Contemporary methods and trends in construction waste management

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Contents of the presentation

- Introduction
- Foundational methods and principles
- Cost-benefit analysis
- Frequently recycled materials
- Final remarks

Introduction

- The definition of "waste" depends on the context and on the breadth that the relevant analyst wishes to give to the term, but in general it can be explained as "any activity that consumes resources but does not bring any value to the user“
- Responsible waste management is an essential aspect of sustainable construction
- As a member state of the European Union, Bulgaria is already involved in international discussions regarding the so-called circular economy

Foundational methods and principles

3 R's principle

- Reducing effectively prevents waste from being generated, directly resulting in minimized cost
- Reusing is chosen whenever reduction cannot occur, implying that the same material is used again, either with the same purpose or a different one
- Recycling is applied whenever the first two cannot be pursued. It is the least favorable option, as it often bears more cost and has more negative environmental impact.

Source: https://www.heritage-enviro.com/

Foundational methods and principles

Source: https://thelawyer.africa/

Polluter pays principle

- Those who pollute the environment through the creation and possession of waste are obliged to cover all costs of waste management without further endangering the environment and society
- In particular, for construction waste, the contractor of construction waste / construction removal is obliged to finance and manage in full the correct and legal treatment of CDW

Foundational methods and principles

Sustainable development principle

- At the same time, Regulation 305/2011 on construction products sets as the 7th basic requirement for construction "sustainable use of resources", providing for "the creation of harmonized standards for construction products and regulating the obtaining of European technical approvals"
- Based on the principle of "sustainable development", a large part of the construction waste treatment process should focus more on its recovery than its landfilling

Source: Opalis. https://opalis.eu

Foundational methods and principles

BATNEEC principle

- best available techniques not entailing excessive costs
- According to this principle, a critical approach should be taken towards the evaluation of different alternatives in making CDW management decisions that protect both the environment and can be applied in practice at a reasonable cost

Source: https://www.cloudfuze.com/

Cost-benefit analysis

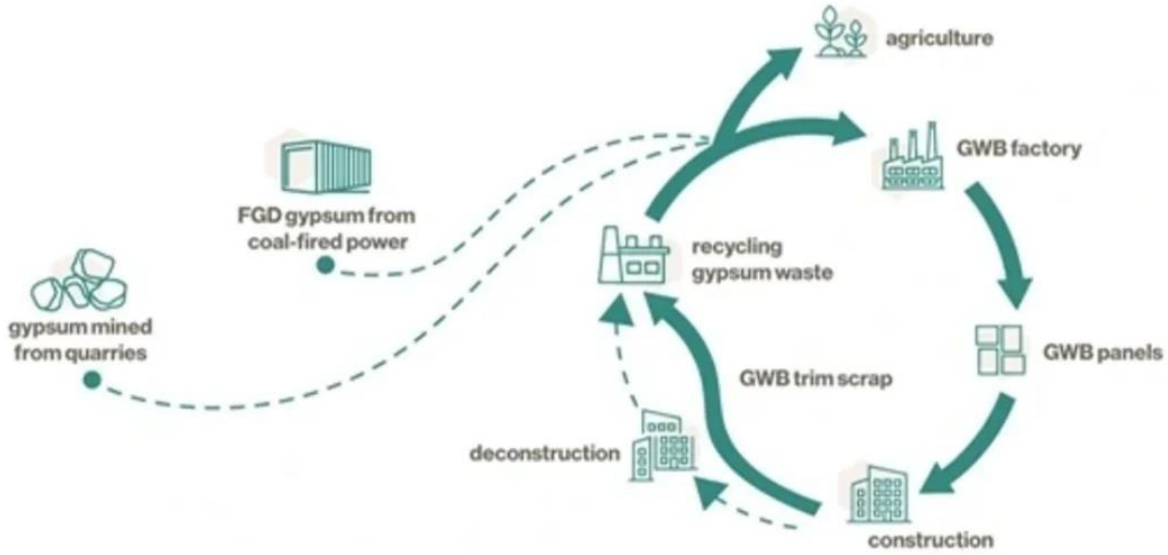
	Preparing for reuse	Recycling	Disassembly	Destruction/Disposal
Cost	Possibility to lower costs with proper reuse	Generally high, but significantly lower if the recycling infrastructure is in place	High due to labor, but this can be offset by selling the salvaged materials	Initially low, but increasing due to landfill charges
Time	Relatively slower process compared to demolition and recycling	Depends on the recycling location (onsite or offsite)	Slow process due to manual deconstruction	Fastest method
Quality of implementation / results	Up to 85% less disposed materials); faster restoration of the site surface	Up to 70% less disposed material	Up to 90% less disposed materials; but the site may be left in a chaotic and untidy state	No waste, but transferred to landfills
Safety	More safety measures are needed because of many additional tasks for workers	More safety measures are needed because of many additional tasks for workers	More safety measures are needed because of many additional tasks for workers	Compliance with existing regulations is required
Risk	The client bears most of the risk and costs; possible environmental risks	Risks related to the timely fulfillment of the contractual terms; possible environmental risks	Potential risks to worker safety, resulting in liability for damages and payment of penalties; possible risks related to unforeseen circumstances	Easy to manage cost, time and environmental risks, but not so easy for contractual risks

Cost-benefit analysis

	Preparing for reuse	Recycling	Disassembly	Destruction/Disposal
Implementation	The contract does not include special information about the recovery of the materials; additional documentation is required for the offer	A recycling promotion clause is often added to a standard contract	Either an entirely new and independent process for the submission of deconstruction proposals/projects is drawn up, or participants are required to submit deconstruction bids in addition to their standard bids/proposals	Standard process regarding invitation to submit proposals/tenders; standard contract clauses
Opportunities	Potential to train staff on how to recover and use materials	There is no possibility of additional training, already qualified personnel are appointed	Great potential for staff training, even if they are not sufficiently qualified before	There is no possibility of additional training, already qualified personnel are appointed

Frequently recycled materials

- Gypsum is infinitely recyclable
- Good example of a closed loop, part of the circular economy concept
- For the moment, there is a lack of adequate information on the reuse and recycling of gypsum in Bulgaria, despite the proven benefits of this process



Source: https://gypsum2gypsum.com/

Final remarks

- Innovative phenomena and concepts such as "circular economy“ and "sustainable development" stand out in the foreground in the global and in particular the Western European construction sector
- One of the main challenges facing the implementation of the circular economy in Europe, and in particular in Bulgaria, remains the need to preserve market principles for competitiveness and cost reduction

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THANK YOU!

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