A presentation from the 2009 Topical Symposium:

# *Energy Security: A Global Challenge*

Hosted by:
The Institute for National Strategic Studies
of
The National Defense University

29-30 September 2009

**By**
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INTERNATIONAL ENERGY AGENCY

# *Energy Security: A Global Challenge*

National Defense University
29-30 September 2009

## *The emerging petroleum and natural gas economy*

**Ambassador Richard H. Jones**
**Deputy Executive Director**
**International Energy Agency**

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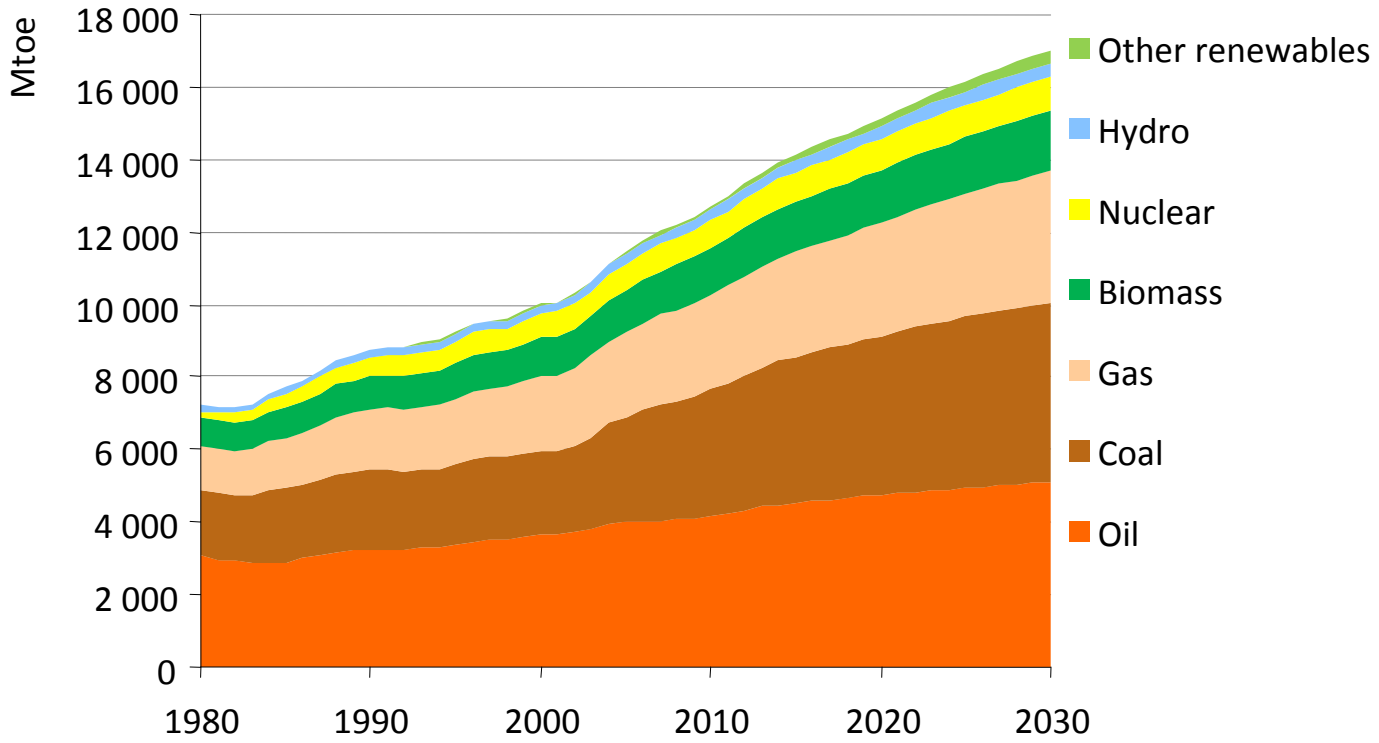
# World primary energy demand in the Business as Usual Scenario




