

# Estimation of building waste flows and adequacy with resources

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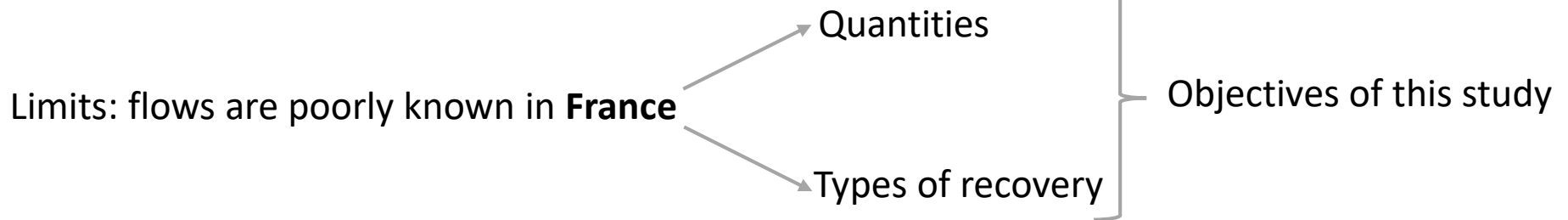
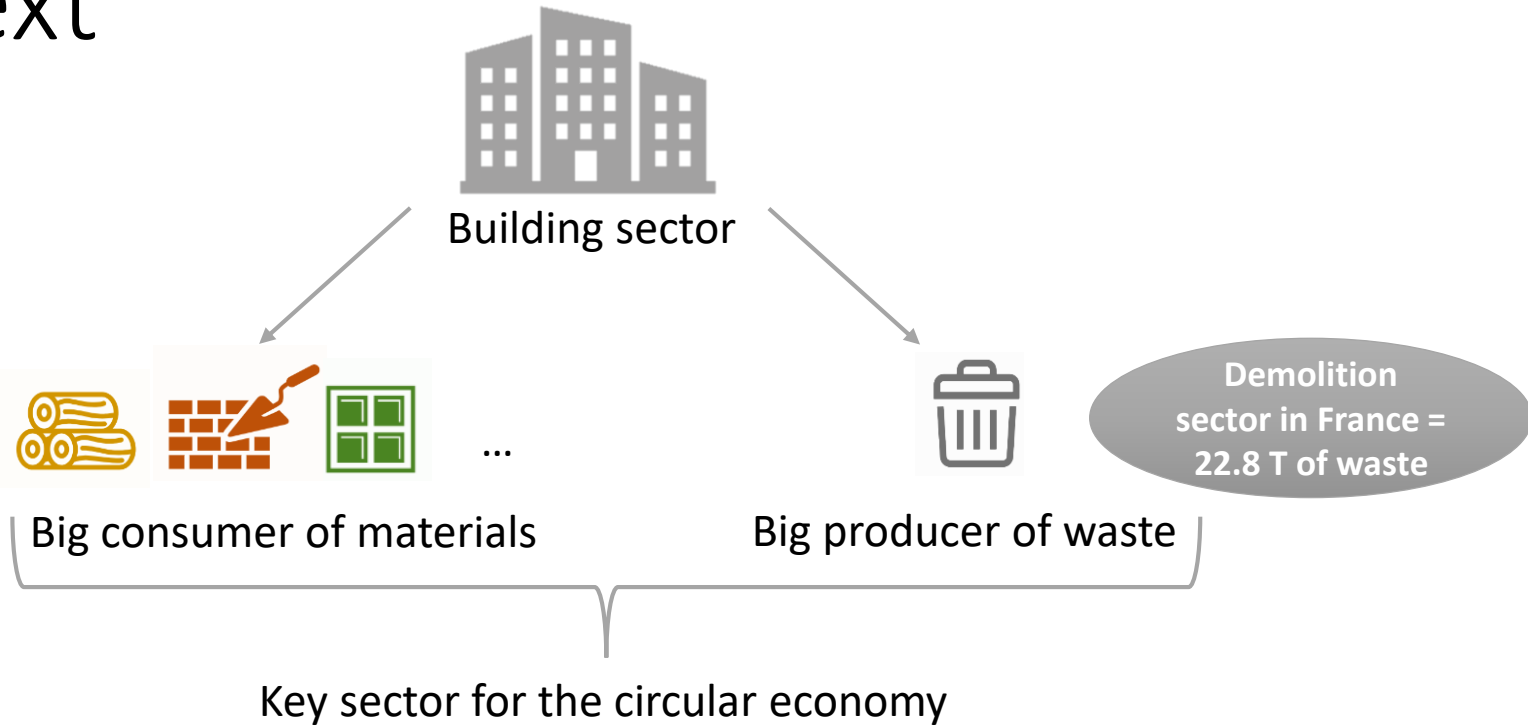
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# Plan

