

# Emission trading, CCS and policy relevant research?

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## Background

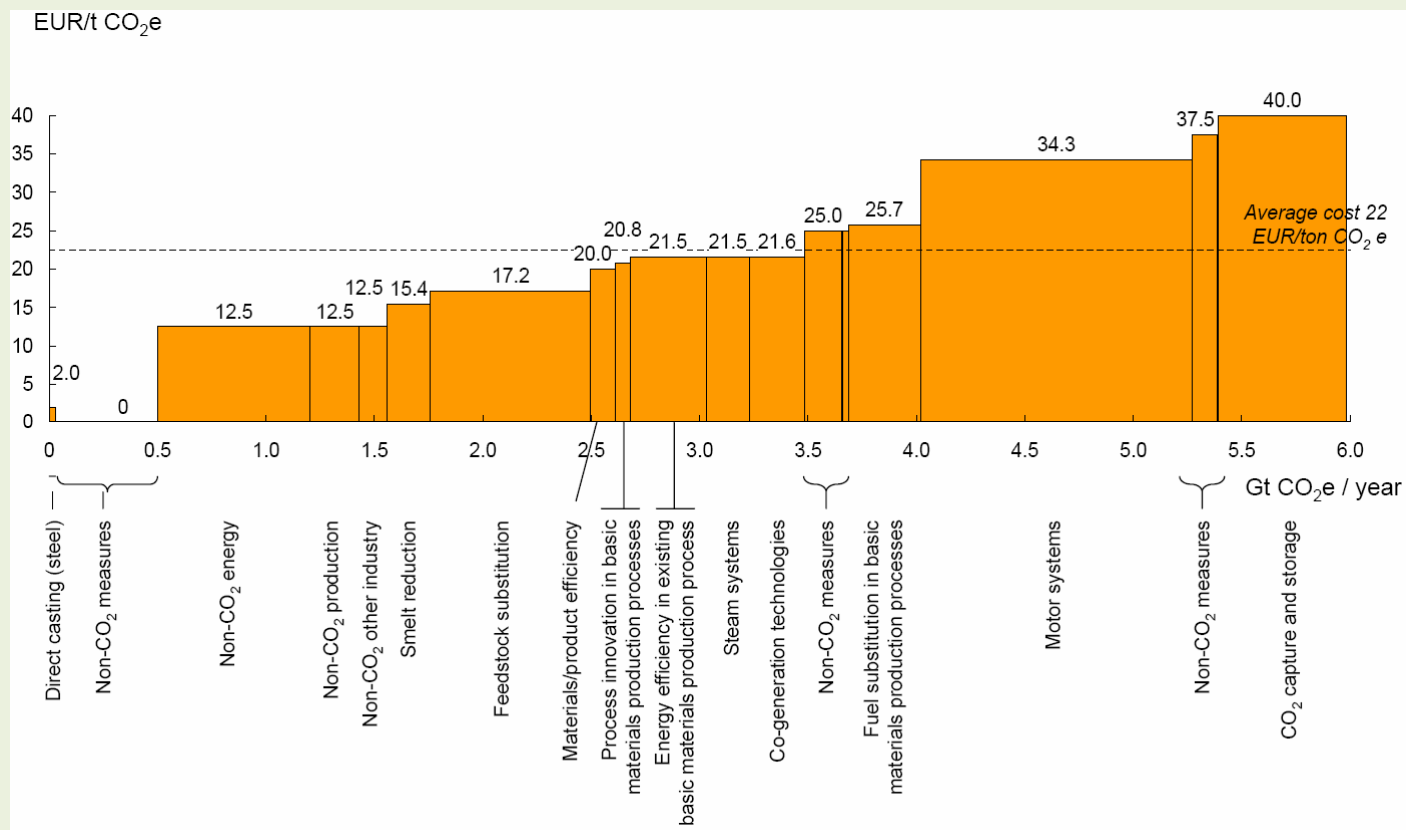
The EU has set out to reduce GHG:s emissions by 20-30 % by 2020 and by 50-80 % by 2050 compared to the 1990 levels

In 2005 the EU Emission Trading Scheme (EU ETS) was introduced as a mean to achieve these goals as cost efficient as possible.

