

# Construction and Demolition Waste management in

## Greece

V2 – September 2015



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# Screening factsheet

## 1. Summary

The management of Construction and Demolition Waste (CDW) in Greece faces several challenges and appears to be significantly underperforming, despite the fact that a comprehensive legislative framework concerning the management of CDW is in place since 2010 (with several new legislation, regulations and amendments following up since then).

### Construction and Demolition Waste (CDW) management national performance

Latest available data for CDW generation and treatment in Greece is the Eurostat data for 2012. Data concerning CDW in Greece rely mainly on estimations since national reporting is not sufficient to describe the actual situation in Greece. The last years, data collection is improving but at a low pace. Preliminary data for 2014, through the reporting of the officially certified CDW Management System organisations, cover approximately half of the CDW amounts generated and treated in Greece. The data reported to Eurostat for 2012, do not include soils and naturally occurring materials from excavations.

Waste category	Generated in 2012 (ktons)	Recovered in 2012 (ktons)
Non-hazardous CDW	815.3	2.7
Hazardous waste	0.02	0
Total CDW	815.3	2.7

In 2012, about 815 thousand tonnes of CDW was generated in Greece, of which only 2.7 was recovered (including backfilling) while the rest was sent to landfills. CDW generation is decreasing steadily since 2010, due to the significant slowdown in the construction sector and is not expected to recover in the foreseeable future. CDW recovery remained persistently at low levels throughout the last decades in Greece. Hazardous CDW (asbestos) is exported for proper treatment to Germany.

CDW generation including soils is estimated to be 6-10 times higher than the figures reported to Eurostat. There is also a significant amount of CDW which slips through the official CDW Management Systems and is not reported or accounted for in any statistics, official or unofficial. Only rough estimations can be drawn for CDW that is illegally managed.

According to the calculation method in Commission Decision 2011/753/EU for verifying compliance with WFD targets, Greece reached approximately 0% recovery rate of CDW in 2012, taking into account data in Eurostat statistics. However, Greece has not reported yet any official data on CDW generation and recovery pursuant to Commission Decision 2011/753/EU.

Preliminary data for 2014, gathered within the context of this study from a few licenced CDW Management System organisations, indicate that the actual CDW recovery performance of Greece lies approximately between 12-15% (see section 5.2). The Greek authorities will be able to produce more reliable statistics once data from all CDW Management Systems have been gathered and analysed. Data for 2014 is expected to be more inclusive and to depict more accurately the current situation of CDW management in Greece than ever before.

### CDW management practices

According to legislation, actors in the construction sector (construction works contractors, demolishers, etc.) are obliged to organise CDW Management Systems (either single legal entity organisations or collective organisations with many participants) for the proper management of CDW from their operations. The CDW Management Systems are entitled to organise the entire waste management chain (from collection to final recovery, disposal and return to the market of the recycled product).

CDW produced in the construction/demolition site is transported to CDW treatment facilities where it is sorted and processed into final recycled products. The fraction of the received CDW that is not materially recovered is deposited into landfills or used for purposes such as backfilling. Iron and steel is sorted out and sent to iron smelters for recycling, while other materials such as plastics and glass are not found in critical

quantities in the mixed CDW stream in order to be recycled. The main product of CDW treatment facilities is aggregates for use in road works and other mild landscaping and engineering purposes.

In practice however, large quantities of CDW is illegally managed and as a result none of the above described procedures takes place. In the case of illegal CDW management, the whole load of CDW generated in the construction/demolition site is transported and disposed without prior planning or environmental permitting in natural sites (e.g. mountain sides, water courses, etc.) preferably in remote locations which are difficult to be detected by environmental inspectors. There are many locations filled with CDW all over Greece and the quantity stored in such places is considered to be significantly high (accumulated CDW generation). Once such locations are identified, there is a possibility to regain the deposited material by bringing it in to CDW treatment facilities of the licenced CDW Management Systems.

Finally, large quantities of CDW are re-used on site for landscaping and other engineering purposes. The amount of CDW re-used on site is not reported as CDW generated or treated and thus is not taken into account for the calculation of national or EU targets. There is no official estimation available about the volume of CDW re-used this way on site.

### **Main obstacles to sustainable CDW management**

- Lack of political will
  - There is low, if non-existent, political will to tackle the issue of illegal CDW disposal and the enforcement of the law concerning CDW management. Major delays in the application of the laws and complementary regulations for CDW.
  - Low financial and human resources support to environmental inspections renders the inspection and enforcement of the CDW management regulations totally ineffective.
  - Recent amendments in CDW management regulations resulted in ambiguity which stalls the effort for increased CDW recovery.
  - Delays in administration of fines or non-conviction of CDW management rules violators
- Mentality in the construction sector
  - General mentality in the construction sector (and of the general public in Greece) is that CDW is not considered to be a waste stream that requires immediate attention and treatment. It can be disposed somewhere and left there, since its inert nature makes it harmless for human health and the environment.
  - Contractors prefer to avoid the cost of CDW management.
  - No market/no demand for recycled CDW, natural materials are always preferred over recycled materials in the construction works.
- Lack of treatment facilities and low territorial network
  - The current network of CDW treatment facilities is not sufficient to cover the total amount of generated CDW or even the national territory of Greece
  - There is no register of appropriate sites (e.g. abandoned quarries, etc.) for the establishment of new CDW treatment facilities.
- Lack of incentives for recycling
  - The landfill tax is not considered enough for diverting CDW from landfilling to recovery, accentuated by the ineffective control of illegal activities concerning dumping of CDW.
  - Cost of recovery activities is higher than the prices of the recycled end-product. No pull effect from market conditions.

### **Main drivers to sustainable CDW management**

- Existence of a well-articulated legal framework for CDW management including provisions for the sustainable management of CDW.
- Existence of a separate authority (EOAN – Greek Recycling Organisation) for the supervision of the alternative management of CDW (recovery, recycling).
- Organisation of CDW Management Systems by the actors in the construction sector (obliged by legislation) for the sustainable management of CDW
- Strong community awareness for the creation of preconditions for sustainable CDW.

## 2. Definitions concerning construction and demolition waste (CDW) and management

In this section the definitions of waste used in Greece are presented.

### 2.1. Definition of waste

The Waste Framework Directive (WFD) 2008/98/EC was transposed in Greek legislation by Law 4042 of 2012 *'Penal protection of the environment – Compliance with Directive 2008/99/EC – Framework for waste generation and management – Compliance with Directive 2008/98/EC – Regulating issues of the Ministry of Environment, Energy and Climate Change'*. The definition of waste used in Greece is in line with that in the Waste Framework Directive.

*'waste' means any substance or object which the holder discards or intends or is required to discard;*

### 2.2. Definition of construction and demolition waste (CDW)

The applied definition of CDW used currently in Greece follows the definition found in Commission Decision 2011/753/EU for verifying compliance with WFD targets. Specifically:

*'construction and demolition waste' means waste corresponding to the waste codes in Chapter 17 of the Annex to Commission Decision 2000/532/EC (List of Wastes), excluding hazardous waste and naturally occurring material as defined in Category 17 05 04.*

However, the term which has been widely used in Greece, and still is in use, to describe the waste stream of CDW is *Excavation, Construction and Demolition Waste (ECDW)*, as presented in the Joint Ministerial Decision (JMD 36259/1757/E103/2010) setting out the *'Measures, terms and program for the alternative management of waste from excavation, construction and demolition (ECDW)'* which consists the main regulatory document specific on the management of CDW. The definition is formulated as follows:

*'Waste from excavation, construction and demolition (ECDW)' means any material or object from excavation, construction and demolition which is considered as waste within the meaning of waste in Article 2 (point a) of JMD 50910/2727/2003 (Measures and terms for Solid Waste Management. National and Regional Management Planning – introducing the European List of Waste in Greek legislation) in conjunction with paragraph 4 of Article 2 of Law 2939 of 2001 (as regards the alternative management of solid waste) and included in Annex I (listing the codes of waste category group 17 of the European List of Waste) of Article 17 of JMD 36259/1757/E103/2010.<sup>1</sup>*

The definition as presented above, in JMD 36259/1757/E103/2010, applies to all waste from excavation, construction and demolition, regardless of their shape, volume, weight or material characteristics, as well as solid waste resulting from the cutting of marble in preparation for construction purposes and excess concrete (concrete that remains after construction works are completed).

There is a distinction between waste deriving from excavation, construction and demolition activities, but no distinct definitions are provided in the relevant legislation.

Although soil and naturally occurring excavated materials during the course of construction are included in the definition of CDW found in JMD 36259/1757/E103/2010, these are not considered in the definition of CDW for calculating the WFD target. The LoW categories excluded in the latter definition are 17 05 04 and 17 05 06.

