
CEMENT AND LIME INDUSTRY – SETTING THE SCENE

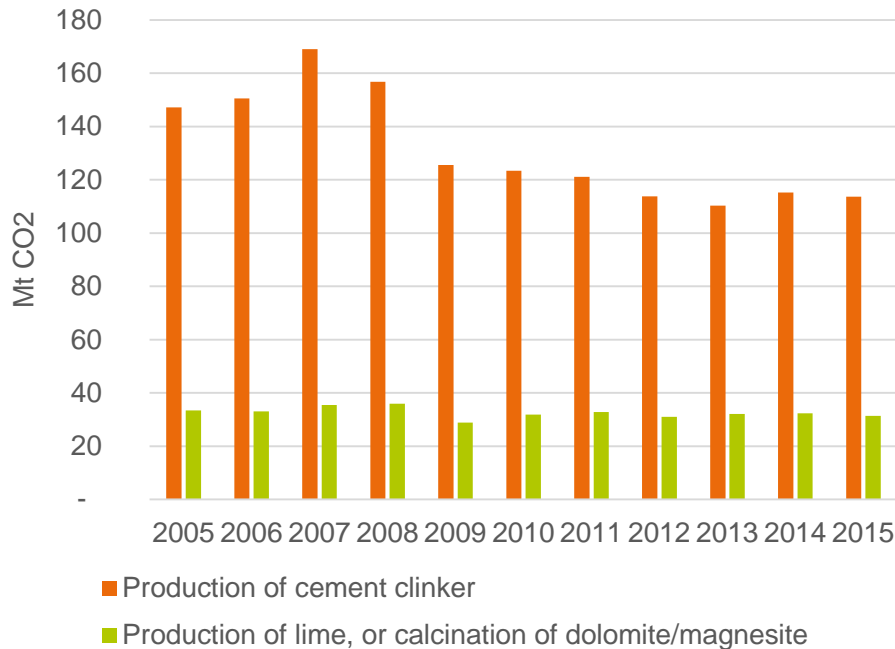
Finance for Innovation: Towards the ETS Innovation Fund
Workshop 3: Cement and lime

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CO2 emissions in cement and lime (EU28) (direct emissions, excl. electricity and DH)



Sources CO2: EU ETS Transaction log

CO2 (verified emissions EU ETS):

