



Conference « Waste as Materials »  
Košice – Est Slovakia – 18 October 2012

# Trends waste from demolition valorization

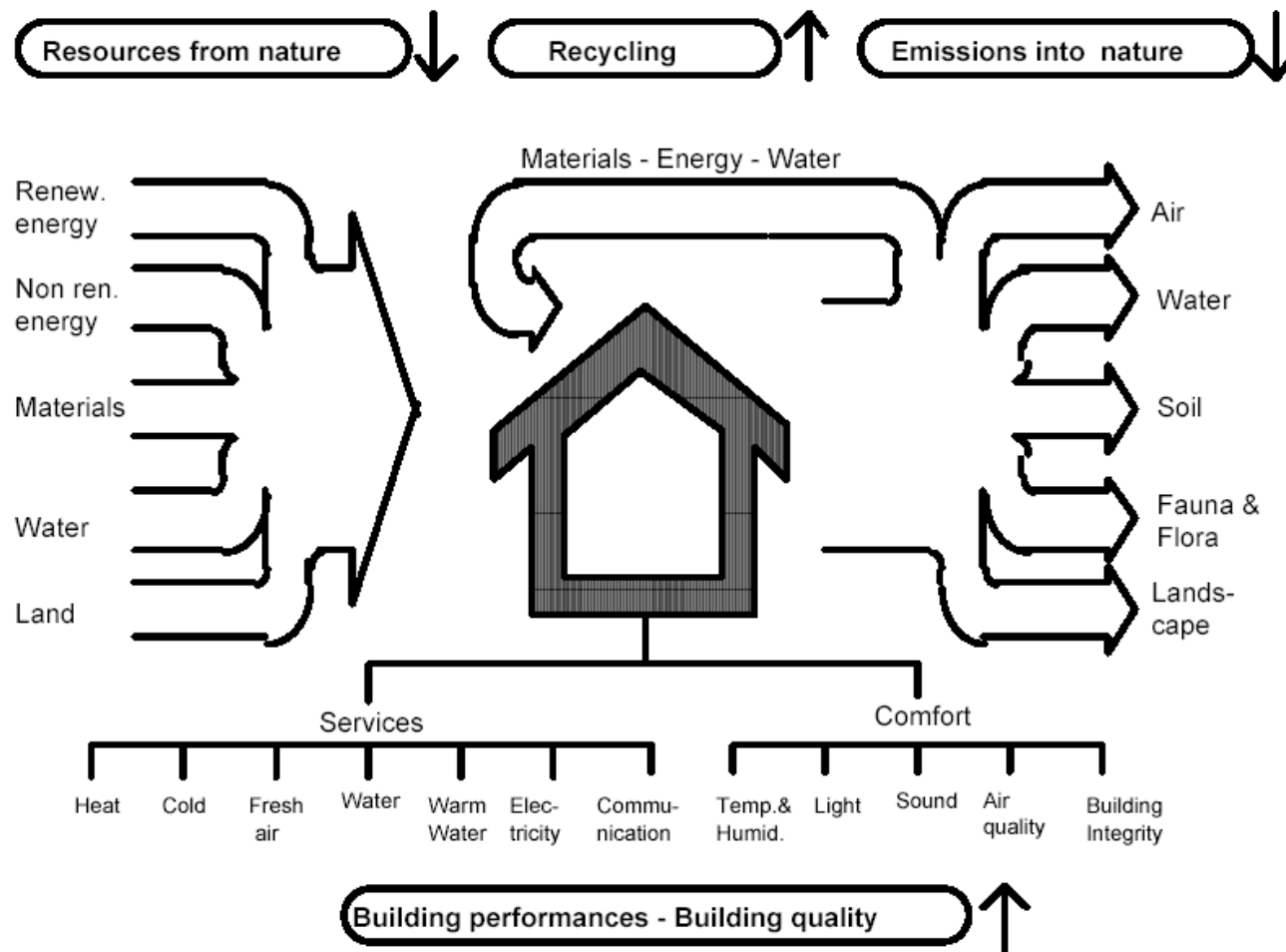
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# Urban metabolism of buildings



# Construction and Demolition Waste(CDW) : first stream of waste

- **Building and works : shorter life expectancy:**
  - 60 years in EU countries,
  - 45 years in USA,
  - 30 years in Japan
- **Demolition works produce waste:**
  - CDW > 1 t / capita per annum  
i.e. 500 millions tonnes per year in the EU
- **After construction boom of 1945 – 75 period,**  
CDW volumes will increase tremendously in the coming years



# Construction & Demolition Waste : Uncontrolled dumping threatens environment



# Recycling Construction & Demolition Waste: a must-do for sustainability

- To save non-renewable natural resources:  
sand, gravel and rocks from pits and massive rock quarries
- To spare environment (natural milieu)
- To reduce transportation and energy consumption
- To reduce non-recovered waste set for abandonment
- To make projects sponsors aware of their responsibilities  
towards environment
- To generate new job opportunities



