The New World Energy Order and Implications for Climate Change

Dr. Fatih Birol
Chief Economist
International Energy Agency

Reference Scenario

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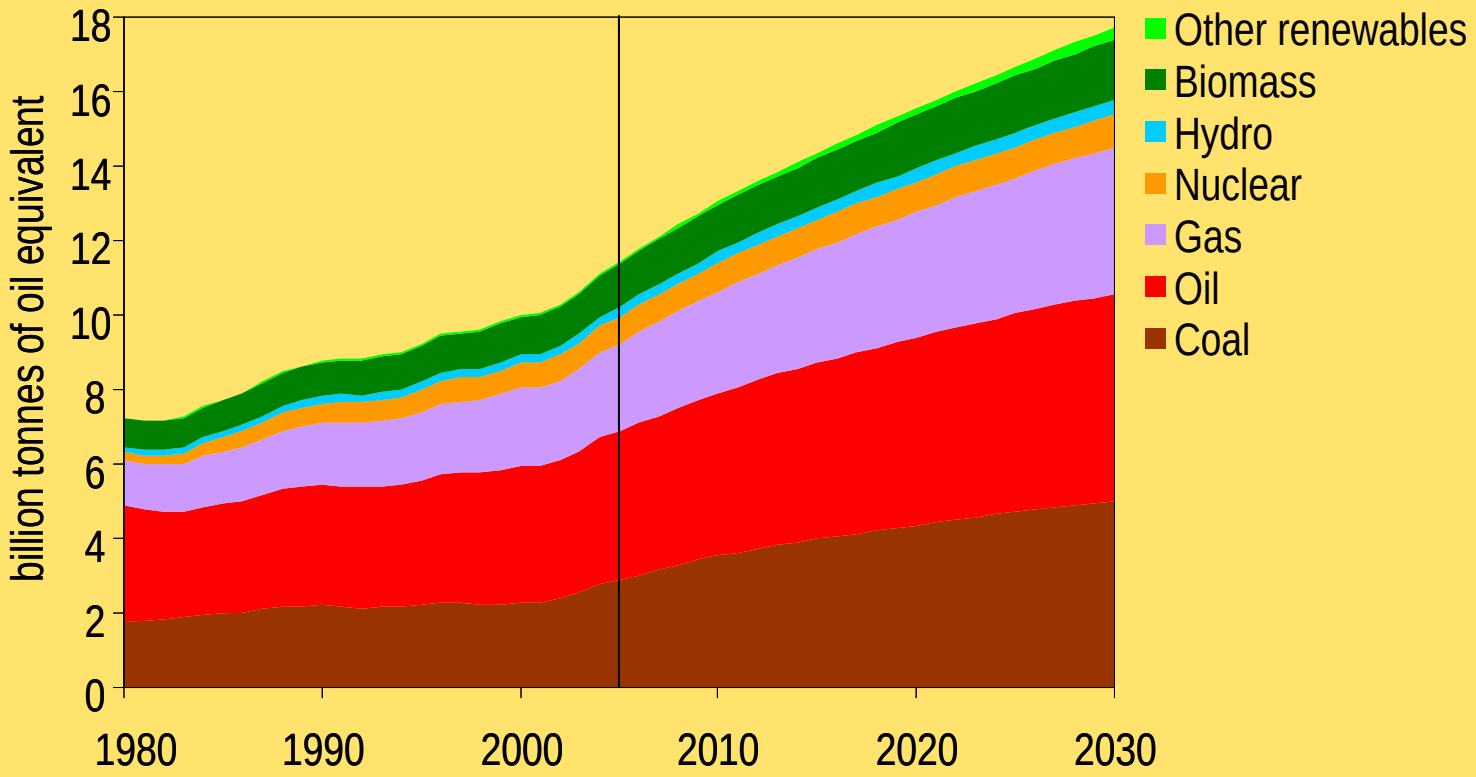
Reference Scenario:

World Primary Energy Demand



Global demand grows by more than half over the next quarter of a century, with coal use rising most in absolute terms

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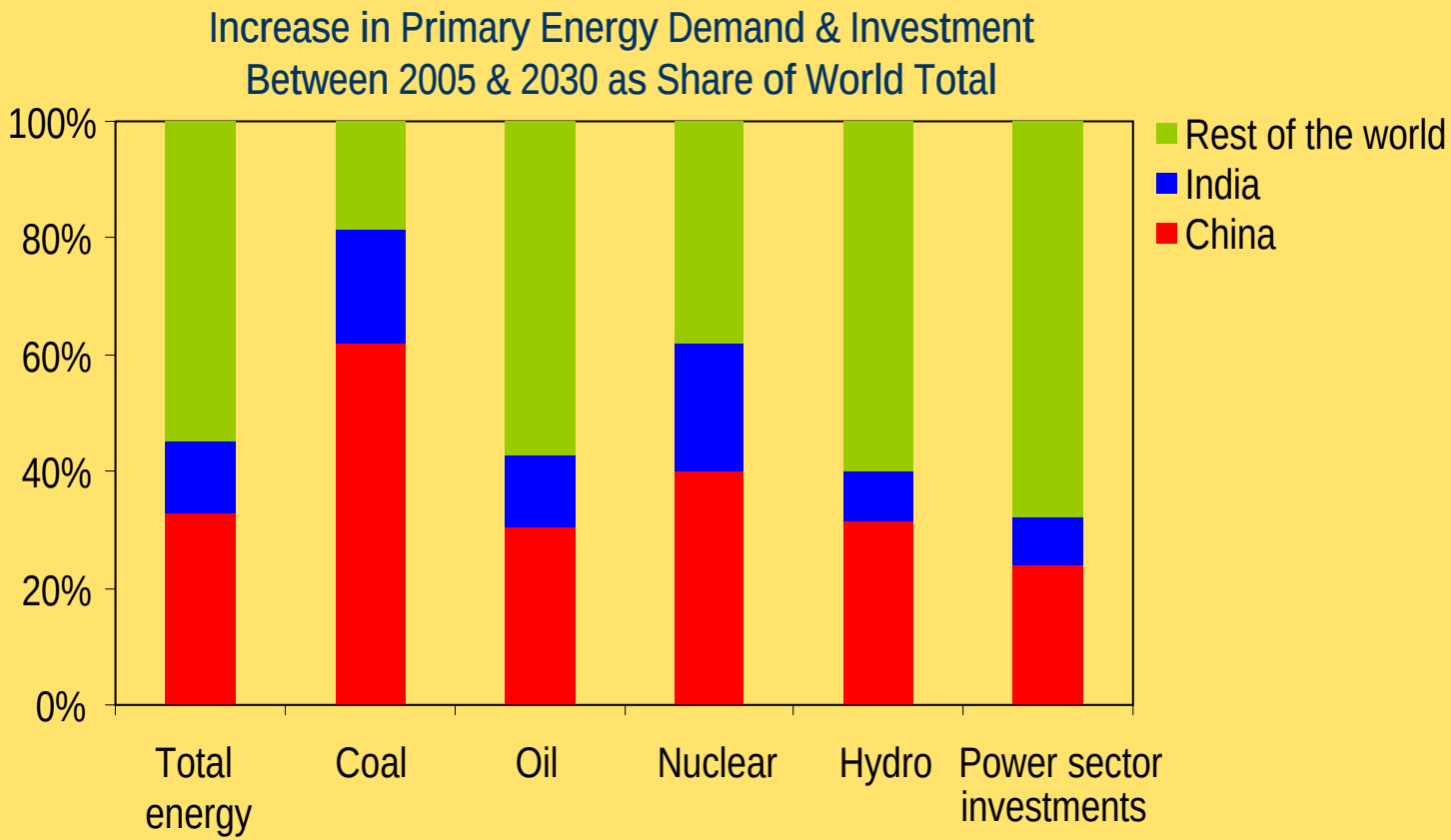
The Emerging Giants of World Energy



