

### 1.3.4. REPORT ON THE POSSIBILITIES TO REUSE OR RECYCLABILITY OF BUILDINGS MATERIALS IN ROMANIA

OERCO2  
ONLINE EDUCATIONAL RESOURCE FOR INNOVATIVE STUDY OF CONSTRUCTION  
MATERIALS LIFE CYCLE

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BUILDING  
COUNCIL



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del mármol, piedra y materiales



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Environmental standards are seen nowadays as an encouragement to use alternative and less dangerous materials. Also, to use environmentally friendly materials in the design of a product to encourage reparability in order to minimize waste and increase recycling. Construction and demolition waste are waste resulting from activities of construction, renovation, rehabilitation, repair, demolition of the industrial constructions and town structures, transport infrastructure etc.

For the past ten years, due to increasing development of the construction sector combined with lack of legislation to regulate this type of waste, Romania faces a problem of increased illegal dumping of waste management from construction and demolition. Firstly, the existing buildings stock consists a majority of poor physical condition or no longer meet construction standards (e.g. energy efficiency class, seismic risk) or require repairs, upgrades, consolidations. Secondly, local authorities tend to relocate production units outside towns or they relocate old production plants, requiring the demolition of the industrial platform left behind. Second, in the last 10 years, residential investment make this sector to be very dynamic.

Developing of the construction sector lead to increased quantities of construction and demolition waste, composed of: concrete, bricks, tiles and ceramic (80%), wood, glass, plastics, bituminous mixtures, coal tar products tarred, steel, earth, insulation materials, gypsum etc. The composition of waste from construction and demolition depends on construction works, whether it is building a new space or renovation / modification of an older construction/ from summer work / modification resulting in more waste.

Construction and demolition waste can be inert, non-dangerous or contaminated with various dangerous substances, in consequence it is mandatory to collect it separately. Construction and demolition waste classified as dangerous may include: asbestos, heavy metals, paints, adhesives, treated wood, soil contaminated with PCB materials. Even though the amounts are small compared to the total waste from construction and demolition, builders should apply specific measures to manage this type of waste.

The main materials that can be reused from construction and demolition waste are excavated material (soil, sand, gravel, adobe, rock):

- materials from road construction or cracks in the roads (bitumen, pavement, sand, gravel, crushed rock, old asphalt);
- materials from construction or demolition of buildings (soil, cement, tiles, bricks, concrete, plaster, wood, metal/steel, glass);
- materials from construction sites (wood, plastic, paper, cardboard, metals, cables, solutions and varnishes).

Currently in the main cities of Romania there is no warehouse for waste from construction and demolition, removal of this waste being achieved, most often in the site of landfills for municipal waste. Nationwide, there are a few operators who operate crushers transforming concrete and bricks in materials that can have a future use. But it is necessary that the material resulting from crushing must rise in terms of cost and quality at the level of the raw materials normally used. Currently, in Romania there are no regulations regarding material quality resulting from construction and demolition waste treatment, excepting the rule regarding its use in various applications (e.g. as filling material in the construction of transport corridors).

Level of recycling reduced construction and demolition waste of Romania may be because of technical reasons (inexistence of infrastructure for separate collection and sorting, namely lack of recycling capacity for certain types of materials such as wood), and economic (the absence of financial instruments to encourage / oblige operators to deliver the waste collected by sanitation treatment facilities / recovery and not to remove). Also in Romania, natural aggregates are in sufficient quantities and at reduced prices, making it difficult to enter the market of recycled aggregates. In Romania there are several concrete crushing installations (for example <http://ecobihor.ro/beton.htm>) (Corbu, O. et. al., 2016).

The concrete is one of the most used building materials, and when treated as waste, are generated in appreciable amount due to building demolition. Crushing of the waste chop the concrete and then the screens using magnetic separators, metal/steel debris can be recycled later separated. The concrete waste can be recycled and turned into a wide range of products with the role of paving or drainage. Concrete debris can be used as aggregate for fresh concrete. For this purpose they crushing of the waste until reach normal size aggregate and shorts

necessary to produce a specific type of concrete.

