Some informal remarks after the King Review of low-carbon cars

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Outline

- **Context: neither Stern nor G8 (2007) CCL are based on the latest IPCC report (2007)**
  - **Impacts happen at lower temperature than previously thought (i.e. EU 2°C target may have to be revised to an even lower temp. increase)**
  - **Carbon cycle feedbacks aggravate the problem: a lower CO_2 concentration is « allowed » for a given temp. increase (i.e. 350 ppm CO_2 is probably needed to stay below 2°C, not 450 or 550!)**
- **What does the IPCC WG3 AR4 say about transport?**
- **Some personal remarks**

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Stern admits he underestimated global warming

FT INTERVIEW

Lord Stern tells **Fiona Harvey** and **Jim Pickard** he should have taken a much stronger view over the effects of greenhouse gases

The Stern report on climate change underestimated the risks of global warming, its author said yesterday, and should have presented a gloomier view of the future.

"We underestimated the risks . . . we underestimated the damage associated with temperature increases . . . and we underestimated the probabilities of temperature increases," Lord Stern, former chief economist at the World Bank, told the Financial Times yesterday.

In retrospect, he said, he would have taken a much stronger view in the report on the drastic changes that would come about if greenhouse gas emissions were unless greenhouse gas emissions were stabilised and then cut within the next decade.

"The damage risks are bigger than I would have argued. Things like the damage associated with a 5 degree temperature increase are enormous. We can't be precise about what it would be like but you can say it would be a transformation," he said.

But he defended his estimates of the cost of taking action on emissions, which he put in the report at about 1 per cent of global GDP.

"Subsequent reports, [from] McKinsey, the International Energy Agency, the Intergovernmental Panel on Climate Change, have pointed to the [Stern report's] costs of action being roughly in the right ball park. Nothing [since] has led me to revise the cost of action," he said.

"I probably would have emphasised the importance of good policy [if writing the report again today] and how bad policy puts up the costs [of cutting emissions]," he

Source: Financial Times, April 2008

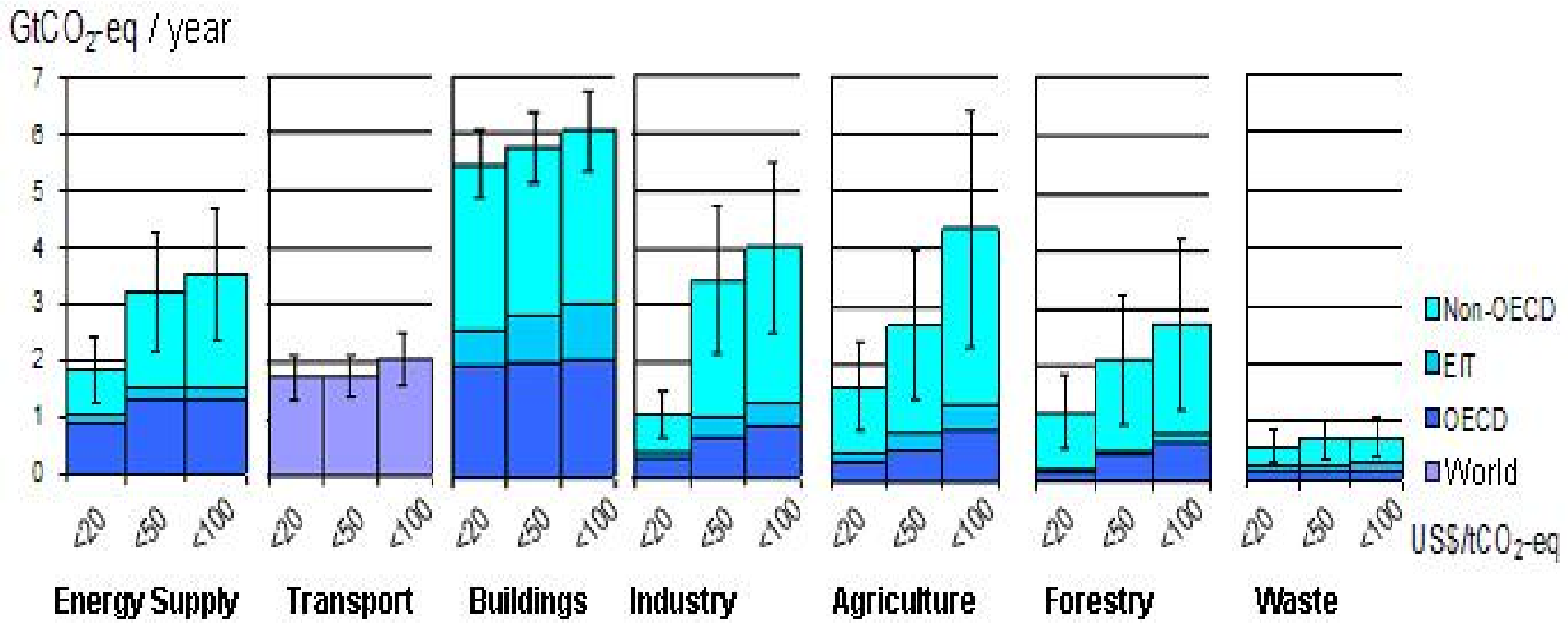
IPCC AR4: Long term mitigation (after 2030)

