

# Resource Efficient Use of Mixed Wastes

Task 5 – Minutes of the workshop  
IMPROVING MANAGEMENT OF  
CONSTRUCTION AND  
DEMOLITION WASTE

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bre



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# Introduction

## Context of the study

Construction and demolition waste (CDW) has received more and more attention in the past few years as it is a lens to understanding the potential for resource efficiency improvement in the construction sector. Indeed, construction and workshop activities are the main source of waste in the EU and currently, an important part of this flow is made of materials that can be readily recycled (glass, concrete, etc.) but with a recycling potential still under-exploited. Moreover, recycling performances between EU Member States (MS) differ significantly between MS (from 10% to 90%), showing that MS with the lowest recycling performances can certainly improve by applying good practices from MS with the highest recycling performances. The potential to increase construction sector resource efficiency by increasing CDW recycling and reuse rates is significant.

However, identifying and transferring good practices from a given country to another country is not an easy task. In fact, practical management of CDW varies greatly across MS and depends on a number of framework conditions (socio-economic and geographical context, legislation, enforcement, and construction practices). Moreover, monitoring and data capture of recycling performance are often not accurate, due to traceability and availability issues. Monitoring MS performances in recycling CDW is a real challenge that the MS and European authorities are facing. It is however an essential step in evaluating MS progress toward recovery targets.

## Presentation of the workshop

The workshop

### **'IMPROVING MANAGEMENT OF CONSTRUCTION AND DEMOLITION WASTE – LESSONS LEARNED FROM THE STUDY 'RESOURCE EFFICIENT MANAGEMENT OF MIXED WASTE'**

was held on Wednesday 25 May 2016 at the premises of the European Commission in Brussels, with two key objectives:

- Discuss the findings of the study and share best practices.
- Carry out an open exchange of views with the aim of achieving a good understanding of key barriers and opportunities, and the measures, tools and steps to take in order to address these barriers and benefit from the opportunities. It should also be considered how European legislation and funds could be used to improve the situation in the Member States.

In order to meet the aforementioned objectives, two forms of exchanges were proposed:

- A plenary session to present the preliminary findings of the study
- Six thematic breakout sessions focussing on the main issues related to CDW management to enable exchanges of views between participants and discuss possible solutions at European level.

### Workshop Programme

9:15	<b>WELCOME AND REGISTRATION</b>
9:30	<b>OPENING AND INTRODUCTION</b>
<b>Welcome, purpose of the meeting. Presentation of ongoing initiatives on CDW</b> Julio García Burgués, European Commission, Head of Unit, DG Environment	
9:40	<b>MANAGEMENT OF CONSTRUCTION AND DEMOLITION WASTE : STATE OF PLAY AND LESSONS LEARNT FROM THE STUDY</b>
<b>Study, Current situation, key problems and challenges, preliminary conclusions</b> Mathieu Hestin, Bio by Deloitte ; Gillian Hobbs and Katherine Adams, BRE ; Marie Pairon, ICEDD	
10.20	<b>PRESENTATION OF THE TOPICS OF THE BREAKOUT SESSIONS</b>
Mathieu Hestin, Bio by Deloitte	

<b>10.30</b>	<b>FIRST BREAKOUT SESSION</b>
<b>1st topic: EU targets (Room 0.1, ground floor)</b>	
Targets for CDW – Backfilling Session facilitated by Gillian Hobbs, BRE <u>Speakers:</u> Maria Arm, SGI ; John Barritt, John Barritt Consulting ; Geert Cuperus, FIR	
<b>2nd topic: Prevention (Room 1.11, 1st floor)</b>	
Prevention targets, eco and long-lasting design criteria, promotion of modular design Session facilitated by Katherine Adams, BRE <u>Speakers:</u> Caroline Henrotay, Brussels Environment (IBGE/BIM) ; Katherine Adams, BRE	
<b>3rd topic: Demolition practices (Room 4.61, 4<sup>th</sup> floor)</b>	
Sorting on site, pre-demolition audits and post-demolition reporting Session facilitated by Mathieu Hestin, Bio by Deloitte <u>Speakers:</u> Johan D'Hooghe, EDA ; Hervé Grimaud, Recylum ; Jean-Yves Burgy, Recovering	
<b>11.45</b>	<b>COFFEE BREAK</b>
<b>12.00</b>	<b>SECOND BREAKOUT SESSION</b>
<b>4th topic: Reuse (Room 1.11, 1st floor)</b>	
Drivers and barriers Session facilitated by Katherine Adams, BRE <u>Speakers:</u> Petr Hradil, VTT ; Claus Juul Nielsen, Gamle Mursten	
<b>5th topic: Supporting the recycled materials market (Room 4.61, 4th floor)</b>	
Green public procurement, standards for recycled materials, material content traceability, end of waste criteria Session facilitated by Mathieu Hestin, Bio by Deloitte <u>Speakers:</u> Brian James, UEPG ; Vincent Basuyau, European Commission – DG GROW ; Geert Cuperus, FIR	
<b>6th topic: Data / Statistics (Room 0.1, ground floor)</b>	
Level of detail, exhaustiveness, quality of data across all MS Session facilitated by Marie Pairon, ICEDD <u>Speakers:</u> François Wiaux, ICEDD ; Gillian Hobbs, BRE ; Dr C.P Baldé, Statistics Netherlands	
<b>13:15</b>	<b>LUNCH BREAK</b>
<b>14.15</b>	<b>RESTITUTION OF THE BREAKOUT SESSIONS</b>
<b>Conclusions</b>	
<b>Questions and answers</b>	
<b>15.15</b>	<b>MANAGEMENT OF HAZARDOUS CDW</b>
<b>Asbestos management in Flanders, Belgium</b> Philippe Van de Velde, OVAM	
<b>16.00</b>	<b>COFFEE BREAK</b>
<b>16.15</b>	<b>DEBATE: How to move towards CDW management in line with the waste hierarchy – priority of actions</b>
Discussion with Gunther Wolff (European Commission, DG Environment), Geert Cuperus (Fédération Internationale du Recyclage), Christophe Sykes (Construction Products Europe) and Jean-Yves Burgy (Recovering)	
<b>17.00</b>	<b>CLOSING SESSION</b>
<b>Conclusions, next steps</b> Mathieu Hestin, Bio by Deloitte – Recapitulation Mr Gunther Wolff, European Commission, DG Environment – Conclusions	

## Content of this report

This report contains the minutes of the workshop 'Improving management of construction and demolition waste'.

It presents the exchange of views which have taken place during the six breakout sessions and the debate. Except for those of the speakers, the views expressed during the workshop and reported here were anonymised. The presentations made during the plenary session are not reproduced here.

The summary of this report is the following:

- Session on EU targets
- Session on Prevention
- Session on Demolition practices
- Session on Reuse
- Session on Supporting the recycled materials market
- Session on Data collection practices
- Breakout sessions restitution
- Debate

All presentations made during the workshop are available on the [webpage of the study](#).

# 1. Session on EU targets

## 1.1. Presentation of the session

### 1.1.1. Preliminary recommendations

Based on the preliminary findings of the study, the following preliminary recommendations were formulated:

- Revise the 70% target after 2020
- Introduce separate targets for inert, non-inert & non-hazardous and hazardous waste
- Reassess the inclusion of backfilling in the calculation of the 70% objective by clarifying the definition and/or revising the accounting method, or even exclude certain backfilling operations from the objective.

### 1.1.2. Key issues

The key issues discussed during this breakout session were:

- Would introduction of separate targets for each type of waste help increasing the recovery rates of non-inert waste?
- Should backfilling be excluded from recovery definition? Should it be kept but more precisely defined?
- Should the existing 70% recovery target for CDW be kept and an additional recycling target (e.g. 50%) be introduced to ensure that the 70% target cannot be met by backfilling only?
- Should a specific R-code (recovery operations according to the Waste Framework Directive) be introduced for backfilling

### 1.1.3. Invited speakers

The following organisations/speakers presented the topic of EU targets:

- Maria Arm, Swedish Geotechnical Institute (SGI), Sweden
- John Barritt, John Barritt Consulting Ltd, UK
- Geert Cuperus, Fédération Internationale du Recyclage (FIR), The Netherlands

## 1.2. Minutes of the session

### 1.2.1. Presentations

**Maria Arm, SGI**, presented the ENCORT-CDW study<sup>1</sup>, an evaluation of the European recovery target for CDW. Maria Arm explained that the CDW recovery target does not ensure a sustainable waste recovery, because:

- It favours recycling of heavy-weight waste types but does not provide incentives to recycle lighter, often valuable fractions;
- It does not favour the most sustainable recovery operations;
- It is very sensitive to interpretations of:
  - What is considered as waste?

