Market analysis of recycled sands and aggregates in North-West Europe: drivers and barriers

S. Delvoie, Z. Zhao, F. Michel & L. Courard
University of Liège (Belgium)
Project Interreg NWE SeRaMCo
The study is performed in the framework of the project SeRaMCo

**Secondary Raw Materials for Concrete Precast Products**

(in progress: 2017 → 2020)

**Objective**

Increase the use of CDW as secondary raw materials for *cement* and *concrete precast products*
Recycling construction and demolition waste accounts for 8% of the total generated aggregates in the EU.

2.7 billion tonnes of aggregates generated in the EU28+EFTA in 2016 (UEPG, 2018)

- **Natural origin**
  - 47.4% crushed rock
  - 40.3% sand & gravel

- **Recycled origin**
  - 8% recycled (220 million tonnes)
    - Concrete
    - Mixed

Construction & demolition wastes (CDW)
The market of recycled aggregates may be influenced by many parameters.

**Focused parameters in NWE**

- Availability of RA and recycling plants
- Challenge with natural aggregates
- Regulation on CDW landfilling
- Standards and specifications
- Public perception
- Financial incentives
- Quality certification of RA
- Green public procurement

**Difficulties:**

- some national statistics are not available or not directly comparable
- market of RA is influenced by local and regional contexts
Recycling and re-use of CDW is developed in NWE


“A minimum of 70% of the generated non-hazardous CDW (excl. excavated soils and stones) must be re-used or recycled by 2020”.

The objective is already reached by the investigated NWE countries

In 2016, NWE countries generated almost **60%** of the recycled aggregates produced by the EU-28 (UEPG, 2018)

In terms of production:

<table>
<thead>
<tr>
<th>Country</th>
<th>Recycled sands &amp; aggregates (Mt/yr)</th>
<th>Recycled sands &amp; aggregates (t/capita)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE</td>
<td>16.5</td>
<td>1.5</td>
</tr>
<tr>
<td>FR</td>
<td>51</td>
<td>0.8</td>
</tr>
<tr>
<td>DE</td>
<td>66</td>
<td>0.8</td>
</tr>
<tr>
<td>LU</td>
<td>0.6</td>
<td>0.9</td>
</tr>
<tr>
<td>NL</td>
<td>18</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Note: This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 642384.
Challenge with primary raw materials

In 2016, NWE countries generated almost **40%** of the natural sands & aggregates produced by the EU-28 (UEPG, 2018)

![Bar chart showing percentage of recycled sands and aggregates compared to the total production in different countries.

BE: 18.5%
FR: 12.1%
DE: 12.8%
NL: 21.1%
EU-28: 8.5%

Percentage of recycled sands and aggregates compared to the total production

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 642384.
Favourable market context for recycled aggregates in the Netherlands

Demand vs supply for sands and aggregates:

Demand higher than supply
Imports represent 20% of the demand in sands and aggregates

Lack for coarse aggregates
70% (10-11 Mt) are imported every year
Regional disparities in Belgium

Production of **natural** sands & aggregates
70-75 million tonnes/year

- Flanders: 20%
- Wallonia: 80%

Consumption of sands & aggregates
100 million tonnes/year

- Wallonia: 23%
- Brussels: 11%
- Flanders: 66%

Production of **recycled** sands & aggregates
16.5 million tonnes/yr from ~350 recycling plants

- Flanders: 79%
- Wallonia: 21%
- Brussels: 3%

Mean distance from quarries

- Flanders: 80 km
- Brussels: 60 km
- Wallonia: 40 km
Inert waste landfilling: availability and legislation

- **NL** and **BE**: ban for inert waste landfilling
- **DE** and **LU**: < 5% (high landfilling taxes, many recycling plants available)
- **FR**: ~15-20% (more inert landfills than fixed recycling facilities)

The cost for 1 tonne of aggregates may double every 30 km by road

![Image of waste landfill]

![Graph showing density of inert waste facilities]
Conclusions

Based on a **quantitative analysis**:  

Investigated **NWE countries possess an extensive network of CDW treatment facilities despite the abundance of primary raw materials**  

Countries where **the market of recycled sands and aggregates seems the most suitable are the Netherlands and Belgium** (mainly Flanders) characterized by:

- lack of available local natural rocky materials
- favourable legislation
- developed network of recycling facilities
Thank you for your attention

The work was carried out thanks to the financial support of the European Commission in the framework of the Interreg NWE SeRaMCo project