Construction and Demolition Waste management in

Austria

V2 – September 2015

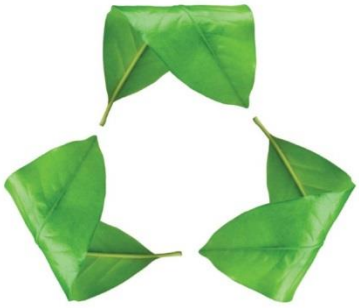

Table of contents

Screening factsheet

1. Summary

National performance of construction and demolition waste (CDW) management

Code (ÖNORM S 2100)	Description	Quantity generated in 2013 (million tons)
31409	Building debris (no construction site waste)	2.4
31410	Road rubble/bitumen and asphalt	0.8
31427	Concrete demolition waste	2.9
31467	Track ballast	0.2
54912	Bitumen, Asphalt	1.6
91206	Construction site waste (no building debris)	0.3
	Other	0.08
Total		**8.3**

In 2013, Austria reported 8.3 Mt of non-hazardous construction and demolition waste in its official statistics, 26% more than in 2010 (6.6 Mt). This significant increase is likely due to the fact that more market actors started reporting their CDW via the EDM (Electronic Data Management System) in the last years. The lion share (35%) was generated by concrete demolition waste, followed by building debris (29%).

Austria has its own national list of waste and strictly separates CDW from soil and stones. According to official statistics, 26.8 Mt of excavated material (soil and stones) were generated in 2013, of which 14.2 Mt (53%) were disposed of in special landfill sites. Austria considers backfilling as a form of recovery only if the following criteria are fulfilled: substitution of other materials for a concrete purpose (structural engineering), ensuring a quality comparable to that of the substituted product by a quality assurance system and limitation of the use to an extent absolutely necessary for reaching the goal of backfilling.

The amount of hazardous excavated materials amounted to 42 kt in 2013. In 2013, 7.2 Mt of CDW were recovered (corresponding to a recovery rate of 87%) and 0.6 Mt were sent to landfill.

Legal Framework

Until recently, different acts and ordinances concerning CDW were in place in Austria. Furthermore, several non-legal guidelines (e.g. the Federal Waste Management Plan, or guidelines for recycled building materials of the Austrian building material recycling association) were taken as a reference by the different market actors.

However, a Recycled Construction Materials Regulation has been under development for several years and was finally published on 29th June 2015. It comes into force on 1st January 2016 and lays down specific requirements that need to be met during the construction or demolition of structures, such as the execution of a pollutant investigation, an organised and recycling-oriented demolition of structures and a duty to separate the waste generated. Furthermore, (quality) requirements for the manufacture and use of recycled construction materials were set.

CDW management in practice

CDW management has been in place for several decades now in Austria and many initiatives exist, both on state and local level. As an example, the city of Vienna established a guideline for CDW reduction including among others recycling oriented demolition.

CDW is generally collected and recovered by smaller or mid-sized companies (10-50 employees) of which 80% are member of the Austrian Association for Recycling of Building Materials (BRV, 74 members). The BRV, in collaboration with the Federal Ministry of Agriculture, Forestry, Environment and Water

Management, has been working on guidelines, such as the guideline for recycled construction material, for several years.

The collection of waste is usually performed directly on the site via containers. This work is most of the time carried out by disposal and demolition operators. Small amounts are also collected at municipal collection points. In order to guarantee an appropriate processing of the waste, separate collection is performed, required by the "Ordinance on the Separation of Waste Generated during Construction" (Federal Law Gazette No 259/1991).

Main obstacles to sustainable CDW management

- **Legal barriers**
  - Legal uncertainties coming from the "soft" regulation within the Federal Waste Management Plan, through directives and the lack of regulations concerning specific waste streams (in particular steelworks slags, old asphalt, grit). These legal issues might be overcome with the new regulation.
- **Heterogeneous quality of recycled materials**
  - Market actors reported a fluctuating environmental and constructional quality of manufactured recycled building materials on the market. This barrier might also be overcome with the new legal framework under development which will require specific standards for recycled building materials.
- **Lack of economic incentives**
  - There is a strong competition coming from low prices of primary raw material, making secondary building materials unattractive.
  - The industry complains about a lack of public initiatives and requirements to increase the demand for recycled construction materials. E.g. there is no fixed quota for recycled materials.
- **End-of-Life status**
  - According to industry representatives, the end-of-life status of recycled materials (waste) is seen as a significant barrier, since products that fulfil strict norms and standards are handled as waste.

Main drivers to sustainable CDW management

- **Advanced practices and a well-established network**
  - Austria is one of the most advanced countries in Europe as far as the management of CDW is concerned. A nation-wide guideline exists for more than 20 years and a detailed waste management plan which covers CDW is published and updated on a regular basis.
- **Legal framework**
  - The new Building Materials Regulation is already in an advanced stage, such that market players already anticipate its enforcement and start to comply with future requirements.
  - One advantage from a legal perspective in Austria is that technical requirements for construction and environment are formulated in one system of rules and that a standardised guideline for recycled materials exists which helps to create a legally binding regulation.
- **Close collaboration between industry and policy makers**
  - The close collaboration between the public and private sector while working on the new regulation is an important driver to sustainable CDW management.
- **Quality norms**
  - Austria has a draft norm for recycled building materials (ÖNORM B 3140) that sets requirements for recycled aggregates. The final publication is planned for 01.01.2016.
- **Enforcement**
  - Since in Austria the customs are in charge to enforce compliance from a financial point of view (taxes) and the contributions are charged by ton, enforcement is considered to work rather well.

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

2.1. Definition of waste

The new Waste Framework Directive (WFD), Council Directive 2008/98/EC has replaced Council Directive 2006/12/EC on waste, Council Directive 91/689/EEC on hazardous waste and the Council Directive on the disposal of waste oils (Council Directive 75/439/EEC). It was required to be incorporated into national law by 12th December 2010. The WFD was implemented by amendment to the Waste Management Act of 2002 (Abfallwirtschaftsgesetz), i.e. the Waste Management Act Amendment of 2010. In Austria, waste is officially defined in § 2 (1) of the Waste Management Act (Abfallwirtschaftsgesetz):

"For the purpose of this Federal Act, waste shall include all movable objects which the holder wishes to dispose of or has disposed of, or where collection, storage, transport and treatment as wastes is required by the public interest"[1]

2.2. Definition of construction and demolition waste (CDW)

The new Recycled Construction Materials Regulation of 29th June 2015 defines construction site waste as "non-hazardous waste arising from construction and demolition and which is no major constituent or in the case of a new building not arising in significant quantities (e.g. insulation materials, plastic pipes, municipal waste, packaging material, blends of various building materials).

Mineral waste from construction
According to Chapter 3.14 of the Federal Waste Management Plan 2011, "waste from construction includes materials that accumulate during construction, conversion and demolition activities. The lion's share originates from the demolition, conversion and reconstruction of building structures. Only some 10% originate directly from the construction of new building structures. Waste from construction originates from structural engineering, geotechnical engineering as well as road and bridge building. In civil engineering, this waste primarily includes concrete, brick and other demolished masonry, making up some 70% to 90% of the overall amount. The remainder consists of wood, metals and various types of construction site waste. Geotechnical engineering produces excavated soil and mixtures consisting of formwork timber and iron reinforcing and concrete debris. In road construction, asphalt and concrete debris as well as excavated soil are usually produced. When building or disassembling tracks, ballast is produced in addition to the above specified waste."

The following table shows the definition of the different waste categories according to ÖNORM S 2100:

[1] http://www.era-gmbh.at/fileadmin/img/downloads/Legal_framework/awg_2002_en.pdf

Table 1: Definition ÖNORM 2100

Designations according to ÖNORM S 2100 (2005)	Composition
Building debris	Bricks, concrete, ceramic, rocks, tiles, mortar, rendering
Road rubble	Demolition asphalt, concrete, base materials
Concrete demolition waste	Construction components or ready-made concrete parts, concrete carriageways, screed
Track ballast	Aggregate from railroad tracks
Bitumen, asphalt	Demolition asphalt
Construction site waste (no building debris)*	Insulation material, gypsum board, rock, plastic pipes, cuttings of various construction materials, composite materials

* in practice, non-mineral waste from construction activities were also subsumed under this type of waste

The figure on the right shows a synthesis of the composition of waste from construction.

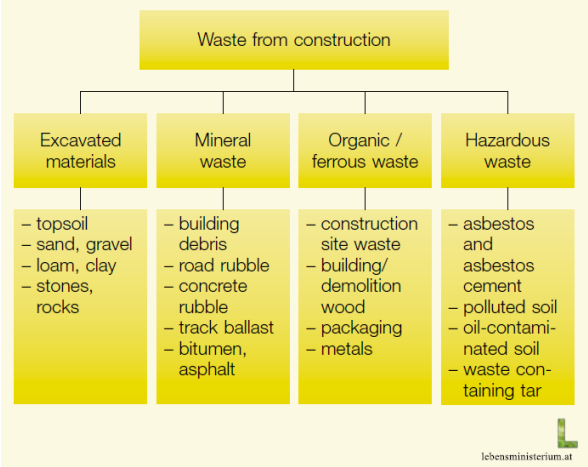

Figure 1: Composition of waste from construction Error! Bookmark not defined.

In the WMP 2011, excavated materials like soil or stones and asbestos are each discussed in their own chapter and traced through separate statistics. While construction and demolition wood is examined in the section “Wood wastes”, hazardous waste from construction is discussed in the Chapter “Hazardous waste”.

