

BP Statistical Review of World Energy 2009



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What's inside?

- 1 Introduction
- 2 Volatility and Structural Change
- 3 Fuel by Fuel
- 4 Conclusion

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1. Introduction

2008 was a very special year.

It was a year of high volatility, in which the worst global economic contraction since World War II started. And it was the year in which non-OECD energy consumption was greater than OECD energy consumption for the first time.

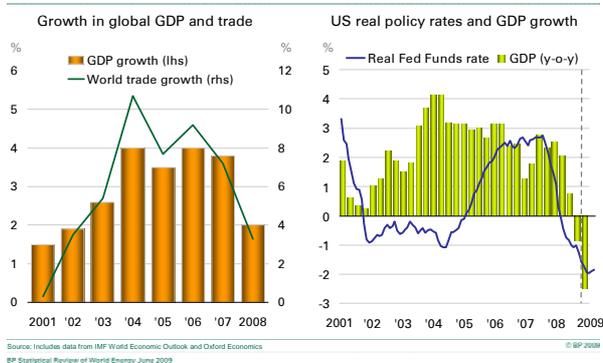
These are two big events and, of course, they are related. Non-OECD economies have had five years of the fastest growth ever, and they have dominated global energy demand growth since the turn of the millennium. It is not a one-way street: energy prices played a role in exacerbating the recession, and they will play a role in what happens next.

One way of putting these themes into perspective is to point at the uncertainty they create. They provoke doubts about our ability to sustain high economic growth and to secure sufficient energy resources. Can markets deliver enough investment to sustain energy security? Do governments have to do it? Or is more energy for more growth just becoming impossible?

As always, this is a review of last year's world energy data. It is fact-based, not an essay in predictions. But the numbers give perspective. To see what the data say, I will first briefly review our two big themes, and then go through global energy markets fuel by fuel.

2. Volatility and Structural Change

The Economy



First, the economy.

For 2008 as a whole, world economic growth was 2%, below the ten-year average for the first time since 2003. The US has been "officially" in recession since

December 2007. It was not until after the financial crisis that output actually fell – but when it did, it fell fast and contagious. By the fourth quarter, the global economy was shrinking.

Let me just focus on a few essentials. First, this recession has been in the making for a while – arguably since US real interest rates were kept negative after the 2001 recession. Second, it spread around the globe with extraordinary speed, transmitted by a lack of credit and working capital, and then by the collapse of international trade. It is now a platitude, but the world did discover that it was more closely linked than many had expected. Third, economic policy has become crucial, with future prospects more than ever tied to today's decisions. When big economies replace credit-financed private consumption with deficit-financed government spending, they put the recovery at risk; and so a return to high rates of economic growth may prove elusive.

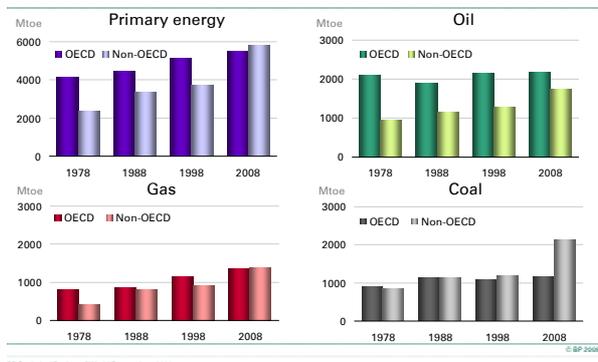
Energy Prices



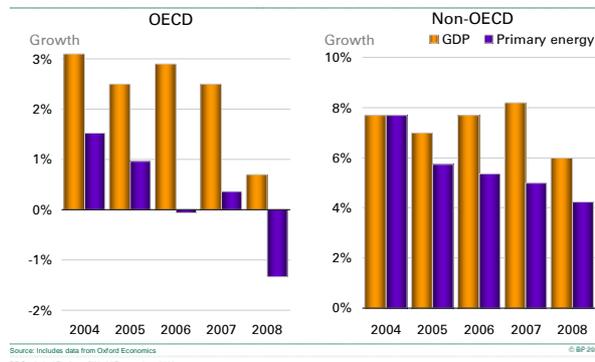
The impact on energy markets was sudden and severe. The contraction in the second half of 2008 caused a strong downward movement of prices and consumption. Prices for all fossil fuels peaked in the summer, and then fell. By January of this year, dated Brent had fallen by 75%, Henry Hub gas by 58%, and North-West European coal by 62%. Inventories rose, and spare capacity emerged, as annual production exceeded annual consumption in all fossil fuels. Power generation saw the lowest growth since 1992; in the OECD it fell. Primary energy growth slowed to 1.4%, below its ten-year average: gas consumption growth was the slowest since 2001, coal the slowest since 2002, and global oil consumption fell for the first time since 1993.

We saw a year of two halves. On the face of it, prices and consumption moved up together in the first half of the year, and then down together in the second half, because of the impact of the economic crisis. But there was more to that year.

OECD and Non-OECD Energy Consumption



GDP and Primary Energy Growth



In 2008, non-OECD primary energy consumption exceeded OECD consumption for the first time; to be precise, it now accounts for 51.2% of global commercial energy consumption. This has been coming for a while: the non-OECD contribution to energy consumption growth has exceeded that of the OECD since the year 2000. For the first time, in 2008 non-OECD economies used more natural gas than the OECD; in addition, China's power generation overtook that of the EU; and carbon emissions from energy use in China exceeded those of the US.

