

CCS in Other Industries: The European perspective

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European Technology Platform for Zero Emission Fossil Fuel Power Plants

ETP Role:

define a strategic agenda for the development and deployment of technologies in the EU involving major economic or societal challenges.

Founded in
2005

UNIQUE
coalition of
stakeholders:
European utilities,
petroleum companies,
equipment suppliers,
scientists, academics
and environmental
NGOs

Over
300
members
from 19
countries

**OBJECTIVE: Enable commercial availability of CCS by 2020 and
kick-start widespread deployment**

ZEP WG Other Industries

- › Founded 2012 by ZEP's Taskforce Technology
- › Membership currently largely from outside ZEP:
- › **Alstom, AirLiquide, Bellona Foundation, CSIC-INCAR, CSM, ENBW, ECN, Eurofer, Gassnova, Heidelberg Cement, IEA GHG, IISD, IMA, Norcem, SINTEF, Shell, Statoil, Tata Steel, University of Utrecht, VTT, World Steel**

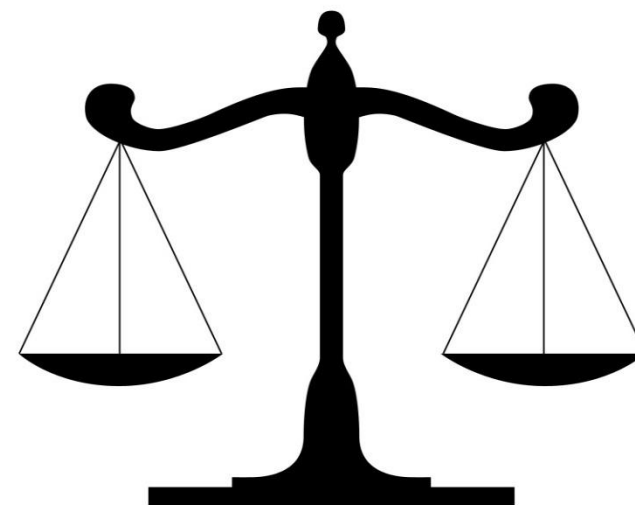


ZEP has been the leading European Commission advisory body on CCS since
2005

- also for industrial emissions?

CO₂ reducing wedges

- › IEA 2009: Global emissions reduction of 50 % by 2050
- › CCS could contribute 19%
- › Power and **Energy Intensive Industries 50/50**
- › **Understanding growing inside ZEP:**
- › **2nd half of the market for future CCS deployment**



Other Industries included in draft implementation plan for the European Industrial Initiative (EII) on CCS

Input on capture technologies for Other Industries included in ZEP long-term R&D plan

ZEP Report: CCS in Other Industries

- › **Co-authored by ECN (Tom Mikunda) and IEA GHG (Stanley Santos), with contributions and peer review by WG members and ZEP membership**
- › **Looking at technology options and potential per industry**
- › **Considering the situation and outlook for those industries in the EU**
- › **Pointing to major EU-specific (and some general) administrative and economic hurdles to CCS deployment**
- › **Discussing some potential options for facilitating EU CCS deployment in non-power industries light of ongoing and future EU policy processes**

European Policy Processes

- ▶ **European Commission CCS Policy is shared by DG CLIMA and DG ENER**
 - DG ENER's focus has (naturally) been on the power industry
 - Circulated early draft of EU CCS Communication, due H1 2013:
 - *2.2.6: Fossil fuels are not only used in the energy sector but also in **other industrial sectors such as steel, where fuel switching is challenging due to the reliance on the coal coking process in the sector.** World crude steel production rose to a record 1,527 Mt in 2011. In Europe, prior to the economic crisis, the EU27's iron and steel industry's consumption of coal remained competitive with stable production between 1993 and 2008 at 30 ktoe per year. The use of coal in other industrial processes has equally been stable. **In total, industrial processes contribute to around 20% of Europe's total CO2 emissions.***

