



"Global Energy Markets: Key Trends and Strategic Challenges"

CEPS Taskforce on Energy Security
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Didier HOUSSIN

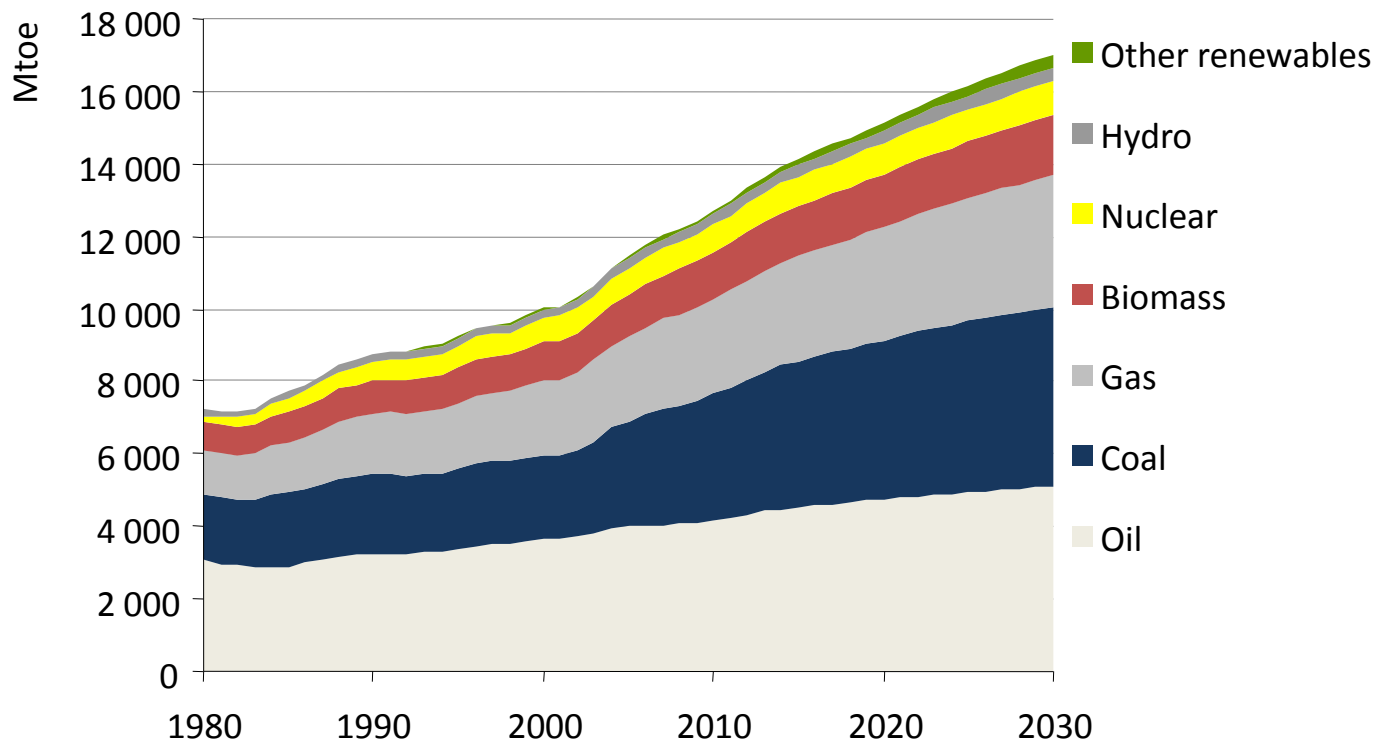
Director

Directorate for Energy Markets & Security



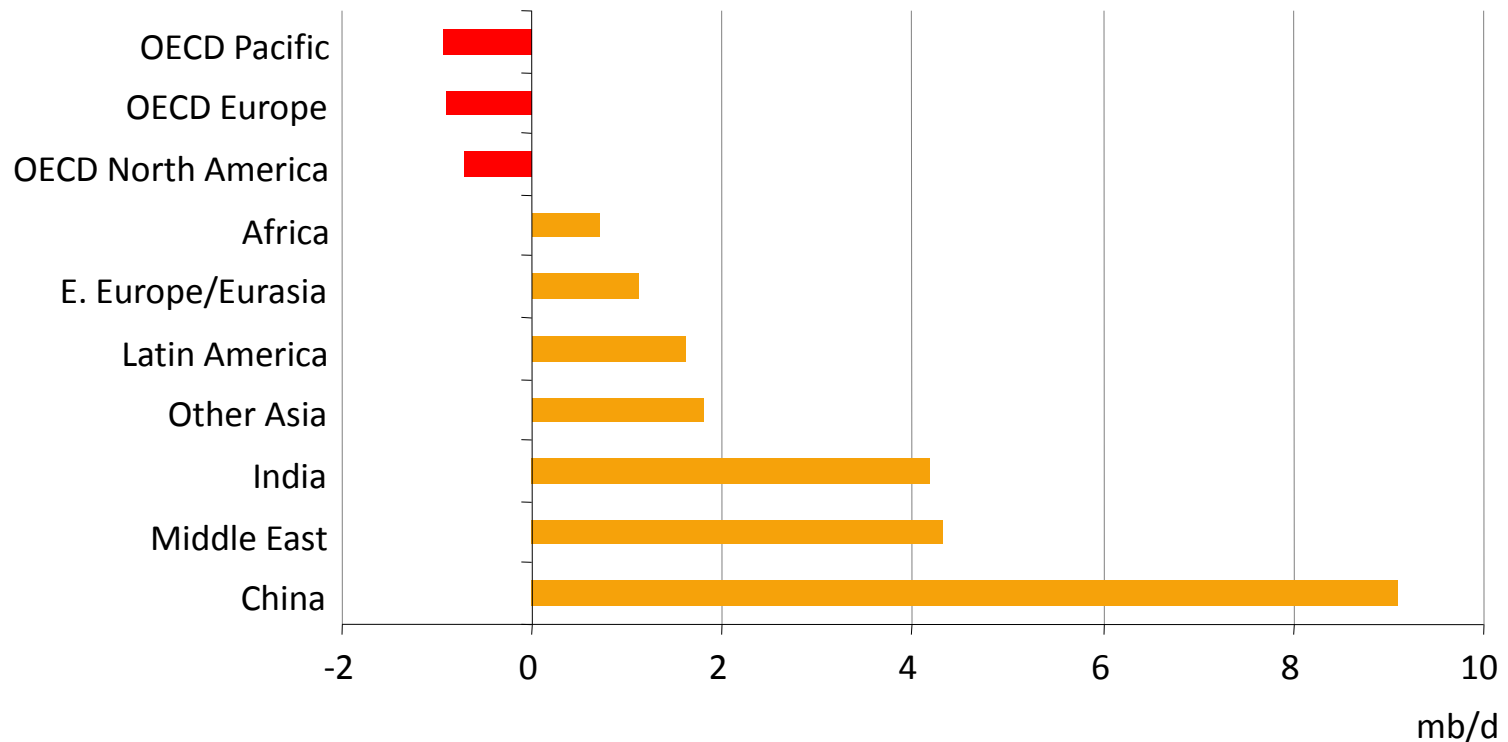
Energy markets : key trends

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



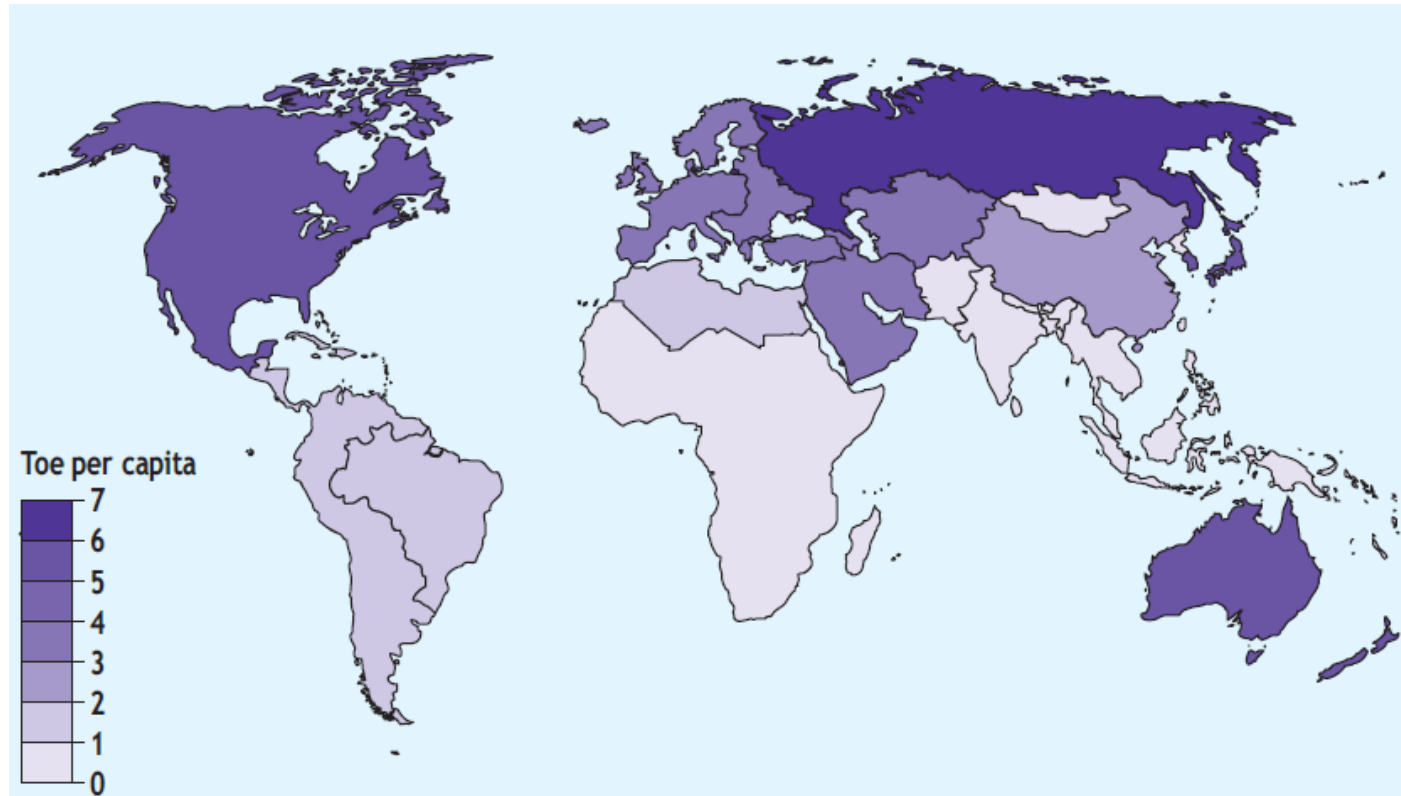
World energy demand expands by 45% between now and 2030 – an average rate of increase of 1.6% per year – with coal accounting for more than a third of the overall rise

