BP Statistical Review of World Energy June 2011

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What's inside?

Christof Rühl, 8th June 2011

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1. Introduction

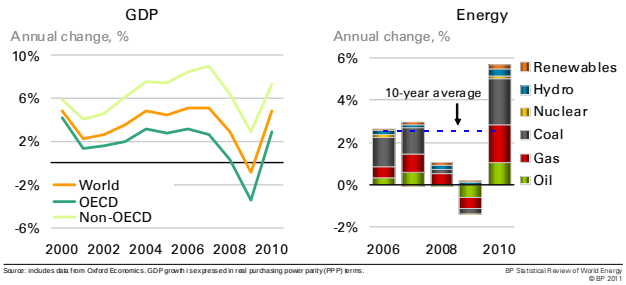
Sixty years ago, the oil man Jamie Jamieson and the statistician Dusty Miller typed up numbers on oil production and consumption, handcrafted a few charts to illustrate, and called their product – for internal circulation only – "Statistical Review". Much has happened since, but one feature surely has not changed for all these sixty years, namely the need to make sense of the numbers. We try to do this every year. The 2010 chapter starts with a simple observation.

At first glance, 2010 was a year of tremendous energy consumption growth - the highest since 1973, to be precise. The growth rate of all major fuels about doubled against their ten-year average. Consumption growth was above its long term trend in every region of the world. Energy intensity – the amount of energy used for one unit of GDP – grew at the fastest rate since 1970. And so, when all the accounting is done, we have consumed more energy in 2010 than ever before in total or per capita. With the exception of nuclear every single fuel hit record consumption as well.

To explain this massive rebound is the main question posed by this year's data crop. But there are others. One is about the role of prices in turbulent times. Are flexible prices directing our complicated global energy system well enough, or are we better off with heavier intervention? Then there is the climate complex, somewhat muted in the public debate these days, and the quest to decarbonise fuel supplies. For the first time we include data on renewable energy in the printed version of the Review this year; and we will use the occasion to have a more extensive look at what it can tell us. All, of course, while striving to apply the same objectivity and rigour that has guided this publication for 60 years.

2. Energy and the economy

The economy and energy demand

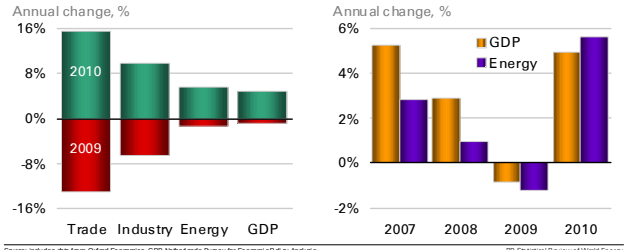


Source: includes data from Oxford Economics. GDP growth is expressed in real purchasing power parity (PPP) terms. BP Statistical Review of World Energy © BP 2011

Let me start with the biggest question: what exactly explains the very high 5.6% energy consumption growth in 2010? Economic growth always is a key determinant of energy demand, and so the economy should be our first port of call. Economic growth has indeed rebounded very strongly. The global economy grew by 4.9% in 2010, as government support and the need to replenish inventories reversed the decline and sparked renewed growth in industry and trade.

Economic growth was led by the non-OECD economies which had suffered least during the crisis. By year-end, economic activity for the world as a whole exceeded pre-crisis levels – driven by the so-called developing world; the OECD still needs to cross that threshold.

Recession and recovery

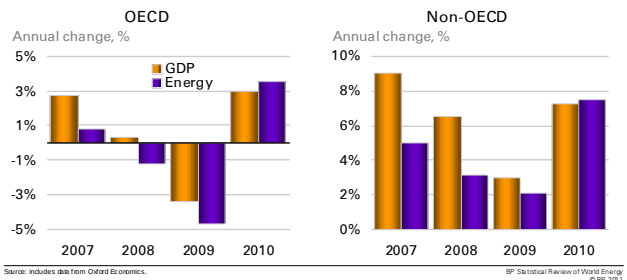


Source: includes data from Oxford Economics, CPB Netherlands Bureau for Economic Policy Analysis. BP Statistical Review of World Energy © BP 2011

Like in every economic cycle, industrial production, trade and investment were more volatile than GDP. Having fallen much further, they had further to rise during the recovery. Of these contributors to economic growth, industry and investment are not only more variable than GDP, but also more energy intensive.

On first sight, energy consumption mirrored the economic cycle: It fell and it rose with the economy. In fact, it overshot – twice. Energy demand fell by more than GDP in 2009 (when it saw its first decline in almost 30 years) and it rose by more than GDP in 2010 (when it saw its strongest increase for nearly 40 years). A look at historical data confirms that this should not come as a surprise: As a rule, the amplitude of fluctuations in energy consumption over the business cycle exceeds that of GDP. And the rule held during this recession: Energy consumption varied more than GDP in 2009 and 2010, in part because of those energy intensive activities, like industry, investment and commercial transport, which vary with larger amplitudes over the cycle than GDP.

