2^{nd} Meeting of Major Economies on Energy Security and Climate Change

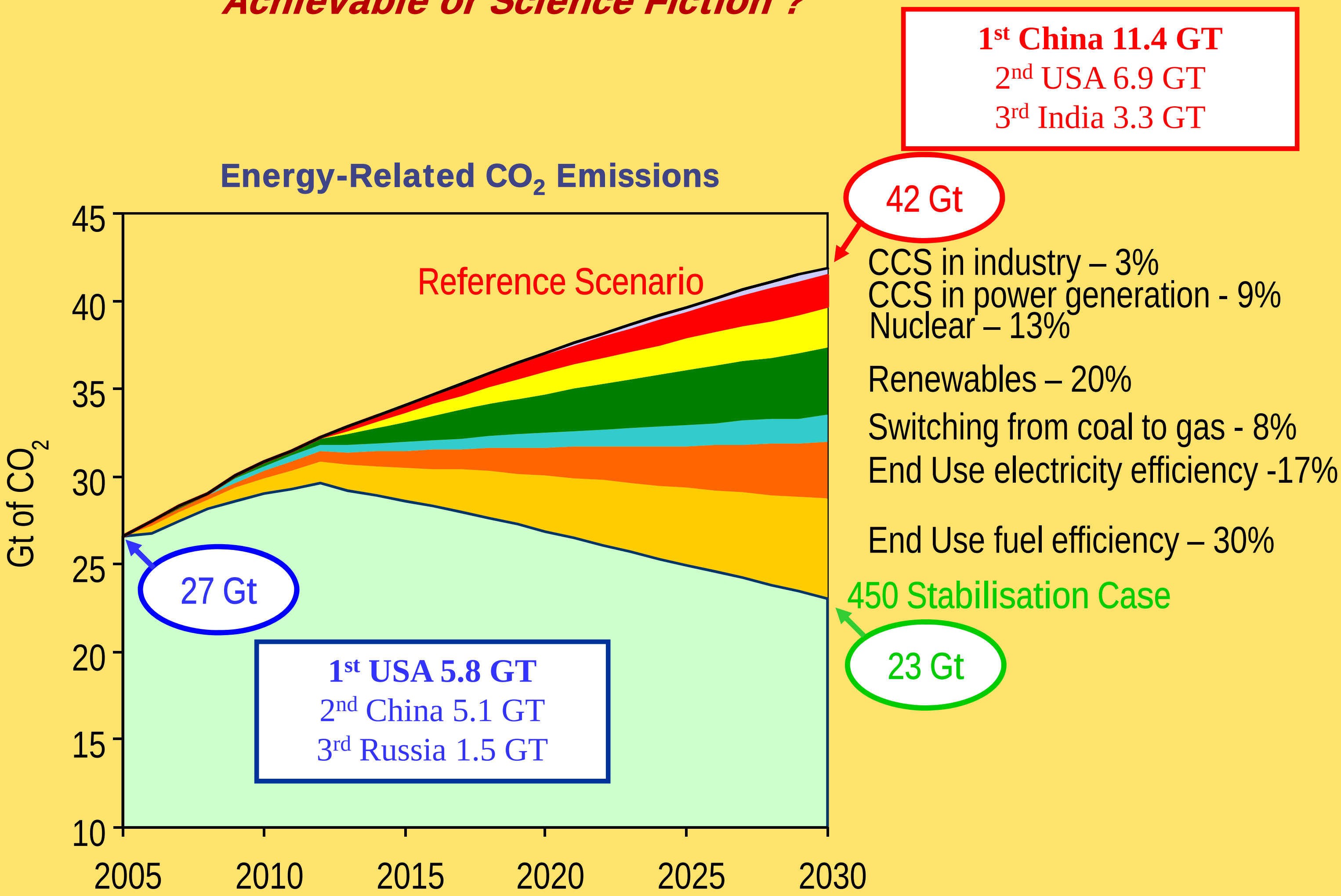
Improving Energy Efficiency and Overcoming Challenges in the Power and Transport Sectors

Nobuo Tanaka
Executive Director
International Energy Agency

Honolulu, 30 January 2008

CO_2 Emissions - 450 Stabilisation Case

Achievable or Science Fiction ?



By 2030, emissions are reduced to some 23 Gt, a reduction of 19 Gt compared with the Reference Scenario

