

4. BULGARIA

4.1 Legal Framework – Waste Management Plans and Strategies

4.1.1 National Legislation concerning CDW

First legal framework and definition of CDW were given in the national act “Law limiting the harmful effects of waste on the environment” (1997). The Waste Management Act of 2003 brought precisions to waste management laws and it was reformulated and completed by the Waste Framework Directive (WFD) 2008/98/EC, in 2012. The updated Waste Management Act was enforced on July 13th 2012. Some specifications about CDW are given in several articles.

An Ordinance on construction and demolition waste management and use of recycled construction materials was put into place the same year, on November 13th 2012. The Ordinance defines more specific regulations regarding collection and re-use of CDW and the obligations of relevant parties.

Some additional Ordinances in the field of waste management, are the following:

- -Ordinance n°1 from June 4th 2014 on the procedures and forms for providing information about the waste treatment activities and the procedures for keeping public registers;
- -Ordinance n°2 from July 27th 2014 on waste classification;
- -Ordinance n°4 on conditions and requirements for the construction and operation of incineration and co-incineration plants;
- -Ordinance n°6 from 27 August 2013 on the conditions and requirements for construction and operation of landfills and other facilities and installations for recovery and disposal of waste.

4.1.2 Waste management plans (WMP) and Strategies

Waste in Bulgaria is governed by the Ministry of Environment and Water, whose National Strategic Plan sets out the overall aims in this area. The waste management strategy for the period 2014-2020 is addressed in the national Development Plan, the Environment Health National Action Plan and the two National Waste Management Programmes. One of these programmes addresses CDW specifically: “Programme to achieve the targets for recycling and recovery of construction and demolition waste”. The action plans have different outcomes such as update of legal texts, use of recycled materials in specific type of constructions and creation of standards and requirements for certifications in the building sector.

Additionally, there is a specific National Strategic Plan for CDW Management for 2011-2020, which presents more details than the National Waste Management plan, such as:

- recommendations and accordingly the legal requirements in Bulgaria
- the current situation and waste management practices and processes
- a forecast of activity and waste to be produced

- a presentation of different plans to reach the objectives
- a choice of plan with concrete actions and indicators to measure the results.

From administrative point of view:

- introduction of “green public procurement (GPP) criteria”;
- including recovery and recycling activities as a part of the National certificate construction system ;
- identifying the main obligations and responsibility to the CDW generators: site waste management plan, achievement of the recycling targets, special requirements for construction design, requirements for selective demolition of buildings.

From economic and technical point of view:

- increasing of landfill tax;
- implementation of quality assurance system for the products, produced from recycled CDW
- Establishing a network of facilities for CDW treatment, producing recycled material with guaranteed quality.

Following those national plans, most municipalities created their own municipal waste management programs, starting from the 2015, with specific sections focusing on CDW management. These programs include a set of “soft” measures mainly related mainly to:

- Preparation of guidelines and sample standard requirements in the tender documents for procurement of construction (by contracting authorities at central, regional and local level) for: preparation for re-use, recycling and other recovery of construction waste; preparation and implementation of management plans for construction waste as part of the project construction documentation and implementation of these plans as a condition for adjustment of investment projects; for use of recycled building materials in the construction works; training for contracting authorities;
- Support for projects of branch organizations of the construction industry and the production of building materials for the development of methodological and training materials/information portals in application of the relevant national legislation and policies relating to construction waste;
- Continued implementation of economic instruments through incentives and sanctions to result in the achievement of objectives/deductions for disposal of household waste and control;
- Integrated activities of recycling and recovery of waste from construction and demolition of buildings in the national certification system for sustainable development in Bulgaria;
- Development and maintenance of a web-based platform for supply and demand of recycled building materials and second-hand building materials and promotion of a platform, etc.

The management plan for construction waste include:

- general data for the investment project;
 - description of the subject of removal;
 - forecast of construction waste generated and the level of material recovery;
 - forecast the type and quantity of products utilized for construction waste, which are used in construction;
 - measures to be taken in the management of construction waste generated in accordance with the requirements of regulations and laws.
- In the negotiation process for the award of construction works and / or removal of construction contracting authority or authorized officer:

- determined responsible for the implementation of the management plan for construction waste for the building;
- When carrying out construction works and removal of buildings, construction waste must be separated by type and transmitted for further material recovery.