*World Energy Outlook* 2008, IEA

**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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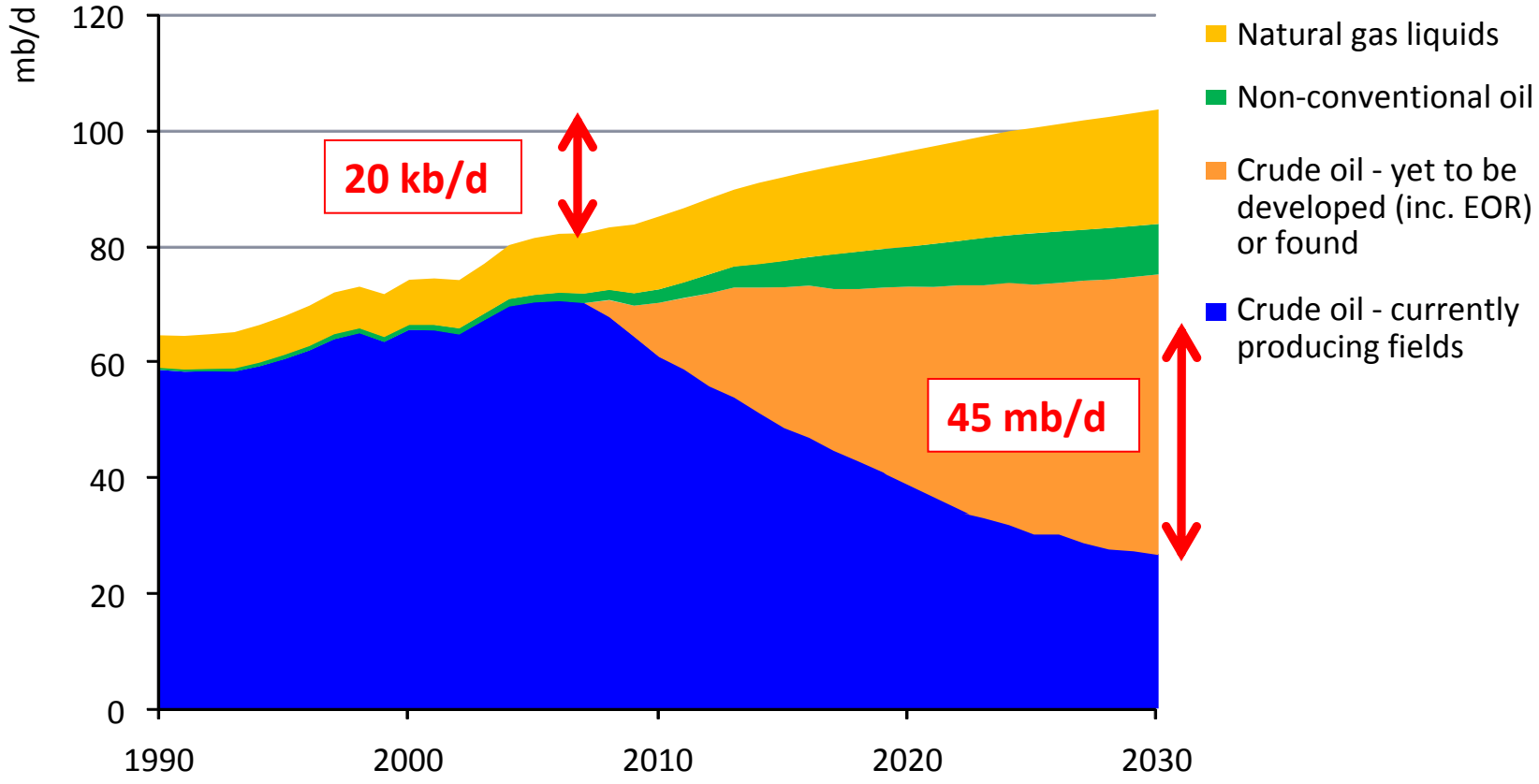
# World oil production by source in the Reference Scenario




**We need more oil to offset declining production from existing fields than to meet rising demand.**

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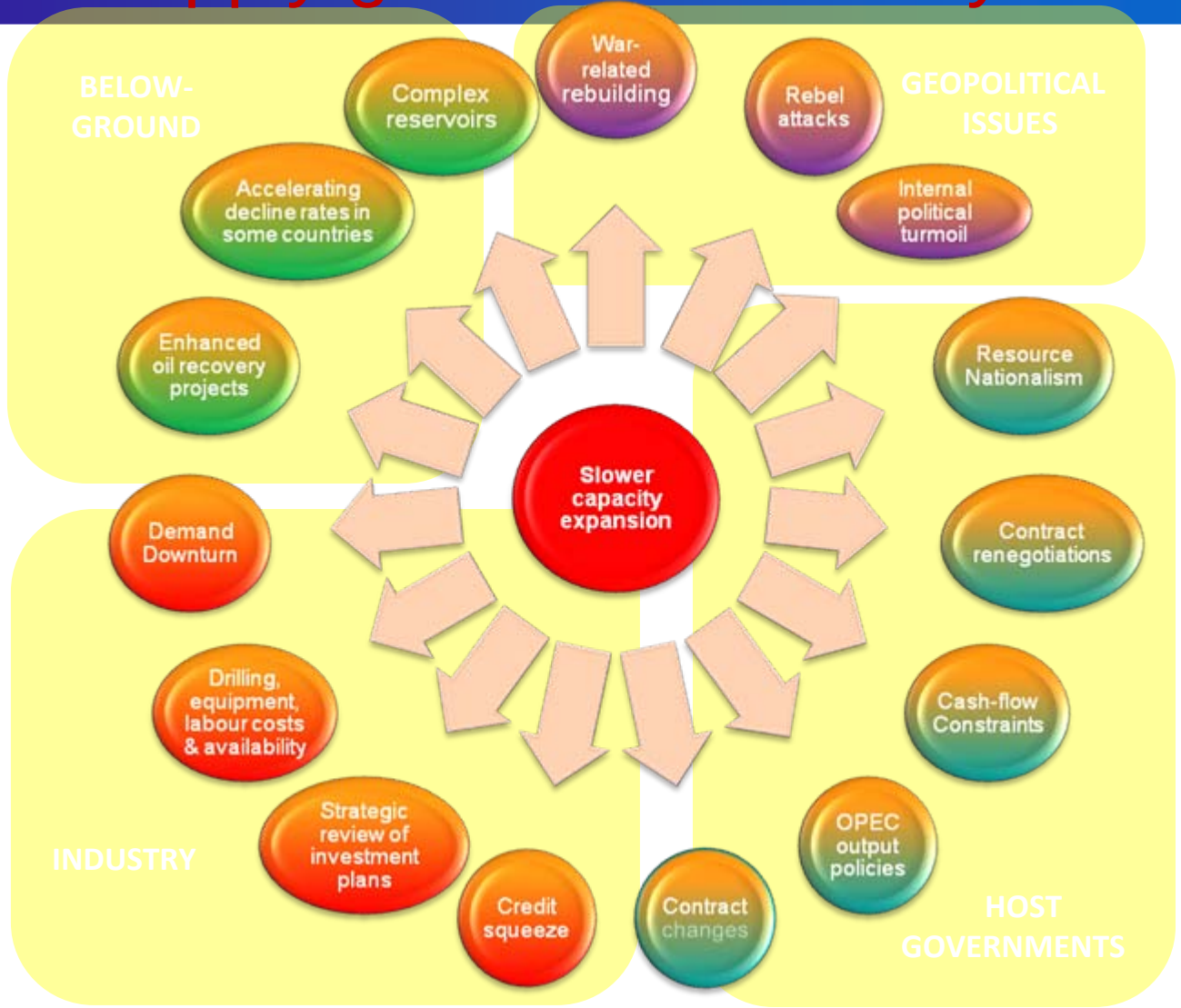
# Peak oil or multiple peak oil? Either way, slower supply growth here to stay