Excavated Materials

According to Chapter 3.13 of the Federal WMP 2011, excavated materials accumulate when soil or subsoil is excavated or removed. The following excavated materials are distinguished:

- Excavated material
- Excavated earth
- Excavated soil material
- Dangerously polluted and dangerously contaminated excavated material
- Not dangerously polluted and dangerously contaminated excavated material
- Technical fill material

The detailed descriptions of each category can be found in the WMP.

Austria is not always referring to the LoW, but uses its own national list of waste categories for construction and demolition waste. The LoW is used for example concerning transboundary shipments or for other necessary reasons, to the extent required by European law. In parallel, Austria is working with its own national list of waste, because it considers that it is important to describe waste by its composition rather than only by its origin. The national list of the classification of mineral construction and demolition waste is presented in the following table:

Table 2: Classification of Mineral Construction and Demolition Waste in Austria

Key Number (ÖNORM S 100)	Description
Mineral Construction and Demolition Waste	
31409	Building debris (no construction site waste)
31409 18	Building debris (no construction site waste, solidified or stabilised, only mixtures from chosen construction and demolition measures)
31409 91	Building debris (no construction site waste, solidified or stabilised)
31410	Road rubble/bitumen and asphalt
31410 91	Road rubble (solidified or stabilised)
31427	Concrete demolition waste
31427 17	Concrete demolition waste (only mixtures from chosen construction and demolition measures)
31427 91	Concrete demolition waste (solidified or stabilised)
31467	Track ballast
54912	Bitumen, Asphalt
Other Construction Waste	
91206	Construction site waste (no building debris)

Non-mineral waste from construction activities

The WMP 2011 also defines non-mineral waste from construction activities. Non-mineral wastes from construction activities are mixed wastes from building sites which contain wood, metals, plastics, glass, cardboard, organic residues and bulky wastes with low mineral content. The composition of this waste stream varies depending on:

- the type of construction work, the building structure and the construction method,
- the construction phase,
- the construction volume,
- the regional conditions such as available space on the construction site,
- regional collection system, services and incentives offered by the collectors (esp. collection prices by fraction), information and motivation of the operators.

2.3. End of Waste (EoW) status

According to the Waste Management Act 2002, the end of waste is defined in §5:

§ 5. (1) Unless regulated otherwise in an ordinance as set out in Par. 2 or an ordinance as set out in Art. 6 Par. 2 of the Waste Directive 2008/98/EG, waste materials shall be considered waste until they or the materials recovered from them are used directly as a substitute for raw materials or products made from primary resources. In case of preparing for reuse within the meaning of § 2 para. 5 Z 6 the end of waste is reached with the completion of this recovery operation.

(2) The Federal Minister of Agriculture, Forestry, Environment and Water Management is authorised, in keeping with the objectives and principles of waste management, in keeping with the public interest (§ 1 Par. 3) and with consideration for the standards set out in the Federal Waste Management Plan, to decree by ordinance under which conditions, at which time and for which purpose the classification as waste shall end for certain wastes in deviation from Par. 1. Such an ordinance shall only be decreed, if

- the object is normally used for this specific purpose,
- there is a market for it,
- there are quality criteria that take the waste-specific pollutants into account, especially in the form of technical or legal standards or recognised quality guidelines, and
- the object does not cause any greater environmental pollution or risk than a comparable primary raw material or a comparable product from a primary resource.

Furthermore, Par. 3 in § 5 sets out specific environmental criteria such an ordinance has to comply with and Par. 4 states that any person who wishes the classification as waste of a certain waste to terminate in accordance with an ordinance as set out in Par. 2 shall report this to the Federal Minister of Agriculture, Forestry, Environment and Water Management and include a declaration of compliance with the ban on mixing or blending as set out in § 15 Par. 2.

More details and further paragraphs are available online, an *unofficial* English translation is available here: http://www.era-gmbh.at/fileadmin/img/downloads/Legal_framework/awg_2002_en.pdf

In the Recycled Construction Materials Regulation, the end of waste of CDW is defined in §14:

§ 14. End of Waste

(1) A recycled construction material of quality class U-A ceases to be classed as waste in accordance with Annex 2 on the transfer by its manufacturer to a third party.

(2) A manufacturer of recycled construction material must, before the first transfer under paragraph 1 – if established according to the Register under § 22 of the AWG 2002 – notify the Federal Minister for Agriculture, Forestry, Environment and Water Management that he is a manufacturer of recycled construction material and submit a binding statement in terms of § 5(4) of the AWG 2002 on the observance of the mixture prohibition under § 15(20) of the AWG.

(3) A manufacturer of recycled construction material who transfers recycled construction material in accordance with paragraph 1 must record and notify these transfers in accordance with the regulations of Annex 5.

2.4. Definitions of waste treatment operations

The Waste Management Act 2002 sets several definitions in §2 (accessed 17/04/2015)[2]:

- Re-use is defined as every procedure in which products as well as parts of it, which are no waste, are used again for the same purpose for which they were originally conceived.
- Recycling is defined as any recovery operation by which waste materials are processed into products, things or substances whether for the original purpose or for other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are intended for use as fuels or for backfilling.
- Recovery means any process, of which the main result it is to feed in waste in the plant or in the wider economy in an environmentally sound manner and for a useful purpose
    - by replacing other materials which would otherwise have been used to fulfil a particular function, or
    - in the case of preparation for re-use – through a specific preparation of the waste such that it fulfils this function.

  Recovery includes the preparation for reuse, recycling and any other recovery (e.g. energy recovery, processing of materials, which are intended for use as fuel, or backfilling) including pre-treatment before these measures. Annex 2 Part 1 of the Waste Management Act contains a non-exhaustive list of recovery operations.

The definitions follow the WFD and Eurostat guidelines are followed by the official statistics in Austria. Backfilling is excluded from the definition of recycling and not separately defined in the Waste Management Act of 2002. Official statistics follow the Eurostat guidance on backfilling when reporting on recovery operations.

3. Legal Framework – Waste Management Plans and Strategies

In this section the legal framework governing CDW management in Austria is explored.

3.1. Legislation concerning CDW in Austria

Until recently no unique regulation existed in Austria and different acts and ordinances concerning CDW were in place:

- Waste Management Act 2002 (AWG),
- Remediation of Contaminated Sites (Altlastensanierungsgesetz (ALSAG)),
- Austrian Ordinance for Tracking Waste (Abfallnachweisverordnung)
- List of waste ordinance (Abfallverzeichnisverordnung)
- Separation of Construction Waste Ordinance (Baurestmassentrennungsverordnung)[3]
- Landfill Ordinance (Deponieverordnung)
- Hazardous Waste Ordinance (Festsetzung von gefährlichen Abfällen und Problemstoffen)
- End-of-Waste Act is under development and is expected in 2016

Furthermore non-legal guidelines (e.g. the Federal Waste Management Plan, or guidelines for recycled building materials of the Austrian building material recycling association) have often been followed or taken as a reference.

[2] Non-official translation.
[3] The Separation of Construction Waste Ordinance expires once the Recycled Construction Materials Ordinance applies (1.1.2016).

In June 2015 the new Recycled Construction Materials Regulation of the Federal Minister for Agriculture, Forestry, Environment and Water Management was published and will come into force on 1st January 2016. It covers among others the obligations during construction and demolition activities, the separation and processing of waste arising from said activities and the production and classification as non-waste of recycled construction materials.

It lays down specific requirements that need to be met during the construction or demolition of structures, such as the execution of a pollutant investigation, an organised and recycling-oriented demolition of structures and a duty to separate the waste generated. Furthermore, (quality) requirements for the manufacture and use of recycled construction materials are formulated.

Its purpose is also to promote the preparation for re-use and recycling of construction and demolition waste in accordance with specific requirements, while ensuring a high quality of the recycled construction materials to meet obligations under the Waste Framework Directive. It is linked to a new Austrian standard on the use of recycled aggregates (ÖNORM B 3140 "Recycled aggregates for the construction industry"[4]) – covering a wider range of end uses than EN 12620, which is limited to concrete.

3.2. Waste management plans (WMP) and Strategies

The Federal Minister of Agriculture, Forestry, Environment and Water Management is required to draft a Federal Waste Management Plan (FWMP) at least once every six years and to publish it on the Internet, in order to implement the objectives and principles of the Waste Management Act of 2002 (AWG 2002).

The FWMP serves to support achievement of the objectives and principles of the Waste Management Act of 2002. In 2011, Austria released its latest Federal Waste Management Plan[5], which is also available in English language. The next one is to be published is expected in 2017. The CDW stream is elaborated throughout different Chapters (e.g. 3.14, 4.7, 5.4.1, 6.4.4.1, 7.11, etc.).

The Waste Prevention Programme of Austria is included in part 6 of the Waste Management Plan (WMP).