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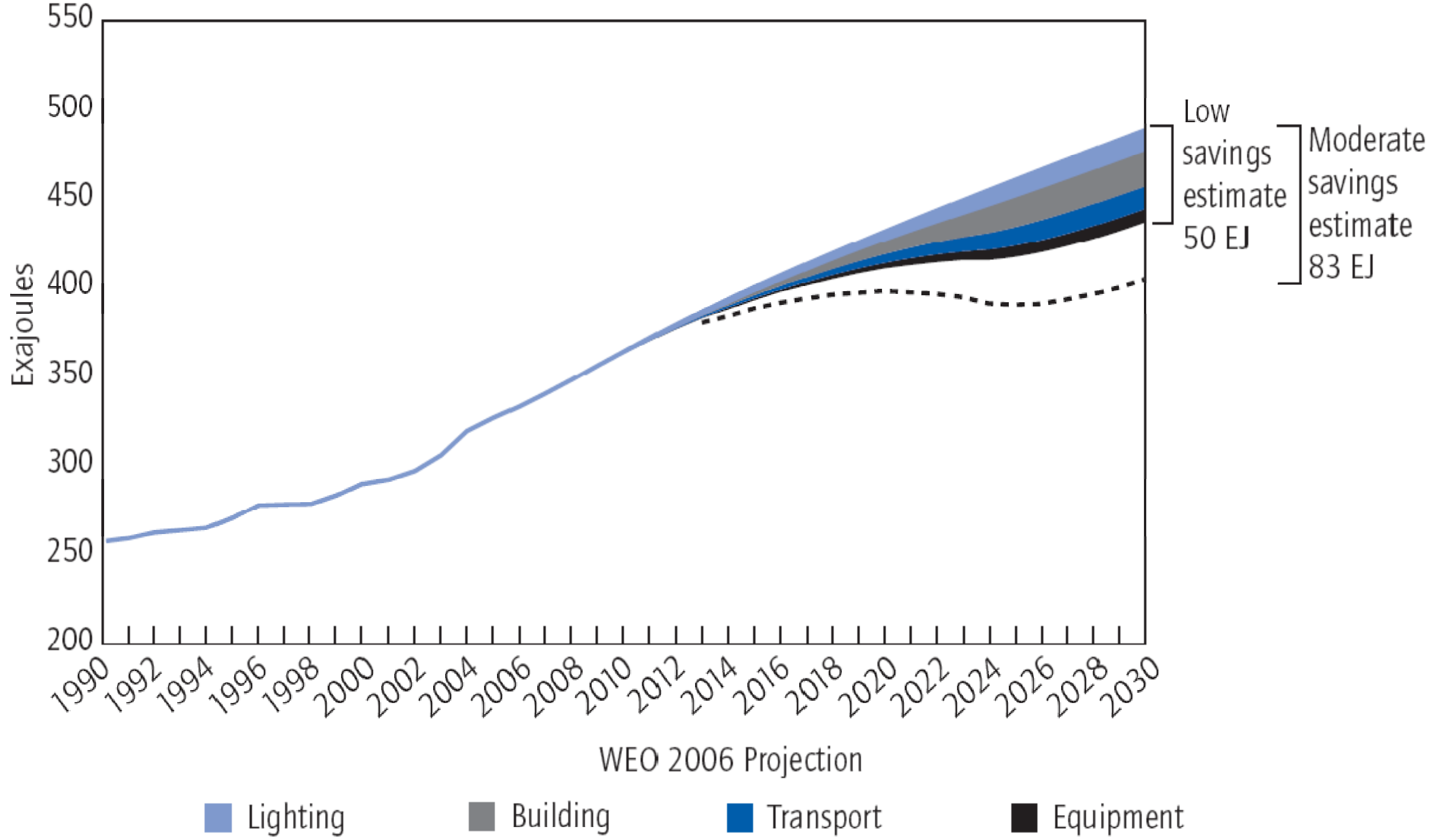
WORLD ENERGY OUTLOOK 2007