- Context
- Methodology
- Presentation of waste diagnoses database
- Results
- Conclusion and prospects

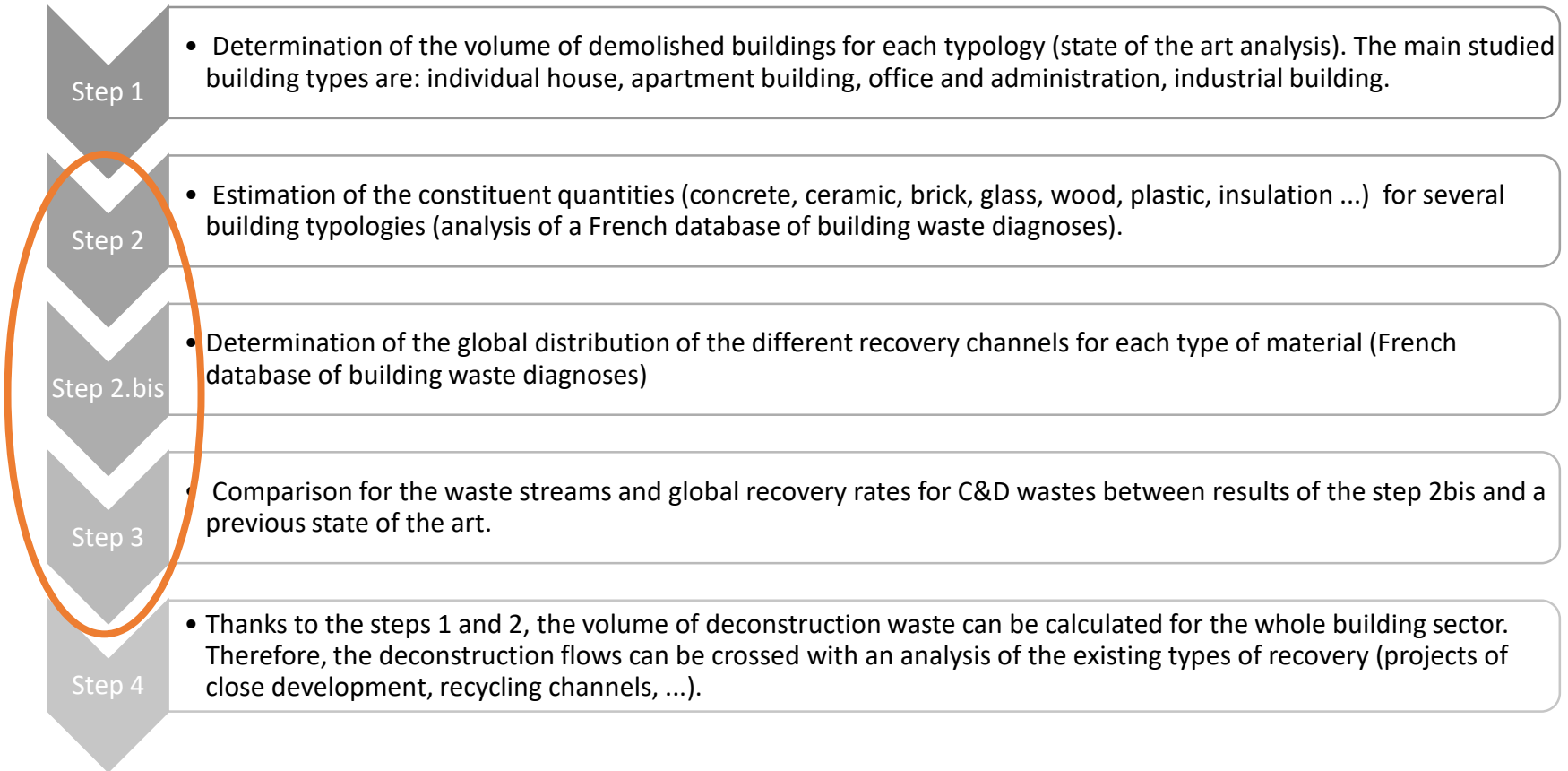


# Context



# Methodology

Objective: identify material flows resulting from the deconstruction of buildings in France

