Measuring stocks in the *urban mine* to monitor circular economy with SEEA

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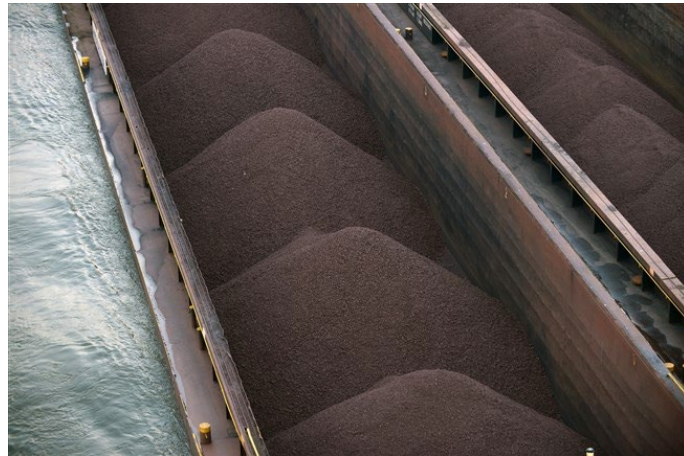- Results for the Netherlands

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Policy and data needs

Policy needs

- Dutch economy 50% circular in 2030 and 100% in 2050
- Shift from raw material use to secondary materials use
- Shift from geological mines to urban mines
- Monitor this transition

Data needs

- Statistics Netherlands measures material flows (Material <u>Flow</u> Monitor)

- Explores measuring material stocks (Material <u>Stock</u> Monitor)

- Objective: support policy on secondary materials use from stocks instead of importing or extracting raw materials

- Macro-economic perspective

Insight in materials in society (stocks)	→	Product lifespan / plans to renovate	→	Insight in available materials: urban mine

Scope

Scope

All products in the economy and from households:

1. **Buildings** (houses, offices, etc.)
2. **Infrastructure** (roads, rails, bridges, sewerage, etc.)
3. **Energy system** (electricity and heat)
4. **Transportation** (cars, etc.)
5. **Electronics and machines** (laptops, airco, etc.)
6. **Consumer goods** (furniture, etc.)
7. **Textile** (clothing, etc.)

Scope

All materials in the products:

1. **Construction materials** (concrete, isolation material, sand, glass, etc.)
2. **Metals** (iron, steel, aluminium etc.)
3. **Biomass** (wood, biobased textile and other biobased materials)
4. **Critical raw materials** (silicon, magnesium, cobalt, etc.)
5. **Other** (plastic, non-biobased textile, other)

Scope

- **Urban mine:** accumulated stock of materials in products (lifespan >2 years) in the economy and society, that – at one point - can be recovered and reused

- SEEA focuses (also) on stocks of **environmental** assets: natural resources and land

- Material Stock Monitor focuses on stocks of **economic** assets
  → *sustainable secondary use of the materials in these assets*

Data sources and methods

Data sources

- **Quantity of the product** (building surface, amount of wind turbines, length of roads): geographical registers and national statistics

- **Lifespan or planning**: literature studies

- **Consumer goods**: international trade statistics, production statistics

- **Material intensity**: several datasets with breakdown per product, literature studies, research of expert organisations (interviews)

Data sources: geographical registers

- Maps of buildings (BAG) and physcial objects e.g. infrastructure (BGT)

- Detailed information:
  - Type of building, construction year, surface m^3
  - Type of bridge, streetlights, etc.

