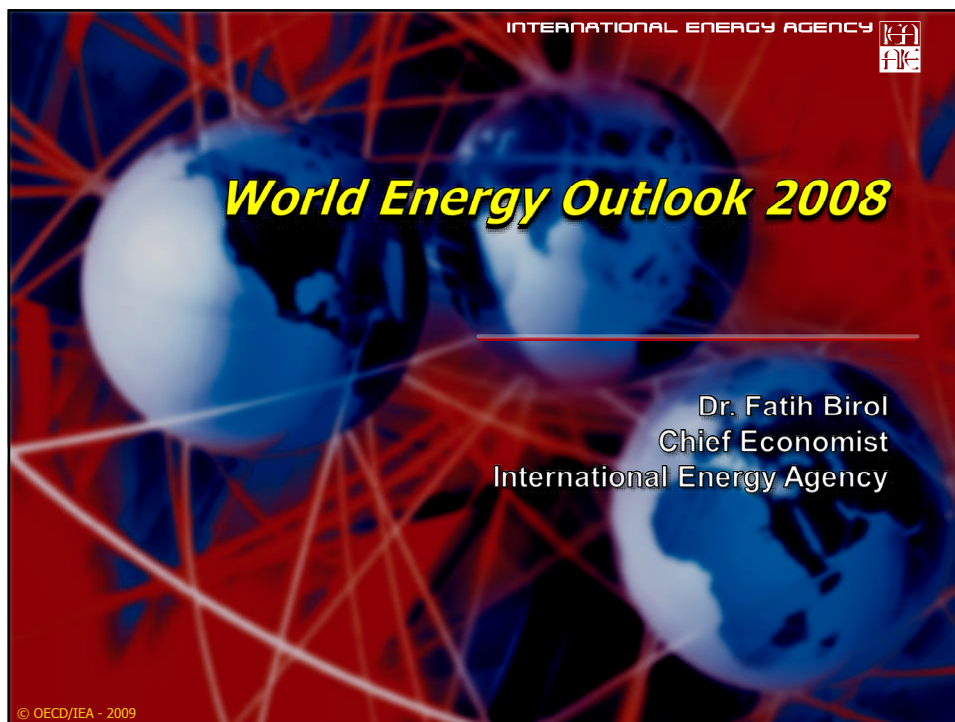




The context

World Energy Outlook 2008

- Soaring energy prices to mid-2008, followed by a collapse – what will it mean for demand?
- How will the financial crisis & economic slowdown affect energy demand & investment?
- Will economic worries divert attention from strategic energy-security & environmental challenges?
- Are we setting ourselves up for a supply-crunch once the economy is back on its feet?
- Will negotiators at COP-15 in Copenhagen in 2009 have the political support needed to succeed?

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Impact of financial crisis on energy investments

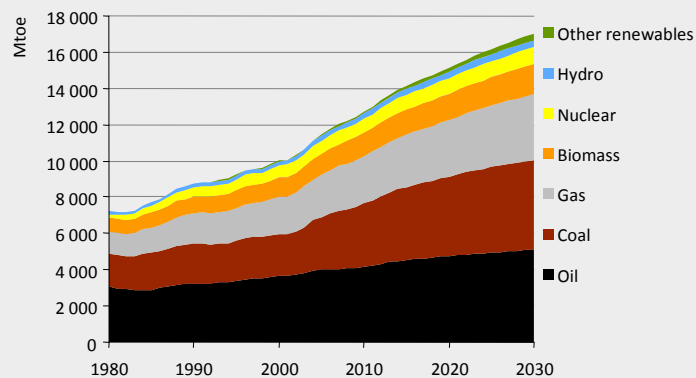
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- Harder to obtain credit for ongoing operations and to raise capital for new projects
- Drop in prices have made new investment generally less profitable as costs remain high
- Falling demand has reduced the appetite of suppliers to invest now in new capacity

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World primary energy demand in the Reference Scenario: this is unsustainable!