However, there is a discrepancy in the List of Waste as transposed to Greek legislation concerning waste code *17 05 06 Dredging spoils*. The description of this code has been translated erroneously in the official translation of the Commission Decision 2000/352/EC<sup>2</sup> and consequently it was incorporated in Greek legislation (JMD 50910/2727/2003) wrongly translated, a fact that might result in misreporting of CDW generated and treated and generally there is a chance of improper accounting of recovery operations of a

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<sup>1</sup> <http://www.ypeka.gr/LinkClick.aspx?fileticket=kzPoL7o5Zn8%3D&tabid=508>

<sup>2</sup> <http://eur-lex.europa.eu/legal-content/EL/TXT/PDF/?uri=CELEX:32000D0532&from=EN>

certain amount of CDW that would be reported under this classification. The Greek translation of code 17 05 06 found in Commission Decision 2000/352/EC (and in JMD 50910/2727/2003) is *'Excavation waste other than those referred in code 17 05 05\*'*. It is evident that this description is very general and could potentially include any type of waste deriving from excavation activities, not only naturally occurring materials. CDW reported under this code would not be taken into account for the calculation of the WFD target, and as a result a certain amount of waste that could have been recovered in order to achieve high recovery rates in line with the target of 2020 might be disregarded and end up in landfills or uncontrolled dumping sites. There is also the issue of reporting and properly treating dredging spoils. Especially in the island regions of Greece, this waste type is considered important since there are many ongoing port construction, upgrading and expansion activities resulting in increased amounts of dredging spoils<sup>3</sup>. Although this waste type does not account for the WFD target, it requires appropriate treatment nonetheless, as the possibility of finding a variety of waste materials, other than naturally occurring stones and soils, is very high. The bottom of the sea in ports or close to port areas is considered to be polluted with different kinds of waste finding their way to the sea from inland or dumped by mooring ships and fishing boats.

### 2.3. End of Waste (EoW) status

There are no End of Waste criteria established in Greece.

### 2.4. Definitions of waste treatment operations

The definitions for re-use, recycling and recovery used in Greece are found in the legislation document Law 4042 of 2012<sup>4</sup> and they are the same as those found in the WFD following the categorisation in Annex II of the WFD. Specifically, they are defined as:

- *'re-use' means any operation by which products or components that are not waste are used again for the same purpose for which they were conceived;*
- *'recovery' means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II sets out a non-exhaustive list of recovery operations;*
- *'preparing for re-use' means checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing;*
- *'recycling' means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations;*

Joint Ministerial Decision 36259/1757/E103/2010 includes all the above definitions of waste treatment, formulated specifically for ECDW. The difference in the definition of *'recycling'* in JMD 50910/2727/2003 lies in the fact that there is no mention of backfilling, while backfilling is specifically mentioned in the definition of *'recovery'* in JMD 36259/1757/E103/2010.

The Hellenic Statistics Office (ELSTAT) follows the guidelines of Eurostat in reporting<sup>5</sup>. The Statistics Office is using a hybrid approach of surveys and estimations for producing data on CDW generation and treatment. This waste stream is not monitored satisfactorily and there is a lack of data resulting from a very limited response to the bi-annual survey questionnaires. As a result, the amounts of CDW generated and treated and the available treatment options are mostly estimated by the actors involved in the sector, coupled with statistical analysis, rather than actually measured.

However, the situation is rapidly changing as the obligation of treatment of CDW through certified systems means that more and more CDW going through the official channels of CDW management will be

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<sup>3</sup> Communication with AANEL – System of CDW management

<sup>4</sup> <http://www.ypeka.gr/LinkClick.aspx?fileticket=7Z1up05Xrto%3D&>

<sup>5</sup> [http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/A1501/Other/A1501\\_SOP06\\_MT\\_2Y\\_00\\_2012\\_00\\_2012\\_01SM\\_F\\_GR.pdf](http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/A1501/Other/A1501_SOP06_MT_2Y_00_2012_00_2012_01SM_F_GR.pdf)

documented and accurately reported. The CDW management systems still (as of May 2015) do not cover entirely Greece, so estimations will need to be employed in the next reporting to Eurostat.

Since Official statistics reportedly follow the Eurostat guidelines, they also apply the guidance on backfilling<sup>6</sup> when reporting on recovery operations. Backfilling is considered as a recovery operation and it is taken into account for the calculation of the WFD target and the National targets on CDW. However, there is no official definition of backfilling in Greek legislation.

### 3. Legal Framework – Waste Management Plans and Strategies

In this section the legal framework governing CDW management in Greece is presented.

#### 3.1. Legislation concerning CDW in Greece

The legislative framework for waste management in Greece is defined by **Law 4042 of 2012**<sup>7</sup> '*Penal protection of the environment - Compliance with Directive 2008/99/EC - Framework for waste generation and management - Compliance with Directive 2008/98/EC - Regulating issues of the Ministry of Environment, Energy and Climate Change*' which transposes the EU Waste Framework Directive (2008/98/EC) into Greek law. All provisions in the WFD related to CDW are valid for Greece and form the legal basis for the management of CDW in the country.

Further legislation, regulations and guidelines concerning CDW in Greece includes:

- **Joint Ministerial Decision 36259/1757/E103 of 2010** stipulating measures, conditions and programmes for the alternative management of excavation, construction and demolition waste (ECDW)<sup>8</sup>. Here, the obligations of all actors involved in the management of CDW is presented with emphasis on increasing the re-use and recovery of CDW following the waste hierarchy.
- **Law 2939 of 2001 for the alternative management of packaging and other products**<sup>9</sup>, as amended by **Law 3854/2010**<sup>10</sup>. This piece of legislation lays down the principles of alternative waste management of the CDW waste stream, among others, and stipulates the organisation systems for the management of CDW. Also, fines and other administrative and legal sanctions are prescribed in the case of non-compliance with the regulation.
- **Law 4030 of 2011**<sup>11</sup> '**New way of issuing building permits, control of construction and other provisions**'. Article 40 describes permit issuing provisions for CDW treatment facilities in inactive quarries and the rules for accepting and managing CDW in these treatment facilities.
- **Law 4067 of 2012**<sup>12</sup> '**New Building Regulation**', where Article 17 stipulates that for the construction of any building and the landscaping of the building surroundings, the provisions of the relevant legislation for alternative management of waste from excavation, construction and demolition waste should be applied.
- **Circular**<sup>13</sup> of the Ministry of Environment, Energy and Climate Change no. 4834 of 25 January 2013 with subject the '**Management of excess excavation materials from Public Works - Clarifications on the requirements of the JMD 36259/1757/E103/2010**', exempting the management of excess materials from excavation activities during public works through the certified systems of alternative CDW management, as long as the excess material is handled in sound environmental manner.
- **Commission Decision 2011/753/EU** establishing rules and calculation methods for verifying compliance with the targets set in Article 11(2) of Directive 2008/98/EC of the European Parliament and of the Council<sup>14</sup>.

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<sup>6</sup> <http://ec.europa.eu/eurostat/documents/342366/4953052/Guidance-on-Backfilling.pdf/c18d330c-97f2-4f8c-badd-ba446491b47e>

<sup>7</sup> <http://www.ypeka.gr/LinkClick.aspx?fileticket=7Z1up05Xrto%3d&tabid=777&language=el-GR>

<sup>8</sup> <http://www.ypeka.gr/LinkClick.aspx?fileticket=kzPoL7o5Zn8%3D&tabid=508>

<sup>9</sup> [http://www.elinyae.gr/el/lib\\_file\\_upload/a179\\_2001.1118312315977.pdf](http://www.elinyae.gr/el/lib_file_upload/a179_2001.1118312315977.pdf)

<sup>10</sup> [http://www.elinyae.gr/el/lib\\_file\\_upload/94a\\_10.1277446374921.pdf](http://www.elinyae.gr/el/lib_file_upload/94a_10.1277446374921.pdf)

<sup>11</sup> <http://www.ypeka.gr/LinkClick.aspx?fileticket=WsLJDdwJypw%3d&tabid=506&language=el-GR>

<sup>12</sup> <http://www.ypeka.gr/LinkClick.aspx?fileticket=5nRUKLGIL8E%3D&tabid=506&language=el-GR>

<sup>13</sup> <http://www.anakem.gr/images/banners/EGKIKLIOS.pdf>

<sup>14</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011D0753&from=EN>

- **Law 4280 of 2014<sup>15</sup> ‘Environmental upgrading and private urbanization - Sustainable development of settlements. Forest law regulations and other provisions’**, Article 52 stipulates the possibility of deposition and processing of CDW in inactive mines and quarries by the certified systems of alternative CDW management.