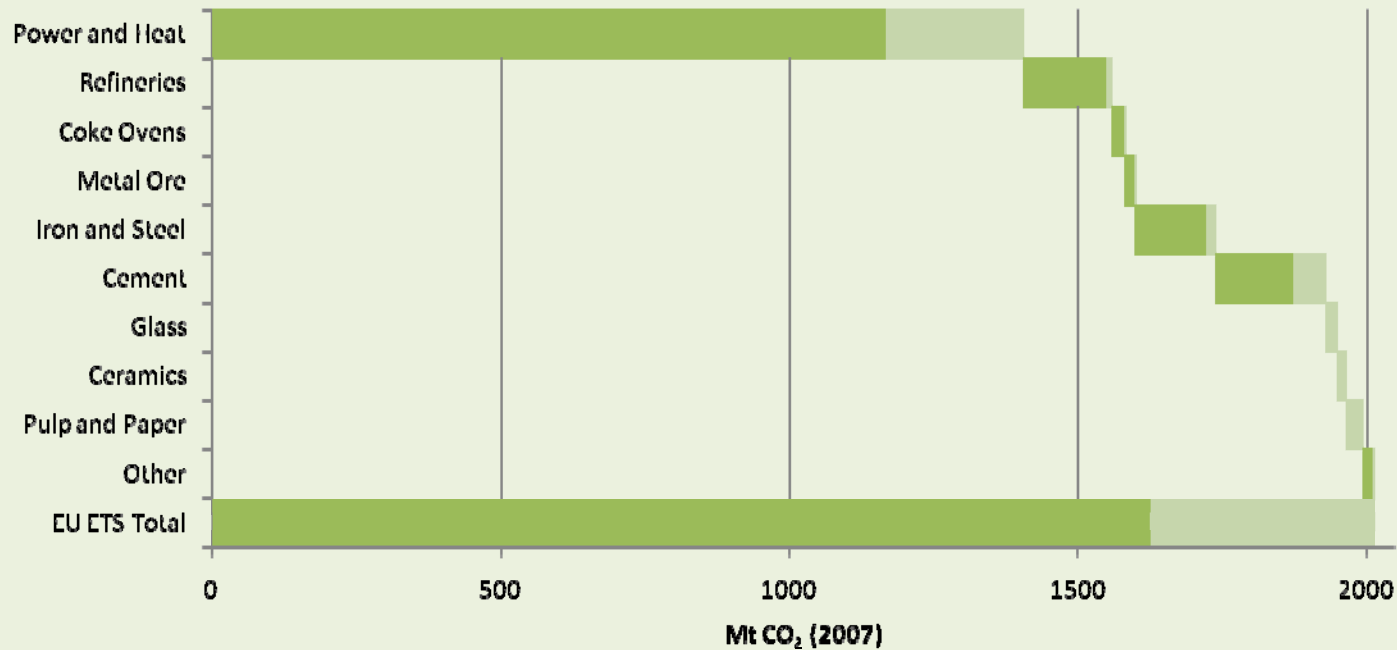
In its present shape the EU ETS covers CO<sub>2</sub> emissions from large stationary sources in the power and industry sectors.

To realise the goals of further, extensive, emission cuts beyond 2020 the European Community has agreed to increase the efforts to deploy CCS technologies

## What is the potential role for CCS when it comes to reducing CO<sub>2</sub> emissions from European heavy industries?



# Sectoral breakdown of the EU ETS



A relatively small number (~800) of large emitters (> 0.5 Mt CO<sub>2</sub>/year) in four sectors are collectively responsible for more than 80 % of all EU ETS emissions (~30% of EU's total GHG emissions).