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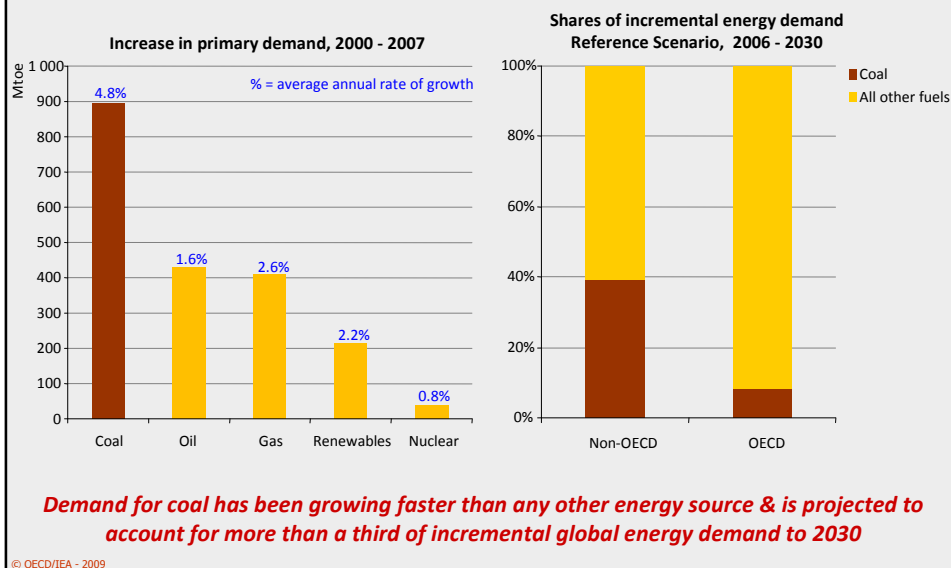


World energy demand expands by 45% between now and 2030 – an average rate of increase of 1.6% per year – with coal accounting for more than a third of the overall rise

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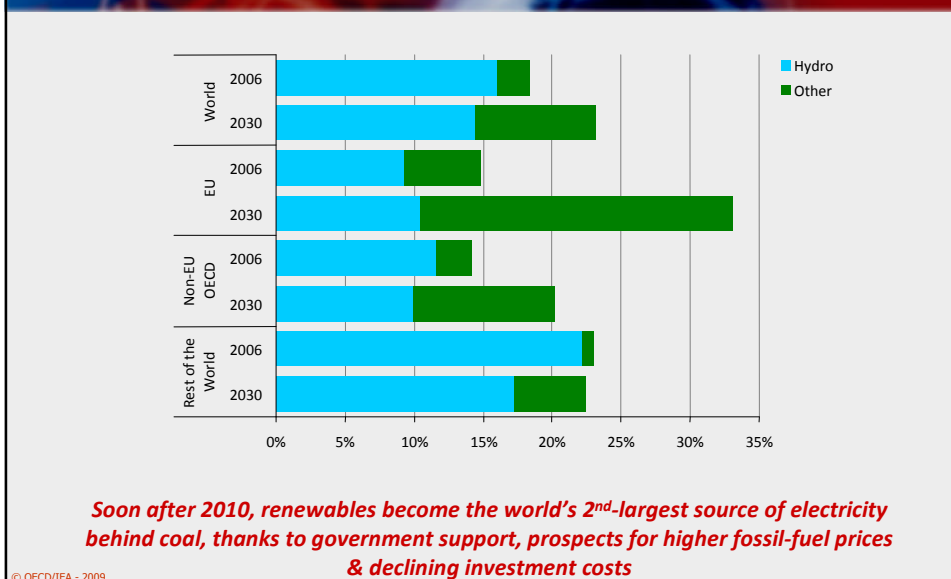
The continuing importance of coal in world primary energy demand

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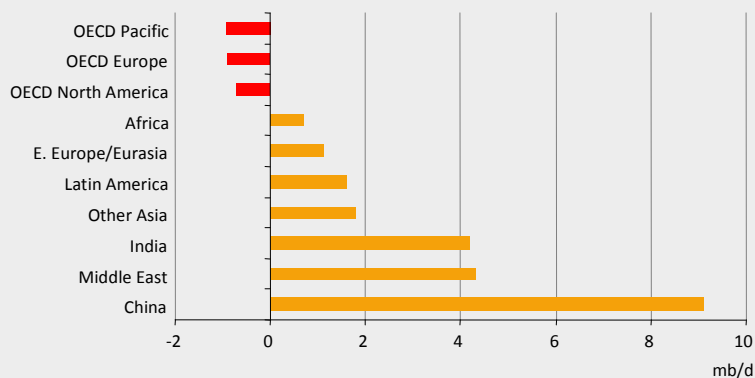
Share of renewables in electricity generation in the Reference Scenario

