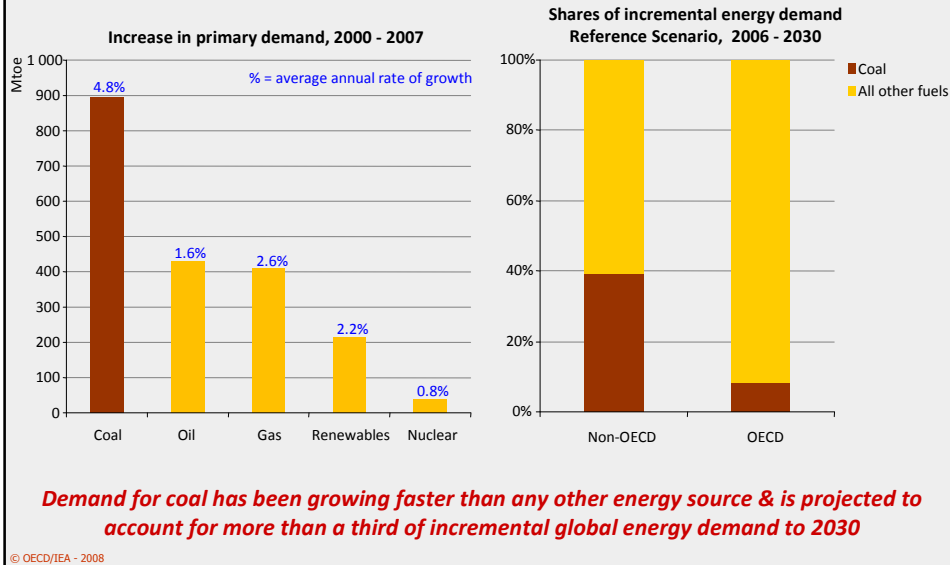


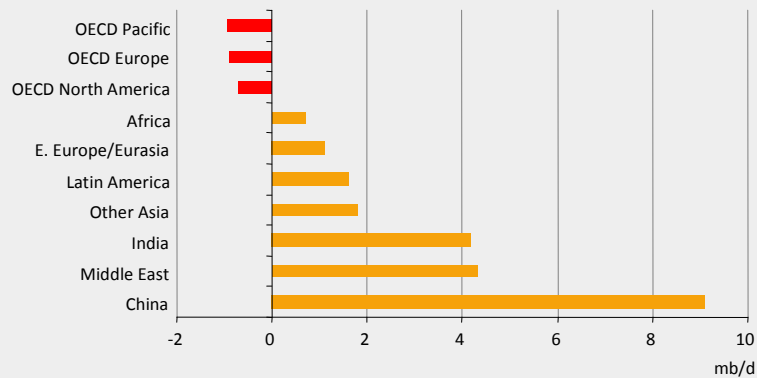
## The continuing importance of coal in world primary energy demand