■ Cement 2015: 114 Mt CO2

■ Lime 2015: 31 Mt CO2

■ Together ~8% of EU ETS
verified emissions

■ Emissions source

■ ~60% process related

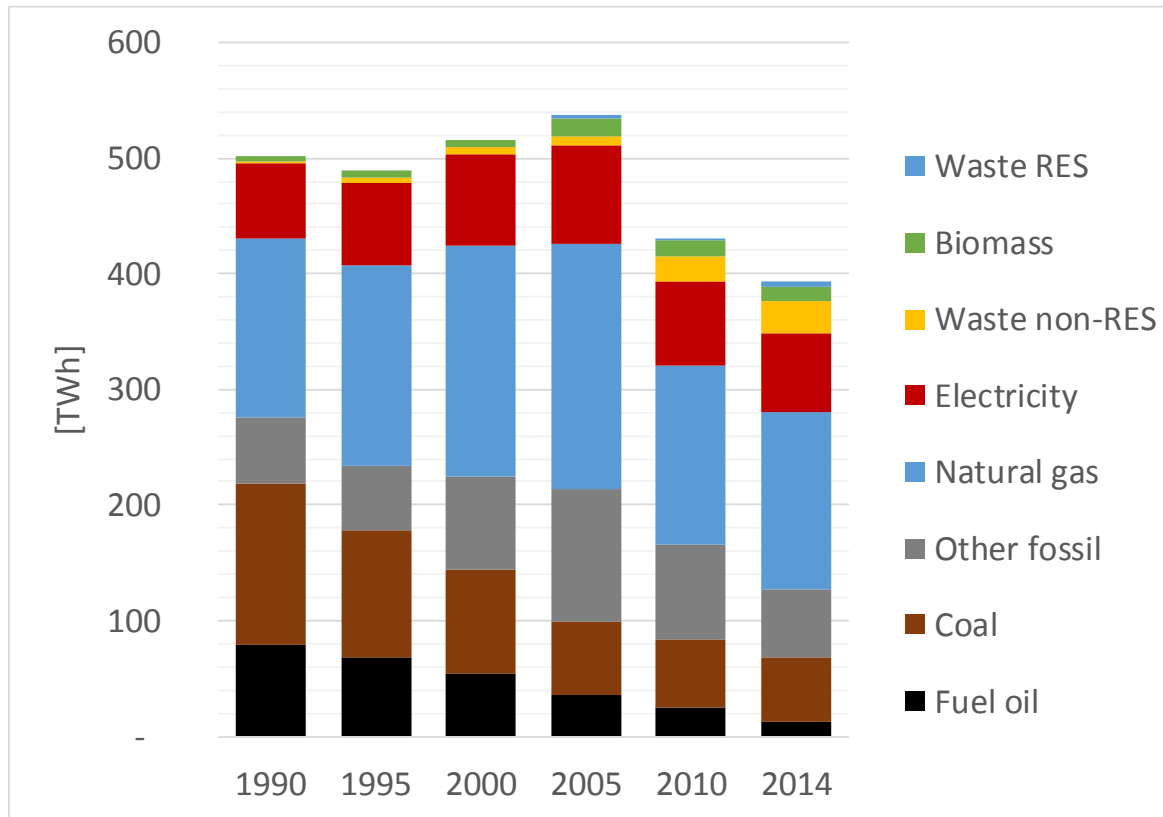
■ ~40% energy related

Production

■ Increase from 1990 to 2007

■ Drop in 2009

Final energy demand in **non-metallic minerals** (EU28), Eurostat

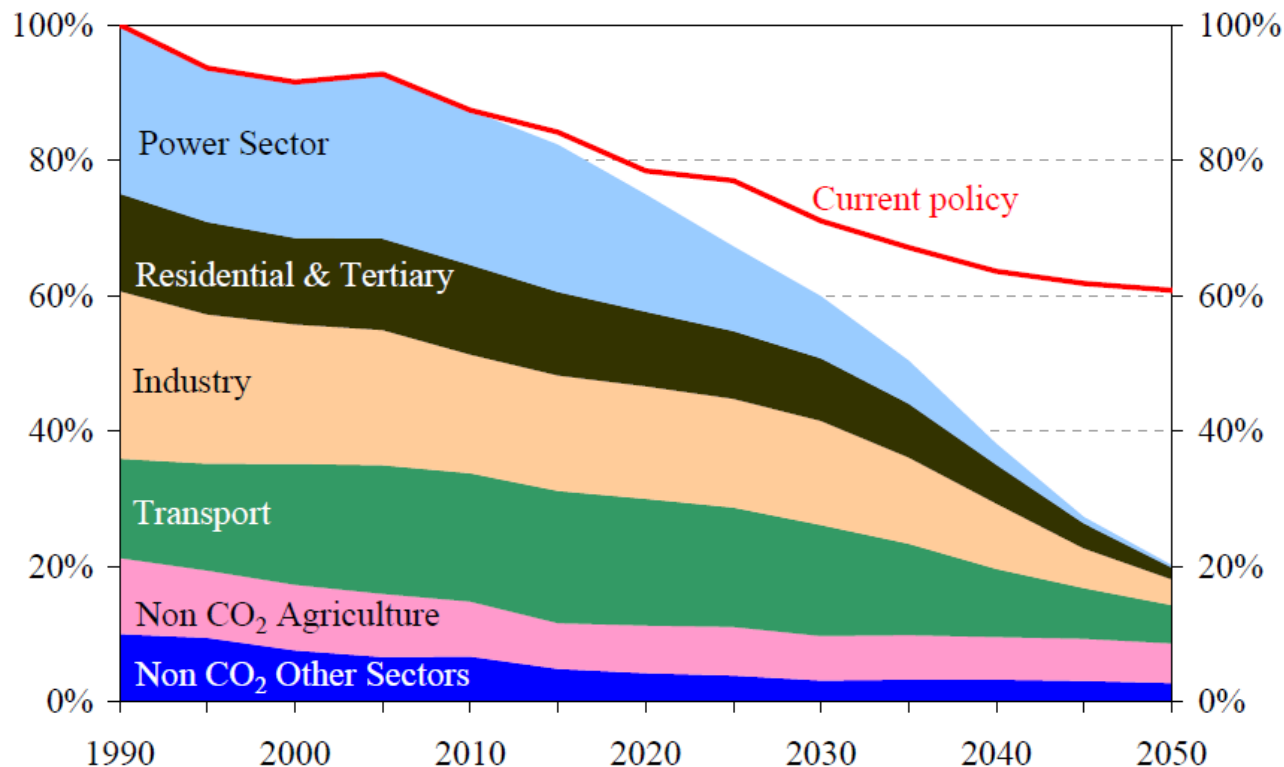


- Figures include Cement, lime, glass and ceramics!
- Biomass increased substantially to about 4% in 2014
- Waste increase to about 7%
- Fuel oil, coal and other fossil fuels decreased

Source: Eurostat

Ambition needed – the EU low-carbon roadmap 2011

Figure 1: EU GHG emissions towards an 80% domestic reduction (100% = 1990)