The structural shift we are observing is uneven across fuels. Coal demand has been dominated by the needs of industrializing economies since 1988; the non-OECD now accounts for 65% of consumption. Oil demand is converging, with non-OECD consumption growth having outpaced the OECD every year since 1999. Currently, 45% of all oil is consumed outside the OECD.

How are these two themes related? Extreme situations tend to bring out what really matters. So how did energy markets cope? Did the reaction to the economic shock differ across fuels, or across countries? Can the volatility of 2008 tell us anything about the longer-term quest for energy security?

Economic growth is always the main driver of energy demand. For the world as a whole, primary energy demand growth slowed in line with GDP growth in 2008. In the non-OECD economies, the relationship remained broadly stable. But in the OECD, the relationship between GDP growth and primary energy growth shifted last year. Primary energy consumption fell by 1.3%, perhaps a sharper drop than the slowdown in economic growth would have suggested. Strikingly, when all the moving parts are netted out, last year's decline in OECD primary energy consumption can be accounted for by one fuel in one country – namely, the biggest decline in US oil consumption since 1980.

However, the strong reaction of primary energy demand in the OECD comes on the back of two years of below-average growth relative to GDP. OECD (and US) oil consumption also had started to fall as early as 2006, a long time before the recession.

It would therefore be wrong to attribute the decline in OECD primary energy and oil demand entirely to the economic slump. There was something else at work. The data seems to confirm what many of us have long suspected, namely that energy demand in the OECD was more sensitive to rising prices; and in the non-OECD, it was more sensitive to years of economic growth.

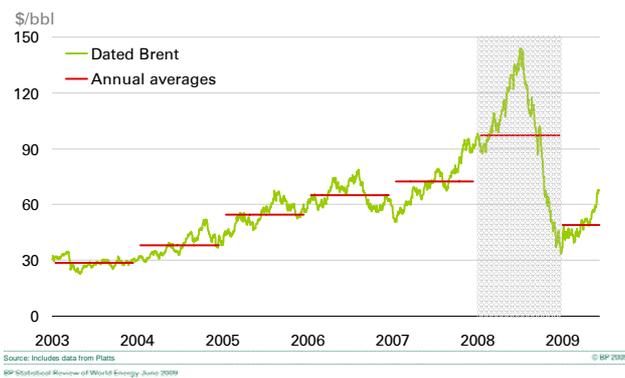
The data also shows an asymmetric reaction across fuels. In the non-OECD, oil and coal consumption slowed in lockstep with GDP growth; natural gas was the only fuel that accelerated. In the OECD, oil and coal consumption declined; but an increase in natural gas consumption partially offset the decline in coal consumption.

To appreciate and understand better these diverse reactions, we have to look at the data fuel by fuel.

3. Fuel by Fuel

Oil

Crude Prices: What Happened?

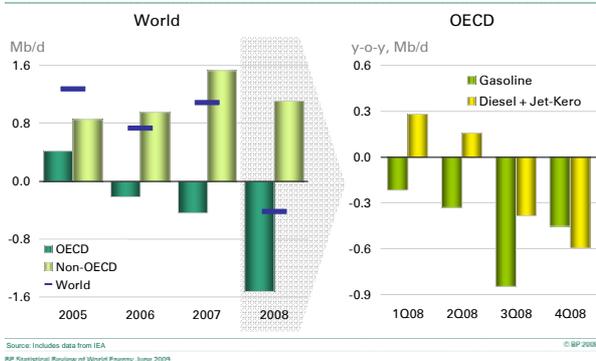


For the year as a whole, dated Brent averaged \$97/bbl, an increase of nearly \$25/bbl over 2007. This was the seventh consecutive increase in the annual oil price, something that has never happened before in the 150-year history of our industry.

Of course, the annual average masks the unprecedented run-up and decline of which we are all aware: from \$96/bbl on January 1st 2008 to a peak of \$144/bbl in July – a record even on an inflation-adjusted basis – and then back to \$34/bbl by Christmas. Prices have since bounced back to above \$60/bbl.

How are we to explain this?

Oil Consumption Growth

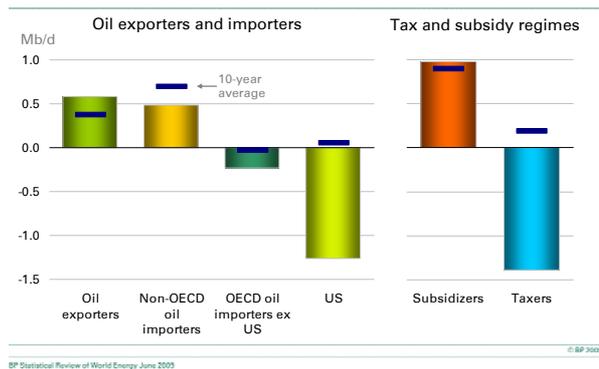


Let's start with consumption. Global oil consumption fell by 0.6% or 420 Kb/d in 2008 – the most since 1982. OECD consumption fell for a third consecutive year, a decline for which the only explanation is the impact of

high and rising prices. Non-OECD consumption growth, in contrast, remained robust until economic growth started to deteriorate.

As I have just pointed out, the OECD fall was concentrated in the US, where oil consumption dropped by 1.3 Mb/d (6.4%), the largest volumetric fall since 1980. The decline gathered pace late in the year when the recession brought down demand for middle distillates (which are more dependent on commercial use); while gasoline demand had already been falling, pushed down by high prices. In September – with the added impact from Hurricane Ike – US consumption fell by nearly as much as India's total oil consumption. And for the year as a whole, the decline in US oil consumption was indeed big enough to account for almost all of the net decline in OECD primary energy consumption.