Methods

1. Buildings, infrastructure, energy and transport:
   Material stock = quantity * material intensity

2. Consumer goods, electronics, machines and textile:
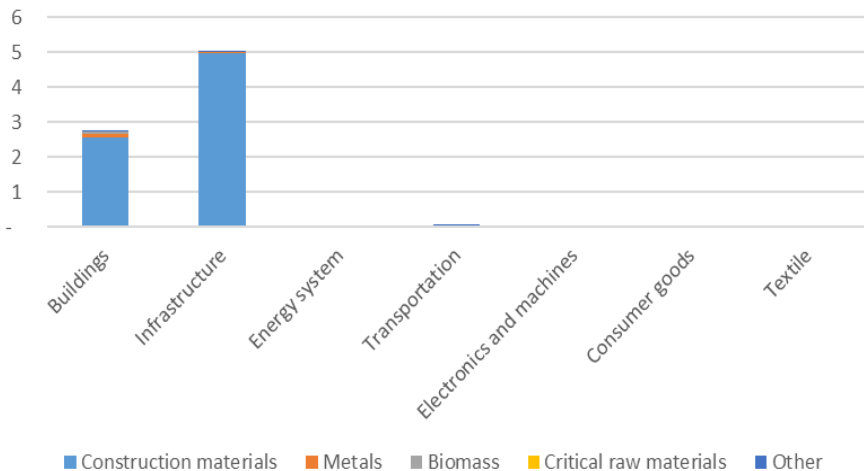   **Put on market (inflow) + lifespan + waste accounts**
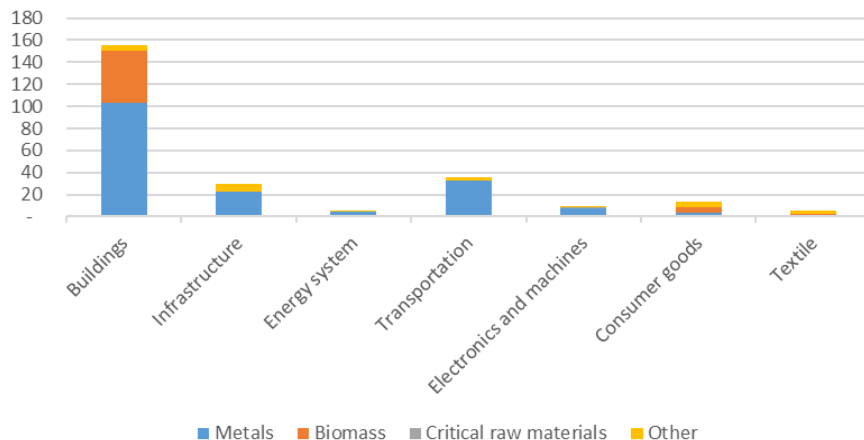
Results for the Netherlands

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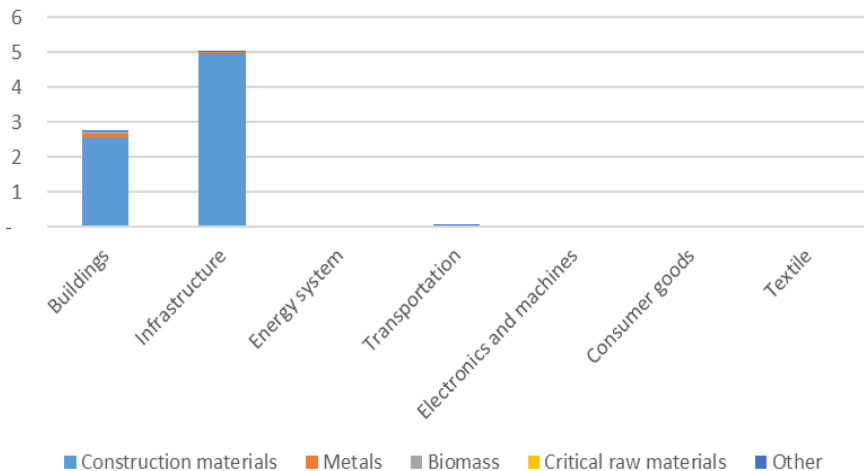

Materials (billion tonnes), 2020

Legend: Construction materials, Metals, Biomass, Critical raw materials, Other

Categories: Buildings, Infrastructure, Energy system, Transportation, Electronics and machines, Consumer goods, Textile

Materials (million tonnes), 2020
(excl. construction materials)

Legend: Metals, Biomass, Critical raw materials, Other

Categories: Buildings, Infrastructure, Energy system, Transportation, Electronics and machines, Consumer goods, Textile

Results for the Netherlands

Results for NL

Buildings

- Material intensity in kilograms per m^2

- Possibility to zoom in on materials (wood, iron, etc.)