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Change in oil demand by region in the Reference Scenario, 2007-2030

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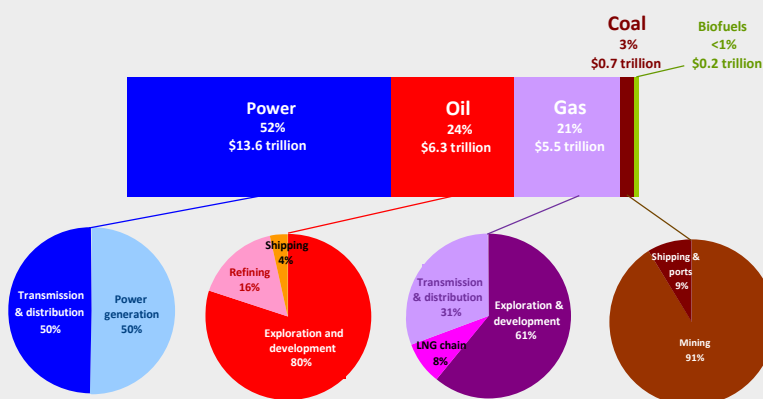


All of the growth in oil demand comes from non-OECD, with China contributing 43%, the Middle East & India each about 20% & other emerging Asian economies most of the rest

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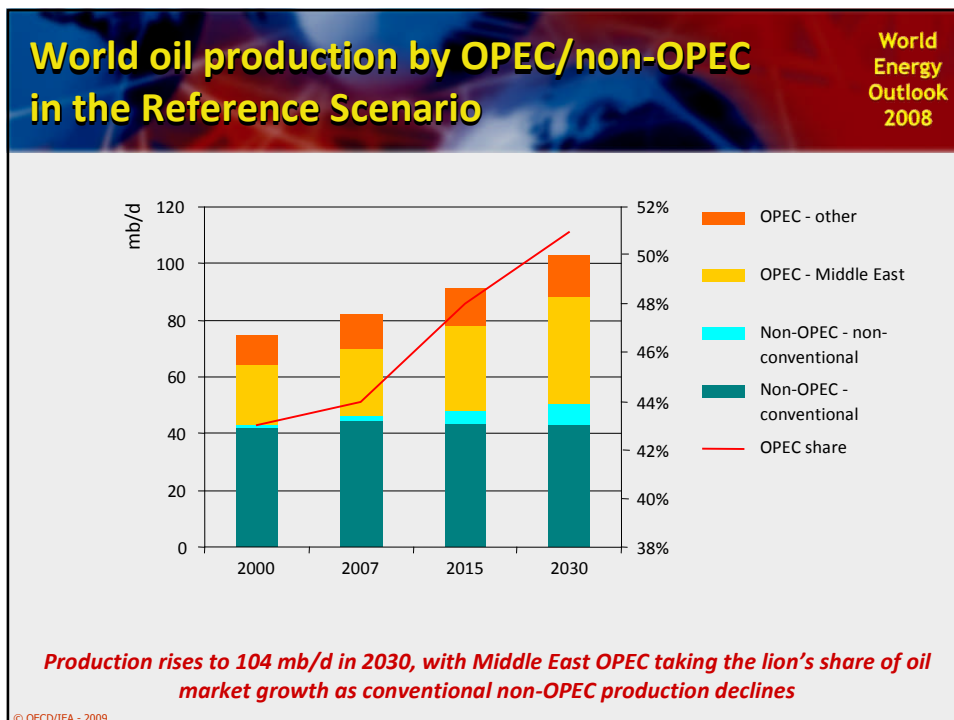
Cumulative energy-supply investment in the Reference Scenario, 2007-2030