World Energy Outlook 2008



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

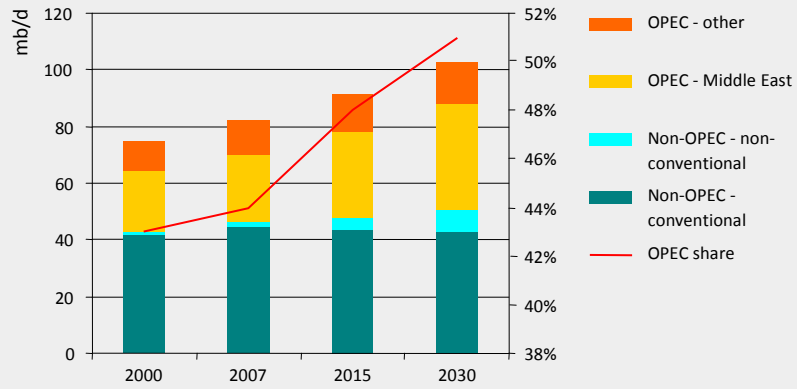
World Energy Outlook 2008



*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*

## World oil production by OPEC/non-OPEC in the Reference Scenario

World Energy Outlook 2008

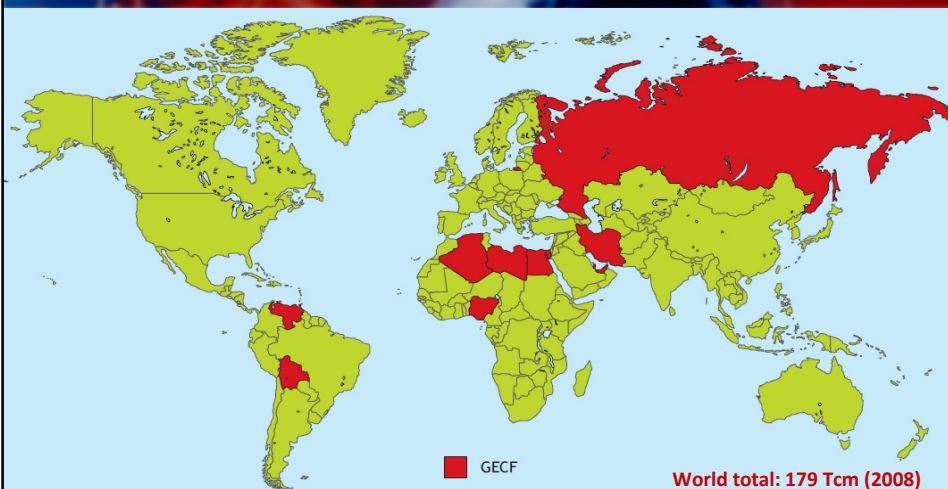


*Production rises to 104 mb/d in 2030, with Middle East OPEC taking the lion's share of oil market growth as conventional non-OPEC production declines*

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

World Energy Outlook 2008

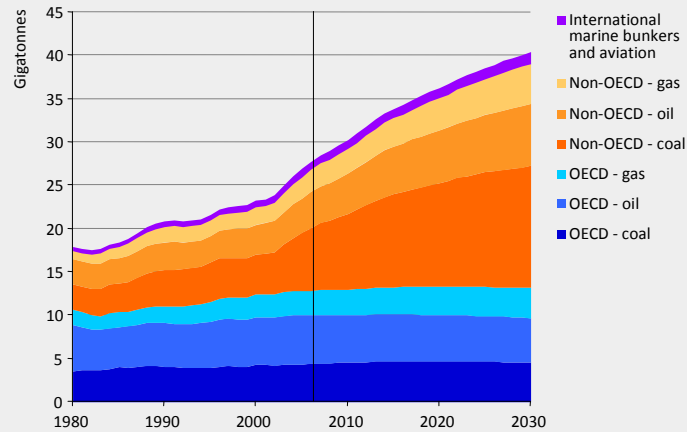


*The 11 members of GECF account for close to three quarters of global gas reserves, while just 2 of them – Russia & Iran – account for over 40% .*

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## Energy-related CO<sub>2</sub> emissions in the Reference Scenario

World Energy Outlook 2008

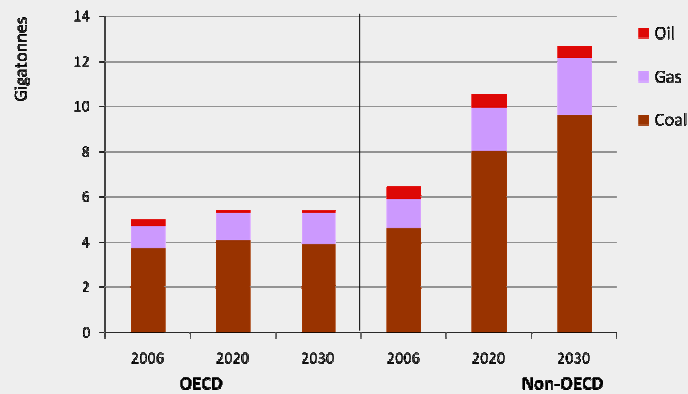


*97% of the projected increase in emissions between now & 2030 comes from non-OECD countries – three-quarters from China, India & the Middle East alone*

