



World Energy Outlook 2007: China and India Insights

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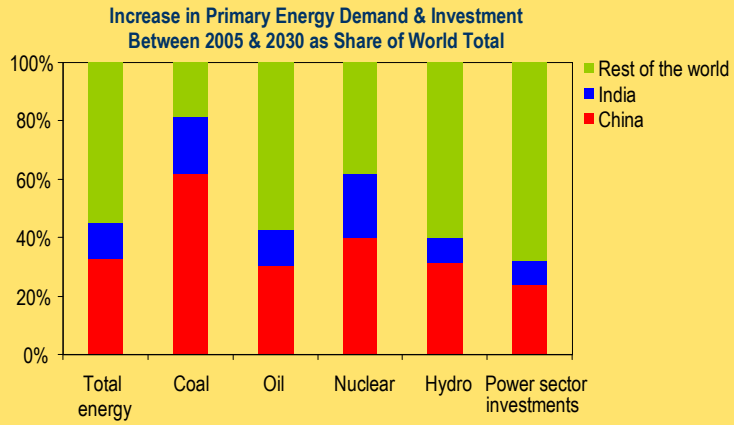
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Reference Scenario

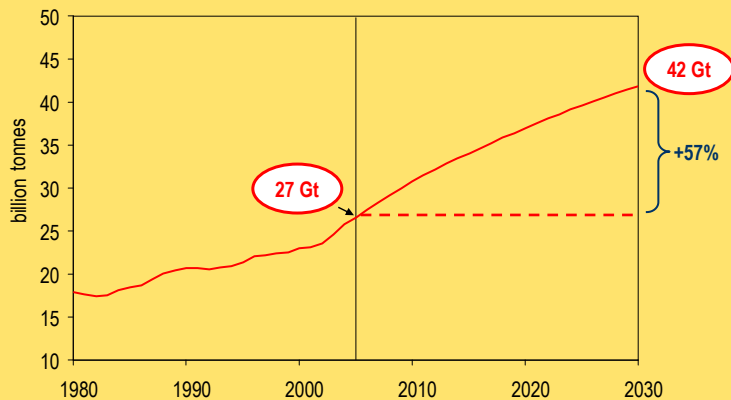
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The Emerging Giants of World Energy



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

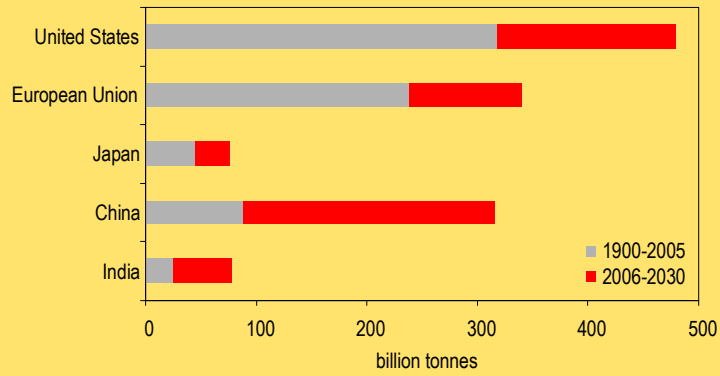
Reference Scenario: Global Energy-Related CO₂ Emissions



Global emissions rise inexorably on current policies, driven mainly by China, India & other developing countries