Currently, there is a landfill tax applicable in all legally operating landfills (there is still a number of operating illegal landfills) in Greece at the level of 40 EUR per tonne (there is no specific landfill for inert waste in Greece, rather the landfills accept all types of waste, except hazardous waste and specific types of waste that fall under special management systems, e.g. End of Life Vehicles). The landfill tax will increase progressively the following years with a vision of reaching 60 EUR per tonne by 2020. The current gate fee in landfills lies within the range of 10 - 48.5 EUR per tonne of incoming waste<sup>16</sup>.

### 3.2. Waste management plans (WMP) and Strategies

The new Greek Waste Management Plan has been in the making over the last three years and although several final deliverables on the preparation of the WMP have been adopted by the Ministry of Environment, including a final draft version of the WMP, the final approved version of an official WMP plan is missing<sup>17</sup>.

In the new WMP all waste streams are analysed and specific measures are proposed for the environmentally sound management of each waste stream following the principles of waste prevention and the efficient use of waste, according to the waste hierarchy as presented in the Waste Framework Directive (2008/98/EC) and the National legislation for waste (Law 4042/2012).

There are dedicated chapters for CDW and the management of asbestos waste which is an important hazardous waste stream in Greece<sup>17</sup>.

Apart from the National Waste Management Plan, the administrative regions of Greece have adopted their own regional Waste Management Plans. However, the current regional WMPs do not cover specifically the CDW stream and on top of that they are rather outdated and fail to meet the requirements of Directive 2008/98/EC. There is a need for the regional WMPs to be updated taking into account the provisions found in the substantial new body of legislation (adopted after 2010, including the transposition of the WFD in national law) and the national planning of waste management as presented in the new National WMP<sup>18</sup>.

There is a new Waste Prevention Plan<sup>19</sup> in Greece since 31 December 2014, which identifies food waste, paper waste, packaging waste and Waste Electrical and Electronic Equipment (WEEE) as priority waste streams for waste prevention. Specific measures are presented for these four waste streams. There is also a section for CDW where a few measures for waste prevention are presented as well. Waste prevention measures for CDW are mostly limited to promoting information and education about waste prevention and engaging business, while there are no binding prevention targets attached to this waste stream.

Since both the WMP and the WPP are very recent, there are no specific policies and/or measures applied as a result of the national planning requirements deriving from these documents. The extent of planning and short term introduction of relevant initiatives as a response to the WMP and WPP is not possible to assess at the moment.

### 3.3. Legal framework for sustainable management of CDW

This section aims at identifying specific legislation that would create good conditions for a sustainable management of CDW.

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<sup>15</sup> <http://www.eoan.gr/uploads/files/306/d85bb787b52bc9bd36ecc642566fa592a4070fe5.pdf>

<sup>16</sup> [http://www.cewep.eu/media/www.cewep.eu/org/med\\_557/1406\\_2015-02-03\\_cewep\\_-\\_landfill\\_inctaxesbans.pdf](http://www.cewep.eu/media/www.cewep.eu/org/med_557/1406_2015-02-03_cewep_-_landfill_inctaxesbans.pdf)

<sup>17</sup> <http://www.ypeka.gr/Default.aspx?tabid=238&language=el-GR>

<sup>18</sup> [http://ec.europa.eu/environment/waste/framework/pdf/GR%20factsheet\\_FINAL.pdf](http://ec.europa.eu/environment/waste/framework/pdf/GR%20factsheet_FINAL.pdf)

<sup>19</sup> <http://www.ypeka.gr/LinkClick.aspx?fileticket=2Y2%2b%2bPSM4P0%3d&tabid=238&language=el-GR>

Description	Level of occurrence (Yes/No) Key Scope/Exemptions	Year established and policy reference	Further detail, information source, related web-site
<i>National/regional obligation for selective demolition</i>	YES – National	2010  JMD 36259/1757/E103/2010	
<i>National/regional sorting obligation (on-site or in sorting facility)</i>	YES – National	2010  JMD 36259/1757/E103/2010	
<i>National/regional separate collection obligation for different materials (iron and steel, plastic, glass, etc.)</i>	NO		
<i>Obligation for separate collection and management of hazardous waste from C&amp;D operations - Please specify</i>	YES – National  In case of hazardous CDW, there is an obligation for separate collection and transport, in order to avoid mixing with non-hazardous CDW, temporary storage and disposal, in accordance with the relevant provisions of the applicable legislation on the management of hazardous waste (JMD 13588/725/2006)  If CDW is already mixed with hazardous materials from construction or demolition activities, it is classified as hazardous waste and treated in accordance with the relevant provisions of the applicable legislation on the management of hazardous waste (JMD 13588/725/2006)	2010  JMD 36259/1757/E103/2010	
<i>Related Green public procurement requirements</i>	NO		
<i>Obligation for establishment of systems for the alternative (= meaning re-use, recycling, recovery) management of CDW, by the construction/demolition project contractors</i>	YES – National	2010  JMD 36259/1757/E103/2010	

Description	Level of occurrence (Yes/No) Key Scope/Exemptions	Year established and policy reference	Further detail, information source, related web-site
<i>Obligation to submit detailed Information on the Management of Waste, resulting from the construction/demolition activities, by the project contractors</i>	YES – National	2010  JMD 36259/1757/E103/2010	
<i>Obligation to reduce the use of hazardous materials in construction, by the project contractors in collaboration with construction materials providers</i>	YES – National	2010  JMD 36259/1757/E103/2010	
<i>Obligation to increase the use of recycled materials in construction, by the project contractors in collaboration with construction materials providers</i>	YES – National	2010  JMD 36259/1757/E103/2010	
<i>Obligation of collection of CDW only by the certified systems of alternative CDW management</i>	YES – National  Exception of excess excavation materials in Public Works (Circular no.4834/25.1.2013)	2010  JMD 36259/1757/E103/2010	
<i>Obligation for the re-use, or return back to the provider of construction materials not used in the construction project</i>	YES – National	2010  JMD 36259/1757/E103/2010	

### 3.4. Targets

Targets for the recovery of CDW in Greece is found in JMD 36259/1757/E103/2010. The quantitative targets for the recovery of waste from excavation, construction and demolition activities, excluding codes 17 05 04 and 17 05 06 of the European Waste Catalogue, according to Decision 2001/118/EC are:

- by January 1st, 2012, reuse, recycling and recovery of CDW should reach at least 30% relative to the total weight of the produced CDW.
- by January 1st, 2015, reuse, recycling and recovery of CDW should reach at least 50% relative to the total weight of the produced CDW.
- by January 1st, 2020, reuse, recycling and recovery of CDW should reach at least 70% relative to the total weight of the produced CDW.

Law 4030/2011 abolishes the exemption of waste code 17 05 06 for the calculation of the above national targets, as it is not included in the target setting for CDW proposed by the Waste Framework Directive (2005/98/EC) in Article 11(2). However, with Commission Decision 2011/753/EU, establishing rules and calculation methods for verifying compliance with the targets set in Article 11(2) of Directive 2008/98/EC, it becomes evident that the waste code 17 05 06 should be excluded from the calculation of the target. Greece is following the rules in 2011/753/EU for the calculation of the target but at the same time retains in place contradicting legislation about including waste code 17 05 06 for the calculation of the target in Article 40(5) of Law 4030/2011.

Taking into account the fact that waste code 17 05 06 is translated wrongly in Greek legislation, there is high risk of unreliable (or at least questionable) data influencing the achievement of the national and WFD targets by 2020.

The 2012 national target was not achieved and there is doubt whether the 2015 national target can be achieved or not. There is lack of reliable data on CDW generation and treatment and therefore it is not possible to monitor the performance of CDW management in Greece. With the establishment of the Systems of Alternative Management for CDW, it is expected that the flow of reliable and traceable data will be improved and better statistics will enable the monitoring of CDW recovery performance towards the national and WFD targets.

There are no specific targets concerning the re-use, recycling or recovery of specific material waste streams that are used in construction.

Backfilling is used in Greece in different applications, mostly for rehabilitation of spent mines and quarries or landscaping as well as for landfill cover. However, the use of CDW for backfilling was not properly recorded in statistics and as a result it is unknown what quantities of generated CDW has been used for backfilling in the past. Pursuant to the current legislation, all generated CDW should be diverted to certified CDW management systems and the amounts of CDW used for backfilling will be appropriately reported. According to first data from CDW management Systems<sup>20</sup>, it is reported that quantities of recycled CDW that is cannot be marketed (due to low demand – undeveloped market for recycled CDW) is diverted to backfilling.

#### 4. Non legislative instruments

In this section, any other instruments that may specify how the country is addressing the question of CDW management maybe highlighted as these instruments might be creating conditions for a sustainable management of CDW.