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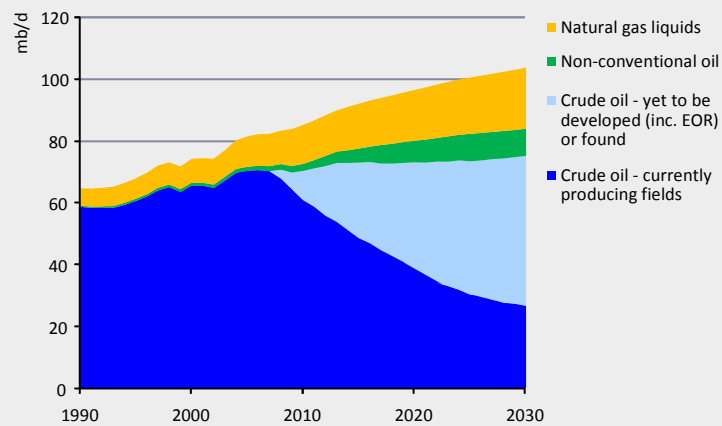
Investment of \$26 trillion, or over \$1 trillion/year, is needed, but the credit squeeze could delay spending, potentially setting up a supply-crunch once the economy recovers

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World oil production by source in the Reference Scenario

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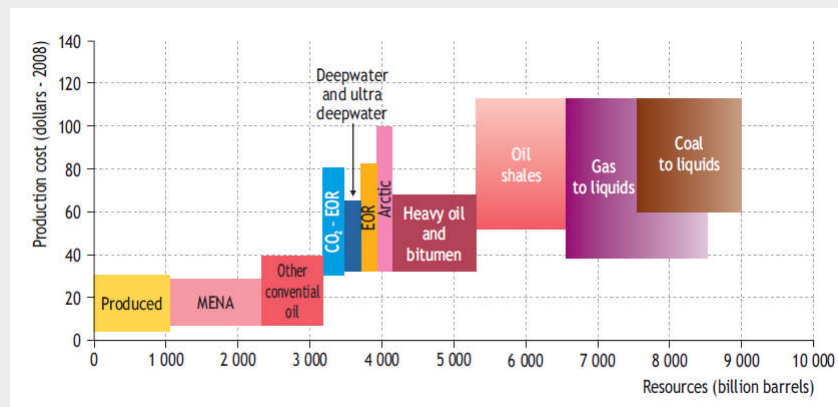


64 mb/d of gross capacity needs to be installed between 2007 & 2030 – six times the current capacity of Saudi Arabia – to meet demand growth & offset decline

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Long-term oil-supply cost curve

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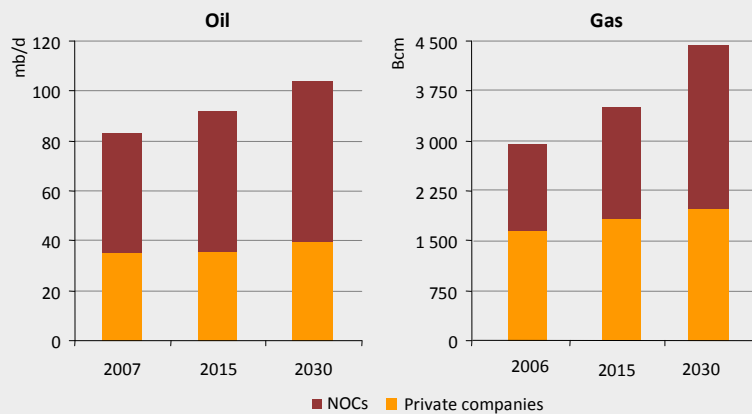


The total recoverable oil-resource base is estimated at 9 trillion barrels (including 2.5 trillion barrel of GTL/CTL) of which we have so far produced 1.1 Tb

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A sea change: world oil & gas production by company type in the Reference Scenario

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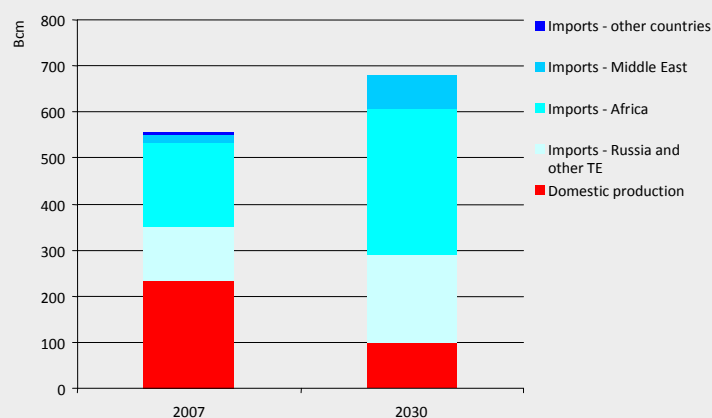