China and India Insights

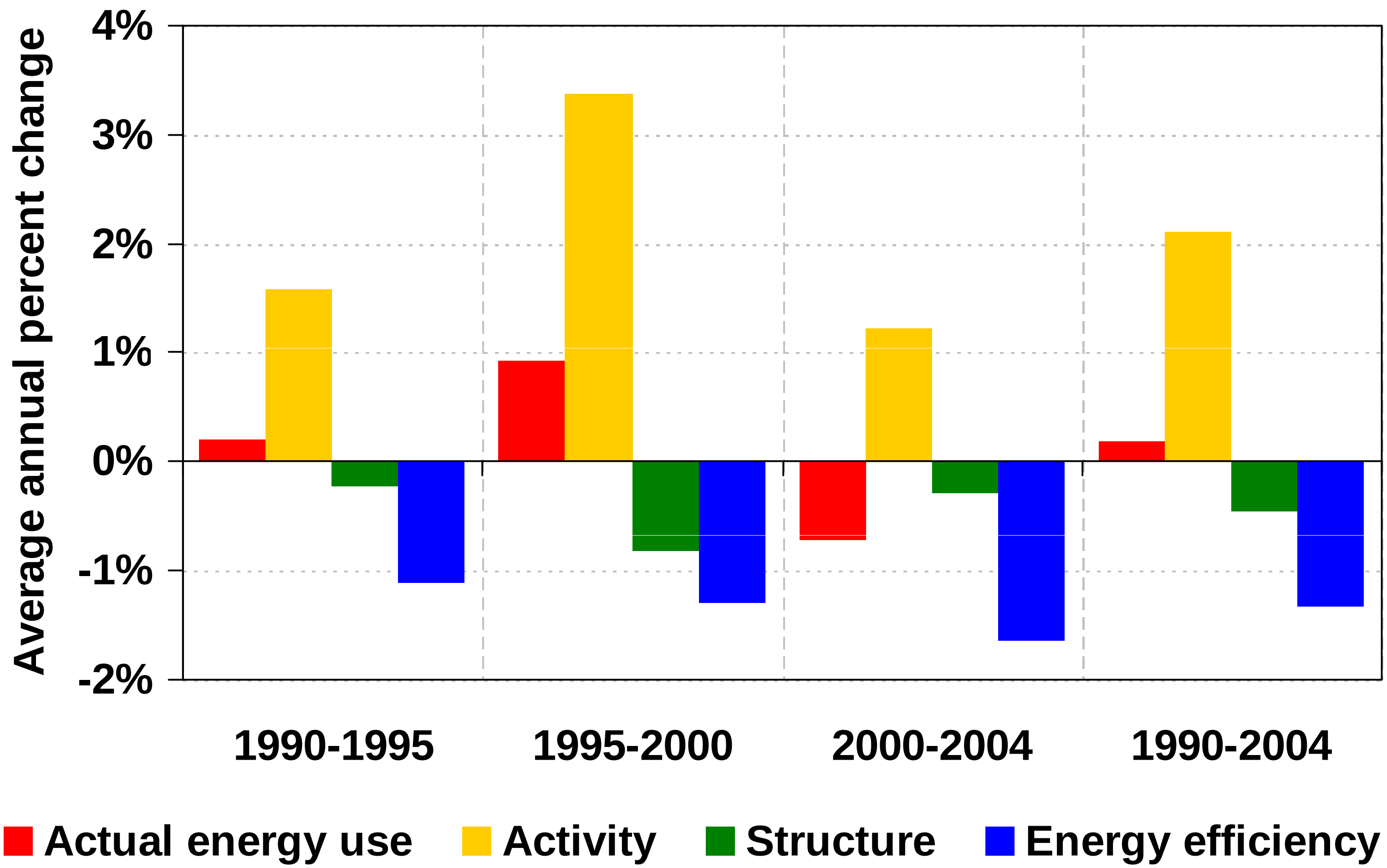
Energy efficiency: The IEA's recommendations to the G8



The IEA's 16 concrete recommendations for energy efficiency could save 5.7 GT of CO_2 by 2030