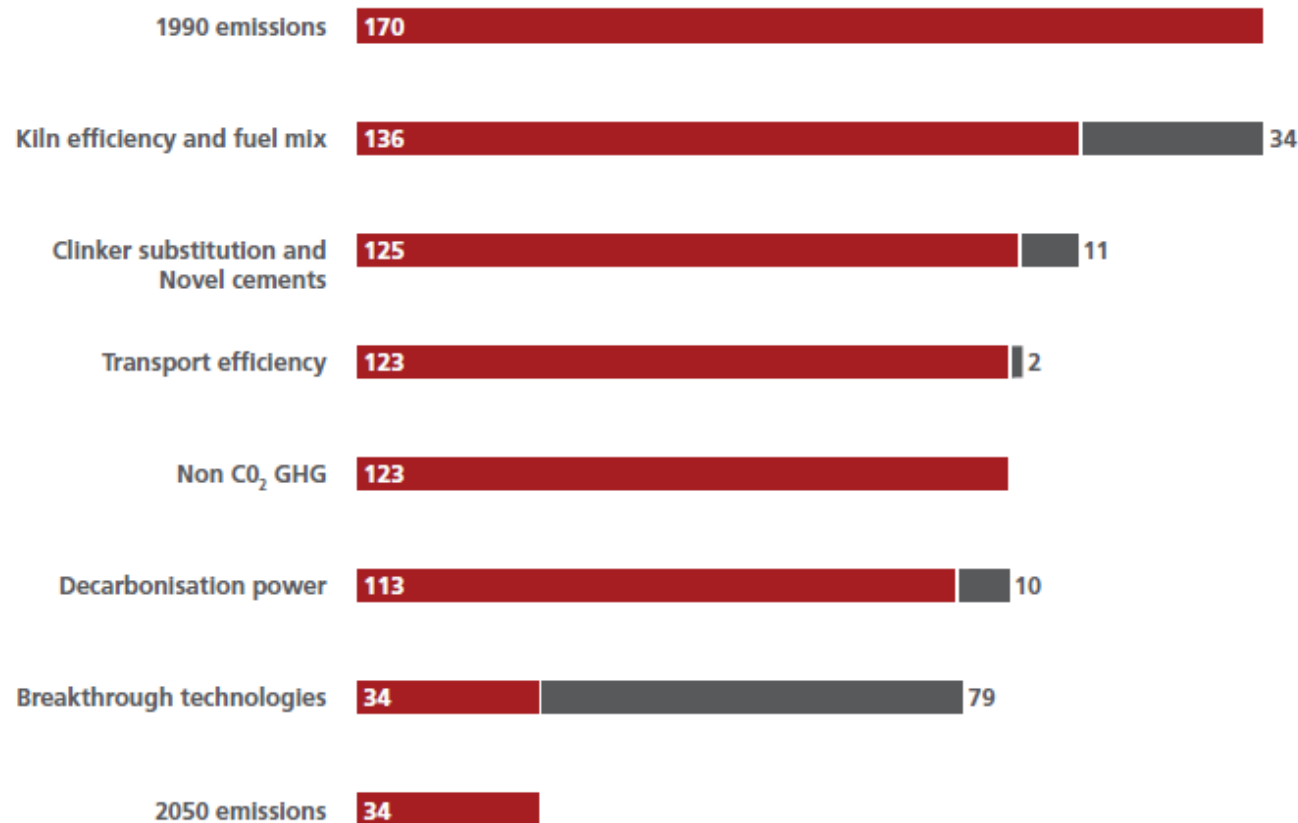


- Industry (CO₂): -83 to -87%
- Ambition from Paris? „Well below 2°C“

Source: EU COM (2011)

Cement mitigation opportunities towards -80% as regarded by Cembureau

Multiple paths to emissions reduction



Source: Cembureau: The role of cement in the low carbon economy

Clustering mitigation options

Clusters of mitigation options		Technology Readiness Levels TRL
Materials industry	Integrated process improvement <ul style="list-style-type: none">- Energy Efficiency (modernization and replacement)- Reduction in process-related emissions	
	Fuel switch <ul style="list-style-type: none">- towards renewable energy sources (e.g. based on hydrogen)- towards decarbonized electricity (indirect emissions)	
	Carbon Capture and Storage CCS/ Carbon Capture and Use CCU	
downstream	Recycling and re-use (innovative recycling processes)	
	Material efficiency (downstream)	
	Material substitution (downstream)	

TRL definition from Horizon 2020

TRL	Description
1	Basic principles observed
2	technology concept formulated
3	Experimental proof of concept
4	Technology validated in lab
5	Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
6	Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
7	System prototype demonstration in operational environment
8	System complete and qualified
9	Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

Thank you for your attention!