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Pöyry Energy Consulting

Winter 08/09 Outlook

A presentation to BIEE

David Cox

22nd October 2008

Pöyry Energy Consulting

- The leading advisor to the European energy sector
- A pan-European energy consultancy formed from the merger of five highly respected consultancies

ILEX ENERGY CONSULTING
Convergence Utility Consultants
econ
ELECTROWATT-EKONO Jaakko Pöyry Group
Verbundplan

- Over 250 energy market experts in 15 offices across Europe:
  - Copenhagen
  - Düsseldorf
  - Helsinki
  - London
  - Madrid
  - Milan
  - Moscow
  - Oslo
  - Oxford
  - Paris
  - Stockholm
  - Stavanger
  - Vienna
  - Villach
  - Zurich

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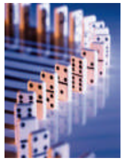
Pöyry Energy Consulting supports clients throughout the energy business

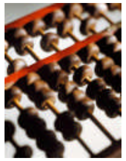
Strategy

We help our clients to build stronger, more competitive, long-term positions throughout the energy value-chain, by focussing on the goals and activities that generate value



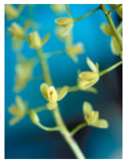
Business Operation

We improve the performance and competitive position of our clients by developing and implementing innovative energy markets solutions



Valuation & Financing

We apply our extensive expertise, projections and models to the valuation of businesses, projects and contracts to assist in the financing of our clients' energy market activities



Sustainability

Delivering long term success increasingly requires companies to demonstrate environmental competence and social responsibility in their actions. Our experience helps us to find sustainable solutions for business and the wider environment

Clients

Utilities
Generating Companies
Wholesalers
Traders
Distribution Companies
Shippers
Retailers
Market Operators
Independent System Operators
Transmission Companies
Governments
Large Consumer
Regulators
Non-Governmental Organisations
Financial Institutions
Trade Associations
Manufacturing Companies

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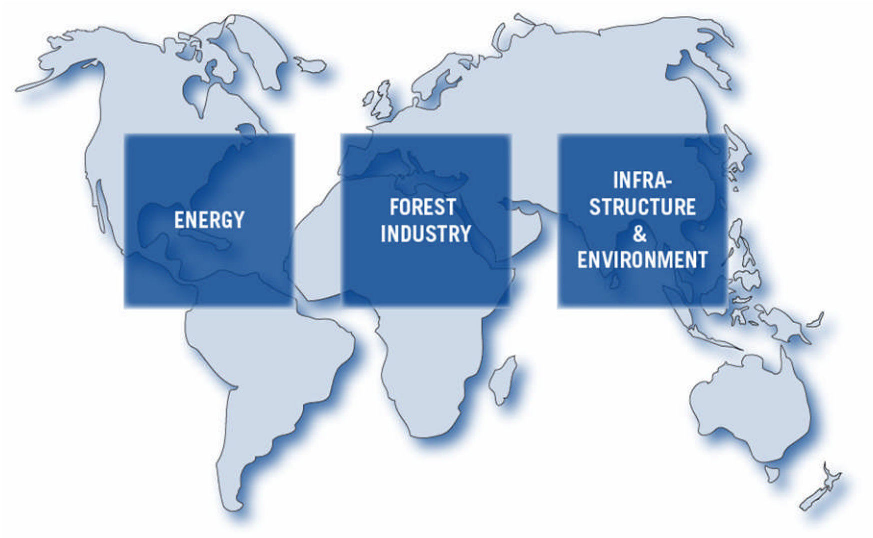
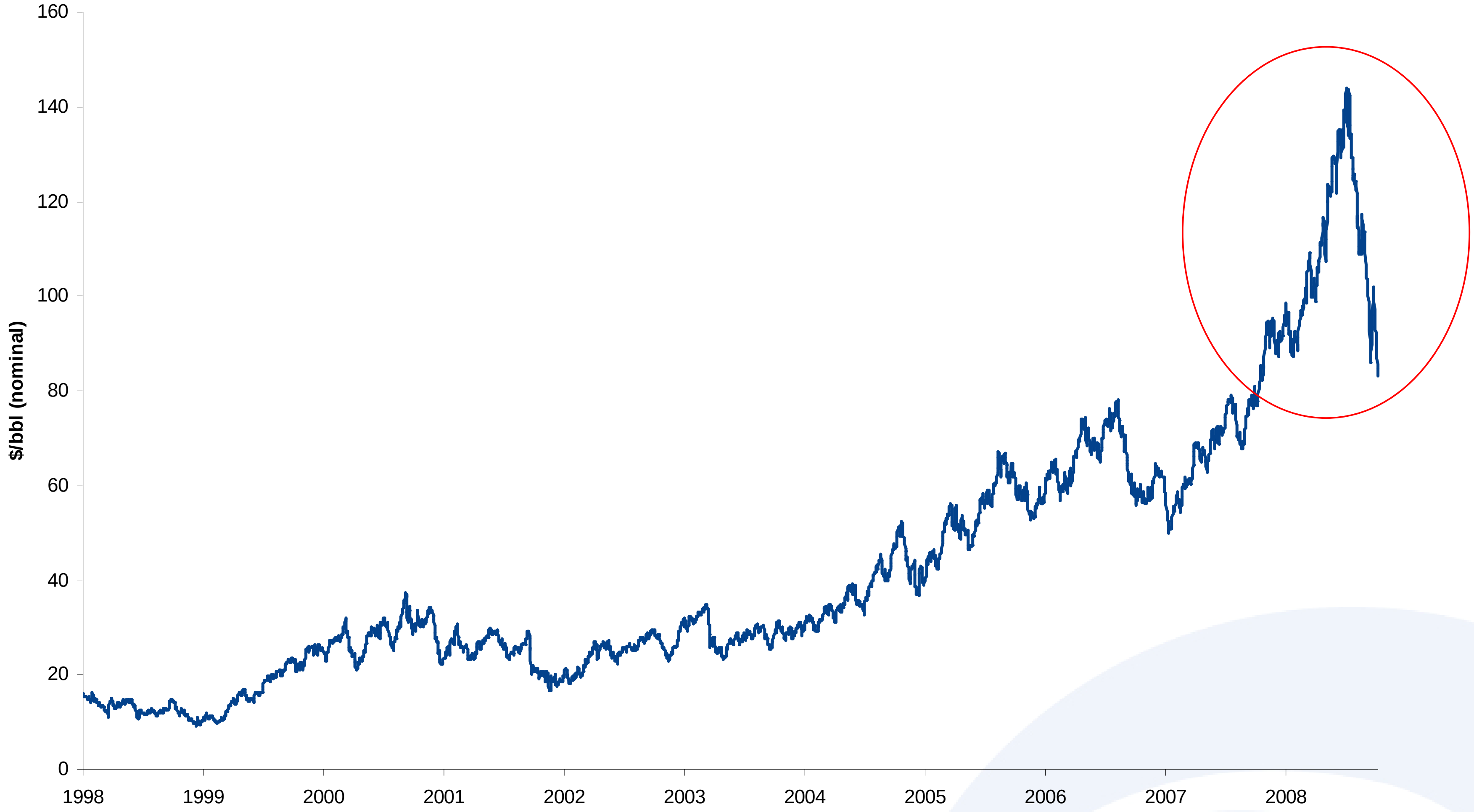
Pöyry Plc – global consulting and engineering company