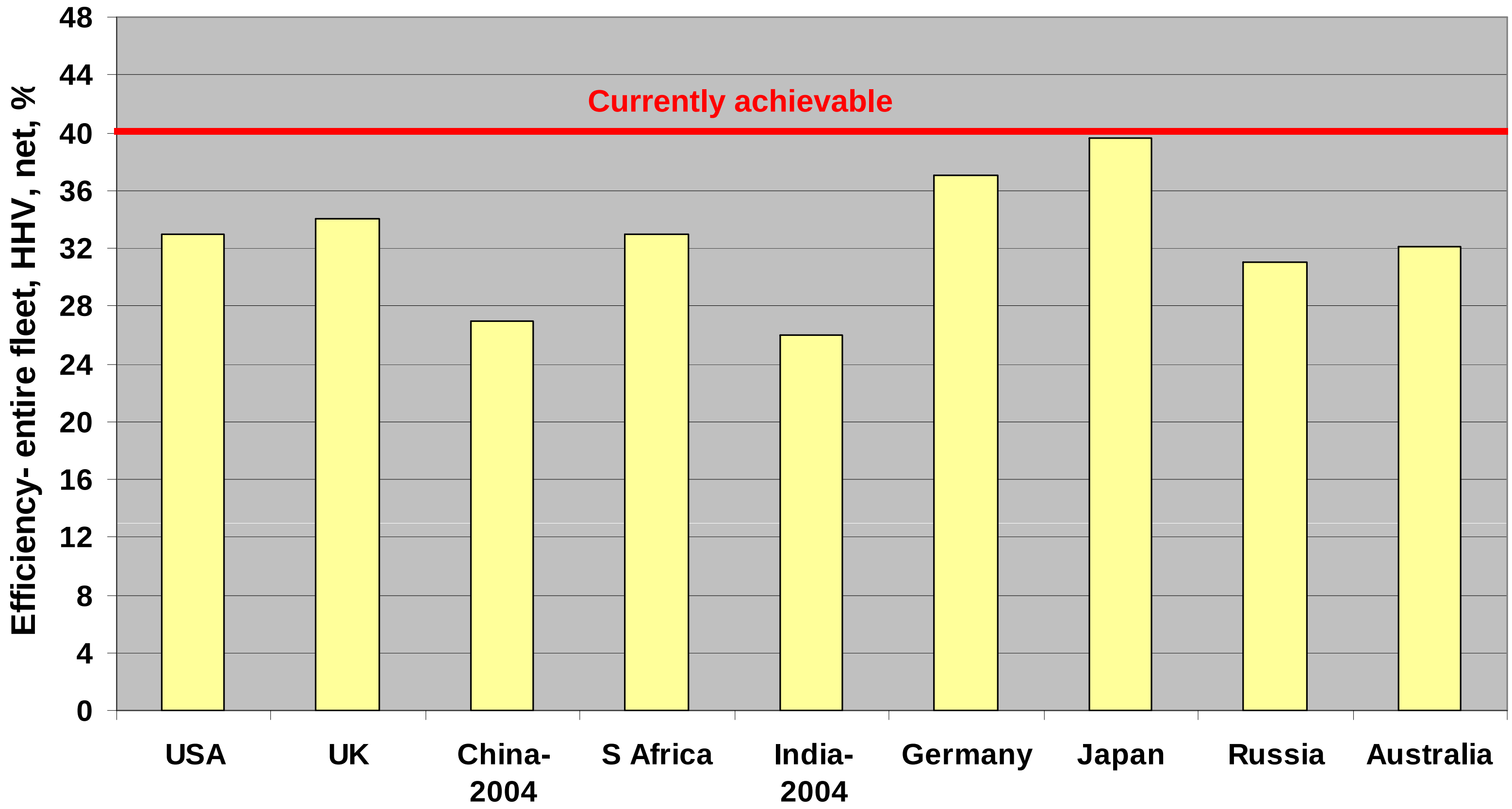
Sectoral Analysis Of Energy Efficiency

Manufacturing Energy Use



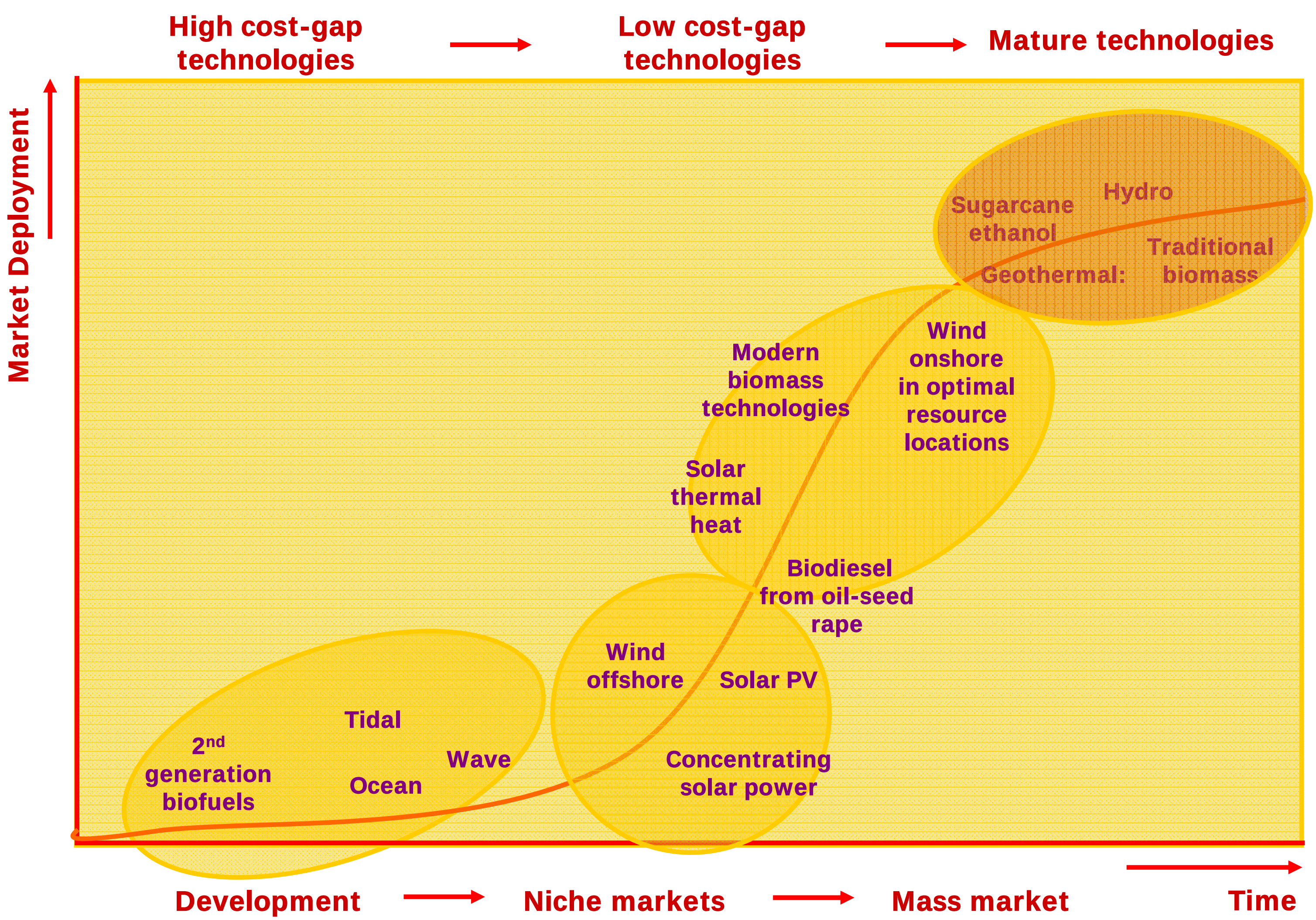
There has been a strong decoupling of energy use from manufacturing output. The largest improvements in energy efficiency were seen in metal products, chemicals, non-metallic minerals and paper and pulp.