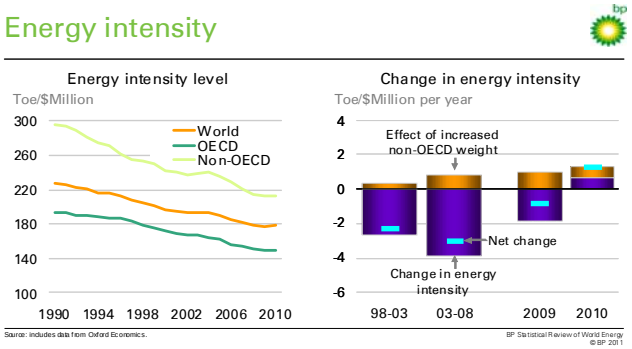
GDP and energy growth



Source: includes data from Oxford Economics. BP Statistical Review of World Energy © BP 2011

This effect was more pronounced in the well-to-do economies of the OECD than it was in the non-OECD – simply because the recession and recovery was much more violent there. Many large developing countries avoided a decline in GDP altogether, often because of massive, and energy intensive, stimulus packages, and they grew much faster after the crisis. Non-OECD energy consumption growth therefore decelerated in 2009, but it did not fall. In 2010, as these economies resumed rapid growth, they boosted energy demand even further, adding impetus to the cyclical recovery in the OECD.

But this is not all there is to it.



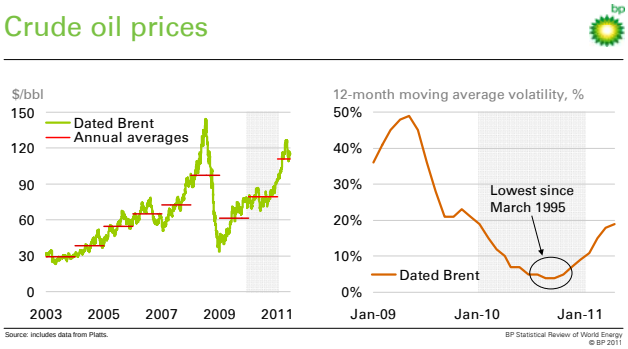
Recall that, since the early 1990s, the share of the developing world in global GDP has been rising. The years of recession and recovery accelerated this trend. Energy intensity continues to fall in both camps, but for the time being, it remains almost 1.5 times as high in the non-OECD. The rising weight in global GDP of the fast growing and more energy intensive non-OECD economies means that global energy intensity in extremis may rise, even if it falls in both the OECD and the non-OECD. And to lower the rate at which energy intensity improves globally is exactly what has started to happen as part of the long ascent of the non-OECD to a more powerful global economic position.

Overall, we therefore have two effects at work here: the bounce-back of energy demand as the economy recovered, and the rise of more energy intensive developing countries. The first one is a cyclical element, which we have seen before, driven by the recovery of the industrial sector. The second is part of a secular trend, shaped by the ascent of industrializing economies into the 21st century. It is new but it seems here to stay. In 2010, both effects pushed in the same direction to generate one of these rare episodes, when energy consumption globally grows faster than the economy.

3. Fuel by fuel

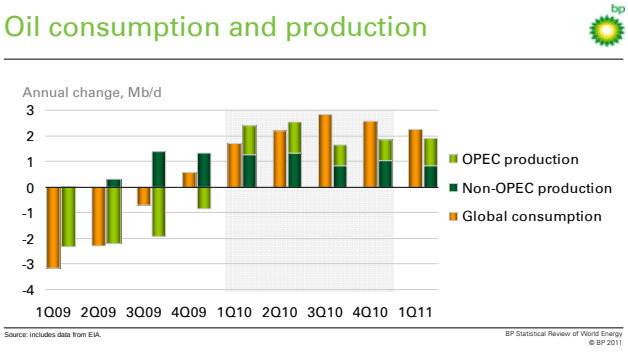
Let us investigate how this played out across individual fuels, starting with the market for oil.

Oil



Like other fuels, oil consumption and production rebounded strongly in 2010. Unlike other fuels, prices rose strongly as well: Dated Brent averaged almost $80/bbl for the year, an increase of nearly 30% over 2009. Prices started to rise toward the end of 2010 and have continued to do so this year, with Brent now near $115. These headline figures hide a somewhat more involved story within the year – a story driven by the economic recovery (a theme shared by all fuels) and OPEC production restraint (a feature unique to oil).

For the most part, the year 2010 experienced unusual stability. From the autumn of 2009 through the autumn of 2010, crude traded broadly in a range of $70 to $80/bbl. Monthly price variability over summer and autumn had calmed to levels not seen for 15 years.



Underneath that veil of stability, however, the fundamentals of demand and supply were setting the stage for prices that started to rise in the fourth quarter of last year – well before the unrest in North Africa and Middle East – as strong consumption out-paced production growth over the latter part of 2010.