Oil Consumption Growth in 2008

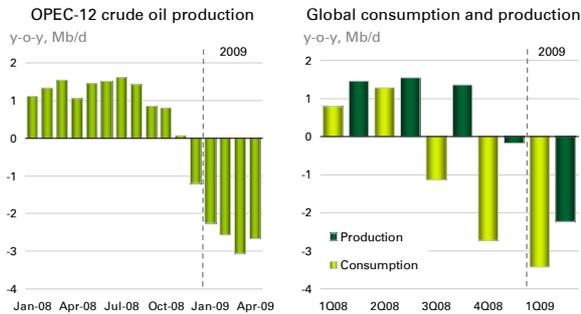


The second key event for oil consumption was the slowdown of non-OECD importers. It was concentrated in Asia, where growth halved, from 750 Kb/d in 2007 to 340 Kb/d in 2008. Chinese consumption growth slowed, from 360 Kb/d to 260 Kb/d, but still accounted for the single largest increment to world oil consumption.

All of the cumulative increment in global oil consumption since 1999 has come from the non-OECD, and 2008 was no exception. Although a number of countries could not sustain subsidies as oil prices increased, subsidized oil consumption has accounted for all the global demand growth over the past five years. Again 2008 was no exception.

But to explain the price trajectory we have observed, we need to look at supply developments as well.

OPEC Adjusts to Falling Consumption

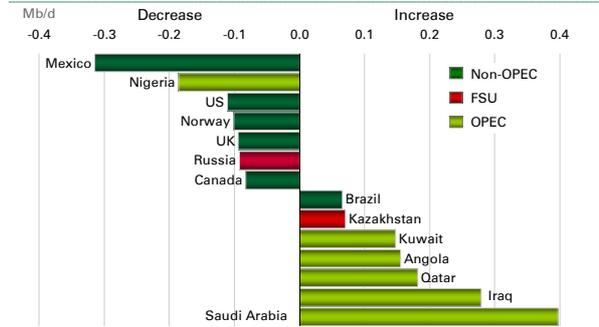


Source: Includes data from US DOE
 BP Statistical Review of World Energy June 2009

Recall that in 2007, producers with OPEC quota arrangements – the then OPEC-10 – had cut crude production by almost 1 Mb/d, supporting the price rally that lasted from early 2007 until last summer. In early 2008, as crude prices continued to go up, OPEC production recorded large year-on-year increases. Saudi Arabia accounted for the lion’s share, with significant growth also seen in Iraq, Qatar, and Kuwait. As prices approached \$120/bbl, Saudi Arabia announced unilateral production increases in May, and in June. Markets were unconvinced, reacting with price jumps in both instances. With the usual lag between wellhead and storage facility, these production increases showed up in higher inventories by the summer of 2008 – just about the time that global demand collapsed. This brought prices down sharply.

Responding in a hurry, OPEC announced separate production cuts in September, October, and December, totalling more than 4 Mb/d. But relative to faltering demand, this was too little, too late, to avoid a large price decline by the end of the year. The full impact of OPEC’s cuts has only been felt in 2009, with production falling by more than 3 Mb/d early in the year. By historical standards, compliance has been solid: OPEC cuts had helped to keep prices stable in the face of falling demand earlier this year, and they do support prices now.

Main Oil Production Changes

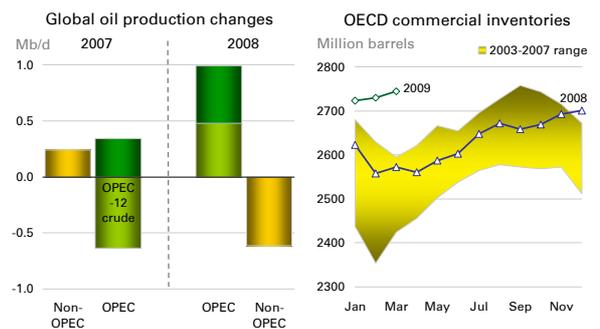


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Meanwhile, non-OPEC production fell by 610 Kb/d, suffering the largest decline since 1992.

The fall in non-OPEC production was driven by OECD countries, where decline accelerated to 750 Kb/d, with Mexican output falling by 310 Kb/d (9.1%). In the face of an adverse tax system, a lack of drilling activity led to the first annual fall in Russian production in a decade (of 90 Kb/d). A combination of field maturity, high cost, and increasingly constrained access to investment meant that non-OPEC supply continues to struggle, despite those seven years of rising prices.

Changes in Production and Inventories



Source: Includes data from IEA
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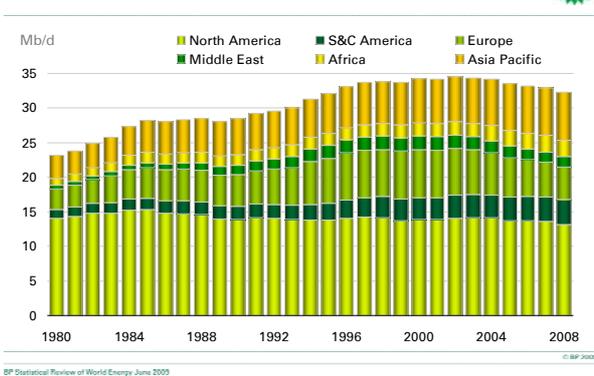
In the event, OPEC production rose by 990 Kb/d (2.7%) over the year – and more than compensated for the large non-OPEC decline. Global oil production thus grew by 380 Kb/d (0.4%), excluding biofuels: For the year as a whole, the decline in non-OPEC supply was more than offset by robust growth in OPEC production.