As can be seen from the graph below, one important part of the waste prevention and recovery strategy is the prevention and recovery of construction and demolition waste. Chapter 6.4.4.1 gives more detailed information on set of measures for the prevention of construction and demolition waste. Three packages of measures are defined:

- building pass
- low-waste construction and extension of the useful life of buildings
- selective dismantling/urban mining/re-use of building parts

[4] When drafting the country factsheet this norm was still in a draft phase, publication is planned for 01/01/2016.
[5] http://www.bundesabfallwirtschaftsplan.at/

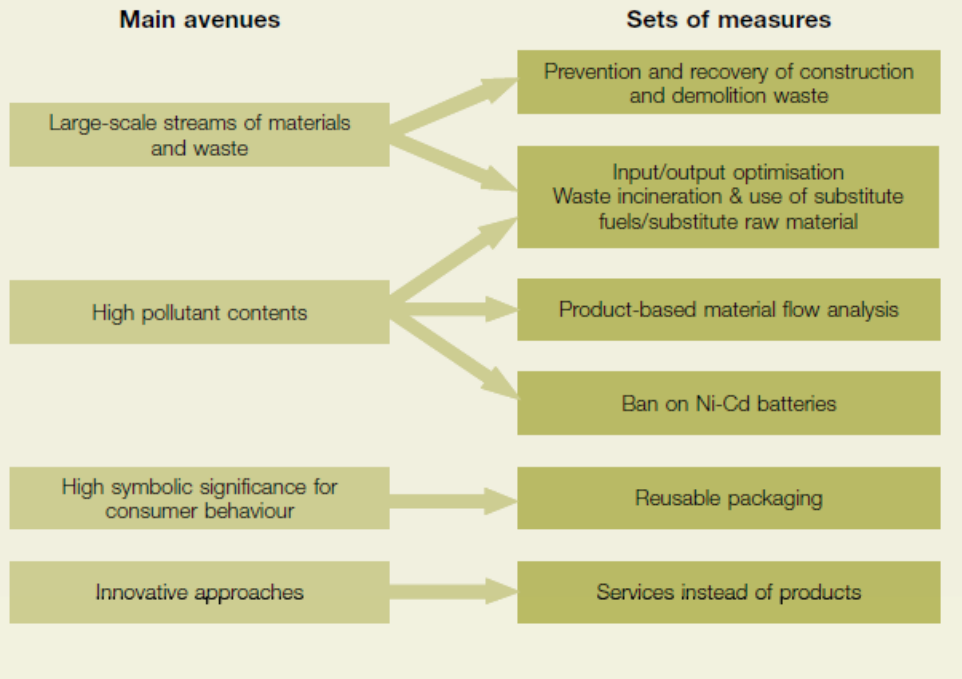

Figure 2: Waste prevention and recovery strategy in Austria

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.

Table 3: Selection of legal frameworks for 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
National/regional obligation for selective demolition?	Yes. Dismantling is part of the new Recycled Construction Materials Regulation. E.g., in this regulation the ÖNORM B3151 which is defined by the Austrian Standards Institute (recovery-oriented dismantling) is made mandatory. Further details are available in the box below.	June 2015 coming into force in January 2016	See box below
National/regional sorting obligation (on-site or in sorting facility)?	So far, the Ordinance on the Separation of Materials Generated during Construction (Federal Law Gazette No 259/1991) (Baurest-massentrennungsverordnung) requires that groups of materials (mineral building debris, excavated soil, waste fragments, broken asphalt, waste wood, metal and plastic, as well as construction site waste) must be separated once they exceed certain threshold levels. Once the Recycled Construction Materials Ordinance applies on 1st January 2016 the Separation of Construction Waste Ordinance will expire. Further details with respect to obligations for sorting and separation in the Recycled Construction Materials Ordinance are available in the box below.	Enacted in 1993, expires in 2016	www.brv.at/service/pg16
National/regional separate collection obligation for different materials (iron and steel, plastic, glass, etc.)?			
Obligation for separate collection and management of hazardous waste from C&D operations? Please specify			
Public Procurement	Recovery is part of the requirements set for demolition of buildings. It is required that demolition is performed according to the state of technology and that demolition follows specific guidelines and norms.	2012	http://www.bmwfw.gv.at/Tourismus/HistorischeBauten/Seiten/Hochbau.aspx

While the Recycled Construction Materials Regulation comes into force only in 2016, many aspects can already be observed in practice, since the guidelines have been defined in different parts of the FWMP and tested with the industry. As an example, the plan explicitly states that “the separate collection of different fractions on construction sites is generally important in order to ensure material recovery of the fractions. (…). For this reason, the most extensive separate collection possible on site is to be sought (cf. the obligations under the Ordinance on Construction and Demolition Waste and in Chapter 7.14. Construction and demolition waste)”.

The same holds for sorting obligations. As far as hazardous waste is concerned the FWMP defines the following guidelines: “Hazardous waste, such as batteries, paint and lacquer wastes, waste oils, fluorescent tubes, waste electrical and electronic equipment, waste asbestos, asbestos cement waste as well as mineral fractions generally need to be collected separately, directly at the construction site itself. Additionally, and irrespective of the size of the construction project, the following fractions should be separated directly on site, as a matter of priority, or, at any rate, subsequently sorted and separated:

- paper packaging and cardboard
- plastic packaging and films
- polystyrene
- metal packaging
- other waste metals
- untreated wood (e.g. boxes and pallets)
- plastic windows (if quantities are substantial)

- pipes (if quantities are substantial)
- Sorted fraction of other high-calorific fractions (contaminated plastic waste, not individually collected plastic waste other than packaging waste, contaminated paper and cardboard packaging, organic insulation materials, treated woods, organic composite building materials)".

The following box shows an extract from the Recycled Construction Materials Ordinance for dismantling (selective demolition) and the obligation to separate directly at the site[6]. The Regulation comes into force in January 2016.

§ 5. Dismantling

(1) The demolition of a structure must be undertaken as dismantling in accordance with ÖNORM B 3151. It is to ensure that components which can be fed to a preparation for re-use and which are in demand from third parties can be developed and transferred in such a way that the subsequent re-use is not hindered or made impossible. Pollutants, in particular hazardous waste (e.g. asbestos cement, waste containing asbestos, tar, PCBs, or phenol, or (H)CFC insulation or construction parts) and impurities (e.g. gypsum-containing wastes), which complicate recycling, have to be removed. The development of reusable components and the removal of contaminants and impurities must take place before any dismantling by machines.

(2) The removed waste containing pollutants and contaminants must be separated from each other on the site and given proper treatment.

(3) The documentation of the dismantling must be according to ÖNORM B 3151 when more than 100 tonnes of construction and demolition waste arise from a demolition (excluding excavated materials). The building owner and the contractor are responsible for the correct conduct and documentation of the dismantling. The compliance to the obligations shall be verified by the obligated party.

(4) The building owner and the contractor are responsible for ensuring that the documentation of the dismantling is available at the construction site before the state and during demolition of a structure and that it is presented to the authority on request. In the case where mineral or wood waste is transferred, the developer and every further transferee must pass on a copy of the documentation of the dismantling when the first transfer of waste to a third party is made.

(5) The building owner must keep the documentation of the dismantling at least seven years after conclusion of the demolition of a structure and to provide it to the authority on request.

§ 6. Obligation to separate

(1) The main components determined for the dismantling must be separated at the site during the demolition of a structure. If separation at the site where the waste occurs is technically impossible or associated with disproportionate costs, it must be made at a treatment plant approved for this purpose.

(2) The separation obligation under paragraph 1 does not apply to those main components whose joint processing is permissible and necessary for the manufacture of a particular recycled construction material.

(3) Hazardous waste must be separated from non-hazardous waste and construction site waste from other waste at the site of construction and demolition work.

(4) In the case of new construction with a total capacity exceeding 3 500 m³, other than line construction works or hard surfaces, at least the material groups wood waste, metal waste, mineral waste, construction site waste and any other waste (e.g. plastic waste, biogenic waste) must be separated at the site. If separation at the site where the waste occurs is technically impossible or associated with disproportionate costs, it must be made at a treatment plant approved for this purpose.

(5) The building owner and the contractor are responsible for the separation of the waste. The building owner is further responsible for the preparation of the areas required for this.

[6] Own translation, since no official English translation of the document was available during the drafting phase of the country factsheet.

3.4. Targets

Concerning national targets with respect to re-use, recycling and recovery of CDW, Austria refers to the WFD target. Austria does not include excavated soils in the CDW stream, but treats it in separate statistics. Uncontaminated excavated soil material, building debris and concrete demolition waste may be used for land restoration or different backfilling activities.

4. Non legislative instruments

In this section, any other instruments (guidance and tools) that may specify how the country is addressing the question of sustainable CDW management are highlighted. The following table shows some of the major guidance publications and tools for CDW management in Austria:

Table 4: Non-legislative Instruments for CDW management

Description of guidance/ tool	Scope	Year	National or regional	Public sector and/or Industry lead organisation	Levels of use	Further information/ web-site
Federal Waste Management Plan (FWMP)	The FWMP serves to support achievement of the objectives and principles of the Waste Management Act of 2002.	2011	National	Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW).	High	www.bmlfuw.gv.at
Guideline for Recycled Construction Material (Version 8)	This guideline regulates the production of quality proven recycled construction materials made from demolition waste for standardized applications. Setting grade and quality standards it also determines the kind and the extent of assessments which have to be carried out on recycled construction materials. A new version of the guideline (version 9) is expected in 2015.	2009	National	Austrian Construction Materials Recycling Association	High	www.brv.at
Guideline for Mobile Processing of Demolition Waste	Leaflet "Mobile treatment of construction waste"	2011	National	Austrian Construction Materials Recycling Association	High	www.brv.at
Guideline for pourable, self-thickening trench filling materials	Outdoor facilities, trench backfilling, parking etc.	2007	National	Austrian Construction Materials Recycling Association	High	www.brv.at
Best practice checklist “intermediate storage of mineral demolition waste, asphalt and concrete demolition waste”	Mineral demolition waste, asphalt and concrete demolition waste	2006	National	Austrian Construction Materials Recycling Association	High	www.brv.at
Guideline “Recycling-Oriented Demolition”	On-site sorting of demolition waste	2006	National	Austrian Construction Materials Recycling Association	High	www.brv.at
Sustainable Construction (2. Auflage Fibel: „Nachhaltig Bauen“ 2012	Enhance sustainability in the construction sector.	2012	National	Resource Management Agency (RMA)	NA	www.rma.at/node/1359