Description	Level of occurrence (Yes/No) Key Scope/Exemptions	Year established and policy reference	Further detail, information source, related web-site
<i>Sustainability standards that cover CDW (e.g. BREEAM)</i>	BREEAM: YES New construction – Buildings	2012	<a href="http://www.greenbooklive.com/search/buildingmapgoogle.jsp">http://www.greenbooklive.com/search/buildingmapgoogle.jsp</a> 2 buildings certified
	LEED: YES New construction – Buildings	2013	<a href="http://www.usgbc.org/projects?keys=greece">http://www.usgbc.org/projects?keys=greece</a> 5 buildings certified and 10 under the process of certification
<i>Extended producer responsibility scheme</i>	NO		

<sup>20</sup> Communication with AANEL and SANKE CDW management systems

Description	Occurrence (Yes/No) Mandatory (Yes/No) Scope & exemptions	Year established	National or regional (specify if regional)	Details of Public sector and Industry enforcement/ involvement/ collaboration	Levels of performance e.g. tonnes recycled,% coverage	Further information/ web-site
Requirement for pre-demolition audits	NO					
Standards for recycled CDW	YES – Not mandatory, but required in order for CDW to be marketed	2002 - 2004	National	Voluntary, reliant on market conditions.  Standards developed by the Greek Body for Standardisation (ELOT)	n.a.	These standards refer to products and not waste. BUT in order for CDW to return to the market, need to fulfil these standards
Selective demolition/ plan for large demolition sites/demolition standard	NO					<i>Are these obligations enforced in practice?</i>
Letter of guarantee amounting to 0.2% of the total project budget for excavation and construction works and 0.5% of the total project budget for demolition	YES	2010	National	Required by the Building and urban planning authorities in order to make sure that the management of CDW will comply with existing legislation	n.a.	EOAN

The main type of hazardous CDW generated in Greece is asbestos waste. There is no data or available information for the generation and management of any other type of hazardous waste deriving from construction and demolition activities. The management of asbestos-containing CDW is considered in the new national WMP<sup>21</sup> as the most significant hazardous waste stream and a detailed description of measures for its management is presented. Specifically, the asbestos-containing CDW management includes the following:

- Enterprises that perform asbestos removal works must hold a specific licence for enterprises engaging in asbestos demolition and removal activities (EAK), they are obliged to employ qualified personnel for the operations of removal, to implement a regular training of technical staff and possess adequate facilities and equipment. They must also keep a register of employees.

<sup>21</sup> <http://www.ypeka.gr/Default.aspx?tabid=238&language=el-GR>

- During asbestos removal works there should be specific measures taken in order to prevent leakage of asbestos fibres into the air. The staff must necessarily wear appropriate protective equipment.
- The collected waste must be packed and placed in containers in order to be transferred to interim storage or final disposal in landfills for hazardous waste.

Currently, the asbestos-containing CDW collected in Greece through certified operators is exported for final disposal (D1 or D5) in Germany.

## 5. CDW management performance – CDW data

Data on the generation and treatment of CDW in Greece is collected by the Greek Statistical Office (ELSTAT) through surveys and complemented with estimations in order to fill data gaps and/or low quality data. However, official data do not represent the actual situation in Greece since until recently, according to the new WMP, there was a significant lack of data on recorded quantities of CDW due to the absence of reporting obligation from CDW generators and from treatment operations. Therefore data collected through surveys was only partial and voluntary in nature.

Since the establishment of CDW management systems started in 2011, it is expected that the quality of reported data will improve significantly in the following years. However, the CDW management systems which have been certified by the responsible authorities and have already started operations do not cover the entire Greek territory and still approximately 40% of CDW generated and treated will remain unreported in the short term future. ELSTAT will carry on performing estimations of CDW data in the short term, until adequate number of CDW management systems is established, capable of covering the entire Greek territory.

Data are reported by the Greek Statistics Office every two years in response to the Waste Statistics Regulation (2150/2002/EC). However, data estimations are also available for uneven years (e.g. 2011), as presented in the baseline situation of the new WMP. The methodology used for even and uneven years is the same and follows the Eurostat methodology on waste statistics.

The focus of CDW statistics is on the construction sector (code F in NACE Rev.2) and other sectors whose waste generation and treatment operations are closely monitored, such as the manufacturing and electricity and gas sectors (codes C and E in NACE Rev.2 classification). Renovation waste from households is very unlikely to be taken into account, since the destination of this waste is largely unknown and most of the times is taken up by municipalities and disposed together with municipal solid waste. Moreover, it is not possible to distinguish between wastes coming from construction, demolition or renovation activities.

The only official source of CDW data, which maintains a consistent time series, is the Greek Statistics Office (ELSTAT). ELSTAT is reporting to Eurostat and therefore the data in Eurostat database are the same (pursuant to Waste Statistics Regulation 2150/2002/EC) as the data found in ELSTAT's database, although the latter is not updated. Data for 2012 does not appear on ELSTAT database, however has been displayed in detail in Eurostat tables.

### 5.1. CDW generation data

Data on CDW generation are presented in Table 1. The data provided by the official Statistics Office of Greece (ELSTAT) is the same as presented in Eurostat's Waste database. Data on CDW generation in the official statistics exist only for even years, but in the new WMP estimated data from ELSTAT have been provided also for 2011, thus creating a consistent time series for the period 2010-2012.

**Table 1: CDW generation in Greece<sup>222324</sup>**

CDW generation (tonnes)	2010	2011	2012
<b>Total</b>	<b>2 086 985</b>	<b>1 310 000</b>	<b>815 347</b>

<sup>22</sup> ELSTAT, Environment Statistics, at [http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p\\_param=A1501](http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p_param=A1501)

<sup>23</sup> WMP, <http://www.ypeka.gr/Default.aspx?tabid=238&language=el-GR>

<sup>24</sup> Eurostat Waste database: Generation of waste (env\_wasgen)

Non-hazardous	2 085 300	1 309 402	815 325
Hazardous	1 685	598	22

However, estimations about the actual quantities of CDW generation in Greece vary from two to ten times higher than that of the officially reported statistics<sup>25,26</sup>. This may lie in the fact that the official statistics on CDW waste do not include soils and stones or other natural occurring materials, whereas CDW management systems in Greece tend to adopt the scope of the whole category 17 of the European List of Waste.

Higher amounts of CDW are generated in the highly urbanised areas of Attica and Central Macedonia, where over 50% of the Greek population resides, representing around 47% of the total CDW generated in Greece in 2011<sup>27</sup>. Due to economic constraints and the slowing down of construction activities in Greece, the generation of CDW has decreased drastically over the last years. On the other hand, the generation of CDW at the island regions of Greece is rapidly increasing, as the tourism industry has experienced a significant boost over the last years. Increased construction of tourist accommodation has spurred CDW generation as well, while the proper CDW management on the islands is an acute problem due to the limited space.

## 5.2. CDW treatment data

The latest available data on CDW treatment presented in Table 2 refer to the year 2012. Since CDW treatment data is not published yet by the Greek Statistics Office (ELSTAT), Eurostat data is used to present the treatment situation in Greece for 2012, as it has been verified that national data is identical to the data presented in Eurostat's Waste database. Data on CDW treatment in the official statistics exist only for even years.

**Table 2: CDW treatment in 2012<sup>28</sup>**

CDW treatment (tonnes)	Landfill/Disposal (D1-D7, D12)	Energy recovery (R1)	Backfilling	Recovery other than energy recovery - Except backfilling
<b>Total</b>	601 668	0	133	2 567
Non-hazardous	601 668	0	133	2 567
Hazardous	1	0	0	not available

Comparing Table 2 to Table 1, the quantity of CDW reported under the different treatment options in total is lower than the quantity of CDW generated. There is a significant amount of CDW missing, which means that the remaining CDW was not treated or the final treatment destination was unknown. However, the missing amount could also be attributed to misreporting. For example, in the CDW treatment figures the amount of hazardous waste exported for landfilling (asbestos waste) is not included.

Year 2012 was the first year of operation of the first three CDW management systems in Greece and the amount of 2 567 tonnes of recovered CDW is attributed to the operations of the systems. Prior to 2012, there was no reported data for recovery of CDW. Backfilling was used mainly for landscape rehabilitation within construction projects, excavated materials re-used on site. However, in general practice CDW treatment on site is not reported as CDW management but it is integral part of the construction project activities. Storage of CDW for recovery at a later point in time is not performed in Greece. Some sources<sup>25</sup> indicate that the re-use and recycling rate of CDW in Greece was about 5% in 2011, although solid data is lacking in order to support this allegation.