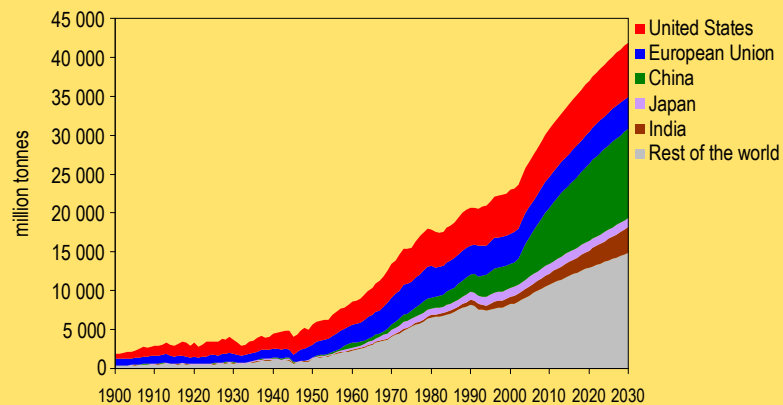
China & India in Global CO₂ Emissions

Cumulative Energy-Related CO₂ Emissions

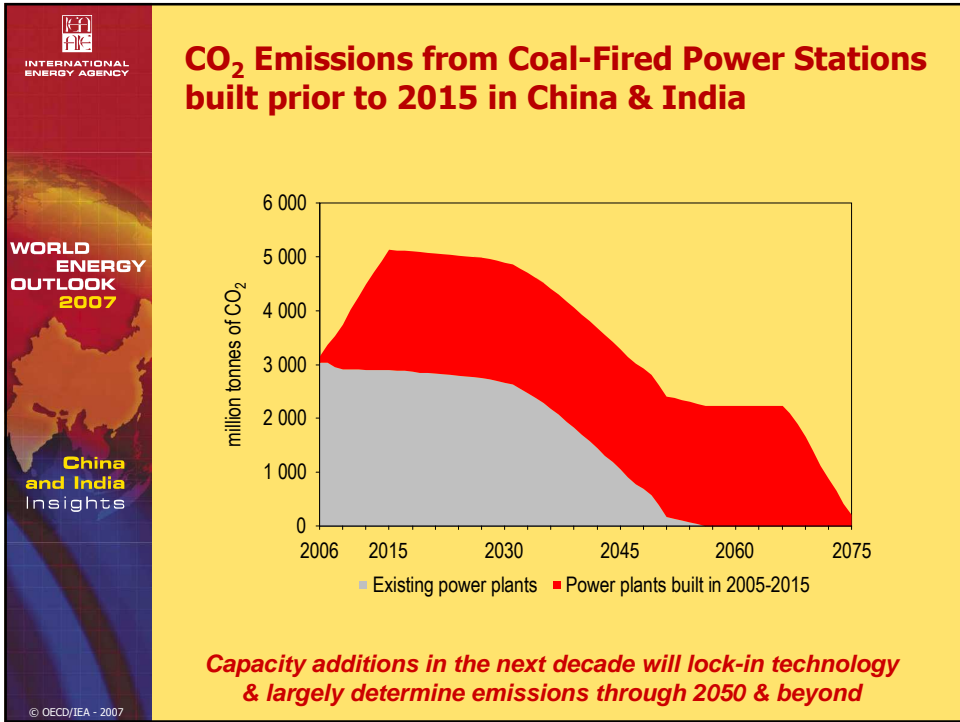
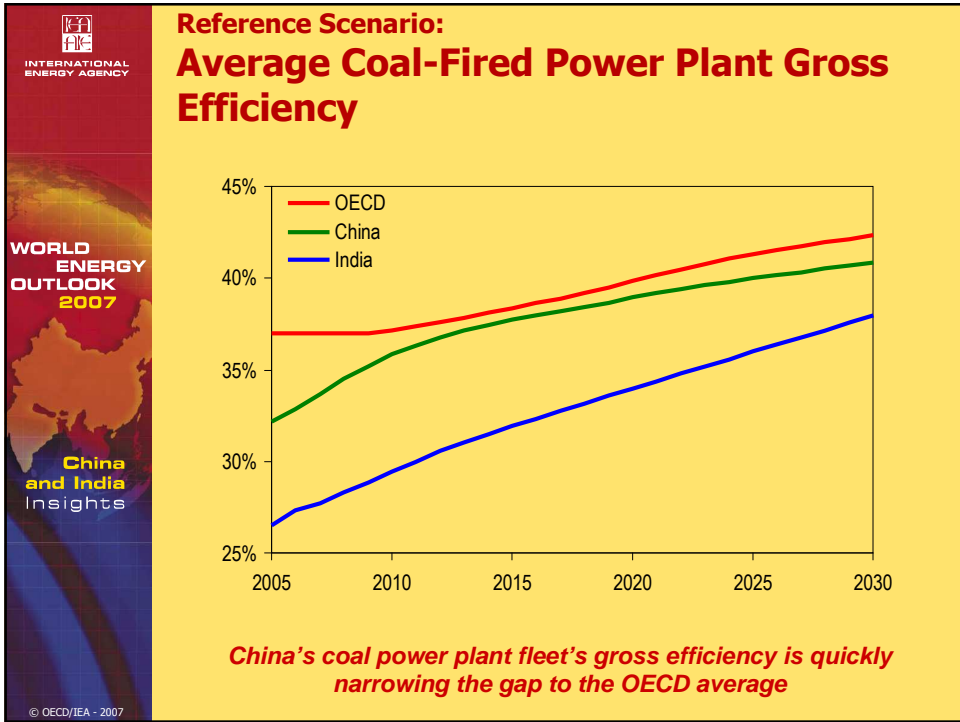