China & India will contribute more than 40% of the increase in global energy demand to 2030 on current trends

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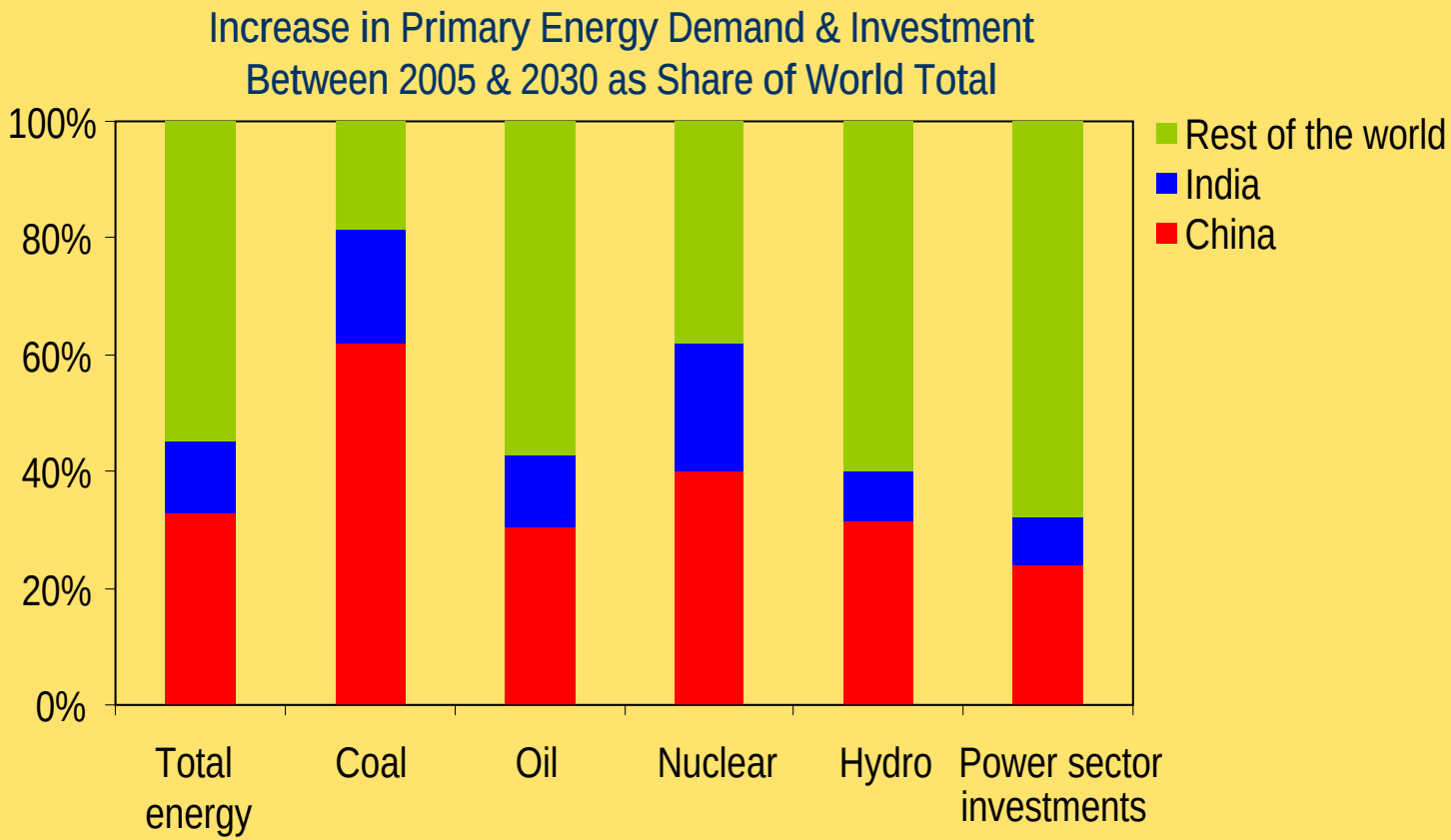

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Global Oil Supply Prospects to 2015

- Oil supply/demand balance is set to remain tight
- In total, 37.5 mb/d of gross capacity additions needed in 2006-2015
  - → *13.6 mb/d to meet demand & rest to replace decline in existing fields*
- OPEC & non-OPEC producers have announced plans to add 25 mb/d through to 2015
- Thus, a further 12.5 mb/d of gross capacity would need to be added or demand growth curbed
- Otherwise, a supply crunch cannot be ruled out

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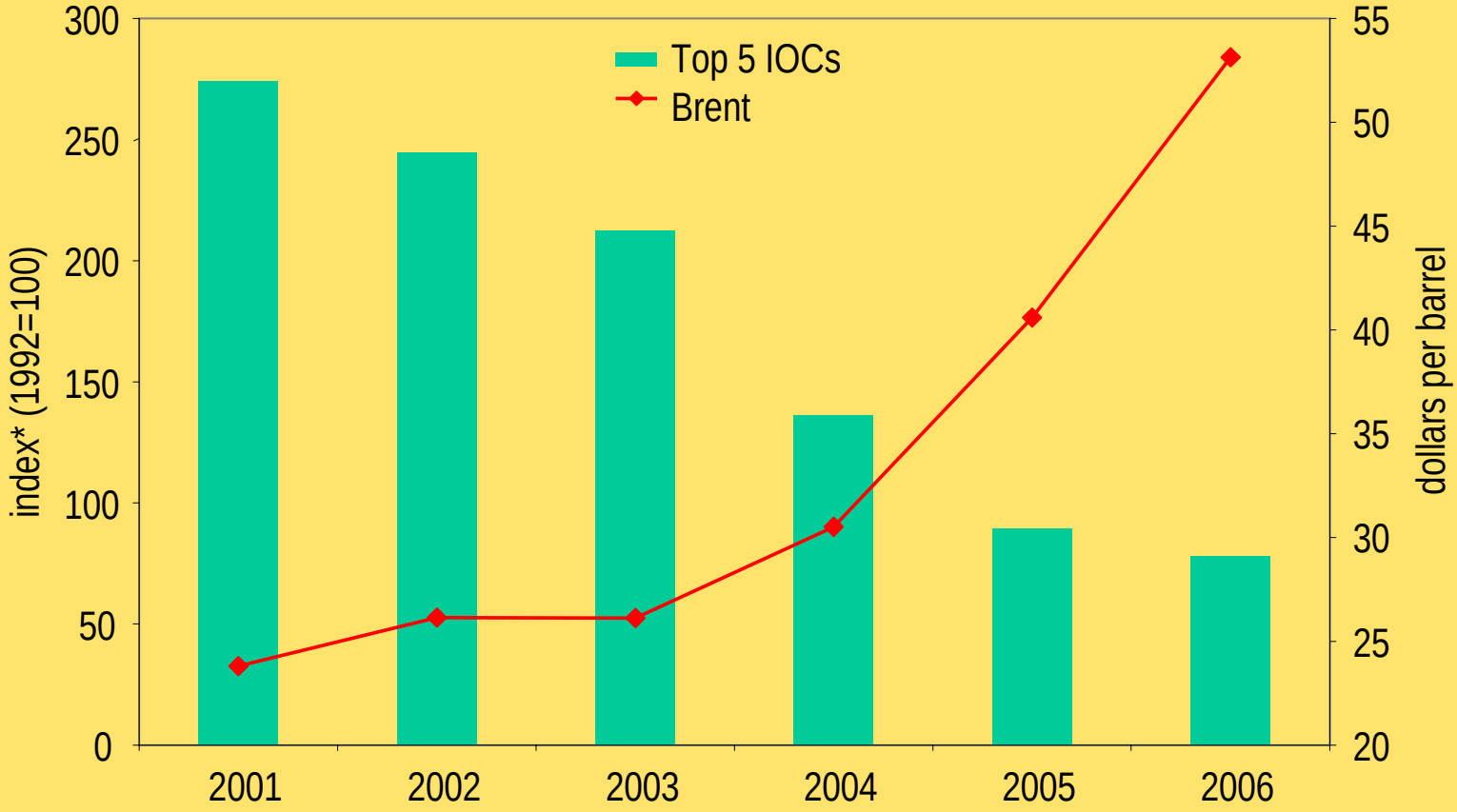
Index of average of Top 5 IOCs' Reserves Replacement Ratio