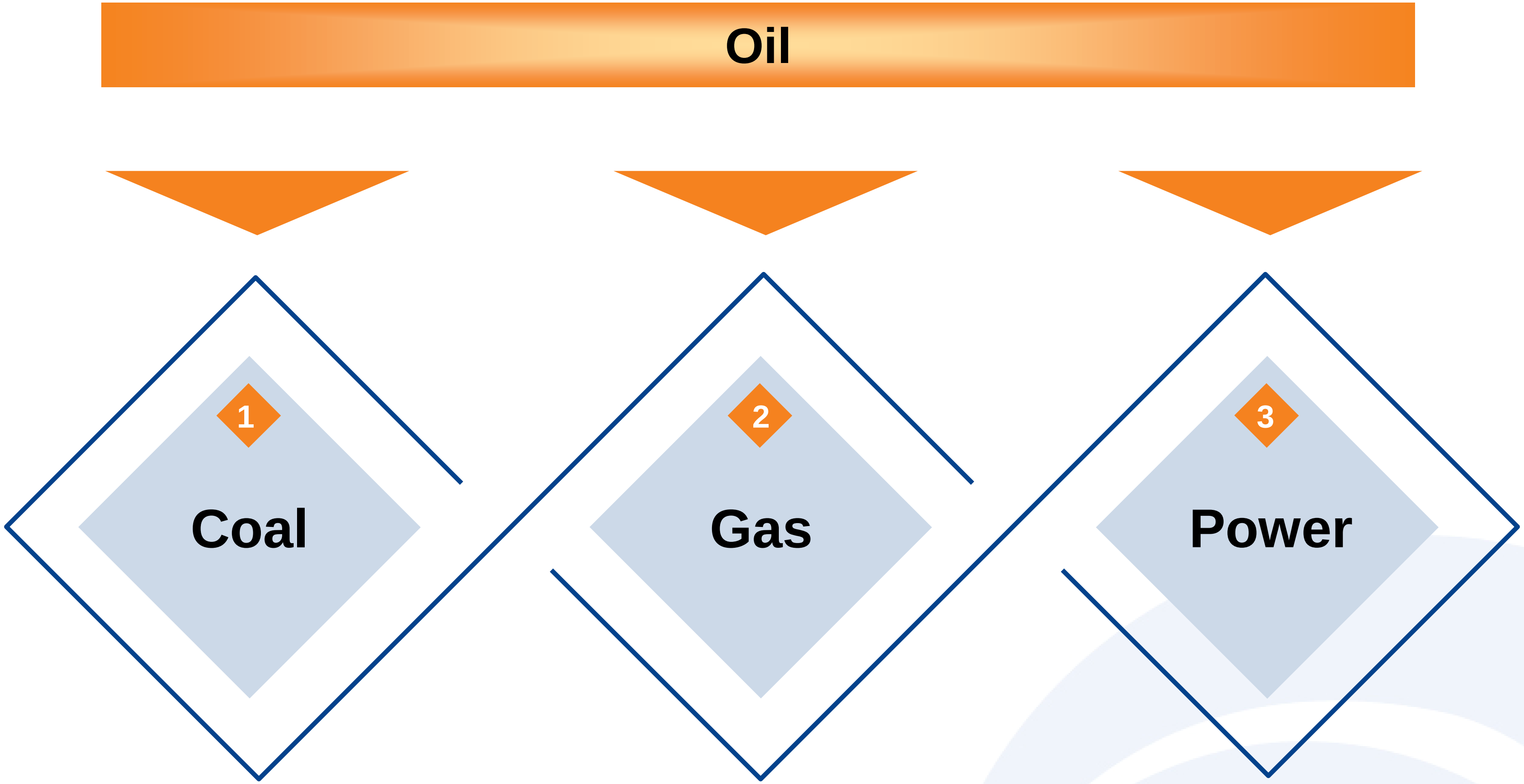
- Client- and technology-oriented globally operating consulting and engineering firm
- Core operations based on three know-how clusters:
  - Energy
  - Forest Industry
  - Infrastructure and Environment
- Global market leader in forest industry
- Strong international position in energy, and infrastructure & environment
- Office network in 45 countries

Oil prices – the straw to break the camels back?



Major drivers of energy prices

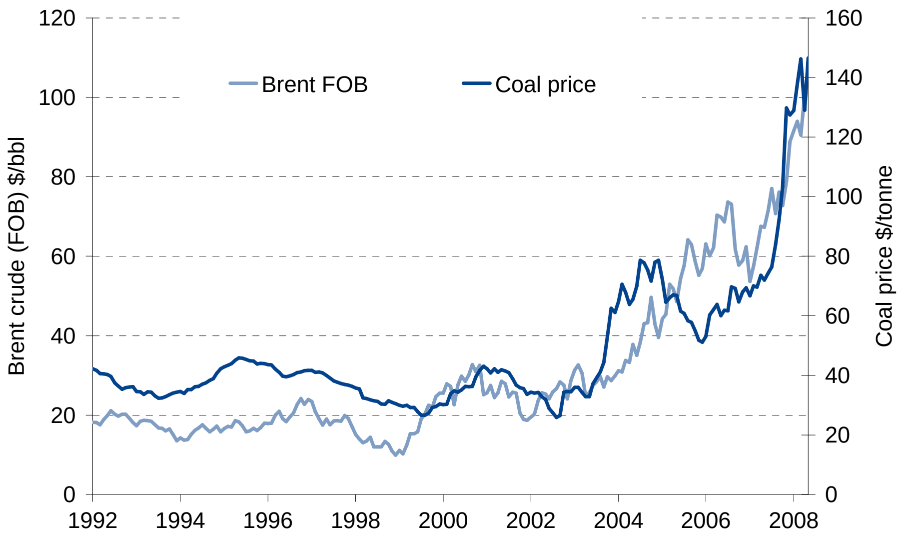
Oil is the key factor in energy markets

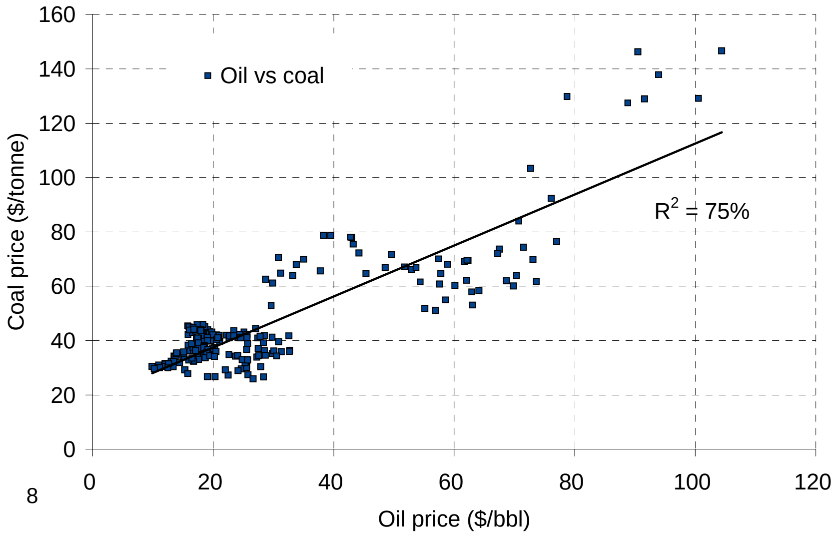


Oil and coal

Coal

There is undoubtedly a link between oil and coal prices, but it is not strong, and likely to get less strong with time





- Link between coal and oil through freight costs
  - But these only represent c. 20% of total coal cost
- Main link due to rising demand for all types of energy
- In the future, further market divergence…
- Oil exclusively for transport
  - Too expensive to burn in power stations
- Coal exclusively for power and heating
  - No more coal powered trains…