With more CDW management systems starting their operations in the last three years, comprehensive data on the recovery of CDW are going to be reported systematically in the following years. CDW management systems are obliged to yearly reporting of the CDW treated amounts and to keep full traceability of CDW

<sup>25</sup> Galetakis M., 'Re-use of ECDW'. Technical University of Crete. (source title: Επαναχρησιμοποίηση Αποβλήτων Εκσκαφών, Κατασκευών και Κατεδαφίσεων)

<sup>26</sup> Communication with AANEL and SANKE CDW management systems

<sup>27</sup> WMP, <http://www.ypeka.gr/Default.aspx?tabid=238&language=el-GR>

<sup>28</sup> Eurostat Waste database: Treatment of waste (env\_wastrt)

within their operations. The CDW management systems are obliged to maintain detailed data on the receiving quantities of CDW including the source of the waste, distinguishing between new construction, renovation and demolition.

Some first results from CDW management systems show an increasing trend in the recovery of CDW. ANAKEM CDW management system recycled 39 thousand tonnes of CDW (data until the beginning of 2014). AANEL CDW management system treated 4.5 thousand tonnes of CDW in 2014, while SANKE CDW management system at the same period treated 15 thousand tonnes.

By combining the latest data received from the CDW management systems (paragraph above) and the estimated generation of CDW in the projection provided in the new WMP (section 5.5), the recycling rate of CDW in Greece falls somewhere between 12% - 15%. However, these rates are only estimations and not based on official data.

### 5.3. CDW exports/imports data

There is no data available concerning the exports and imports of CDW. However, data on notified shipments of hazardous waste under the Basel Convention exist. CDW hazardous waste data refer to asbestos-containing CDW. Data exist for the period 2008-2011, presented in Table 3. The destination of the exported construction and demolition asbestos waste was Germany for the purpose of final disposal (landfilling) in designated hazardous waste landfills.

**Table 3: Exports of hazardous CDW (asbestos)<sup>29</sup>**

Hazardous Waste (tonnes)	2008	2009	2010	2011
Asbestos CDW (LoW codes: 17 06 01*, 17 06 05*)	285.3	5 494.5	1 685.1	597.6

### 5.4. CDW treatment facilities data

Landfills for inert CDW do not exist in Greece. There are mostly general purpose landfills, receiving all kinds of waste except hazardous waste. Latest data available from Eurostat<sup>30</sup> indicate 176 active landfill sites in Greece and 2 landfills for hazardous waste. As of 2013, there are still 73 sites of uncontrolled dumping<sup>31</sup> failing to fulfil compliance with EU legislation. There is no comprehensive data on the total capacities of available landfills in Greece.

According to national waste planning, it is suggested that at least one landfill for inert waste should be constructed in each of the Greek administrative regions, with specific preference in the island regions to integrate separate modules for inert waste in existing landfill sites instead of designating a new site<sup>32</sup>. This translates to the development of at least 13 new landfill sites for inert CDW across the Greek territory.

CDW has been used for the covering and rehabilitation of existing landfills as well as dumping sites forced to close down by EU court decision C-502/03. The amounts of CDW used for that purpose are not reported as being recovered or backfilled and therefore not included in the official statistics.

The existing CDW treatment facilities in Greece treat mainly the mineral fraction of CDW, while materials such as metals, plastics and glass are sent to recycling facilities that handle each specific material fraction. Wood wastes sometimes are treated in the CDW treatment facilities or alternatively disposed. There are 54 CDW treatment facilities in Greece, all affiliated with the certified CDW management systems pursuant to JMD 36259/1757/E103/2010. Table 4 shows the number of treatment facilities by administrative region.

<sup>29</sup> WMP, <http://www.ypeka.gr/Default.aspx?tabid=238&language=el-GR>

<sup>30</sup> Eurostat Waste database: Number and capacity of recovery and disposal facilities by NUTS 2 regions (env\_wasfac)

<sup>31</sup> WMP, <http://www.ypeka.gr/Default.aspx?tabid=238&language=el-GR>

<sup>32</sup> WMP, <http://www.ypeka.gr/Default.aspx?tabid=238&language=el-GR>

**Table 4: CDW treatment facilities in Greece<sup>33</sup>**

Administrative region	Number of CDW treatment facilities
Attica	18
Central Greece	4
Western Greece	2
Peloponnese	2
Central Macedonia	14
Eastern Macedonia and Thrace	4
Western Macedonia	0
Epirus	0
Ionian Islands	1
North Aegean	0
South Aegean	6
Crete	3
Thessaly	0
<b>Greece (Total)</b>	<b>54</b>

No comprehensive figures on the total treatment capacity for CDW in Greece were available during the course of this study and only partial information could be obtained by only a small share of the existing CDW management systems in Greece. Reportedly, the CDW management system AANEL and its seven affiliated treatment facilities have a nominal treatment capacity of just over 1 million tonnes per year<sup>34</sup> and the ANAKEM system through its 4 affiliated treatment facilities has nearly 1 million tonnes per year<sup>35</sup>. Additional capacity of about 50 000 tonnes per year is found at the CDW recovery facility of SEDPEKAT management system<sup>36</sup>.

Although the installed capacity in Greece is higher than the official data on CDW generation in Greece, in reality the two figures are not comparable and there is a significant undercapacity at the moment for the recovery of CDW in Greece. As mentioned in section 5.1 the reported figures exclude naturally occurring soils and stones as well as dredging spoils and other excavation wastes. However, the CDW management systems in Greece are obliged to treat these types of waste as well (if available and not re-used on site). Moreover, the CDW management systems do not cover the entire territory of Greece and certain amounts of CDW remain out of reach for the treatment facilities, since the transport of such voluminous waste stream for recovery does make economic sense. In addition, there are significant quantities of CDW historically deposited in several dumping sites all over Greece, which gradually will have to be located, collected and treated in the existing CDW recovery facilities. This fact is expected to put additional strain in the already inadequate treatment capacities in CDW recovery facilities.

## 5.5. Future projections of CDW generation and treatment

The new WMP includes the projection of future CDW generation until 2020. For the projections of the annual generation of CDW, data on the current situation was used (reference years 2010 and 2011) together with macroeconomic indicators detailing the performance of the construction sector in Greece. In order to increase the accuracy in the generated amounts of CDW, provisional figures of CDW generation for 2012 and the first semester of 2013 were used as well in the calculations. However, the projection of CDW generation was based on the production of the building construction sector since no concrete data exist on CDW from road works, infrastructure projects and excavations. As a result, naturally occurring materials from

<sup>33</sup> Skordilis A., Alternative management of CDW in Greece (source title: 'Η εναλλακτική διαχείριση των ΑΕΚΚ στην Ελλάδα'), at [http://www.anakem.gr/index.php?option=com\\_content&view=article&id=79&Itemid=418](http://www.anakem.gr/index.php?option=com_content&view=article&id=79&Itemid=418)

<sup>34</sup> AANEL – Affiliated CDW recovery units, at [http://aanel.gr/?page\\_id=132](http://aanel.gr/?page_id=132)

<sup>35</sup> ANAKEM – Activity report 2013, at [http://www.anakem.gr/index.php?option=com\\_content&view=article&id=83&Itemid=427](http://www.anakem.gr/index.php?option=com_content&view=article&id=83&Itemid=427)

<sup>36</sup> <http://www.sedpekat.gr/>

big infrastructure projects and other excavation activities are not taken into account in the projections. Moreover, naturally occurring materials are also excluded from the calculation of the CDW recovery target in the WFD. Table shows the projection of CDW generation until 2020, based on the evolution of the construction production index.

**Table 5: Projection of CDW generation<sup>37</sup>**

Year	Quantity (in thousand tonnes)
2010	2 080
2011	1 310
2012	810
2013	590
2014	520
2015	480
2016	470
2017	490
2018	520
2019	590
2020	690
<i>Change 2010-2020</i>	<i>- 67%</i>

The development of CDW generation reflects the low figures in the construction sector due to the current economic recession. The projection did not include potential waste prevention measures, which are expected to lead to further reduction in the CDW generation quantities. In construction projects, prevention mainly includes limiting the use of materials containing hazardous substances and replacing them with materials with better environmental performance. Also, excess construction materials, not used in the construction project, should be returned (in agreement with suppliers) or be stored for use at a later stage in the same or another project.

The estimations developed above, regarding CDW generation, were based on Gross Value Added (GVA) data and the production index of the construction industry. The estimations are considered as reliable as the data used for calculating future projections. Data on construction sector activities, such as GVA and production of construction are considered robust. However, data on CDW generation of the reference years 2010 and 2011 contains a great deal of estimations so this uncertainty is transmitted to the calculated projections. Overall, the estimations show a satisfactory trend in CDW generation based on econometric parameters and the forecast of economic developments of Greece in the future, taking into account the current political and economic uncertainty.