An important requirement of the Bulgarian legislator is that construction waste has to be collected, stored, transported and prepared for use separately.

This training is done on specially equipped sites — these are sites for recovery and recycling of construction waste.

Generally, sites are of three types. Each site must meet specific requirements. Requirements must meet construction waste:

- construction waste must comply with the requirements laid down in the investment project construction;
- person making the material recovery through the use of construction waste backfilling must have a document according to the requirements of the waste management for activities waste treatment code R10.

4.1.3 Legal framework for sustainable management of CDW

Waste from construction and demolition operation are highly recyclable and reusable. Thus, from environmental problem it can be transformed into a useful resource. This is a basic approach to sustainable waste management imposed by the active EU policy in this sector.

Bulgarian legislation requires before starting construction works and/or removal of construction contracting to prepare a management plan for construction waste.

With specific text, the legislature prohibits illegal dumping, incineration, and any other form of unauthorized treatment of construction waste, including disposal in containers for collection of household waste and packaging waste.

The main national instrument for sustainable management of CDW is the Ordinance on CDW management, which has the aim to:

- Develop of CDW waste management model, to ensure implementation of legal framework, technical infrastructure for CDW treatment;

- To ensure that by 2020, the preparing for re-use, recycling and other material recovery, of non-hazardous construction and demolition waste shall be increased to a minimum of 70% by weight;
- To reduce the environmental impacts caused by generated CDW;
- To improve the efficiency of use of resources;
- To increase the investments in CDW management sector;
- To increase the responsibilities of pollutants.

Main requirements contained in the Ordinance are:

- selective deconstruction of buildings with separation of the main components
- separation of waste materials during the execution of construction and repair works;
- recycling of concrete , ceramics , asphalt and mineral components (Implementation of Targets 70% until 2020
- implementation of CDW recycling products in infrastructure projects:
 - ✓ for construction of buildings - 2 % from total amount of construction products;
 - ✓ road construction - 10 %;
 - ✓ renovation works – 3%
- CDW MANAGEMENT PLAN
 - ✓ general information about the investment project -Annex № 2;
 - ✓ description of the demolition object -Annex № 3 ;
 - ✓ forecast CDW generation and the level of material recovery - Annex № 4;
 - ✓ estimates of the type and quantity of CDW recycling products implemented during the project - Annex № 5;
 - ✓ measures to be taken relative to the CDW management
- TRANSPORT BOOK
 - ✓ Information for those who carry out the transportation of CO and – Annex 6
 - ✓ persons who are transferred to CO process works and removal.
- Specific waste stream recovery targets for every projects
 - ✓ 17 01 01 concrete - 85%;
 - ✓ 17 01 02 bricks- 70%;
 - ✓ 17 01 03 tiles - 70 %;
 - ✓ 17 02 01 wood - 80%;
 - ✓ 17 02 02 glass- 80%;
 - ✓ 17 02 03 plastics- 80%;
 - ✓ 17 03 02 asphalt- 80 %;
 - ✓ 17 04 01 metals- 90 %;

– Specific CDW recovery targets for road and rail road construction sector - 80%.

Requirements do not apply to:

- ✓ demolition of buildings with a gross floor area less than 100 square meters
- ✓ reconstruction and renovation of buildings with an area less than 500 square meters
- ✓ renovation of use of buildings with an area less than 500 square meters
- ✓ Building with an area less than 300 square meters;
- ✓ remove unusable or unsafe buildings, as ordered by the emergency authority.

In the National Construction and Demolition Waste Management Strategic Plan 2011-2020 there is a description of CDW management scenario:

- selective demolition of buildings,
- separate collection,
- high quality recycling of main streams – concrete, asphalt, ceramics, wood, plastic, metals and glass.

Main priority is for construction of entire needed infrastructure for CDW recycling and quality assurance of the final products, including achievement of high CDW recycling level.

4.1.4 Targets

According to Waste Framework Directive (WFD) by 2020, the preparing for re-use, recycling and other material recovery of non-hazardous CDW should be increased to at least 70% of their total weight, excluding contaminated soil, earth and rock masses from excavations in natural state. These ambitious targets are envisaged in the national legislation by defining in a stepwise manner by year the targets for recycling and other recovery, to achieve the ultimate goal in 2020:

- by 1 January 2016 – at least 35% of the total weight of waste
- by 1 January 2018 – at least 55% of the total weight of waste
- by 1 January 2020 - at least 70% of the total weight of waste.