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<sup>1</sup> 'ENCORT-CDW: Evaluation of the European recovery target for construction and demolition waste' is a Nordic project performed in 2012-2013 by SGI, SINTEF, DHI, VTT and IVL. It was supplemented in 2016. The project report is available here: <http://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A724760&dswid=-5327>

- What is considered as waste recovery?

She suggested to amend the CDW recovery target by:

- Setting waste specific targets with clear definitions to reflect the potential benefits of different waste types to be recycled;
- Ranking the recovery operations in the reporting procedure in order to avoid “downcycling”.

**John Barrit, John Barrit Consulting**, presented the discrepancy between the WFD objective of promoting high quality recycling and the inclusion of backfilling in the recovery target for CDW. He also looked into the various interpretations of the backfilling definitions.

According to the Eurostat guidance, “suitable waste” for backfilling are inert wastes with minimal potential for environmental risk: concrete, bricks, tiles, ceramics, stone and glass. But backfilling potentially diverts these inert wastes from the “high quality recycling” required by Article 11 of WFD.

The table below presents the potential of these inert wastes for high quality recycling to quality standards:

CDW suitable for backfilling (inert in the context of Landfill Directive)	Included in scope of WFD CDW 70% target	Recycling potential at higher quality/value than backfilling		Recycling within scope of EN product Quality Standards
		aggregates	glass	
17 01 01 Concrete	Yes	100%	n/a	Yes
17 01 02 Bricks	Yes	100%	n/a	Yes
17 01 03 Tiles and ceramics	Yes	100%	n/a	Yes
17 01 07 Mixtures of concrete, bricks and ceramics	Yes	100%	n/a	Yes
17 02 02 Glass	Yes	100%	100%	Yes
17 05 04 Soils and stones	No	Minimal	n/a	n/a

The inclusion of the term ‘backfilling’ in the present wording of Article 11 2/b has caused, and continues to cause misunderstandings, creating a disincentive to achieving the resource efficient objective of high quality recycling to quality standards. As shown in the table below, the present scope of ‘backfilling’ presents opportunities for misuse:

Activities within the scope of WFD backfilling (excluding Dec.’16 Circular Economy Package proposals)	Likelihood of compliance with WFD backfilling criteria			Suitability of activity for recovery of waste code 17 05 04 Soils and Stones (i.e. not included in WFD 70% target)	Environmental Risk*
	Substitution of non-waste materials	Activity would take place if waste was not available	Not intended to be returned to the economic material cycle		
Reclamation of excavated areas (in construction)	Medium	High	High	High	Low
Reclamation of excavated areas (mines and quarries)	Low	Low	High	High	Low
Landscape engineering	Low	Low	High	High	Low
Reprocessing of material to be used for backfilling	Low	n/a	Low	n/a	Low
Covering landfills	Low	High	High	High	Low

As a conclusion, Mr Barrit proposed possible revisions to the recovery target wording below:

*‘By 2020, the re-use, recycling and recovery of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in the list of waste shall be increased to a minimum of 70 % by weight’;*

and

*'A construction and demolition waste recovery operation includes applications where suitable unprocessed inert waste is used for engineering purposes in construction instead of other non-waste materials which would otherwise have been used for that purpose'.*

**Geert Cuperus, FIR**, presented on backfilling versus construction applications for recycled materials. He contended that landscaping applications are too ill defined and could lead to poor quality/untreated materials being used, which can be worse than landfilling from an environmental point of view. Mr Cuperus queried the need to have backfilling as a possible recovery route for CDW at all, pointing to the need to better define the recycling applications and the relevant recovery/landscaping/landfill operations.

According to Mr Cuperus, it is impossible to characterise the environmental quality of untreated CDW (inert CDW must have undergone waste acceptance criteria and crushing) and mixed CDW cannot perform any function at all.

#### Conclusions:

- Backfilling applies only to quarries and mines. When used for construction (embankments, costal work, road construction), it should not be considered as backfilling but as a use in construction.
- Landscaping offers the way out for environmentally unsafe options.
- Inert CDW can be used for filling and construction after processing.
- Mixed CDW cannot be a material for backfilling.
- The route for backfilling goes via recycling, so backfilling should be skipped in the target.

### **1.2.2. Discussion**

#### **The backfilling issue**

- There was a consensus on the fact that backfilling should not be misused as a de facto landfilling. Construction operations where waste undergoes a treatment and a quality control to meet standards should be excluded from the definition of backfilling and should be considered as recycling.
- The definition of backfilling should be clearer about rehabilitations in quarries.
- Mr Cuperus provided a new example showing that some Member States (e.g. Poland) confused the terms 'backfilling' and 'recycling'. Use of inert CDW, which is crushed and applied to fill gaps to construct roads is wrongly considered as backfilling instead of recycling.
- Guidance might also be needed on the following issues:
  - What degree of treatment / crushing / change of shape is necessary to become recycling or not recycling?
  - What defined environmental criteria should be met for backfilling/recycling?

The public was invited to vote on the following question: is there a need for backfilling definition other than for mines and quarries?

The poll showed 6 persons thought that backfilling should be excluded from the target definition, 6 persons thought that backfilling should not be excluded and a majority of 20 persons was undecided.

The majority agreed on the fact that backfilling should defined more precisely if it is to be kept in the definition..

#### **The proposal for defining specific targets for different waste streams**

- There are two problems that make defining waste specific targets premature:
  - Data quality is not sufficient to set targets for specific waste materials;
  - Variability of waste occurring (construction/demolition/refurbishment).
- Reliable data are required before talking about specific targets.
- Defining quantitative targets may be problematic in the absence of reliable data. It would be interesting to set quality targets instead of quantitative targets.
- Some products (steel, glass) on the markets can have a recycled content of up to 100%. It also depends of the consumer side: will they choose the best performing product that is not made of

recycled products or are they environmentally minded and will choose materials that have a higher recycled content even if these materials may possibly be less performing?

- Sorting mixed CDW could contribute to improve recycling as it would help recovering all materials like plastics, wood, gypsum. There should be a diagnosis of what materials are not recycled right now and how they could be diverted from landfills.

# 2. Session on Prevention

## 2.1. Presentation of the session

### 2.1.1. Preliminary recommendations

Based on the preliminary findings of the study, the following preliminary recommendations were formulated:

- Make eco and long-lasting design criteria more demanding for new buildings
- Favour design for modularity, deconstruction and reuse at materials level
- Set a specific EU target for CDW prevention
- Have reliable site-level benchmarks, against which targets can be set and progress monitored
- Develop an EU (with MS variation if applicable) dataset for wastage rates to highlight the products that are inherently wasteful at the point of installation to encourage actions to reduce these amounts at a sector or proprietary level.
- Greater understanding at a building-level of the environmental and economic benefits associated with demonstrated levels of waste reduction (e.g. reduction compared to the relevant benchmark) would act as a driver to implement waste reduction activities. Reusing buildings instead of demolishing them would prevent much waste but needs to be set against other environmental issues, such as energy efficiency
- Offsite fabrication and building information modelling could help to reduce waste (but this has still to be proven)

### 2.1.2. Key issues

Prevention is at the top of the waste hierarchy. However, national and European policies do not focus sufficiently on waste prevention. As a result, there are far fewer prevention measures compared to recycling and recovery. There appears to be little evidence of pan EU consistency in the approaches taken.

