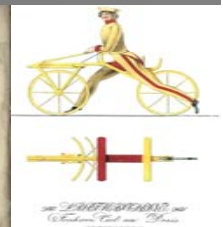


Carbon markets:
impact on energy, environment & competitiveness
Carbon EXPO 2007

Carlos de Regules

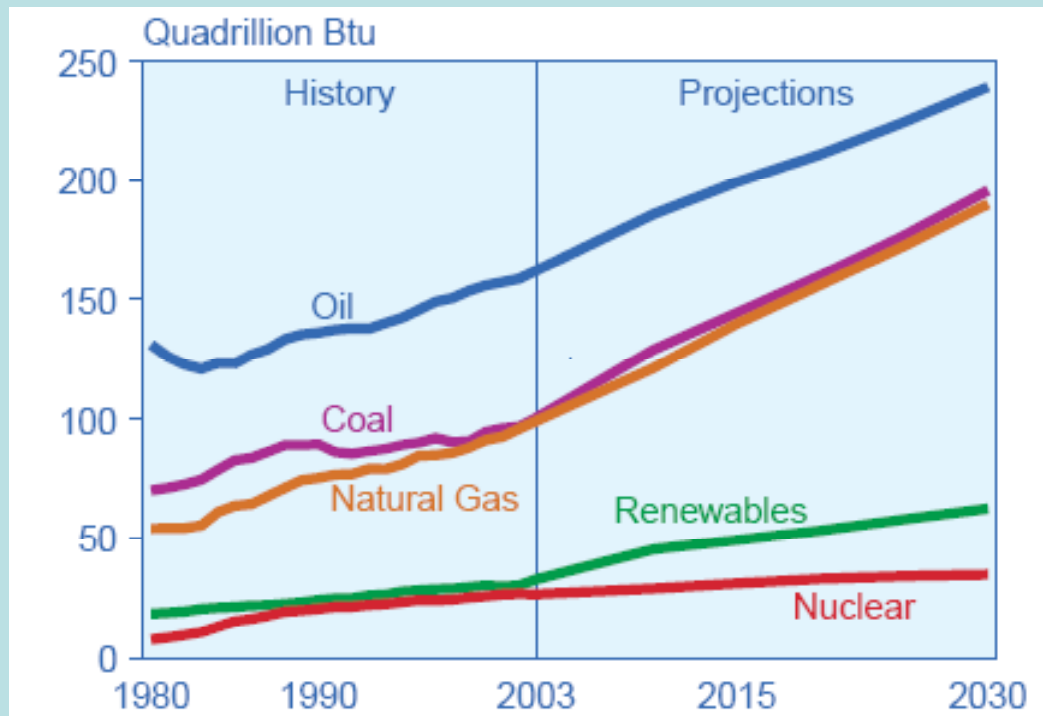


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Carbon market impact on growing energy needs

World Marketed Energy Use
by Energy Type, 1980-2030



* History: *International Energy Annual 2003*, Energy Information Administration (EIA), May-July 2005.
Projections: *System for the Analysis of Global Energy Markets*, EIA, 2006.

"World energy consumption is projected to increase by 71 percent from 2003 to 2030.

Fossil fuels continue to supply much of the energy used worldwide, and oil remains the dominant energy source."

...carbon market impact on growing energy needs?

A supply of abatement perspective

Abatement potential for greenhouse gases by sector*
(GtCO₂^e per year by 2030, costing up to 40E/ton)

100%=26

Possible abatement measures (examples)

Power, manufacturing

Power

5.9

- Renewables (wind, solar, biomass)
- Nuclear
- Carbon capture and storage

Manufacturing

6.0

- Energy efficiency (eg. Cogeneration, process shift)
- Fuel switching
- Carbon capture and storage in industrial process

Buildings, transportation

Buildings

3.7

- Improved building insulation, heating/cooling efficiency
- Energy efficiency in lighting, appliances