# Breakdown of CO<sub>2</sub> emissions from industrial production processes

	Source	Fraction of CO <sub>2</sub> emissions
Refineries	Furnaces and boilers	65%
	Regeneration of cat. cracker catalyst	16%
	Power (55% imported)	13%
	Other sources	6%
Integrated steel plants	Coking plant	5%
	Sinter plant	10%
	Blast furnace	65%
	Other sources	20%
Cement plants	Pyroprocessing (in precaliner and rotary kiln)	>80%
	Other sources	<20%

Industry sector	CO <sub>2</sub> captured (Mt CO <sub>2</sub> /year)	
	"High cost"	"Low cost"
Mineral oil refineries	116	94
Integrated steel plants	106	106
Cement plants	107	67
<b>Total</b>	<b>329</b>	<b>267</b>

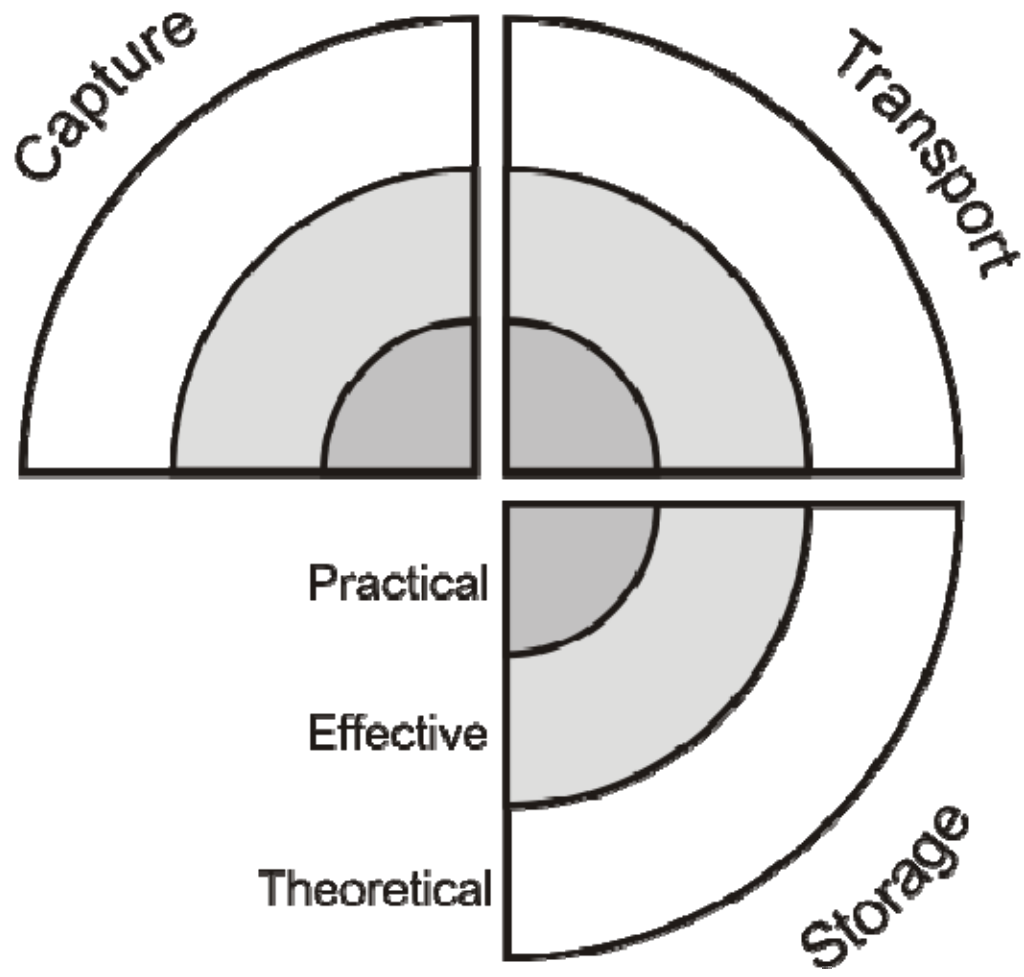
"High cost"-scenario - 20 to 60 € per tonne CO<sub>2</sub> captured

"Low cost"-scenario – 20 to 35 € per tonne CO<sub>2</sub> captured

## Conclusions

Considerable emission reductions could be achieved if targeting large point sources in some of the most emission intensive sectors (i.e. mineral oil refineries, integrated steel plants and cement plants).

First estimate of the capture potential  $\sim 270 - 330 \text{ MtCO}_2/\text{year}$   
( $\sim 5 - 6\%$  of EU's total GHG emissions)



# Geographical distribution of large industry point sources

- ▲ Refineries
- Integrated steel plants
- ★ Cement plants