The excess of production over demand led inventories to rise substantially. OECD inventories rose by 134 Mbbls in 2008, the largest increase on record (with data

going back to 1984) and continued to increase well into this year, leading to the deployment of floating storage to exploit the fall of spot below future prices. Needless to say, OPEC spare capacity has increased as well.

Based on Statistical Review data we have long held the view that the world is not resource constrained. Why have seven years of rising prices not delivered more of a supply response from outside OPEC?

Non-OPEC ex FSU Oil Production

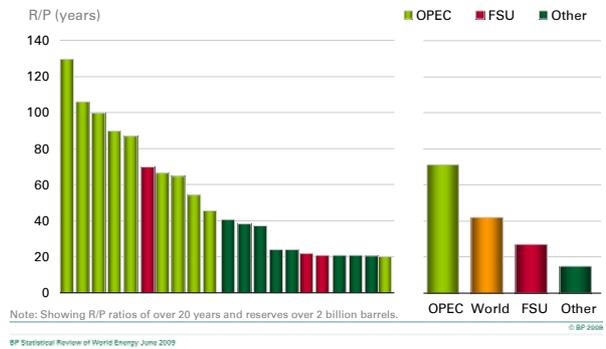


The 1980s provide an interesting comparison. Then, as now, the world came out of a period of seven years of high prices, rising from a little above \$3/bbl in 1973 to almost \$37/bbl by 1980 (just for comparison, in today's prices this would be an increase from \$16/bbl to almost \$97/bbl). Between 1980 and 1985, OPEC cut production by more than 10 Mb/d, while production in the Soviet Union was broadly flat. At that time, OPEC countries and the Soviet Union were, of course, largely closed to private investment.

Over the same period, non-OPEC production rose by 5 Mb/d. 80% of this came from 14 countries with a collective reserves-to-production (R/P) ratio of 31 years. All other non-OPEC countries (including large producers such as the US, Canada and China) increased their joint output by only 4.3%; their collective R/P ratio was just below 12 years.

The unsurprising lesson is that for high prices to have an impact on supply one needs a sufficiently large resource base *and* a sufficiently attractive investment regime.

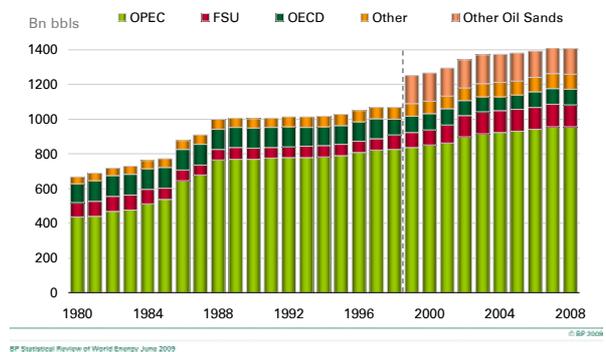
Reserves-to-Production Ratios



The countries that today have the proved reserves sufficient to support increased production at scale are almost all OPEC members. All of the countries today with R/P ratios above 30, and reserves above 2 billion barrels are members of OPEC, except for Kazakhstan, Gabon, Sudan, and Vietnam. The question is whether the large reserve holders will allow investment to take place at a scale sufficient to grow production.

Of course, technological change and the new prospects it opens – such as Canada's oil sands, or the emerging sub-salt discoveries in the deep water off Brazil – can and should not be ignored. Technology and innovation change the resource base in the long term – we will discuss the example of non-conventional gas in the US in a minute.

Global Oil Reserves



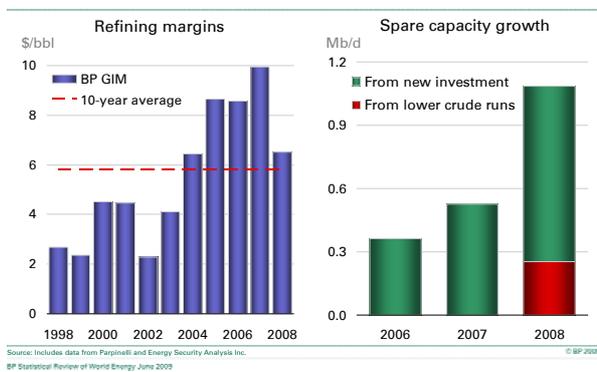
But even if we stick with our hypothetical example of an unchanging world for the moment, the world's proved oil reserves are sufficient to meet current production levels for 42 years. This ratio has been above 40 years for a decade, as the world continues to replace every barrel of oil produced with new reserves. OPEC and the

FSU account for 76% and 10% of global proved reserves.

On a fundamental level, the oil market story is one of volatile price changes in a constrained market. Supply growth in regions open to investment has been anaemic, and openness to investment has itself deteriorated. This has left OPEC in the driver's seat controlling, together with other large resource holders, investment as much as production.

