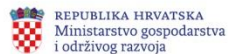




CIRCULAR ECONOMY
APPROACHES IN
SOLID WASTE
MANAGEMENT



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REGIONAL WORKSHOPS ON CIRCULAR ECONOMY APPROACHES WITH FOCUS ON CONSTRUCTION SECTOR

INTRODUCTION TO MEASURES TO INCREASE RECYCLING CONTENT IN BUILDINGS AND PRODUCTS

Barriers and enabling conditions

Description of the problem

- **Increase recycled content** – main objective in many strategies and legal requirements
- **Results achieved** – insignificant. In the Netherlands, secondary materials only represent 3–4 percent of all materials used in buildings.
- **Lack of enough legally-binding requirements** - in GPP, building certifications schemes, standards, in technical specifications (e.g. for the use in highways) but not in buildings
- **Lack of trust** – standards and certification of tested performance of construction products with recycled content is needed
- **Supply** of enough quantity of high quality recycled waste (selective deconstruction required)



Green Deal prescribing recycled content in concrete in the Netherlands

Signatories of the Concrete Agreement

- Government – the Implementing Agency of the Ministry of Infrastructure and Water Management, the Central Government Real Estate Agency and the South Holland province
- Business - fifty leading producers, recycling and construction companies

Commitment

- To use at least 5% recycled content in production of new concrete
- before 2030 all concrete from demolition will be used again in high-quality new concrete

Standards and guidelines – support by the Government

- **EN 12620** - up to 20% recycled concrete content is not considered to lower the new concrete's properties or influence the its workability. More than 50% is usually only suitable for certain applications and testing is required (e.g. national standards).
- **Dutch standards** - allow up to 50% per cent by volume of the stony fraction of concrete aggregates for certain applications to be recycled without testing

→ Replacement rates that go further than the current standards are technically feasible if the right measures are taken – selective demolition, adapted milling processes, extra processing of the aggregates

Mandatory use of recycled materials by the public authorities in Italy

Legal obligations

- 30% of the annual uptake earmarked for purchase through public procurement should be of products and goods made with recycled materials
- catalogue of products and goods obtained from recycled material
- application procedure for registering of a product into the catalogue - declaration by a qualified certifier as well as technical report comparing the product with the conventional product from virgin materials
- periodic checks by the professional associations in the respective sector to verify the compliance
- the products must be readily available and their price should not exceed that of the corresponding products and goods containing virgin raw materials by a percentage defined by an inter-ministerial working group
- all public bodies and companies with prevalently public capital must be identified
- the technical parameters and their limit values that shall be fulfilled by the different product categories are defined through Circulars, issued by the Ministry of Environment.



Mandatory use of recycled materials by the public authorities in Italy

Circular n. 5205 containing performance characteristics of the recycled aggregates used in construction, road and environment sectors

- for the following intended uses of recycled aggregate, performance characteristics and their limit values are specified:
 - A.1 - embankment of earthworks;
 - A.2 - road, railway, airport and civil and industrial aprons;
 - A.3 - foundation layers of transport infrastructures and civil and industrial yards;
 - A.4 – for realization of environmental recovery, and filling;
 - A5 – for layers (having an anti-capillary, antifreeze, draining function, etc.);
 - A.6 - for the preparation of concrete with resistance class ≤ 15 Mpa
- performance characteristics that influence the quality of the final products are:
 - presence of harmful fines, such as silts and clays, responsible for the plasticity;
 - shape index: presence of elongated granules
 - presence of soft elements, such as e.g. bricks
 - Eco-compatibility
- Min. and max. weight limit of waste per type of product/technology:
 - Production of recycled aggregate – max. limit of inert waste- 100%; min.- 60%
 - Production of chipboard panels, MDF - max. limit of wood waste- 90%; min.- 60%

Standards and technical specifications as drivers for the incorporation of recycled content

Construction and environment technical requirements as one system of rules and a standardized guideline. A material must simultaneously meet:

- structural engineering (stability, strength, rigidity of built structures) – which **quality class** (e.g. UA , UB or UE according to Recycled Construction Materials Ordinance) in which **applications** (e.g. unbound; hydraulically bound; concrete; asphalt) is allowed to be used in minor **quantities** (<50%)
- environmental compatibility - **parameters** (e.g. pH value, Cu, Ni, Cl-) and on the basis of **limit values** (mg/kg) different **quality classes** are defined per given application
- structural requirements for construction materials
 - natural aggregates for the production of unbound and hydraulically bound mixtures for civil engineering and road construction (ÖNORM B 3132)
 - natural aggregates for concrete (ÖNORM B 3132)
 - natural aggregates for asphalt (ÖN B 3130)
- CPR - CE marking requirements
- National ÖNORM standards supplementing harmonized EU standards under CPR by addressing special geographical, topographical and climatic conditions in Austria
- to be dismantling-compliant: fulfills ÖNORM B 3151 "Demolition"
- No mandatory recycled content but recycling is high because standards contribute for overcoming prejudice against recycled materials, create legal certainty and boost market