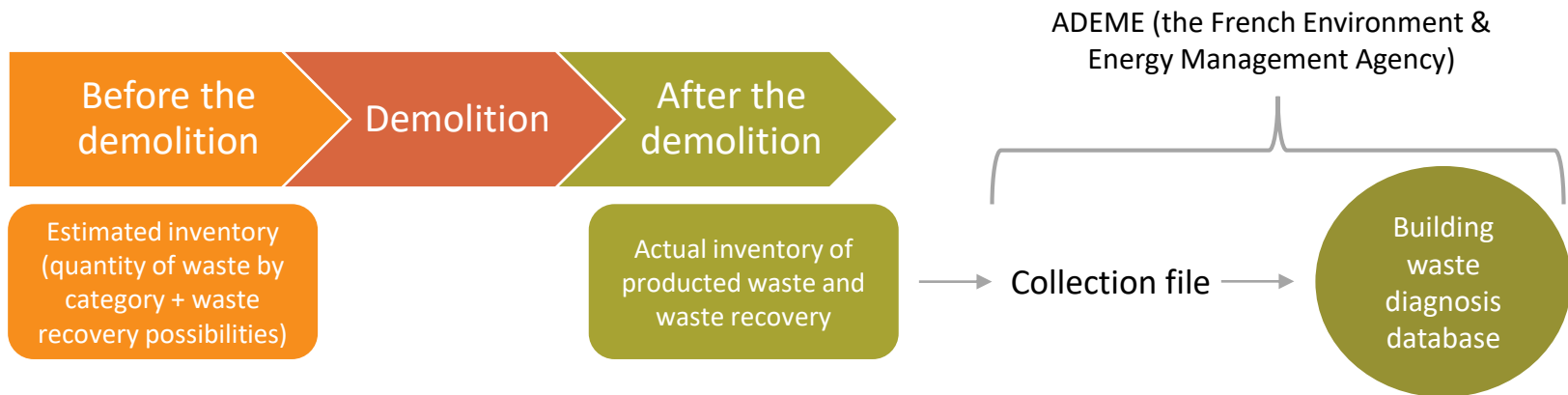


# Presentation of waste diagnosis database

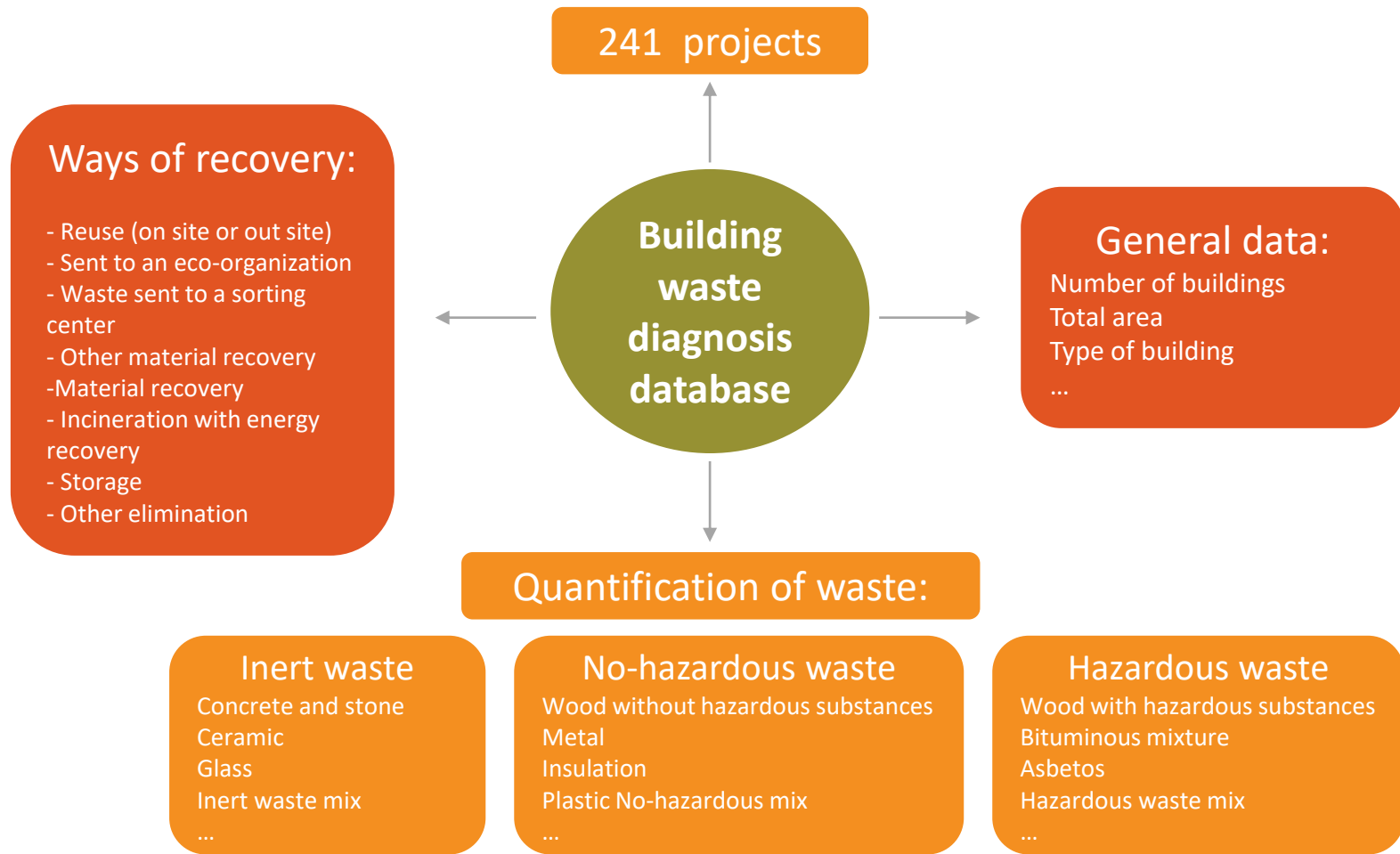
In France, since 2012, it is compulsory to realize a waste diagnosis for the demolition of the following buildings:

- Buildings which have an area upper than 1000 m<sup>2</sup>;
- Professional buildings which have received hazardous substances.