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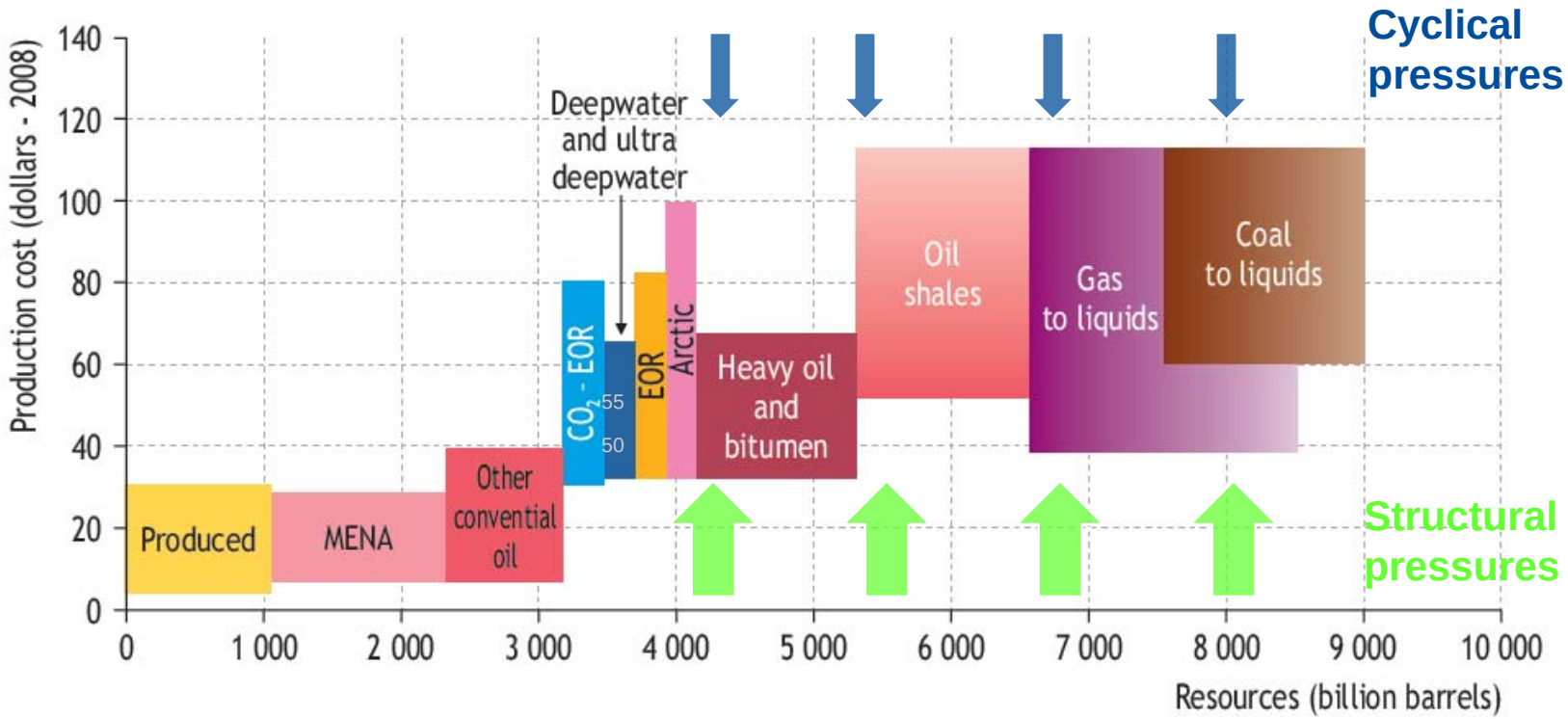
# *Structural* shift to more difficult oil (access constraints) …but *cyclical* element to costs too

