



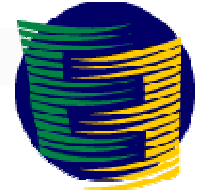
International Coal Pricing

Miharu Kanai
Energy Charter Secretariat

**Sixth Meeting of the Task Force
on Regional Cooperation
9 July 2010**

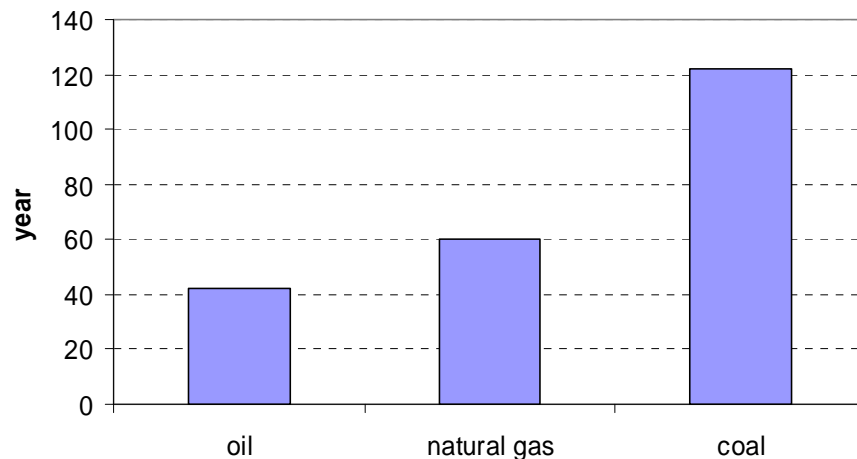


1. Coal Pricing



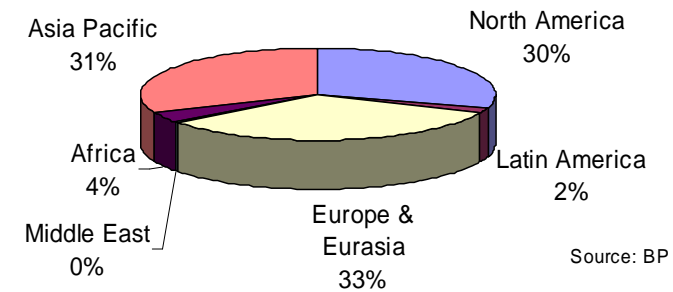
An Abundant and Evenly Split Resource

R/P Ratios (2008)

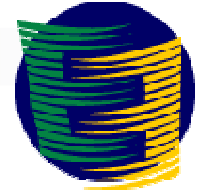


Source: BP

Coal Proved Reserves (2008)

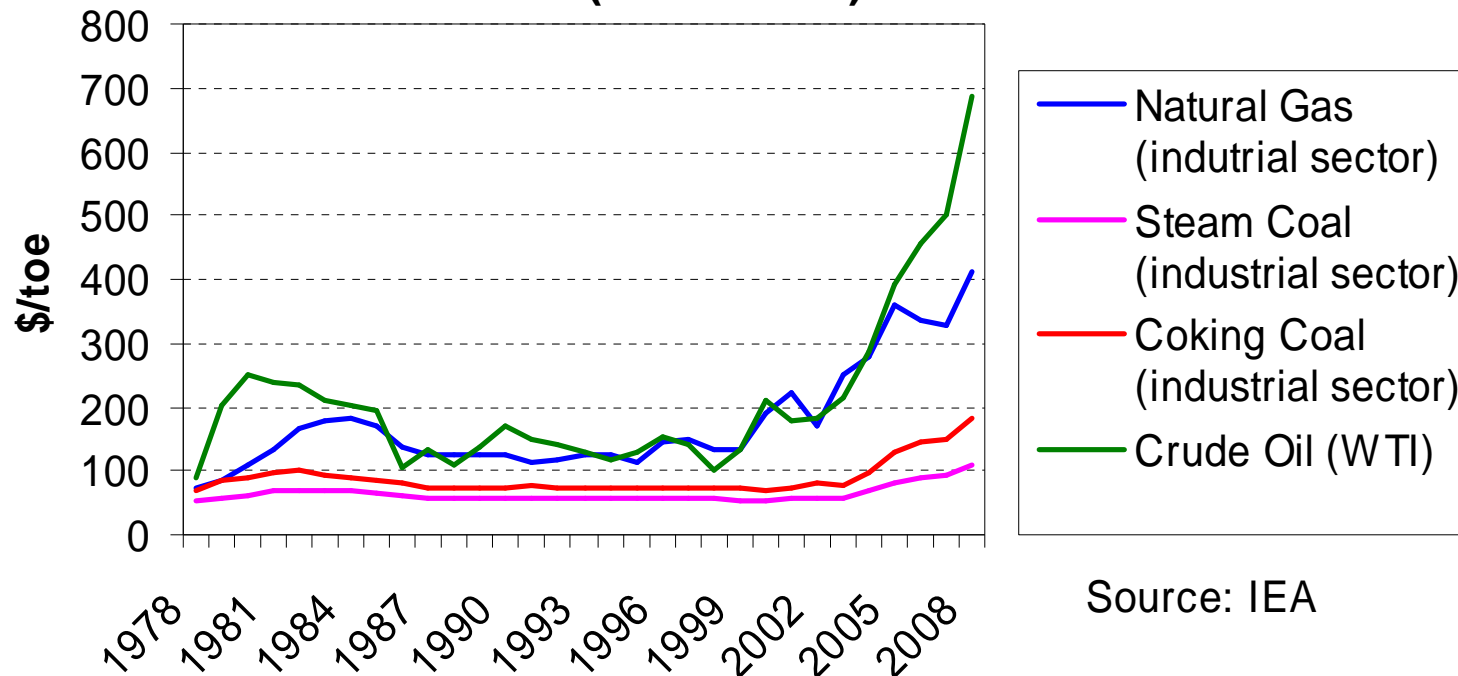


Source: BP

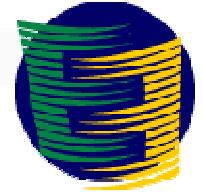


Coal prices used to be low and stable...