The current reserve replacement ratio of top 5 IOCs has fallen, and its becoming more difficult to replace reserves despite rising oil prices

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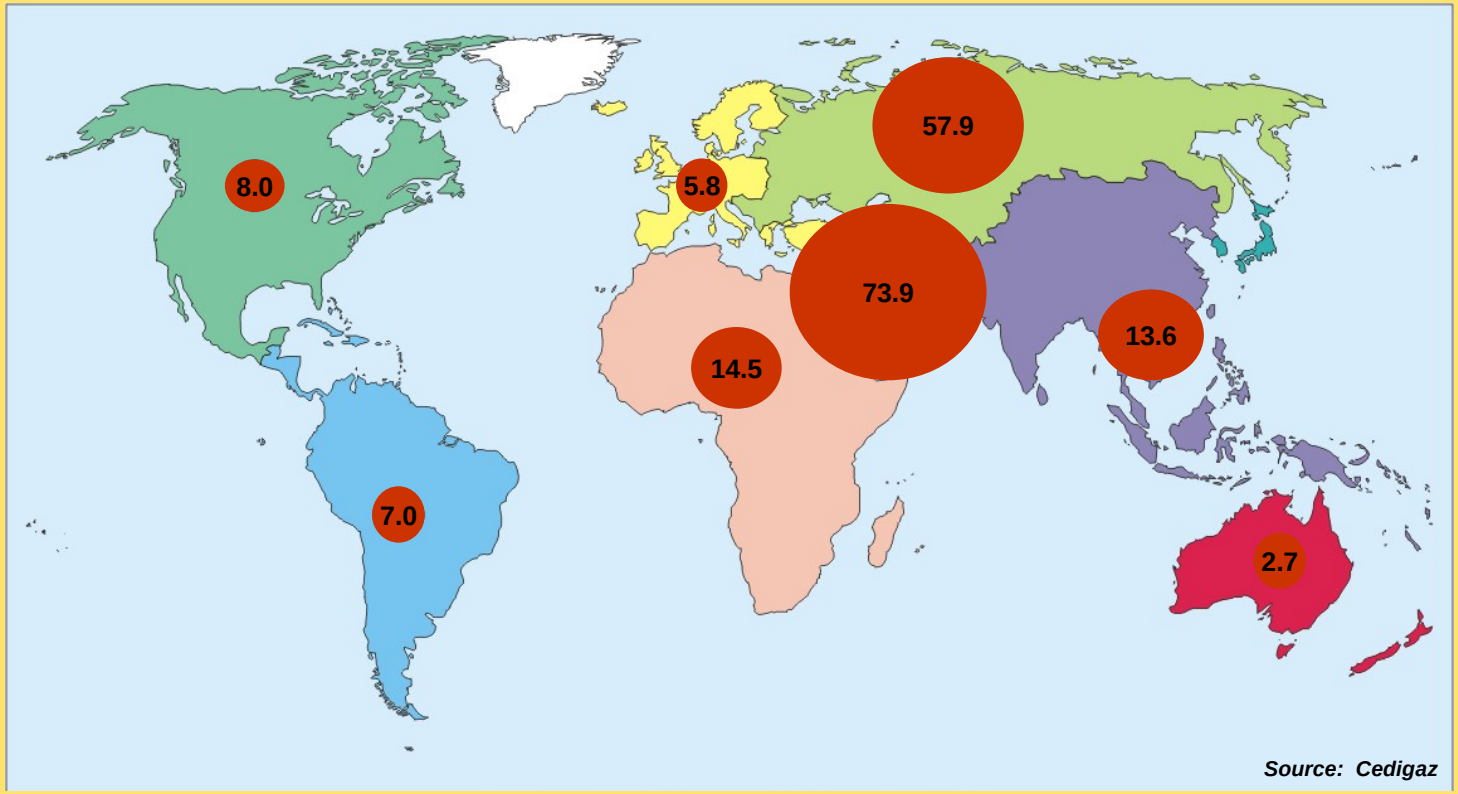
Proven Natural Gas Reserves



World total: 183 tcm as of 1 January 2007

Gas reserves are also concentrated – Russia and Iran together account for almost half of global gas reserves

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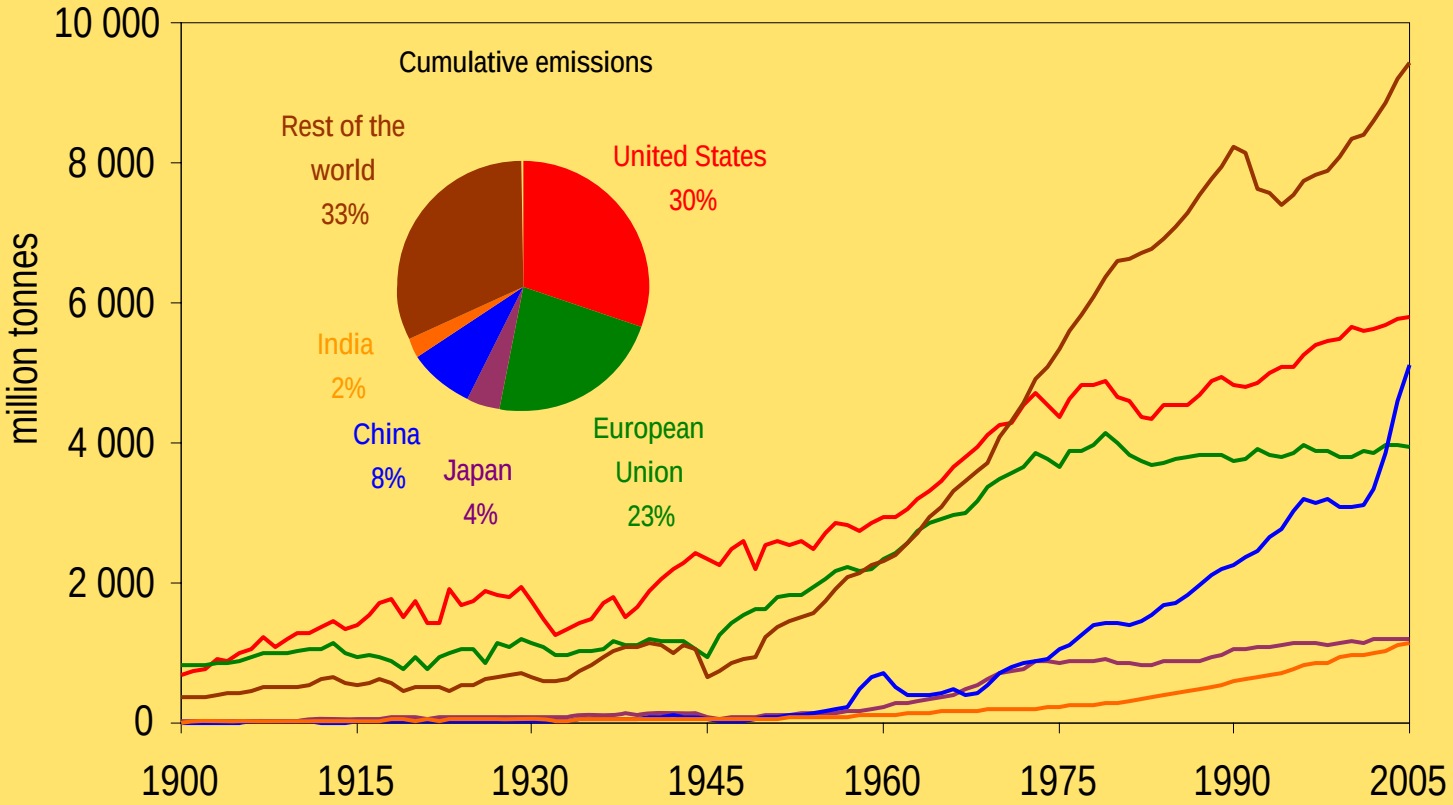
Energy-Related CO_2 Emissions by Region, 1900-2005