**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*

2008

Source: IEA *Oil Market Report*

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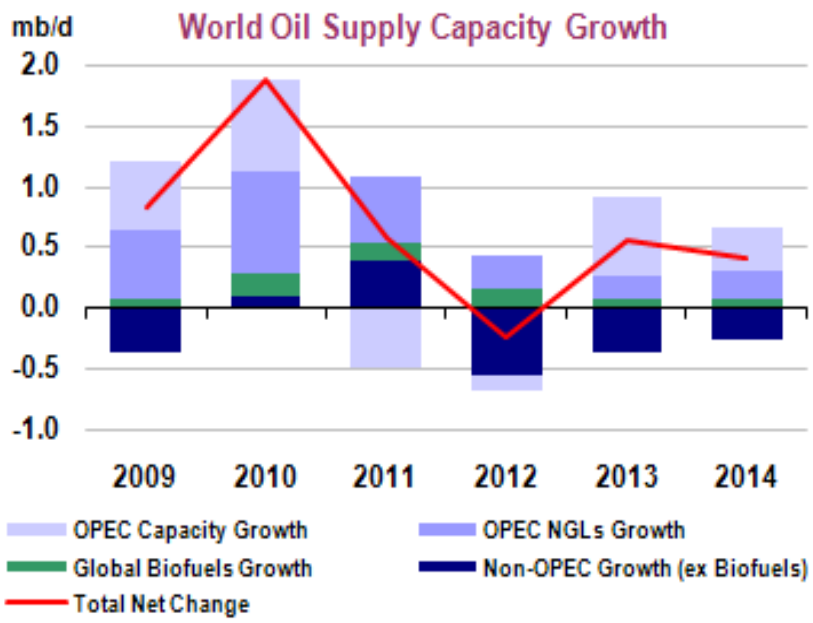
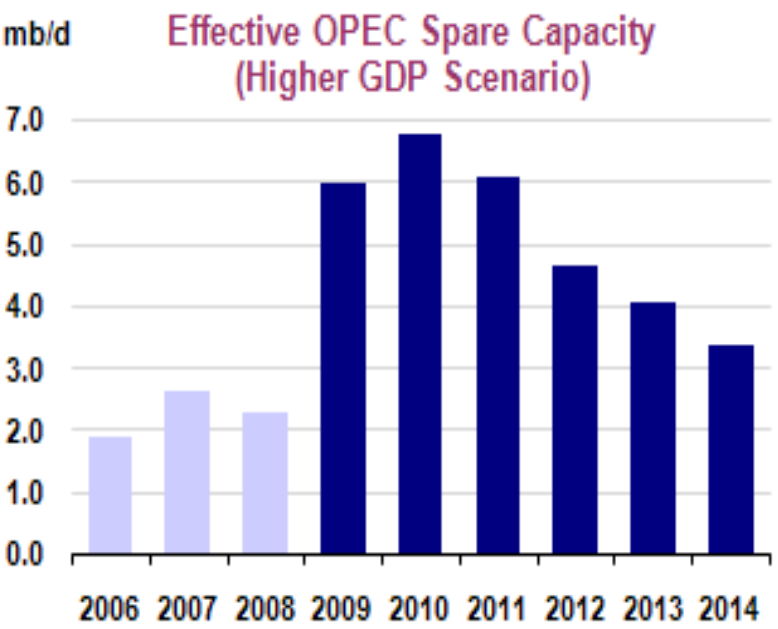
# Two market paths to mid-decade: supply crunch or comfortable capacity margin

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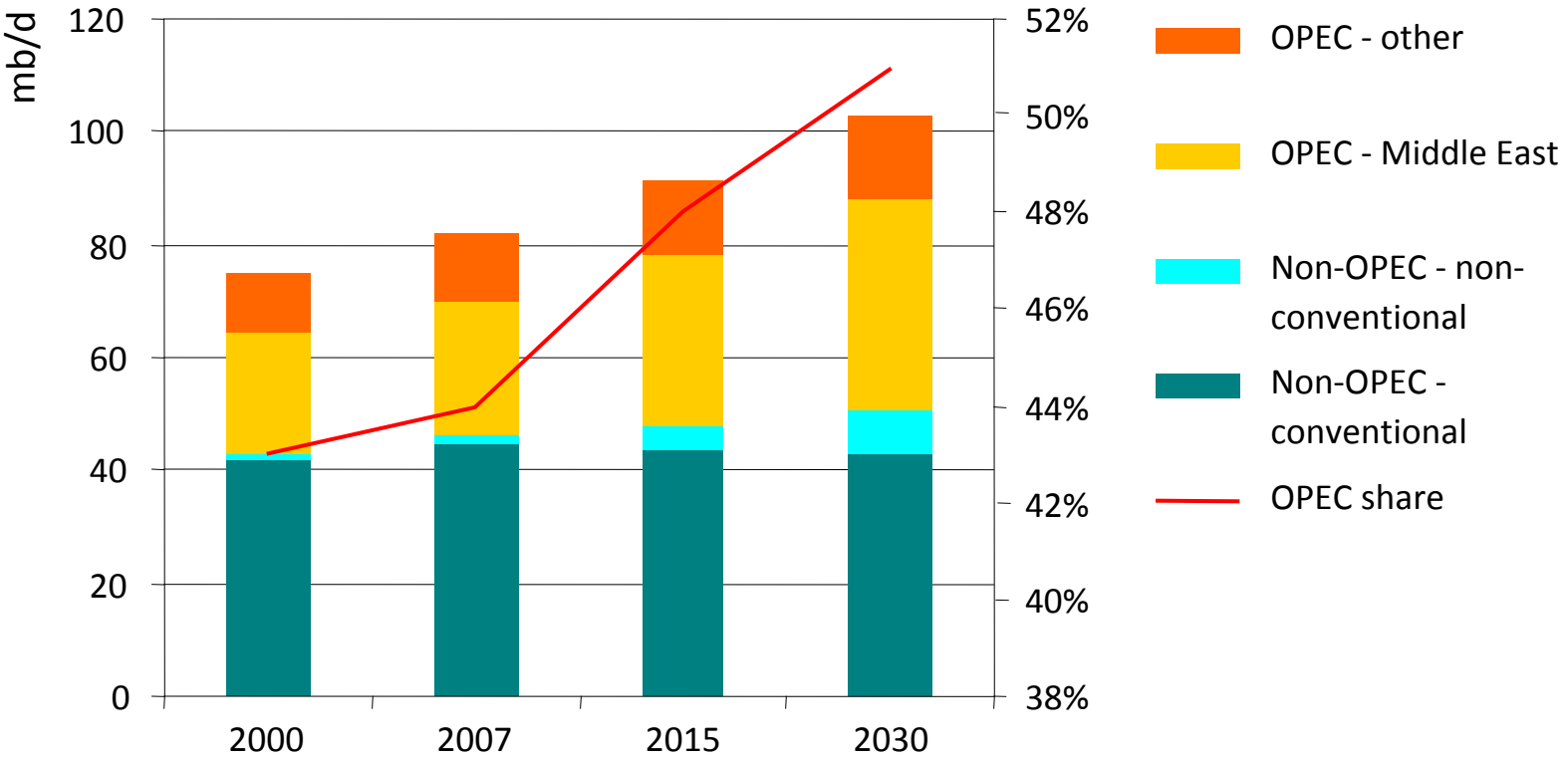
# World oil production by OPEC/non-OPEC in the Reference Scenario