Coal Power Generation: More Efficiency and CCS



The average efficiency of coal power plants is between 26-39%. Over 1.7 GT CO_2 could be saved each year by raising this to 40%.

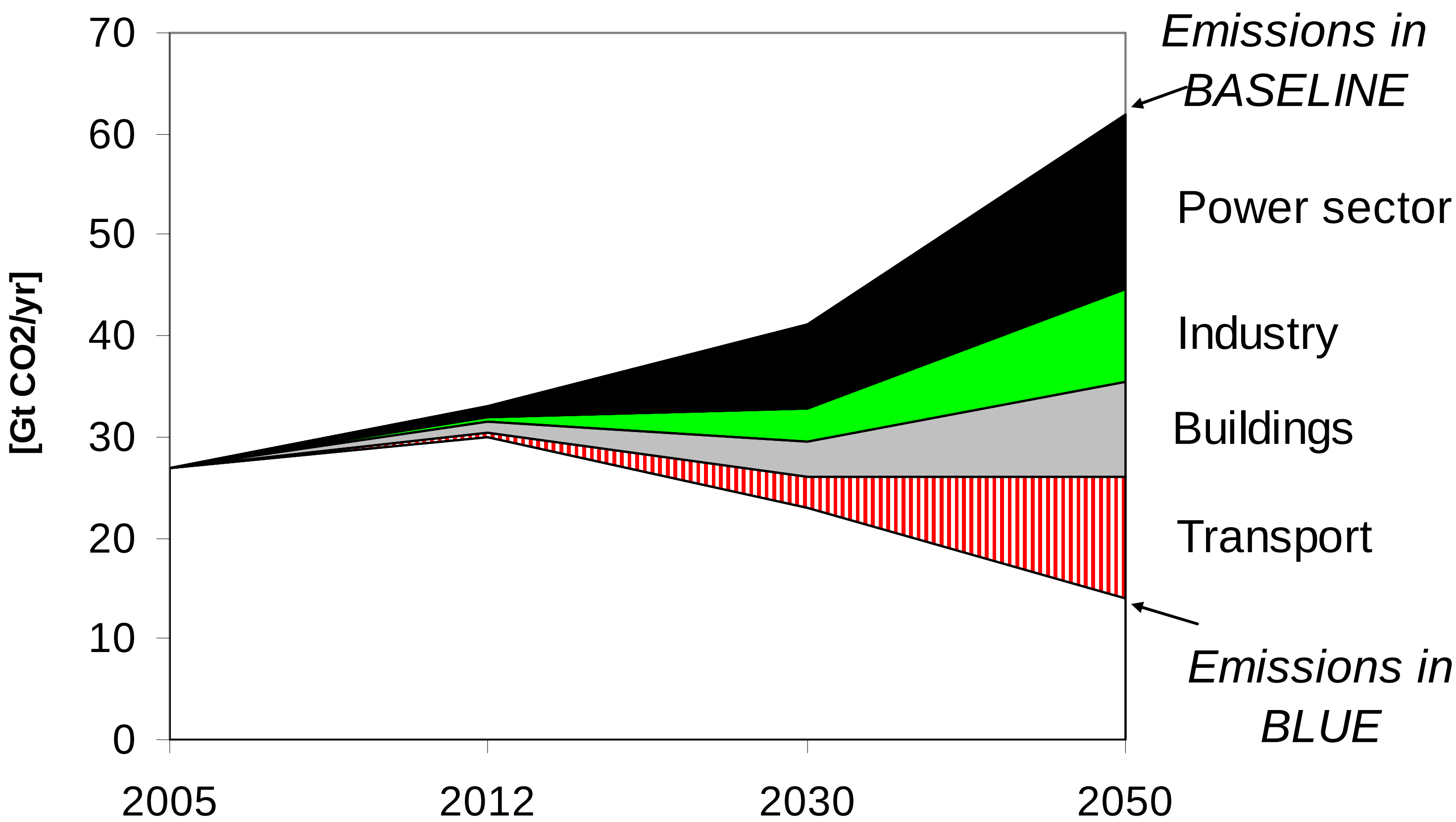
Renewable energy technologies: Today and Tomorrow….