Over the last century, China has contributed only 8% of global emissions & India 2%

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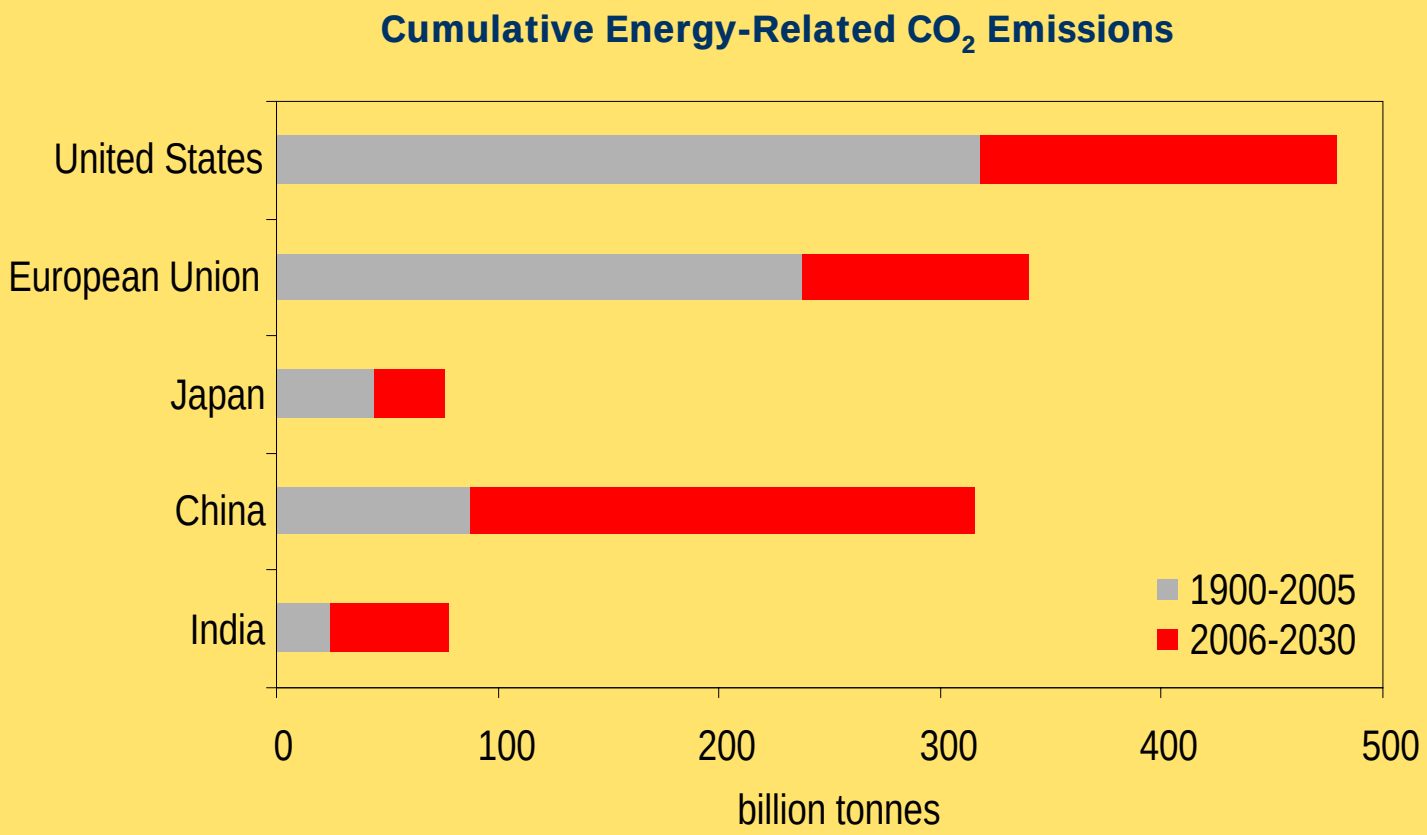
China & India in Global CO_2 Emissions



Around 60% of the global increase in emissions in 2005-2030 comes from China & India

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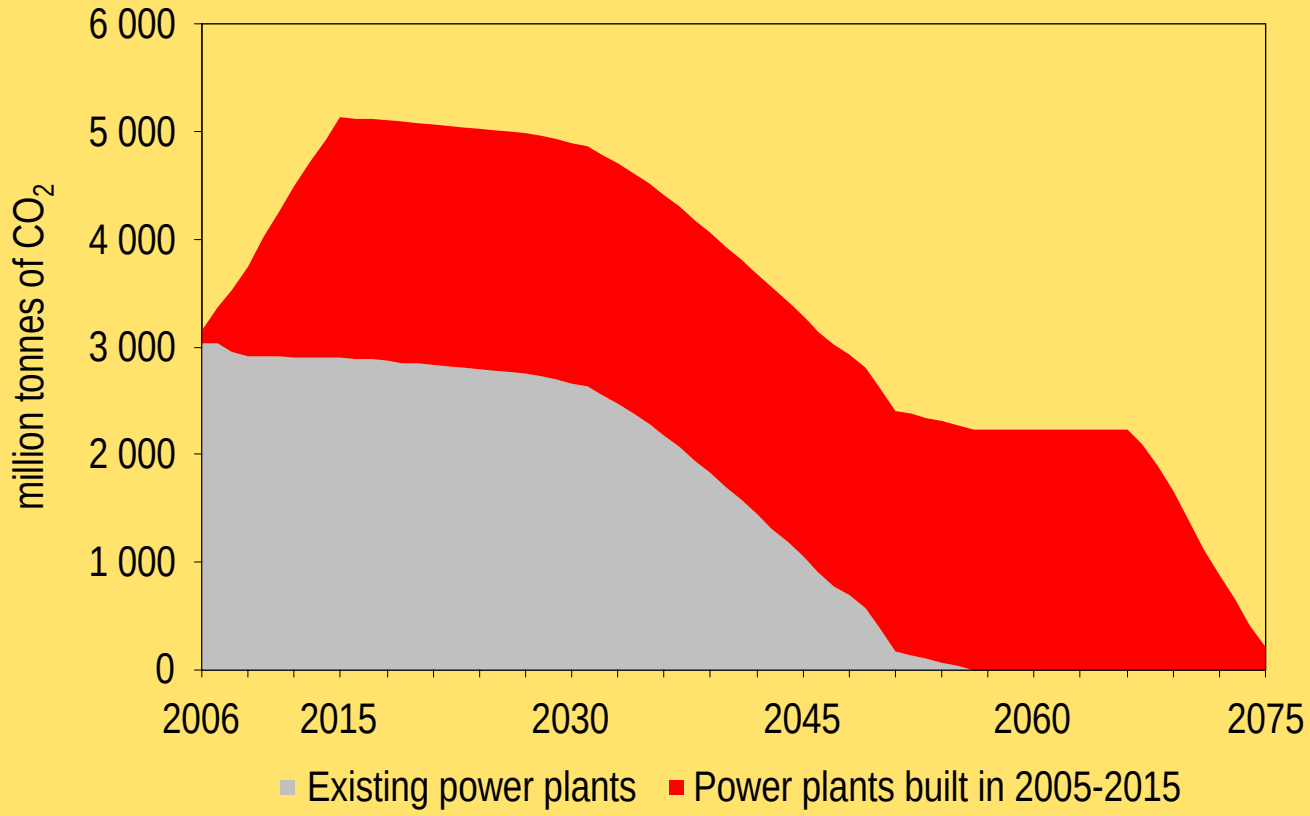
CO_2 Emissions from Coal-Fired Power Stations built prior to 2015 in China & India