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



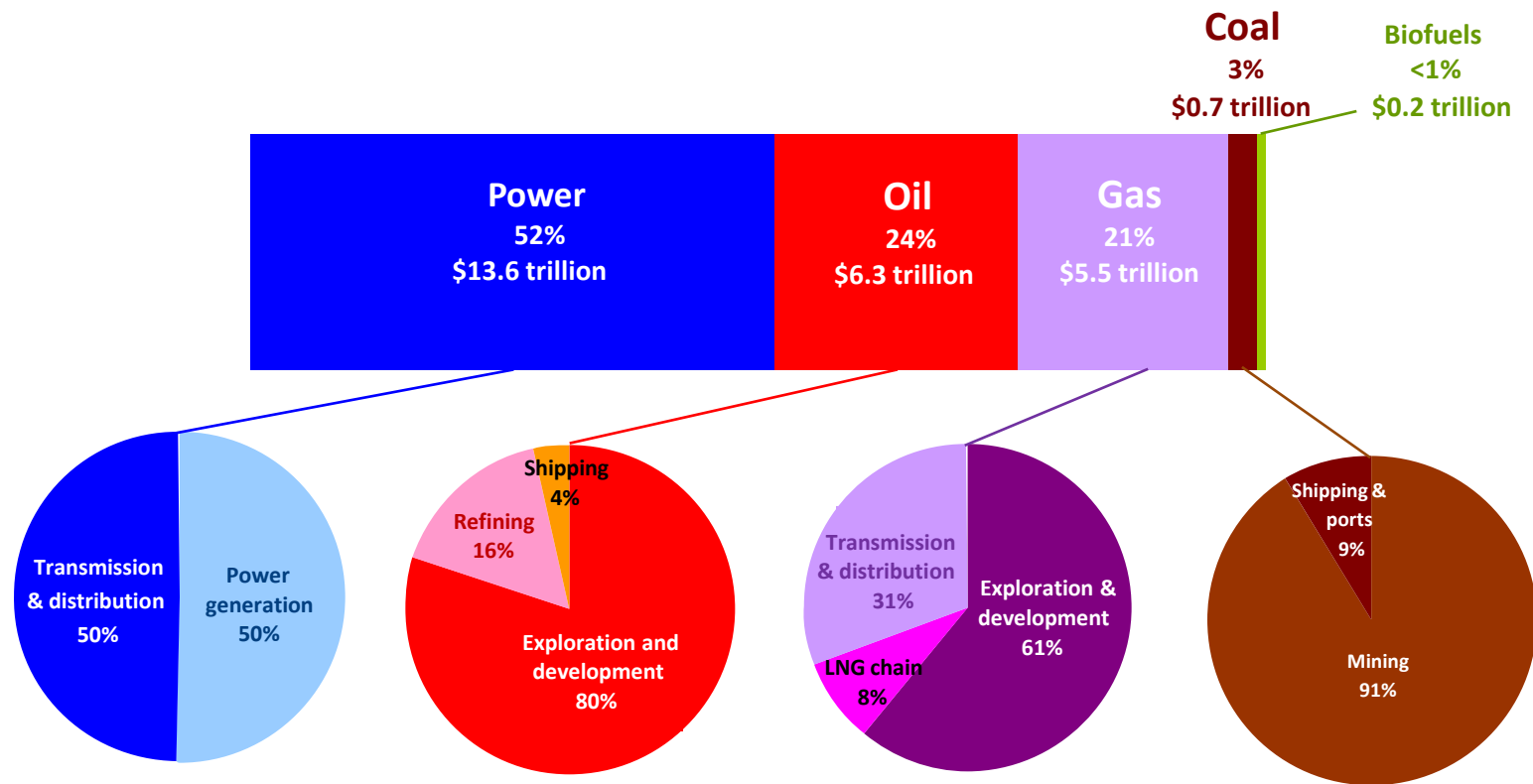
All of the growth in oil demand comes from non-OECD, with China contributing 43%, the Middle East & India each about 20% & other emerging Asian economies most of the rest

The Reference Scenario: Per-capita primary energy demand, 2030



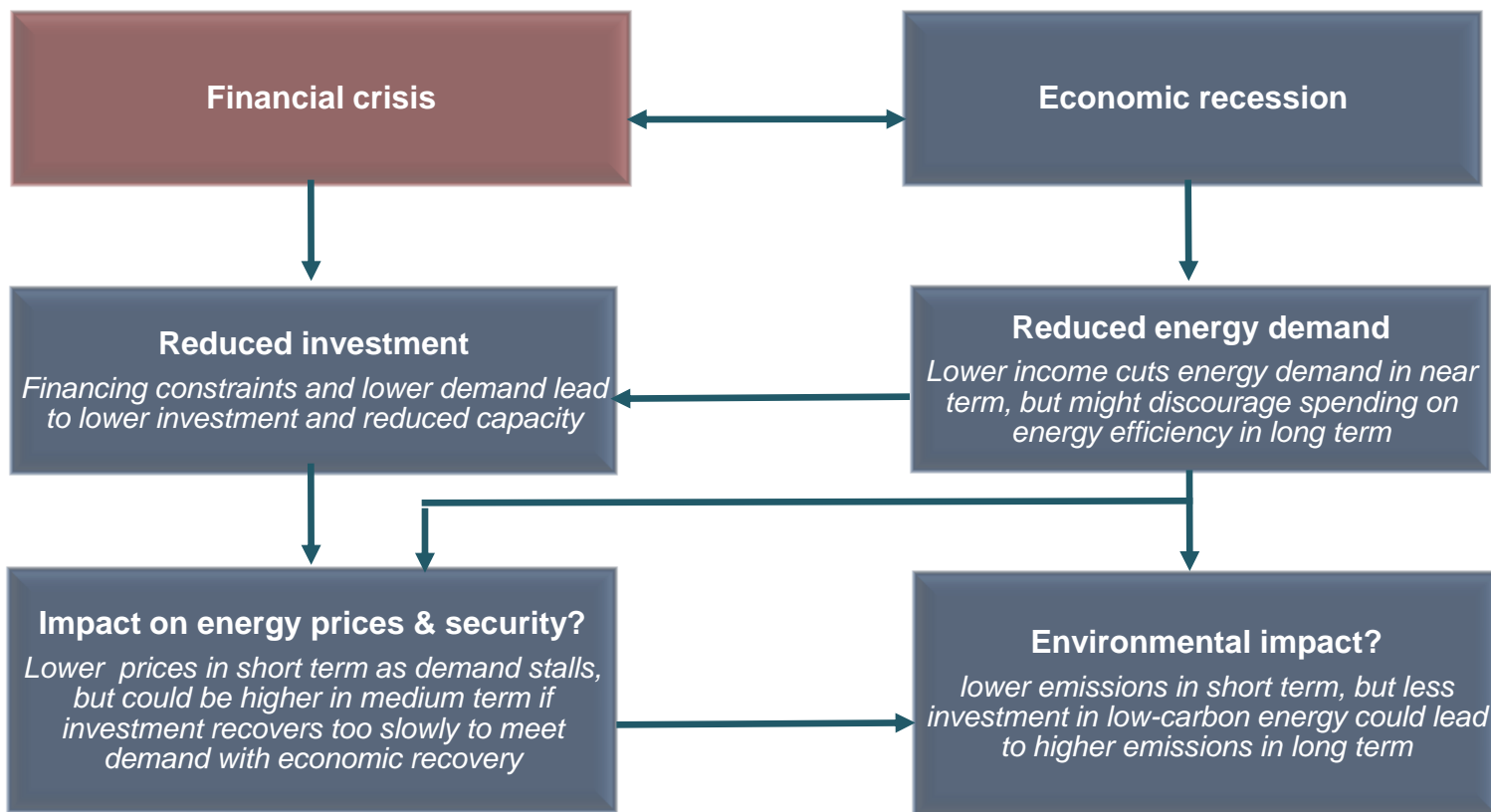
In 2030, disparities in per-capita energy consumption remain stark, ranging from 7 toe in Russia to 0.5 toe in sub-Saharan Africa