Around 60% of the global increase in emissions in 2005-2030 comes from China & India

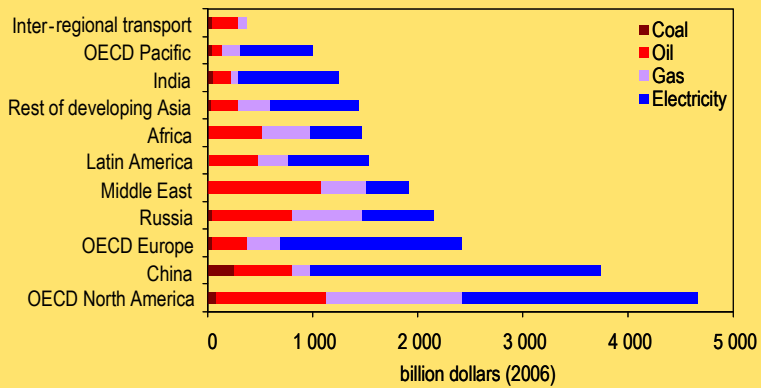
Reference Scenario: Global Cumulative Energy-Related CO₂ Emissions



China and India accounted for 10% of emissions from 1900 to 2005 – by 2030 their share will grow to 20%, still well below OECD countries

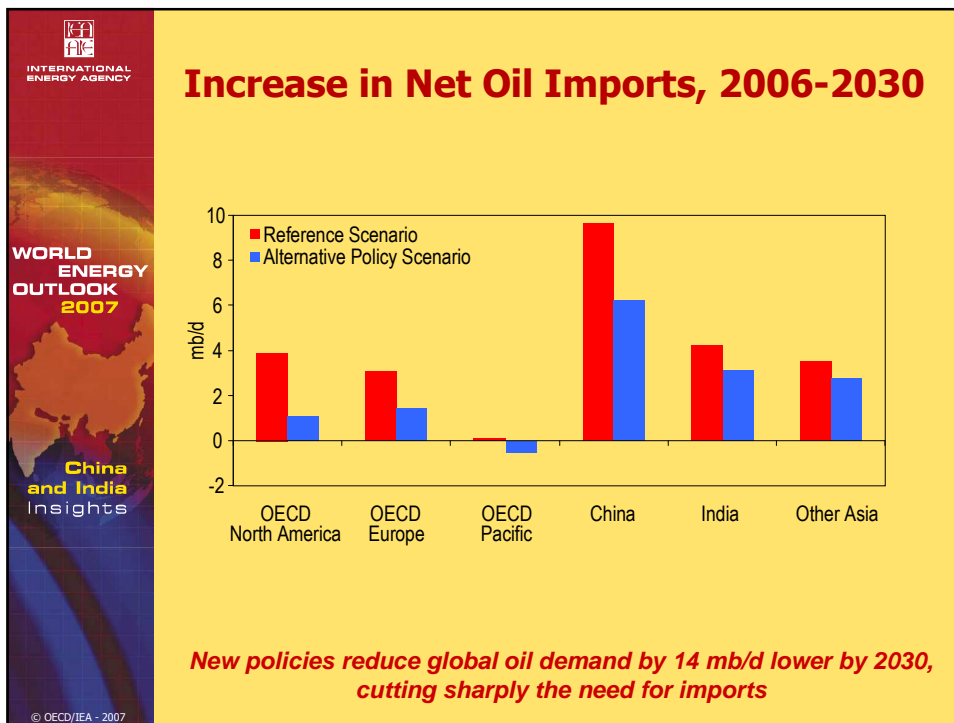
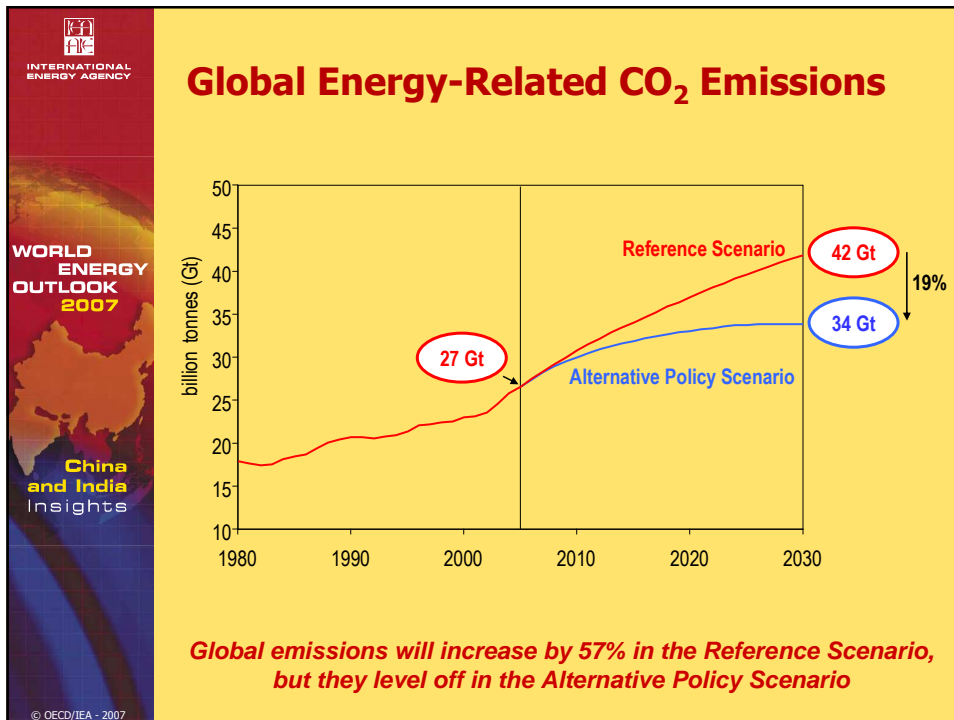


Cumulative Investment in Energy-Supply Infrastructure, 2006-2030

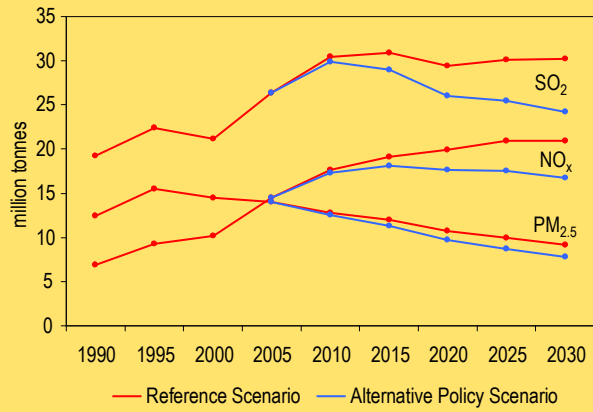


Just over half of all investment needs to 2030 of \$22 trillion are in developing countries, 17% in China & another 5% in India alone