The following table shows some basics for environmentally friendly construction as defined by the Austrian Construction Materials Recycling Association (BRV):

Table 5: Basics for environmentally friendly construction according to BRV

Scope	Description
Demolition plan in the sense of recycling-oriented dismantling	▪ Description Form ▪ Register indicating construction material recycling plants ▪ Guide "recycling-oriented demolition" ▪ Norm ÖN B2251 on "demolition", including pre-demolition audits for hazardous substances ÖNORM-REGEL 192130. ▪ Exchange platform "Construction Recycling" (Prior Information Notice)[7]
Demolition allowance	▪ Information sheet for building owners and planners on the separation of construction waste ▪ Demolition waste identification form
Demolition masses of buildings	▪ Price list of building material recycling plants in Austria
Contamination	▪ Guidelines for the management of contaminated soils and contaminated mineral demolition ▪ Waste policy for the treatment of contaminated soil and components.
Tendering	▪ Standard tender texts for recycling in road construction / civil engineering ▪ ÖNR 22251 "sample texts for environmentally friendly construction tenders" ▪ Price list of building material recycling plants in Austria ▪ Exchange " Recycling in construction"
Excavated Materials	▪ Instruction Sheet "Use of soils for backfilling"
Quality building materials purchase	▪ List of quality protected recycled building materials ▪ Sheet on recovery of construction waste - Exchange " Recycling in construction"
Definition of standard construction methods for road construction	▪ Guidelines for recycled building materials (recommended by the BMWA) ▪ RVS 03.08.63 *, superstructure design ▪ RVS 08:15:01 *, unbound base material ▪ LB-HB (LG 02, LG 03)
Outdoor facilities, trench backfilling, parking etc.	▪ Guideline for recycled building materials from building residual masses, unbound application ▪ Guideline for pourable, self-thickening trench filling materials with recycled, crushed material (RFM)

[7] http://www.recycling.or.at/rbb/cake_rbb/pages/agb

Besides, there exist more than 50 guidelines and norms concerning recycled construction materials that are detailed in the Guideline for Recycled Construction Material of the Austrian Construction Materials Recycling Association. Some of the major norms are presented in the following table:

Table 6: Selection of important norms for CDW management in Austria

Description of guidance/ tool	Scope	Year (latest version)
ÖNORM B 3132	"Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction" – Rules for the implementation of ÖNORM EN 13242.	2010
ÖNORM B 3151	▪ Producing high-quality recycling materials (for building purposes), ▪ Assuring that the recycling materials meet the quality standards and the "end of waste act" demands. ▪ Structural measurements in the course of dismantling. ▪ Recycling oriented dismantling	2014
ÖNORM B 2251	"Demolition work - Works contract". Buildings and building components should be dismantled in such a way as to ensure that they can be mostly recovered (recycled), re-used or disposed of properly.	2006
ÖNORM B 3132	Aggregates for concrete - Rules for the implementation of ÖNORM EN 13043	2010
ÖNORM B 3140	Recycled materials for the building industry (draft document)	2015

The FWMP defines a set of measures for the prevention of construction and demolition waste. The main goal of these measures is to promote different techniques and technologies aimed at extending the use and service life of buildings, avoiding the use of hazardous substances and facilitating the separation of hazardous from non-hazardous substances in order to reduce the amount of waste from construction, as well as the proportion of construction and demolition waste containing hazardous substances.

This set of measures comprises three main packages of measures:

- building pass (information on the material make-up of a building)
- low-waste construction and extension of the useful life of buildings
- selective dismantling/urban mining/re-use of building parts

The building pass provides information on the material composition of a building. It should contain the necessary information for optimal, low-waste management of the building over its entire lifecycle. It documents construction activities, covering the employed construction building materials, technical equipment (e.g. the heating, plumbing and electrical systems) as well as recommended maintenance measures and contains furthermore operating instructions for the entire building.

According to Chapter 6.4.4.1 of the FWMP (2011), the package of measures for "low-waste construction and extended use of buildings" comprises the following elements:

- pilot projects for the development of innovative low-waste technologies and techniques
- development of teaching material and tools on the principles, planning techniques, as well as techniques and technologies for "low-waste construction" for the training of specialists in vocational schools and schools of higher education
- the teaching subjects "low-waste construction", "extended use of buildings", "selective dismantling", "use of recycled building materials" and "production and application of the building pass" are to be used more intensely in the basic and vocational training of specialists
- the developed standards for "low-waste construction", "extended use of buildings", "selective dismantling", "use of recycled building materials" and "production and application of the building pass" are to be implemented within the framework of public procurement

Finally yet importantly, the package of measures for “selective dismantling/urban mining/re-use of building parts” contains the following measures:

- pilot projects on selective dismantling, urban mining and the re-use of construction materials – for example, for the creation of a resource register as a basis for dismantling plans
- the recommendation to make the application of ÖNORM B 2251 and ONR 192139 compulsory under the Federal Provinces’ building codes.
- the introduction of a regime by which the following becomes compulsory: production of a building site waste management plan, the drafting of a dismantling plan, pollutant surveys in buildings before dismantling and the installation of sorting points on construction sites

The Austrian Association for Sustainable Building Construction (ÖGNB) serves as an independent platform for the assessment of buildings across systems and materials, involving all relevant stakeholders of the Austrian construction industry. ÖGNB developed the Austrian quality label for sustainable building construction, which uses the Total Quality Building (TQB) assessment system to capture and assess building quality. Buildings are assessed over their whole lifecycle and ÖGNB uses all relevant aspects of international standardisation activities (e.g. CEN TC350) in its assessment methodology.

5. CDW management performance – CDW data

In this section, the performance of CDW management in Austria is presented.

5.1. CDW generation data

In 2013, approx. 8.3 million tonnes of waste from construction and demolition (without excavated materials) were generated in Austria. The amount produced depends on the developments in civil and structural engineering. The waste from such projects therefore varies from year to year and is difficult to predict. Data on CDW generation are collected on a yearly basis.

According to § 17 of the Austrian Waste Management Act (AWG) all waste owners have the obligation to keep records of the type, quantity, origin and whereabouts of their waste. According to § 20 AWG the initial owner of hazardous waste must report the generation of hazardous waste. According to § 21 AWG waste collection and treatment companies have to declare the origin, quantity and whereabouts of their waste (hazardous and non-hazardous waste). The reports must also contain information on the waste producer (when directly collected from the waste producer).

Until 2010, statistics on CDW generation came from several different data sources, including surveys and interviews. Since 2011, CDW data is directly transmitted by the collection and treatment companies to a central database. This database is called EDM (Electronic Data Management System) and waste producers who treat their own waste are also subject to this reporting requirement. Since 2011, the statistics are based more and more on the evaluation of the EDM and as of today, the EDM is by far the most important source for statistics on waste generation. However, these data are still compared with other sources of information and through further inquiries. The compilation of waste statistics follows the Eurostat guideline.

Table 7 : CDW generation data for Austria

Code (ÖNORM S 2100)	Description	2009	2010	2011	2012	2013
Mineral CDW (t)						
31409	Building debris (no construction site waste)	3 200 000	2 885 000	2 055 000	1 978 000	1 998 000
31409 18	Building debris (no construction site waste, solidified or stabilised, only mixtures from chosen construction and demolition measures)		135 000	261 000	156 000	317 000
31409 91	Building debris (no construction site waste, solidified or stabilised)			18 000	24 000	45 000
31410	Road rubble/bitumen and asphalt	1 300 000	860 000	772 000	703 000	819 000
31410 91	Road rubble (solidified or stabilised)			10 000	1 000	10 000
31427	Concrete demolition waste	1 700 000	1 318 000	1 870 000	2 236 000	2 629 000
31427 17	Concrete demolition waste (only mixtures from chosen construction and demolition measures)		151 000	132 000	169 000	252 000
31427 91	Concrete demolition waste (solidified or stabilised)			6 000	4 000	46 000
31467	Track ballast	370 000	238 000	117 000	227 000	228 000
54912	Bitumen, Asphalt	Accounted for in 31410	Accounted for in 31410	917 000	765 000	1 583 000
	Other mineral CDW, non-hazardous			46 000	21 000	81 000
Sum		*6 570 000*	*5 587 000*	*6 204 000*	*6 284 000*	*8 008 000*
Other CDW						
91206	Construction site waste (no building debris)[1]	300 000	410 000	363 000	300 000	317 000
Total		**6 870 000**	**5 997 000**	**6 567 000**	**6 584 000**	**8 325 000**

[1)] In practice, non-mineral waste from construction activities were also subsumed under this type of waste
Source: BMLFUW (2015): Statusbericht zum Bundes-Abfallwirtschaftsplan 2011. www.bundesabfallwirtschaftplan.at

Excavated materials are accounted for separately. The following table shows excavated materials generated in 2013 according to the list of waste ordinance (ÖNORM S 2100 of 2005, THE INVENTORY OF WASTE MANAGEMENT IN AUSTRIA, STATUS REPORT 2014).