- The lower the stabilization level, the more quickly emissions would need to peak and to decline thereafter
- Mitigation efforts over the next two to three decades will have a large impact on opportunities to achieve lower stabilization levels

Table SPM.5: Characteristics of post-TAR stabilization scenarios [Table TS 2, 3.10][a]

Category	Radiative Forcing (W/m^2)[a]	CO_2 Concentration[c] (ppm)	CO_2-eq Concentration[c] (ppm)	Global mean temperature increase above pre-industrial at equilibrium, using "best estimate" climate sensitivity[b], [c] (°C)	Peaking year for CO_2 emissions[d] (year)	Change in global CO_2 emissions in 2050 (% of 2000 emissions)[d] (%)
I	2.5 – 3.0	350 – 400	445 – 490	2.0 – 2.4	2000 - 2015	-85 to -50
II	3.0 – 3.5	400 – 440	490 – 535	2.4 – 2.8	2000 - 2020	-60 to -30
III	3.5 – 4.0	440 – 485	535 – 590	2.8 – 3.2	2010 - 2030	-30 to +5
IV	4.0 – 5.0	485 – 570	590 – 710	3.2 – 4.0	2020 - 2060	+10 to +60
V	5.0 – 6.0	570 – 660	710 – 855	4.0 – 4.9	2050 - 2080	+25 to +85
VI	6.0 – 7.5	660 – 790	855 – 1130	4.9 – 6.1	2060 - 2090	+90 to +140

IPCC AR4: All sectors and regions have the potential to contribute: Mitigation potential in 2030



Note: estimates do not include non-technical options, such as lifestyle changes.

IPCC AR4: How can emissions be reduced?

Sector	**(Selected) Key mitigation technologies and practices currently commercially available.**
Energy Supply	efficiency; fuel switching; nuclear power; renewable (hydropower, solar, wind, geothermal and bioenergy); combined heat and power; early applications of CO2 Capture and Storage
Transport	**More fuel efficient vehicles; hybrid vehicles; cleaner diesel vehicles; biofuels; modal shifts from road transport to rail and public transport systems; non-motorised transport (cycling, walking; land-use and transport planning**
Buildings	Efficient lighting; efficient appliances and airco; improved insulation ; solar heating and cooling; alternatives for fluorinated gases in insulation and aplliances

IPCC AR4: Changes in lifestyle and behaviour patterns can contribute to climate change mitigation

- Changes in occupant behaviour, cultural patterns and consumer choice in buildings.
- **Reduction of car usage and efficient driving style, in relation to urban planning and availability of public transport**
- Staff training, reward systems, regular feedback and documentation of existing practices in industrial organizations

IPCC AR4: Selected sectoral policies, measures and instruments that have shown to be environmentally effective