Besides resulting in crushing sorts necessary and dust, which in some cases can be added to the mixture, as was found experimentally that, depending on the destination of concrete, this addition is beneficial. The concrete with recycled concrete aggregate is usually more expensive than concrete with crushed rocks (which they are cheap in Romania), due to additional quality control. For this reason, it is necessary to adopt a series of measures to stimulate the reuse of demolition waste as aggregate in new concrete, while limiting the production of natural raw materials. Unlike many other countries, in Romania the amount of waste from demolition is much smaller, because evolution in this building does not have a very high growth but also because not so rigorous evidence, at least until 2010.

Another commonly found building material is wood. But there is no infrastructure for collecting waste wood separately from other types of waste, in particular those resulting from construction and demolition. A very small amount of wood waste from the population reaches the bins / containers, which can be reused in household through heat recovery. Plants processing wood waste for alternative fuels can separate waste resulting from construction and demolition wood or plant waste fraction.

According to EUROSTAT 2010 (Eurostat Communiqué Nr. 48/2012 - 27 March 2012 for year 2010) between hard Member States (MS) of the EU there are significant differences, ranging from the situation of countries where storage is performed largely as Bulgaria (100%), Romania (99%), Lithuania (94%) and Latvia (91%) to the states where recycling of municipal waste occupies an important place: Denmark (54%), the Netherlands (39%), Belgium (37%).

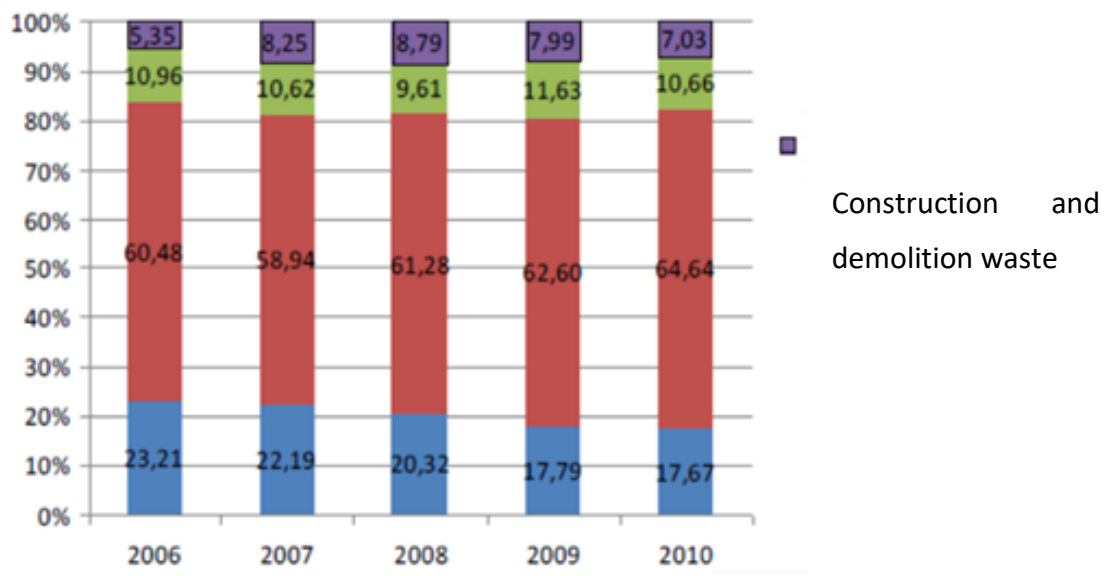
Operate in this final phase is a key strategy to achieve sustainability in the construction sector, to do this the existing concept of waste exchange should be transformed into the traditional open productive model (major waste and emissions generator), to give way to consider this waste stream as a materials resource that aimed at progressing towards a closed productive model, that feeds on itself, reducing the high consumption of natural resources as well as the generation of gas emissions associated with its transformation (Cuchí, A. et al. 2007).