Capacity additions in the next decade will lock-in technology & largely determine emissions through 2050 & beyond

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World's Top Five CO_2 Emitters

	2005		2015		2030	
	Gt	*rank*	*Gt*	*rank*	*Gt*	*rank*
US	5.8	1	6.4	2	6.9	2
China	5.1	2	**8.6**	**1**	**11.4**	**1**
Russia	1.5	3	1.8	4	2.0	4
Japan	1.2	4	1.3	5	1.2	5
India	1.1	5	**1.8**	**3**	**3.3**	**3**

China becomes the largest emitter in 2007 & India the 3rd largest by 2015

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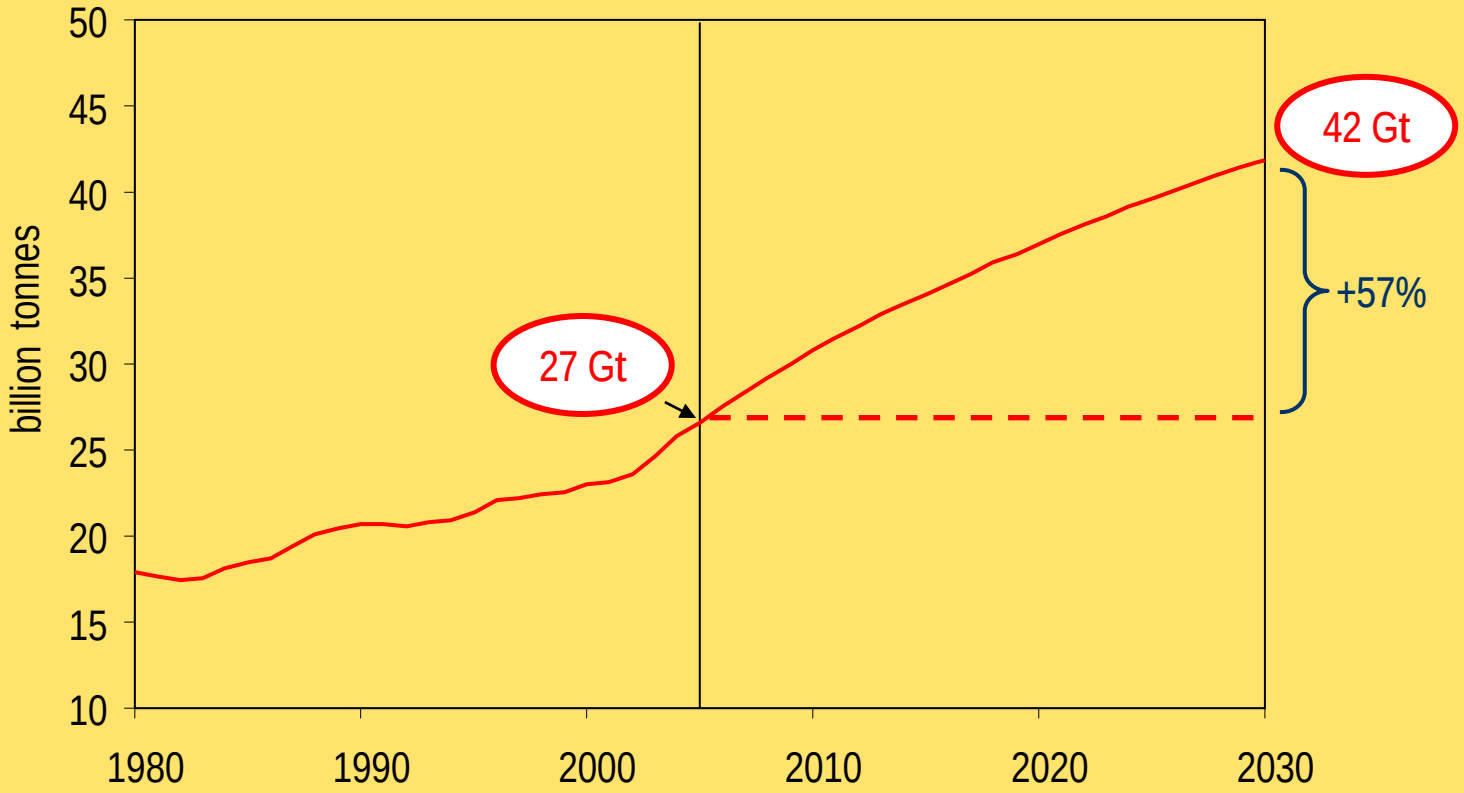
Global CO_2 Emissions and Climate Change



Global CO_2 emissions rise to 42 gigatonnes in 2030, 57% above current levels and double the 1990 level

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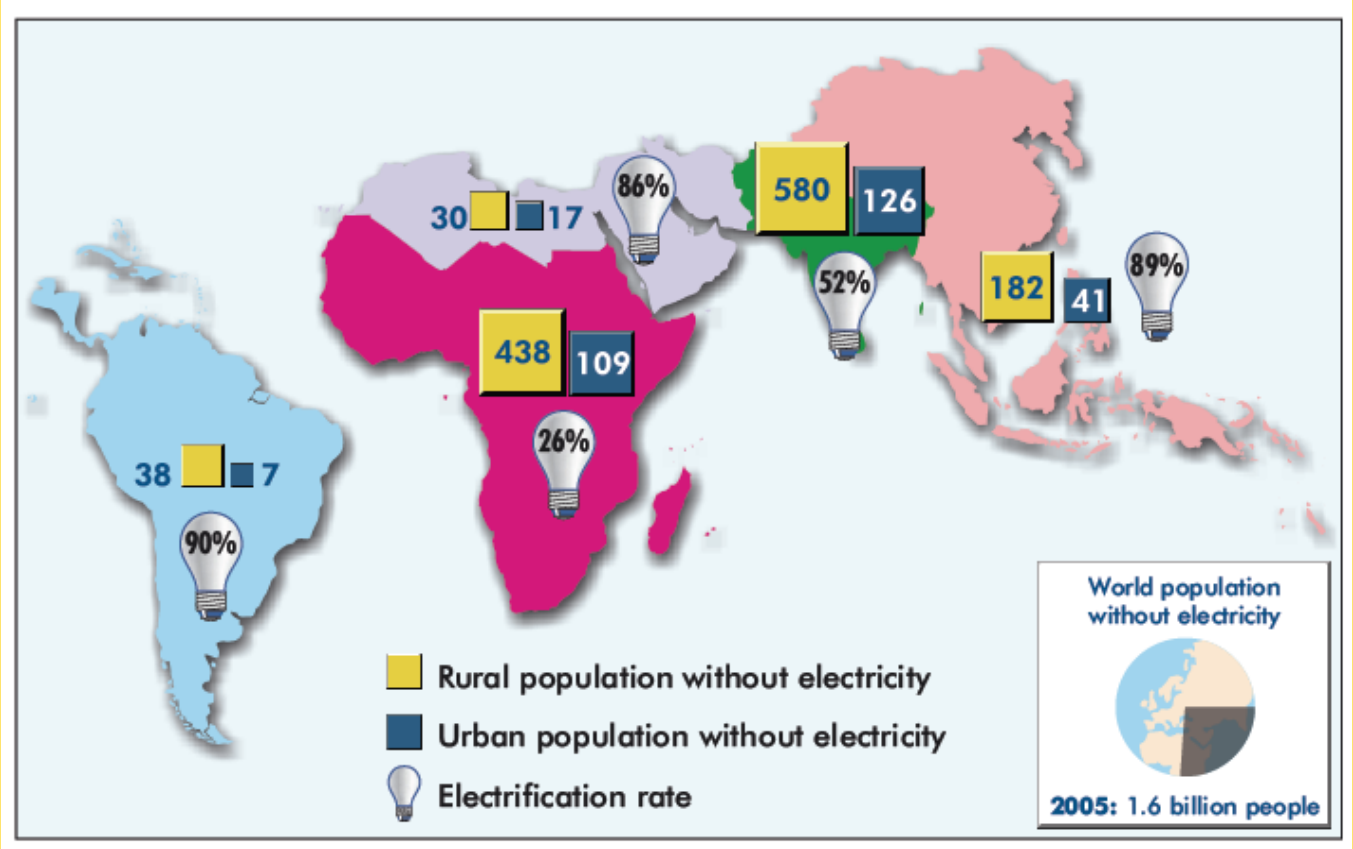
Population without electricity, 2006



In 2030, if no major new policies are implemented, there will still be 1.4 billion people without electricity.