Table 8: Excavated materials generated in Austria in 2013

Code	Specification	Designation of the code	Designation of the specification	Quantities generated (t)
31411	29	Excavated soil	Class BA	11,009,000
31411	30	Excavated soil	Class A1	1,628,000
31411	31	Excavated soil	Class A2	2,338,000
31411	32	Excavated soil	Class A2G	105,000
31411	33	Excavated soil	Inert waste quality	986,000
31411	34	Excavated soil	Technical fill material that contains less than 5% by volume of non-soil constituents	116,000
31411	35	Excavated soil	Technical fill material that contains more than 5% by volume of non-soil constituents	3,000
31423	36	Oil-containing soils	Excavated soil material, as well as excavated fill, contaminated with hydrocarbons, non-hazardous	115,000
31424	37	Other contaminated soils	Excavated soil material and excavated fill, otherwise contaminated, non-hazardous	1,119,000
31625		Sludge from soil and sand		179,000
31625	91	Sludge from soil and sand	Solidified	9,000
54504	88	Crude-oil-contaminated earth, excavated soil, and demolition material	Exempted	42,000
		SUM		**17,649,000**
Estimated amount of excavated material used for terrain corrections, underground backfilling, production of embankments, etc.				9,200,000
		TOTAL		**26,849,000**

5.2. CDW treatment data

The following graph shows the development of recovered construction materials in tonnes since 1995.

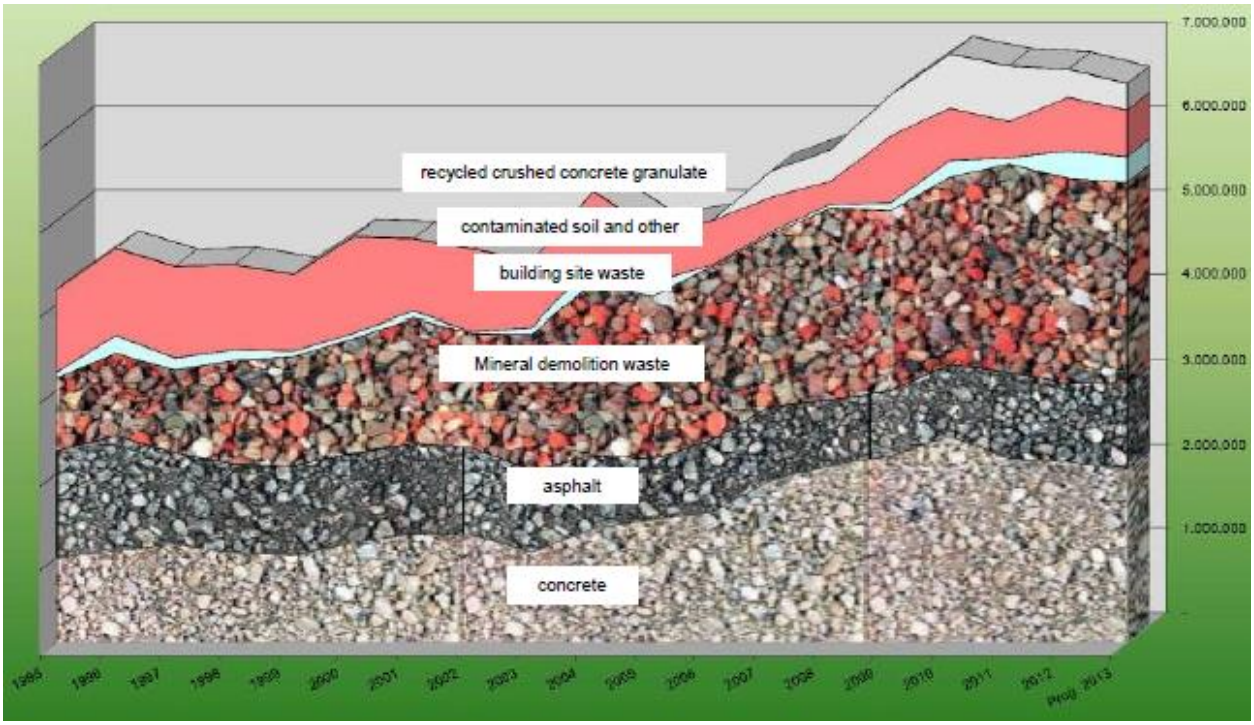

Figure 3: Development of recovered construction materials in Austria since 1995[8]

The majority of the construction and demolition waste is recovered. In 2013, these were about 7.2 million tons (87%). The collection of waste is usually performed directly on the site via containers. This work is largely carried out by disposal and demolition operators. Small amounts are also collected at municipal collection points. In order to guarantee an appropriate processing of the waste, separate collection is performed, required by the "Ordinance on the Separation of Waste Generated during Construction" (Federal Law Gazette No 259/1991). According to an interviewed person, gypsum recycling is still not working very well in Austria.

The following table shows the recovered CDW in 2013 by code according to ÖNORM S 2100:

[8] Source : BRV

Table 9: Recovered CDW in 2013, by ÖNORM S 2100 category

Code (ÖNORM S 2100)	Description	2013
Mineral CDW		
31409	Building debris (no construction site waste)	1,524,000
31409 18	Building debris (no construction site waste, solidified or stabilised, only mixtures from chosen construction and demolition measures)	272,000
31409 91	Building debris (no construction site waste, solidified or stabilised)	45,000
31410	Road rubble/bitumen and asphalt	804,000
31410 91	Road rubble (solidified or stabilised)	10,000
31427	Concrete demolition waste	2,535,000
31427 17	Concrete demolition waste (only mixtures from chosen construction and demolition measures)	235,000
31427 91	Concrete demolition waste (solidified or stabilised)	46,000
31467	Track ballast	86,000
54912	Bitumen, Asphalt	1,538,000
	Other mineral CDW, non-hazardous	12,000
Sum		**7,107,000**
Other CDW		
91206	Construction site waste (no building debris)[1]	124,000
Total		**7,231,000**
In practice, non-mineral waste from construction activities were also subsumed under this type of waste Source: BMLFUW (2015): Statusbericht zum Bundes-Abfallwirtschaftsplan 2011. www.bundesabfallwirtschaftplan.at		

According to the Waste Framework Directive (2008/98/EC) 70% of non-hazardous construction and demolition waste has to be reused or recycled by 2020. The graph on the right shows the share of different treatment methods. It can be observed that the total recovery rate amounted to around 86%, while around 555,000 t (6.6%) ended up in landfill. Export (5,500 t) or incineration (5,000 t) played a minor role (0.1%).

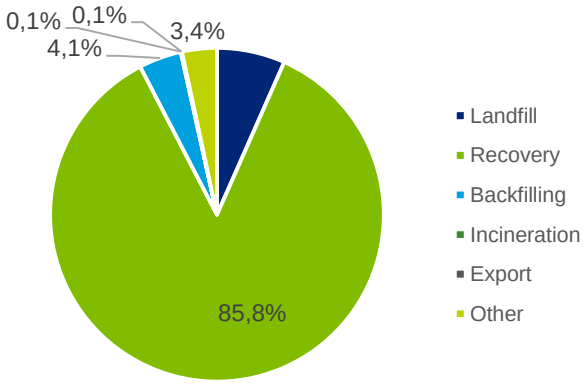

Figure 4: Whereabouts of CDW in 2013 in Austria[9]

[9] THE INVENTORY OF WASTE MANAGEMENT IN AUSTRIA, STATUS REPORT 2014, p. 40

The following table shows the different CDW types sent to landfill in 2013:

Table 10: Different CDW categories sent to landfill

Code (ÖNORM S 2100)	Description	2013 (t)
Mineral CDW		
31409	Building debris (no construction site waste)	411,000
31409 18	Building debris (no construction site waste, solidified or stabilised, only mixtures from chosen construction and demolition measures)	18,000
31410	Road rubble/bitumen and asphalt	2,000
31410 91	Road rubble (solidified or stabilised)	
31427	Concrete demolition waste	13,000
31427 17	Concrete demolition waste (only mixtures from chosen construction and demolition measures)	2,000
31467	Track ballast	10,000
54912	Bitumen, Asphalt	29,000
	Other mineral CDW, non-hazardous	69,000
Sum		*554,000*
Other CDW		
91206	Construction site waste (no building debris)[1]	1,000
Total		**555,000**
In practice, non-mineral waste from construction activities were also subsumed under this type of waste Source: BMLFUW (2015): Statusbericht zum Bundes-Abfallwirtschaftsplan 2011. www.bundesabfallwirtschaftplan.at		

About half of the excavated materials and soils was reinstated in 2013. The recovery of homogeneous excavated materials (crushed stone, gravel, sand, etc.) is usually carried out as a filling and bulk material for terrain corrections. Earth, humus and clay are used in landscaping. For the treatment of contaminated excavated materials 15 stationary systems are available in Austria: 9 facilities use microbiological methods, 3 facilities work with mechanical methods and 2 plants use mechanical methods combined with conditioning procedures. One plant is a soil washing plant.

In 2013, approximately 14.2 million tons of non-hazardous, exempted or treated excavated materials were disposed of in landfills. The largest share of landfilled waste was constituted by SN 31411 30 "Excavated soil Class A1" and the SN 31411 31 "Excavated soil Class A2" with around 1.2 million tons. Waste with key numbers SN 31482, 31482 91, 31483, 31483 91, 31484, were not dumped.

Hazardous excavated material is either treated biologically, physico-chemically or, to a lesser extent, thermally. In 2013, approx. 42,000 tonnes of hazardous excavated materials were generated (mainly contaminated with oil and other contaminated soils as well as crude-oil contaminated earth). Twenty-four plants with a total capacity of at least one million tonnes are currently available for the treatment of contaminated excavated soil material.