The key issues discussed during this breakout session were:

- Which could be suitable CDW prevention indicators?
- Should there be a specific target for CDW prevention and in what form? Would different targets for construction waste and demolition waste be needed?
- To what extent make eco and long-lasting design criteria more demanding for new buildings?
- How to promote modular design and should we promote it?
- Which prevention measures have proven to be successful for CDW prevention? Are there additional good practice examples from the Member States?
- Are there approaches to successfully reduce the amount of square meters per inhabitant without reducing quality of living and wellbeing?

### 2.1.3. Invited speakers

The following speakers presented their views on waste prevention:

- Katherine Adams, Building Research Establishment (BRE), United Kingdom
- Caroline Henrotay, Brussels Environment (IBGE/BIM), Belgium

## 2.2. Minutes of the session

### 2.2.1. Presentations

**Caroline Henrotay**, presented the project 'Building As Material Banks' (BAMB)<sup>2</sup>, which started in September 2015 and will last 3.5 years. The objectives of the project are the prevention of construction and demolition waste, the reduction of virgin resource consumption and the development towards a circular economy through industrial symbiosis, addressing the challenges mentioned in the Work Programme on Climate action, environment, resource efficiency and raw materials. The focus of the project is on building construction and process industries (from architects to raw material suppliers).

The BAMB project implements the principles of the waste hierarchy: the prevention of waste, its reuse and recycling. Key is to improve the value of materials used in buildings for recovery. This is achieved by developing and integrating two complementary value adding frameworks, (1) materials passports and (2) reversible building design. These frameworks will be able to change conventional (cradle-to-grave) building design, so that buildings can be transformed to new functions (extending their life span) or disassembled to building components or material feedstock that can be upcycled in new constructions (using materials passports). This way, continuous loops of materials are created while large amounts of waste will be prevented.

Activities from research to market introduction are planned. Fundamental knowledge gaps should be bridged in order to introduce both frameworks on the market. Advanced ICT tools and management models will enable market uptake and the organization of circular value chains in building and process industries. New business models for (circular) value chains will be developed and tested on selected materials. The inclusion of strategic partners along the value chains in an industrial board will maximize market replicability potential, while several (mostly privately funded) building pilots will demonstrate the potential of the new techniques. Awareness will be raised to facilitate the transition towards circularity by policy reform and changing consumer behavior.

**Katherine Adams** presented the waste prevention program implemented on the London 2012 Olympic Park<sup>3</sup>. When London won the right to host the London 2012 Olympic and Paralympic Games in July 2005, the bid team identified a 2.5 km<sup>2</sup> site in East London as the site for the Olympic Park.

The Olympic Delivery Authority (ODA) pledged to hold the greenest Games of modern times and sustainability was built into all the activities, from the procurement to the operation of the Games.

An exemplar sustainable waste management objective was set during the design, demolition and construction phases of the Olympic Park, and sustainability targets, including an overall target of at least 90% by weight of demolition material to be reused or recycled, were adopted.

In addition to the design and construction of London 2012 Olympic and Paralympic Games, the ODA also took into consideration the post Games legacy, which is managed by the London Legacy Development Corporation.

The project achieved a 98.5% (427,531 tonnes) reuse and recycling rate. Over 1.5 million cubic metres of soil was cleaned onsite and reused. Approximately 22% of aggregates was from recycled and secondary sources.

The key factors of success and potential for replicability are as follows:

- Design out Waste (DoW): the objective is to minimise the amount of materials used for construction and to design future buildings for deconstruction in order to facilitate higher levels of reclamation and re-use;
- Demolition and remediation: integrate pre-demolition audits with materials management planning;
- Construction: operate as a single site in terms of waste management and set up a Waste Consolidation Centre (WCC) to achieve economies of scale, ensure accurate forecasting of waste and incentivise partner organisations via a share in savings and recognition through awards.

### 2.2.2. Discussion

#### Potential prevention indicators for sustainability

- Indicator of the reuse potential of building to avoid new building;

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<sup>2</sup> <http://www.bamb2020.eu/>

<sup>3</sup> [http://ec.europa.eu/environment/waste/studies/cdw/CDW\\_Task%202020Case%20studies\\_Olympic\\_v1.pdf](http://ec.europa.eu/environment/waste/studies/cdw/CDW_Task%202020Case%20studies_Olympic_v1.pdf)  
<http://learninglegacy.independent.gov.uk/publications/designing-out-waste-on-the-olympic-park.php>

- Indicator of the building design, as a proof of the efforts done to meet the target (e.g. waste/m<sup>2</sup>);
- Indicator of the measures achieved to renovate, in order to better understand how waste can be avoided or reduced in renovation and to supply guidance for policy makers;
- Indicator of the proportion of material used in buildings that could be later recycled into mineral aggregates;
- Indicator of the proportion of waste that can be easily segregated.

### **Target for CDW prevention**

- A distinction should be made between demolition waste and construction waste.
- How to find a good metric to measure prevention? GDP is used but it is probably not the best one. Alternative units have been suggested to measure the waste prevention evolution regarding the target:
  - Carbon footprint – link to the amount of material used (no consensus).
  - The entire environmental footprint (not only carbon) should be considered. Life cycle analyses (LCA) and product environmental footprints (PEFs) are important but such an approach needs a multiple level LCA (not only separated LCA for buildings, materials, manufacture, etc.). Also it is questionable as to whether LCA takes into account benefits from further use; benefits of extending the life of buildings are not necessarily known.
- No suggestion for a target at EU level was made since data quality is too poor, but good practice indicators/benchmarks could be set: this is important to gain a better understanding of the drivers and causes (e.g. types of construction activity), which would be useful for policy makers and industry.

### **Eco and long-lasting design criteria**

- There are lots of opportunities but the focus is primarily on construction waste (during the build), challenges include lack of awareness, know-how and information;
- It was suggested to make a building passport (including toxicity) mandatory for construction;
- The authorities need to pull the market to stimulate the use of new concepts in material designs;
- It is also important to have a look at the producer responsibility:
  - Set up price incentives;
  - Adapt the fee on the product depending on its level of toxicity / reusability / recyclability;
- There is a lack of recommendations from the EU on design.

### **Successful prevention measures**

- It is very important to educate architects with new courses, as in Finland where courses about steel and wood design are proposed to decrease the CDW waste.
- One participant cited the FISSAC project<sup>4</sup> (industrial symbiosis), which has some good examples for CDW.
- An example was given of a comparison of different building design producing different amounts of waste depending on the materials used and the way they were used including costs (Target Zero: [http://www.steelconstruction.info/Target\\_Zero](http://www.steelconstruction.info/Target_Zero)).
- It was agreed that building certification schemes should be developed.
- Design for deconstruction should be encouraged. In this view, it is important to look back at old design to avoid the waste production, especially of hazardous waste, as observed currently.
- From a circular economy point of view, the suppliers should be the owners of the waste they produce.

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<sup>4</sup> The FISSAC project involves stakeholders at all levels of the construction and demolition value chain to develop a methodology, and software platform to facilitate information exchange, that can support industrial symbiosis networks and replicate pilot schemes at local and regional levels (<http://fissacproject.eu/en/>).

# 3. Session on Demolition practices

## 3.1. Presentation of the session

### 3.1.1. Preliminary recommendations

Based on the preliminary findings of the study, the following preliminary recommendations were formulated:

- Make sorting on site compulsory: MS where CDW is separated usually achieve higher levels of recovery compared to MS with high levels of mixed waste. Source separation is more likely to occur where there are economic incentives or legal requirements, such as selective demolition;
- Make pre-demolition audits, selective demolition and post-demolition reporting compulsory;
- Enhance landfill restriction and landfill taxing, especially on inert waste;
- Incentivise design for deconstruction and develop standards for salvaged products;
- Improve the consistency of law enforcement across Europe:
  - Identify and set minimum resourcing levels needed to adequately enforce CDW related legislation;
  - Ensure all hazardous CDW is correctly identified and dealt with correctly;
  - Ensure all hazardous CDW is correctly identified and dealt with correctly Ensure all CDW hazardous waste is correctly identified and dealt with correctly;
  - Greater uptake of EDOC (electronic duty of care).