Alternative Policy Scenario

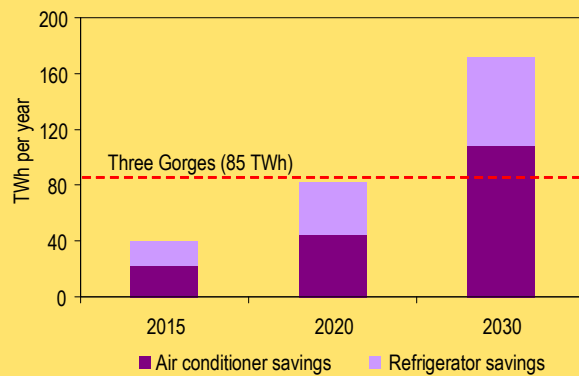


Alternative Policy Scenario: China's Local Pollution



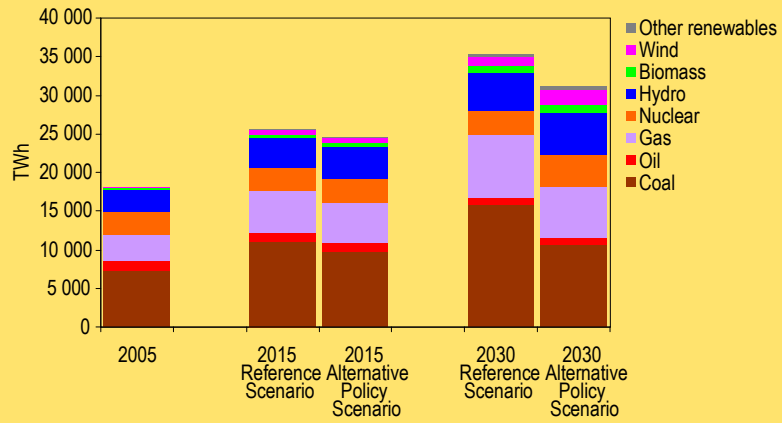
Policies aimed at enhancing energy security & reducing CO₂ emissions also reduce local pollution

Alternative Policy Scenario: Electricity Savings from More Efficient Appliances in China



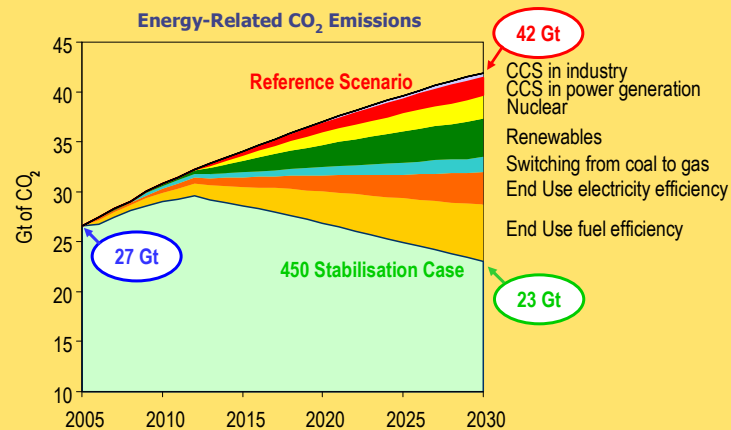
Tougher efficiency standards for air conditioners & refrigerators alone would save the need to build 2 Three Gorges by 2030