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



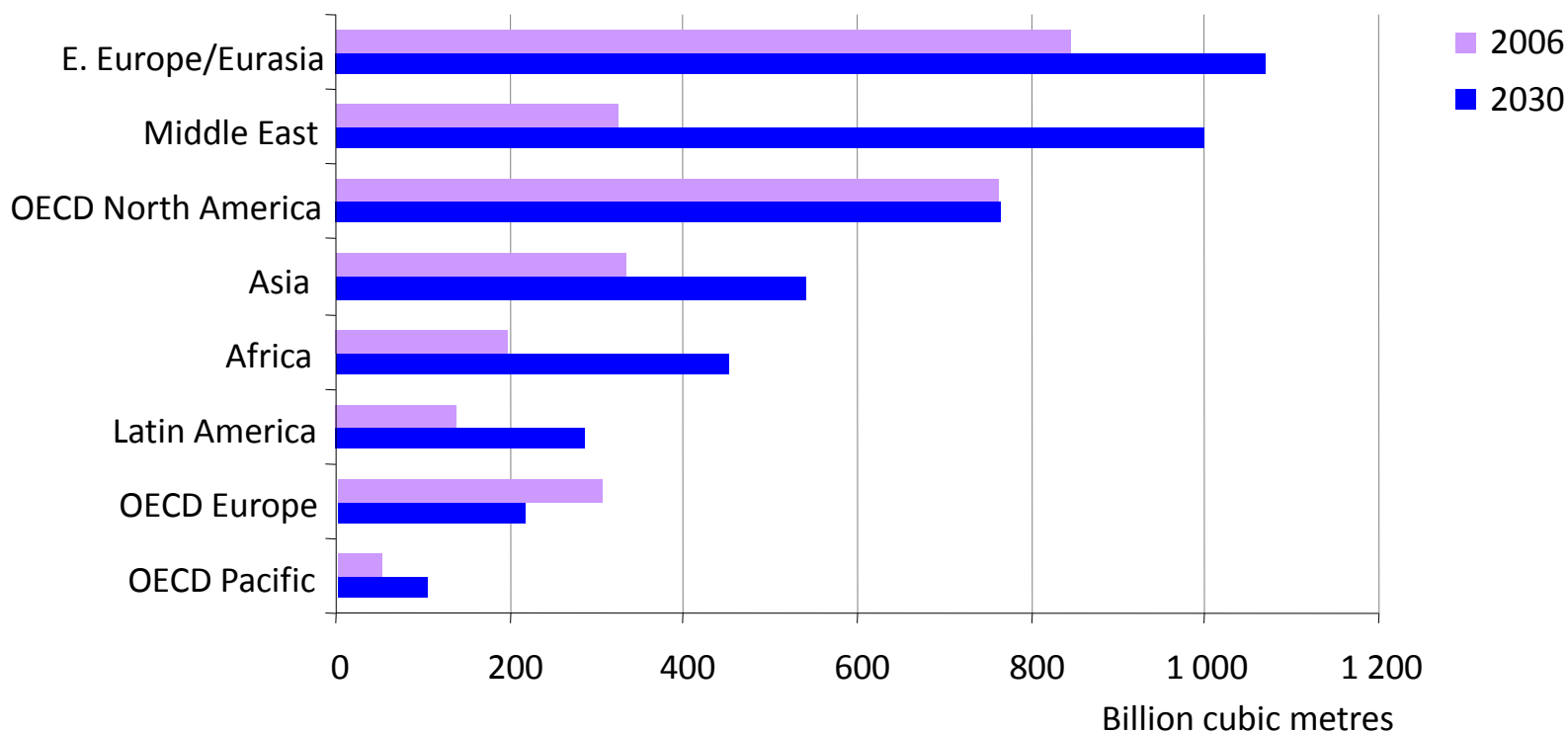
Investment of \$26 trillion, or over \$1 trillion/year, is needed, but the credit squeeze could delay spending, potentially setting up a supply-crunch once the economy recovers

How is the financial crisis affecting the energy outlook?



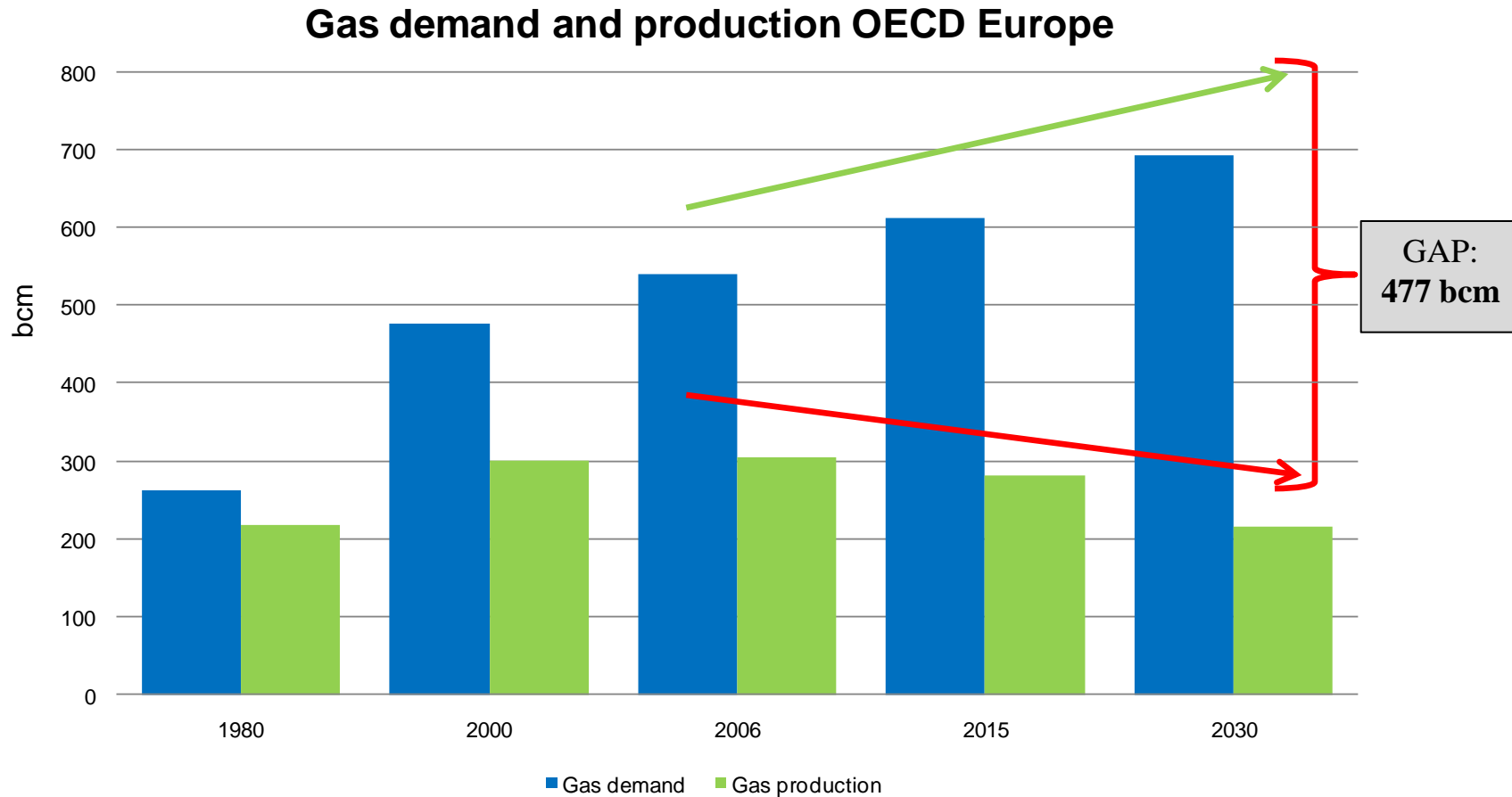
The crisis is driving down demand, prices and investment for now, but an unexpectedly rapid economic recovery could squeeze supply capacity and increase emissions in the medium term

