# IMPLICATIONS ON RECYCLING ACTIVITIES IN THE CEMENT AND CONCRETE SECTOR

Vienna, 25 Oktober 2011

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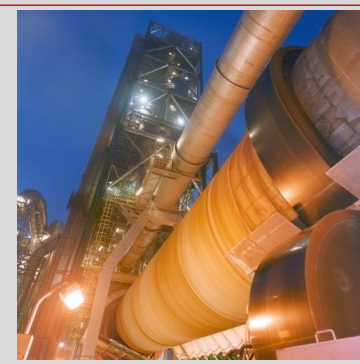
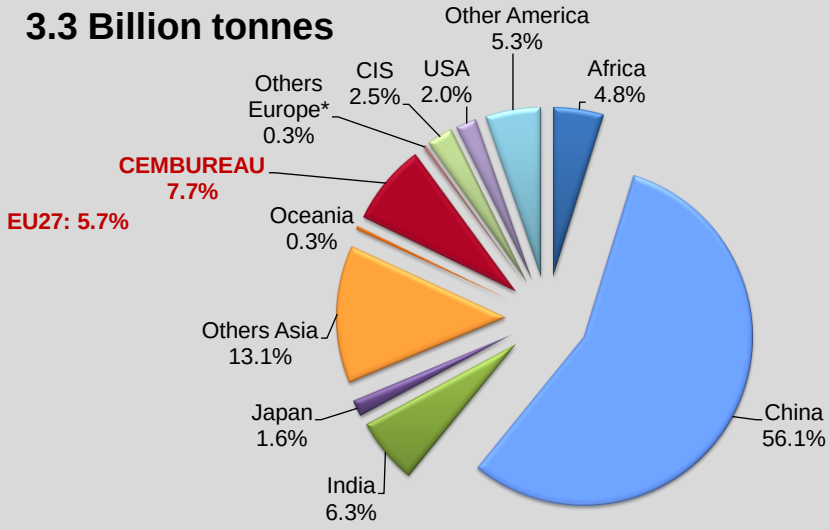


CEMBUREAU: the European Cement Association based in Brussels, representing the cement industry in Europe. Currently, the Full Members of CEMBUREAU are the national cement industry associations and cement companies of the European Union (with the exception of Cyprus, Malta and Slovakia) plus Norway, Switzerland and Turkey. Croatia is an Associate Member of CEMBUREAU.

Lafarge: world leader in building materials, No.1 in cement

# WORLD CEMENT PRODUCTION - 2010

**3.3 Billion tonnes**




* Including EU27 countries not members of CEMBUREAU

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# KEY FACTS

**CEMBUREAU represents virtually 100% of the cement production in its members countries**

| 2010 cement | CEMBUREAU | EU27 | World |
|---|---|---|---|
| Production – million tonnes | 257.4 | 190.4 | 3 300 |
| **% of world production** | **7.7** | **5.7** | |
| Imports – million tonnes* | 21.7 | 21.0 | - |
| Exports – million tonnes* | 50.1 | 32.0 | - |

| 2010 concrete estimated | CEMBUREAU | EU27 | World |
|---|---|---|---|
| Concrete Production – million tonnes (estimated) ** | 2 042 | 1 510 | 26 180 |
| Concrete Production – million m³ (estimated) ** | 872,5 | 645,4 | 11 186 |

** Cement + clinker* *** estimated 295 kg cement/m³ concrete*

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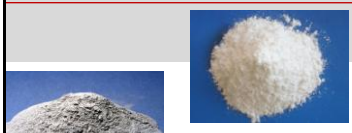
## Cement – Application in Concrete Buildings

## FROM CLINKER PRODUCTION ...

# TO CEMENT PRODUCTION







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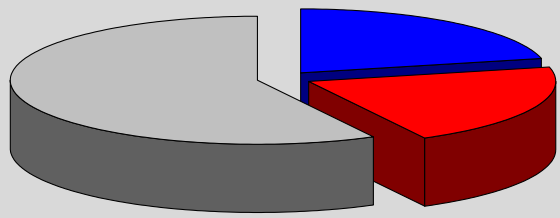
# Austria 2009: The cement industry recycled 1.8 mio t of alternative materials