Alternative Policy Scenario: World Electricity Generation Mix



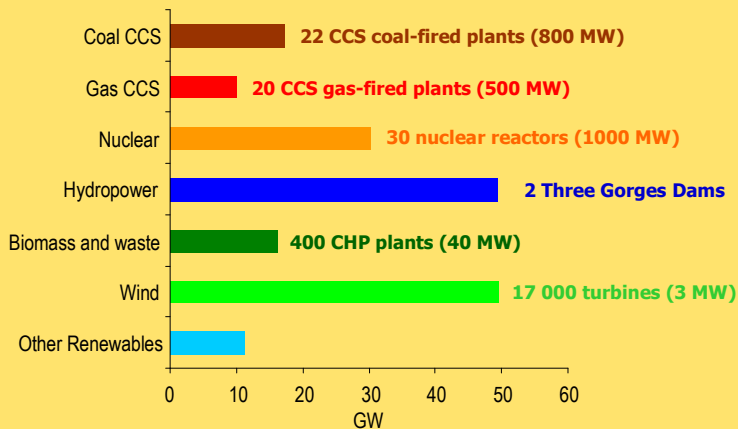
New policies could reduce the need to generate electricity in 2030 by 12% & increase the share of low-carbon sources

CO₂ Emissions - 450 Stabilisation Case



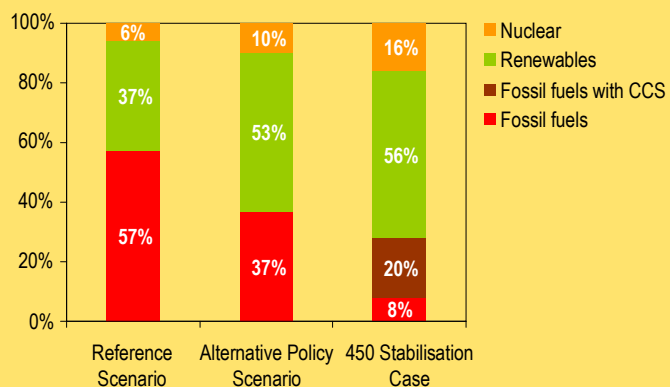
By 2030, emissions are reduced to some 23 Gt, a reduction of 19 Gt compared with the Reference Scenario