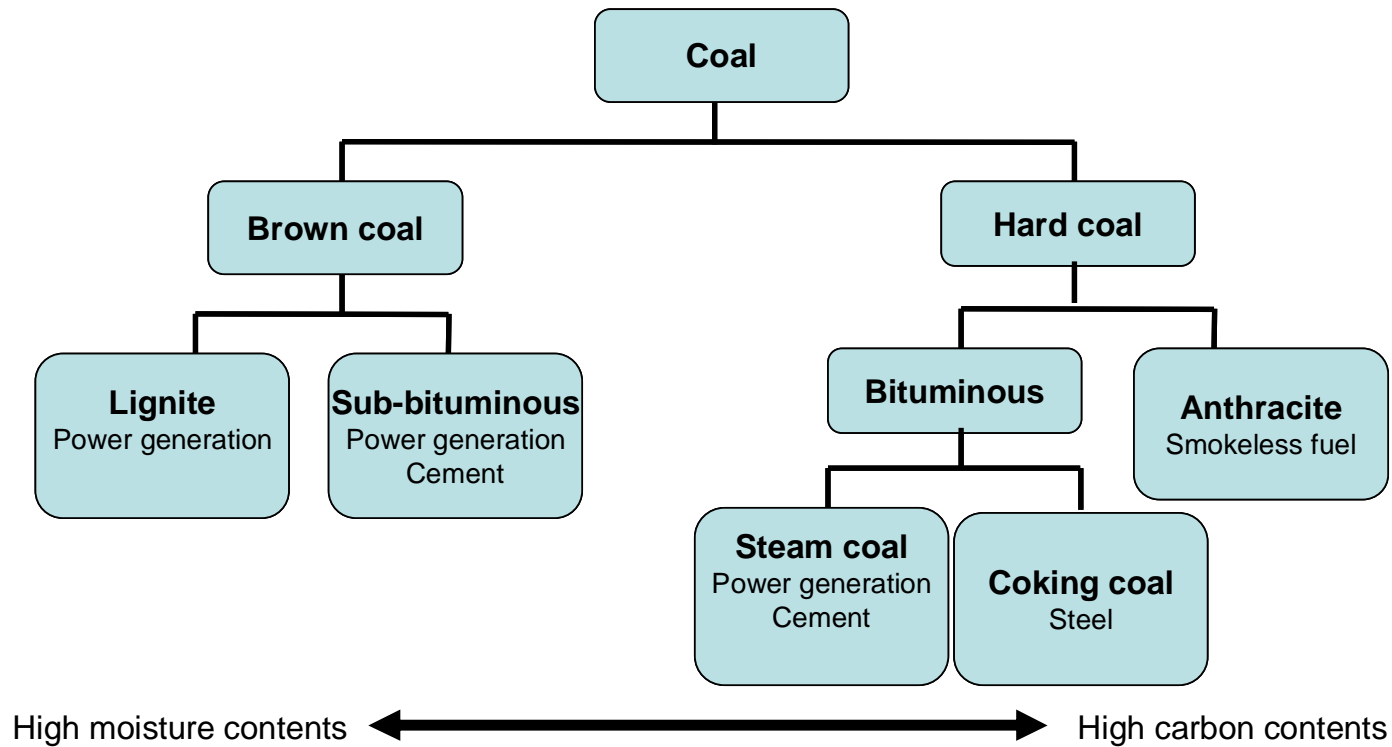
US End-User Energy Prices
(1978-2008)



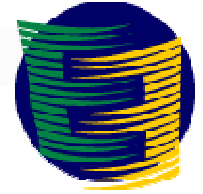
Source: IEA



Types of Coal

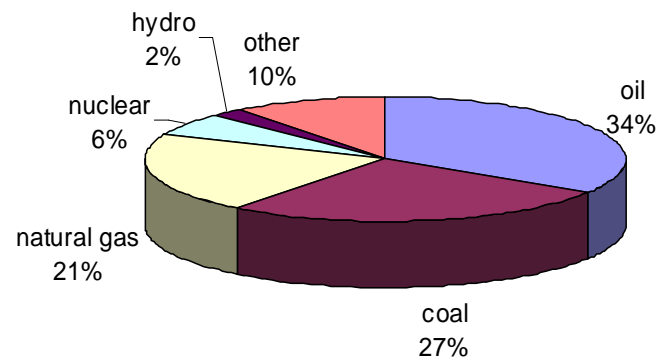


Source: World Coal Institute, IEA



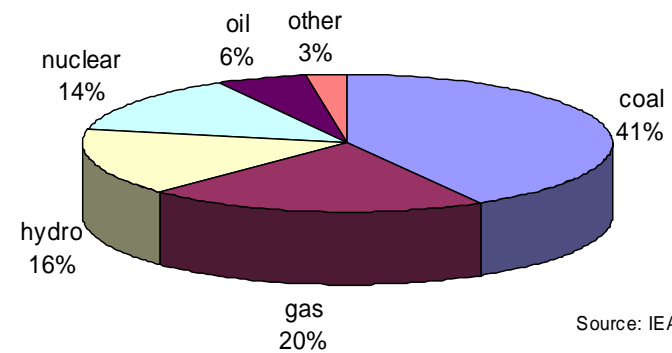
Coal in the Fuel Mix

World Primary Energy Supply (2007)

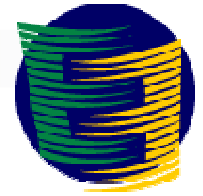
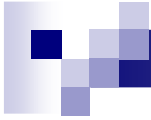