The Reference Scenario: Natural gas production



Gas production is set to become concentrated in the most resource-rich regions, with 46% of the growth to 2030 coming from the Middle East, its output tripling to over 1 tcm

Due to declining production Europe need to secure additional gas imports to cover demand

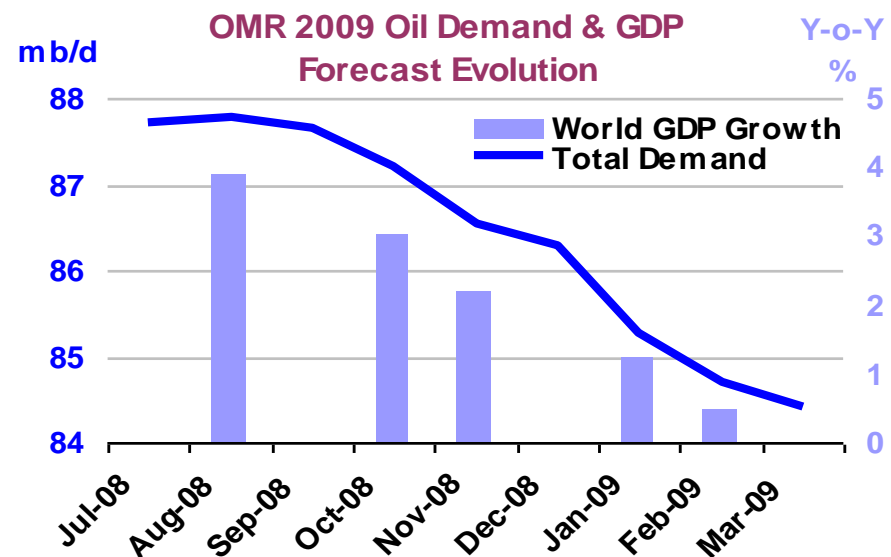
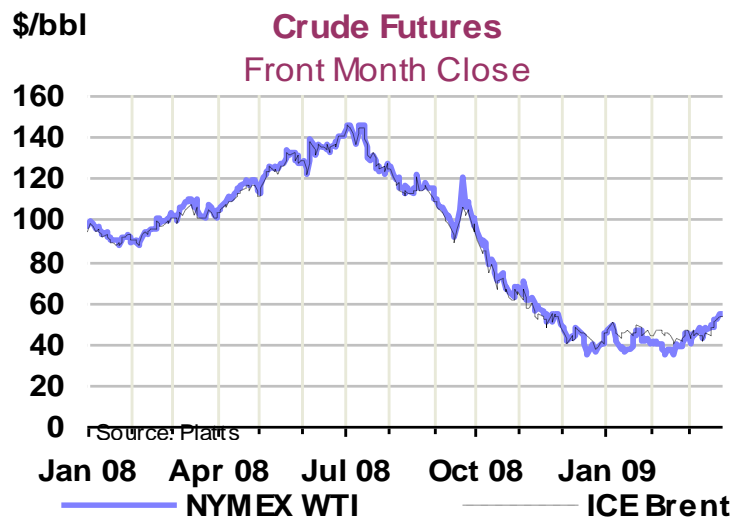


Source: WEO 2008



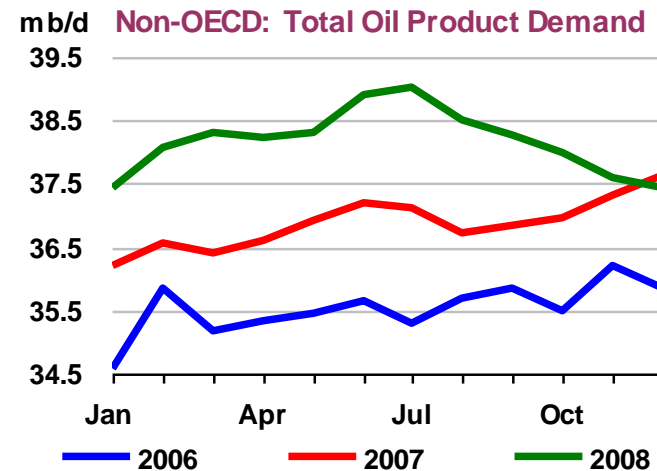
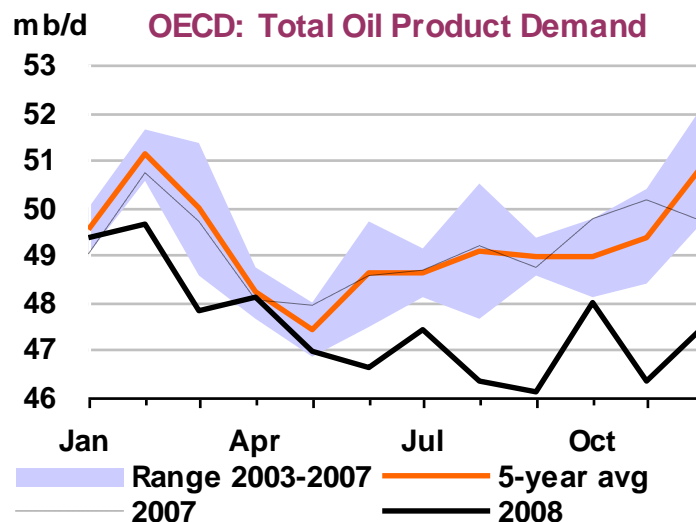
Oil market prospects

Worsening economic outlook underpins market weakening



- Two year demand contraction in 08/09 first since early-1980s
- OECD hit hard, but clear signs that non-OECD is slowing now too

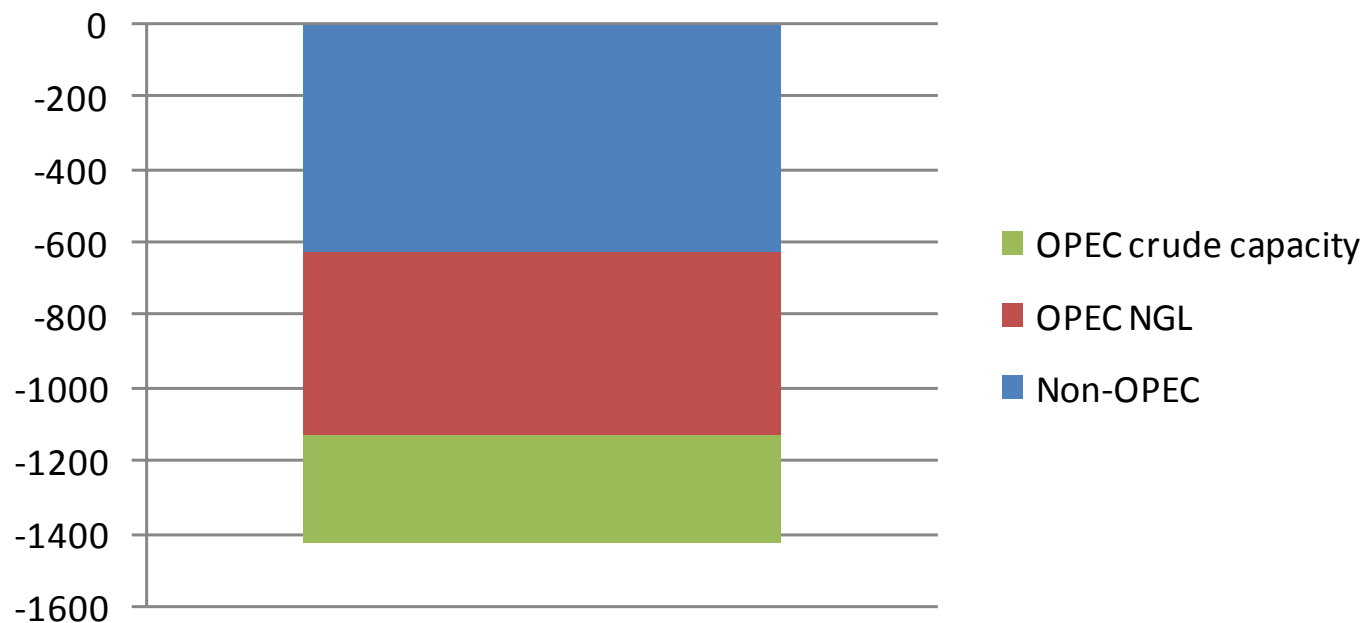
Focus of demand weakness is OECD But non-OECD contagion now evident