Sector	Policies[1], measures and instruments shown to be environmentally effective	Key constraints or opportunities
Transport	Mandatory fuel economy, biofuel blending and CO_2 standards for road transport	Partial coverage of vehicle fleet may limit effectiveness
	Taxes on vehicle purchase, registration, use and motor fuels, road and parking pricing	Effectiveness may drop with higher incomes
	Influence mobility needs through land use regulations, and infrastructure planning	Particularly appropriate for countries that are building up their transportation systems
	Investment in attractive public transport facilities and non-motorised forms of transport	

[1] Public RD&D investment in low emission technologies have proven to be effective in all sectors

IPCC AR4: The importance of a "price of carbon"

- Policies that provide a real or implicit price of carbon could create incentives for producers and consumers to significantly invest in low-GHG products, technologies and processes.
- Such policies could include economic instruments, government funding and regulation
- For stabilisation at around 550 ppm CO2eq carbon prices should reach 20-80 US$/tCO2eq by 2030 (5-65 if "induced technological change" happens)
- At these carbon prices large shifts of investments into low carbon technologies can be expected

Excerpts from IPCC AR4 WG3 ! (Chapter Transport)

- There are !**multiple mitigation** ! **options in the transport sector but** their effect may be !**counteracted by** ! **growth in the sector**. Mitigation ! options are faced with !**many barriers,** ! such as consumer preferences and lack ! of policy frameworks *(medium ! agreement, medium evidence).*

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Excerpts from IPCC AR4 WG3 ! (Chapter Transport)

- Improved vehicle efficiency measures, leading ! to fuel savings, in many cases have net ! benefits (at least for light-duty vehicles), but ! the !**market potential is much lower than** ! **the economic potential** due to the ! influence of other consumer considerations, ! such as performance and size. There is !**not** ! **enough information to assess** the ! mitigation !**potential for heavy-duty** ! **vehicles**.

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Excerpts from IPCC AR4 WG3 ! (Chapter Transport)

- Market forces alone, including rising ! fuel costs, are therefore not expected to ! lead to significant emission reductions.

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Excerpts from IPCC AR4 WG3 ! (Chapter Transport)

- **Biofuels might play an important role in ! addressing GHG emissions in the transport ! sector, !*depending on their production ! pathway*.** !

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Excerpts from IPCC AR4 WG3 ! (Chapter Transport)

- **Modal shifts from road to rail and** ! **to** inland and coastal !**shipping** and ! from low occupancy to high-occupancy ! passenger transportation, as well as ! land-use, !**urban planning and non-motorized transport** offer ! opportunities for GHG mitigation, ! depending on local conditions and ! policies.

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Excerpts from IPCC AR4 WG3 ! (Chapter Transport)

- Although the !**efficiency** of vehicle ! technology !**has improved** steadily over ! time, much of the benefit of these ! improvements have gone towards ! **increased power and size at the** ! **expense of improved fuel** ! **efficiency**.

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Some personal remarks

- **Have we really taken the measure of the size of GLOBAL reductions needed to protect climate?**
- **Technology improvements are clearly welcome, BUT, as Mr Hodac said, we need an integrated approach: if we increase efficiency of cars by factor of 2, and multiply number of cars by 2 (or more!), we have not improved anything for climate!**
- **To determine climate-friendly CO_2/km norm, please do some backcasting, starting from the global emissions « allowed » in 2050 to protect climate.**

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Some personal remarks

- **Public transportation and non-motorized mode of transport, urban and transport planning are therefore even more important than the technological aspects of cars.**
- **CO_2 is not the only environmental factor to take into account. Fine particulate matter is a VERY important pollutant, and recent overemphasis on CO_2 has meant that there is a « dash to diesel », which we likely will regret in a decade or two if we don't stop it (particulate filters retain the coarsest particulate, but not enough of the finest, which are the most dangerous for health). In addition, « black carbon » heats the climate as well.**
- **Life cycle analysis of cars is broader than car emissions…**

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Useful links:

- www.ipcc.ch : IPCC !

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