A waste diagnosis is a 2-step process:



# Presentation of waste diagnosis database



# Results: uses of the building

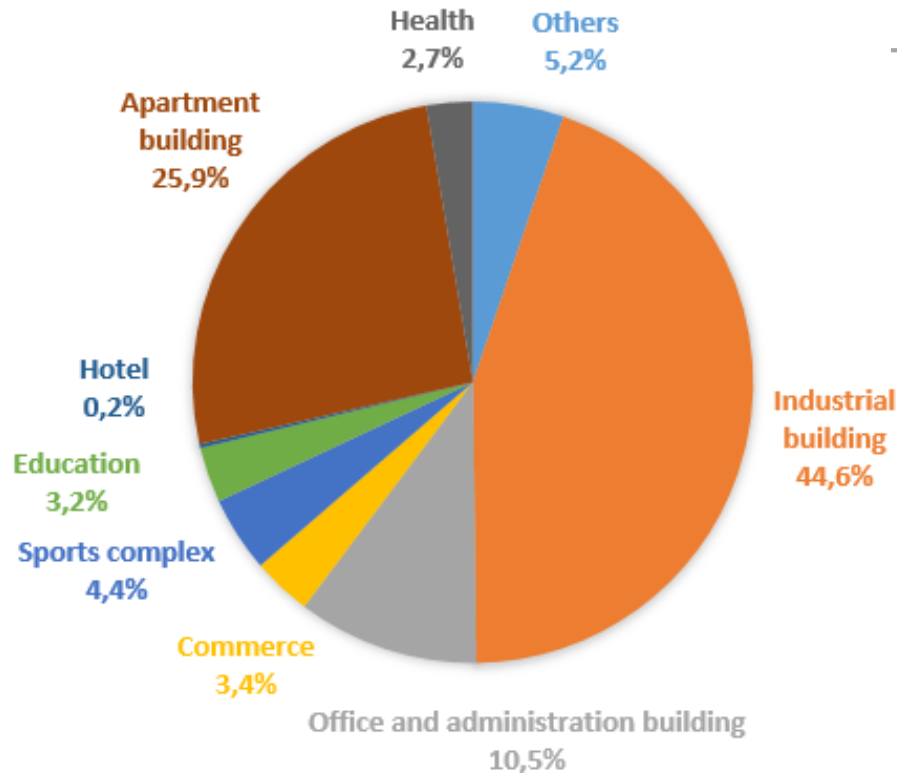


Figure 1. Deconstructed surfaces by building use

The main building uses represented in the database are:

- 80 projects of industrial building;
- 61 projects of apartment building;
- 29 projects of office and administration building.