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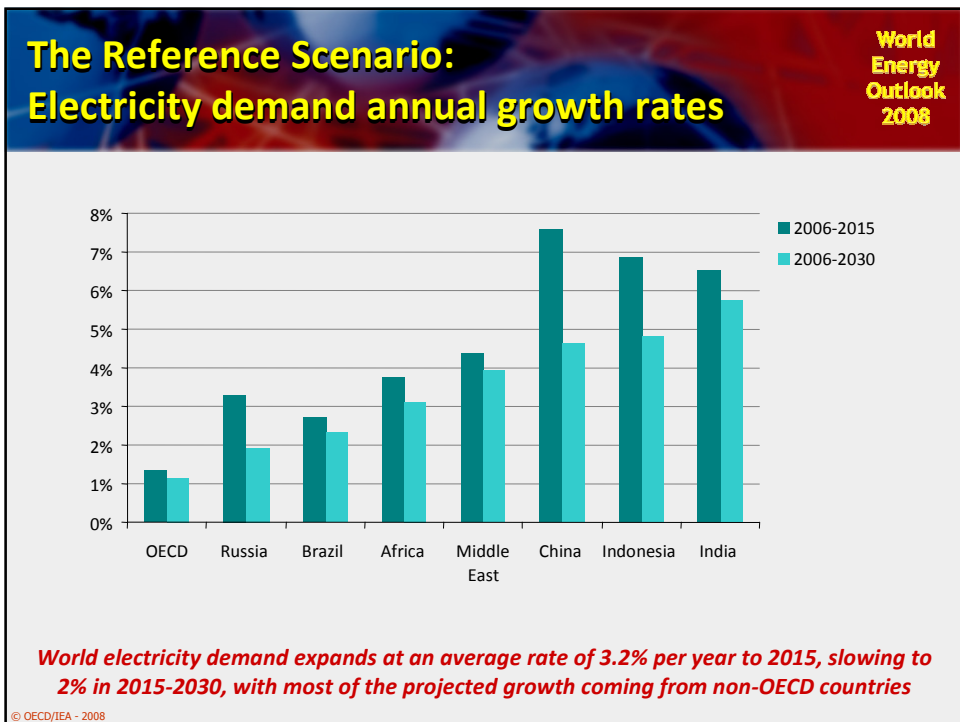
## Power sector CO<sub>2</sub> emissions in the Reference Scenario

World Energy Outlook 2008



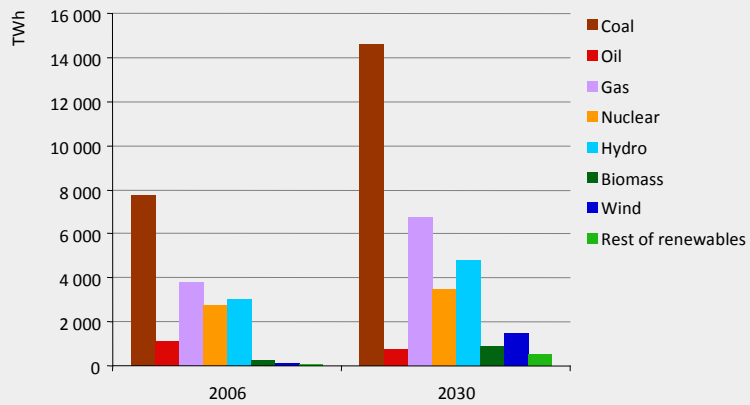
*The power sector is the most important contributor to global carbon dioxide emissions – with its share expected to remain at around 40% of the total through to 2030*

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## The Reference Scenario: World electricity generation

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Energy  
Outlook  
2008



*Coal remains the main source of electricity generation with the increase coming mainly from non-OECD Asia*

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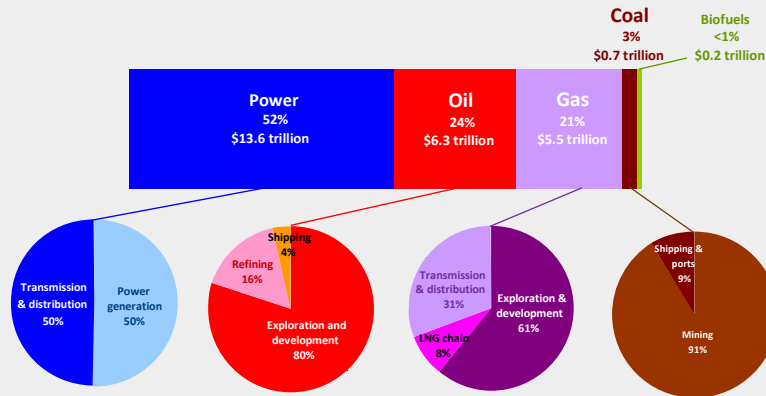
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## Impact of financial crisis on energy investments

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

World Energy Outlook 2008

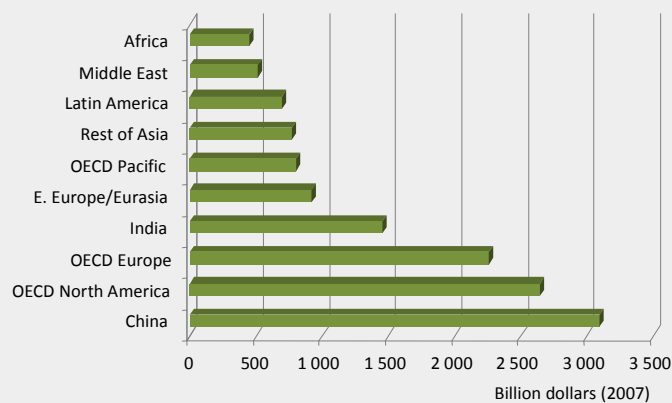


*Investment of \$26 trillion, or over \$1 trillion/year, is needed, but the credit squeeze could delay spending, potentially setting up a supply-crunch once the economy recovers*

