

# From stock to flow: Historical evolution, typologies, and strategies of plastics in the Walloon building sector for a circular and low-carbon economy

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## 1. Introduction / Context

- The AEC (Actors in the architecture, engineering, and construction) sector in Wallonia is a major consumer of raw materials and a significant generator of waste.
- Circularity remains limited due to insufficient knowledge of plastic material stocks embedded in buildings.
- Objective: to propose a spatialized methodology to identify plastic stocks and assess their circularity potential at the territorial scale.

## 2. Data and methodology

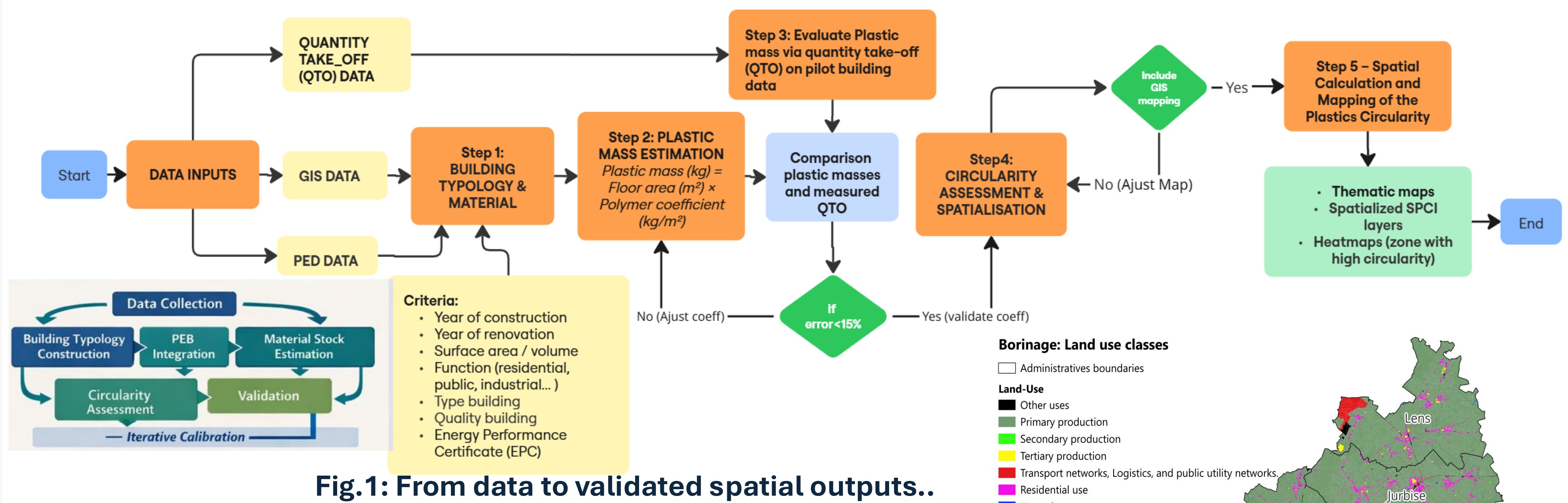


Fig.1: From data to validated spatial outputs..

## 3. Main Results

- ❖ Older buildings (>1970) account for the majority of plastic stocks.
- ❖ Post-1980 buildings show higher plastic intensity (insulation, piping, joinery).
- ❖ Spatial distribution of buildings and plastic types by construction period and building function.

**Borinage: Distribution of building and type of plastic used**

- Administrative boundaries
- Evolution of building and plastics used**
  - Before 1950 (little or no plastics)
  - 1950 - 1979 (PVC, PS, PE, start of PSE)
  - 1980 - 1999 (PVC, PSE, ABS, PC, PUR, PIR)
  - 2000 - 2009 (recycled PVC, PUR, PIR, PEHD, XPS, EPDM)
  - After 2010 (bioplastics, composites, recycled PVC and PE, PP)
  - Not information