**in the cement**
Blast furnace slag , Fly ash etc.
**1.057.800 t/a**

**Secondary raw materials**
**393.671 t/a**



**382.231 t/a alternative fuels**

Daten aus: G. Mauschitz, Emissionen aus Anlagen der österreichischen Zementindustrie, TU Wien, 2010

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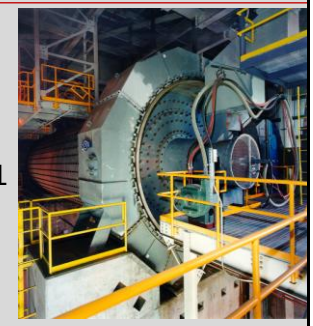
# CLINKER, CEMENT, REACH AND CLP



- Clinker: UVCB substance
  - EC number: 266-043-4
- Cement: Mixture
  - Composition common cements: EN197-1
  - Portland cement clinker
  - Blast furnace slag (sometimes recovered) ◄
  - Pozzolanic materials
  - Fly ash (recovered) ◄
  - Limestone
  - Silica fume ◄
  - Minor constituents – flue dust ◄
  - Calcium sulfate (sometimes recovered or artificial gypsum ◄)
  - Chromate reducers ◄ or other additives ◄

◄ subject to registration

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# MATERIALS USED IN CLINKER PRODUCTION

- Fossil fuels
  - Pet coke
  - Coal
  - Natural gas
  - (heavy) Fuel oil
- Alternative fuels: waste
  - Not covered by REACH
- Limestone, other minerals
  - Naturally occurring substances, not modified chemically
  - Not hazardous
- Alternative raw materials – Si, Fe, Ca and Al sources (foundry sand, industrial sludges, contaminated soil, ...)
  - Waste - substitution rate 4% in 2008 (CEMB)
  - Slags, ashes: product or waste

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# MATERIALS USED IN CEMENT PRODUCTION

- Obligations for manufacturer or importer (or OR)
  - Portland cement clinker
  - Blast furnace slag (sometimes recovered) ◄
  - Pozzolanic materials
  - Fly ash (recovered) ◄
  - Limestone
  - Silica fume ◄
  - Minor constituents – flue dust
  - Calcium sulfate (sometimes recovered or artificial gypsum ◄)
  - Chromate reducers ◄
  - Other additives ◄

◄ subject to registration

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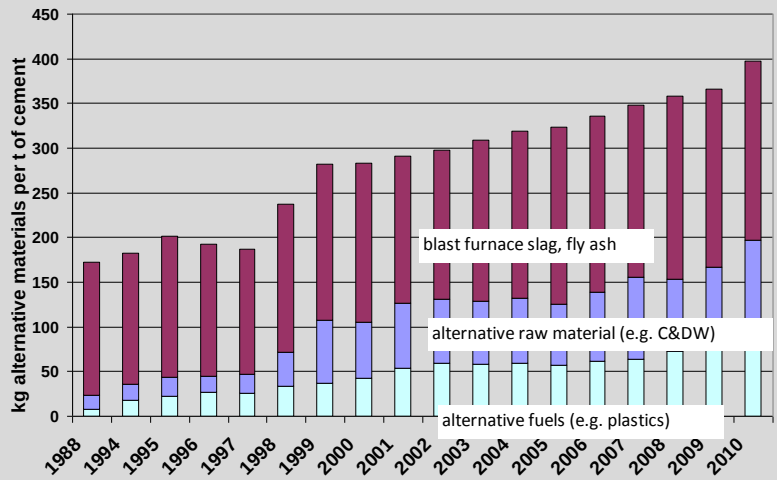
# AUSTRIA 2010: RECYCLING IN THE CEMENT INDUSTRY