Source: IEA

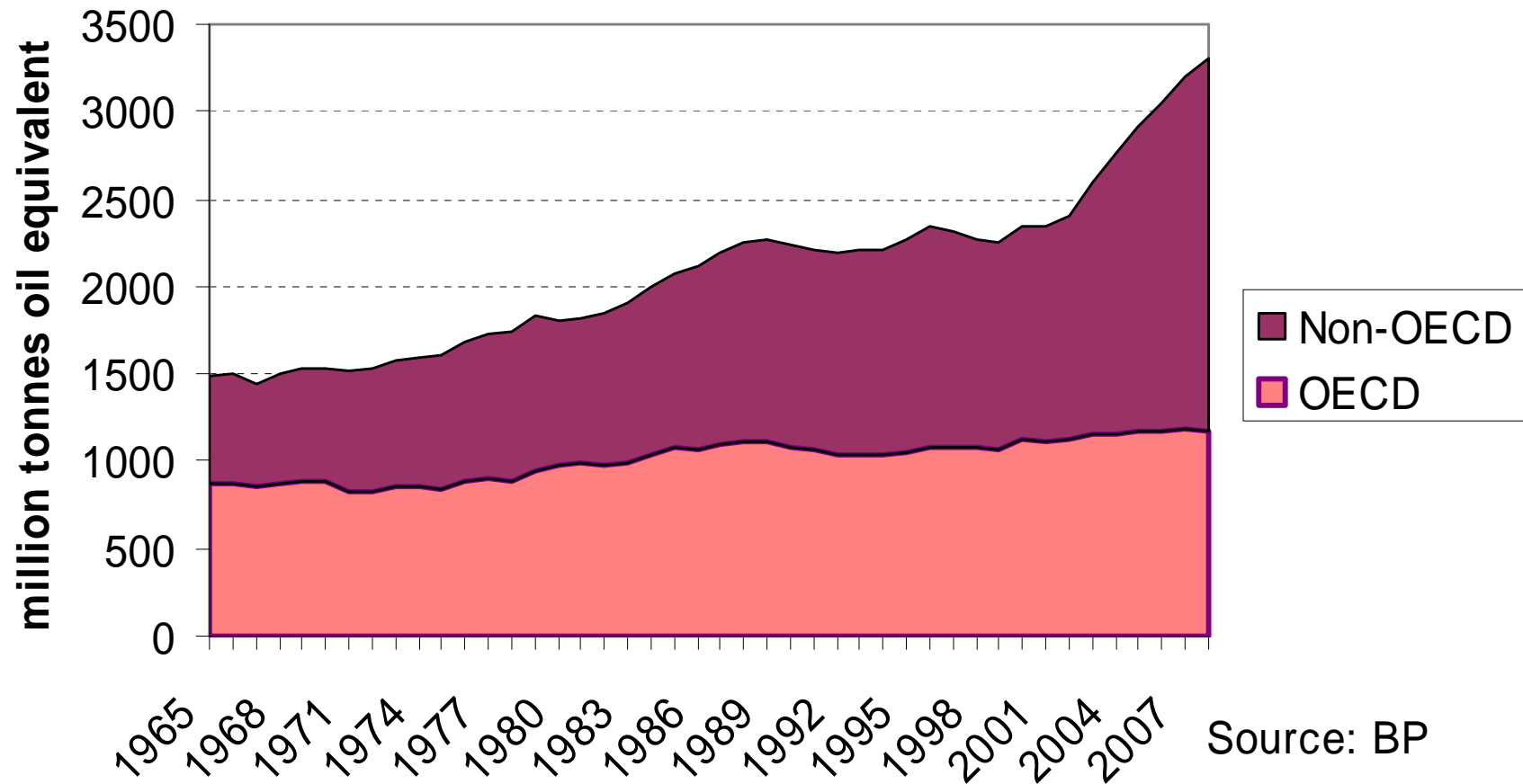
World Electricity Generation by Fuel (2007)

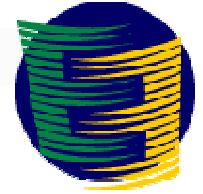


Source: IEA



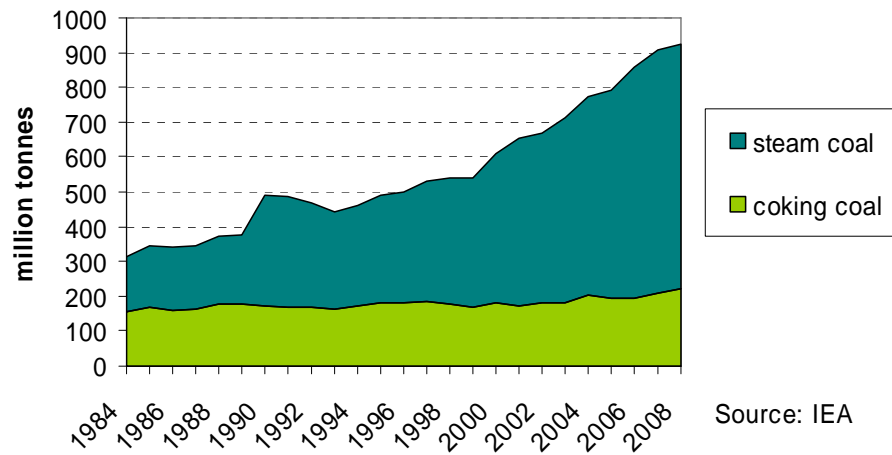
Coal Consumption (1965-2008)



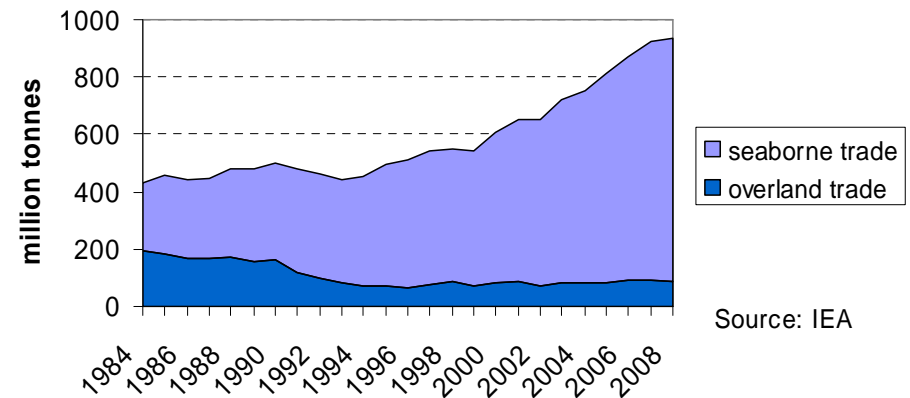


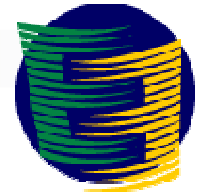
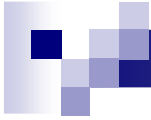
Changes in Global Coal Trade

Steam and Coking Coal Trade (1984-2008)