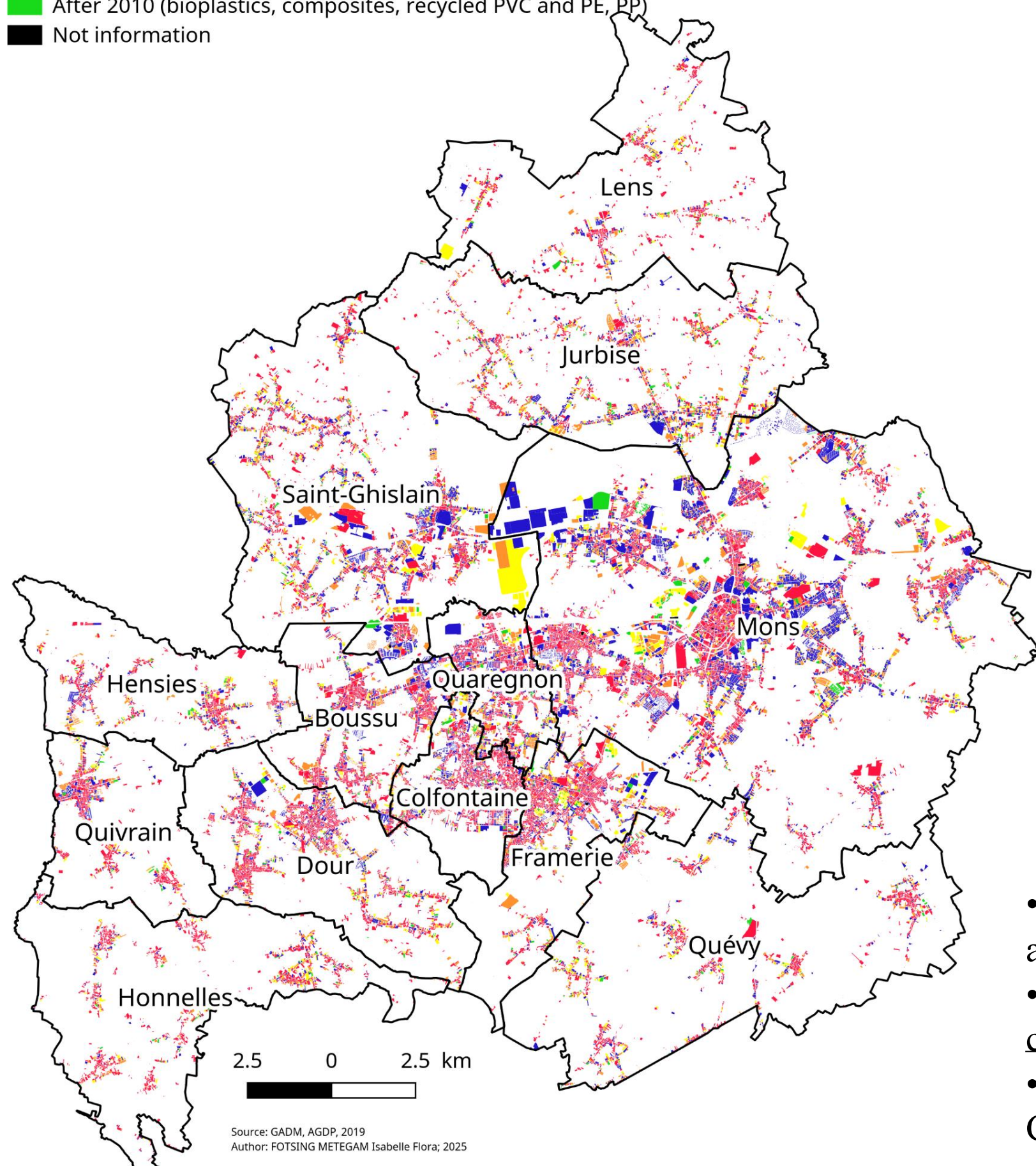


Fig.2: Distribution of Building of Borinage (Wallon Belgium)

Win4C is a regional initiative positioning Wallonia as a Circular Materials Valley by 2030 through innovation in material reuse and recycling.

Circular transition in the building sector relies on recognizing, quantifying, and spatially mapping embedded plastics.”