Alternative Policy Scenario

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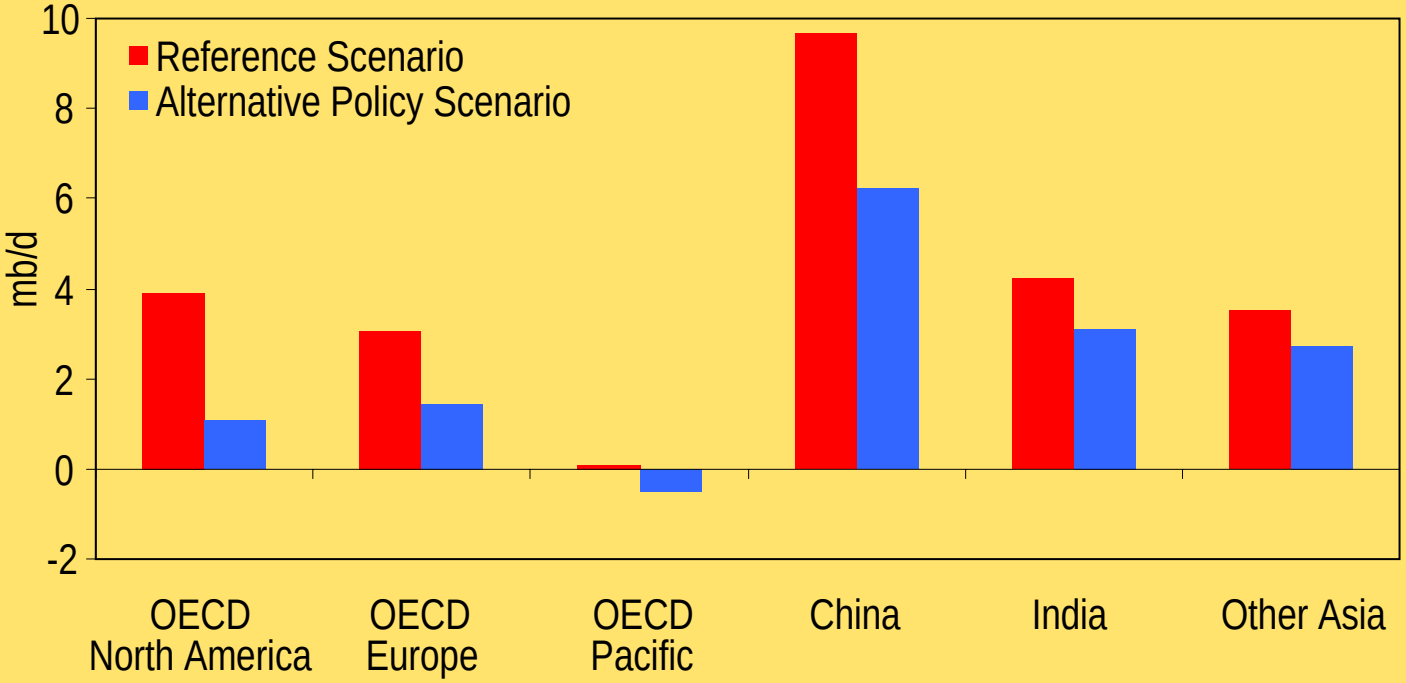
Increase in Net Oil Imports, 2006-2030



New policies reduce global oil demand by 14 mb/d by 2030, cutting sharply the need for imports

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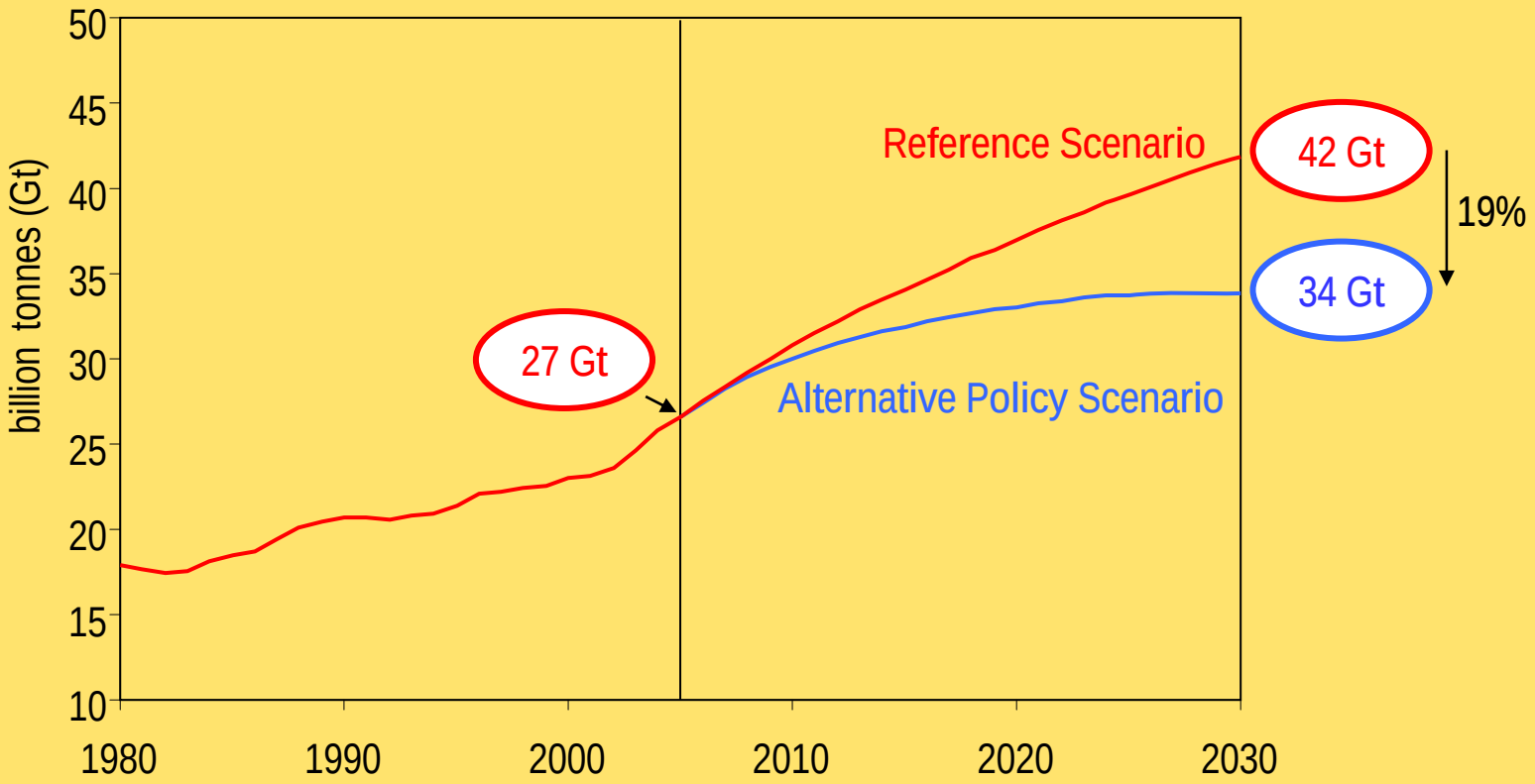
Global Energy-Related CO_2 Emissions