***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***

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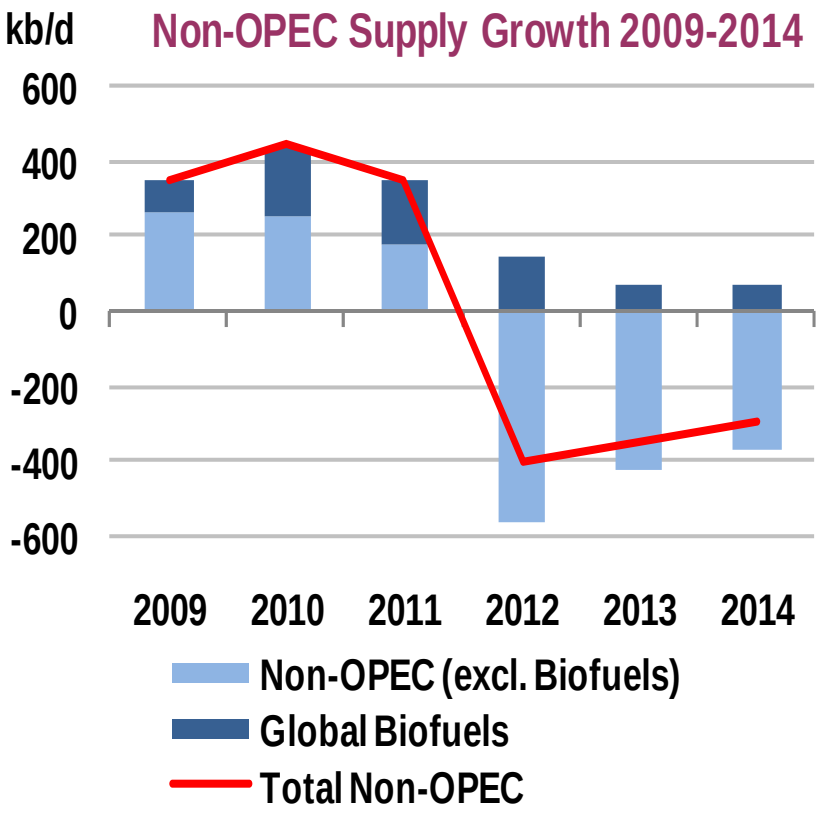
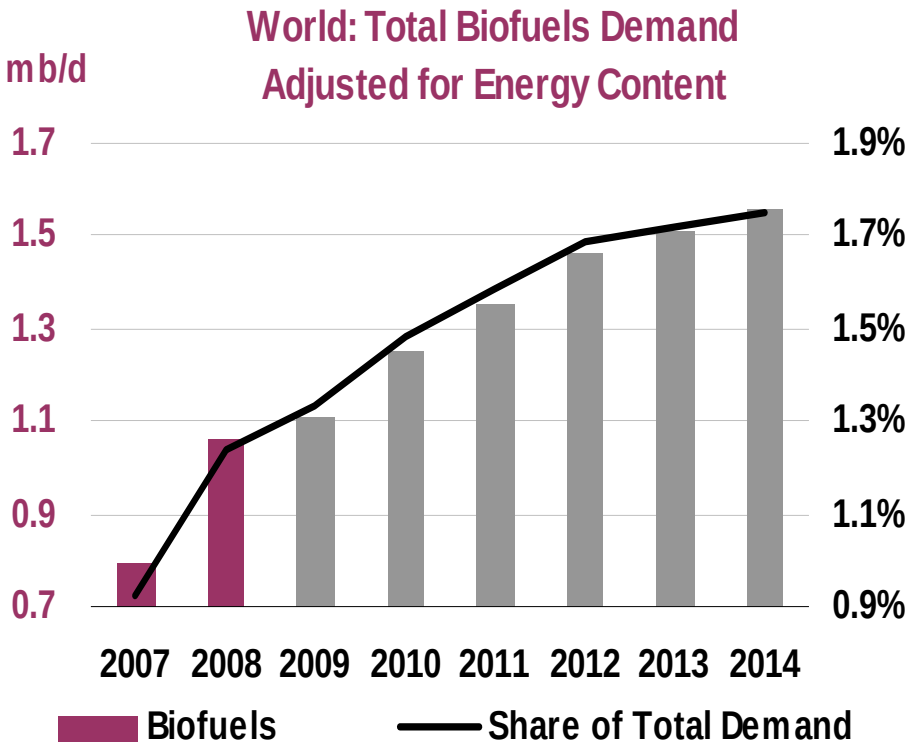
# Though volumes are small, biofuels growth provides a safety valve for oil markets