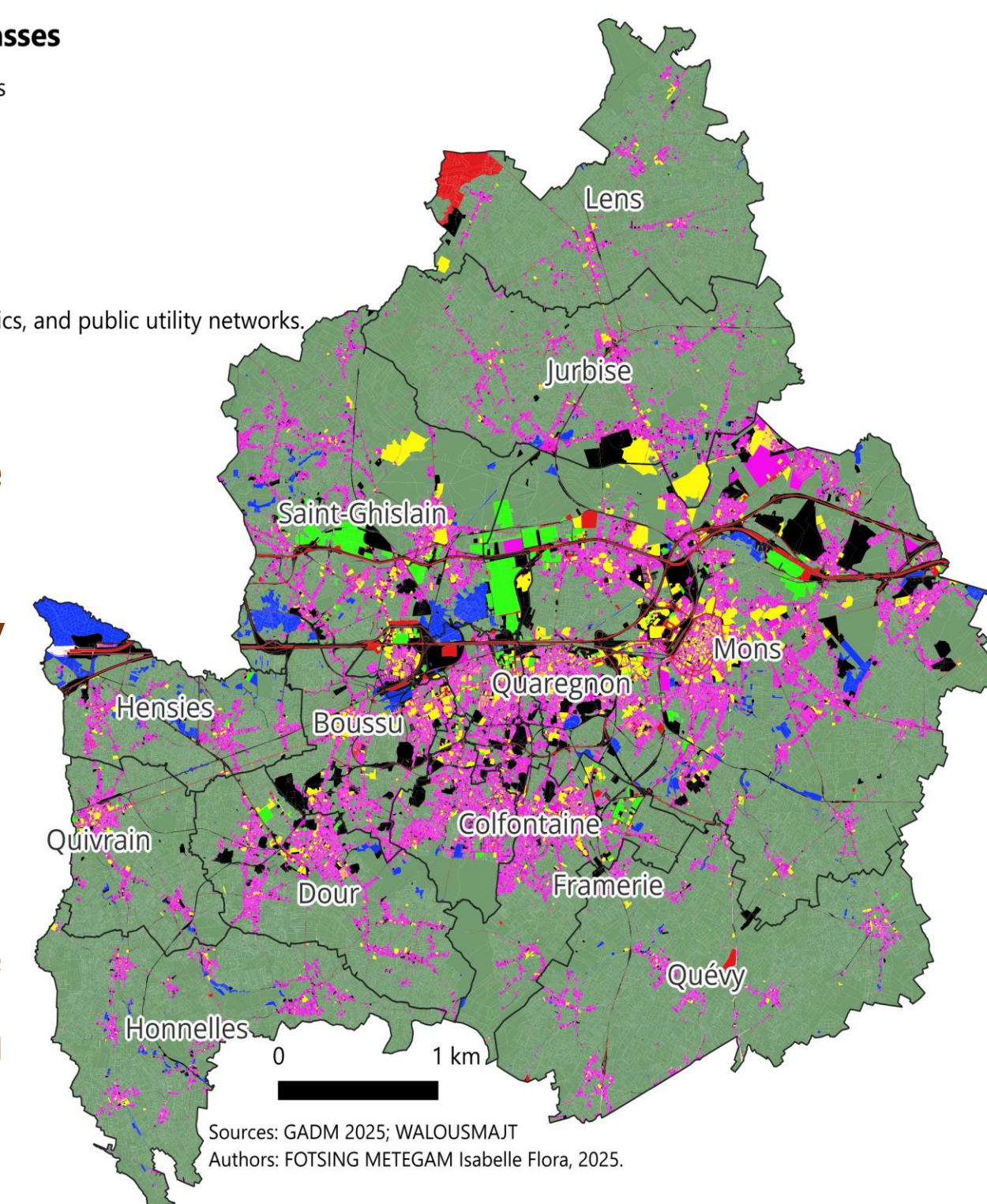


Fig.3: Land-use distribution map of the Borinage.

## 4. Discussion / Circularity Potential

- ❖ Identification of priority buildings for reuse and recycling.
- ❖ Estimated plastic stocks and circularity indicators support targeted interventions.
- ❖ The model enables anticipation of plastic flows from renovation and demolition activities.

## 5. Conclusion / Perspectives

- A robust GIS-PEB-QTO framework to estimate territorial plastic stocks.
- Future work includes polymer-specific analyses, quantitative circularity indicators, and extension to other Belgian regions.

## 6. References

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•Kirchherr, J., Reike, D., Hekkert, M.: *Conceptualizing the circular economy: An analysis of 114 definitions*. Resour. Conserv. Recycl. **127**, 221–232 (2017). doi:10.1016/j.resconrec.2017.09.005

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