Global emissions will increase by 57% in the Reference Scenario, but they level off in the Alternative Policy Scenario

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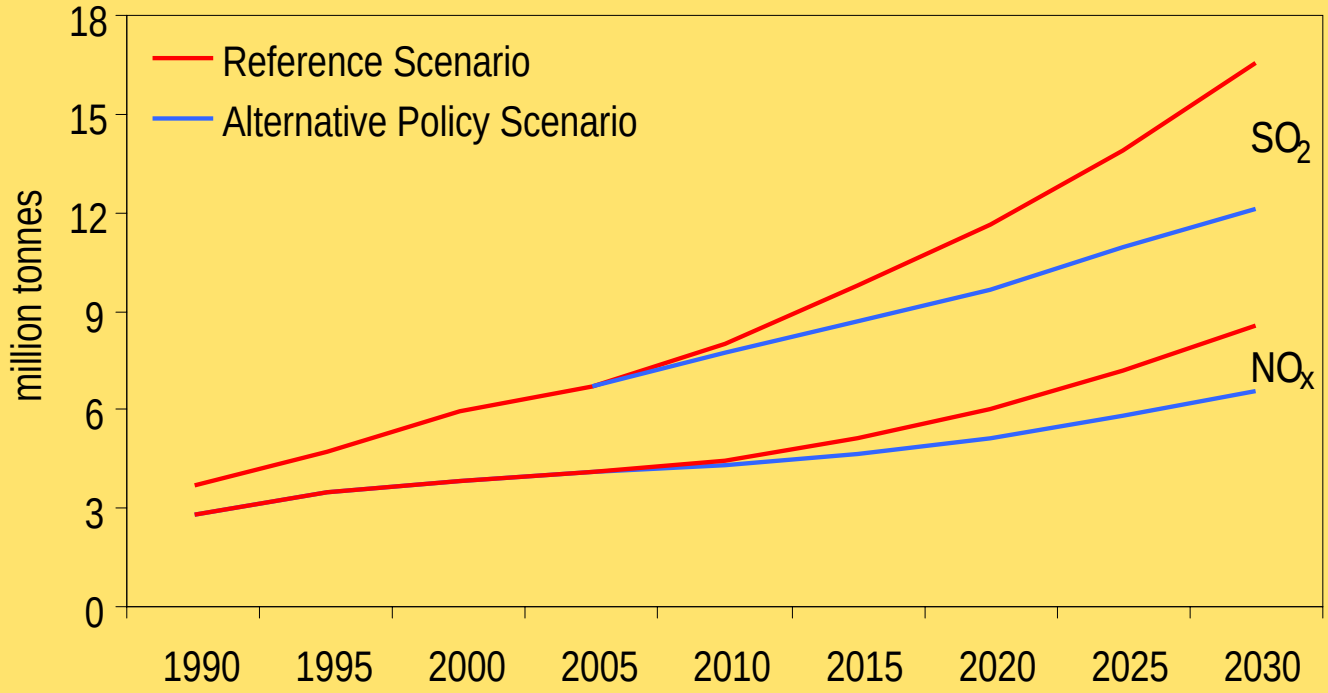
India's Local Pollution



New policies reduce substantially emissions of SO_2 and NO_x – largely from coal-fired power plants, cars & trucks

How to go beyond?

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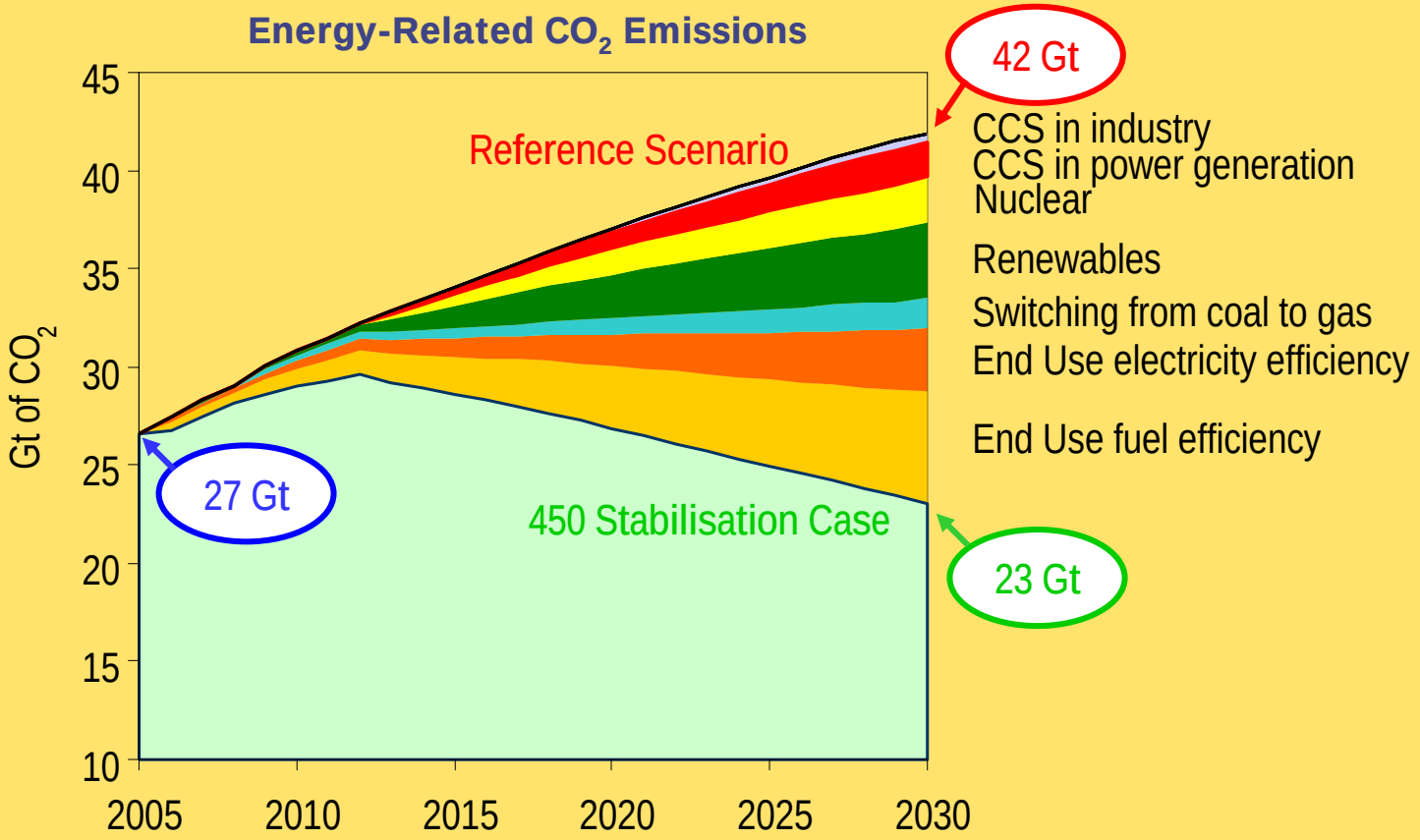
CO_2 Emissions - 450 Stabilisation Case



In line with G-8 appeal in Heiligendamm, by 2030 emissions are reduced to some 23 Gt