- **OECD demand in contraction since early-2008, and falling by 1.5mb/d on average in both 2008 and 2009**
- **Unremittingly weak economic indicators, and no guarantee of recovery in late-2009**
- **For non-OECD, recent downgrades to expectations for Asia and FSU illustrate that economic malaise is spreading**
- **+3.5% 2008 oil growth slows to +1.4% in 2009**
- **Only Middle East appears to be unscathed, so far, by the slow-down**

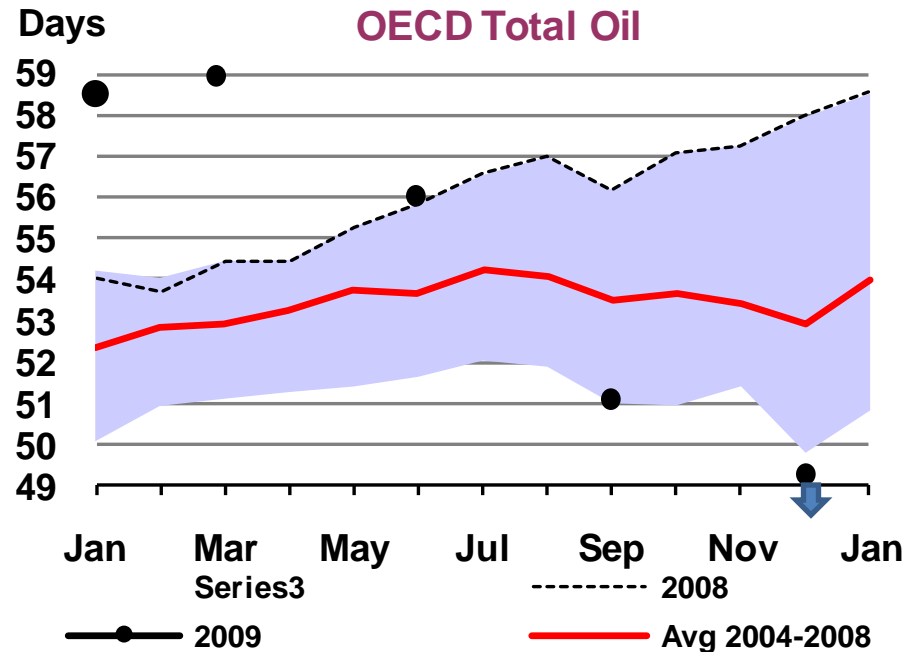
But low demand, weak prices & financial crisis curbing supply potential too

Net revisions to 2009 oil supply forecast,
kb/d



Total 2009 Supply capacity forecast has been revised down -1.4 mb/d since last July (taking into account 2008 baseline changes)

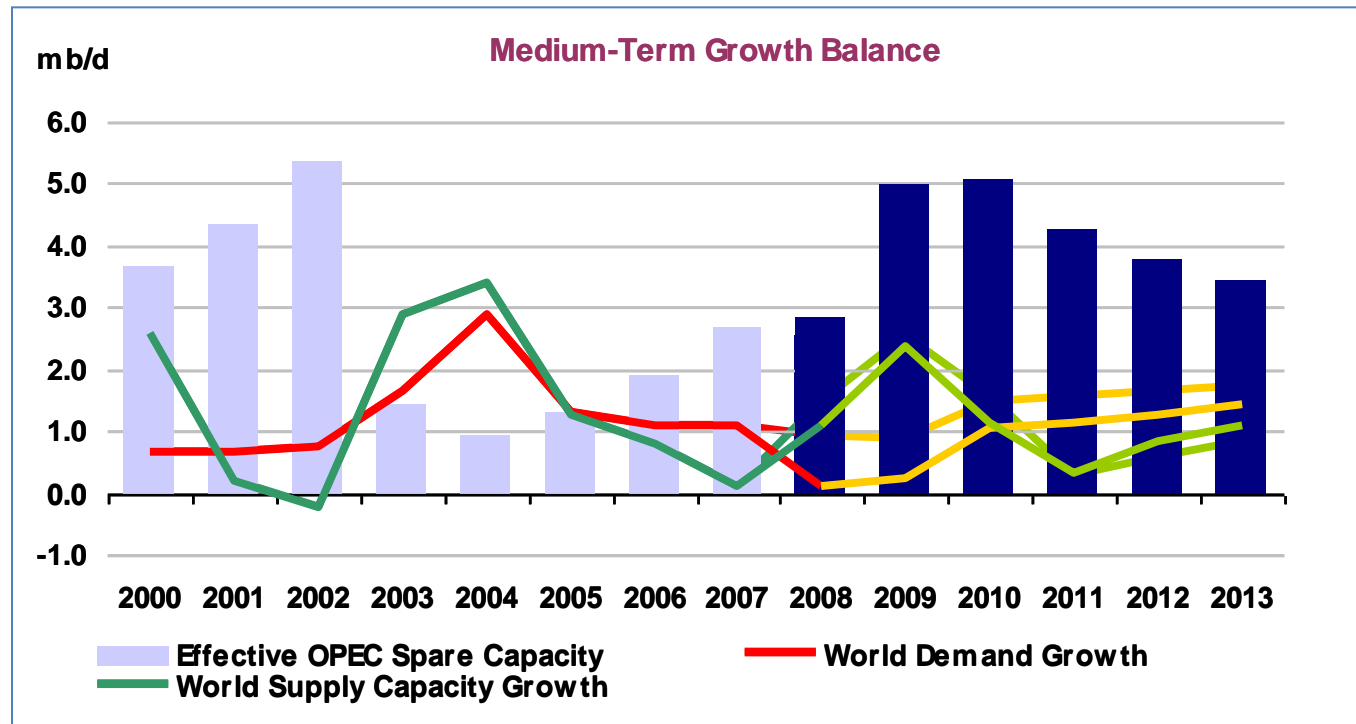
What if OPEC meets its existing targets?



- OMR does not forecast OPEC production – but if OPEC-11 hit target and stayed there from early-2Q, market could rapidly tighten
- Floating storage could offset some of this hypothetical stock draw, keeping markets weak in 2Q...
- ...but implied OPEC curbs of over 3 mb/d year-on-year would outstrip even the most pessimistic view of global demand