Refining

Refining Margins and Spare Capacity



The refining margin environment in 2008 suffered a double blow when falling product demand met a cyclical increase in capacity. The global average margin of \$6.52/bbl (2009 BP GIM basis) was the lowest since 2004, though still above the ten-year average. Early in the year, strong economic growth supported margins through middle distillate demand, which compensated for the price-related decline in US gasoline demand. But with overall oil demand weakening, refiners began cutting runs in several regions, which proved hard to achieve without losing distillate production. The need to produce distillate at the margin brought their prices to between \$25/bbl and 35/bbl above crude oil, delivering record global distillate cracks in May 2008, and widening light heavy spreads globally. In Europe, high sulphur fuel oil reached a record discount to Brent of \$43/bbl; in the US, the discount of Maya to WTI averaged \$23/bbl during May, a record high for any month.

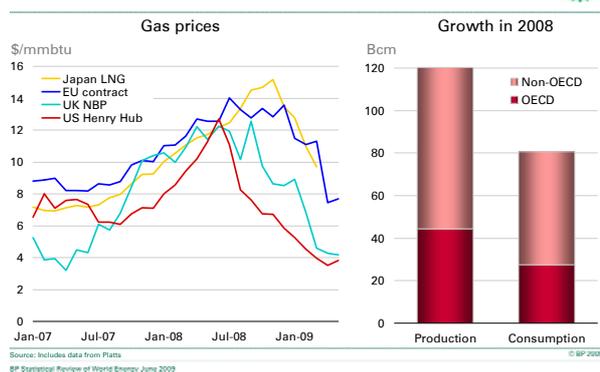
Refining margins weakened towards the end of the year when oil demand – including distillate – collapsed because of the recession. Run cuts were implemented in all regions, for a while helping to contain global product stocks in the seasonal range, but also delaying the reduction in global crude oil stocks that OPEC was attempting to engineer. Only now are we beginning to

see lower global crude supply catch up with declining demand from refineries.

The increase in spare refining capacity is the result of new capacity, reflecting investment decisions during the "good years", exacerbated by run cuts. Global unused refining capacity grew by 1.1 Mb/d in 2008: 800 Kb/d of this was because of new capacity, and 300 Kb/d because of lower crude runs. In 2009, new capacity growth is expected to add another 2 Mb/d. New capacity and run cuts are taking their toll: in April this year, utilisation fell to about 80%, the lowest monthly level for nearly 10 years. Yet, OECD product inventories still reached their highest seasonal levels for 19 years – a stark illustration of the scale of over-supply the industry faces.

Natural Gas

Natural Gas Market



Natural gas prices show a familiar pattern. All annual-average prices reached record nominal highs in 2008, with European contract gas the most expensive in the world. Prices in the liberalized US Henry Hub and UK NBP markets rose sharply in the first half of 2008, but fell back as demand weakened while supply remained abundant. Oil-indexed Asian LNG and European contract prices rose for longer due to lags to oil prices, but then also fell off their peak. Prices remain depressed into 2009.

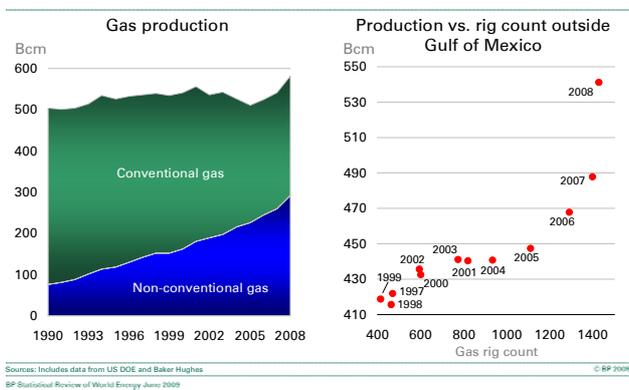
World gas production grew by 3.8%, the second strongest volumetric growth on our records, which go back to 1970. The biggest increment came from the US, but the non-OECD continued to lead global growth in the Middle East and FSU.

Gas consumption in the OECD grew faster than normal in the first half of 2008, but subsequently weakened and, at 2.5%, global consumption growth was below the

ten-year average for the year as a whole. The non-OECD used more natural gas than the OECD for the first time ever last year. Gas was the only fossil fuel for which non-OECD demand accelerated, driven by China, which recorded the world's largest volumetric consumption increase, accounting for 15% of global growth.

The impact of slowing demand on prices has been exacerbated by two reactions to past high prices: investment in 'non-conventional' gas in the US and a bunching of investments in LNG.

US Gas Production



The US and Canada form an integrated and liberalized gas market, responding to similar prices and market signals. But while the US recorded the world's largest production increment (41.7 Bcm, or 7.5%), Canada had the world's biggest decline (9.0 Bcm, or 5.1%). The key difference is the development of non-conventional gas such as shale, tight gas, and coalbed methane in the US. Rising prices caused drilling for these deposits to soar and technological advances allowed output per rig employed to rise exponentially. Production from non-conventional deposits has almost doubled over the past decade; and their share in total US production went from 15% in 1990, to 28% in 1998, and to around 50% in 2008. They are, in fact, becoming conventional.

Such growth allowed US Henry Hub gas prices to be among the lowest in the world, and at a record discount to residual fuel oil prices last year, thus favouring the use of gas in power generation and industry. Meanwhile, natural gas also became a substitute for relatively expensive coal in European power generation, as we will discuss shortly.

