THE CEMENT INDUSTRY &
THE EU CO₂ REDUCTION CHALLENGE

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THE EU KYOTO PROTOCOL

KYOTO PROTOCOL

- Base year 1990
- First commitment period 2008-2012 (-5% for Annex I countries)
- OECD & Eastern European countries

EU - COMMITMENT (the Bubble)

-8% or 336 M tonnes CO$_2$ by 2012
- Binding target of -20% in Climate Change Energy Package 2009
EU - COMMITMENT

- Minus 20% binding target set in 2009 (compared to 1990 level)

THE EU ROADMAP TO 2050

Cost-efficient pathway to an 80% “domestic” reduction in 2050

<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>25%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
</tbody>
</table>

COM(2011) 112 – European Commission Communication
“A Roadmap for moving to a competitive low carbon economy in 2050”
EU – COMMITMENT IS UNILATERAL, NOT CONDITIONAL

- But in EU-ETS Art 28 ETD sets certain conditions

- Will trigger major changes
  - 100% auctioning
  - -20% to -30%
  - No measures to include importers

- Open questions
  - Critical mass of countries
  - Equivalence
  - Similar reduction efforts

- Art 28.1 – ETD 3 months after signature of an international agreement, Commission shall submit an assessing report evaluating the outcome of the negotiations
EU EMISSION TRADING (EU-ETS)
The baseline represents the forecast emissions of a company. Emitters that successfully reduce their emissions below the baseline can receive credit for the amount of pollution not emitted. That credit can be saved or banked and then used to compensate for additional emissions, or can be sold to some other emitter for cash or other considerations.
Baseline emissions

Greenhouse gas emissions (CO₂ equivalent)

Project start

Actual emissions

Emission credits

Project end

Year

An emissions trading scheme where the total volume of allowances in the commitment period is limited or "capped" beforehand and where these allowances can be traded
Emission allowances

## Size of Carbon Markets in €

<table>
<thead>
<tr>
<th>Region</th>
<th>Value</th>
<th>Year</th>
<th>Share of World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global world</td>
<td>€ 121 Bn</td>
<td>2010</td>
<td>100%</td>
</tr>
<tr>
<td>EU</td>
<td>€ 95 Bn</td>
<td>2010</td>
<td>64%</td>
</tr>
<tr>
<td>US RGGI</td>
<td>€ 1.6 Bn</td>
<td>2010</td>
<td>12%</td>
</tr>
</tbody>
</table>

*Source: Point Carbon – 29 Jan 2010*
EU ETS CAP FOR 2013

- Total EU ETS CAP For 2013
  2 039 152 882 EUAs

- Auctioning Cap For 2013
  Around 1 000 000 000

- Free allowances cap For 2013
  Around 1 039 152 882

Source: Commission Decision 2010/634/EU of 22 October 2010 adjusting the Union-wide quantity of allowances to be issued under the Union Scheme for 2013 and repealing Decision 2010/384/EU OJ L 279, 23.10
THE CEMENT INDUSTRY
THE CEMENT INDUSTRY

- An energy intensive industry
- A CO$_2$ intensive industry
- A capital intensive industry
- A low labour intensive industry
- A heavily regulated industry
AN ENERGY INTENSIVE INDUSTRY

- 60 to 130 kg of fuel oil or equivalent fuelling amount per tonne of cement
- Plus 110 kWh of electricity per tonne
A CO₂ INTENSIVE INDUSTRY

- 5% of worldwide CO₂ emissions
- 3% of EU CO₂ emissions
- High intensity per unit of sales (> 9kg CO₂ per €)
- ETS: direct & indirect CO₂ cost = 45.5% GVA
- 60% of CO₂ emissions = process emissions
- 40% of CO₂ emissions = < fuels combustible
A CAPITAL INTENSIVE INDUSTRY

- € 150M per million tonnes of capacity
- Three years of turnover before first € earned
LOW LABOUR INTENSITY

48 000 direct employment in EU minus Cyprus and Slovakia
A HEAVILY REGULATED INDUSTRY

EU ENVIRONMENTAL REGULATIONS (1990 – 2010)
KEY EU REGULATION APPLICABLE TO THE CEMENT INDUSTRY


• Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community revised by Directive 2008/101/EC


• Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

• Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP)

• Council Directive 89/106/EEC on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products (CPD) to be replaced by the Construction Products Regulation (to be published in the OJ EU)
KEY EU REGULATION APPLICABLE TO THE CEMENT INDUSTRY

- Regulation (EC) No 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register (EPRTR)
- Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage (ELD)
- Stockholm Convention on Persistent Organic Pollutants
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes
- A Global legally binding instrument on mercury is in negotiation

>90% EU regulation or EU based national rules
High need for predictability and stability!
World cement production 2010, by region and main countries
3.3 billion tonnes

- China: 56.0%
- Others Asia: 13.1%
- Others Europe: 2.3%
- European Union (EU27): 5.7%
- Oceania: 0.3%
- Others America: 5.3%
- Japan: 1.6%
- India: 6.4%
- CIS: 2.5%
- USA: 2.0%
- Africa: 4.8%
ETS TARGET

Minus 21% in 2020 compared to 2005
CARBON LEAKAGE
CARBON LEAKAGE

• Cement industry qualifies as a sector vulnerable to carbon leakage with production cost increase induced directly and indirectly by EU-ETS of 45.5% GVA (above the 30% requirement)