The graph on the right shows the repartition of deposition of excavated materials in 2013.

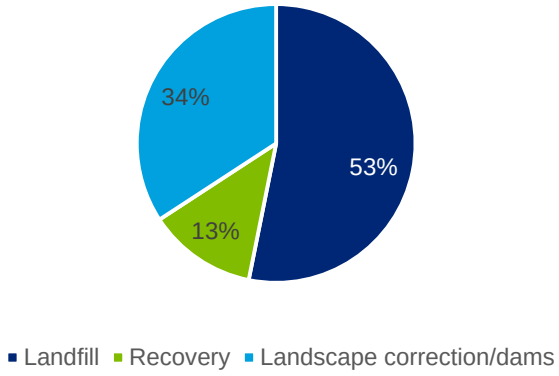

Figure 5: Deposition of excavated materials in 2013

5.3. CDW exports/imports data

In 2013, around 5,500 t of CDW and 550,000 t of excavated materials were exported, which constitutes a non-significant share of the total waste arising (<2%). No information on imports was found.

5.4. CDW treatment facilities data

According to data provided by the Austrian Federal Provinces, there are currently some 418 facilities available for the processing of CDW. However, the Federal Provinces manage the facility data in different ways, e.g. when taking into account intermediate storage. It the latter case mobile facilities do the processing if required. For this reason, the comparability of the number of facilities in the Federal Provinces is still limited.

Federal Province	Plants
Burgenland	12
Carinthia	23
Lower Austria	88
Upper Austria	75
Salzburg	39
Styria	46
Tyrol	103
Voralberg	20
Vienna	12
Austria (2013, total)	**418**

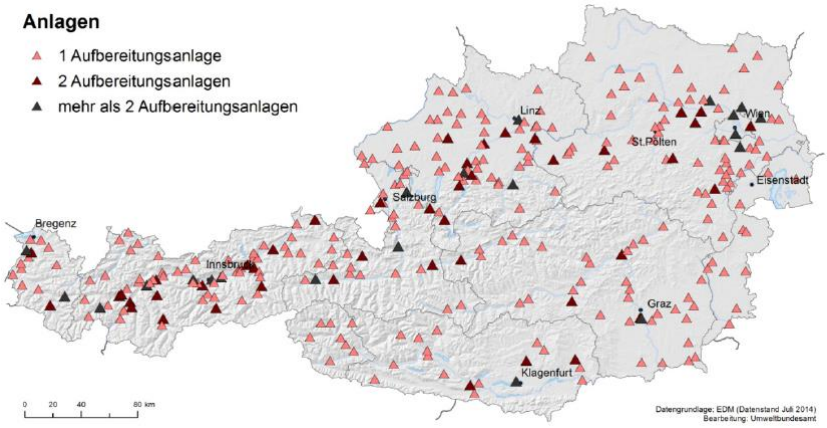

Figure 6: Processing plants for CDW in 2013[10]

According to the FWMP, crushers and sieves are used to produce usable raw materials from mineral CDW (masonry, concrete waste, demolition cement, etc.) and demolition asphalt. It can afterwards be used as aggregates for the production of building materials for bottoming, foundations, or filling. There are stationary and mobile facilities in use. Some 54% of the 108 member companies of the Austrian Association for the

[10] THE INVENTORY OF WASTE MANAGEMENT IN AUSTRIA, STATUS REPORT 2014, p. 84

Recycling of Building Materials (BRV) are operated as mobile facilities and 46% as stationary facilities. While the mobile facilities usually employ crushers and screens, stationary facilities have several modules which can be connected in series in any order required. Below figure shows the development of the number of stationary and mobile recycling plants in Austria that are part of the Austrian Association of the Recycling of Building Materials (around 80% of all companies).

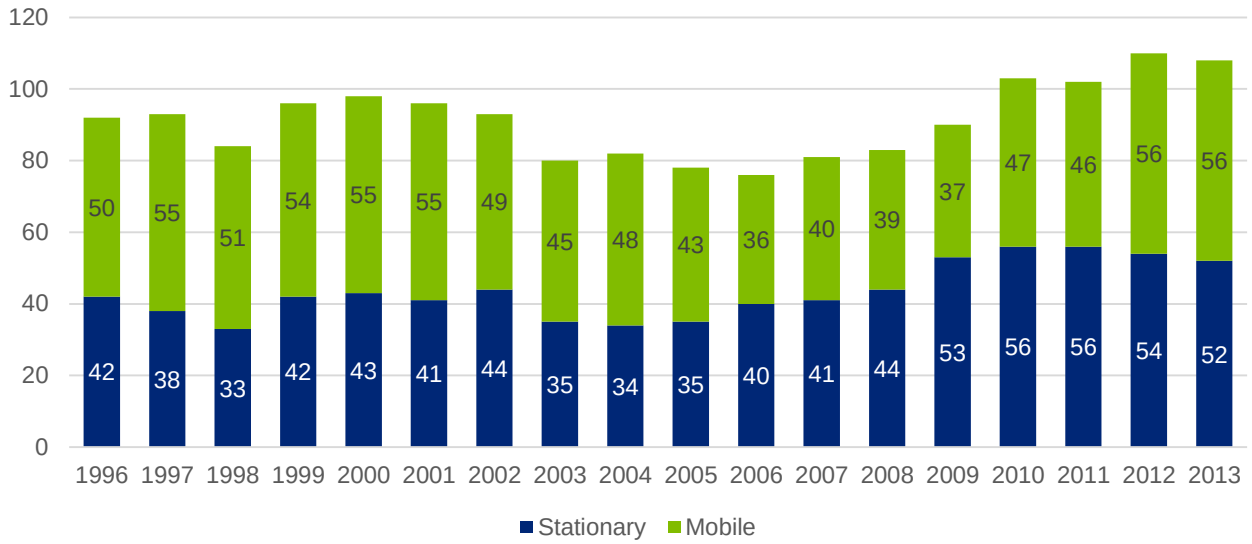

Figure 7: Stationary and mobile recycling plants in Austria[11]

The following figure shows a schematic diagram of a construction and demolition waste processing plant.

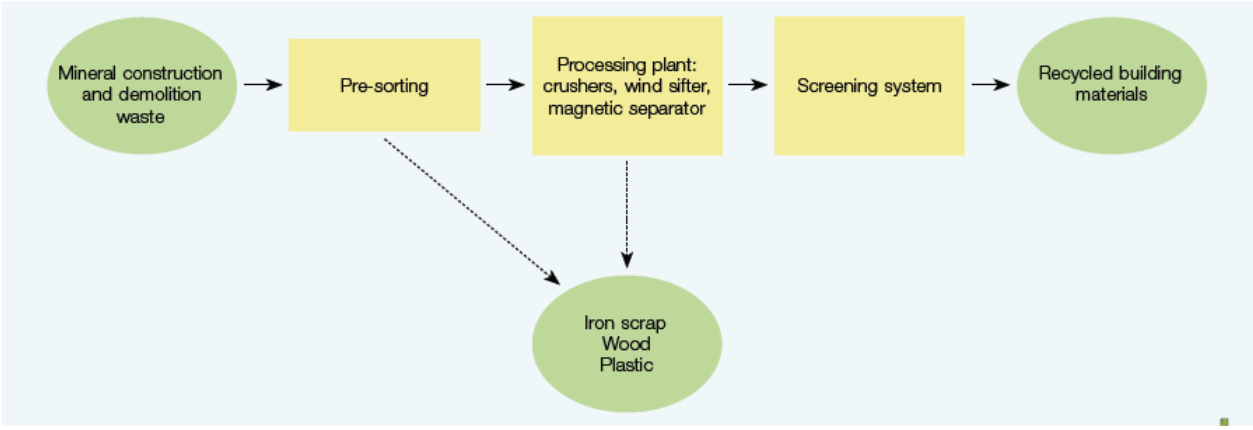

Figure 8 : Schematic diagram of a CDW processing plant[12]

[11] Source : BRV
[12] Source : Environment Agency Austria

Landfill

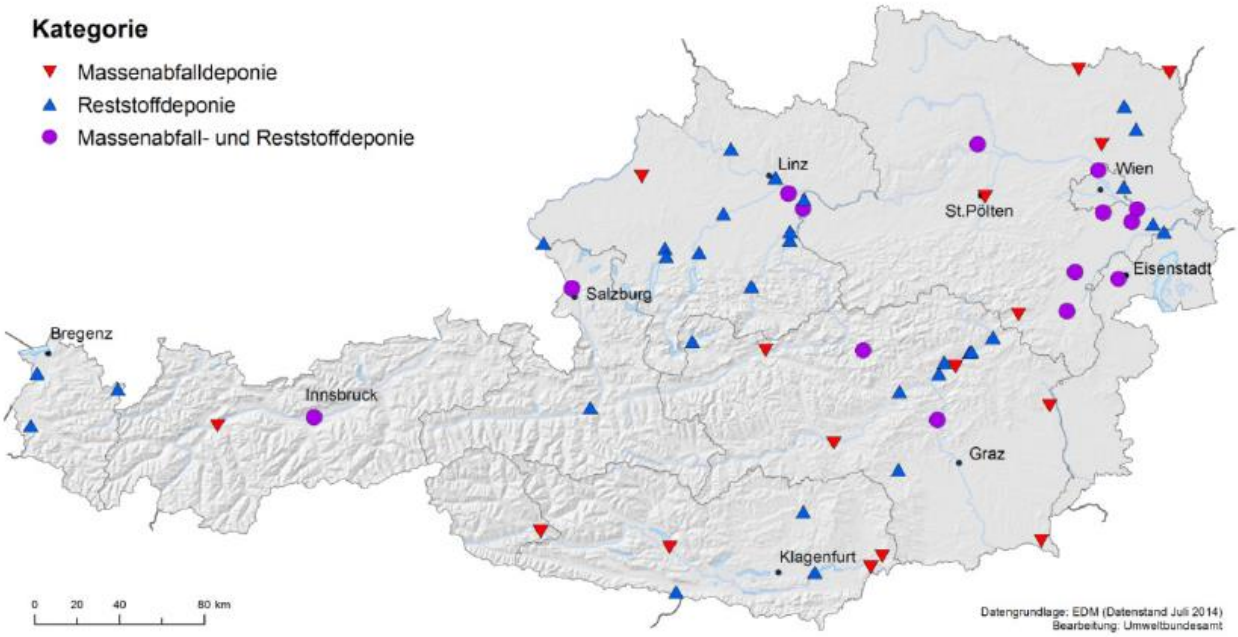

Figure 9: Landfill sites in Austria in 2013[13]