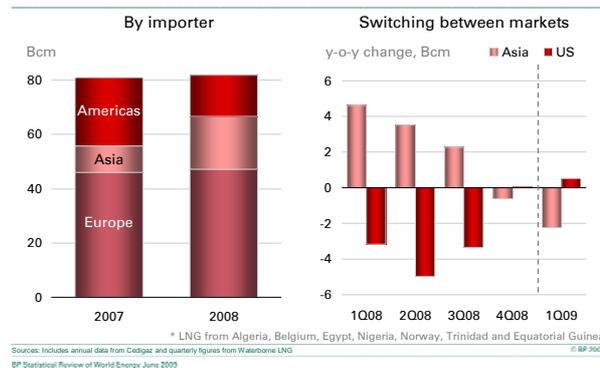
Non-conventional gas is a good example of how investment and technological progress raise reserves estimates. "Proved reserves" are, of course, a commercial measure, depending on the underlying

resource endowment and on economic viability. Investment in frontier technology has increased US gas reserves by 45% over the last decade.

As US spot prices fell from their peak in July 2008, the rig count more than halved. This will have an impact on US gas production, but with a lag, and so has not yet been seen.

Today, 19% of global gas production is traded by pipeline and 7% by LNG. There was a small drop (of 0.5%) in LNG trade in 2008, for the first time since 1981, mainly due to technical problems with new projects.

Atlantic Basin LNG*



However, LNG continues to link regions into one globally integrated market. This demands flexibility. 2008 saw the longest journey ever travelled by an LNG tanker – from Norway to Tokyo. In the autumn, Belgium put LNG back onto a tanker and re-exported it to Asia – a first, as far as we are aware. In 2008 a record amount of flexible LNG headed to Asia, where Japan continued to suffer nuclear outages, and other countries bought more gas because oil prices had been high. In addition, a record number of LNG tankers were delivered last year, expanding fleet capacity by 19%.

A good proxy for global gas market flexibility is the diversion of Atlantic Basin cargoes between regions. Atlantic Basin spot cargoes rose to 12% of total Asian imports in 2008, up from 7% in 2007, and zero in 2000.

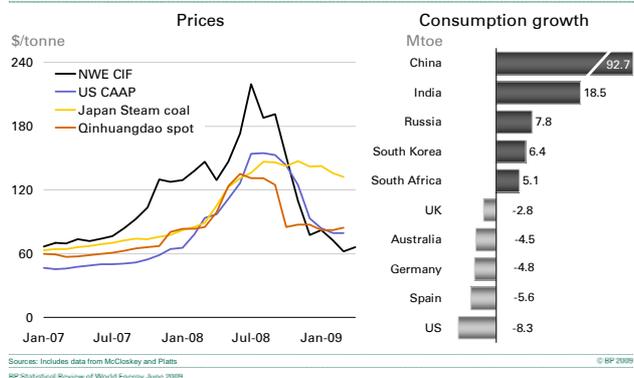
Meanwhile, abundant US production caused US LNG imports to fall by more than half in 2008. Asian LNG demand has turned negative this year, due to the recession, but LNG output is growing. Recovery from 2008 technical problems, the ramp-up of existing liquefaction plants, and new projects in Indonesia, Qatar, Russia, and Yemen, point to a record supply increase

this year. LNG is increasingly “looking for a home” and LNG plants are facing excess capacity.

The story of gas markets in 2008, and into 2009, ends as one of too much supply chasing not enough demand. But behind it is the story of a supply response to high prices in the rise of non-conventional gas in the US; and of accelerating global integration in response to market signals.

Coal

Coal Prices and Consumption Growth



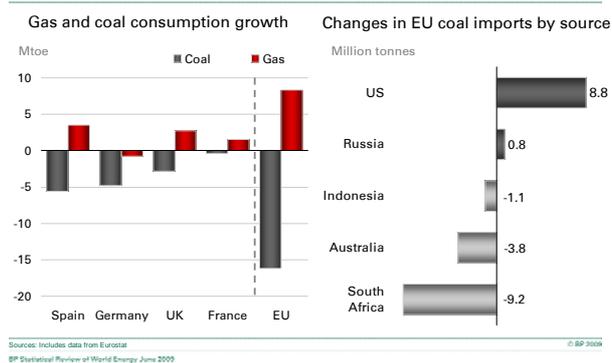
Coal prices also exhibit the pattern familiar from other fuels – peaking in July and then tapering off. Prices in North West Europe, a good proxy for a globally traded coal price, reached \$219 per tonne in July and fell to \$58 by March this year. The volatility of this marker price for traded coal exceeded that for oil – although I have not heard much talk of financial “speculation” in international coal markets.

Coal remained the world’s fastest-growing primary energy fuel. But at 3.1%, global consumption growth was so weak that, without the contribution from India and China, it would have fallen. Coal consumption in the OECD had the steepest decline since 1992, and in the non-OECD it grew at its slowest rate in six years.

Coal is always a China story. It meets 70% of China’s energy needs; China accounted for 43% of global coal consumption and 85% of the growth in coal last year. Yet growth in Chinese coal consumption has been slowing since 2003, and continued to slow in 2008. Power generation growth fell in the last quarter, as the economic crisis reached China and hit its export sector. While consumption slowed, production accelerated, in large part to replenish inventories. Instead of becoming a net coal importer, as had been widely expected, China

maintained a small export surplus. As demand weakened, storage capacity at the main shipping hub was overwhelmed, and the domestic coal price declined by 39% between June 2008 and January 2009. With the dissipation of excess inventories, Chinese coal prices have stabilized this year.