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# C&L CEMENT UNDER CLP

| Hazard class | Hazard category |
|---|---|
| Skin irritation | 2 |
| Serious eye damage/eye irritation | 1 |
| Skin sensitisation | 1 |
| Specific target organ toxicity single exposure respiratory tract irritation | 3 |

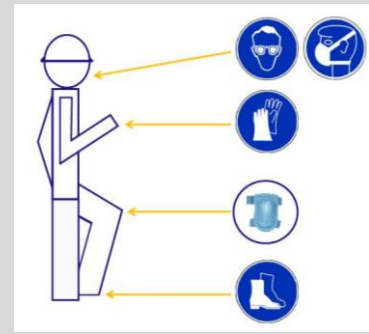
*[Product identifiers (same as on SDS)]*
Mixture: *[trade name]* containing Portland cement clinker

Danger
Causes serious eye damage
Causes skin irritation
May cause an allergic skin reaction
May cause respiratory irritation

Keep out of reach of children
Wear protective gloves/protective clothing/eye protection/face protection
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician
IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention
Avoid breathing dust/fume/gas/mist/vapours/spray. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
Dispose of contents/container to appropriate waste collection point

*[Name, address and telephone number of the supplier/s of the common cement]*
*[Nominal quantity of the common cement in the packages made available to the general public, unless this quantity is specified elsewhere on the package]*

***Supplemental information***
Skin contact with wet cement, fresh concrete or mortar may cause irritation, dermatitis or burns
May cause damage to products made of aluminium or other non-noble metals
*[Additional supplemental information might be necessary, please see below (1)]*



As of 1 December 2012

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# MAIN REQUIREMENTS REACH – CLP

- For cement manufacturers/importers (or Only Representatives)
  - Registration
  - Classification and labelling
  - Notification of C&L
  - SDS
  - Restriction on Cr(VI) for cement
- Not applicable
  - Authorisation
  - Requirements substances in articles
- "Actors" for clinker/cement
  - Cement companies – manufacturer/importer or downstream user
  - Importers and Only Representatives

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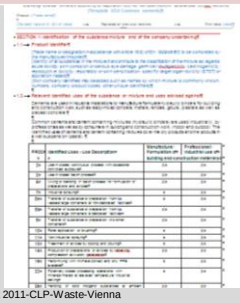
# REQUIREMENTS FOR CEMENT

| Cement | Manufacturer | Importer | Only Representative |
|---|---|---|---|
| Registration | No | No | No |
| C&L | Yes | Yes | - |
| Notification C&L | No | No | - |
| SDS | Yes | Yes | Yes |
| Restriction Cr(VI) | Yes | Yes | Yes |



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# RICHTIGER HAUTSCHUTZ

## BEI DER ARBEIT MIT **ZEMENT UND BETON**

» schützen » reinigen » pflegen

schau drauf!

**www.hautschutz-info.at**

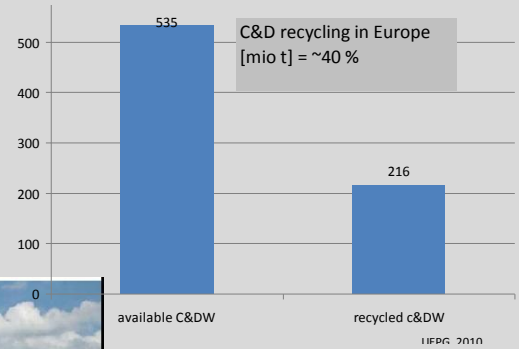
In Austria: Skin protection campaign for users of cement and concrete

SCHAUPLATZ BAUPLATZ

# TARGET OF 70% RECYCLED MATERIALS

**For comparison Austria**:
- approx. 37 mio t of concrete
- from 4,7 mio t of cement (2010)
- ~6 mio t C&DW recycled
- incl. 2.2 mio t concrete demol.
- with ~375 recycling plants