The projections of the generated CDW indicate also the minimum necessary treatment capacity required for the recovery of CDW in line with the targets in the WFD and the national legislation. As mentioned above, what the projections do not take into account is the huge quantities of naturally occurring materials from public works and excavations, which might render the CDW projections irrelevant for the development of the needed treatment capacity for the future.

Concluding, it is considered important that the data on CDW generation should be improved in order to have better projections for future treatment facilities in Greece.

## 5.6. Methodology for CDW statistics

The methodology used by ELSTAT for gathering data on CDW follows Eurostat guidelines as explained in the manual on waste statistics. No changes in methodology have been made since the previously reported data to Eurostat for the years 2010 and 2012. Since ELSTAT is following closely the methodologies developed by Eurostat, no change in methodology for CDW statistics is expected to take place.

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<sup>37</sup> WMP, <http://www.ypeka.gr/Default.aspx?tabid=238&language=el-GR>

## 6. C&D waste management in practice

In this section the CDW management “on ground” in Greece is presented. Specific CDW initiatives, voluntary agreements and any other management practice if available currently in Greece.

### 6.1. CDW management initiatives

There haven't been any specific initiatives in Greece, outside the regulatory obligations, to address the issue of CDW management and the efficient use of this waste stream. Currently, efforts are being made by the certified CDW management systems to increase awareness among the local and regional administrative authorities as well as the construction sector, and to stress the importance of the resource efficient use of CDW - not as waste but as a valuable resource - under economic, social and environmental perspectives.

### 6.2. Stakeholders' engagement

This subsection is addressed to all contacted parties during the stakeholder consultation of the screening phase in order to incorporate their views, insights and hands-on experience on CDW management initiatives already in place in Greece. Since no interesting initiatives were identified in the case of Greece, section 6.2 contains no information of interest to the study.

### 6.3. Waste legislation enforcement

For monitoring and enforcement of the waste legislation in Greece, the ministry of Environment (Ministry of Reconstruction of Production, Environment and Energy) maintains a special unit of Environmental Inspectors with the mission of conducting inspections and determine whether compliance with the environmental terms in projects and activities of public, semi-public and private sectors across the country is respected<sup>38</sup>. Measures to ensure compliance with existing waste legislation include administrative sanctions as well as financial measures (fines). Furthermore, on top of administrative sanctions, the infringement case files are sent to competent prosecutors for investigation of criminal offenses<sup>39</sup>.

However, the special unit of Environmental Inspectors is understaffed and the current workforce comprising the unit is not sufficient for the effective control of environmental violations throughout the territory of Greece<sup>40</sup>. Compliance with waste legislation is only a part of the duties of the inspectors, as they have to cover and monitor the entire environmental legislation package existing in Greece at the moment.

For the control of the recovery and recycling operations, as described in legislation, the responsible authority is the Hellenic Recycling Agency<sup>41</sup>.

Greece is lagging behind compared to other MS concerning waste management in general<sup>42</sup>. As a result, the management of all waste streams and the CDW stream in particular is not in line with the waste hierarchy, set out in the WFD (2008/98/EC), as most of the generated waste is landfilled or even worse disposed uncontrollably in the environment. Any recovery or recycling operations have only recently started taking place through the establishment and operation of alternative waste management systems for CDW, required by legislation and monitored by the Hellenic Recycling Agency (in Greek: EOAN - Ελληνικός Οργανισμός Ανακύκλωσης). Currently, there is no sufficient treatment facilities to manage the generated quantities of CDW in Greece.

There have been numerous cases of infringement of EU waste legislation over the last two decades and still progress needs to be made in order Greece to be fully compliant with the relevant EU waste regulations. There is a list of cases concerning mostly the widespread existence and systematic use of uncontrolled dumping sites across the Greek territory, with increased presence in the region of Peloponnese and the numerous small islands spread out in the Aegean Sea. There have been a few recent references to the EU

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<sup>38</sup> <http://www.ypeka.gr/Default.aspx?tabid=407&language=el-GR>

<sup>39</sup> <http://www.ypeka.gr/Default.aspx?tabid=396&language=el-GR>

<sup>40</sup> <http://www.econews.gr/2015/03/19/epitheorites-perivallontos-tsironis-121300/>

<sup>41</sup> <http://www.eoan.gr/el/content/3/armodiotites>

<sup>42</sup> [http://ec.europa.eu/environment/waste/studies/pdf/Screening\\_report.pdf](http://ec.europa.eu/environment/waste/studies/pdf/Screening_report.pdf)

court of justice (IP/13/483, P/13/143) concerning landfill violations. Court cases concerning violations of Greece against EU law and non-compliance with certain directives include the following:

- C-600/12 for the continuing use of an oversaturated landfill site in the island of Zakynthos
- C-286/08 for non-compliance to Directive 2006/12/EC especially for the management of hazardous waste
- C-502/03 for failure to take measures to ensure the safe disposal of waste, environmentally sound waste management and the establishment and control of actions need to be taken by the waste holder in order to fulfil the previous two.

This last case foresees the immediate closure and rehabilitation of hundreds of illegal uncontrolled dumping sites all over Greece and includes high daily fines. The process of closing down the illegal dumpsites is a long and slow process which still hasn't been completed to date, despite the fact that the court case decision was taken ten years ago in 6/10/2005<sup>43</sup>.

The practice of illegal dumping of CDW is still used extensively today although it has significantly reduced compared to two years ago when there were no systems of CDW management available in the country. There is no data available on the quantities of illegally dumped CDW and it is very difficult to estimate approximately such quantities, as the illegal dumping might take place in the most unexpected places that are difficult to identify and control (e.g. mountainsides, water courses, etc.). As a result, not only it is very difficult to assess the quantities of CDW dumped in the environment, there is also no possibility of controlling these practices by the competent authorities due to the inaccessible (or secret) location of the dumping sites.

Finally, the shipment of waste is controlled and policed by the special unit of Environmental Inspectors of the Ministry of the Environment. However, the extent of the effective control of the type and content of transboundary shipments of waste is not known.

#### 6.4. Drivers / barriers to increase CDW recycling

Factor / characteristic / element in CDW recycling chain	Drivers	Barriers
<b>Legislative Framework</b>	<ul style="list-style-type: none"> <li>• Existence of a specific legal framework for the management of CDW since 2010</li> <li>• Transposition of the target defined in the WFD for recovery of CDW (article 11)</li> </ul>	<ul style="list-style-type: none"> <li>• Partial or complete lack of implementation of the existing legal framework. Although a comprehensive legal framework exists, it is not applied in practice</li> <li>• Non-proliferation of legislation and the necessary administrative actions in the construction processes</li> <li>• Lack of clarifications of legal definitions and concepts, including waste codes and reporting</li> <li>• Contradicting regulation about excavation waste in public works, which allows excess excavated material to be exempt from treatment through the official systems for CDW recovery. In this way, construction works systematically report the generated CDW as excess excavated material and avoid sending it to the systems and as a result saving the costs of treatment.</li> <li>• Significant delays in amending regulations or normative actions.</li> </ul>