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## Cumulative power-supply investment in the Reference Scenario, 2007-2030

World Energy Outlook 2008

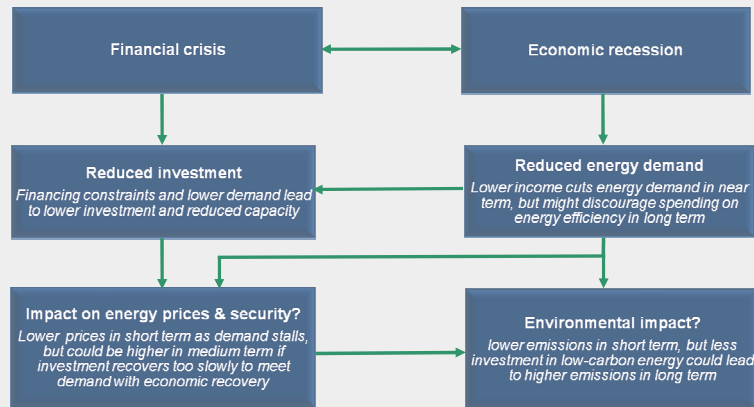


*Over 50% of total energy-supply investments, \$13.6 trillion, are in the power sector alone, of which 3/4 are within China, India and the OECD*

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## How is the financial & economic crisis affecting the energy outlook?

World  
Energy  
Outlook  
2008



*The crisis is driving down demand, prices and investment for now, but an unexpectedly rapid economic recovery could squeeze supply capacity in the medium term*

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## Impact of financial crisis on energy investments

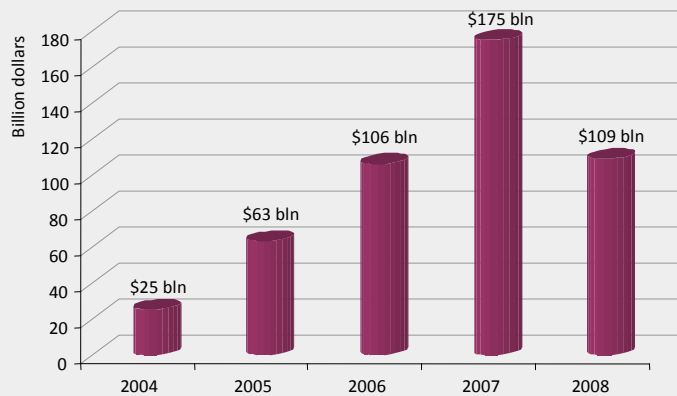
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Energy  
Outlook  
2008

- 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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## Impact of financial crisis on global investment in renewable energy

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Outlook  
2008



*Annual investment in renewables increased sevenfold between 2004 and 2007, but fell by 38% in 2008*

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## Impact of the crisis on electricity investment (1)

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2008

- Impact varies depending on the region and on the regulatory regime (much bigger in deregulated markets)
- Uncertainty about future electricity demand is a key risk factor that influences company's investment decisions
- Cost of capital has substantially increased due to higher perceived risk
- Renewables & nuclear especially vulnerable to financing difficulties & lower fossil-fuel prices

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## Impact of the crisis on electricity investment (2)

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Outlook  
2008

- Impact much bigger on large-scale capital-intensive power plants with long lead times, such as nuclear
- Renewables projects also being hit depending on the government policy framework (smaller impact with high feed-in tariffs)
- Many wind developers are small (BBB-type rated) and some are facing problem to raise finance
- If credit crunch lasts longer and fossil-fuel prices remain low, investments may shift to coal- and gas- fired plants in the longer term

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## Summary & conclusions

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## Summary & conclusions

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2008

- **Current energy trends pose twin challenges – increasing risks to energy security and a growing climate threat**
- **Energy and geopolitics will be increasingly interconnected**
- **Globally we need \$1 trillion of energy investment annually – this is largely concentrated in the power sector in developing countries**
- **The financial crisis has had a particularly severe impact on the energy sector due to its capital intensive nature**
- **Governments need to address financing constraints for energy investment**