Romania is part of the new member states where most of municipal waste collected is are

eliminated through storage, recycling and recovery operations being used in a very small extent. It is noted important variations between the amounts of waste construction and demolition waste generated in EU countries from 4,1 tons / year per person in Austria, at 0,07 tons / year per person in Romania (Iacobeanu, C., et al., 2016).

Percentages in Romania on the total amount waste in construction and demolition waste in the period 2006-2009 was below 9%.

An important problem of waste management system in Romania is represented by lowest covering area with collection services.



Distribution of municipal waste generated during 2006-2010(ANPM- Romanian National Environmental Protection Agency, Report on environment standing, 2011)

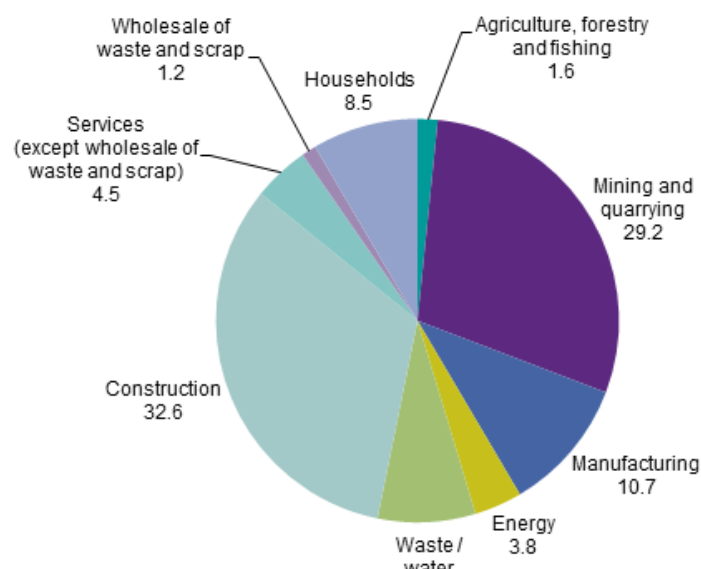
Considering the fact that until 2013, Romania still does not have a characteristic legal specifications for demolition and construction waste, and law no. 211/2011 sets for waste producers and local government authorities obligation to obtain "by 2020, a level of preparation for reuse, recycling and other material recovery, including reuse operations reuse waste to

substitute other materials, minimum 70% of the quantities of dangerous waste from construction and demolition activities "(National Waste Management Strategy 2014-2020). But now Romania is far from this target, with issues related to the collection and storage, without the question of reuse and recycling in the required proportions (Piskas, A. et al. 2014). However it is apparent regions, a relationship between construction companies and companies waste collection. (Iacobeanu, C., et al., 2010).

Another impediment to data collection is the fact that some construction companies have multiple work points and dispersed throughout the national territory and not collect the data quantities of waste produced. Many times owners demolition and construction waste are difficult to identify by environmental authorities as are operators whose activity profile does not require holding an environmental permit. Usually construction and demolition waste are removed from the old municipal storage without weight, or at worst are discarded on vacant lands illegally causing pollution of air, water and soil. The amount seems lower than the European average (25-30%) because the construction companies are developing their activity on sites all over the country and do not have a centralized waste record. Given these deficiencies, the rate of collection and recovery of this category of waste still remains undervalued, or at least inaccurate. (Iacobeanu, C., et al., 2016).

The quantity of waste collected by specialized companies in household waste disposal in Romania in 2011 was 5 085 082 tons. Of these quantities represents 10,46% of construction and demolition waste (531 783 tones).

In the year 2012 waste from demolition and construction sector activity it was 1,325 million tons (according to EUROSTAT).



## Waste generation by economic activities and households, EU-28, 2012 (%)

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