### 3.1.2. Key issues

Demolition practices are a key issue when it comes to CDW generation and recovery. Unfortunately, due to the ever-present low commitment level of clients / contractors on this issue and the large number of actors on construction sites, demolition practices too often result in the mixing of all CDW fractions and sometimes even in illegal dumping.

The key issues discussed during this breakout session were:

- Should sorting on site be compulsory? If yes: how should the sorting requirement be defined?
- Should pre-demolition audits and post-demolition reporting be compulsory and how should it be implemented?
- Should a mandatory deposit being requested by local/regional authorities before demolition and reimbursement being conditional to delivering proof of lawful CDW management?

### 3.1.3. Invited speakers

The following speakers presented their views on the topic of demolition practices:

- Johan D'Hooghe, European Demolition Association (EDA), Belgium
- Hervé Grimaud, Recylum, France
- Jean-Yves Burgy, Recovering S.a.r.l., France

## 3.2. Minutes of the session

### 3.2.1. Presentations

**Johan D'Hooghe** presented the view of EDA on demolition practices. On-site sorting, pre-demolition audits and post-demolition audits should be made mandatory but only if there is a need for a market for recycled materials. Binding legislation without a market is not efficient.

In the right context there are almost no limits to selective demolition (scrap, non-ferrous, gypsum, roofing, cellular concrete, glass, etc. can be separately dismantled and collected). But demolition is an economic activity and selective deconstruction only happens if an appropriate economic model is applied.

It is essential to carry out in-depth pre-demolition audits as the precision and the completeness of the information provided to the demolition contractor will affect the quality of the selective demolition performed.

Johan d'Hooghe also presented the situation in Flanders, where there are high taxes on landfilling and a landfill ban for recyclable fractions. In this context the actual rate of recycling of CDW is > 90% and a real market has been existing for many years already. Primary materials are not used anymore in road construction.

To improve this further and to level the playfield by enforcing the existing legislation for all the contractors, EDA started a cooperation with TraciMat vzw to trace demolition waste from jobsite to the recycler's gate (TraciMat system enables to distinguish between the high and low risk environmental profile of rubble and differentiate the recycling cost according to the high or low risk profile).

**Hervé Grimaud** presented the project Democles, a 2 years collaborative project involving more than 40 French stakeholders of the construction sector: Authorities, the national environment agency (ADEME), building owners, project managers, demolition companies, waste management companies, building material and equipment manufacturers participate in the project. The aim of DEMOCLES was to study with pragmatic approach measures to increase finishing works waste (FWW) recycling without increasing the global cost of projects, nor increasing the administrative burden. 6 renovation/demolition projects (residential, offices, hotels...) were accurately followed and about 20 projects were analysed.

10 million tons of FWW are produced every year in France, which represents 25% of total CDW. The recovery rate of FWW is below 35%.

FWW are made of 48% inert waste (bricks, ceramics, sanitary furniture...), 47% non-hazardous waste (gypsum, floor covering, windows, doors...) and 5% hazardous waste (lamps, treated wood, electrical equipment, asbestos, lead...)

Most FWW could be reused or recycled but they are not due to a lack of:

- Will/knowledge from building owners and projects managers
- Coordination between all actors
- Knowledge about what can be operationally recycled or not
- Appropriate packaging to allow proper recovery of FWW
- Transparency in waste traceability.

DEMOCLES conclusions to increase FWW recovery rate:

- Switch from a responsibility on demolition companies only to a responsibility shared by all actors, starting with building owners
- The building owner at the very beginning of the project (building refashion or demolition) must:
  - Express his will to achieve reuse/recycle/recovery targets due to regulation pressure, quality standards (HQE, LEEDS, BREEAM)...
  - Anticipate in the project the necessary time to perform a proper finishing work removal
  - Create in the tender process a demolition work package dedicated to a demolition contractor which is directly liable for the reach of the recovery target
  - Apply financial penalties in case reuse/recycle/recovery targets are not reached
- The project manager must:
  - Conduct a pre demolition audit in order to evaluate prior to the selection of the demolition contractor, the quantity and quality of each waste stream generated by the building refashioned or demolished (Mandatory in France above 1,000 m<sup>2</sup> of demolition).
  - Provide to demolition contractors competing for the contract, the pre demolition audit for relevant demolition works quotation.
  - Set a waste management plan, to share it with all contractors and to adapt it all the project long to take into consideration potential modifications.
  - Collect evidence of proper reuse/recycle/recovery of each waste stream and compare them with pre demolition audit data.
- Demolition contractor must:

- Be a specialist with all necessary tools/skills to remove and dispose FWW in a safe manner for human beings.
- Provide with its quote all details regarding the future of each FWW identified in the waste audit.
- Use appropriate containers/packaging to allow recovery
- Wastes manager must:
  - Stop to say that all FWW collected in bulk with a dumper truck will be sorted and recycled !
  - Provide relevant FWW pick-up logistics to allow proper and efficient recovery.
  - Publicize the list of FWW they can recycle or prepare for recycling with detailed quality criteria for waste acceptance.
  - Provide to their clients relevant recycling rate per waste stream and not their average recycling rate for all demolition wastes received.

Hervé Grimaud also pointed out that mixing all types of waste in the WFD objective might hide low FWW recovery rates behind the high recovery rate of concrete waste.

**Jean-Yves Burgy** presented the Life+ project Gypsum to Gypsum (GtoG)<sup>5</sup>. The main objective of the GtoG project is to change the way gypsum based waste are treated. The GtoG project aims at transforming the European gypsum demolition waste market to achieve higher recycling rates of gypsum waste, thereby helping to achieve a resource efficient economy.

The project involved 17 partners (including demolition and recycling companies, manufacturing facilities, universities and consultants) in eight countries.

The project aimed to:

- Phase A: Establish current practices in demolition/deconstruction, recycling and production of gypsum products in Europe.
- Phase B: Conduct pilot projects whereby the demolition companies applied best practices to the deconstruction of buildings in order to maximise the quantity of gypsum available for recycling. The pilot projects aimed to provide best practices for the audit of a building prior to deconstruction and also best practice deconstruction techniques.
- Phase C: Qualitative and quantitative assessment of the pilot projects and overall project.

The main conclusions of the pilot projects are as follows:

- The demolisher has a key role:
  - Deconstruction phase: Importance of the way plasterboards and plaster blocks are dismantled
  - Waste management phase:
    - Appropriate segregation and storage of the gypsum-based waste
    - Important role in the choice of the final outlet
    - Responsible for the follow-up of the waste until their final elimination or recovering
- Costs of classic demolition and selective demolition are similar but transport and treatment costs are 2 times lower for selective demolition due to better economic valuation of sorted waste. Below figures are based on a French refurbishment project:
  - 2.30€/m<sup>2</sup> for selective demolition costs versus 2.34€/m<sup>2</sup> for classic demolition
  - 0,48€/m<sup>2</sup> for selective demolition transport and treatment costs versus 0,95€/m<sup>2</sup> for classic demolition

### 3.2.2. Discussion

#### Waste management roles and responsibilities

- Pre-demolition audits should be mandatory and the owner of the building should be responsible

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<sup>5</sup> Case study:

[http://ec.europa.eu/environment/waste/studies/cdw/CDW\\_Task2\\_Case%20studies\\_Gypsum%20to%20Gypsum\\_Sept2015.pdf](http://ec.europa.eu/environment/waste/studies/cdw/CDW_Task2_Case%20studies_Gypsum%20to%20Gypsum_Sept2015.pdf)

Website: <http://gypsumtogypsum.org/>

- For projects including a demolition phase, the call for tenders should include a specific lot dedicated to demolition with a demolition company directly responsible towards the project owner, instead of having demolition made by subcontractors.