Almost 80% of the projected increase in output of both oil & gas comes from national companies – on the assumption that investment is forthcoming

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EU natural gas market outlook

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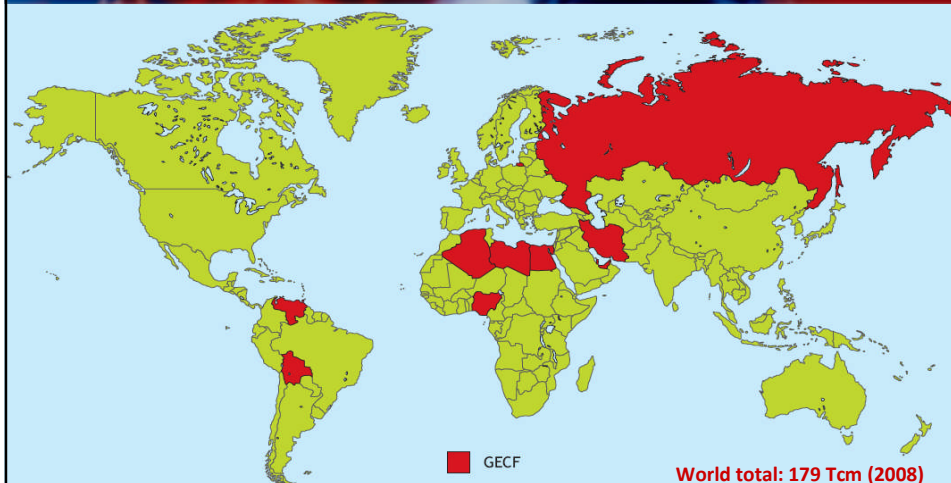


EU import dependency rises from 58% today to 86% in 2030 as a result of declining domestic production and increasing demand

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World natural gas reserves and Gas Exporting Countries Forum (GECF)

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The 11 members of GECF account for close to three quarters of global gas reserves, while just 2 of them – Russia & Iran – account for over 40%.

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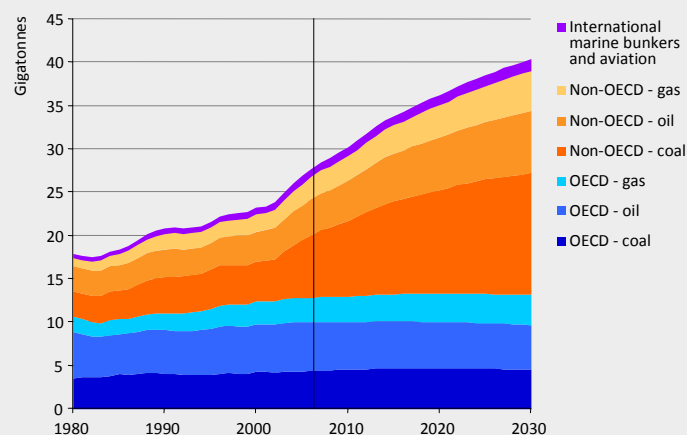
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Post-2012 climate-policy scenarios

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Energy-related CO₂ emissions in the Reference Scenario

World Energy Outlook 2008

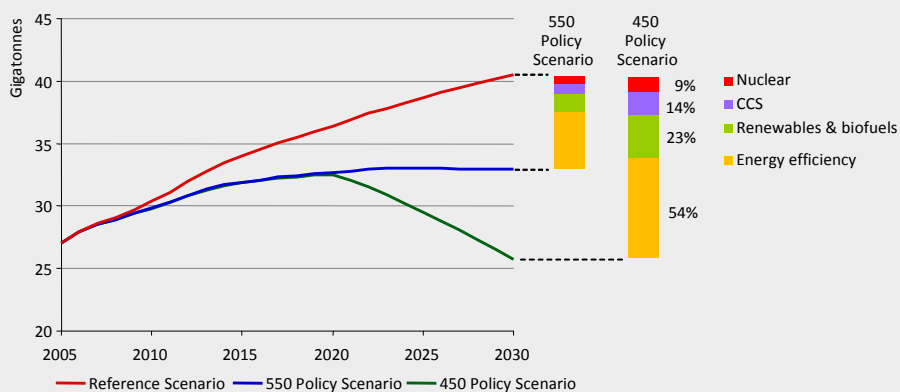


97% of the projected increase in emissions between now & 2030 comes from non-OECD countries – three-quarters from China, India & the Middle East alone