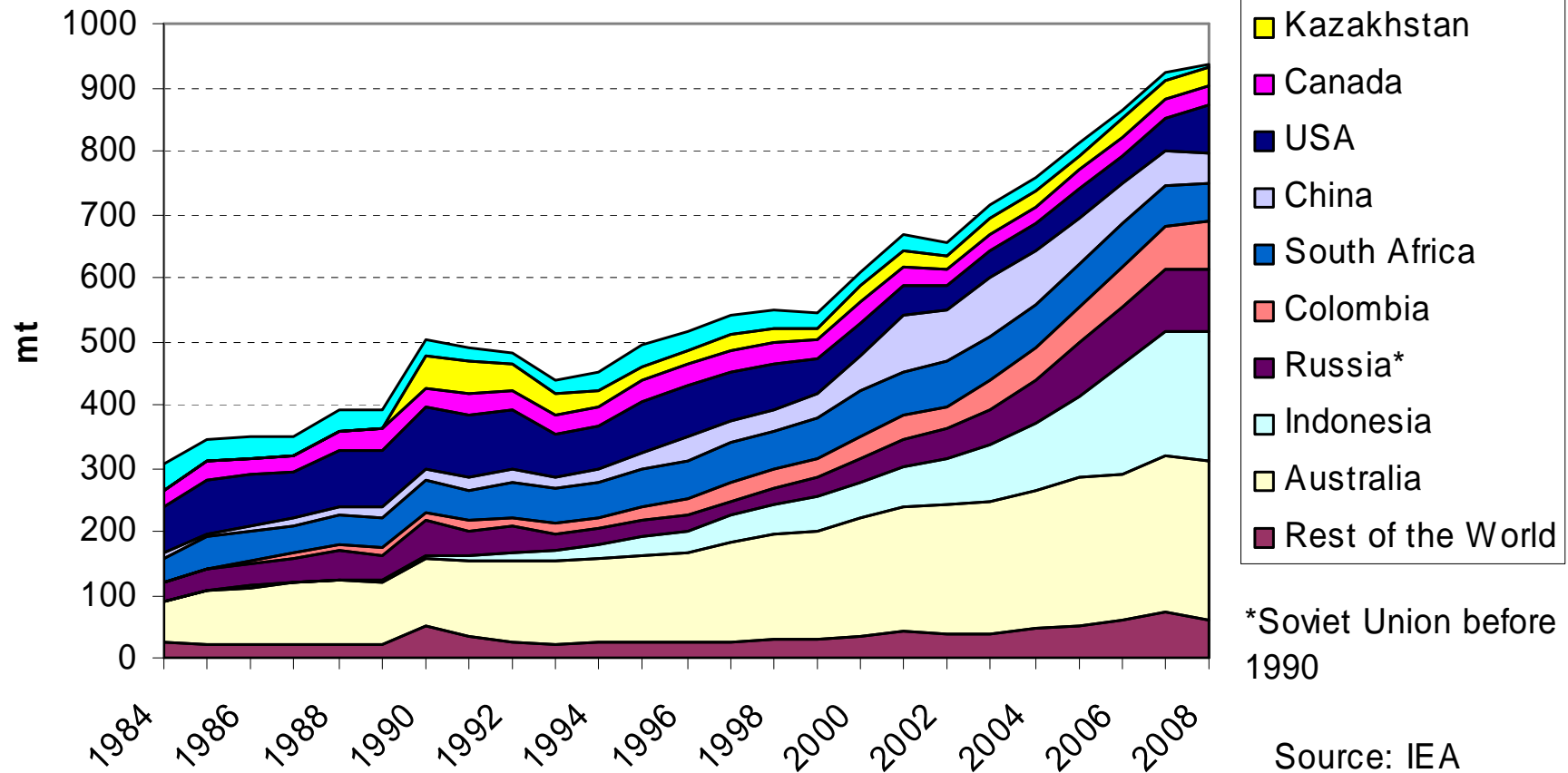


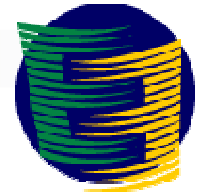
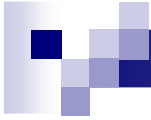
Seaborne and Overland Hard Coal Trade (1984-2008)



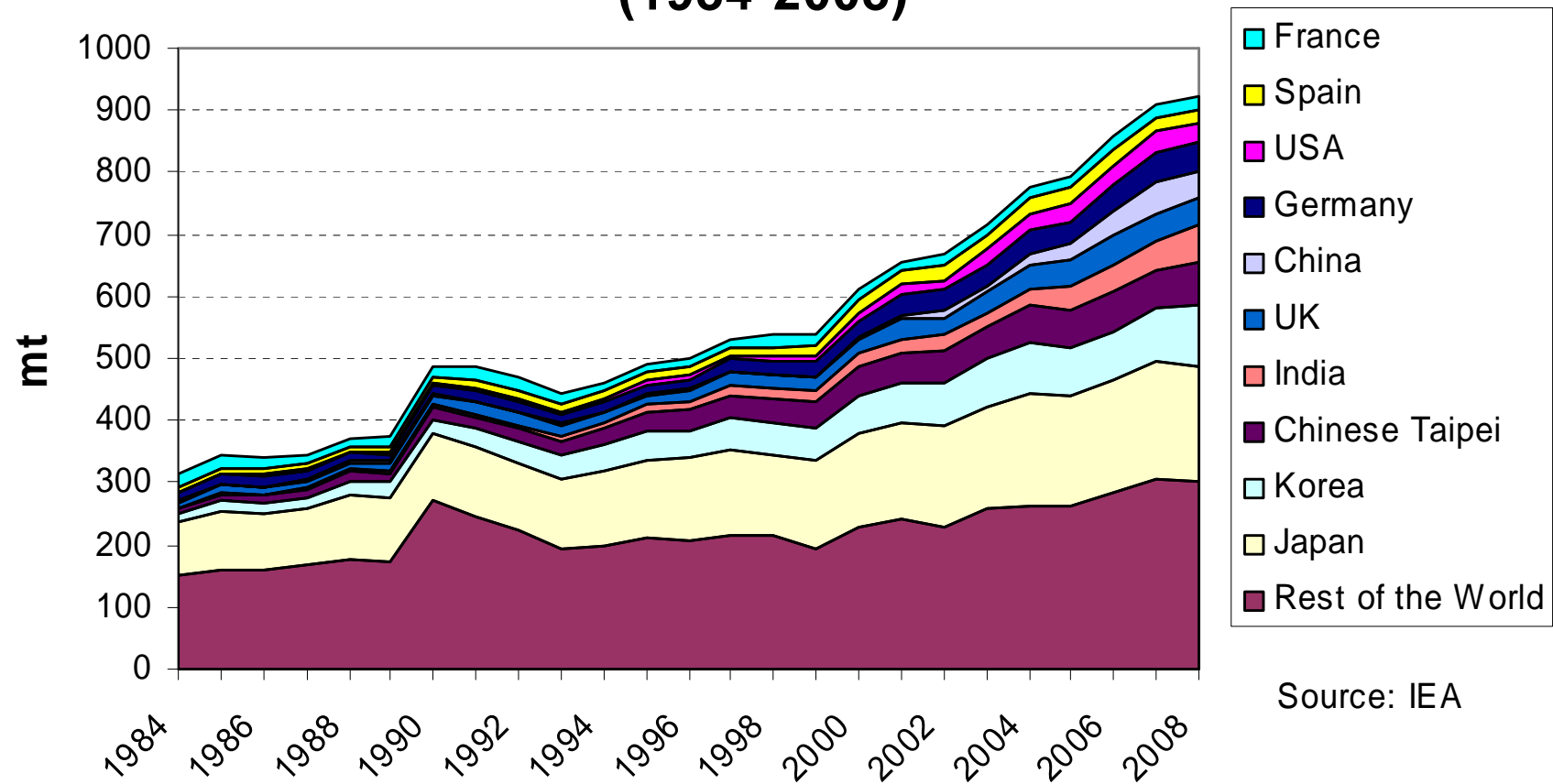


World Hard Coal Exports (1984-2008)