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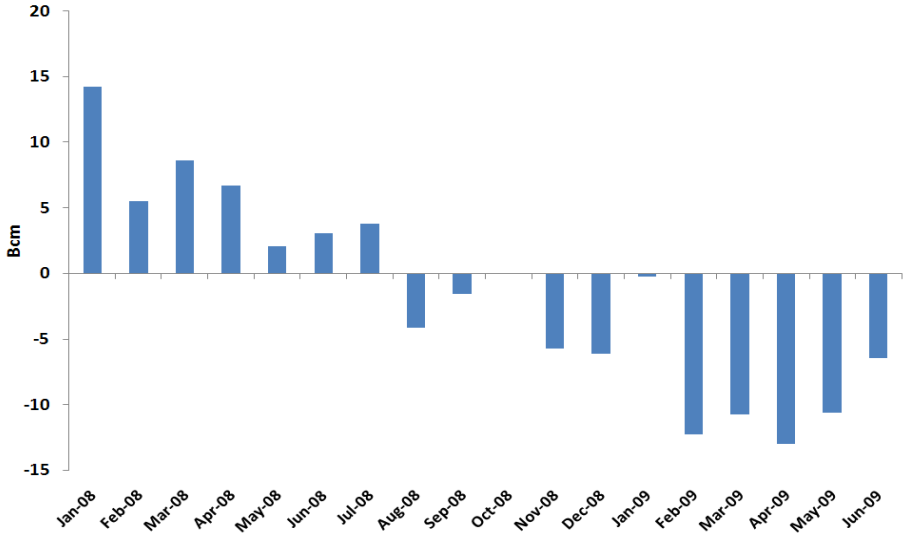
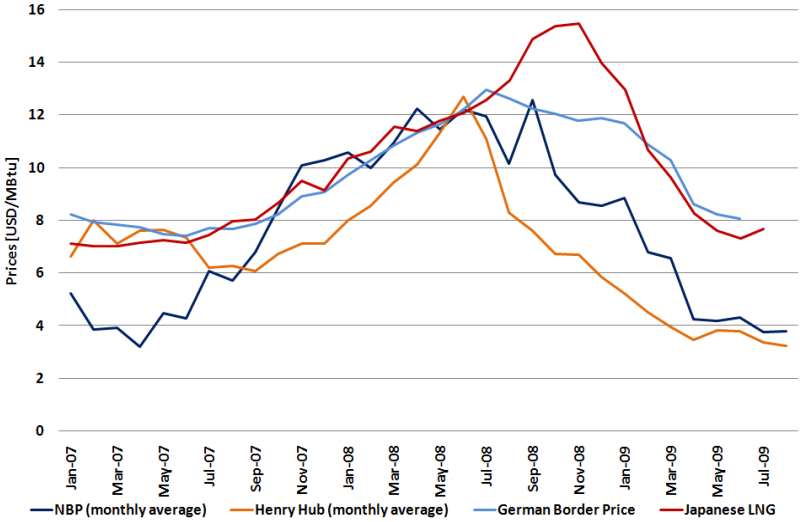
# Recent Gas market developments

## OECD Gas Demand, Changes yoy




## International gas prices




- **Recent market developments**
  - **Gas demand is weakening in major economies**
  - **Prices have peaked before collapsing to a fifth of last year's level**
  - **Unconventional gas developments have had global impact on gas trade**
  - **Gas exchanges are globalizing**