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Reductions in energy-related CO₂ emissions in the climate-policy scenarios

World Energy Outlook 2008

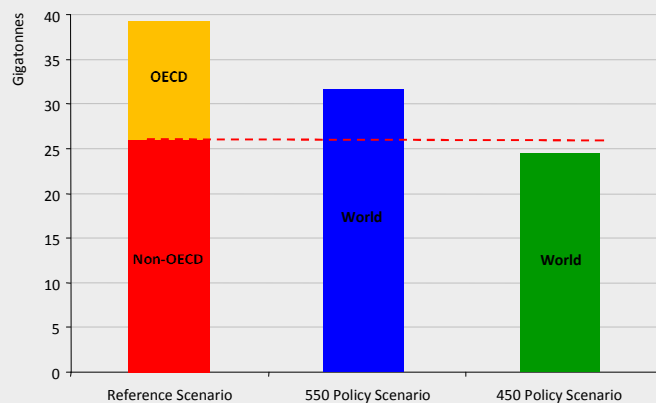


While technological progress is needed to achieve some emissions reductions, efficiency gains and deployment of existing low-carbon energy account for most of the savings

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World energy-related CO₂ emissions in 2030 by scenario

World Energy Outlook 2008



OECD countries alone cannot put the world onto a 450-ppm trajectory, even if they were to reduce their emissions to zero

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Key results of the post-2012 climate-policy analysis

World Energy Outlook 2008

550 Policy Scenario

- Corresponds to a c.3°C global temperature rise
- Energy demand continues to expand, but fuel mix is markedly different
- CO₂ price in OECD countries reaches \$90/tonne in 2030
- Additional investment equal to 0.25% of GDP

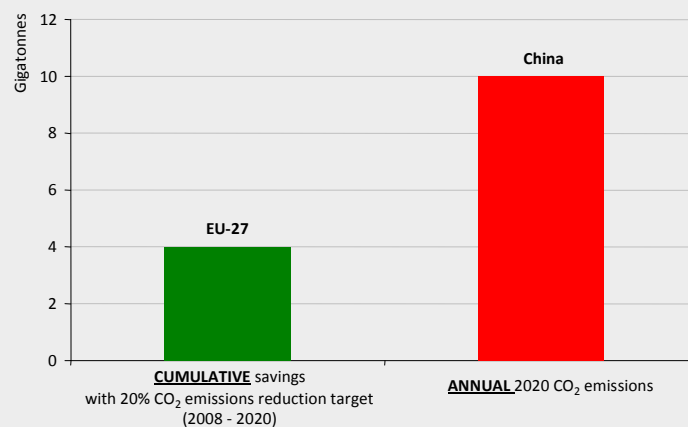
450 Policy Scenario

- Corresponds to a c.2°C global temperature rise
- Energy demand grows, but half as fast as in Reference Scenario
- Rapid deployment of low-carbon technologies and a big fall in non-OECD emissions
- CO₂ price in 2030 reaches \$180/tonne
- OPEC production still 12mb/d higher in 2030 than today
- Additional investment equal to 0.6% of GDP

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Cumulative European Union CO₂ savings with 20% reduction target in 2020

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*EU cumulative savings over 2008-2020
would represent only 40% of China's annual CO₂ emissions in 2020*

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Summary & conclusions

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Summary & conclusions

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- Current energy trends are patently unsustainable — socially, environmentally, economically
- Oil will remain the leading energy source but...
 - > *The era of cheap oil is over, although price volatility will remain*
 - > *The oil market is undergoing major and lasting structural change, with national companies in the ascendancy*
- Energy and geopolitics will be increasingly interconnected
- We need a major decarbonisation of the world's energy system -- Copenhagen is crucial
 - Addressing environmental issues will substantially improve energy security
- Financial crisis can plant the seeds for an “energy investment crisis”