Coal in the European Union



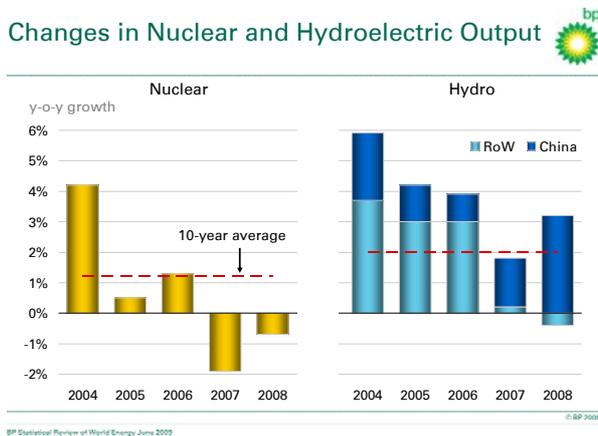
In the OECD, coal consumption fell by 1.9%, the steepest decline since 1992. In the EU, where consumption fell by 5.4%, the steepest in a decade, relatively low gas prices led to inter-fuel competition with natural gas. The rising price of emissions within the European Emissions Trading Scheme made electricity production from coal more costly than from gas for most of 2008. As a result, UK coal-fired power generation fell by 8.3%, while gas generation rose by 8.9% in 2008. In Germany, coal generation fell by 6.5%, and gas generation rose by 9.1%. But because coal prices have been falling more rapidly than oil-indexed gas prices and because carbon prices have fallen too, fuel switching is now reversing in those parts of Europe where pipeline gas dominates.

International trade in coal continued to grow in 2008, although from a small base. Transport costs when freight rates were high, along with bottlenecks on railways and at ports, shaped international trade flows. An example was the switch of Australian and South African exports from Europe to the Asia-Pacific region, because of more attractive netbacks. To compete, European prices rose. This did not outweigh the competitive advantage in freight rates for Indian Ocean exporters, but it did attract imports from the US. In the end, Europe lost over 14 million tonnes of hard coal imports from Australia, Indonesia and South Africa in 2008 (6.8% of total imports in 2007), but gained 8.8 million tons (4.2%) from the US.

Coal remained the world's fastest growing fossil fuel, but only because of continued growth in China and India. Otherwise this prize would have gone to natural gas. Elsewhere, weaker demand for power generation and supply bottlenecks plus the additional burden of carbon prices in the EU left coal losing market share to gas. Trade in gas and coal both supported European fuel switching, thus allowing gas to displace coal in electricity production in an overall stagnant OECD market, where power generation declined in lockstep with GDP.

Other Fuels

Hydro and Nuclear

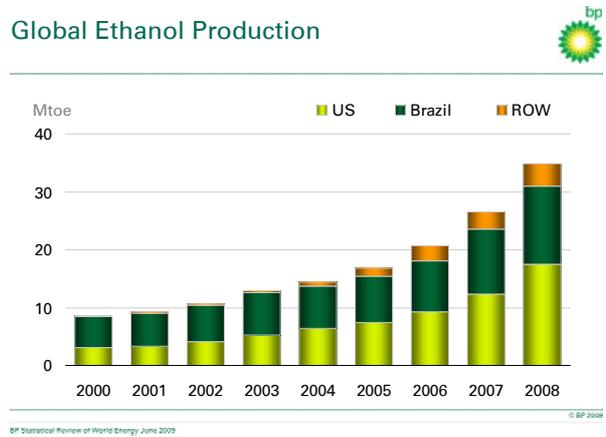


Hydroelectricity and nuclear power account for 11% of global primary energy consumption – with global shares of 6% and 5%, respectively. Their shares have been stable for decades, and 2008 was no exception. Hydroelectricity generation increased by an above-average 2.8%, with the increment accounted for by growth in China, including completion of Phase One of the Three Gorges project.

Nuclear power generation fell by 0.7%, and for the first time for which we have data (since 1965), it fell for two years in a row. But these were one-off events: Last year's decline was the result of the full-year shutdown of Japan's largest nuclear power station and extensive maintenance in the UK. No new unit entered into service in 2008.

Renewables

Global Ethanol Production

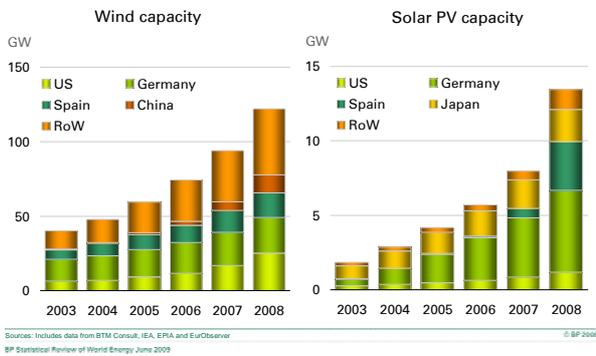


Renewables still account for only a small share of total energy consumption, and for the most part, still require government support. But from that small base they continued to grow fast, with global deployment reflecting government support as well as natural endowments.

In contrast to all the other fuels, growth in renewables was led by OECD countries, where policy support is strongest. But like other fuels, 2008 saw rapid growth in the first half followed by a marked deceleration towards the end of the year, and into 2009.

Ethanol is now equivalent to 0.9% of global oil consumption. Production growth accelerated for a fourth consecutive year, rising by 31% in 2008. In volume terms it rose to 0.7 Mboe/d. The US accounted for 62% of global supply growth, Brazil for most of the remainder. US production rose to 600 Kb/d, as new capacity responded to mandated increases in blending requirements and to high gasoline prices. The credit crisis and falling product prices after mid-year slowed things down and left the US ethanol industry with overbuilt capacity – by year-end about 15% of US ethanol production capacity lay idle.