### **Pre-demolition audits**

- Pre-demolition audits (including audits prior to refurbishment) should be performed by specialists if they are meant to be useful for the demolishers. A certification for pre-demolition audits consultants could be relevant.
- In France the demolishers sometimes perform their own pre-demolition audit because it is rarely required in the project terms of reference and because pre-demolition audits by demolishers are of better quality. But it is long and costly for demolishers to do it. Pre-demolition audits should be performed by independent certified consultants to ensure high quality and absence of conflicts of interests.
- The example of Flanders shows that introduction of mandatory pre-demolition audits (under the responsibility of the owner of the project) has helped to reduce significantly illegal traffic.
- It was reminded that EDA provides training and guidelines for pre-demolition audits.

### **Hazardous waste management**

- Hazardous waste in concrete may pose a problem. EoW criteria entailing a comprehensive set of tests before recycled products are placed on the market may be a solution.
- Demolishers can play an essential role in dealing with hazardous waste: e.g. in Flanders demolishers may stop a demolition project if hazardous waste is found that was not detected during the pre-demolition audit and if the project owner does not want to pay for the treatment of this waste.

# 4. Session on Reuse

## 4.1. Presentation of the session

### 4.1.1. Preliminary recommendations

Based on the preliminary findings of the study, the following preliminary recommendations were formulated:

- Make eco and long-lasting design criteria more demanding for new buildings
- Promote waste exchanges and industrial symbiosis programmes to help match supply and demand
- Innovate to reduce the health and safety risks and the time needed for removing products for reuse during demolition
- Develop building passports and material passports, along with design for deconstruction and building information modelling (BIM)
- Improve construction products and materials declaration and recertification
- Incentivise the establishment of private/social enterprises to act as stockholders for products and materials, enabling their accumulation and retention for a demand that might not be available when they are removed from buildings at end of life.
- Invest in tools to have data that can be used to promote reuse in preference to recycling.

### 4.1.2. Key issues

Like prevention, reuse is regarded as the optimal solution to reduce unavoidable waste, but it has been neglected as a policy objective when compared to recycling and recovery. Some of reuse drivers (mandatory pre-demolition audits, waste exchanges, industrial symbiosis programmes) and barriers (certification issues, time needed to deconstruct) are known. The objective of this breakout session will be to think about the best ways to overcome the main barriers and to leverage and replicate the drivers.

The key issues discussed during this breakout session were the main barriers and drivers for reuse of construction products / materials.

### 4.1.3. Invited speakers

The following speakers will present their views on the topic of reuse:

- Petr Hradil, VTT Technical Research Centre of Finland, Finland
- Claus Juul Nielsen, Gamle Mursten, Denmark

## 4.2. Minutes of the session

### 4.2.1. Presentations

**Petr Hradil** presented the ReUSE (Repetitive Utilization of Structural Elements) research project, conducted in 2013-2014 on the drivers and barriers to reuse of structural elements. The aim of the project was to:

- summarize barriers and opportunities for structural elements reusing;
- define the reuse potential geographically;
- identify the most suitable materials and building elements to be reused.

Structures can be reused completely, their parts can be reused or can be repurposed. Demolition companies are already selling stairs, roofs, bars, or even complete building to be reused. It is already happening but not on a wide scale.

The main barriers identified are:

- Structural connections: glued, welded or grouted connections are difficult to separate;
- Material quality certification: there is a need to update CE marking rules or to provide alternative certification accepted by the authorities;
- Long service life:
  - performance criteria are changing over time;
  - it is difficult to predict the building's real fate;
- Public awareness and acceptance
  - generally the process is unknown to the owners and many contractors;
  - stakeholders want to have reusable buildings, but do not want to have reused buildings.

The main drivers identified are:

- Owners / developers / designers:
  - Higher value at the building's end-of-life (capital expenditure) can be expected;
  - Green credits can be applied for;
  - Reuse of structural elements allow flexible design and extended life, as buildings can be completely relocated.
- Contractors / demolition companies can sell the elements from deconstructed buildings.
- Product manufacturers can buy back their products after demolition.
- Material producers have new opportunities for more reusable materials to replace the traditional ones.

Future trends are modular reusable structures and custom-made not reusable structures made of recycled materials.

**Claus Juul Nielsen** presented the REBRICK project.

Reclaimed bricks are valuable product and are being taken out and cleaned by hand in many countries. Gamle Mursten is a company that puts on the market bricks (from buildings that have been demolished) that can be reused in building façades. The company recovers the bricks mainly from demolition companies (to a lower extent from waste collectors/handling companies), cleans them manually and tests their technical qualities before they are sold. They also provide a logistic solution for companies that demolish and want to rebuild after with the same material. The process of the company is also viable economically with a final price per brick ranging between 0.08 and 1 euro per reused brick vs. 1.5 euro for a new brick.

The company sells lime mortar and encourages the use of it. (The cleaning process of bricks is only possible for bricks that were put together with lime mortar; Bricks with cement mortar cannot be cleaned and therefore cannot be reused; however cement mortars are cheaper and are increasingly been used),.

The company scaled up the production process of reusable bricks and is now also developing readily made walls with cut bricks (thanks to a new robot technology).

Currently 50-60% of the bricks that arrive at the company can be reused, depending on the conditions under which demolition is undertaken. When considering tiles and half bricks, 70-80% is reused. The company sometimes has to pay for the material, sometimes they get paid to receive the materials.

There is no CE marking for the products, but the company is doing an ETV scheme with the same marking procedure than for the new bricks to increase their credibility on the market.

#### **4.2.2. Discussion**

The following issues were raised during the discussion:

- Standardization would contribute to increase the uptake of reused materials. However, it is a very complex and a lengthy process.
- Question of liability :
  - Who is liable for reusable product?

- The time lapse between buildings being built and the demolition phase makes it very difficult to have a company being liable for the materials in the building. It is the value of building materials that make them being reused. This is the case of steel for instance.
- One participant shared the example of Czech Republic, where demolition permits enable reuse of steel sections.
- New buildings are conceived as or include complex systems that may be more difficult to demolish selectively / recycle than old buildings. This bears the risk of less materials that can be recycled in the future and an increase in CDW sent to landfills.
- Many waste streams can be separated from a building, but it is necessary to have a system where this is economically viable.
- Reuse will be a local market due to the low value of materials and the high transport costs.
- It is important to take into account all aspects to achieve higher reuse rates: product requirements, design requirements (not just focus on manufacturer).
- It is unclear whether voluntary certification schemes are powerful drivers for reuse and whether the voluntary certification schemes should go beyond the certified buildings only.
- Reuse should be monitored to allow assessing performances and eventually setting targets.

Possible solutions were discussed:

- Use GPP (with specific requirements) as a driver for reuse;
- Make available more guidance on how to reuse elements;
- Showcase selected case studies to increase acceptance;
- Make end-of-life stage of buildings a priority as important as energy efficiency;
- Develop building passports containing information on the material content and on how to use it;
- Include CO2 savings in a credit to incentivise the use of reused materials, e.g. bricks;
- Develop waste exchange and industrial symbiosis programmes to help match demand and supply.

# 5. Session on Recycled materials market

## 5.1. Presentation of the session

### 5.1.1. Preliminary recommendations

Based on the preliminary findings of the study, the following preliminary recommendations were formulated:

- Enhance green public procurement through the introduction of mandatory percentages of recycled aggregates in large civil engineering projects
- Develop a reuse/reclaimed products programme of support & promotion within MS and across the EU. A powerful driver could be to have a reuse % target – either for management of CDW or to displace new products and materials that would otherwise have been used in the built environment
- Develop standards for recycled materials for various utilisation for waste that did not meet EoW criteria
- Facilitate material content traceability
- Encourage the use of Environmental Product Declaration (EPD) in order to facilitate the assessment of construction products and materials sustainability
- Introduce EoW criteria for recycled aggregates across all MS? At EU level?
- Introduce for non-aggregate applications across all MS
- Encourage the construction products and materials supply chain to have much greater provision for taking back and incorporating recycled materials into new products
- Deploy financial incentives to use recycled aggregates, e.g reduction on VAT for recycled materials

### 5.1.2. Key issues

It is crucial to develop the recycled materials market in order to promote recycling over landfill. Indeed, without secured trade opportunities and profitable selling prices, the recycled materials market will never take off. In this view, technical standards and End of Waste criteria, as well as the public procurement lever, should be developed and strengthened.