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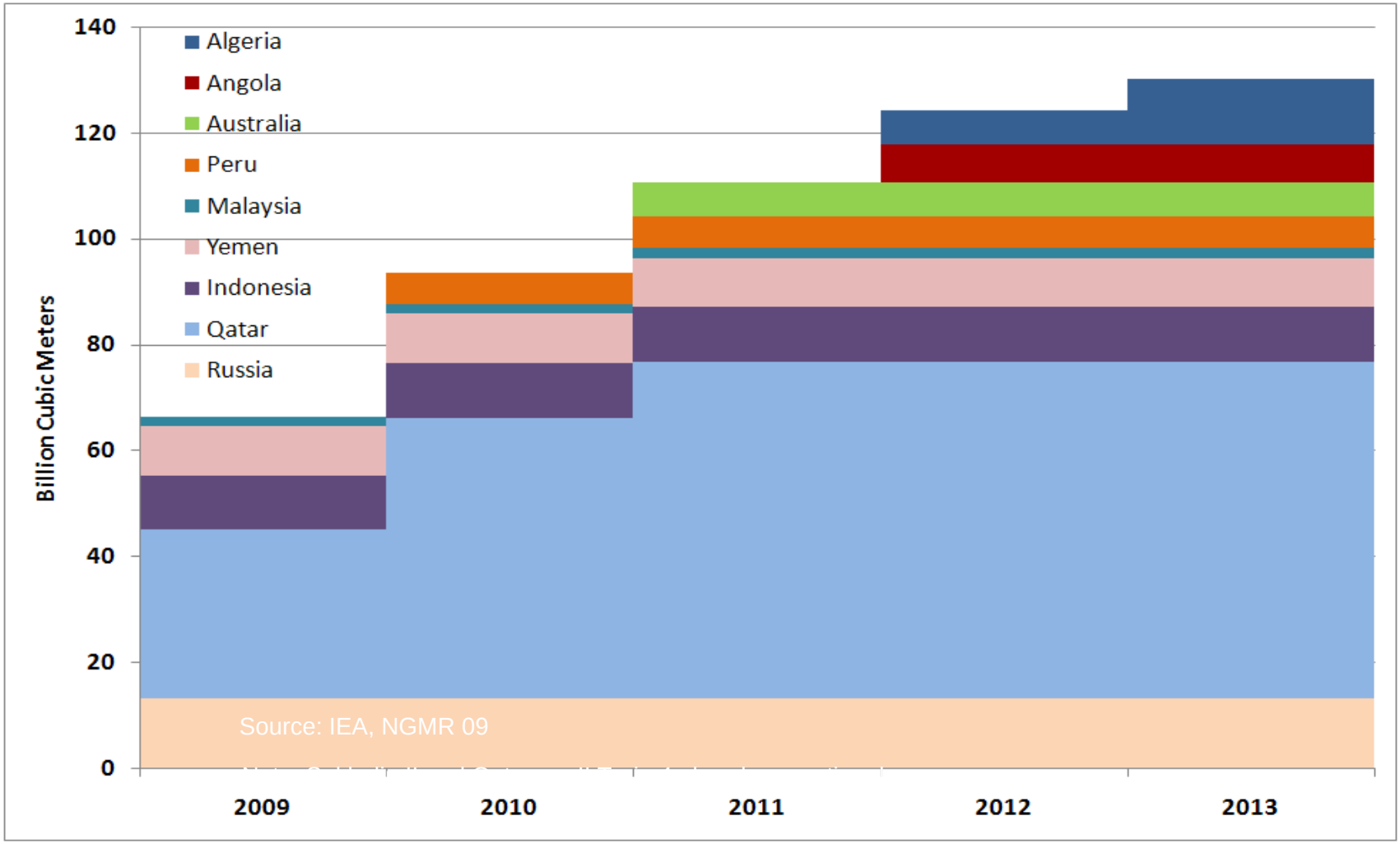
# Significant liquefaction capacity to start
## *Capacity does not mean production …*

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# Energy investment

- The financial and economic crisis is affecting energy investment

- Declining gas demand and uncertainties about the future demand path and import requirements has reduced the urgency & appetite for suppliers to invest
- Lower oil and gas prices have impacted project sponsors revenues and make new investments less attractive
- Difficulties in obtaining credit & higher cost of capital
  - Increased aversion to risk
  - Paralysed credit markets
  - Plunging share values have increased debt-equity ratios

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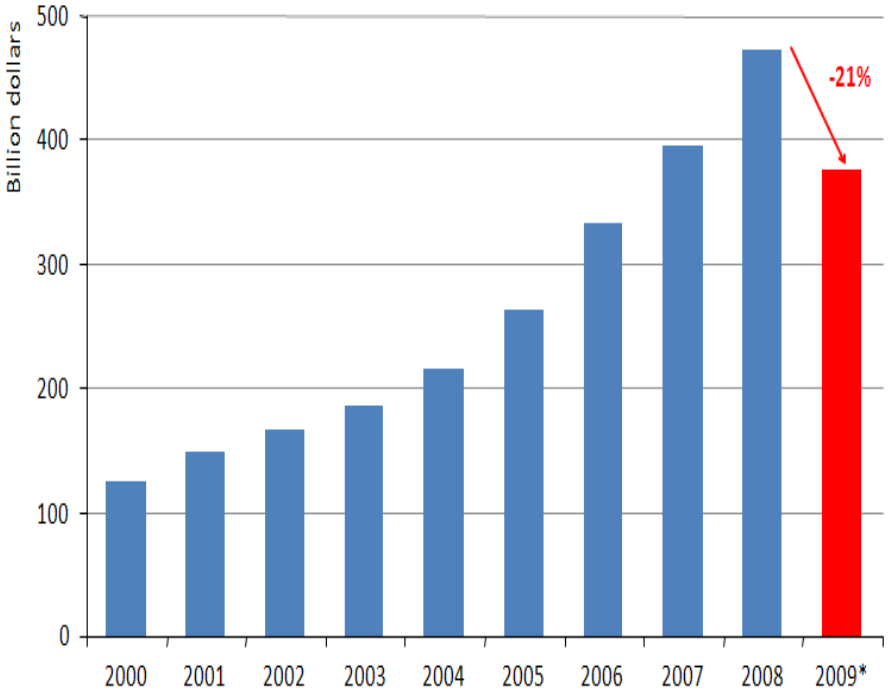
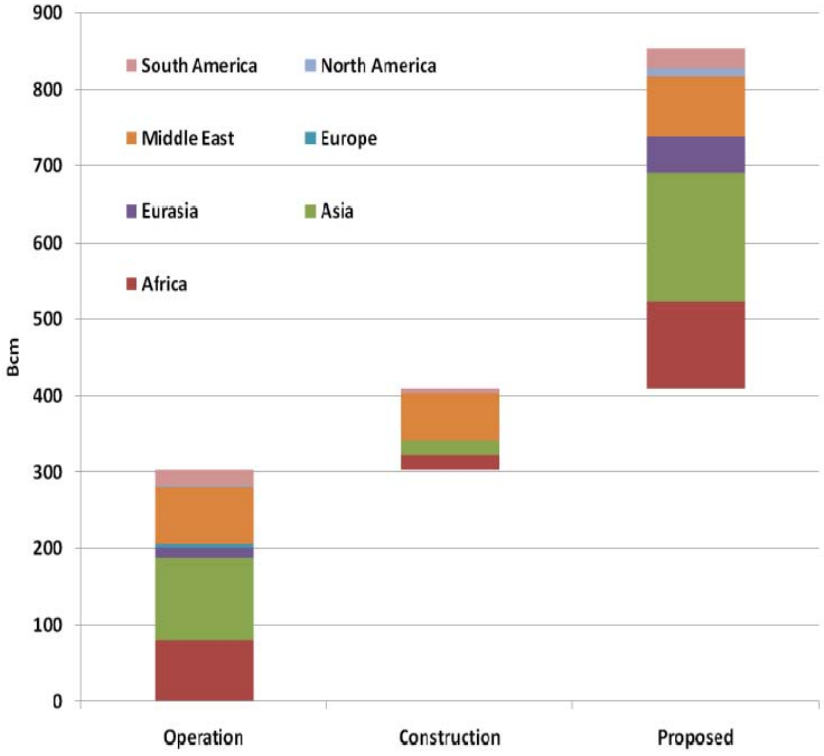
# Worldwide oil & gas upstream capital expenditures