<sup>43</sup> WMP, <http://www.ypeka.gr/Default.aspx?tabid=238&language=el-GR>

<b>Inspection procedures and CDW legislation enforcement</b>		<ul style="list-style-type: none"> <li>• Human resources allocated to waste law enforcement deemed not sufficient</li> <li>• Inefficient public sector and public administration. Ineffective controls. Critical deficiencies in enforcement</li> <li>• No or little corrective action is taken in identified cases of non-compliance with legislation. Sanctions are rarely applied.</li> <li>• No fines are administered in cases of non-compliance concerning CDW management</li> </ul>
<b>Treatment facilities territorial network</b>	<ul style="list-style-type: none"> <li>• Legislation obliges the development of adequate CDW managements systems, covering 100% of Greece and a network of treatment facilities that can manage the total amount of CDW produced in their respective area or responsibility.</li> </ul>	<ul style="list-style-type: none"> <li>• Delay in the application of the legislation concerning the establishment of CDW management systems, currently about 40% of the Greek population is not covered by any system of alternative CDW management.</li> <li>• Currently not sufficient treatment capacity.</li> <li>• Incomplete or absent records on inactive or spent mines and quarries which could serve as location for CDW treatment sites.</li> <li>• NIMBY phenomena.</li> <li>• Existence of illegal sites of uncontrolled disposal of CDW (CDW dumps) hampers the potential of the development of sufficient networks of treatment facilities throughout Greece for increasing recovery and recycling of CDW.</li> <li>• Existence of private land/allotments used for the purpose of dumping CDW by their owner for a price and thus diverting CDW away from CDW management systems</li> </ul>
<b>Key stakeholders involvement</b>	<ul style="list-style-type: none"> <li>• Existence of the Hellenic Recycling Agency (EOAN), monitoring the operation of existing CDW alternative management systems.</li> <li>• Existence of several CDW management systems covering about 60% of the Greek population (as of beginning of 2015)</li> <li>• The responsibility for CDW management is well defined in the legal framework for the different actors involved.</li> <li>• Local community action, taking matters on its hands. Recycling of CDW comprises thriving new business opportunities in small communities</li> <li>• Rising conscience among the public about the need of sound environmental management and sustainability issues in general</li> </ul>	<ul style="list-style-type: none"> <li>• Widespread corruption and loose control over the licencing of CDW management systems, which are not compliant with the minimum requirements for a permit</li> <li>• General mentality of the 'traditional' stakeholders involved in construction activities (contractors, operators, etc.) which consider CDW as not a waste stream that needs to be dealt with since it is mostly inert material and therefore not dangerous for the general public.</li> <li>• Construction sector try to avoid the costs of CDW management.</li> <li>• Distortion in CDW management systems operations where the owner of the system is also the CDW producer. Lack of transparency in the data of CDW generated and treated.</li> <li>• Lack of coordination and synergies between stakeholders</li> <li>• Lack of pro-active initiatives of stakeholders</li> </ul>
<b>Data reporting</b>	<ul style="list-style-type: none"> <li>• The obligation of the officially licenced CDW management systems to report data regarding CDW management (both the receiving quantities and the treated quantities, indicating the final destination of CDW, R-D codes)</li> <li>• Estimation of the type and amount of CDW generated and the expected treatment option as prerequisite for the permitting of a construction project</li> <li>• Eurostat guidelines on CDW data reporting</li> </ul>	<ul style="list-style-type: none"> <li>• Despite legal obligation, not all CDW management systems has provided data on CDW management to date.</li> <li>• Inability to record CDW generation data. Data reporting obligation by the CDW management systems refer only to treated quantities. Some CDW fraction might remain unreported.</li> <li>• Estimation quantities of CDW generated missing accuracy and in the case of re-using of CDW within the same construction project no reporting on this waste is expected.</li> <li>• Lack of control of waste generation for small and medium construction activities, because they are not obliged to register with a CDW management system, which</li> </ul>

		<ul style="list-style-type: none"> <li>can lead to lack of proper treatment and illegal dumping.</li> <li>It is very difficult to assess precisely CDW sources and streams.</li> </ul>
<b>Market conditions</b>	<ul style="list-style-type: none"> <li>Landfill tax is used as a landfill diversion mechanism.</li> </ul>	<ul style="list-style-type: none"> <li>There is no market for recycled CDW. No financial incentives. Raw natural materials are still cheaper and easier to access than recycled.</li> <li>Lack of tax to natural resources that could render recycled CDW cheaper compared to natural products</li> <li>High recovery/recycling costs. High costs of establishment of treatment facilities</li> <li>Final recycled product is not redirected to markets – currently very low demand. It is mostly given for free to the municipalities for low scale public works.</li> </ul>
<b>Construction works contracts</b>	<ul style="list-style-type: none"> <li>Obligation prior to construction permitting for setting up a Waste Management Plan concerning the construction project, by the contractor.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative management of CDW (=re-use/recycling/recovery) provisions consistently missing from the Tendering procedures of public works</li> <li>Lack of a harmonised invoicing system for the alternative management of CDW.</li> </ul>
<b>Recycling process</b>		<ul style="list-style-type: none"> <li>Although obligation for sorting and dismantling at the construction site exists, CDW is usually delivered mixed to the treatment facilities.</li> <li>Low amount of other materials (metals) sent to industry for recycling (smelters). However, not critical load of other materials, low recycling rates.</li> <li>No obligations for recycled materials or recycled content in construction materials. No standards available.</li> <li>No technical specifications for selective demolition.</li> <li>Inexistence of an effective policy for the use of recycled materials.</li> <li>No EoW criteria for inert CDW;</li> <li>Unfavourable economic situation of the country, with significant slowdown in the construction sector for the last years, resulting to low quantities of materials for recycling</li> <li>Lack of promotion for the CDW market.</li> </ul>

## 7. CDW sector characterisation

In this section some specific characteristics of the CDW management sector in Greece are presented.

### 7.1. Sector characteristics

The management of CDW in Greece involves a wide range of actors from the public and private spheres. An outline of the basic actors involved in the CDW management value chain is presented in Figure 1.

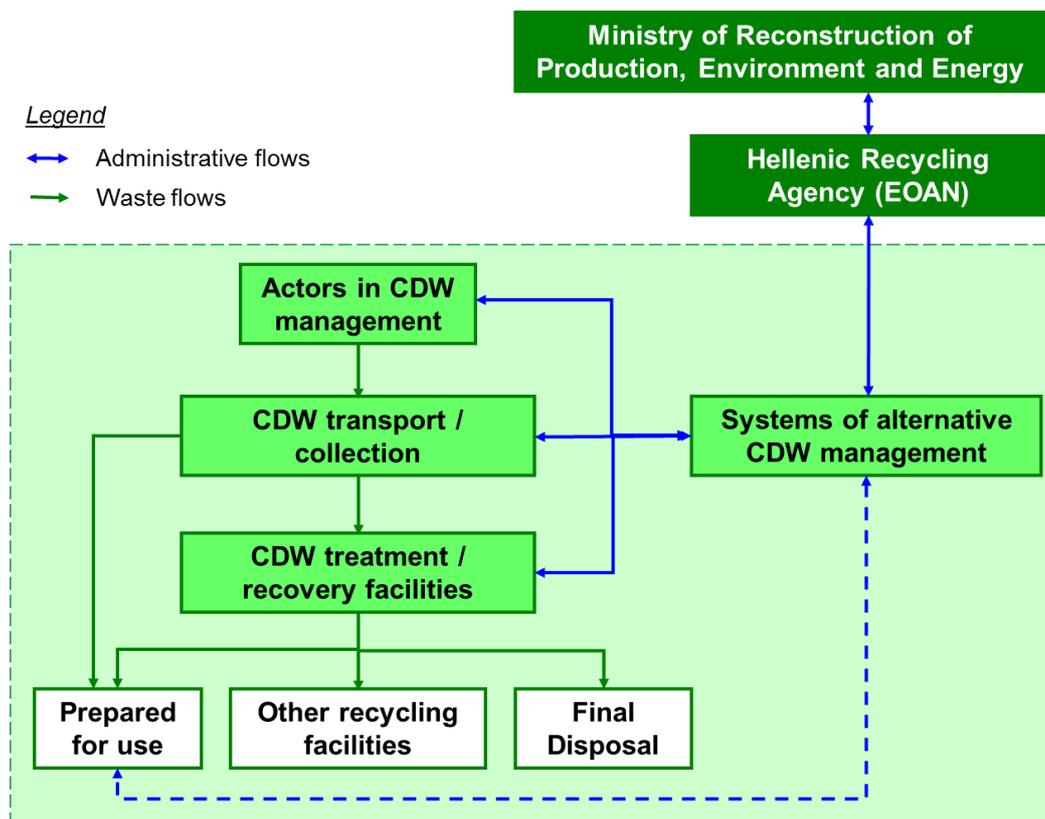


Figure 1: Outline of actors involved in CDW management in Greece<sup>44</sup>

The Ministry of Reconstruction of Production, Environment and Energy is responsible for setting the scope of national policy concerning the management of waste, drawing the draft legal framework for waste management and delivering the National Waste Management Plan. For the implementation of the legislation for the alternative waste management in Greece, the Hellenic Recycling Agency (EOAN) is established (under the control of the Ministry) to oversee all operations regarding the re-use, recycling and recovery of all waste streams. Specifically for CDW, EOAN is licencing and monitoring the ‘Systems of alternative CDW management’. The Systems of alternative CDW are private entities owned by one or more contractors (or the owner of the construction works if not contracted to any other entity) which are obliged by law to create such systems for the alternative management of the waste generated by their operations. The Systems are responsible for organising and supervising the operations of alternative management (collection, transport, recovery) of CDW conducted by public or private legal bodies on behalf of the System and for informing the public administration and CDW holders about their obligations according to law.

The roles of all actors involved in CDW management are well articulated in national legislation. However, it is common that other actors might operate ad-hoc or by-passing the legislation, especially concerning the collection and disposal of CDW in unauthorised dumping sites after removing valuable recyclable materials (e.g. metals, plastics). These operations are not in line with legislation and should be limited by the competent authorities.

