, Materials and Waste Diagnostics and make them accessible to all project actors*

Axis 2 : Valorisation of the existing building stock

Our strategy: Contribution to the recognition of Reuse practices

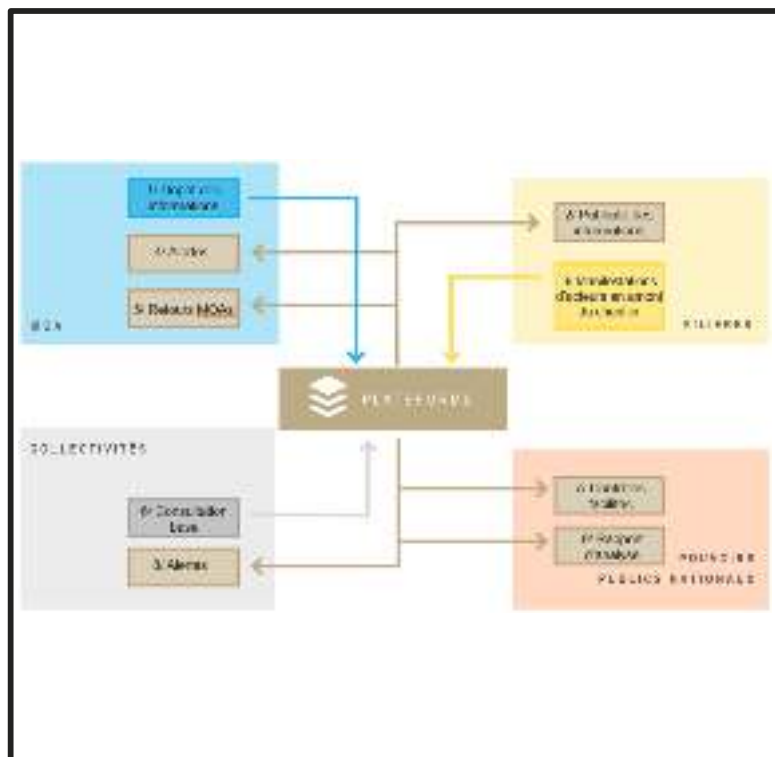
- Setting up and developing a reuse strategy to integrate reuse in construction operations
- Developing technical guides for the evaluation of performances in light of reuse of reclaimed products
- Working closely with actors involved in reuse value chain: with auditors and project owners, contractors, insurers to familiarize them with their roles in the reclamation process, with reconditioning platforms to acknowledge their role and with insurance companies to normalize reuse from an insurance point of view





Axis 2 : Valorisation of the existing building stock

Project story : Development of a digital platform associated with the national PEMD diagnostic



PARTNER:

> DHUP, ADEME

DATE:

> 2021-2022

OBJECTIVES:

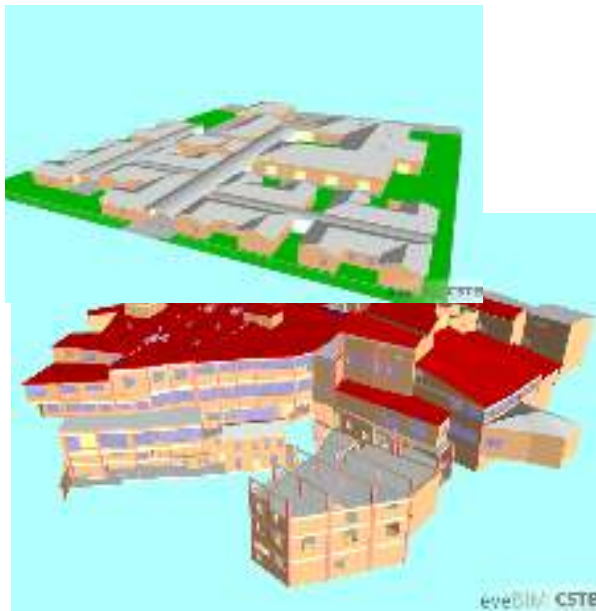
- > Capitalize the PEMD diagnostics: Products, Equipment, Materials, and Waste issued from building deconstruction and renovation operations
- > Make the quantities and nature of material and waste flows visible to valorisation sectors
- > Ensure a statistical followup

ROLE OF CSTB:

- > Proposing the template of the diagnostic to the ministry
- > Development and design of the platform
- > Creation and animation of a network of actors;

Axis 2 : Valorisation of the existing building stock

Project story: Explore the potential of BIM and the digitization of the existing to improve deconstruction processes



PARTNERS:

> EPF PACA et Occitanie

DATE:

> 2020-2022

OBJECTIVES:

- > Definition and harmonization of methods for digitizing existing systems for deconstruction and the circular economy
- > Articulation of the various stakeholders in a deconstruction process around the BIM model
- > Structuring and access to data on local material and waste recovery sectors

ROLE OF CSTB:

- > Specify the methodology and develop tool prototypes,
- > Experiment with the approach on two digitized pilot sites scheduled for deconstruction in 2021: l'EHPAD vallée du Lauquet à Saint Hilaire (11), et les anciennes tanneries Vaillant à Barjols (83)



Axis 3 : Integrating circularity at the design level

Our strategy:

1. Developing the knowledge on the principles of building **reversibility and transformability**
2. *Developing tools and methods to assess the circularity at the building and neighborhood scale*
3. *Developing tools to ensure the traceability and the circularity of new products while defining a technical scope of product ecodesign and developing the related indicators and metrics*

Axis 3 : Integrating circularity at the design level

Project story: Test HQE « Performance Economie Circulaire » Part 1 & 2



PARTNERS:

> Alliance HQE/GBC, EVEA

DATE:

> 2019-2022

OBJECTIVES:

- > Propose circularity indicators at the building level and test them on pilot operations
- > Development of an online tool based on this assessment methodology. This tool allows project actors to analyze their project's standardized energy-environment declaration sheet, which is a declaration imposed by the new national environmental regulation in France. This tool is to be launched end of 2022

ROLE OF CSTB:

- > Contribution to the development of indicators, to the calculation methodology as well as to the analysis of pilot operations results
- > Development of the online tool

Axis 3 : Integrating circularity at the design level

Project story: Development of a Product Ecodesign quality sign

OBJECTIVES:

- > Development of indicators to characterize different criteria of product eco-design : carbon, recycled/ renewable content, demountability, recyclability, reusability
- > Application to specific product families

DATE:

> 2021 – ongoing

Recycled and renewable content indicator

% content of secondary materials and biosourced materials in product

Demountability Indicator

Characterizes the potential for a product to be disassembled without damaging it in order to facilitate its reuse or recycling

Recyclability Indicator

Characterizes the capacity of a product to integrate an end-of-life recycling channel with a potential to being recycled

Reusability Indicator

Characterizes the capacity of a product to be reused at the end of its first life cycle in the same function as that for which it was designed