Transportation

2.9

- Fuel-efficient vehicles
- Biofuels

Forestry, agriculture

Forestry

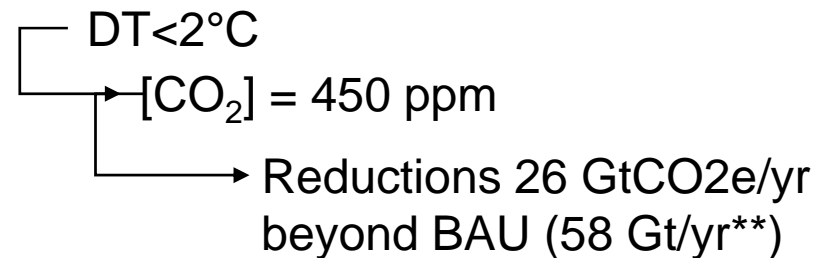
6.7

- Deforestation avoided
- Afforestation/reforestation

Agriculture/waste

1.5

- Capture of methane from landfills
- New agricultural methods without tillage



@ less than 40 E / ton, 2 paradigms:
Potential

1. No tech or mature tech 3/4 !

2. Tech dependent 1/4

Example of competitiveness issues

Deforestation avoided:

- Agriculture policy (subsidies & fair trade, deforestation, commercial logging, subsistence farming)

Carbon Capture & Storage:

- Tech deployment to appropriately select and manage geological reservoirs.

* A cost curve for greenhouse gas reduction, Enkvist, Nauclér & Rosander, The McKinsey Quarterly, January 2007.

** Idem. with projections from International Energy Agency and US-EPA

Some thoughts...

On carbon markets: it's not about making compliance cheaper, it's about assigning a real value to an "externality" ..from a trading place to an investment decision instrument.

On fossil fuels: it's not how much we will be able, or eager, to stop consuming, it's about how much the atmosphere can take (currently accumulating at 4Gt/yr).

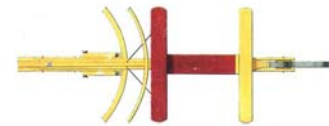
On carbon markets again: carbon markets work, but are not sufficient, a policy portfolio with regulations and standards is required (2Gt expected to be traded by 2012, vs 26 needed).

On technology: should we rely on Prometheus to deliver an ever cleaner supply or put some more serious talent on curbing demand and avoiding deforestation?

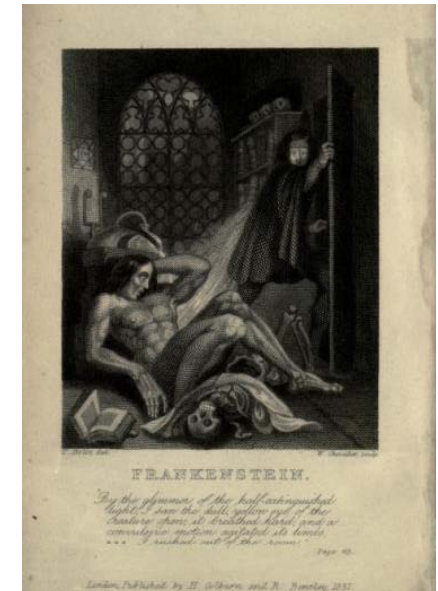
On unilateral capping: the EU 20% goal: turning resource efficiency capability into a global competitive advantage... "the most resource efficient region of the world" (3rd report of the HLG on competitiveness, energy and the environment).



Prometheus bound, Nicolas-Sébastien Adam, 1762.



1817
Freiherrn Carl von Drais.



Climate change, ghost stories and the making of a bicycle...

In the summer of 1816 in Europe, far more than the usual amount of rain fell.

It was the year without a summer.

It rained nonstop in Ireland for eight weeks.

The potato crop failed. Famine ensued.

The widespread failure of corn and wheat crops in Europe and Great Britain led to what historian John D. Post has called “the last great subsistence crisis in the western world.”

In Germany, in the state of Baden the soaring price of oats prompted Karl Drais to invent a replacement for the horse - the draisine.

Just across the border, on holiday by Lake Geneva Mary Shelley and her husband were trapped in Lord Byron's house by constant rain...

Byron suggested a competition to write a ghost story.

Frankenstein, or The Modern Prometheus

was conceived and written at a time of dramatic advances in technology: a warning that the application of science can lead to unintended consequences?

Gracias

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