Selection of 3 building uses:  
- apartment building  
- industrial building  
- office and administration building

# Results: Criteria for selection

To determine the quantity per waste category, the selected projects had to meet the following criteria:

- 1) The use of building is apartment building or industrial building or office and administration building and the principal material is concrete;
- 2) It is necessary that concrete/stone quantity is specified;
- 3) The metal or tile/brick quantities (per m<sup>2</sup>) are not upper than concrete/stone quantity (per m<sup>2</sup>);
- 4) The concrete/stone quantity (per m<sup>2</sup>) has not to be aberrant in comparison with the other projects;
- 5) The analysis of the categories of quantified waste must suggest that the sorting of the waste was actually carried out.

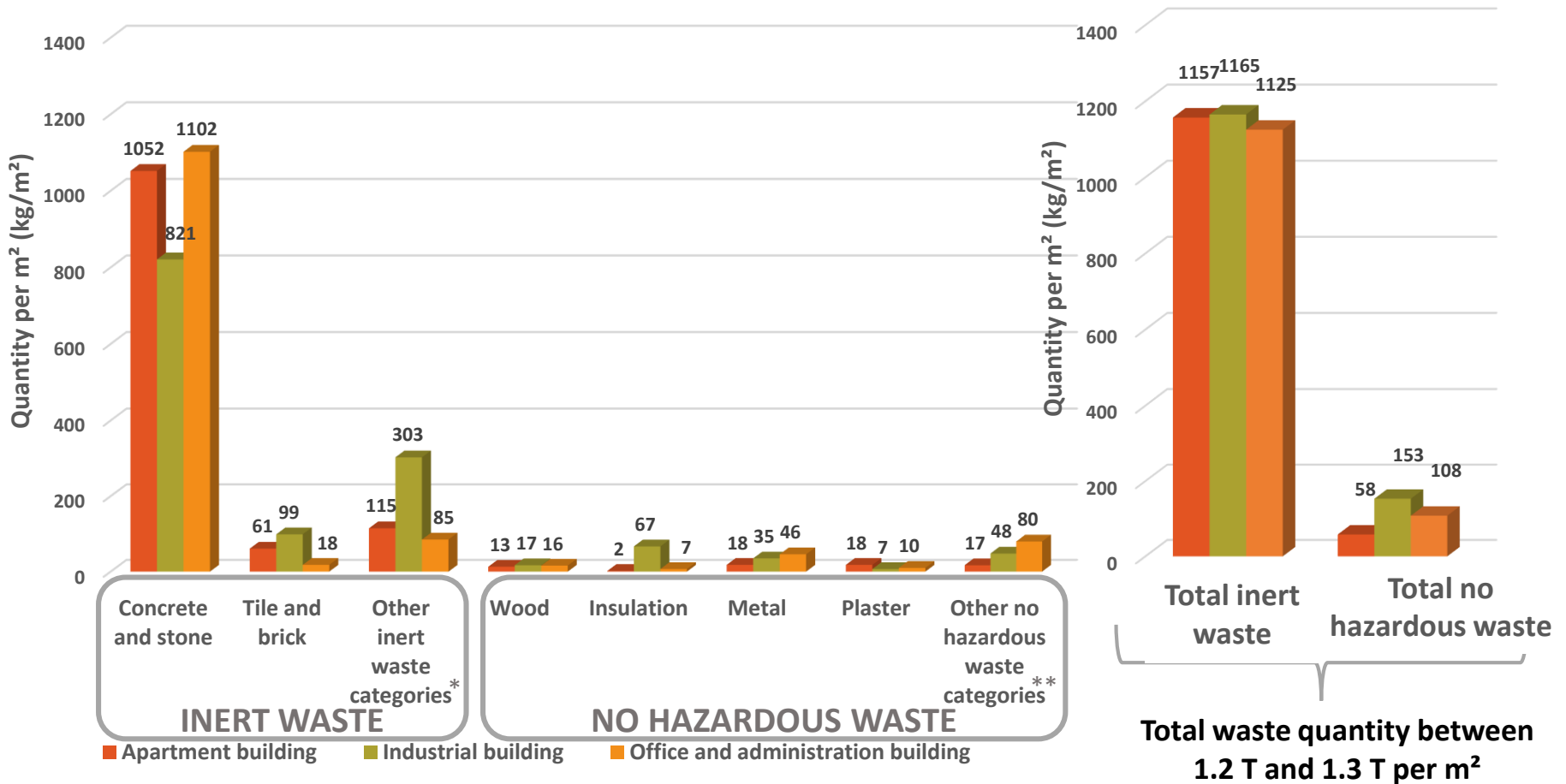
Typology	Apartment building	Industrial building	Office and administration building
Number of selected projects	18	9	9