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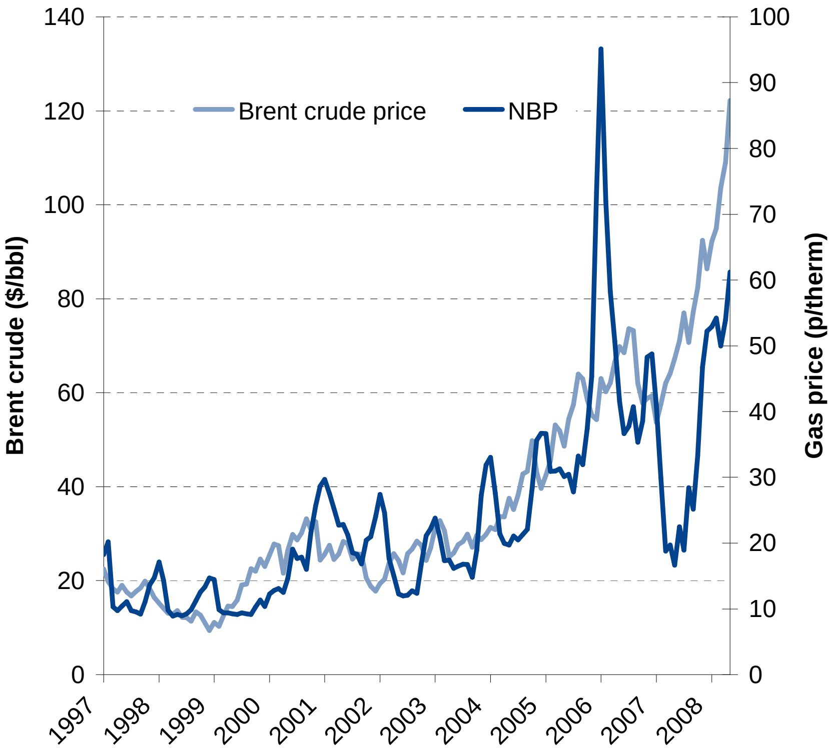
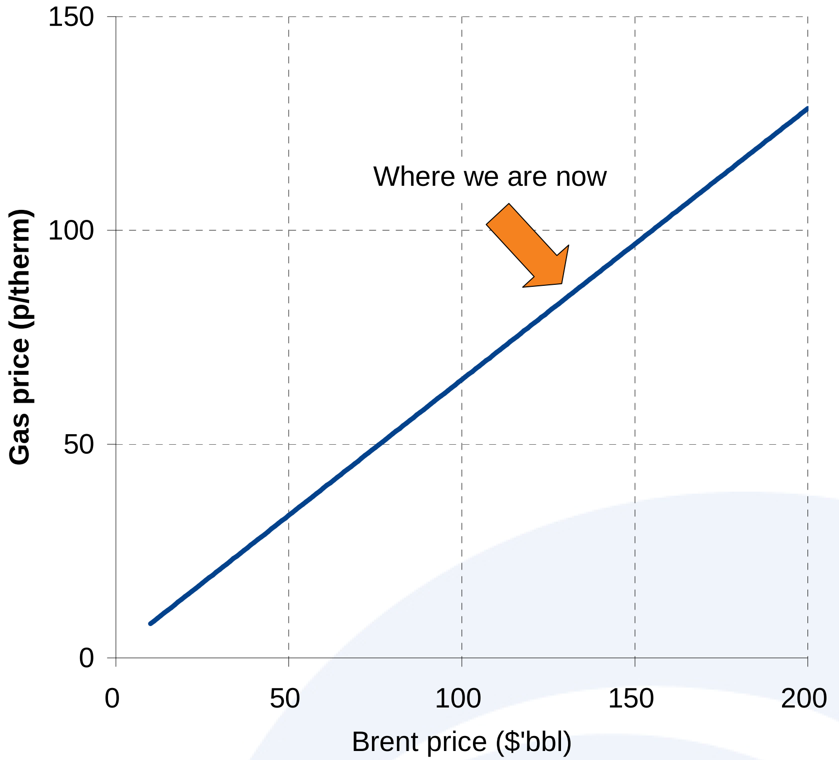
Oil and gas prices

As is well-documented, there is a strong relationship between oil and gas prices, driven in Europe through contractual linkages

Gas and oil linkage



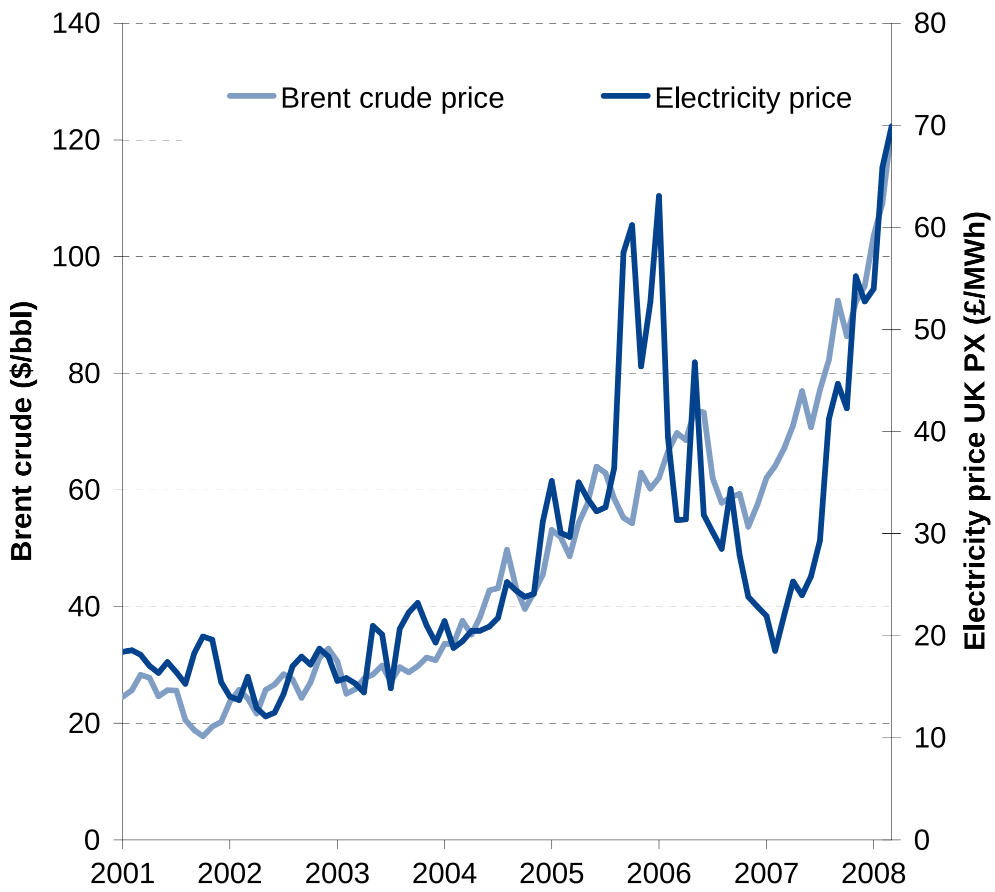
Gas and oil linkage



Oil and power

The main link between oil and power prices lies through the oil-indexed gas price.

Oil and power price



- Apparent strong link between electricity and oil lies (mainly) in gas price linkage
- Electricity market more complex due to coal and carbon effects
- UK market increasingly driven by gas prices

