The Recycling of Construction & Demolition Waste

Peter Broere
Introduction

De Terp Holding

Eerland Recycling Services Consultancy

Eerland Laboratorium Testing

Eerland Certification Certification
Contents

• Definition of C&D waste
• Recycling in Europe
• Recycling in The Netherlands
• Origin of C&D waste
• Processing
• Products and Applications
• Recent developments
• Conclusions
What is C&D waste?

- Waste material resulting from constructing and demolishing:
  - Roads
  - Buildings
  - Bridges, fly-overs
  - etcetera
C&D waste in Europe (1)

estimates

M ton

0 50 100 150 200 250

EU

Mton in 2002
Mton in 2000
Mton in 1990
C&D waste in Europe (2)

The chart illustrates the percentage of reuse targets and established reuse for various countries and regions in Europe. The x-axis represents the percentage of targets achieved, ranging from 0% to 100%, while the y-axis lists the countries and regions: B (country), G (country), Ch (country), N (country), EU (European Union), I (country), E (country), UK (country), NI (country). The chart shows the percentage of reuse targets achieved and the percentage of reuse established for each region, indicating the degree to which C&D waste management goals are being met.
Netherlands
general information

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<table>
<thead>
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<tbody>
<tr>
<td><strong>Numer of inhabitants</strong></td>
<td>Over 16 million</td>
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<tr>
<td><strong>Inhabitants per km²</strong></td>
<td>400</td>
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<tr>
<td><strong>Need for raw materials</strong></td>
<td>200 million tons</td>
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<tr>
<td><strong>for construction</strong></td>
<td></td>
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<td><strong>Quantity of C&amp;D waste</strong></td>
<td>26.5 million tons</td>
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<tr>
<td><strong>% reuse</strong></td>
<td>90 %</td>
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<tr>
<td><strong>N° of recycling companies</strong></td>
<td>150 crushing</td>
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<td>90 separation</td>
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Development of reuse in the Netherlands
Sector flowchart

- Demolition
- Separation
- Crushing
- Dumping
- Re-use
Separation-process

- pre-sorting
  - coarse wood
  - coarse metals
  - coarse rubble

- feeder

- screening
  - sand
  - plastics
  - paper
  - wood

- wind sifting
  - ferrous metals

- magnetic-belt separator
  - wood
  - PVC piping
  - non ferrous metals

- conveyor
  - concrete and masonry debris

- hand-picking
  - to crusher
Crushing process

- **pre-sorting**
  - coarse wood
  - coarse metals
  - coarse rubble

- **feeder**

- **pre-screening**
  - sand

- **Primary crusher**

- **magnetic-belt separator**
  - ferrous metals

- **secondary crusher**
  - wood
  - PVC piping
  - non ferrous metals
  - light weight materials

- **mechanical separator**
  - granular materials

- **screening**
Main products and applications

• Secondary asphalt for reuse in hot mixtures
• Secondary aggregates for new concrete
• Cement bound asphalt granulate road base
• Cement bound granulates for road base
• Secondary aggregates for new road base
• Secondary sand for sub base
Products and applications

- mixed granulates
- concrete granulates
- hydraulic granulates
- asphalt granulates
- other products

- road base
- warm asphalt
- concrete
- rest

12.8%
2.0%
1.7%
0.6%
0.6%
0.4%
0.3%
0.6%

mixed granulates
concrete granulates
hydraulic granulates
asphalt granulates
other products
road base
warm asphalt
concrete
rest
Netherlands application regulations

• Environmental standards (public)
  - Building Materials Decree
    • Environmental requirements for use
    • Marking by certification or research protocol
    • Testing by regulated tests

• Technical standards (Privat)
  - grain size distribution
  - composition
  - application specific requirements
Recent developments

- Market situation due to economic recess
- Secondary organic fuel
- Increment on export of separation materials
- Drive for new applications
Conclusions

• It is not only the quantity of reuse, also the quality is important.
• Other applications than road building are necessary for durable recycling.
• Special local government policy can rise the amount of recycling of C&D waste.
• CE marking will be the next step in the broad acceptance of secondary granulates.