An important prerequisite for achieving these objectives are the adoption and respect of proper actions, as described in the previous paragraph.

Recycled waste excludes backfilling purpose materials and energy recovery.

Targets for recovery of materials from non-hazardous construction and demolition waste from 2014 to 2020 are given following the classification of the WFD (Table 5). The last two lines are referred to road works and rail works:

Table 5. Targets for recovery of materials from non-hazardous construction and demolition waste [tons].

	2016	2017	2018	2019	2020
17 01 01 Concrete	85%	85%	85%	85%	85%
17 01 02 Bricks	43%	50%	57%	63%	70%

	2016	2017	2018	2019	2020
17 01 03 Tiles and Ceramics	43%	50%	57%	63%	70%
17 02 01 Wood - untreated	67%	70%	73%	77%	80%
17 02 02 Glass - uncontaminated	44%	53%	62%	71%	80%
17 02 03 Plastic - excludes packaging waste	58%	63%	69%	74%	80%
17 04 05 Iron and steel	90%	90%	90%	90%	90%
17 04 01 Copper, bronze and brass	90%	90%	90%	90%	90%
17 04 02 Aluminum	90%	90%	90%	90%	90%
17 04 03 Lead	90%	90%	90%	90%	90%
17 04 04	90%	90%	90%	90%	90%
17 04 06 Tin	90%	90%	90%	90%	90%
17 04 11 Other cables e 17 04 10 Cables containing oil, coal tar and other hazardous substances	90%	90%	90%	90%	90%
17 03 02 Other bituminous mixtures	62%	67%	71%	76%	80%

Also, targets for use of recycled products are as follows (Table 6) [38]:

Table 6. Targets for use of recycled products.

	2016	2017	2018	2019	2020
Construction of building financed by public funds	1%	1.5%	1.5%	1.5%	2%
Construction of roads with public funds	8%	8%	8%	10%	10%
Rehabilitation, renovation or reconstruction of roads financed by public funds	2%	2%	3%	3%	3%
Construction, reconstruction and renovation of other buildings with technical infrastructure financed by public funds	5%	5%	6%	7%	8%
Recycling of construction waste for backfilling	10%	11%	11%	11%	12%

4.1.5 End of Waste (EoW) status

In chapter 4 of the Ordinance on construction and demolition waste management and use of recycled building materials, specific criteria are established when construction and demolition waste becomes a recycled building material.

4.2 Non legislative instruments (best practices, guidelines, recommendations...)

Bulgaria is associated to European Quality Association for Recycling e.V. (EQAR), founded in 2005. The activities of this association are:

- Promoting international cooperation and experience sharing between national quality protection organizations and their members,
- Transfer of know-how on CDW recycling
- Supporting the dissemination of thinking on quality protection and quality assurance for recycled building materials at European level.

Non-legislative instruments are:

- Economic instrument such as landfill tax which is increased between 2011 to 2014 years, from 0.25 €/t to 17.5 €/t, for construction and demolition waste
- Voluntary agreement between government, business and construction industry
- Sustainability standards, such as BREAAAM, LEED, HQE, DGNB. Out of these four standards, DGNB is the most applied in Bulgaria, but still certification of sustainable buildings is limited (about 10 project under all systems in Bulgaria). It is not compulsory for any project type, and there is no big public awareness either.

4.3 CDW management performance – CDW data

4.3.1 CDW generation data

EUROSTAT database reports the following data (Table 7) for CDW generated between years 2010 and 2014.

Table 7. EUROSTAT database for CDW generated between years 2010 and 2014 [tons].

	2010	2012	2014
Mineral waste from construction	27.109	624.332	491.341
Metal wastes, ferrous	1.244	10.225	11.893
Metal wastes, non-ferrous	19	7.233	315
Glass wastes	24	56	3
Plastic wastes	43	77	110
Wood wastes	409	15.356	1.721
Total	78.880	1.032.651	1.340.467

4.3.2 CDW treatment data

Main treatment options for CDW in Bulgaria are:

- Landfill
- Recycling into aggregates for road construction or backfilling
- Re-use
- Energy recovery.