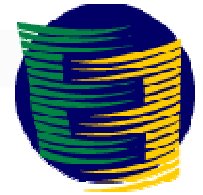
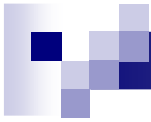




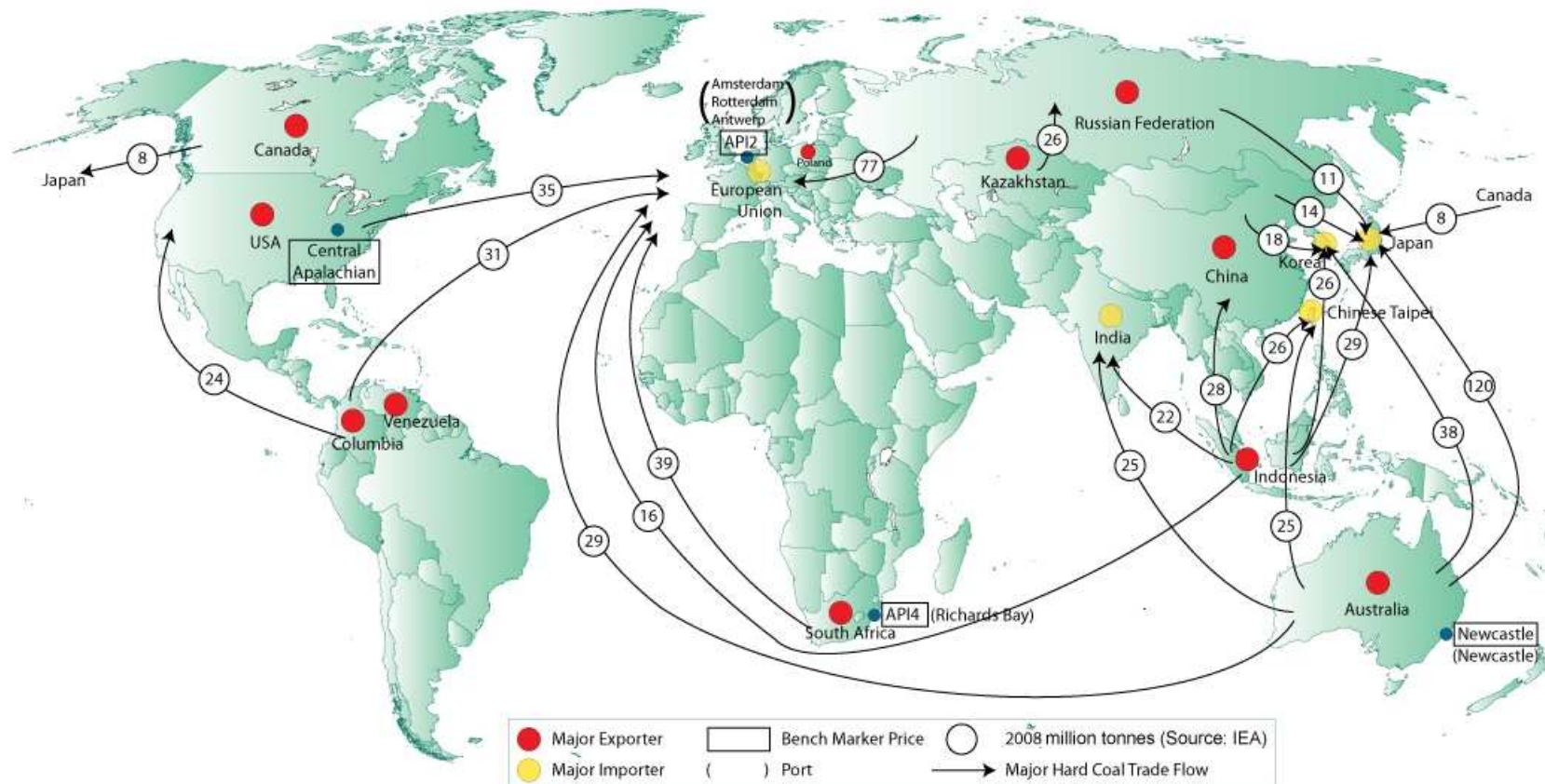
World Hard Coal Imports (1984-2008)

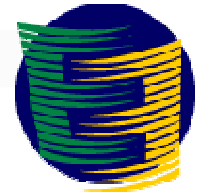
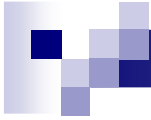