The key issues discussed during this breakout session were:

- To what extent and under what conditions could green public procurement be enhanced?
- Should/could standards for recycled materials for various utilisation be developed?
- How to facilitate material content traceability?
- End of Waste state of play

### 5.1.3. Invited speakers

The following organisations/speakers have been invited to present specific insights on the topic of recycled materials content:

- Brian James, European Aggregates Association (UEPG), UK
- Vincent Basuyau, DG GROW, European Commission
- Geert Cuperus, Fédération Internationale du Recyclage (FIR), The Netherlands

## 5.2. Minutes of the session

### 5.2.1. Presentations and discussions

**Vincent Basuyau**, presented 2 key initiatives for recycling CDW which are part of the EU action plan for the Circular Economy: pre-demolition study/guidelines and common CDW Management Protocol in the EU.

- First initiative: A study to develop a pre-demolition and renovation waste audit
  - The study started in January 2016 and focusses on the following key issues: market, methodology, economic, regulatory, cultural aspects.
  - The objective of the study is to improve the recyclability of CDW through:
    - Tools and/or guidelines for assessment of building prior to demolition and renovation;
    - Operational information for maximization of recycled materials beforehand.
- Second initiative: A common CDW Management Protocol.
  - There are currently some barriers for secondary materials market, in particular low perceived quality of CDW derived materials
  - The Protocol includes a common set of principles to increase confidence:
    - CDW industry professionals expertise and best practices
    - Uptake by public authorities and support
    - Transparency, traceability, monitoring and reporting
  - The Protocol is co-produced with industry, national authorities and the Commission.
  - The final draft of the Protocol is expected by end of June 2016. Dissemination and communication of the Protocol will then be completed by mid-2017.

**Brian James** presented the recycling task force of UEPG. The objectives of this task force are as follows:

- To promote recycling in a sustainable way, at a realistic level: for the most appropriate application on the place of use and provided it is environmentally and economically viable. Limitations of recycling should also be underlined: extraction of natural aggregates cannot be totally replaced by recycling (current figures show that 100% recycling of CDW would cover only about 20% of the total demand).
- To give clear definitions of recycled aggregates and increase the level of reliability of data and statistics.
- To share best practice and inform members about ongoing European projects related to recycling
- To address EU institutions' topics related to the promotion of recycled aggregates (EoW, taxation, waste targets, etc.).

The current barriers to increase the uptake of recycled aggregates are:

- Quality (and perceived quality): Recycled aggregates can compete only if their quality is equivalent to that of natural aggregates.
- Economic:
  - Acceptability of the product on the market is a major issue.
  - Location: high transport costs means recycled materials will be used locally.
  - Tax incentives: high landfill tax supports recycling tipping fees.
- Environmental cost.
- Legislation: There is a lack of a comprehensive policy (waste/water/CE Marking).

In order to develop recycling:

- End of Waste Criteria are needed.
- Potential users need clear information about uses and availability of recycled materials .
- It is necessary to understand the limitations of recycling: it cannot replace all virgin materials. A 100% recovery rate would only cover 20% of aggregates demand.

Mr James also described the UK Aggregates Levy, which according to Mr James did not succeed in lowering demand for virgin materials and stimulate the use of recycled aggregates. To increase recycling, other factors are more important than the levy:

- Increasing cost of landfill, including landfill taxes;
- Increasing willingness of clients to use such materials, implying greater technical awareness and confidence in these material;
- More “professional” marketing of recycled and secondary materials.

**Geert Cuperus** presented the Dutch example and the actions taken by the government to improve management of CDW.

A few years ago CDW were commonly backfilled under the roads and used to fill ditches, inducing contamination of soils and asbestos under roads. In response to this situation, several measures were taken and all stakeholders were mobilised:

- The government established an adequate legislation, including a landfill ban
- The industry developed trust in recycled materials
- The ministry of Transport started to take up recycled aggregates through green procurement (GPP) schemes.

If no measures had been taken, there would still be massive backfilling and landfill in the Netherlands. But thanks to the momentum initiated the Netherlands reached over 95% CDW recycling in just a few years .

Thanks to willingness of government to close loops, innovative entrepreneurs, clients willing to cooperate and sound preparation and good quality assurance, materials such as aggregates, incinerator bottom ashes, PVC tubes, plastics and roof bitumen are now recycled in the Netherlands. It is to be noted that this was achieved without Environmental Products Declaration (EPD) nor End of Waste (EoW) criteria and little GPP.

Mr Cuperus indicated that the next steps that should be taken are the introduction of an incineration ban for recyclable materials and further joint action to recycle all waste (e.g. gypsum and insulation materials).

Mr Cuperus relativized the importance of EoW criteria as they do not add much in countries where an appropriate framework already exists. On the other hand, setting EoW would not be very helpful in less mature countries wishing to develop CDW recycling. The following elements would be needed as well:

- Well controlled selective demolition;
- Acceptance procedures;
- Factory Production Control;
- Compliance with EN standards;
- Compliance with environmental requirements;
- Have quality assurance schemes in place.

Mr Cuperus also made complementary recommendations on how to support the recycled materials market:

- Prescribe a minimum recycled content or labelling.
- Set framework conditions (including enforcement) and let the market do his job.

# 6. Session on Data collection practices

## 6.1. Presentation of the session

### 6.1.1. Preliminary recommendations

#### Data quality

As far as the methodologies of CDW data collection are concerned, the common points between Member States characterized by a good level of quality of their CDW data, and the subsequent recommended practices to ensure the quality of CDW data are the following:

- For Member states using surveys to collect data on CDW:
  - The survey should be updated on a yearly basis and should cover a representative sample of industries, following some thresholds based on the number of employees (e.g. as in Portugal) and/or on the generated amount of CDW (e.g. as in Slovenia), to assess which groups of industries have to be either exhaustively selected, or in part, or not considered at all (in line with the WStatR manual).
  - An extrapolation of CDW data is often necessary when collected information do not cover entirely the actual waste production and treatment deposits. For example, in case of surveys, the non-replying and non-questioned waste producers have to be estimated using data reported by similar units. Easily available economic proxies (e.g. Turnover and employment) are recommended used to choose the reporting unit within the same sector that is most similar to the non-reporting unit. A possible method used to choose which unit is more similar to the one missing is the closest neighbour unit method (e.g. in Portugal).
- For Member states using administrative sources to collect data on CDW:
  - The key points are to avoid both the undercoverage (and the subsequent underestimation of CDW amounts) and the double counting (and subsequent overestimation of CDW amounts). This last issue is of paramount importance when CDW generation data are estimated based on treatment data (secondary information). Therefore, two efficient methods can be used. The first recommendation is to adopt an input oriented approach for CDW generation data (e.g. as in Germany), which means that treatment plants report directly to the NSO the amounts of waste received for treatment (rather than the amounts of CDW leaving the plants). Also, some MS have established systems to ensure the traceability of CDW and provide reliable data, e.g. allowing to avoid double counting.
- For all data collection methodologies, consistency and comparability among Member states could be improved by:
  - Having a common definition of CDW : i.e. Excluding dredging spoils (EWC code W127) and of soils (EWC code W126) from the definition of CDW (these waste types are not supposed to be declared as CDW according to the definition of CDW used by the EC, as explained in the section 2.1.1) ; Some MS (e.g. Finland) include soils in W121, leading to an overestimation of CDW amounts (see the section 5.1.2);
  - Separately reporting backfilling data, even though a clear definition does not always exist in all MS.
  - The collaboration of different national organisms to achieve the wide range of tasks all along the process of CDW data collection. These kinds of collaboration ensure a cross-check of the data, probably inciting each actor to thoroughly achieve its task.
  - The statistical control (quality checks) and correction of the data: external controlling organism (e.g. in Germany) or experts from NSO (e.g. in Czech Republic and Denmark) perform manual checks (first undertaken by experts in the field and then by contacting respondents to clarify any technical issue) and/or automatic checks.
  - The inclusion of waste imported and the exclusion of waste exported in the treatment table.