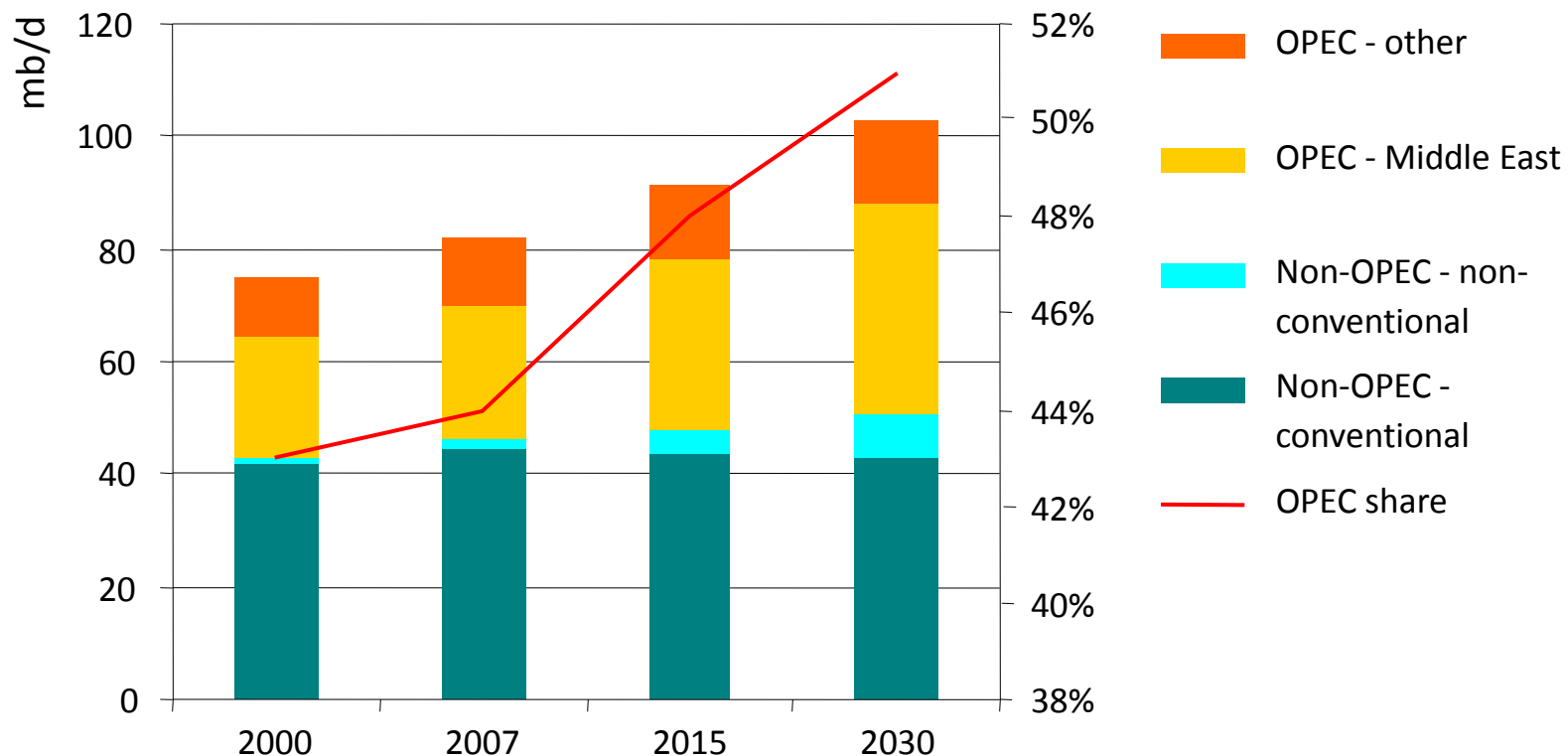
Supply and Demand Outlook Comparison 2008-2013

November 2008 Forecast
July 2008 Forecast



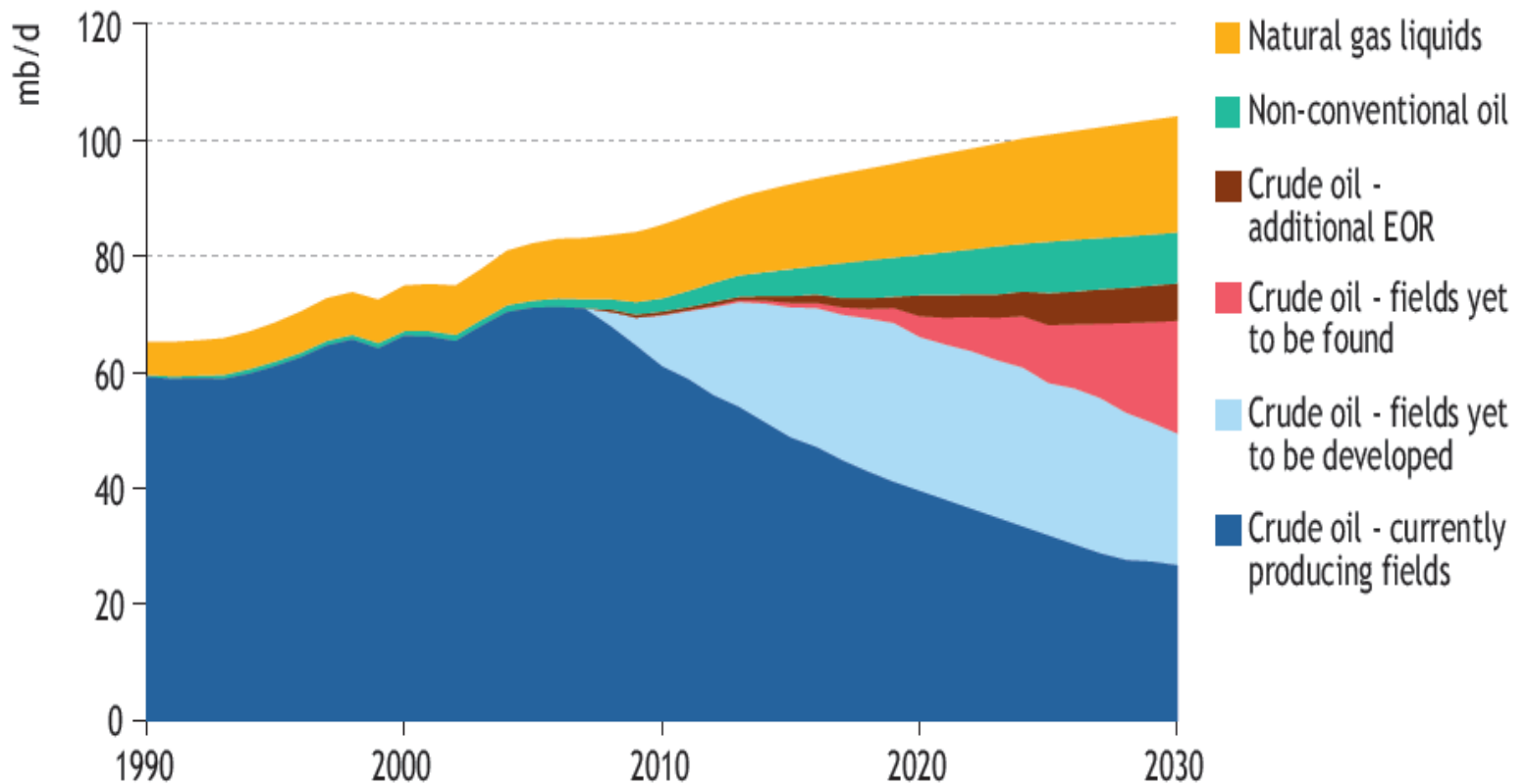
- OPEC 2013 spare capacity 3.5 mb/d vs. 1 mb/d forecast in July 2008
- But even this number could go lower as project slippage intensifies
- And 3% spare capacity is tight by any measure

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



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

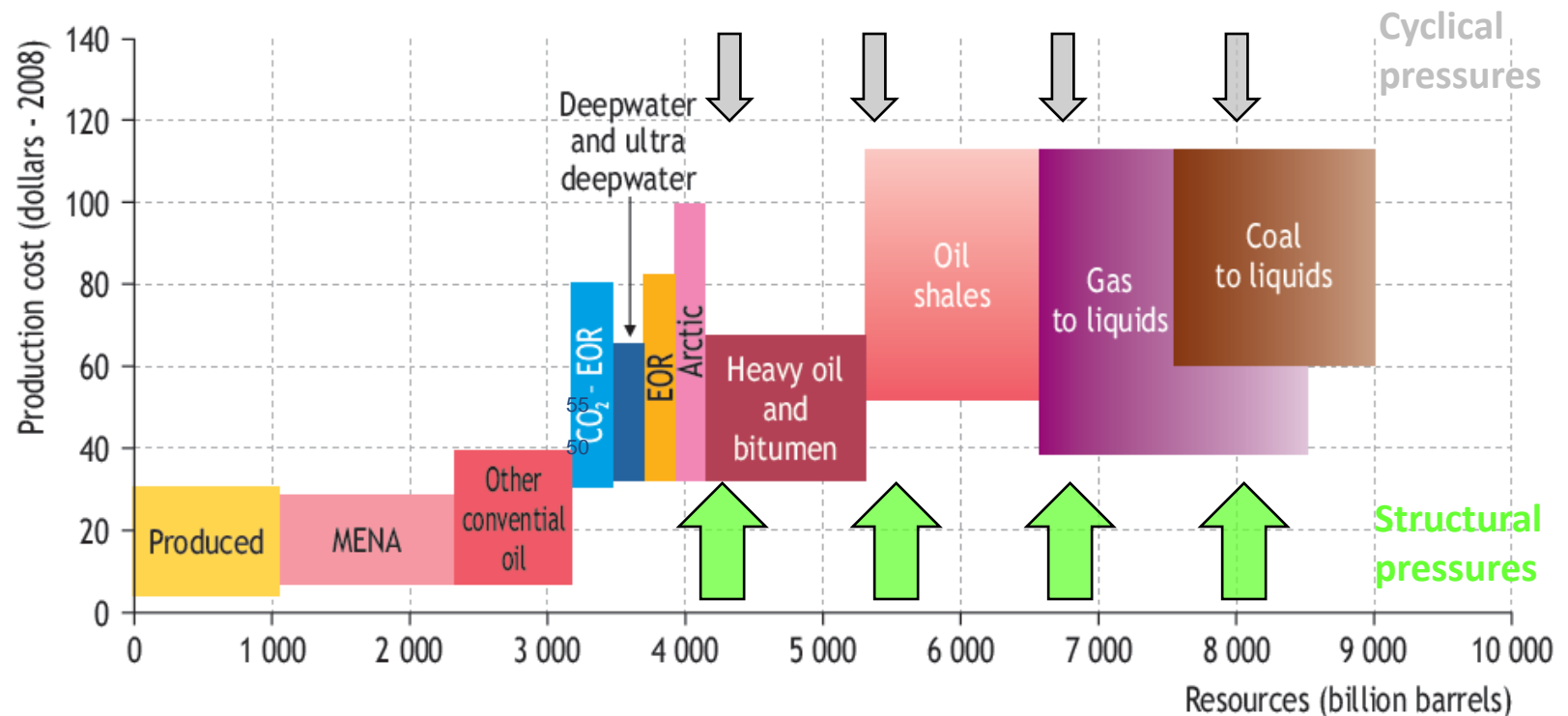
World oil production by source in the Reference Scenario