- Possibility to zoom in on product groups (houses, offices, etc.)

Legenda
kg/m2
- < 70
- 70 - 150
- 150 - 250
- 250 - 400
- > 400

0 5 10 20 30 40 Kilometers
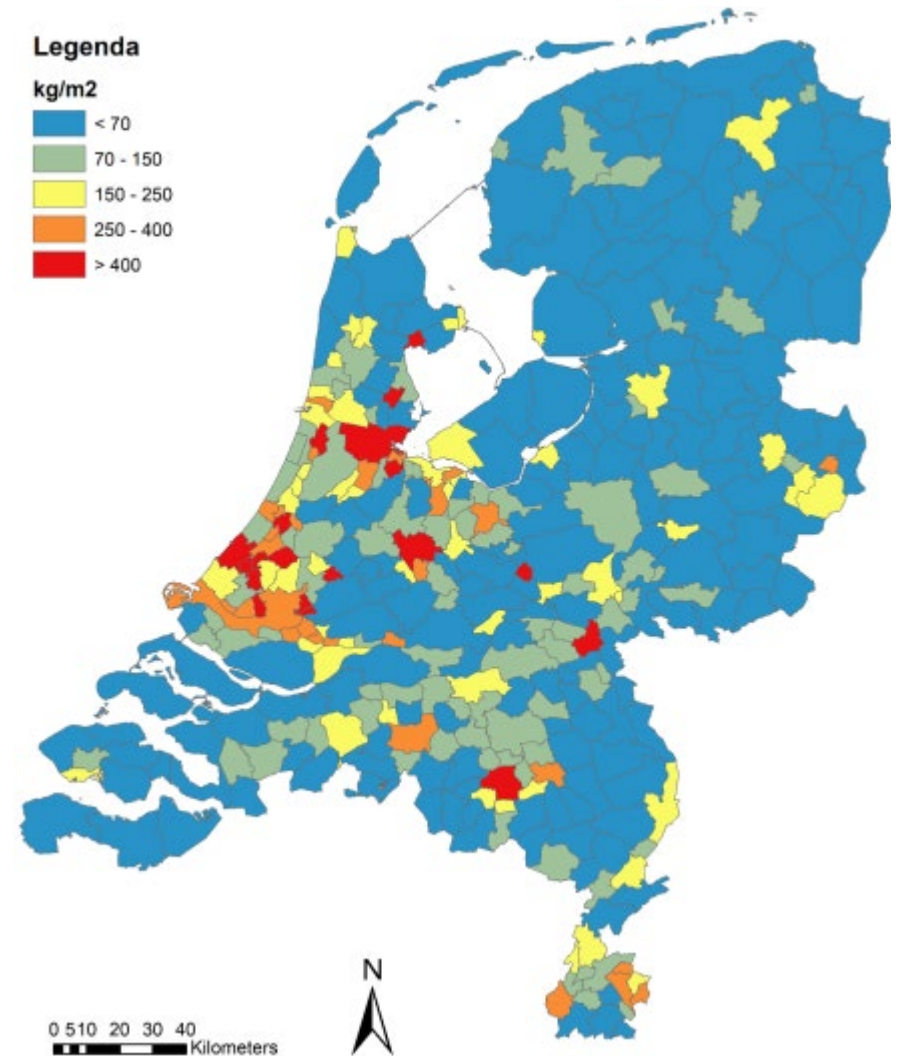
Conclusions and next steps

Conclusions and next steps

- Demand for statistics directly related to key national environmental policy themes

- Multiple applications possible: zoom in on specific materials or products, insight in circularity

- Bulk materials in buildings and infrastructure

- Most biomass materials in buildings

- Many data sources needed, complexity, frequent updates are a challenge

Next steps:

- Improved statistical data on **material intensity** of products

- Improved statistical data on **lifespan and durability** of products

125 years reliable statistics