Renewable Energy



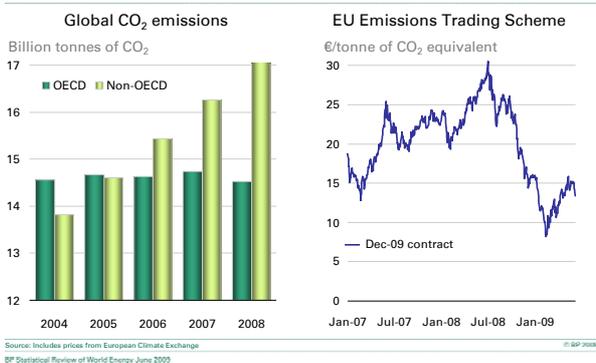
Wind power generating capacity growth accelerated to 30% in 2008, the fourth consecutive year of accelerating growth. Growth becomes a race between newly emerging big players: China recorded the fastest growth rate among the major markets and the second largest volume increment (6.2 GW, 106% growth), but the US added the most new wind capacity, overtaking Germany, and with 21% has now the largest global share of wind power capacity.

Solar power generating capacity grew even faster than wind. Spain and Germany together accounted for more than 75% of the solar growth, due to strong government support. However with capacity reaching 13.4 GW, solar is still a long way behind wind, which stands at 122.2 GW.

Together, wind, solar and geothermal power supply around 1.5% of global electricity.

Carbon Emissions

CO₂ Emissions and Prices



Carbon emissions from energy use grew by 1.6% in 2008, which is slower than last year and below the ten-year average for the first time since 2002 – I hasten to add our usual caveat: we apply standard conversion rates to our energy consumption data, so our figures are not comparable to official data.

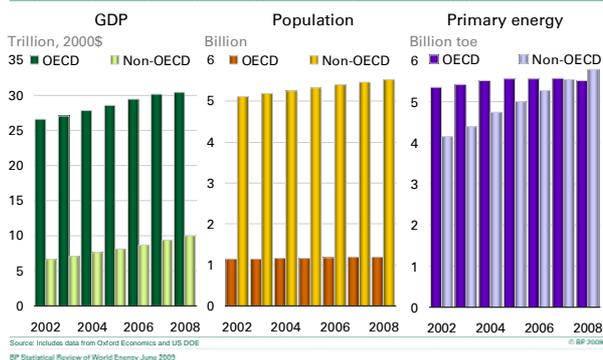
China became the world's largest emitter of energy-related CO₂ in 2008, and Asia Pacific accounted for nearly all of the world's net emissions growth. OECD emissions fell by 1.7%, mostly due to reduced oil and coal consumption, including switching from coal to gas for electricity generation in the EU.

Carbon markets grew strongly in 2008: trading volumes increased by 61% and traded value doubled to \$126bn, of which \$92bn was under the EU Emissions Trading Scheme. But the recession is taking its toll: As energy demand and energy prices came down, carbon prices fell to €16/tonne CO₂e at year-end, from almost twice as much last July.

The outlook for a global post-Kyoto framework is mixed: the European Parliament adopted a Climate and Energy Package in December; the US Congress is debating one; but plans for an Australian trading scheme were postponed in May this year.

3. Conclusion

GDP, Population and Primary Energy Consumption



Energy markets in 2008 saw extreme volatility and the crossing of a landmark. Allow me to trot out one last set of numbers before concluding.

Despite their rapid growth, non-OECD economies still account for only 25% of global GDP. But this 25% is produced by 82% of the global population. Per capita income is therefore only \$2,300, compared with \$32,000 in the OECD. And because of the importance of

industry in growth, and also because of inefficiencies, it takes more energy to produce one unit of GDP in the non-OECD than in the OECD. To be precise, to produce \$1000 worth of GDP takes 3.4 boe in the non-OECD versus 1.1 boe in the OECD. The scale of the challenge is easy to see.

Can the experience of a volatile year 2008, tell us anything about this longer-term challenge?

Conclusion



- 2008: Rapid market adjustment
- Non-OECD: The future is here
- Volatility: Unavoidable in our industry?

In 2008, market reactions explain the developments we saw. In the short term, we registered huge price volatility. Where these price changes were allowed to play themselves out – which was not always the case – they drove an efficient response.

- The brunt of the OECD decline in primary energy consumption was taken by US oil because it is most exposed to crude price fluctuations.
- Globally, outside China and India, high coal prices and available gas supplies translated into falling coal and increasing gas consumption.
- In the EU, relative coal and gas prices prompted fuel switching in power generation, partially offsetting the decline in coal consumption growth.
- Intra-fuel price differentials also directed fuels to their highest valued use through international trade – for example, when the EU replaced coal imports from Africa and Australia; or when low prices induced the re-contracting of LNG shipments.
- Where investment was allowed to react, high prices have translated into new supplies –

witness the growth of non-conventional gas in the US. Where investment is constrained, this mechanism fails – witness the oil market.

- But in energy, the commodity cycle has not disappeared. Refining, and to some extent also the North American gas market, bear witness to the threat of over-investment and feedback loops in capital intensive industries.

Extreme situations do bring out what really matters. Energy is a capital intensive business with long lead times; demand for its products depends on overall economic conditions. Cycles and price volatility are the norm reflecting our imperfect knowledge over long investment horizons.

In 2008 we saw a sharp turn in the economic cycle, and associated volatility in energy prices. The key to meeting the longer-term challenge is to manage through these ups and downs. In 2008, markets have served global energy security well on the way up, and on the way down. And they have served it better the more they were allowed to develop without interference.