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

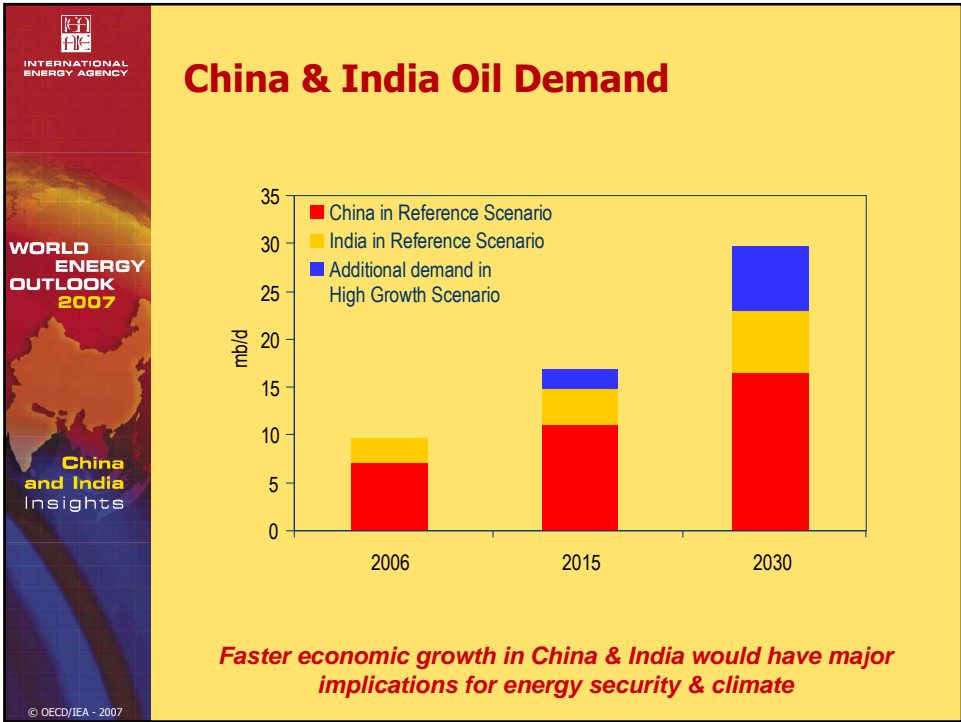
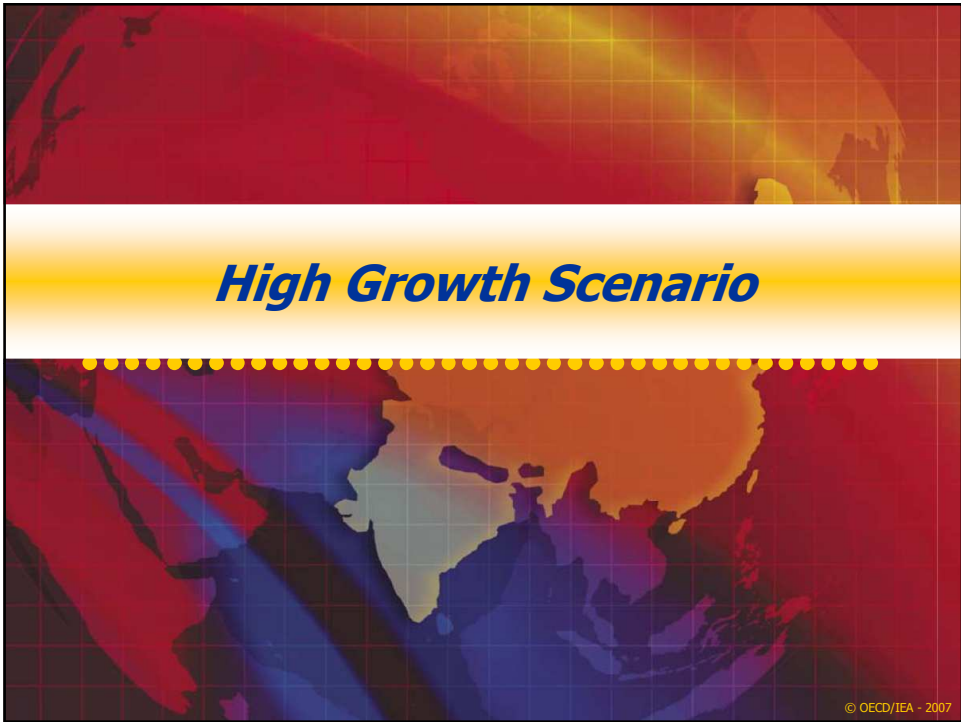


A large amount of capacity would need to be retired early, entailing substantial costs

450 Stabilisation Case: Share of Cumulative Power-Generation Investment by Technology, 2006-2030



The capital costs involved in stabilising CO₂ concentrations at 450 ppm would be very large





Summary & Conclusions

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Implications for Global Climate

- Reference & High Growth Scenarios trends are consistent with dramatic climate effects
 - Atmospheric concentration of greenhouse gases would rise to 850 - 1 130 ppm of CO₂-equivalent
 - Implies a rise in global average temperature of more than 4.9 - 6.1°C above pre-industrial levels
- Increase in concentration & temperature is much less marked in the Alternative Policy Scenario
- The 450 Stabilisation Case is very ambitious
 - Would require early retirement of energy-related capital on a large scale & at high cost
 - Would hinge on much stronger policy action than currently envisaged



Conclusions

- Global energy system is on an *increasingly* unsustainable path
- China and India are transforming the global energy system by their sheer size
- Challenge for *all* countries is to achieve transition to a more secure, lower carbon energy system
- New policies now under consideration would make a major contribution
- Next 10 years are critical
 - *The pace of capacity additions will be most rapid*
 - *Technology will be "locked-in" for decades*
 - *Growing tightness in oil & gas markets*
- Challenge is global so solutions must be global