The structure of actors and their responsibilities within the system of CDW management is theoretically sufficient to divert significant quantities of CDW from landfills to recovery. However, persistent inadequacies in implementation has not allowed increased recycling over the last few years in Greece to take place. Furthermore, the development of the Systems of alternative CDW management is reportedly very slow and still the entire Greek territory is not covered, in contrast to the fact that in legislation it is clearly stipulated that by 1 January 2014 the entire Greek territory must be covered with at least one System of alternative CDW management<sup>45</sup>. This means that further progress is needed if Greece is to achieve the target of the WFD by 2020.

<sup>44</sup> Adapted from Remoundou A., 2014, ‘Alternative ECDW management in Greece’ (source title: *Η Εναλλακτική Διαχείριση Αποβλήτων Εγκαταστάσεων, Κατασκευών και Κατεδαφίσεων (Α.Ε.Κ.Κ.) στην Ελλάδα*), EOAN, 9.5.2014

<sup>45</sup> <http://www.ypeka.gr/LinkClick.aspx?fileticket=kzPoL7o5Zn8%3D&tabid=508>

There is no data on the total treatment capacity for CDW currently installed in Greece, but partial figures can be found in section 5.4. Taking into account these figures, it is considered certain that further expansion in treatment facilities all over Greece is urgently required in order to manage the generated CDW as well as quantities of CDW deposited in several locations in previous years due to lack of proper disposal and treatment sites.

It is certain that the CDW managements systems will continue to expand (legislation requirement) and new treatment facilities will be established. This will create new employment opportunities and contribute to economic activity at the local conditions. There is no specific data on the prospective employment and economic potential of new CDW treatment facilities.

## 7.2. Exports / imports of CDW

There are no imports or exports of CDW to or from Greece. The only reported amounts of CDW exported are hazardous asbestos-containing CDW. Despite the fact that the recycling/recovery capacity in Greece is not highly developed and cannot accommodate the generated CDW, exports for CDW recovery do not take place. Primarily because there is no economic incentive for that and the destination countries that could use CDW as inputs to recycling/recovery operations are situated far enough so that the transportation would not make sense economically but also environmentally.

## 7.3. CDW as landfill cover

There is no information available about the use of CDW as landfill cover.

## 7.4. Market conditions / costs and benefits

There are no significant financial incentives for CDW recycling while at the same time the uncontrolled dumping of CDW and the breaching of legislation by many actors in the CDW management chain, especially the waste holders and the collection services not affiliated to any CDW management system as laid down in legislation, hampers any efforts towards the direction of increasing CDW recycling.

Since 2014, the landfill tax was introduced in Greece, at the level of 40 EUR per tonne of incoming waste to landfills. However, this tax covers Municipal Solid Waste (MSW), while there is no specific information about special provisions governing the landfilling of inert waste. In case the landfill tax applies to CDW it is a significant deterrent for landfilling due to the fact that this is a voluminous waste stream and its disposal to landfill would cost a lot. Apart from the landfill tax, there are no other taxes or financial instruments targeting the use of natural resources.

The recycling of CDW is perceived as a cost to pay, since alternatives are not well developed in Greece and the market for recycled CDW is not developed. The following financial data (Table 6) concerning the treatment of CDW in facilities affiliated to the official CDW management systems show the situation in Greece and why it is considered uneconomical to recycle.

**Table 6: Financial data on CDW treatment<sup>46</sup>**

Cost of treatment	EUR / tonne
Excavation waste	0.5 – 4.3
Demolition waste, separated at source	2.5 – 10.8
Demolition waste, not separated at source	6.3 – 11.8
Renovation waste	4.4 – 25
Waste from the removal of asphalt	0 – 3.3
Selling prices of recycled CDW materials (mineral)	EUR / tonne
Prices range	0 – 4

<sup>46</sup> Communication with EOAN – Hellenic Recycling Agency

Although it is considered uneconomical at the moment to recycle CDW in Greece, especially due to lack of other financial incentives supporting recycling and/or punishing landfilling and dumping, there is a possibility that resource scarcity issues might become more prominent in the future and ultimately the recycling of CDW would become more favourable. For example, there is a significant construction activity at the moment on the Greek islands due to the expanding tourism infrastructure. Some of the smaller Greek islands are resource poor and significant quantities of construction materials need to be transported long distances to reach the insular construction sites. Therefore, it is considered highly beneficial to re-use and recycle CDW on the islands. CDW recovery facilities are fast expanding on the islands of the southern Aegean<sup>47</sup>.

Similar situations might occur also in other insular regions in Greece or remote areas where access is hindered by the terrain. However, in the latter case there is low possibility for establishment of recycling facilities, but rather the implementation of local re-use and recycling initiatives is considered more likely.

The landfilling capacity in Greece is becoming increasingly saturated and serious problems with waste management are expected in the near future, unless new landfills or treatment facilities are initiated shortly. Under this light of developments, CDW treatment facilities have a crucial role to play in diverting this voluminous waste stream away from landfills and leave enough space for the remaining waste that still goes to landfills. However, special attention needs to be taken as to the proper management of CDW in respect of the regulations and not go back again to practices of illegal dumping.

### **7.5. Recycled materials from CDW**

Currently, there is no market for recycled CDW in Greece. No financial incentives enable the creation of such a market since the prices of raw materials for construction are still cheaper and are easier to access than recycled materials from the treatment of CDW. As there is no market for the recycled materials developed at the moment, the treatment facilities have limited options of selling the recovered materials and therefore most of the times give it for free to the municipalities for low scale public works. Also, there are no obligations for recycled materials or recycled content in construction materials, which renders the recycling product unfavourable for use in new construction activities.

According to CDW treatment operators, the recycled CDW at the output of the recycling process should comply with technical criteria similar to that of the natural products in order to be used for construction activities. There is a plurality of standards concerning aggregates for construction purposes, which the recycled aggregates must fulfil in order to be returned back to the market. The standardisation body in Greece, responsible for setting technical standards, is called ELOT (Greek Organisation for Standardisation). The following standards have been established according to Joint Ministerial Decision 5328/122/2007<sup>48</sup>:

- Aggregates for concrete (ELOT EN12620-2002)
- Aggregates for bituminous mixtures (ELOT EN 13043-2002)
- Aggregates for mortar (ELOT EN 13193-2002)
- Aggregates for road construction (ELOT EN 13242-2002)
- Aggregates for railway ballast (ELOT EN 13450-2002)
- Natural boulders (ELOT EN 13383-1-2002)
- Lightweight Aggregates (ELOT EN 13055-1-2002 and ELOT EN 13055-2-2004)

There are no End of Waste criteria for aggregates established in Greece.

### **7.6. Construction sector make up**

The construction sector make up in Greece is presented in Table 7 for 2012.

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<sup>47</sup> Communication with AANEL CDW management system

<sup>48</sup> [http://www.elot.gr/488\\_ELL\\_HTML.aspx](http://www.elot.gr/488_ELL_HTML.aspx)

**Table 7: Construction sector make up in Greece<sup>49</sup>**

Sector	Production value (million EUR)	Number of enterprises	Number of persons employed
Construction of buildings	4 879.1	21 682	73 579
Specialised construction activities (incl. demolition)	3 166.3	59 620	91 896
Other civil engineering (e.g. roads, etc.)	2 813.1	5 571	31 887
Construction sector <i>TOTAL</i>	10 858.4	86 873	197 363

The construction activity has been declining rapidly in Greece over the last five years due the current economic recession observed in Greece (since 2009). In Table 8, the number, volume, surface and value of new built properties in Greece is presented.

**Table 8: Construction activity in Greece for the period 2010-2014<sup>50</sup>**

	2010	2011	2012	2013	2014
Number of new built properties	23 380	15 114	9 066	5 675	4 620
Surface (m <sup>2</sup> )	7 987 904	4 464 072	2 641 200	1 688 735	1 435 461
Volume (m <sup>3</sup> )	27 823 083	16 411 950	9 577 553	6 494 208	6 004 603
Value (EUR)	348 073 077	202 683 069	128 614 813	81 065 157	73 137 523

The construction activity has declined approximately 500% during the period 2010-2014. This is a significant reduction in construction activity which affects directly the generation of CDW. Low quantities of CDW are expected to arise in the future if the construction sector follows the existing trend, as shown in Table 8.

There is no indication of recovery of the construction sector in the near future, due to the persistence of economic recession, low demand in new housing and the availability of adequate new housing that remains unoccupied.

<sup>49</sup> Eurostat, Annual detailed enterprise statistics for construction (NACE Rev. 2, F) (sbs\_na\_con\_r2)

<sup>50</sup> ELSTAT, Construction activity database: [http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p\\_param=A1302](http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p_param=A1302)

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- E-mail communication with Mr Ioannis Konstantinou, Hellenic Recycling Agency (EOAN), May 2015

## Other consulted stakeholders

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