Source: IEA

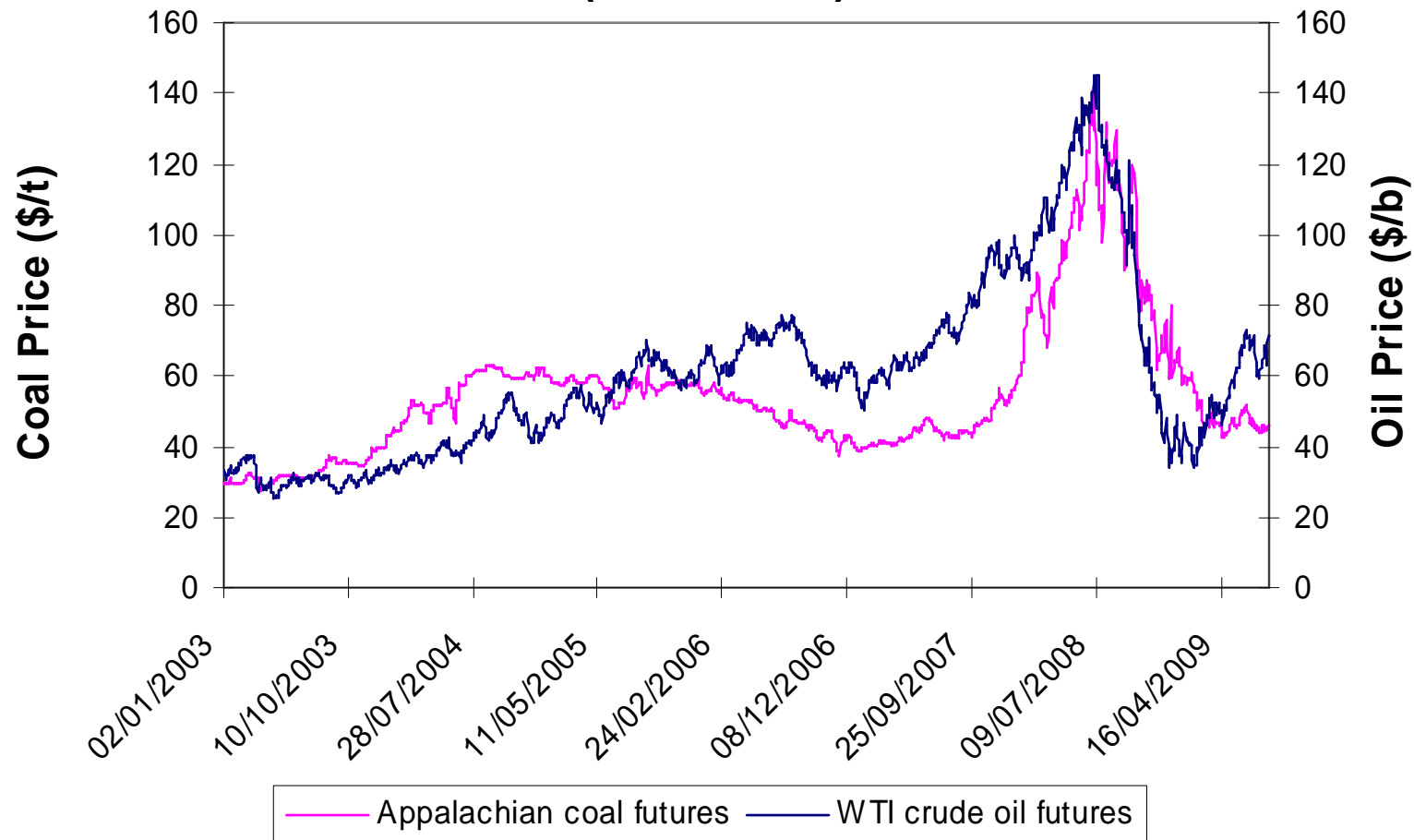


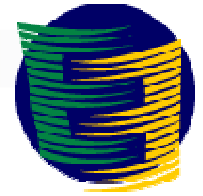
World Coal Map: Major Trade Flows and Bench Marker Prices



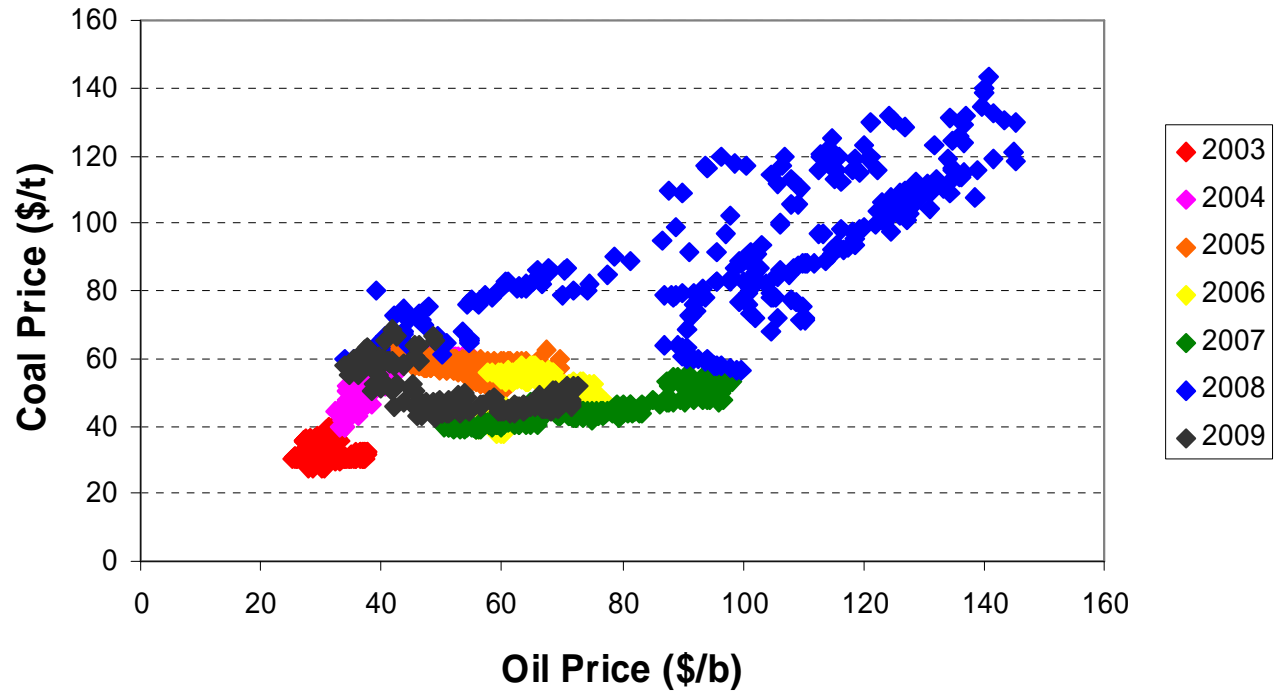


NYMEX Coal and Crude Oil Futures Prices (2003-2009)

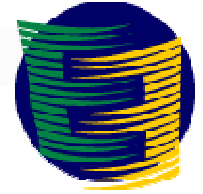




Price Correlations (2003-2009)



Correlation Coefficient (2003-2009)								
Period	2003	2004	2005	2006	2007	Jan-Jul 2008	Aug- Dec 2008	2009
Value	-0.02	0.79	-0.39	-0.48	0.85	0.91	0.95	-0.58

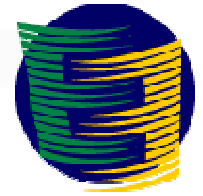
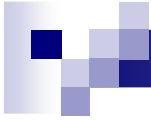


Conclusions

- The coal sector has undergone two major changes in the last decade.
 - One change is in the global demand structure. In around 2000 steam coal demand from developing countries started increasing in an unprecedented way.
 - The other change is the emergence of financial and derivative coal markets. As a result, coal has become a “commodity” in terms of pricing.
- In 2008 in particular coal and oil prices went up and came down in a synchronised way. Traders connected the two markets through spread trading.
- Currently policy makers are discussing re-regulation of the financial sector including commodity markets in the US and Europe. Coal markets need to be discussed in the same framework.