The following table shows different wastes deposed of in landfills in Austria in 2012 and 2013.[14]

Table 11: Different waste sent to landfill in Austria

Waste	Mass in 2012 (t)	%	Mass in 2013 (t)	%
Excavated Materials	12,824,000	80.1	12,907,000	78.9
Other contaminated soil	1,205,000	7.5	1,090,000	6.7
Slag and ashes from incineration plants	455,000	2.8	494,000	3.0
Mineral construction waste (no construction site waste)	427,000	2.7	411,000	2.5
Other Waste	1,093,000	6.9	1,461,000	8.9
Total	**16,004,000**	**100**	**16,363,000**	**100**

[13] Source: Environment Agency Austria
[14] THE INVENTORY OF WASTE MANAGEMENT IN AUSTRIA, STATUS REPORT 2014, p. 93

Table 12: Number of landfill sites for different waste categories

Landfill Types	Landfill sites in 2012	Free landfill volume in 2013 in million m^3	Landfill sites in 2013	Free landfill volume in 2013 in million m^3
Landfills for excavated materials	505*	43.7*	722	69.3
Landfills for inert waste	36	5.5	36	5.7
Landfills for CDW	79	11.6	83	10.2
Landfills for residual waste	43	17.9	45	19.7
Landfills for mass waste	31	11.3	31	11
other	**-**	**-**	**5**	**-**
Total	**694**	**90**	**922**	**115.9**
*** Data for excavated wastes are based on the year 2010**				

According to the latest waste status report (2014), the high number of excavated soil landfills in 2013 as compared to previous years is probably due to the fact that "backfilling sites" are increasingly accepted as excavated soil landfills and that the operators of such plants increased compliance with the electronic reporting obligation (EDM). The current landfill capacities are sufficient.

5.5. Future projections of CDW generation and treatment

No future projections of CDW generation and treatment was found.

5.6. Methodology for CDW statistics

According to the Federal Ministry of the Environment the methodology used for gathering data on CDW generation and treatment following Eurostat guidelines.

As mentioned above, the reason for the increased numbers observed after 2009 is likely due to increased compliance to reporting, rather than increased waste arising. There are no planned changes in methodology for CDW statistics for the time being.

6. C&D waste management in practice

In this section the CDW management “on ground” in Austria is explored.

6.1. CDW management initiatives

The following table summarises different CDW management initiatives in Austria.

Table 13: CDW management initiatives

Description of initiative	Scope	Year established	National, regional, local (specify which local area/region)	Public sector and/or Industry lead organisation	Further information/ web-site
Styria has established a guideline on CDW at state level with information for all the market actors.	CDW management in Styria	NA	Regional (Styria)	Public	www.baurestmassen.steiermark.at
INITIATIVE "Waste reduction in Vienna"	The city of Vienna has established a guideline for CDW reduction including among others recycling oriented demolition.	2003	Regional (Vienna)	Public	http://www.wenigermist.at/uploads/2010/06/Endbericht_AbfallvermeidungBausektor2003.pdf
Exchange for recycling materials in the construction sector (RBB)	Platform to match supply and demand for recycled CDW.	2009	National	Industry	http://recycling.or.at/rbb/cake_rbb/
Consulting	Consulting activities for recycling companies	NA	Regional (Tyrol)	Public/Industry	NA
Urban Mining	Project related to legal incentives for urban mining waste legislation	2013/2014	Resource Management Agency (RMA)	Public	http://www.rma.at/node/1560
EnBA – Concept for the sustainable use of CDW	Concept for the sustainable use of construction and demolition waste based on the Strategy on Waste Prevention and Recycling of the EU	2009-2011	Resource Management Agency (RMA)	Public	http://www.rma.at/node/36
The project RaABa	Framework for the development and initiation of a regional network for reuse of components from the building as a contribution to resource conservation	2012-2015	Resource Management Agency (RMA)	Public	http://www.rma.at/node/1506

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 Austria.

Table 14: Focus on some CDW management initiatives

Description of initiative	Scope, year established, actors involved	Advantages/ Enabling factors	Disadvantages/ Obstacles	Further information/ web-site
INITIATIVE "Waste reduction in Vienna"	City of Vienna	Easy to understand guideline for sustainable management of CDW.	Difficult to control and enforce	http://www.wenigermist.at/uploads/2010/06/Endbericht_AbfallvermeidungBausektor2003.pdf
Exchange for recycling materials in the construction sector (RBB)	BRV, Federal Ministry of Agriculture, Forestry, Environment and Water Management, and others	Platform to bring together supply and demand of recycled CDW.	Did not gain momentum in the past, not enough activity.	http://www.recycling.or.at/rbb/cake_rbb/

6.3. Waste legislation enforcement

With the new Regulation the Federal Ministry of the Environment will be responsible to control for the premature end of waste status.

The law for Remediation of Contaminated Sites (Altlastensanierungsgesetz (ALSAG)) states that every ton of CDW that is not recovered in proper and structurally engineered way is charged with 9.20 EUR. This law is controlled by the fiscal authorities and enforced by the customs. However, if CDW is backfilled according to the law, the responsible person is exempt from a monetary contribution per ton.

6.4. Drivers / barriers to increase CDW recycling

The following table summarises main drivers and barriers for CDW recycling.

Table 15: Main drivers and barriers for CDW recycling

Factor / characteristic / element in CDW recycling chain	Drivers	Barriers
Quality of recycled building materials	There exists a draft norm for recycled building materials (ÖNORM B 3140) that sets requirements for recycled aggregates. Publication of the final version is planned for the 01.01.2016.	There is a fluctuating environmental and constructional quality of manufactured recycled building materials on the market. This barrier should be overcome with the new legal framework under development which will require specific standards for recycled building materials.
Price		There is a strong competition coming from low prices of primary raw material, making secondary building materials unattractive.
Legal	The new Building Materials Regulation is already in an advanced stage, such that market players already anticipate its enforcement and start to comply with future requirements. One advantage from a legal perspective in Austria is that technical requirements for environment and construction engineering are formulated in one system of rules and that a standardised guideline for recycled materials exists, which helps to create a legally binding regulation. Another driver can be seen in the close collaboration between the public and private sector while working on the new regulation.	Trade and use of recycled building materials are permitted only within the waste legislation. Thus there are increased licensing and accounting costs for manufacturers and users as compared to primary products.[15] Legal uncertainties coming from the "soft" regulation within the Federal Waste Management Plan, through directives and the lack of regulations concerning specific waste streams (in particular steelworks slags, old asphalt, grit).These legal issues shall also be overcome with the new regulation. The end-of-life status of recycled CDW is seen as a significant barrier from the industry, since products that fulfil strict norms and standards are handled as waste.
Public procurement		The industry complains about a lack of public initiatives and requirements to increase the demand for recycled construction materials. For instance, there is no fixed quota for recycled materials.
Reputation		Secondary building materials still have a negative image in Austria. Many tenders still discriminate secondary building materials, since constructers made negative experiences in the past and do not trust in the quality of recycled materials.
Guideline	A nation-wide guideline exists for more than 20 years and complies with EU standards.	

[15] http://vivis.de/phocadownload/2014_mna/2014_mna_51_58_starke.pdf

7. CDW sector characterisation

In this section, some specific characteristics of the CDW management sector in Austria are explored. Issues covered in this section concern the CDW sector characteristics including market conditions, enabling factors, import and exports of CDW and the characteristics of recycled CDW products.

7.1. Sector characteristics

With 418 processing plants (mobile and stationary) and 115.9 million m^3 free landfill volume the sufficiency and the adequacy of waste infrastructure seems to be guaranteed. The sector is characterised by many small actors with fewer than 10 or fewer than 50 employees when it comes to collection and treatment of CDW. It is difficult to find exact figures, because smaller companies can have the tendency not to declare their business as a "recycler" but rather as a building company. Mid- and larger sized companies are present along the whole value chain, and often run several treatment plants.

Many of those actors are organised in the Austrian Association for Recycling of Building Materials, which has 74 members and represents around 80% of the CDW companies in Austria. It coordinates its work closely with the Federal Ministry of Agriculture, Forestry, Environment and Water Management, among others to establish guidelines, such as the guideline for recycled construction material.