# Construction & Demolition Waste : a growing stream within all Europe to be managed locally

- 500 Mt inert waste recyclable within EU-27
- 42% currently recycled ( $\approx$  200 Mt)
- **Diverse situations**
  - > 70% UK-B-NL-D-PL
  - > 35% et < 70% CZ-S
  - > 10% et < 35% A-F-I-RO-SK
  - < 10% other MS
- **Europe: Target 70% of the C&D Waste i.e. 350 Mt**

# European Community framework: Directive 2008/98/CE « Waste »

- Waste prevention
- Re-using – Recycling – Recovery
- End of Waste criteria:
  - Current (re)-uses
  - Actual market
  - Non hazardous for Health & Environment
- In 2020 :
  - 70% re-used or recycled as construction fills
- REACH :
  - Recycled Aggregates = Articles (Not to be registered)

**Table 4.2 Recycled amounts in the EU-27 Member States plus Norway in 2006/2007 related to EU directives, which include binding recycling/recovery targets**

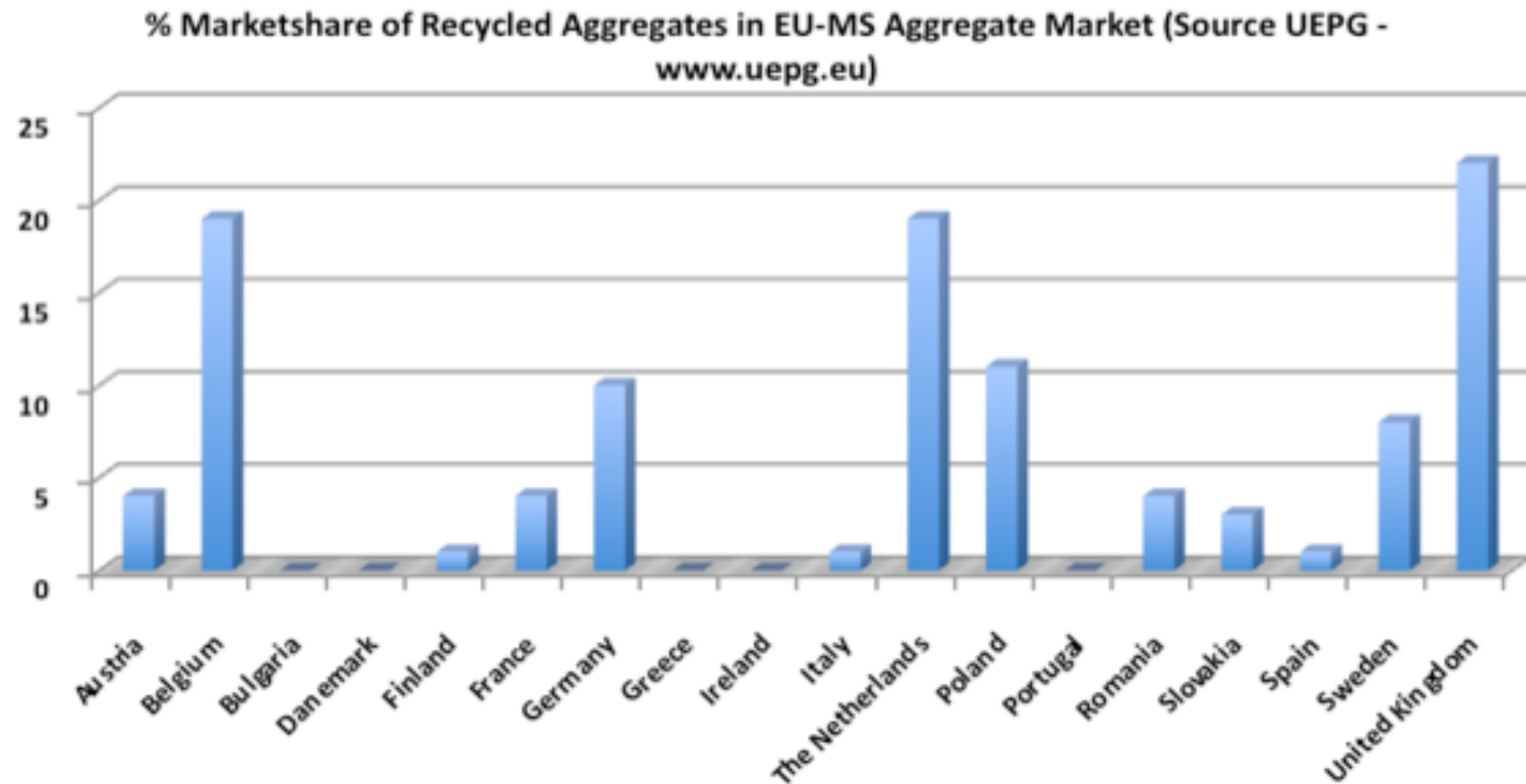
	Generation	Recycling + reuse currently achieved <sup>a</sup>	Estimated reuse+recycling rate <sup>f</sup>
	Million tonnes	Million tonnes	
Packaging waste (2007)	82.5	48.3	59 %
End-of-life vehicles (2007) <sup>a</sup>	6.1	5.0	82 %
Waste electric and electronic equipment (2006) <sup>b</sup>	6.7	1.5	23 %
Municipal waste (2007)	262.3	101.5	39 %
Construction and demolition waste including soil (2006) <sup>c</sup>	971	518	53 %
Total waste targeted with EU recycling targets (2006)	1 329	675	51 %
Estimated total waste in the EU, without waste from waste treatment operations <sup>d</sup>	2 803	1 062	38 %