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

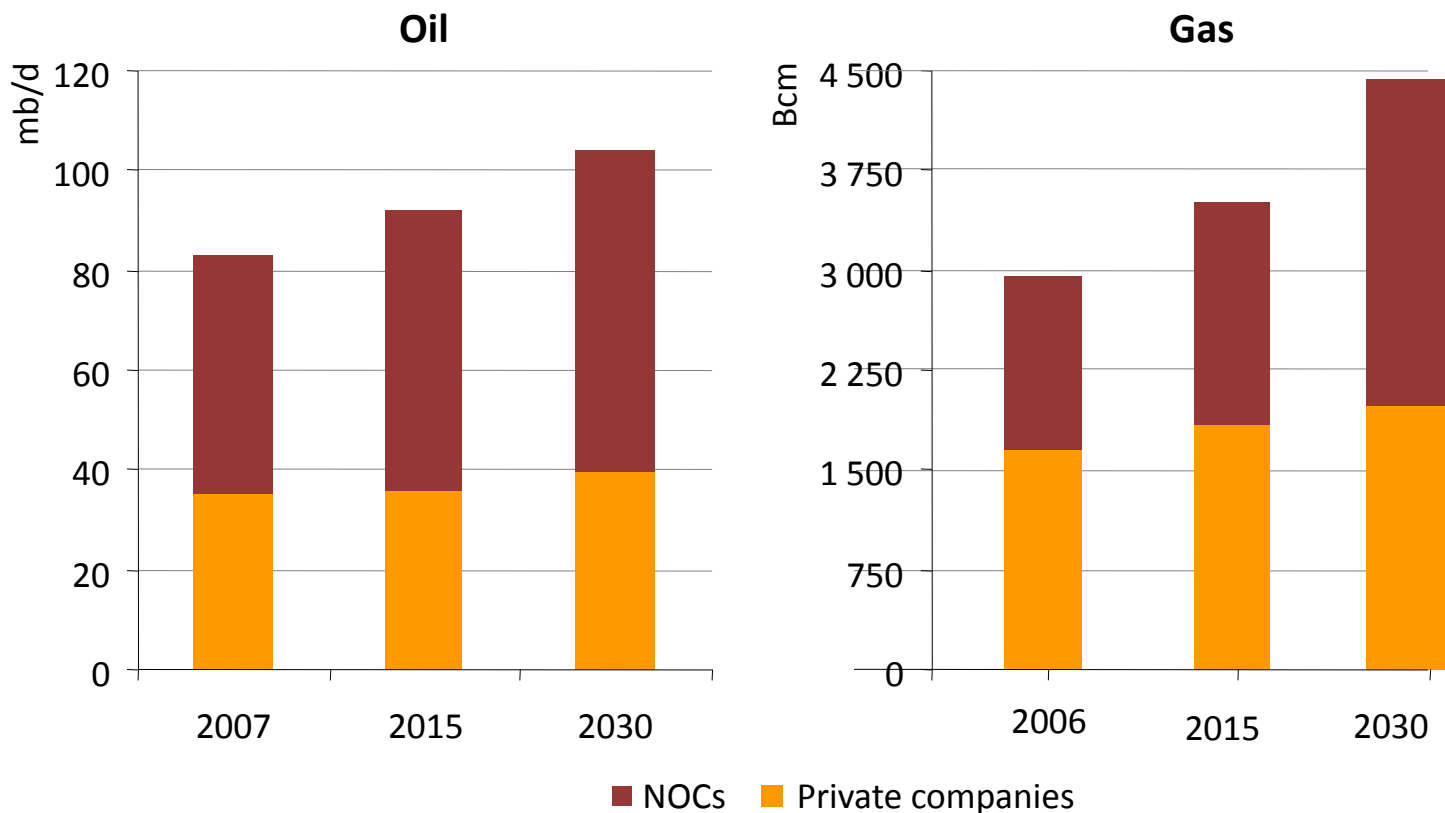
Structural shift to more difficult oil (access constraints)...but cyclical element to costs too

Figure 9.10 • Long-term oil-supply cost curve



- Cost curves have moved higher, \$60-80/bbl for some oil sands projects
- Deep water not far behind
- But some cyclical easing of earlier cost inflation also now evident
- So picking an arbitrary 'ideal' price makes little sense

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

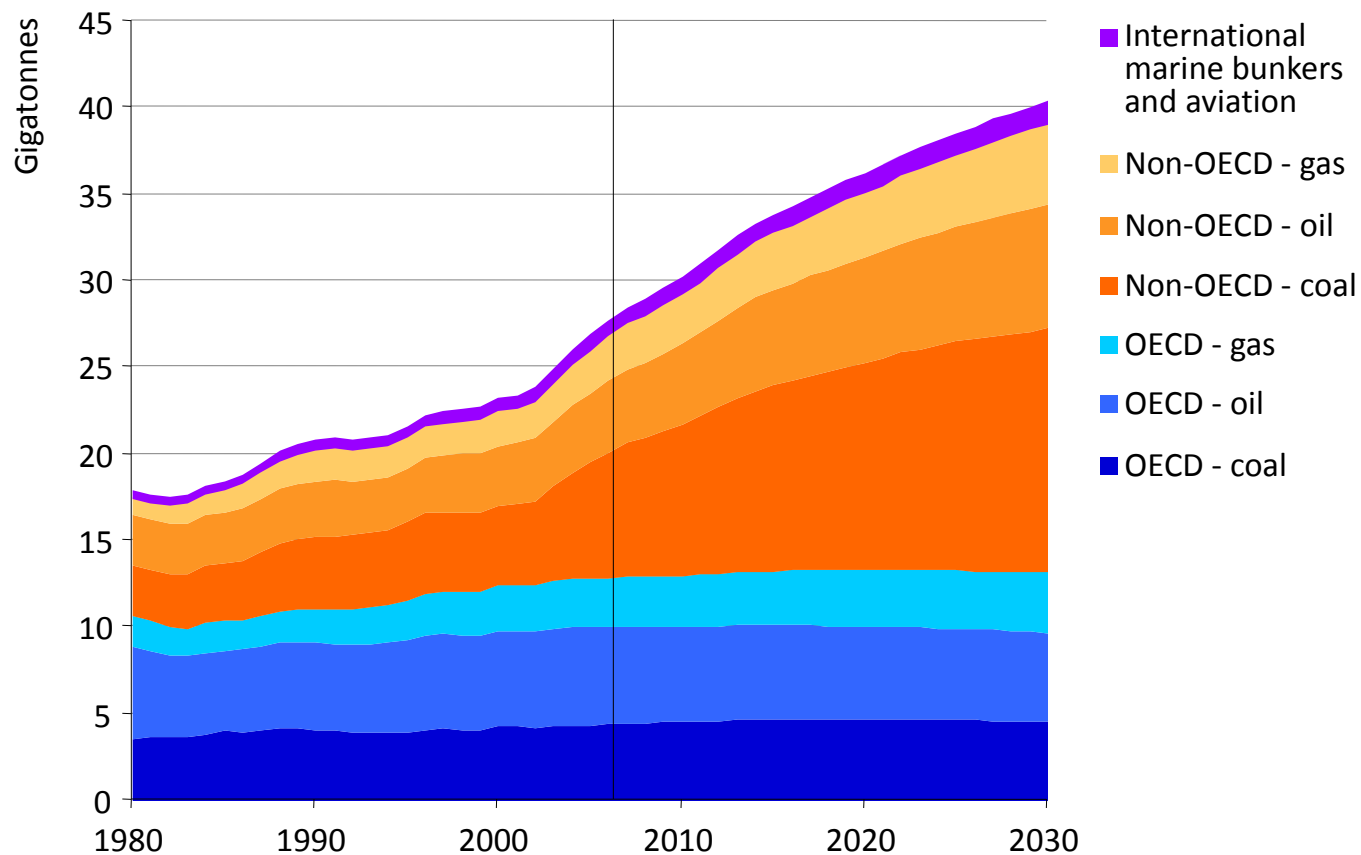


Almost 80% of the projected increase in output of both oil & gas comes from national companies – on the assumption that investment is forthcoming