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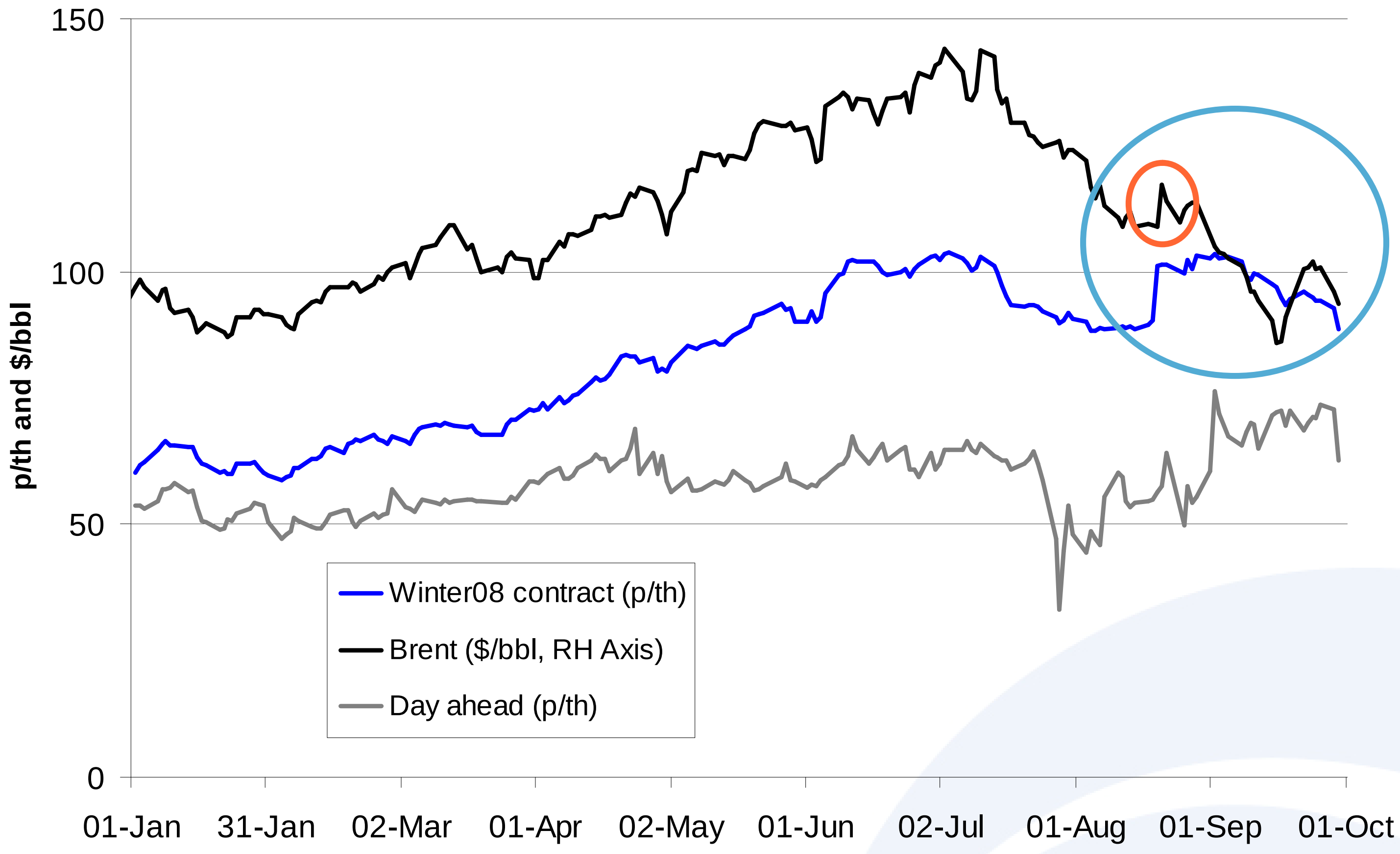
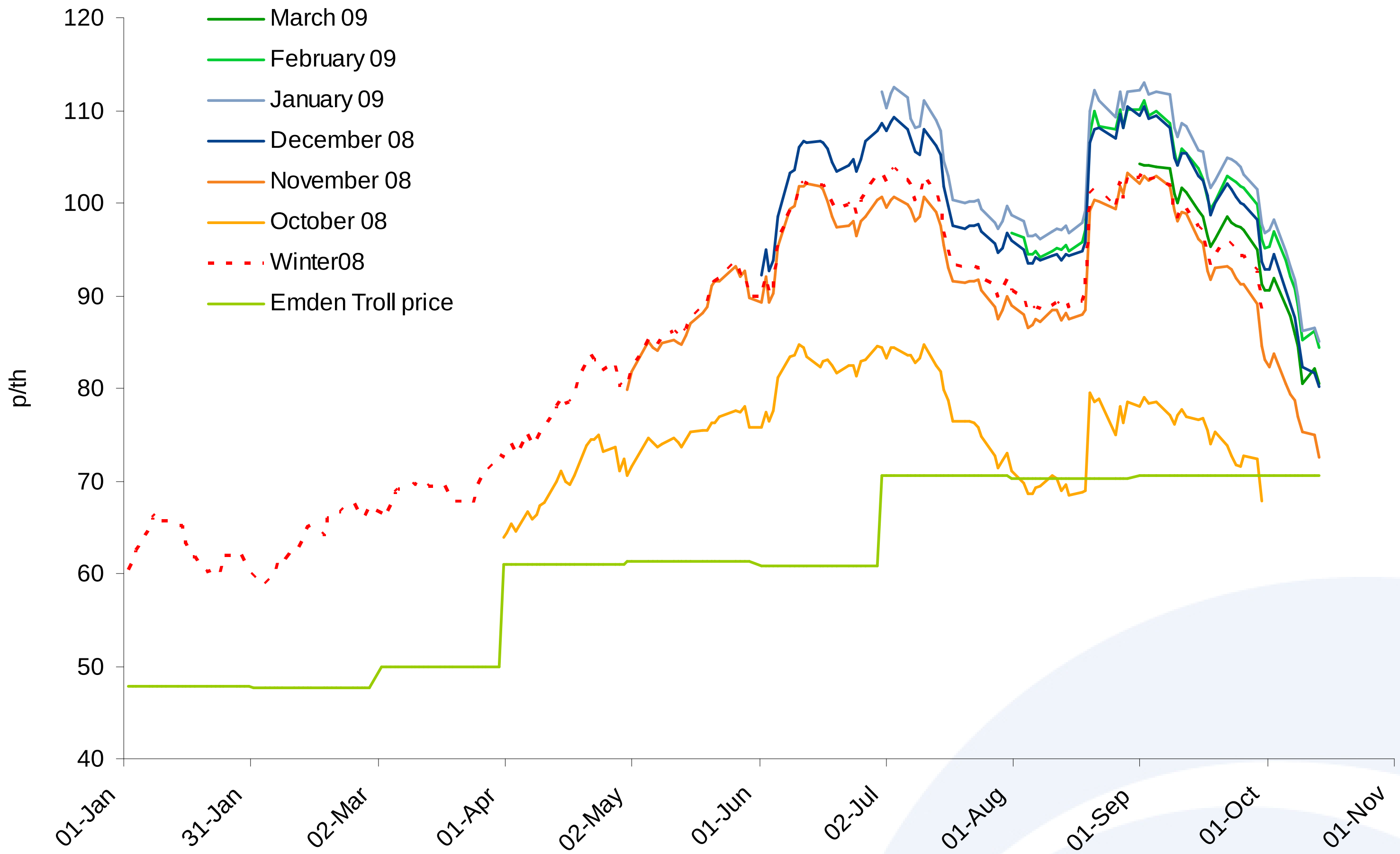
Impact of spike in forwards – over-bullish gas?

- Strong correlation when bullish, weak when bearish
- Over reaction to spike in oil?