The Ordinance N.1 of 4 June 2014 states that quantitative and qualitative CDW data shall be collected annually by the companies for collecting, transporting, treating and using recycled CDW, but no public data was found yet. Data published by EUROSTAT deal with different waste categories becoming from all the economic activities. Therefore, only for the category “Mineral waste from construction”, data can be considered reliable, as reported in the Table 8.

Table 8. EUROSTAT database for “Mineral waste from construction” [tons]

Mineral waste from construction	2010	2012	2014
Landfill / disposal (D1-D7, D12)	18.814	417.774	29.503
Deposit onto or into land	18.797	417.774	29.503
Land treatment and release into water bodies	17	0	0
Incineration / disposal (D10)	23	8.656	2
Incineration / energy recovery (R1)	0	0	0
Recovery other than energy recovery	30.040	60.606	652.508
Recovery other than energy recovery - backfilling	0	0	0
Recovery other than energy recovery - except backfilling	30.040	60.606	652.508
Total waste treatment	48.877	487.036	682.013

4.3.3 CDW exports/imports data

Very low and variable quantities of imports/exports of CDW are reported by National Statistics Institute, as write in the Deloitte factsheet (Table 9).

Table 9. Quantities of imports/exports of CDW reported by National Statistics Institute

	2008	2009	2010	2011	2012	2013
Quantities of CDW exported (Ktons)	-	3	-	-	5.743	-

Experts believe that imports and exports of CDW is not developed at all in Bulgaria to this date due to a lack of:

- Information of the concerned players;
- Incentive to recycle;
- Maturity of treatment facilities and capacities in neighbouring countries offering a cross-border service with a substantial financial benefit for the Bulgarian companies.

4.3.4 CDW treatment facilities data

The last known data about CDW treatment facilities traces at year 2013, as reported in the DELOITTE factsheet. Data as of September 2013 shows that the country counts 12 municipal landfills for construction waste, 113 municipal landfills and 32 regional landfills. Among these landfills, only the regional ones are compliant with the EU legislation. The other landfills accept all kind of CDW, such as bricks, tiles and ceramics, mixed materials, soil, stones.

The 2014-2020 plan from the Ministry of Environment and Water states that, according to the actual distribution of facilities, 28 regions are targeted for the construction of mobile and fixed treatment facilities:

- 14 fixed platforms with total capacity 1 040 000 tons per year;
- 14 mobile platforms with total capacity 790 000 tons per year.

In 2014, there are several fixed and mobile facilities for recycling construction waste operating in major cities such as Sofia, Rousse and Burgas.

Construction projects of facilities are ongoing, led by regional administrations.

4.3.5 Future projections of CDW generation and treatment

No data found about this topic.

4.3.6 Methodology for CDW statistics

The methodology for CDW statistics of data reported in this document follows Eurostat guidelines.

4.4 C&D waste management in practice

4.4.1 CDW management initiatives

No data found

4.4.2 Drivers / barriers to increase CDW recycling

- Economic barriers: High availability and low cost of raw materials
 - ✓ The main corresponding policy option to overcome this is making landfilling of waste unattractive, by introducing a ban or high levies on landfilling
- Cultural barriers: Misconception of the quality of recycled products

- ✓ Turning waste into a valuable raw material: this can be achieved through quality certification of secondary raw material from CDW
 - ✓ Communicating on the benefits of secondary raw material
 - ✓ Development of end-of-waste criteria
 - ✓ Green Public Procurement (GPP)
- Technical barriers: ineffective sorting and contamination of the waste flows
- ✓ Encourage the sorting of CDW “at source”
 - ✓ Selective demolition / controlled deconstruction.

4.5 CDW sector characterization

4.5.1 CDW materials (CONCRETE, BRICKS, TILES AND CERAMIC, ASPHALT, WOOD, GYPSUM)

Product description and applications

Concrete appears in two forms in the waste. Structural elements of building have reinforced concrete, while foundations have mass non-reinforced concrete. Concrete constitute more than 40% of waste generated. Main applications in the construction sector are: buildings, roads and infrastructure.

Bricks and masonry are generally mixed with cement, mortar or lime. Masonry can be recycled with or without mortar separation. Main applications in the construction sector are masonry construction especially for building.

Ceramic construction products are used mainly for buildings. After a building is demolished, ceramic construction products can be crushed and then used as secondary raw materials for different applications. Recycled tiles are almost identical to bricks. Tile is, often, mixed with brick in final recycled product. Main application in the construction sector are: covering of roofs, floors and walls.