Energy Technology Perspectives Publication 2008 (Forthcoming)

- **A study on the role of technology**
- **How to achieve dramatic emission reduction targets**
  - **Short and medium term technology policy needs**
  - **Special attention for technology roadmaps**
- **Scenario analysis, including**
  - **Emission <u>stabilization</u>**
  - **Emission <u>halving</u>**
- **A key deliverable to the G8 Hokkaido Summit**

The Carbon Challenge



Improved efficiency and decarbonizing the power sector could bring emissions back to current levels by 2050. To achieve a 50% cut we would also have to revolutionize the transport sector.

ENERGY TECHNOLOGY PERSPECTIVES

2008

Scenarios & Strategies to 2050

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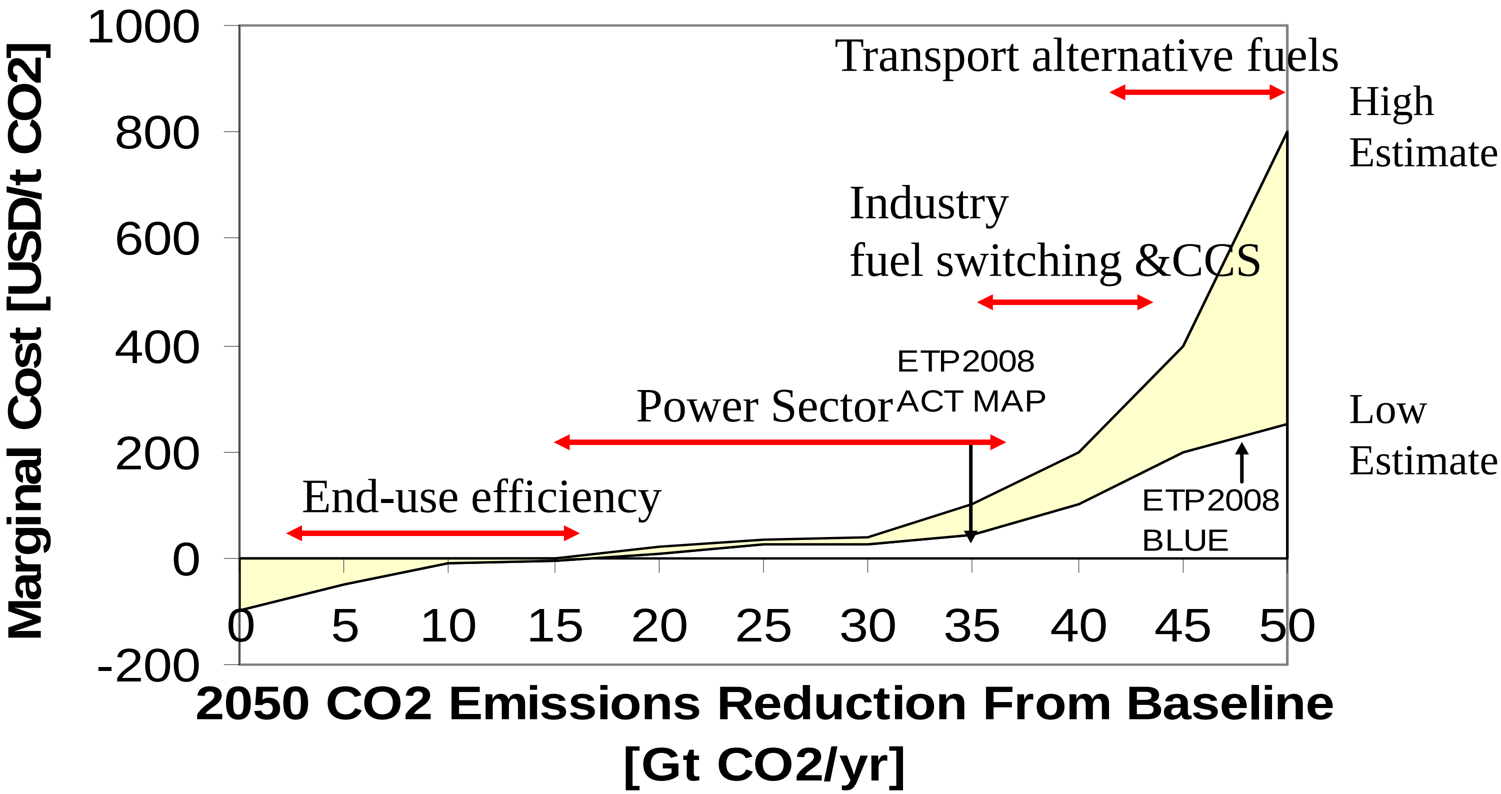
A New Energy Revolution ?



To bring emissions back to current levels by 2050 a CO_2 incentive of $50/t is needed. Reducing emissions by 50% would require a $200/t incentive.