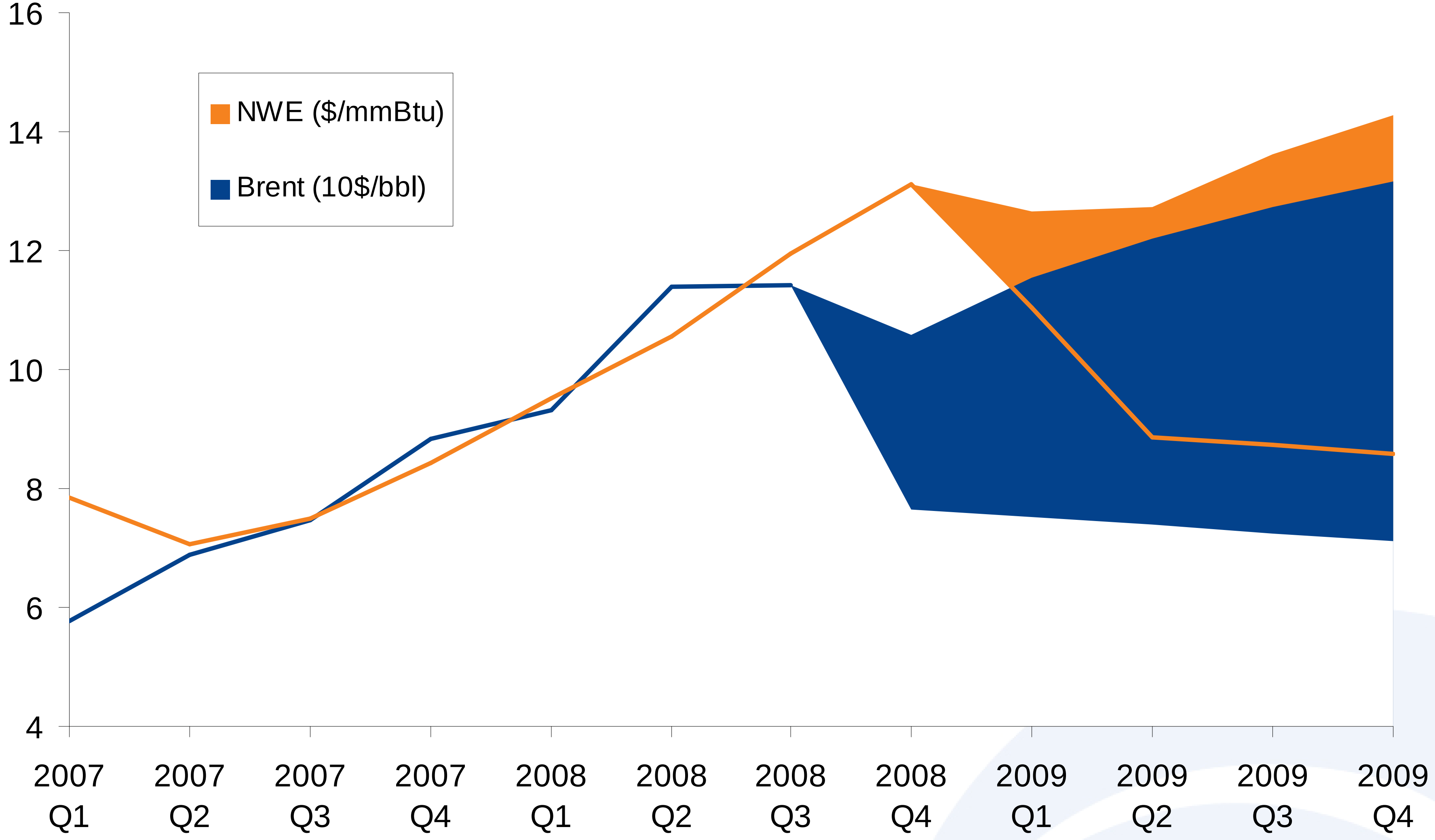


Recent forwards overpriced

- Down 20% in 6 weeks - where will they land?



Near-term projections – have we captured the price risk?



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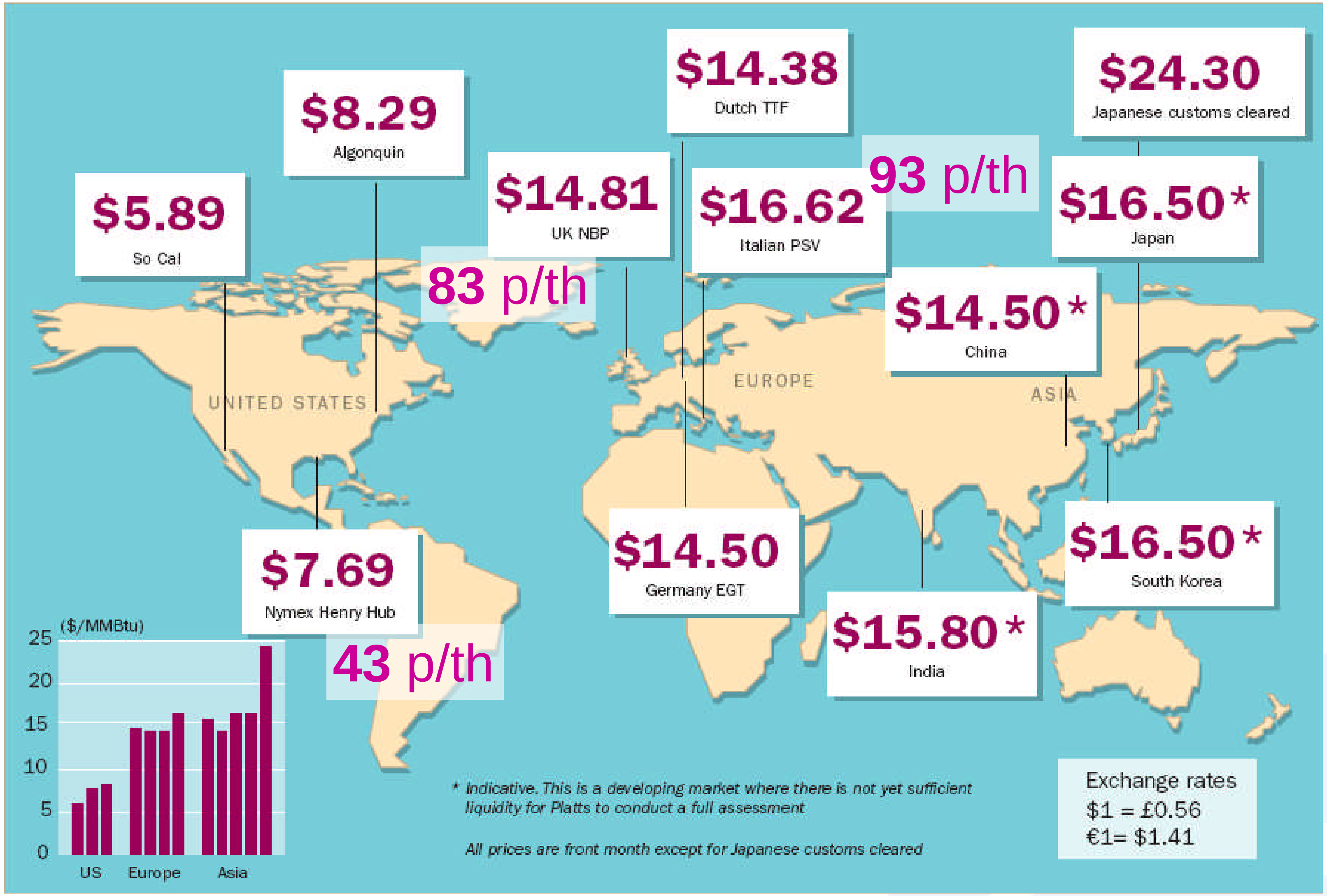
Is there a global gas or LNG market?



Source: Platts

Credit crunch – will this affect liquidity

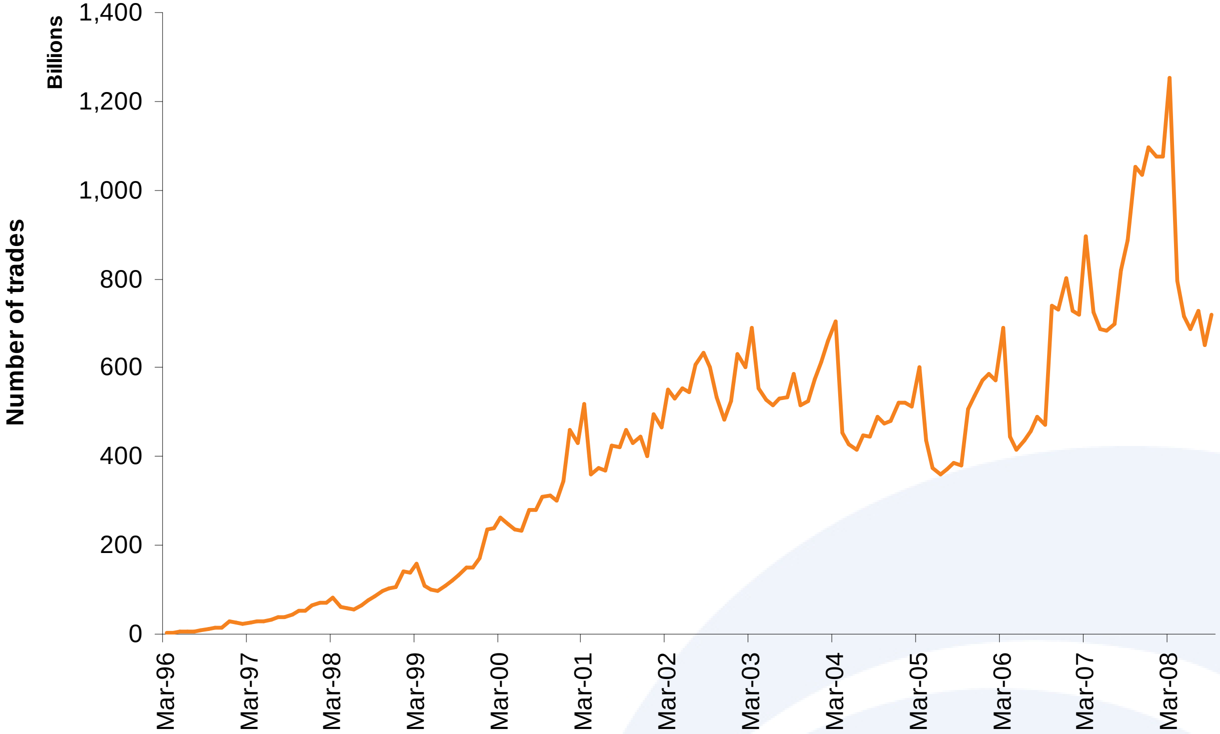
- Heren, 24th January
  - UBS making traders redundant, turning away from US property
- Similar noises in Heren and Platts throughout Q1 and Q2