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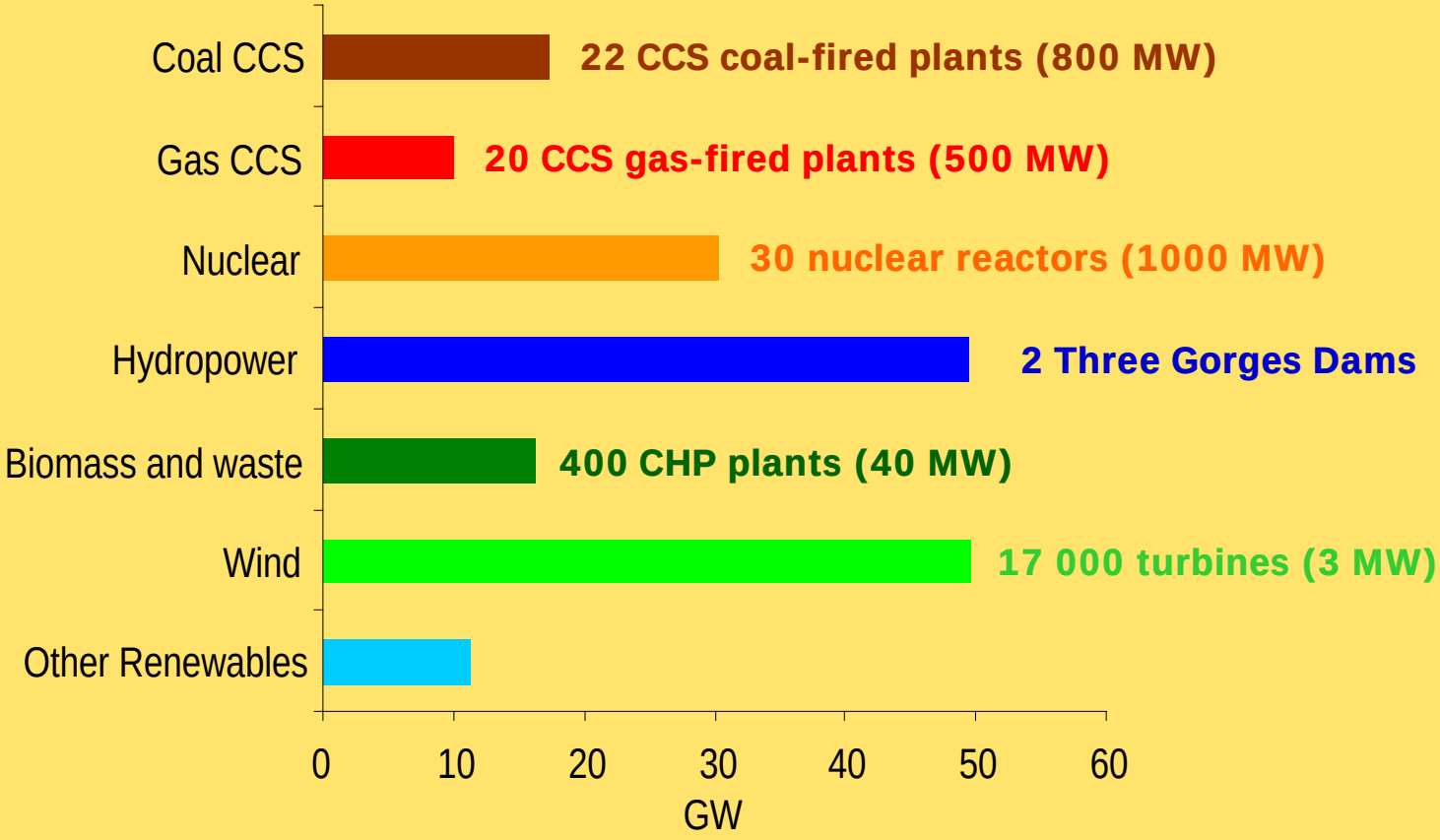
Average Annual Power Generation Capacity Additions in the 450 Stabilisation Case, 2013-2030



So what would the '450ppm Stabilisation Case' mean in practice?

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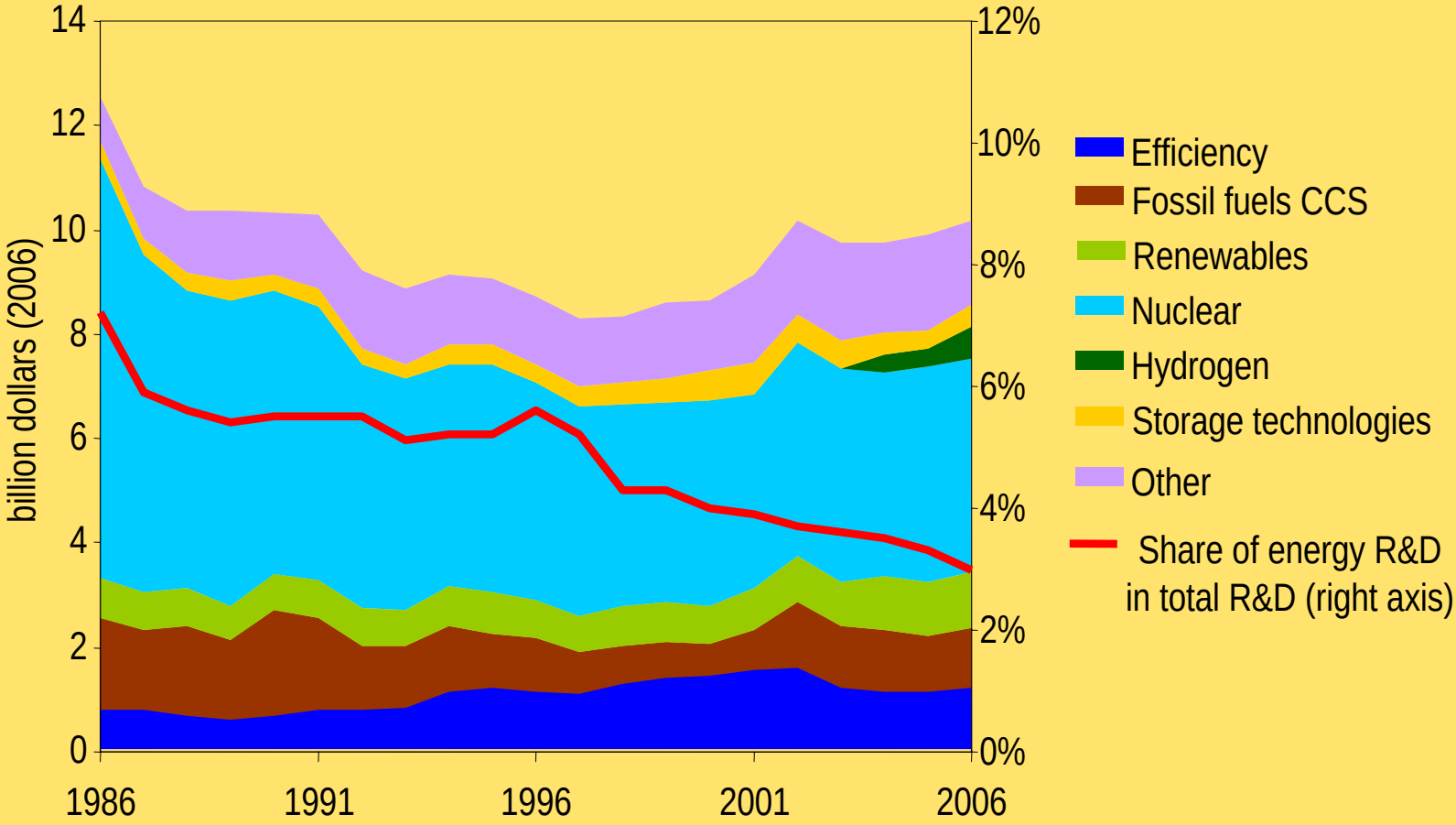
Public Energy Research and Development Funding in IEA Countries



Share of public budgets for energy R&D in total R&D fell over 50% in the last two decades

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Conclusions

- Global energy system is on an *increasingly* unsustainable path
- China and India are engines of global energy demand -- countries putting economic development as top priority
- Next 10 years are critical
- Road to Copenhagen – a way out ?