Further actors that are important in the sector are:

- The association of the construction industry which is responsible for all Austrian construction industry enterprises as their legal representative.
- The Austrian Federation of Limited-Profit Housing Associations (GBV) which functions as compulsory audit organization for its members as well as interest representation body.
- The VÖEB, which is the Association of Austrian and Raw Materials Management Industry Waste Management Companies. Its role is to act as a link between society, economy and industry, and to put the various stakeholders in the Austrian waste management sector in a dialogue.
- Austrian Waste and Ressource Management Association, which is the legal representation of the interests of the private companies, which are active in the waste sector.

7.2. Exports / imports of CDW

There is enough capacity in place in Austria for recycling of CDW (and particular components of CDW) and there is no real need to export CDW for recycling. Only small shares of CDW and excavated materials are exported (<2%). Because of economic reasons exports remain within a small radius and go to neighbouring countries such as Germany.

7.3. CDW as landfill cover

According to the Landfill Ordinance 2008 CDW has to be disposed of in specific landfill sites. In 2013, 411,000 tons of CDW were disposed of in 83 specific CDW landfill sites in Austria.

7.4. Market conditions / costs and benefits

One of the main incentives that drives recycling of CDW is the law for Remediation of Contaminated Sites (Altlastensanierungsgesetz (ALSAG), which charges 9.20 EUR for every ton that is not recovered in proper and structurally engineered way. Other market conditions are listed in above table describing drivers and barriers.

7.5. Recycled materials from CDW

The following figure shows the development of quality labelled recycling materials and the amount of plants in Austria producing quality labelled recycling materials. Quality labels are provided by a third independent organisation (Quality Label Association).

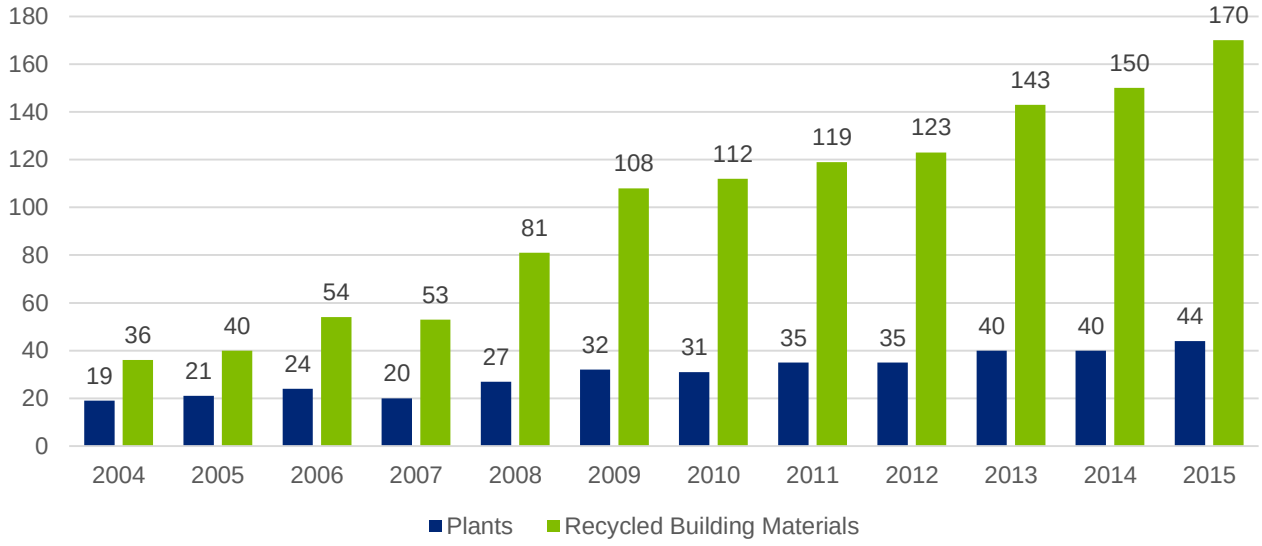

Figure 10: Quality labelled recycling materials[16]

In general, CDW products face relatively difficult market conditions, driven by relatively low prices for primary materials and a bad image, despite of existing standards, norms and quality labelling (see above).

7.6. Construction sector make up

In 2012, the construction sector listed around 32,000 companies with 285,000 employees. 81% of the companies employed less than 10 people, making around 24% of the total sector's turnover. There existed 71 companies with more than 250 employees that were responsible for 24% of the overall turnover (42 bn EUR in 2012). More details are provided in below graphs[17]:

[16] Source : BRV
[17] Source : STATISTIK AUSTRIA, Leistungs- und Strukturstatistik 2012

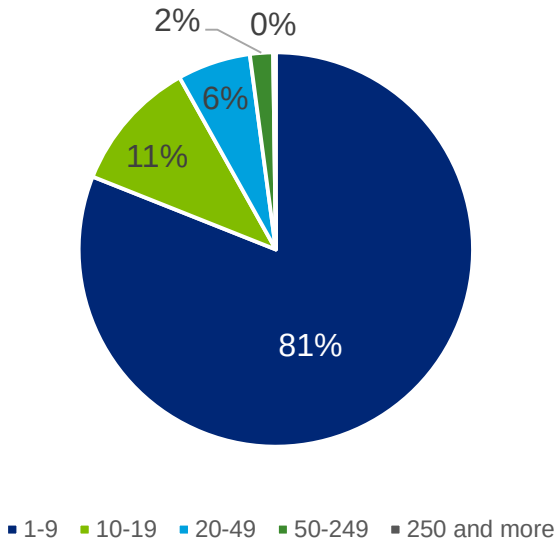

Figure 11: Structure of companies in the building sector in Austria

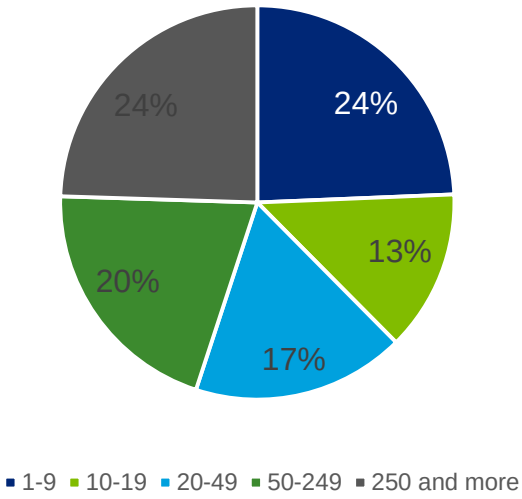

Figure 12: Turnover by company size

References

Interview sources:

- Interview with Martin Car, Dipl.-Ing., Austrian Association for Recycling of Building Materials, 17/04/2015
- Interview with Roland Starke, Dipl.-Ing., The Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management, 23/04/2015
- Regular exchange with Hubert Reisinger, Environment Agency Austria, April 2015

Other contacted stakeholders:

The following stakeholders have been contacted but did not participate:

- Wirtschaftskammer Österreich

Literature sources:

- Federal Ministry of Agriculture, Forestry, Environment and Water Management - Waste Management Act (2002)*, http://www.bmlfuw.gv.at/greentec/abfall-ressourcen/abfall-altlastenrecht/abfallwirtschaftsgesetz.html*
- Federal Ministry of Agriculture, Forestry, Environment and Water Management - Federal Waste Management Plan (2011), http://www.bundesabfallwirtschaftsplan.at/
- Federal Ministry of Agriculture, Forestry, Environment and Water Management (2015) - Statusbericht zum Bundes-Abfallwirtschaftsplan 2011
- Environment Agency Austria - Remediation of Contaminated Sites (1989, amended in 2000), http://www.umweltbundesamt.at/umweltsituation/altlasten/gesetze/alsag/
- Federal Ministry of Agriculture, Forestry, Environment and Water Management - List of Waste Ordinance (2012),http://www.bmlfuw.gv.at/greentec/abfall-ressourcen/abfall-altlastenrecht/awg-verordnungen/anvo.html
- Federal Ministry of Agriculture, Forestry, Environment and Water Management - Waste Register Ordinance (2008), http://www.bmlfuw.gv.at/greentec/abfall-ressourcen/abfall-altlastenrecht/awg-verordnungen/abfallverzeichnisvo.html
- BRV - Separation of Construction Waste Ordinance (1993), http://www.brv.or.at/service/pg16#baurestmassentrennungsverordnung
- Federal Ministry of Agriculture, Forestry, Environment and Water Management - Landfill Ordinance (2008), http://www.bmlfuw.gv.at/greentec/abfall-ressourcen/abfall-altlastenrecht/awg-verordnungen/deponievo.html
- Ressourcen Management Agentur (RMA) - 2. Auflage Fibel: „Nachhaltig Bauen“ (2012), http://www.rma.at/node/1359
- STATISTIK AUSTRIA, Leistungs- und Strukturstatistik 2012

Online sources:

- Database for norms: http://www.bdb.at/Service/NormenDetail?id=368433
- Roland Starke – Die geplante österreichische Recycling-Baustoffverordnung (2014), http://www.vivis.de/phocadownload/2014_mna/2014_mna_51_58_starke.pdf (30/04/2015)
- www.baurestmassen.steiermark.at
- http://www.wenigermist.at/uploads/2010/06/Endbericht_AbfallvermeidungBausektor2003.pdf
- http://recycling.or.at/rbb/cake_rbb/
- http://www.rma.at/node/1560
- http://www.rma.at/node/36
- http://www.rma.at/node/1506
- http://www.brv.or.at/
- http://www.umweltbundesamt.at/en/
- http://www.bmlfuw.gv.at/