- More recently..
- Heren, 11th September
  - Lehmans not actively trading gas; utilities risk averse, requiring stricter credit
- Platts, 16th September
  - Lehmans bankrupt: market reassessing risk from banking counterparties
- Heren, 10th October
  - Curve bearish on falling oil and credit-crunch induced illiquidity

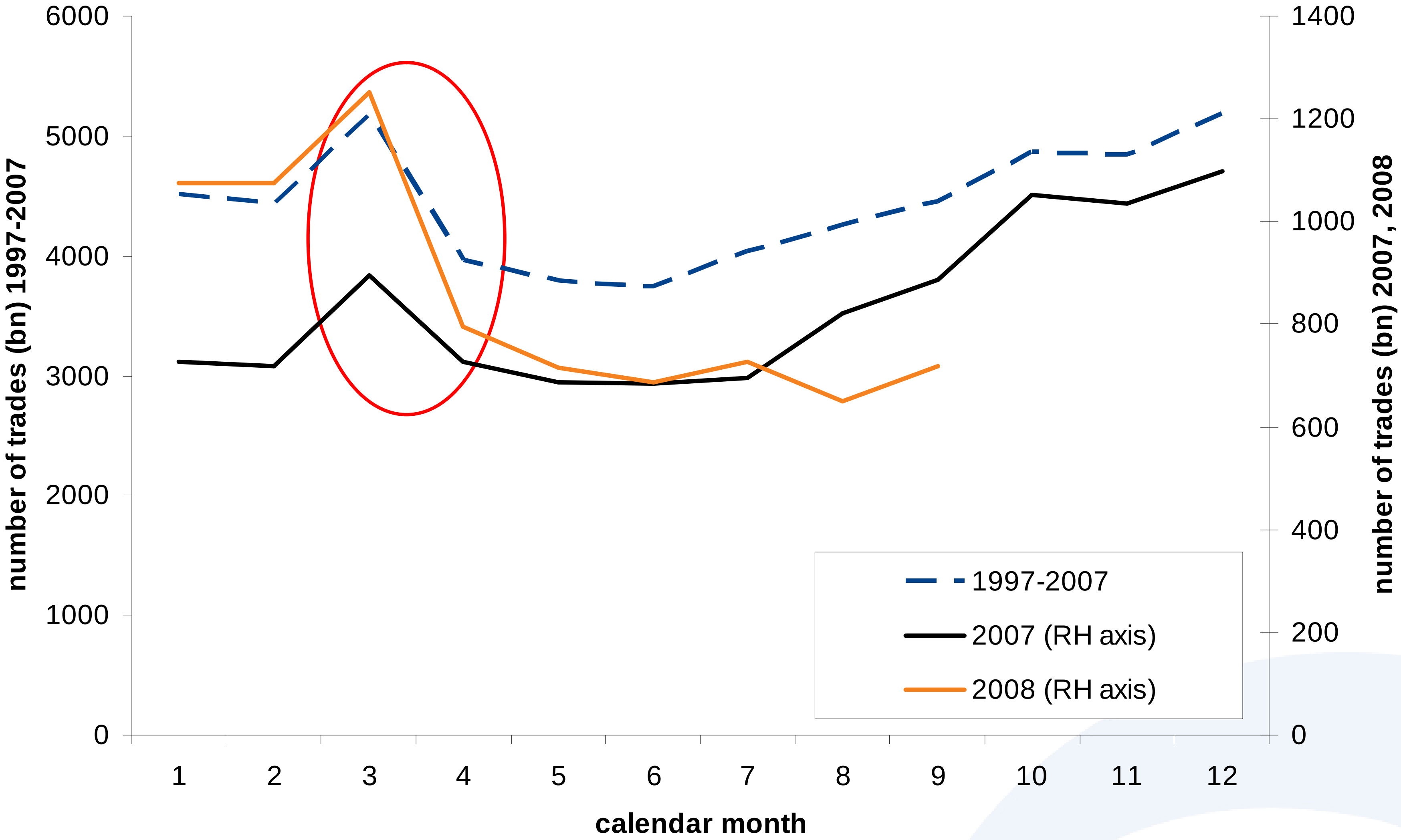
But, signs not immediately obvious

- OTC trades moving to on-exchange rather than off, to make use of better, standardised credit facilities
- Some use of intermediaries by brokers, as a “sleeve” (i.e. intermediaries buy + sell), to unblock maxed-out credit limits

- Massive long-term growth in OCM trades makes analysis difficult



Is there real evidence of loss of liquidity?



- **Maybe only time will tell!**

Four views of the future world

A — Slow-Motion Shock

- The current high oil price persists, and demand falls gradually.
- Energy nationalism flourishes across the former Soviet Union, Latin America and Middle East.

B — Supply Hell

- Invasion of Iran, an escalation of insurgency in Iraq, severe disruptions in Nigeria.
- Russia and the states of the Caspian basin limit foreign investment further.

C — Demand Crash

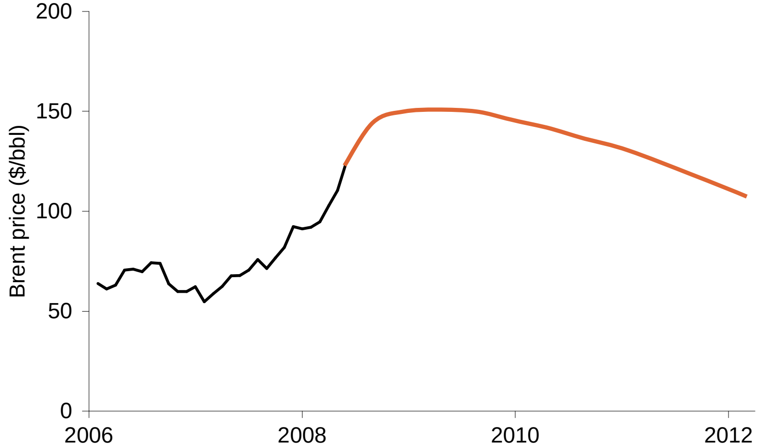
- Global downturn and recession in the OECD.
- The currently large subsidies in consumer states – notably, China and India – become unsustainable.

D — Technology Heaven

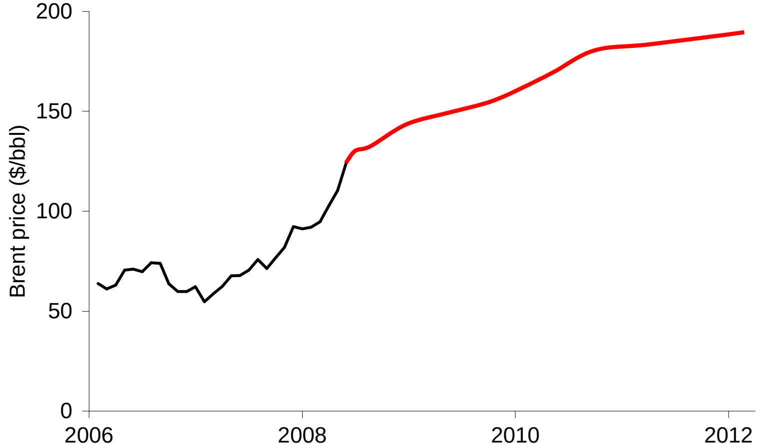
- The OECD invests more in R&D, which leads to a technological breakthrough, easing demand and reducing the price of oil.
- Alternative fuels reduce the power of oil and gas producing states.