European Policy Processes

- ▶ **European Parliament's Energy Committee (ITRE) Report on the EU Energy Roadmap 2050, adopted 24th January 2013:**
 - *Compromise Amendment 22: Notes that Carbon Capture Storage (CCS) could play a role on the road to decarbonisation by 2050; notes, however that CCS is still at the research and development stage; notes that CCS development remains highly uncertain due to unresolved problems, such as non-specified delays, high costs and efficiency concerns; stresses that CCS developed in an economically efficient, safe and sustainable way will need to be in use on a commercial scale as soon as possible; **highlights that CCS is also an important option for the decarbonisation of several energy intensive industries such as oil refining aluminium smelting and cement production;***

EC DG CLIMA: NER300 funding

- **No CCS projects received funding in the 1st round**, largely due to lack of adequate and/or timely EU Member State support for the respective projects
- Notably, **only one project received govt. support: the ULCOS project** in Florange
- Project discontinued by ArcelorMittal; notwithstanding, the significance is clear
- **The EU Steel Industry:**
- Relatively few sites
- Large CO₂ point sources
- Higher CO₂ concentration (relative to power production)



Florange, FR

The European Cement Industry

CO₂ Emissions from the European Cement Industry

EU: 190 Mt CO₂ emissions in 2008 (cement and lime industry)



source: Bellona CCS WEB, www.bellona.org/ccs

2013 – CO₂ increasingly an issue?

› EU Emission Trading System (ETS)

2013: Energy Intensive Industries will increasingly have to purchase emission allowances. Benchmarks have been set by the Commission per industry.

› ETS allowances down 1.74% per year

› CO₂ allowance Costs

No real concern as of today. The Emission Unit Allowance (EUA) price hit an all-time low last week and has been fluctuating between €5-7 for a long time. Yet, the ETS benchmarking represents a future uncertainty

› Major headache for EU policy makers and industry leaders: Carbon Leakage

› Growing resistance against an increased EUA price among industries beyond the power sector, while it seems to decrease in the power industry

› The lack of an international agreement on climate targets and measures leads to controversial measures being discussed

CCS and Carbon leakage: Viewpoints from industry

- **CCS - the only near/medium term option to drastically reduce emissions by industry representatives**
- **EU-ETS unlikely to stimulate CCS in energy intensive sectors due to continued free allocation of EUAs**
- **EU carbon constraints would severely impact competitiveness – without additional policy measures**

Carbon leakage – High risk sectors in EU

Sector	Trade intensity %
Cement	6.8%
Iron and steel	32.3%
Refined petroleum products	16.1%
Aluminium	35.9%
Fertilizers	27.4%

- **Unilateral carbon pricing – potential to reduce EU exports, increase imports from outside EU**

Measuring leakage and competitiveness

- Wide range of findings, some conflicting
- Ex-post analyses limited due to free allocation
- Ex-ante analysis based on numerous economic assumptions
- **However – all studies generally agree that EU competitiveness will be significantly affected if free allocations were to be reduced**

Options to prevent leakage

• Level costs downwards

- Free allocation with benchmarks – stimulate incremental improvements - but CCS?
- Investment subsidies
- Change cost structure of production – reduce non-carbon cost burden (e.g. taxes)

• Upwards cost adjustment

- *Border Carbon Adjustment*
- Sectoral agreements – long term

• Border Carbon Adjustments (BCA)

- Returning discussion at the EU level: **France, Italy, MEPs...**
- Recent report by the International Institute on Sustainable Development (IISD) claims BCA could be compatible with WTO rules
- Remains **highly controversial**

Beyond carbon leakage...

- **Technologies for major sectors remain in pilot phase – demo projects needed**
- **Smaller industrial producers concerned with chain integration – no transport/storage expertise**
- **Regulatory concerns – provision of financial security, unquantifiable burden of long-term storage liability**
- **Timing – matching CCS availability with future investment plans: 2050 emissions = 2015 decisions!**

**Thank you for your attention
Questions/Comments?**

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