- Notes:**
- <sup>a</sup> Arising and treated at authorised treatment facilities. Slovenia is included with 2006 data. 4.51 million tonnes are recycled and 0.51 million tonnes are reused.
  - <sup>b</sup> WEEE generation figure covers amount put on the market, as generated amount is not known. Twenty-two countries have reported and 18 countries have reported recycling and reuse of WEEE.
  - <sup>c</sup> The recycling amounts include material recovery and backfilling operations. Soil is also included but excluded in the new recycling target for construction and demolition waste of 70 % by 2020. Data about recycling of construction and demolition waste have been found for 18 countries.
  - <sup>d</sup> In order to avoid double counting, the amount is calculated by using the total generated waste amount according to Eurostat less the waste generated by waste management facilities. Recycling is calculated as the difference between waste recovered and waste incinerated with energy recovery.
  - <sup>e</sup> Reused waste included only for ELV and WEEE.
  - <sup>f</sup> The achieved recycling rates for WEEE, MSW and construction and demolition waste cannot be directly compared to the recycling targets in Table 4.1 as they are partly calculated differently than required by the respective directives.

**Source:** Calculated by ETC/SCP, based on data from Eurostat Data Centre on waste, March 2010 and ETC/SCP, 2009a.



# Recycling podium in the European Union



# Waste or secondary primary resource?





# Is recycling construction & demolition waste an environment friendly activity?





# 1 - Discriminating and storing incoming raw construction & demolition waste by nature





## 2 - Calibrating demolition waste before crushing





### 3 - Crushing materials to be recycled



## 4 - Sorting and extracting foreign materials





## 5 - Screening Stones, Coarse Aggregates and Sand





## 6 - Specifications and quality control for recycled materials





UEPG

## Recycling Policy Statement

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As a significant contribution to the sustainable development policy, UEPG welcomes and encourages the use of recycled aggregates. UEPG considers the following issues to be of importance:

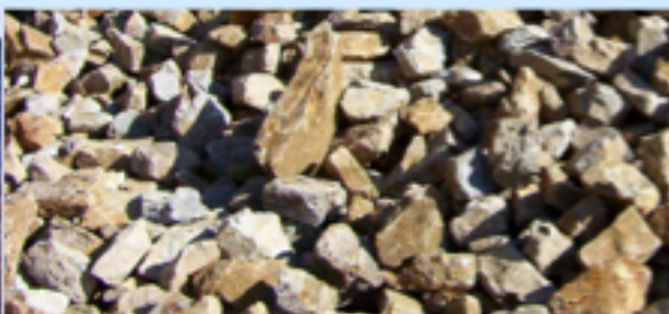
- Recycled construction materials are an additional source of aggregates,
- The same technical rules should apply to all aggregates irrespective of their origin,
- Integration of recycled aggregates into the standards of CEN TC 154,
- Quality certification of recycled aggregates should be promoted,
- Environmental regulations and controls should apply to fixed and mobile recycling plants.

Paris/Duisburg, 2 May 2000

Vincent Basuyau  
Chairman UEPG Recycling Committee

Hans-Peter Braus  
Secretary General

# Recycling Ecological Paradox



	Natural materials	Recycled materials
Producing	<b>Extraction ban</b>	<b>Recycling incentive</b>
Using	<b>Traditional</b>	<b>Reluctancies</b>



## Competitiveness at stake

<b>Advantages</b>	<b>Impediments</b>
<b>No raw primary material purchases</b>	<b>Low productivity</b>
<b>Service to companies and local authorities</b>	<b>Workforce intensity</b>
<b>Market proximity</b>	<b>Urban locations</b>

**With higher production costs, recycled materials can compete with natural materials if only they benefit of market proximity.**



# Recarbonation through Recycling

Nordic study (2005) has shown that between 25% and 50% of the CO<sub>2</sub> emitted during the cement manufacture can be re-absorbed by concrete crushed during recycling!

Confirmed by 2010 New Zealand study

An unexpected environmental benefit!



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# Conclusions

## Professionnallism

- Knowledge dissemination
- Best practices
- Standardization
- New paradigm for construction

## Economy

- Raw materials costs
- Waste dumping costs
- Integration of environmental costs in building
- Marketing

## Environment

- Wastes = Resources
- Transportation reduction
- Energy saving
- Environmental regulation