• Next review in 2014 – CO$_2$ price critical!
CARBON LEAKAGE

Consequences

• Free allocation up to 2020
• Member States may opt for state aids to compensate higher electricity prices
• Possibility to include importers in ETS
FREE ALLOCATION
FREE ALLOCATION: BENCHMARK (1)

- EU-wide grey cement clinker benchmark
  = 766 kg of CO\textsubscript{2} per tonne of clinker

- EU-wide white cement clinker benchmark
  = 987 kg of CO\textsubscript{2} per tonne of clinker
FREE ALLOCATION: BENCHMARK (2)

- Benchmarks to be multiplied with Historical Activity Level (HAL), i.e. production to get amount of free allowances per installation
  - BM x Median HAL 2005-2008 or 2009-2010, whichever is higher

- Maximum total free allocation for industry set at industry’s share in total cap based on emissions in 2005-07
  - A correction factor may be applied if necessary
PRODUCT
Reduction of clinker ratio in Europe cement
### DOMESTIC DELIVERIES OF CEMENT BY TYPE AND STRENGTH

**CEMBUREAU COUNTRIES - SYNTHESIS 2007**

<table>
<thead>
<tr>
<th>Strength Class</th>
<th>Ordinary (32.5 of prEN 197-1)</th>
<th>High (42.5 of prEN 197-1)</th>
<th>Very High (52.5 of prEN 197-1)</th>
<th>Unspecified</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
<td>Ktonnes</td>
<td>%</td>
<td>Ktonnes</td>
<td>%</td>
<td>Ktonnes</td>
</tr>
<tr>
<td>CEM I - Portland cement</td>
<td>4 807</td>
<td>5.8%</td>
<td>35 270</td>
<td>49.1%</td>
<td>13 230</td>
</tr>
<tr>
<td>CEM II - Portland-composite cements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portland-burnt shale cement</td>
<td>488</td>
<td>0.4%</td>
<td>69</td>
<td>12.4%</td>
<td></td>
</tr>
<tr>
<td>Portland-composite cement</td>
<td>20 534</td>
<td>24.6%</td>
<td>25 706</td>
<td>33.0%</td>
<td>1</td>
</tr>
<tr>
<td>Portland-fly ash cement</td>
<td>3 723</td>
<td>0.4%</td>
<td>10 039</td>
<td>13.1%</td>
<td>491</td>
</tr>
<tr>
<td>Portland-limestone cement</td>
<td>20 615</td>
<td>17.6%</td>
<td>32 303</td>
<td>57.5%</td>
<td>769</td>
</tr>
<tr>
<td>Portland-pozzolana cement</td>
<td>1 404</td>
<td>1.7%</td>
<td>3 324</td>
<td>33.7%</td>
<td>10</td>
</tr>
<tr>
<td>Portland-silca fume cement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Portland-slag cement</td>
<td>6 719</td>
<td>4.5%</td>
<td>6 256</td>
<td>36.7%</td>
<td>1 187</td>
</tr>
<tr>
<td>TOTAL CEM II</td>
<td>52 996</td>
<td>63.5%</td>
<td>78 116</td>
<td>52.2%</td>
<td>2 026</td>
</tr>
<tr>
<td>CEM III - Blastfurnace cement</td>
<td>5 904</td>
<td>7.1%</td>
<td>6 970</td>
<td>38.5%</td>
<td>230</td>
</tr>
<tr>
<td>CEM IV - Pozzolanic cement</td>
<td>14 697</td>
<td>17.6%</td>
<td>447</td>
<td>2.4%</td>
<td></td>
</tr>
<tr>
<td>CEM V - Composite cement &amp; Others</td>
<td>5 023</td>
<td>6.0%</td>
<td>1 043</td>
<td>12.5%</td>
<td>711</td>
</tr>
<tr>
<td>TOTAL</td>
<td>83 427</td>
<td>100%</td>
<td>121 846</td>
<td>100%</td>
<td>16 197</td>
</tr>
</tbody>
</table>

**Notes**

National cement types do not, in some cases, correspond exactly to EN 197-1. However, for the purpose of producing a summary they have been categorised accordingly.

Countries not included: AT, IE, LT, LV, LU, NO, RO

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2011...-JMC
Domestic deliveries by type - CEMBUREAU
2007 (%)

- CEM II - Portland Composite Cement, 58.1%
- CEM III - Blast Furnace & Slag Cements, 6.5%
- CEM IV - Pozzolanic Cements, 5.4%
- CEM V - Composite Cement & Others, 3.1%
- CEM I - Portland Cement, 26.9%
Domestic deliveries of CEM II by sub-type
CEMBUREAU 1999 - 2007

- Portland burnt shale & silica fume
- Portland-limestone
- Portland-composite
- Portland-fly ash
- Portland-pozzolana
- Portland-slag
- Unspecified
WHAT’S THE FUTURE LIKE?

• 2014 – Carbon Leakage list to be reviewed – CO₂ prices critical

• Full auctioning will prevail (70% 2020 to 100% 2027):
  ▪ Best allocation method in the absence of an international agreement; provided importers are included!
  ▪ Possibility to include importers in a limited number of sectors such as steel and cement;
  ▪ Is there a political will to include importers? Aviation case will be the test
  ▪ The question is WHEN? Provided that cement industry still at risk of carbon leakage