Source: VÖZ, BAWPI 2011




Source: EQAR



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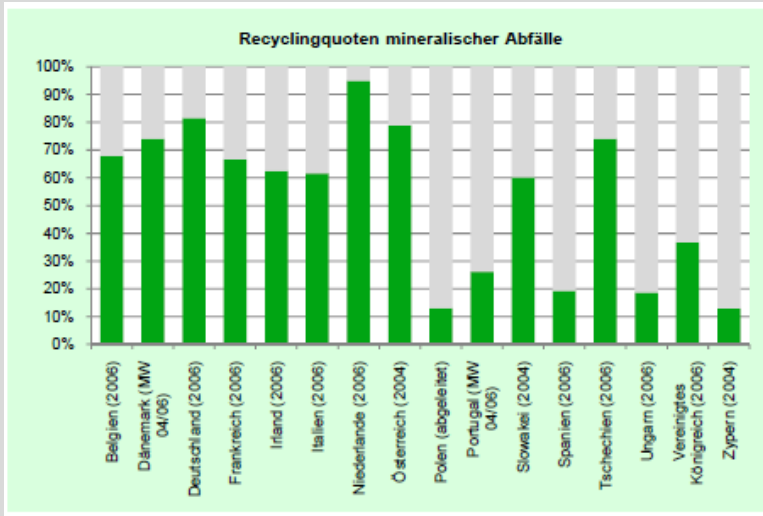
# Recycling Rate of Mineral Waste in EU




Source: EQAR

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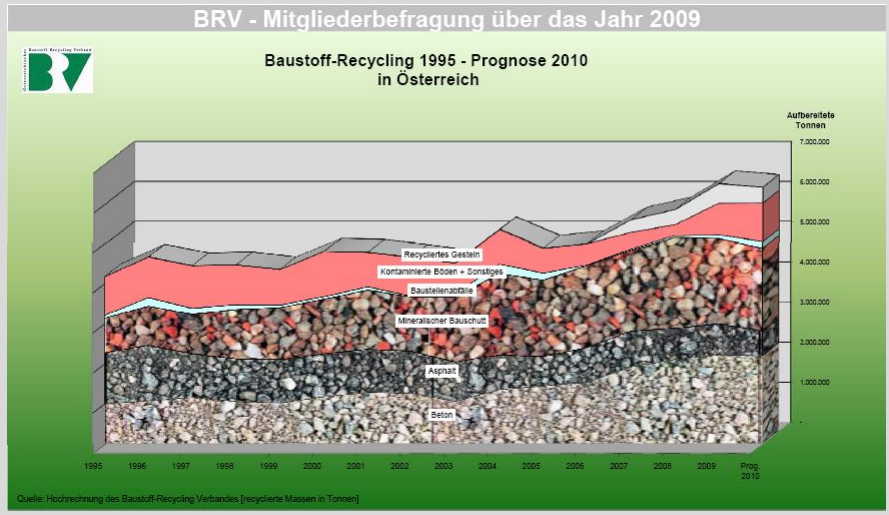
# C&D RECYCLING IN AUSTRIA



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# CONCLUSION

- The cement industry contributes already very well to recycling of mass materials.
- Concrete with cement as a main component is a mass product.
- The Recycling of C&D waste with a target rate of 70 % includes huge amount of waste concrete.
- There are too many C&D waste plants, to be all classified as hazardous waste treatment plants (IPPC/IED, EIA).
- Ökopol's suggestion to use the pH as a proxy for the classification of solid waste needs some qualification and differentiation. For construction and demolition waste, in particular for waste concrete, this method leads to wrong results.
- Waste (hardened) concrete is an inert waste, and thus not hazardous by itself.
- Grinding the waste concrete to the particle size required to carry out the test (particles typically smaller than 4 mm) does not at all reflect the real state of the waste concrete.
- The test which Ökopol refers to, leaching test for soil, does not require the soil to be ground.
- Because of the very small particle size used in the test, and in some specific cases (eg concrete which was covered during its service life, or very young concrete), a pH around 11.5 could be measured by the proposed test method.
- The results of the test will be highly dependent on the type of water used for the test: distilled water (not at all reflecting a "real life situation") leads to a higher pH than tap water.



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**Thank you for your attention**

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