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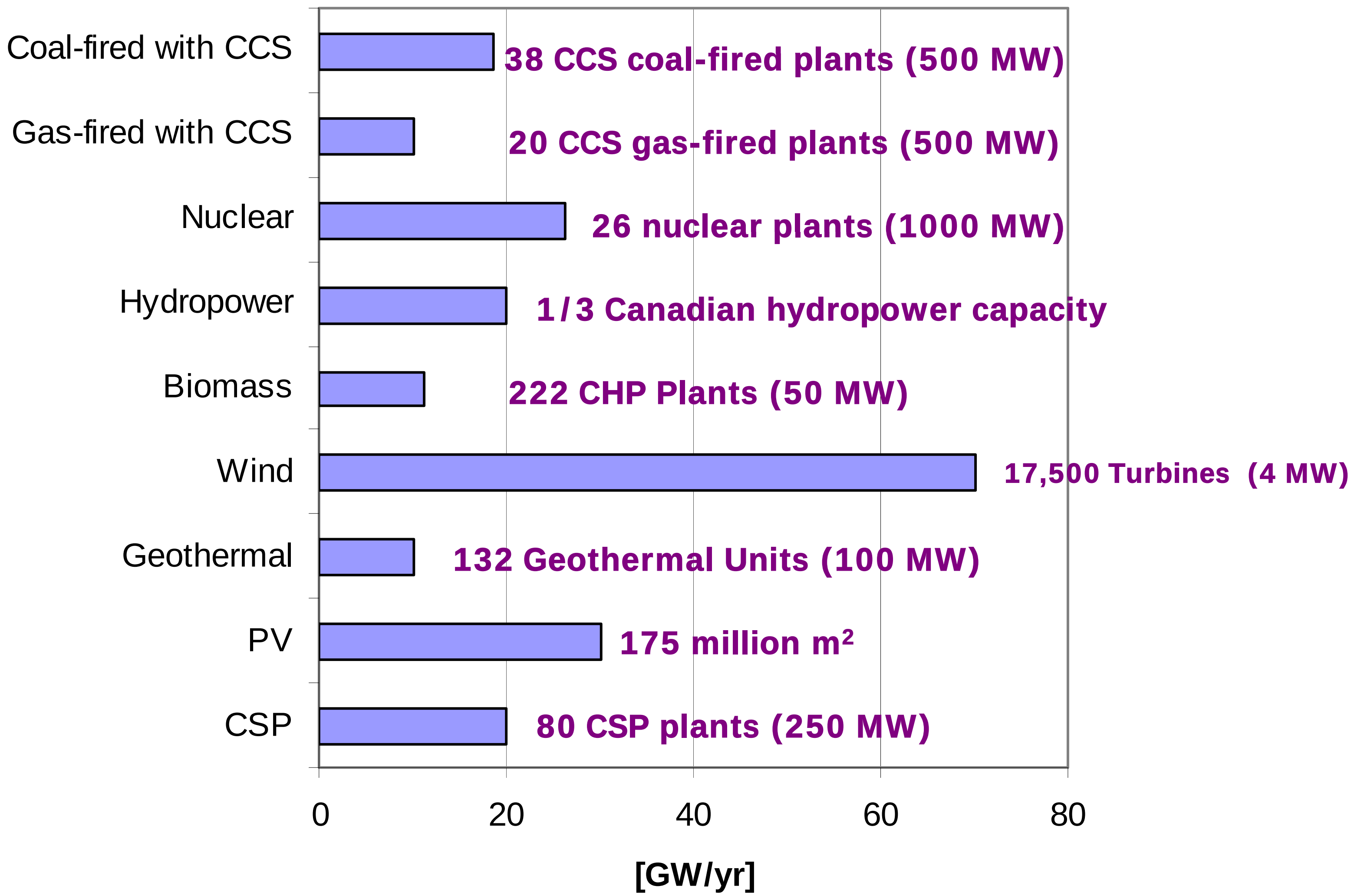
Average Annual Power Generation Capacity Additions in the BLUE Case, 2010 – 2050 (DRAFT)