- There is clear evidence that investments this year will be falling
- This will have an impact on FIDs for projects currently planned, in particular the most capital intensive ones.

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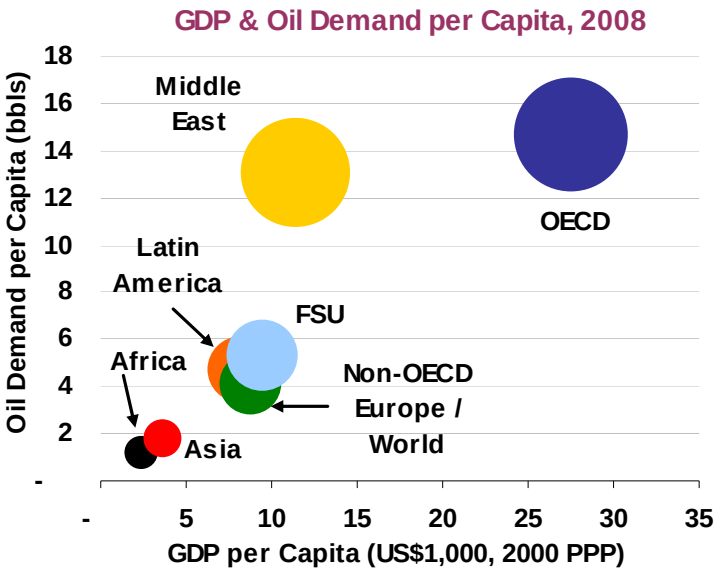
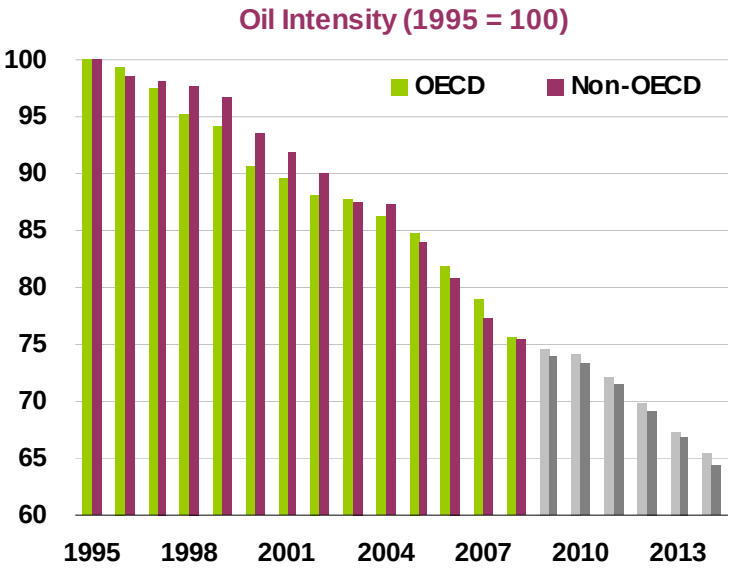
# Efficiency gains can have an impact

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# Conclusions

- There is cause for concern with regard to the future of both the oil and gas markets.
- On the oil side, although spare capacity is comfortable now, the rapid growth in demand for transportation fuels, is putting us on a path where we need ever more production from ever fewer countries. Investment remains problematic.
- On the gas side, a combination of weak demand and surprising advances in non-conventional production have produced a glut that could undermine investment in supply and change the structure of the market. However, demand could bounce back quickly and produce a tight market again in a few years.
- Environmental sustainability is another serious concern. Even if there were no constraints on supply we would not want to use the amounts of oil and gas (not to mention coal) implied by IEA scenarios.
- In addition to investing in oil and gas, we must also invest in new technologies for a clearner energy future. Such investments will lower energy bills and promote energy security as well as alleviate global climate change concerns.

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