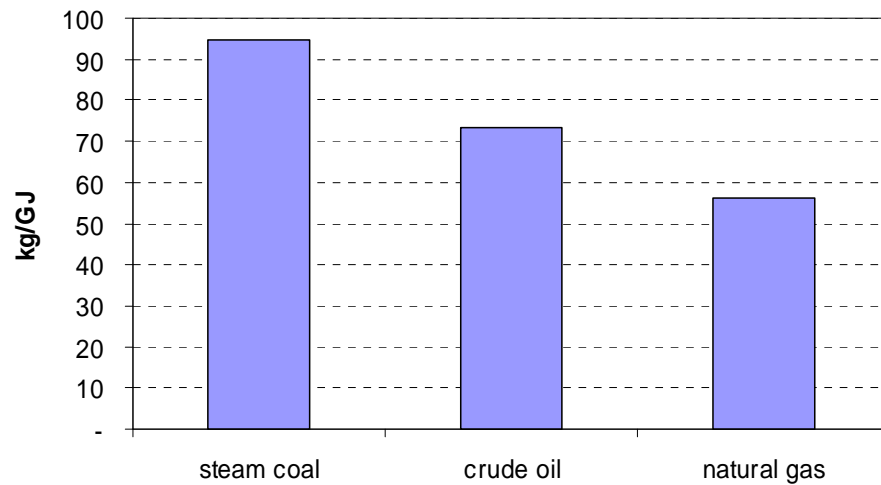


2. CO2 Pricing



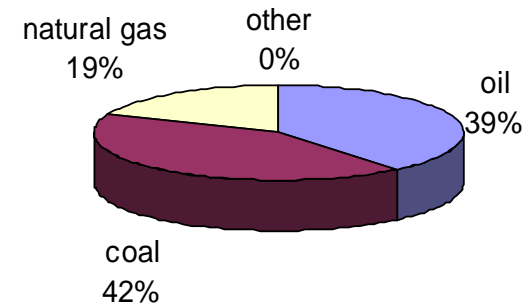
Coal and CO2

CO2 Emissions per Unit Calorific Value

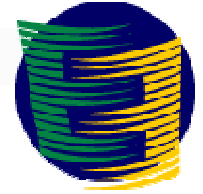


Source: 2006 IPCC Guidelines

CO2 Emissions from Fuel Combustion by Fuel (2006)

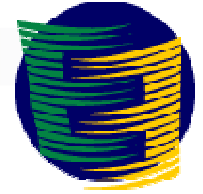


Source: IEA



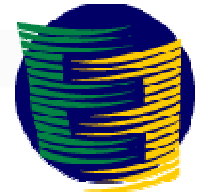
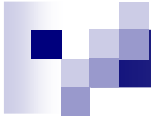
Internalising Externalities

- “The tragedy of the commons”
Garrett Hardin, Science (1968)
- Government environmental measures
 - MBIs: taxes, subsidies, fees, marketable emission permits, etc.
 - CAC regulations: emission standards, technology-based standards, etc.