Table 1. Number of selected projects in function of the studied typology

Low number → low reliability → limit of the study



# Results



**Total waste quantity between 1.2 T and 1.3 T per m<sup>2</sup>**

\* glass, inert mix waste, ceramics, ...

\*\* plastics, floor covering, vegetals, no hazardous waste, ...



# Results: recovery channels

- Inert waste

	Reuse	Sent to a sorting center	Other material recovery	Incineration with energy recovery	Sent to an eco-organization	Waste storage facility	Other elimination
Concrete/Stone	64%	11%	19%	0%	0%	5%	1%
Tiles/bricks/Ceramics	59%	6%	0%	19%	0%	16%	0%
Glass	2%	12%	79%	0%	0%	7%	0%

**Table 2.** Recovery rates for some type of inert waste (database of building waste diagnosis results).

	Material recovery				Energy recovery	Waste storage facility	Incineration without energy recovery
	Reuse	Recycling	Career filling	Road underlay			
Concrete	Between 58 and 70%				/	Between 30% and 42%	/
Tiles and ceramics	20%	20%	55%	/	/	5% in inert waste storage facility	/
Glass	/	5%	/	/	/	95% in no-hazardous waste storage facility	/

**Table 3.** Recovery rates for some types of inert waste (results from the state of the art).

# Results: recovery channels

- Inert waste

	Reuse	Sent to a sorting center	Other material recovery	Incineration with energy recovery	Sent to an eco-organization	Waste storage facility	Other elimination
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# Results: recovery channels

- No-hazardous waste

	Reuse	Sent to a sorting center	Other material recovery	Incineration with energy recovery	Sent to an eco-organization	Waste storage facility	Other elimination
Wood	2%	23%	21%	34%	0%	20%	1%
Plastic	0%	25%	65%	0%	0%	10%	0%
Metal	1%	15%	80%	0%	0%	4%	0%
Insulation	5%	30%	7%	5%	0%	53%	0%
Plaster	6%	24%	17%	2%	4%	47%	0%

**Table 4.** Recovery rates for some type of no-hazardous waste (database of building waste diagnosis results).

	Reuse	Recycling	Career filling	Road underlay	Energy recovery	Waste storage facility	Incineration without energy recovery
	Material recovery						
Wood	40.2 %				34 %	25.1%	/
Plastic	From 0 to 5%				/	From 95 to 100% in no-hazardous waste storage facility	/
Metal	From 0 to 11%	From 87% to 98%	/	/	/	From 2 to 15% in no-hazardous waste storage facility	/
Insulation	/	From 0 to 40%	/	/	/	From 60 to 100% in no-hazardous waste storage facility	/
Plaster	/	From 0 to 5%	/	/	/	From 95 to 100% in no-hazardous waste storage facility	/

**Table 5.** Recovery rates for some types of no-hazardous waste (results from the state of the art).



# Conclusion and prospects

## Conclusions:

- We obtained some orders of magnitude for the waste quantities by m<sup>2</sup>: between 1.2 and 1.3 T of waste by m<sup>2</sup>.
- Repartition of recovery rates: contrasted results for the comparison database/state of the art.

## Limits:

- The number of the projects in the database
- The inputs of the database. The analysis lets suggest that some projects don't fulfill the collection file correctly.
- The reliability of the results is weak.

## Prospects:

- Reliability: consolidate the data with other projects
- Quantities of data:
  - ❖ Extend the scope of the study to renovation waste
  - ❖ Determine the quantity of waste for other uses of the building and construction systems (concrete, wood, metal...)



**Thank you for your attention**  
**Do you any questions ?**

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