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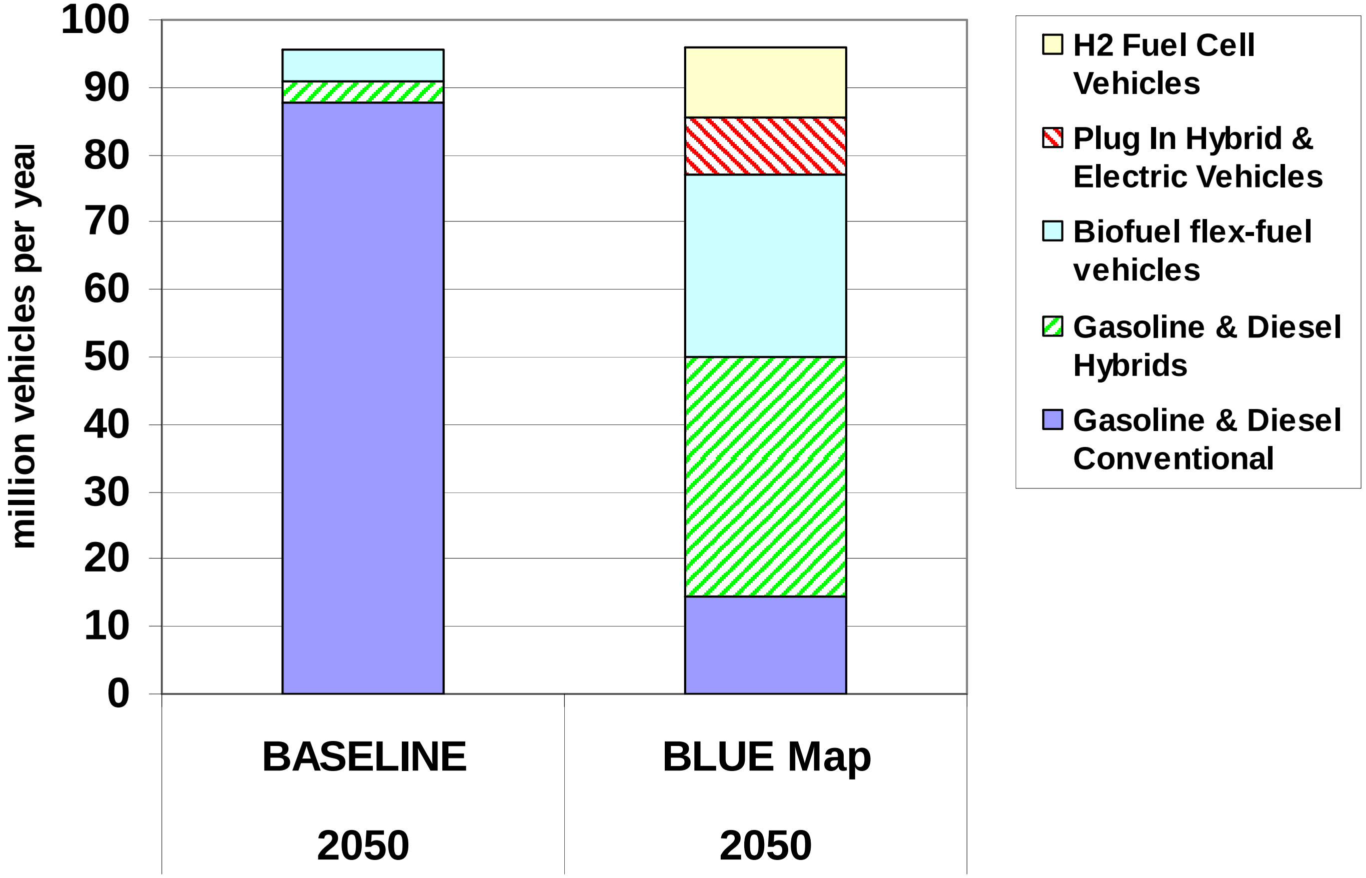
Average Annual Car Sales, 2010-2050 (DRAFT)



The transport sector presents enormous challenges for achieving deep cuts in GHG emissions as key technologies such as fuel cells and vehicle on-board energy storage are not yet technically proven or cost effective.

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A New Energy Revolution….

- CO_2 emissions are rising faster than anticipated
- Energy efficiency is a near term options available to all countries: Implement ! Implement ! Implement !
- Achieving deep CO_2 emission reduction targets will require action from developed and developing countries
  - Emission stabilization means decarbonizing power gen
  - Emission halving means also revolutionizing transport
- There is an urgent need for CCS demonstration plants in fast developing economies
- All parts of government, industry and society need to work together towards a solution

ANNEXES

ETP2008 Industry Consultation and Cooperation

- **16 January CTO meeting with >30 leading energy companies**
- **10 workshops with key manufacturing industry sectors**
- **Government RD&D only one quarter of industry spending**
- **“BLUE is achievable but may not be realistic given policies under consideration today”**
- **Credible long-term investment incentives needed**
- **More developing country participation needed for “level playing field”**

Physical Investment Needs – Business Opportunities (DRAFT)

		ACT Map	BLUE Map
Coal-fired with CCS	500 MW units	1,350	1,500
Gas-fired with CCS	500 MW units	45	800
Nuclear	1000 MW units	880	1,050
Wind turbines	4 MW turbines	500,000	700,000
Solar PV	million sq m	3,000	7,000
Concentrating solar thermal power	250 MW units	150	3,000
Biomass plants (+ co-combustion)	50 MW units	8,400	8,900
Geothermal	100 MW units	2,000	5,275
Hybrid vehicles (including plug-ins)	millions	2,300	2,300
Electric vehicles	millions	0	375
FC vehicles	millions	0	430
Houses renovated/demolished (OECD)	millions	n.a.	300
CO2 capture in industry	Mt p.a. capacity	1,000	3,000

Sectoral Approaches for Greenhouse Gas Mitigation

- **Why consider sectors?**
  - Shore up reduction objectives
  - Encourage developing countries participation
  - Address competitiveness concerns related to climate policy
- **Challenges**
  - Technical
    - Data availability and sharing
  - Institutional
    - Whether and how to feed sectoral expertise in UNFCCC
  - Cost-effectiveness