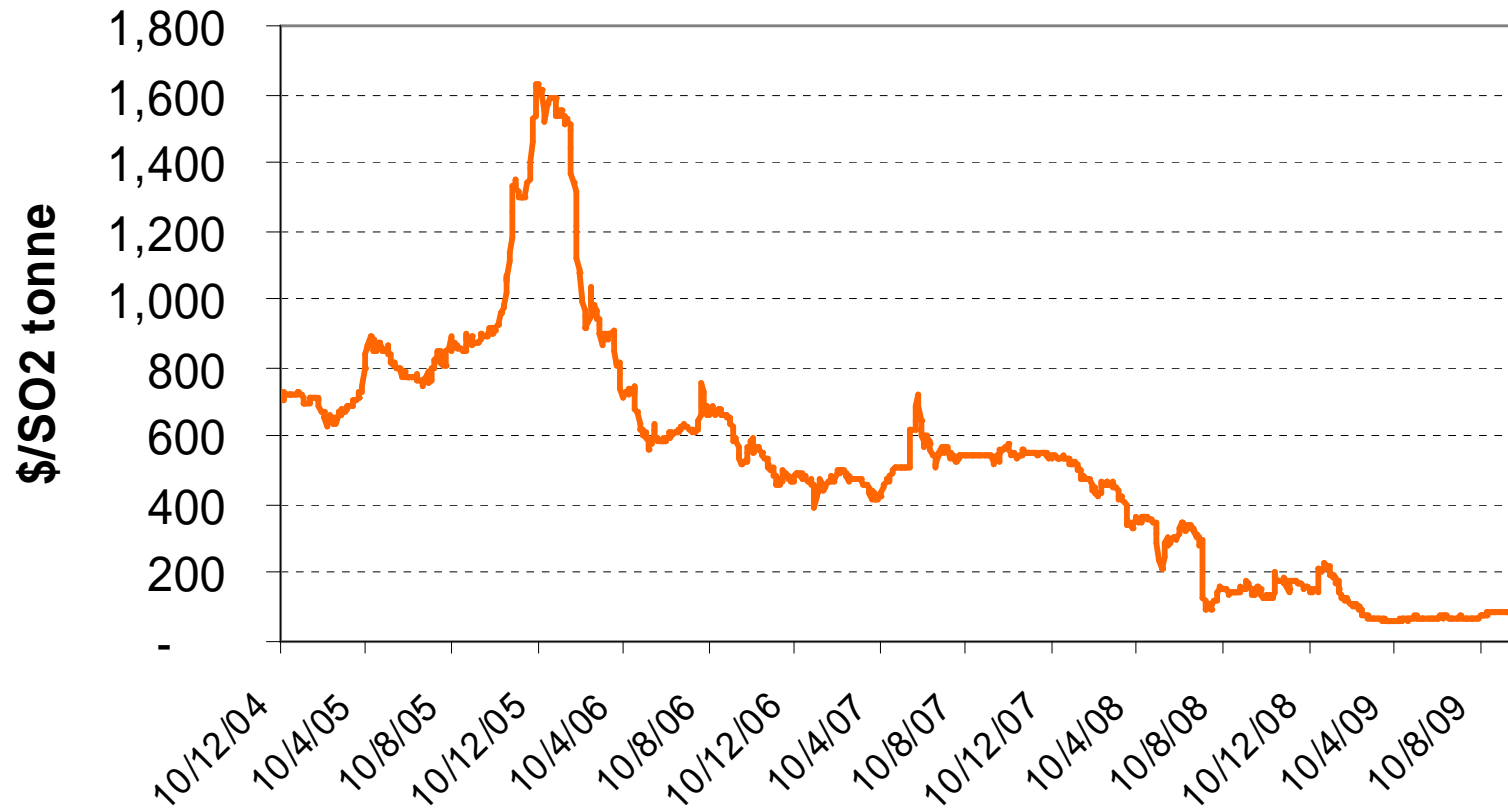


US SO₂ Market

- The first environmental measure to use marketable emission permits
- Created by the US Clean Air Act of 1990, to tackle acid rain problems
- Goal: 10 million tonnes below 1980 levels
- Equipped with cap-and-trade scheme, auctions (and free distributions), tracking system
- Phase I (1995-1999), Phase II (2000-2009), CAIR (2010-)
- Currently 97% of the allowances are distributed for free
- Market participants: power companies, brokers, environmental groups, trading in OTC markets and futures exchanges (CCFE, NYMEX)

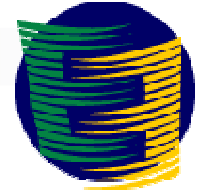


US EPA SO2 Emissions Allowance Futures Prices* (Oct 2004-Oct 2009)



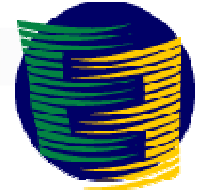
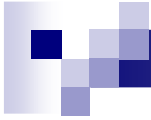
Source: CCFE

*prompt delivery contract prices



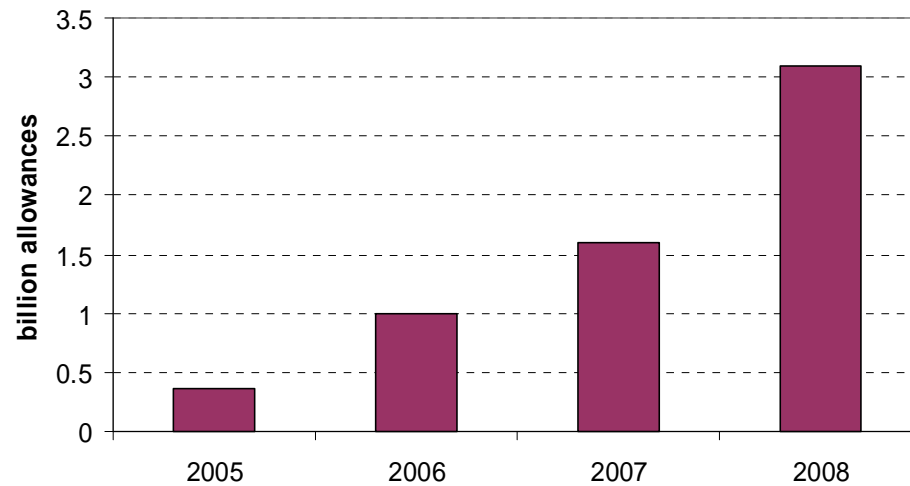
European Carbon Market

- EU ETS created by EU Directive (2003/87/EC)
- Coverage: EU 27 countries plus Iceland, Liechtenstein and Norway
- Phase 1 (2005-2007), Phase 2 (2008-2012), Phase 3 (2013-2020)
- Goal: 21% below 2005 levels by 2020
- Currently most allowances are distributed for free under NAPs. But from 2013 there will be an EU-wide cap and more than 50% of allowances will be auctioned.
- Trading EUAs, CERs (CDM) and ERUs (JI)
- Market participants: power/manufacturing companies, (airline companies), and traders, trading in OTC markets and futures exchanges (ICE, EEX)



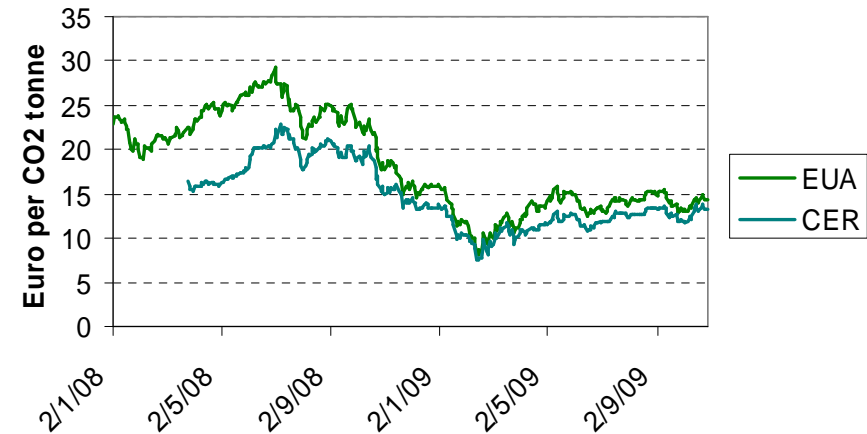
EU ETS

EU ETS Trading Volumes (2005-2008)



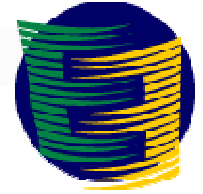
Source: Point Carbon

EEX EUA and CER Futures Prices*
(Jan 2008-Oct 2009)



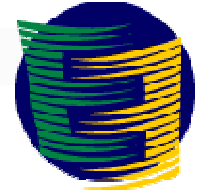
Source: EEX

*prompt delivery contract prices



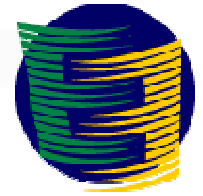
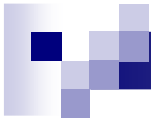
Costs of CO2

- If a power generator burns one tonne of steam coal in Europe,
 - API2 steam coal: \$94.00 (at ICE on June 29)
 - 1 tonne of the average steam coal emitting 2.44 tonnes of CO2
 - EUA €15.22 per CO2 tonne x 2.44 = €37.14 (\$45.53) (at ICE on June 29)
- Total cost \$139.53



Conclusions

- In 2008/2009 CO2 emissions allowance prices have gone up and come down drastically.
- Some analysts think that the volatility in the carbon market comes from small trading volumes, where CO2 emitting facilities receive the bulk of emissions allowances for free and need to buy or sell only a small portion of them. This problem would be solved, if and when trading volumes increase in the future.
- Emissions trading and carbon pricing are likely to influence supply/demand and prices for coal.



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