Four views of the world

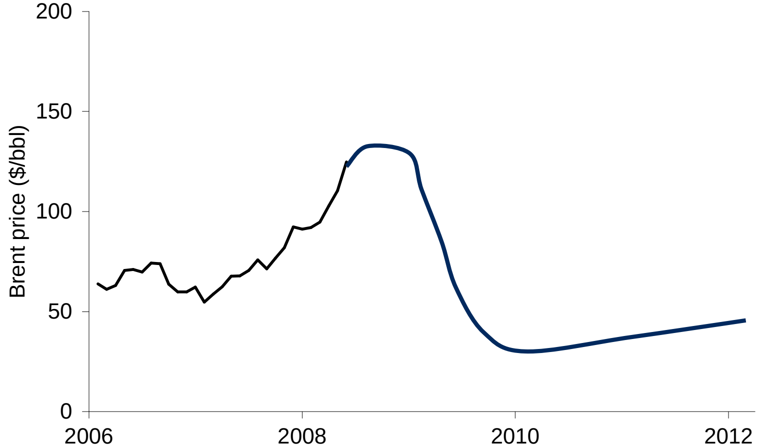
A Slow-Motion Shock



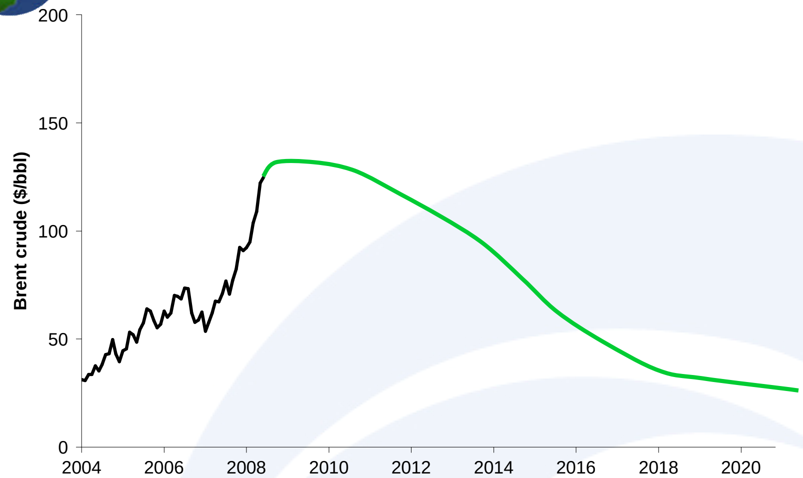
B Supply Hell



C Demand Crash



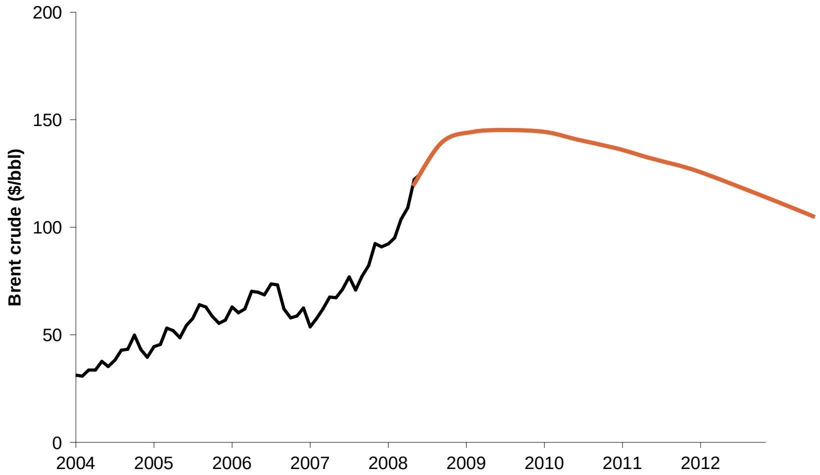
D Technology Heaven



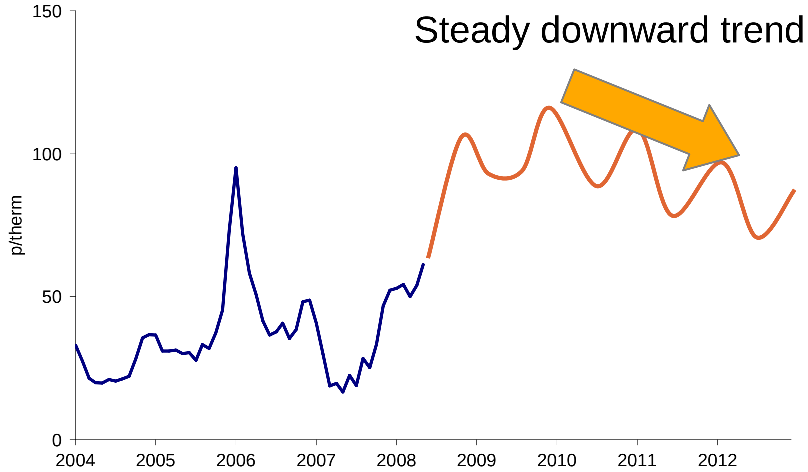
Note: Illustrative simulations only

‘Slow-Motion Shock’ and its effect on the gas price

Oil price



Gas price



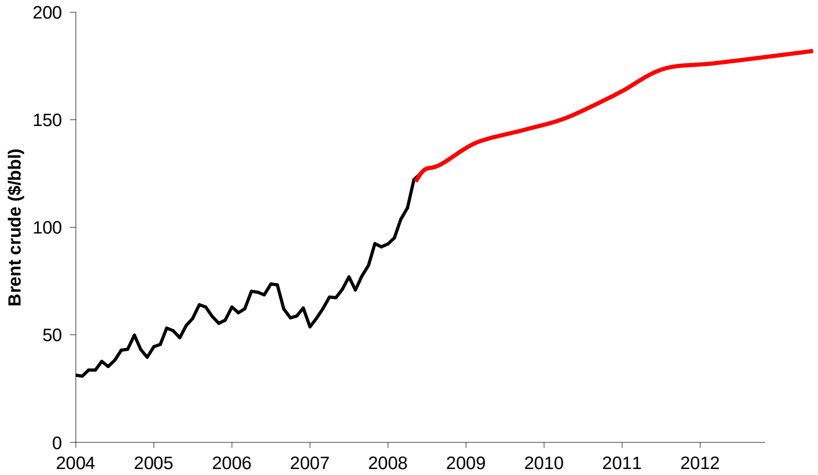
Slow motion shock

- Slow demand response from oil consuming world
- Continuing but slowing demand growth from China and India
- Demand-side reduction by gas consumers
- High emissions due to coal favoured over gas
- Carbon price rises steadily, due to high emissions from coal plant
- Highly beneficial environment to other technologies:
    - nuclear, renewables and CCS all benefit

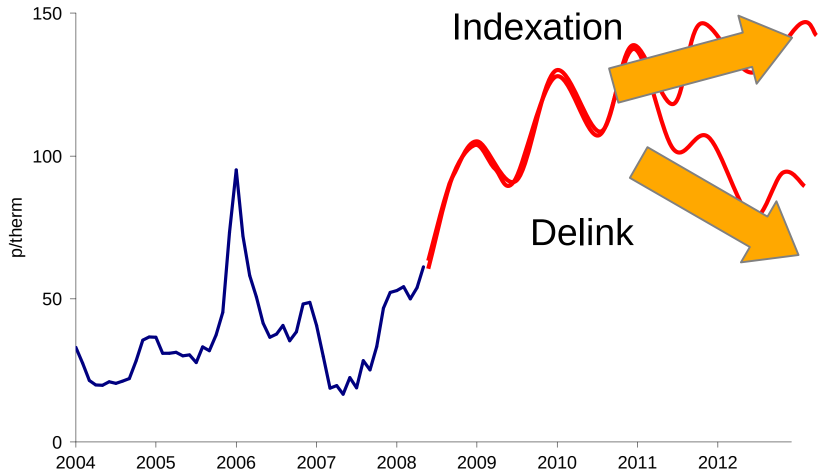
Note: Illustrative simulations only

Supply Hell and its effect on the gas price

Oil price



Gas price



Supply Hell

- Severe political disruptions in major oil-producing countries eg
  - Invasion of Iran, an escalation of insurgency in Iraq, severe disruptions in Nigeria.
- Other oil-producing nations unable to bring on further supplies
- Gas prices driven up sharply on back of rising oil prices
- High gas prices drives considerable investment
  - This could lead to more gas 'finds' than oil
- Potential circumstances for a delinking of oil and gas

Note: Illustrative simulations only

Is delinking a one-off?