Even though gypsum comprises a small share of the stony CDW material, it is 100% and eternally recyclable thanks to its chemical composition.

Asphalt waste application in the construction sector is pavement for road construction and maintenance.

Wood recovered in good condition from beams, window frames, doors, partitions and other fittings is reused. Wooden material can, next to or after being re-used, recycled for roof structure, building framework, floors, doors, etc.

Quantitative analysis

No data found

Recovery techniques

Recovery techniques for several building materials are reported in Table 10

Table 10. Recovery techniques

CDW material	Recovery techniques
Concrete	<ul style="list-style-type: none"> - Landfill - recycling into aggregates for road construction or backfilling - recycling into aggregates for concrete production re-use of precast elements (concrete blocks)
Bricks	<ul style="list-style-type: none"> - landfill - recycling (replaces sand, gravel, stones, rocks e.g. to fill roads, to produce tennis sand, to serve as aggregate in concrete re-use
Ceramics and tiles	<ul style="list-style-type: none"> - landfill - recycling (replaces sand, gravel, stones, rocks e.g. to fill roads, to produce tennis sand, to serve as aggregate in concrete re-use
Gypsum	<ul style="list-style-type: none"> - landfill recycling into new plasterboards (In substitution of natural gypsum or In substitution of synthetic gypsum)
Asphalt	<ul style="list-style-type: none"> - landfill, - recycling in a stationary plan, in-situ, recycling, material recovery
Wood	<ul style="list-style-type: none"> - landfill - recycling into derived timber products, energy recovery
Concrete	<ul style="list-style-type: none"> - Landfill - recycling into aggregates for road construction or backfilling - recycling into aggregates for concrete production re-use of precast elements (concrete blocks)

Environmental and economic impacts of CDW waste management

- Saving the natural resources
- Low material consumption
- Low transport costs
- Low emissions
- Low cost for landfilling
- Preserve the environment and human health.

Drivers / barriers to increase recycling

Please refer to Section 4.4.2

4.5.2 Recycled materials from CDW

The construction market going down also affects the recycled products market. So far only three of the most common and significant materials are recycled from the 22 existing platforms: concrete, reinforced concrete and ceramics.

In practice, even if recyclers have recycling authorizations for a wider range of codes of products, in reality it appears that CDW can be refused to the transporter coming to dispose of the waste as it is considered to have too poor recoverable output, as it is been observed with ceramics for example.

4.5.3 Market conditions / costs and benefits

The construction industry in 2015 was characterized by favorable dynamics and a change in the growing negative trend established over the years.

Statistical data for some indicators bear a positive sign and indicate the expected pace of recovery and rebuilding growth of the construction sector.

The ranking by economic indicators in comparative aspect registers optimism and positive outlook for the industry. The illustrated growth is mainly based on completed EU projects in the area of road and water supply and sewage infrastructure.

The construction industry in 2015, according to preliminary data, formed 4.7% of the total gross value added for the economy.

In the future, the main priorities of the industry should be searching for and finding mechanisms for better absorption of EU funds as a major factor of growth rates in the construction industry at this stage.

The estimates of the Construction Chamber in Bulgaria for 2016 bring more optimism. After record low levels of construction volumes, the construction sector is set for a slow return to a positive rate in 2016.

There are still obstacles, which need to be eliminated:

- Still there are no factors for sufficiently secure environment enabling companies and related suppliers to show growth and positive development trends.
- Lack of activity and good conditions for stimulating the investments.
- There is indebtedness of the business to the banks as well as intercompany indebtedness. There are initiated projects where the banks had stopped the financing at some stage due to non-repayments on loans.
- Intercompany deficit persists; there is no free cash. Indicative is the fact of a significant drop of nearly 62.0% on an annual basis in tangible fixed assets in 2015.
- The banking crisis in 2014 in Bulgaria left significant impact and the signs could be seen in 2015. Many of the construction companies are still trapped in the banking crisis. The business remained on the market, but a serious economic revaluation of the business programs had to be made.
- What should be the priorities for the construction sector development the in the future:



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- ✓ Investment in „green economy“.
- ✓ More funds in the state budget for public investment – public procurement.
- ✓ Development of small and medium businesses.
- ✓ Creating conditions by the government for attracting foreign investment.
- ✓ Progress in absorption of funds under EU-funded programs.