## Data exhaustiveness

Apart from improving existing data, the present study has showed that, in order to best measure CDW management practices, more detailed data should be collected:

- Waste generation data at site, activity, regional and national level for new build, demolition and refurbishment waste;
- Waste generation data at material and product level;
- Waste treatment data available for reuse, recycling, 'backfilling', energy recovery and disposal;
- Waste treatment data split by recovery route and material type;
- Waste treatment data split by recovery route, sector and activity type.

### 6.1.2. Key issues

Statistical reliability is of outmost importance to ensure the validity and precision of any kind of analysis on CDW and hence for policymaking.

The key issues discussed during this breakout session were:

- How to improve data quality and level of detail: splitting by nature / outlet?
- How to improve data exhaustiveness: on recycled and reclaimed content, on reuse, on prevention...?
- How to ensure the same level of quality across all MS: definitions, data collection process, frequency?
- Should recycling and recovery be reported separately?
- Should construction waste and demolition waste be reported separately?
- Should MS report about their treatment and disposal facilities?
- Should a specific R-code (for recovery operations according to the Waste Framework Directive) be introduced for backfilling?

### 6.1.3. Invited speakers

The following speakers presented their views on the topic of data/statistics:

- François Wiaux, Institut de Conseil et d'Etudes en Développement Durable (ICEDD), Belgium
- Gillian Hobbs, Building Research Institute (BRE), UK
- Dr Cornelis Peter Baldé, Statistics Netherlands, The Netherlands

## 6.1. Minutes of the session

### 6.1.1. Presentations

**François Wiaux** gave a global overview of the data collection practices in the EU and ways to improve the reporting. Based on the analysis undertaken (see Chapter 4 of the study), it appears that the overall quality of data is modest: 2.3/5 in average, ranging from 1.5/5 to 4.3/5.

Recurrent problems identified in reported data are:

- Overestimation of mineral waste due to:
  - Double counting (9 MS) and
  - Inclusion of soils in EWC-Stat<sup>6</sup> 12.1 (Mineral wastes) instead of EWC-Stat 12.6 (Contaminated soils and polluted dredging spoils) (4 MS).

Since EWC-Stat 12.1 constitutes about 95% of the total amount of non-hazardous waste, overestimating this waste category has a tremendous importance

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<sup>6</sup> EWC-Stat is the European Waste Classification for Statistics

- Under-estimation of metallic waste (6 MS)
  - Classification of metallic scrap is unclear for some (many EWC codes could apply)
  - Metal recovery is often not considered as waste treatment (some members states and/or treatment centres may indeed consider metal scraps as new resources more than as waste)
  - Stakeholders tend to report all metallic wastes (gathering 06.1, 6.2 and 06.3 codes) as EWC-Stat 06.3 (mixed ferrous and non-ferrous).
- Under-estimation of wood waste (3 MS): a significant amount of wood waste is reused, which is no longer qualified as waste
- Null values of hazardous glass waste (EWC-Stat 07.1) (26 MS): there is often confusion with hazardous mineral waste and small pieces are often not collected separately from mineral CDW
- Underestimation of asbestos (EWC-Stat 12.B) (4 MS): asbestos is sometimes mixed with other mineral CDW (EWC-Stat 12.1)
- Underestimation of hazardous mineral waste (EWC-Stat 12.1) (7 MS): these waste are often illegally managed and therefore not reported

Key lessons to learn from 'best practice':

- If a survey is used to collect data, it should be updated on a yearly basis and cover a representative sample of industries. An extrapolation of CDW data or an estimation of missing firms should be performed.
- To avoid both the undercoverage and double counting, tracing systems are used with success.
- Dredging spoils (EWC-Stat 12.7) and soils (EWC-Stat 12.6) are excluded from the definition of CDW
- Backfilling should be available and separately declared, even though a clear definition does not exist in all MS.
- The collaboration of different national organisms and the statistical control (quality checks and correction of the data) are essential to obtain reliable data
- The non-use of 'pre-treatment' codes and lack of information on the final treatment lead to underestimations of amounts treated.

Some countries can be taken as example: Germany (administrative data sources), the Netherlands (survey – Second presentation), Slovenia (combination) and the United Kingdom, where some local methodologies of CDW data collections are also interesting, e.g. SMART (England).

**Dr Cornelis Peter Baldé**, presented the Dutch statistics methodology on CDW.

Statistics on CDW generation and treatment in the Netherlands are obtained through a survey. Information is collected according to LoW codes. Chapter 17 of the LoW codes is used to distinguish CDW.

All waste transports are registered in the Netherlands (consignment registry), there is a reporting obligation.

For waste generation, all data entries are analysed and to avoid double counting the assumption is that waste generation is equal to waste collection, which is true for most waste types. Amounts coming from industry and municipalities (households waste) are known from other surveys.

For waste treatment: an average of waste treatment per waste code is determined. Several assumptions have to be made because it is impossible to follow the different pre-treatment flows until final treatment.

The main recommendation is to extend waste statistics:

- Include consumption, lifetime and stocks
- Include better forecasts on CDW generation in future
- Provide better insights in urban mine
- Provide better insights in suboptimal waste management
- Include composition of built environment
- Provide more effective indicators when value is also considered

**Gillian Hobbs** presented on SMARTWaste, an online construction site monitoring and reporting tool.

It is crucial to have separate data on waste prevention, reuse, recycling, distinguishing construction, demolition and refurbishment in order to set targets, measure performance, plan for appropriate infrastructure and prioritise actions.

Therefore it is important to collect site based data to enable benchmarking. Measuring through environmental data collection enables to save money and time, achieve compliance and improve performance. SMARTWaste measures all site based resource use and waste in one online tool:

- On average SMARTWaste users have reduced related costs by £12,000 per project;
- SMARTWaste has been used on more than 14,000 projects valued at £125 billion;
- SMARTWaste users have reduced waste generated onsite by over 40%.

## 6.1.2. Discussion

### General comments

- Data quality is of tremendous importance to monitor progress towards meeting targets to prioritise actions and to provide accurate forecasts.
- Data quality is variable across countries and comparability is not always achieved among MS.
- MS tend to have problems due to:
  - Double counting
  - Misclassification (separate collection at the generation site not performed)
  - Underestimation (waste that cease to be waste or multiple pre-treatment steps)
- The Commission provided information on the current work being carried out for the amendment of the WFD. Several options are being discussed:
  - Impose a yearly reporting for the target;
  - Include a definition of backfilling in the WFD;
  - Include a distinction between recycling and backfilling in the reporting obligations..

### Is it interesting to have more detail in the data available?

- Representatives of the Commission expressed their preference to have more detailed information:
  - A distinction between construction and demolition and
  - A distinction between recycling and recovery would be helpful.
  - Furthermore a list of treatment disposal facilities (subject to permits) would be useful to have an overview of existing capacities and potential bottlenecks at regional level.
  - The Czech Republic indicated that there are already problems in the current reporting (two existing catalogues LoW - EWC-Stat)
  - Finland could agree to more detailed reporting if the existing obligations are harmonised.
  - Further guidance is needed on how to harmonise the current data collection.

### Would it be easier for MS reporting to have a separate R code for backfilling?

The representatives of the Commission would be in favour of a separate R-code to avoid confusions. The representative of the Czech Republic agreed.

### Ways to improve the current reporting

- An electronically based system seems to be much more efficient
- Strong collaboration between different institutes seem to gather very efficient results regarding data quality.

# 7. Restitution from the breakout sessions

The following is a summary of the restitution of the breakout sessions. For each session are indicated the main conclusions and the remarks and questions by the participants, if any.

## Session on EU targets

### Main conclusions

- Would introduction of separate targets for each type of waste help increasing the recovery rates of non-inert waste?
  - Not until data is much better
  - All EU Member States have different states of play so separate targets should be tailored to individual MS performance and help drive up quality of recycling, not just quantity.
- Should the existing 70% recovery target for CDW be kept and an additional recycling target (e.g. 50%) be introduced to ensure that the 70% target cannot be met by backfilling only? This was not discussed specifically but it appears that more work is needed on backfilling issue first.
- On backfilling:
  - Most participants agreed that backfilling should be kept in the recovery definition but more precisely defined.
  - A specific R-code (recovery operations according to the Waste Framework Directive) should definitely be introduced for backfilling.