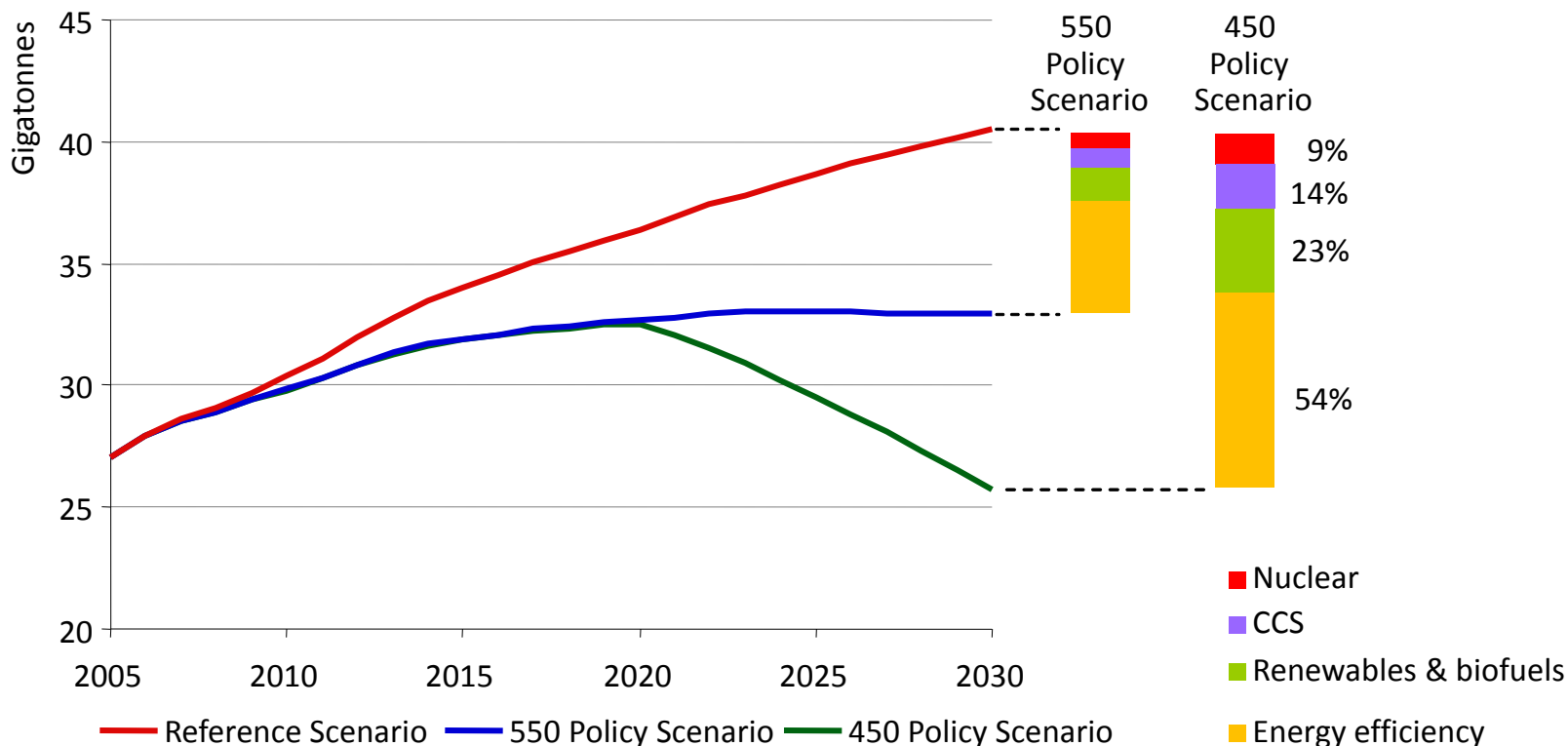
Post-2012 climate-policy scenarios

Energy-related CO2 emissions in the Reference Scenario



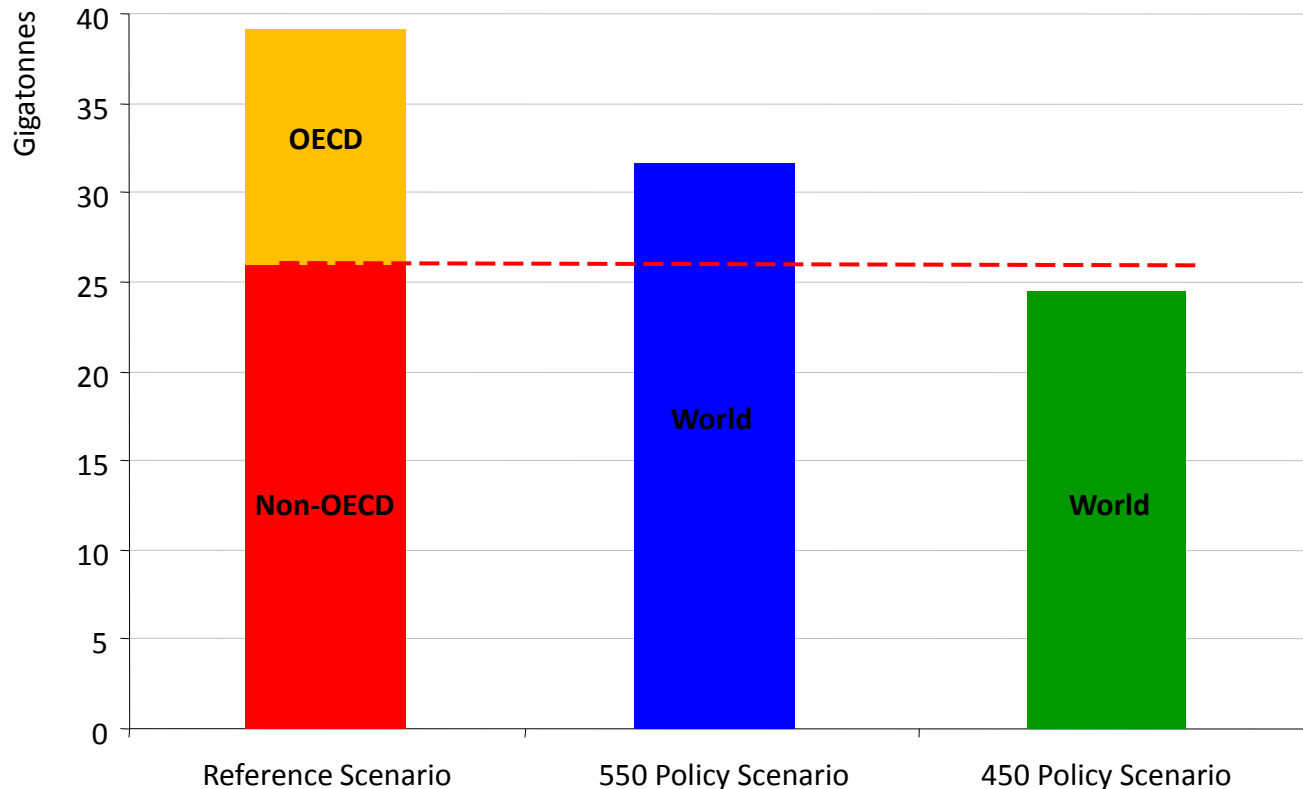
97% of the projected increase in emissions between now & 2030 comes from non-OECD countries – three-quarters from China, India & the Middle East alone

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



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

World energy-related CO2 emissions in 2030 by scenario



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



Summary & conclusions

- Current energy trends are patently unsustainable in the long term
- 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 and OPEC countries in the ascendancy
- Energy security is not just about oil but also gas and power: availability, affordability, sustainability
- Energy security and climate change challenges intertwined
- The economic crisis impacts not only demand but also investment : investment deferral can affect future energy supply and price levels when the economy bounds back
- A long-term approach is of paramount importance in energy policy : the present economic worries do not excuse back-tracking or delays in taking action to address energy challenges