Delinking of oil and gas occurred in the US and the UK – however, it needs very specific circumstances…

The US example

- Considerable supplies 'close to market' (eg Gulf of Mexico)
- Limited investment costs for new fields
- Overinvestment
- Competitive, liquid market
- Market isolated from other markets

The UK example (1990 – 1998)

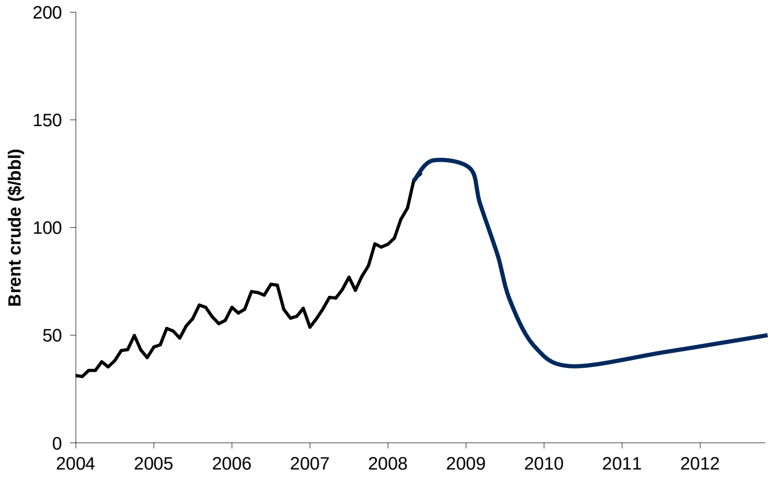
- Considerable supplies ;close to market' (UKCS)
- Low investment costs in 'new' fields
- Isolated from wider European market
- Overinvestment by incumbents
- Competitive liquid market
- Strong action by regulators

Could it happen again?

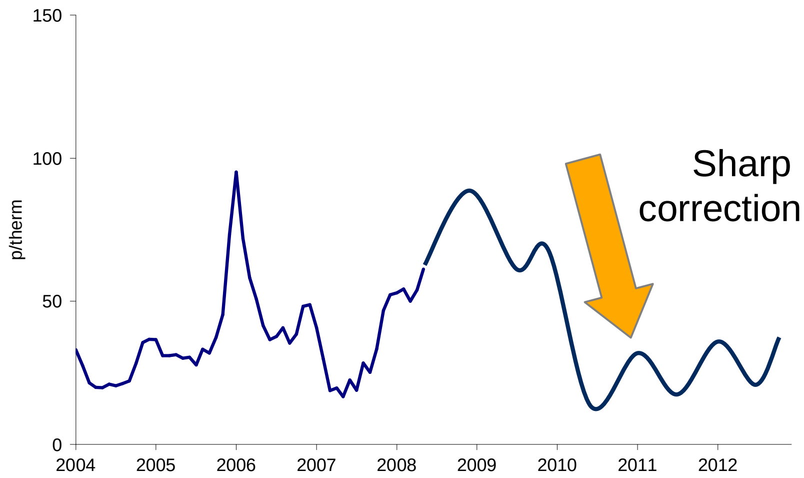
- UK is now part of much bigger market
- Oil-indexed contracts are fundamental to European market
- Influence of LNG – most LNG priced on oil-indexed long-term contract (as huge capex)
- Overinvestment/oversupply hard to see with dual pressures of accessibility of new fields and environmental drivers
- However, plenty of known gas to still to be exploited

Demand Crash and its effect on the gas price

Oil price



Gas price



Demand crash

- High oil prices and the fall-out from sub-prime leads to a global recession
- Worldwide subsidies cut, leading to downturn in consumer demand and industrial output
- In gas prices, there is no delink – the oil market corrects itself quick enough to prevent over-investment in the gas market
- Competition takes off – falling gas prices drive competitive markets
- New coal investments curtailed. CCS becomes less viable
- Investment in renewables (and nuclear) harder in tough economic climate with cheap gas
- Regulators claim that 'competition has driven down prices…'

Note: Illustrative simulations only

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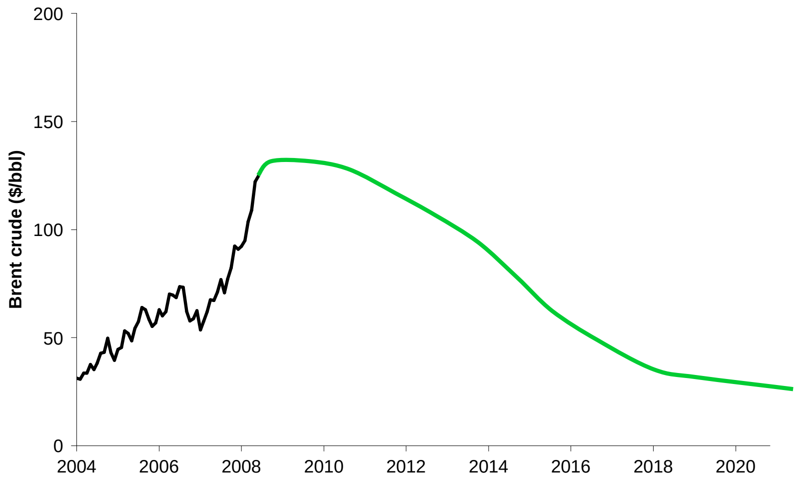
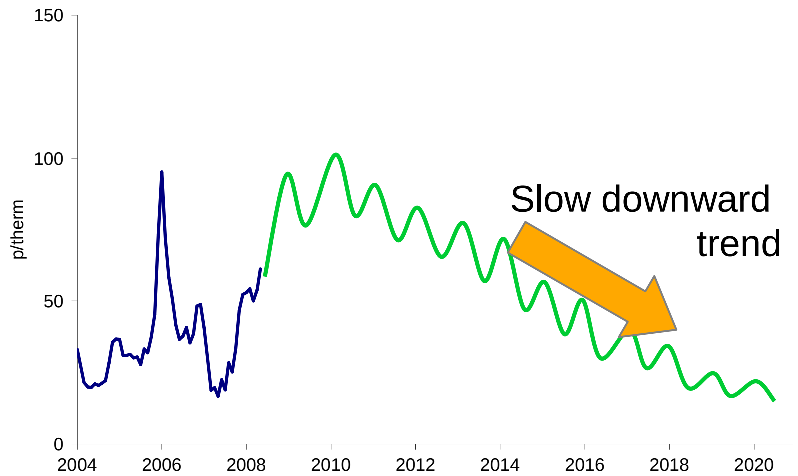
Technology Heaven and its effect on the gas price

Oil price



Gas price



Technology Heaven

- Step-changes in technology due to heavy investment lead to falling demand for oil
- EU on target to meet 20:2020 targets
  - Renewables bonanza
- Electrification of transport becomes a possibility (though not actuality)
- First CCS projects are a success
- Improved drilling techniques open up more finds on UKCS and NCS
- Large gas finds worldwide drive further LNG projects
- Smaller gas finds become viable through onboard liquefaction
- Carbon prices remain around €30/tonne

Note: Illustrative simulations only

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Summary and discussion

- Oil price weakening will bring down Continental oil-indexed gas contracts – but not before next spring
- Continental gas prices should set the floor for UK gas prices – circa 70 p/therm
- However, a number of factors could combine to result in much lower prices
  - Warm winter
  - Low coal prices result in lower gas demand in power generation
  - Lower demand for global LNG results in cargoes being “dumped” into the UK
  - Prices – 40 p/therm?
- But …. If the winter is colder than average and gas from Norway/Continent/LNG does not arrive….the price could rocket upwards
- And any decrease in liquidity will exasperate the volatility

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