## Session on Data collection practices

### Main conclusions

- Representatives of the European Commission believe that it would be useful to gather more detailed data, in particular a clear distinction between construction and demolition waste on one side and between recycling and recovery on the other hand. More details on treatment facilities would also be very useful.
- Member States are reluctant to more detailed data as many of them already have issues with the current requirements.
- As the participants of the session on EU targets, the participants of the session on data agreed that a separate R-Code for backfilling would be needed.
- Having only one statistics body in charge of the national data collection system is preferable

## Session on Demolition practices

### Main conclusions

- Pre-demolition audits and on-site sorting are the key for a good management of CDW
- The building owner should be responsible for the pre-demolition audit (including also renovation/refurbishment) and it should be mandatorily performed by a certified company
- Selective demolition practices are a win-win situation but there is a lack of knowledge on the side of building owners and project managers.

### Remarks and questions

- Pre-demolition audits require a high level of expertise but their cost moderate, (less than 1 Euro per ton, according to Austrian sources).

- Pre-demolition audits are essential since they enable all players to know the composition of waste, which commits the building owner and makes it easier to find markets for the different waste types.
- Finishing works: construction companies, who perform a lot of deconstruction works, are not always competent to read and understand pre-demolition audits reports

## **Session on Recycled materials markets**

### Main conclusions

- If a clear political will is shown, including adequate legislation (landfill tax or ban, green public procurement), and good enforcement), high recovery rates can be reached in a few years.
- It is not EoW criteria or binding regulation that lead to high recovery rates, it is more about having a comprehensive framework in place: selective demolition, acceptance procedures, production control, environmental requirements, quality assurance schemes...
- If these preconditions are met, setting EoW criteria is straightforward.
- Recycled products face the problem of their perceived quality, which has to be overcome to move towards a circular economy,

### Remarks and questions

- Markets cannot rule everything. The governments have to be proactive and set the framework conditions, especially through landfill regulation and green public procurement.
- Interaction between the clients and the recyclers is key.
- EoW criteria can further contribute to promoting recycling.
- The potential second and third lives of materials must be taken into account when certifying recycled materials.
- GPP: Recycled content should not be applied to all materials but only for the ones that need it most.
- Incentives for eco-design on the supply side are needed.
- It is too simplistic to say that there is a lack of demand for recycled materials: there is a market if they can prove that they meet the quality requirements.

## **Session on Prevention**

### Main conclusions

- Waste prevention is too complex (different approaches towards demolition - long lifetime of construction products – and construction waste) to set up a specific target.
- There is a need for specific best practice benchmarks.
- It is important to understand the causes of the waste generation. Most interesting prevention indicators at building level are:
  - Indicator of the building design, as a proof of the efforts done to meet the target (e.g. waste/m<sup>2</sup>);
  - Indicator of the proportion of waste that can be easily segregated and recycled;
  - Indicator of the proportion of waste that can be easily segregated.
- Much work is needed on design for deconstruction.
- Is the Waste Framework Directive the right vehicle for waste prevention?

### Remarks and questions

- Soil stabilizing instead of soil excavation is a good way to prevent waste produced by road construction
- Additional research is needed to find workable indicators to measure prevention.

## **Session on Reuse**

### Main conclusions

- The main barrier is the absence of a real system in place for reused products, especially regarding standards.
- GPP is a major driver to stimulate demand
- Incentives through CO2 savings could be imagined
- There is an important issue of liability and ownership

# 8. Debate

Below is a transcript of the “How to move towards CDW management in line with the waste hierarchy – priority of actions” debate.

The participants of the debate were:

- Gunther Wolff (European Commission, DG Environment)
- Geert Cuperus (Fédération Internationale du Recyclage)
- Christophe Sykes (Construction Products Europe)
- Jean-Yves Burgy (Recovering)

The debate was moderated by Mathieu Hestin, from Bio by Deloitte.

## **What is your evaluation of the workshop and what would you like to emphasize about it?**

**Mr Sykes:** The main issues that concern increasing recycled content are reliability and cost. If a recycled product is more expensive relative to a non-recycled product, clients are less likely to buy it. Currently, there is a lack of recycled materials in markets. Producing products with recycled components takes time and requires long-term investment. Consequently, reliable sources are limited.

**Mr Cuperus:** There are very positive things happening. The workshop discussed the right measures to go forward. Now, the challenge faced is implementing them.

**Mr Wolff:** We have seen a number of best practices but indeed the current challenge is implementing what already works in some of the Member States in others. Today we found food for thought, but cooperation will be needed to ensure the effective transfer of best practices.

**Mr Burgy:** It is a pity that we have fixed the objective yet we are unable to collect reliable data. In addition, if we want to move forward we need to overcome obstacles, such as low landfill tax.

## **Does the 70% target put too much of an emphasis on inert material? Do we need specific targets?**

**Mr Sykes:** Some materials are easily recycled because they have a value. Setting specific targets won't solve the problem. In Flanders it works because there is a comprehensive system in place with all stakeholders involved. Waste management is the biggest income for the mafia: we need to regain control of waste. This can only be done through enforcement.

**Mr Cuperus:** The initial step is management of aggregate since there are high volumes as well as demand from clients (national authorities). Where to begin with implementing a system? It starts with political will. There are countries and regions where recycling systems have been set up within the space of a few years.

**Mr Wolff:** The Commission has mixed feelings about specific targets. The sorting obligation has the potential to build the framework for obtaining clean fractions while compulsory pre-demolition audits would create the conditions for better recycling of all materials. At the same time, recycling facilities must be developed and landfill made more expensive.

**Mr Burgy:** This shouldn't be decided at EU level but at regional level, with attention to local contexts: economic, organisational... In areas where no facilities or infrastructure exist it is not feasible to apply the same objectives.

**Mr Sykes:** Auditing and sorting are not enough. We need to talk to manufacturers: is it the right size? Is it the right shape? How can we transport it to the right site? We need to understand the process in order to deliver something that can be used.

**Mr Wolff:** Of course this is very important. Logistics is also very important. However, the first part of the equation is: pre-demolition auditing and the sorting obligation for CDW, which are essential. In addition, legislation has to be enforced, especially on illegal dumping.

**Mr Cuperus:** One major step would be an incineration ban, so that waste would go to recycling facilities. Authorities have a big role to play.

### **What is the EU doing in the domain of sustainable CDW management?**

**Mr Wolff:** Besides this study, several projects are in progress, in particular the study on Pre-demolition and Renovation Waste audits and the Common CDW Waste Management Protocol in the EU. Unfortunately poor quality of data has prevented us from including more precise requirements in the circular economy package. The European Commission is aware of the backfilling issue and has proposed a new definition to provide more clarity. In addition, an obligation to sort CDW has been introduced as a legislative proposal.

Some actions are foreseen within the framework of the circular economy action plan, including actions to promote green public procurement.

We will see the follow-up of the study. As the circular economy package is being discussed now, it is not the right time to come up with new legislative proposals.

Some actions might be taken Member States as well. Targets for prevention or reuse would not make sense now but action at the micro level is possible, i.e. focussing on benchmarks and best practices.

### **Question from a participant: Don't you think industry should be incentivised through something like carbon credits?**

**Mr Sykes:** Incentives always work but what happens when incentives stop?

**Mr Cuperus:** Instead of incentives, I think that landfilling and incineration should be stopped and their ban enforced.

**Mr Burgy:** There are other mechanisms. For certain waste streams, the whole recycling route in France is paid for by the producers (Extended Producer Responsibility, EPR), for example for Waste electrical and Electronic Equipment (WEEE). However, there are some issues that concern, for instance, reaching the objectives. If financial conditions are favourable, having EPR can be a good solution.

**Mr Sykes:** EPR systems should not be generalised to construction materials.

**Mr Wolff:** The types of economic incentives implemented to promote C&D waste recycling need to be decided at Member State level.

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