Global oil consumption grew by a massive 2.7 million b/d or 3.1% last year, to reach a record of 87.4 million

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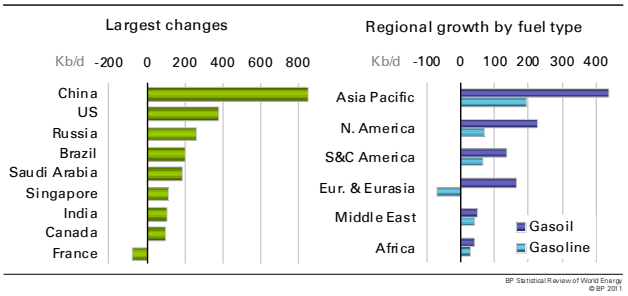
barrels consumed each day. The growth rate was more than twice the ten-year average; it featured the first increase in OECD oil consumption since 2005 and the largest volumetric increase outside the OECD ever.

Oil consumption growth in 2010

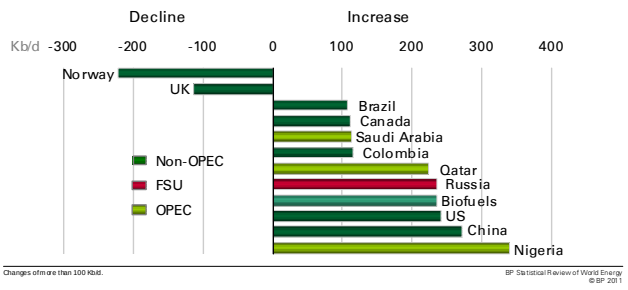


China contributed the largest national increment; its consumption rose by 860,000 b/d or 10.4%. The United States, Russia, and Brazil also recorded large increments.

What drove this strong growth? Like for other fuels, the rebound in global economic activity and the energy-intensive nature of the recovery appear to have been the most important factors. Middle distillates – the fuel for industry and commercial transport – saw the strongest increase among refined product categories, growing by 4.4%. This provides a mirror image of 2009 when middle distillates and fuel oil recorded the strongest declines, because of the recession's disproportionate impact on industry. Meanwhile, growth in gasoline demand was relatively weak – stagnating in the OECD – suggesting higher prices had already started to have an effect.

So far this year, global oil consumption has continued to grow, albeit at a slower rate. The continued increase in prices is now clearly having an impact in OECD economies: In recent months, consumption in the US, for example, has begun to decline as prices "at the pump" have risen. With subsidies in developing countries reduced in recent years, the price impact may become more noticeable outside the OECD as well.

Oil production growth in 2010

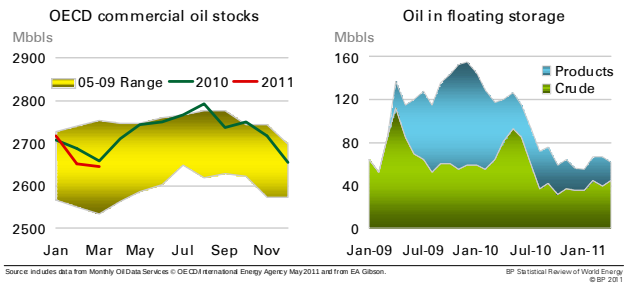


Oil production grew by 1.8 million b/d, or 2.2%, also the strongest growth since 2004, but not as strong as consumption. To this has to be added 240,000 b/d (13.8%) growth in biofuels – one of the world's largest increments of liquids supply. For crude oil, supply growth was roughly split between OPEC and non-OPEC producers.

Non-OPEC oil production increased by 860,000 b/d or 1.9%. China saw the largest increase in the country's history due to rising offshore output. Russia and the US also contributed significantly, while Norway experienced the world's largest production decline. Russia retained its ranking as the world's largest producer as large Siberian projects ramped up. Output in the US grew onshore in the Lower 48 as well as offshore in the Gulf of Mexico. Increments in biofuel production were once again concentrated in the US (140,000 b/d or 17%), where they are subsidised, and in Brazil (50,000 b/d or 11.5%), where they are not.

Meanwhile, OPEC production grew by 960,000 b/d or 2.5%. The group's production targets remained unchanged in 2010 – as they have since the end of 2008 – but production discipline continued to erode gradually. OPEC growth was led by Nigeria, which recorded the world's largest increase due to new offshore production and an easing of civil unrest, and by Qatar, where natural gas liquids followed growth in natural gas production.

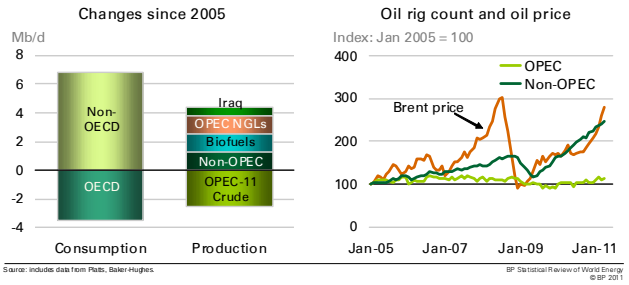
Oil inventories



With consumption growth so far outpacing production, one would expect a large decline in inventories during 2010. But in fact, OECD commercial inventories fell only by a very modest 30,000 b/d over the year – not nearly as much as implied by the large gap between consumption and production. The explanation lies in floating storage: In 2009, when the oil market was well-supplied, large volumes were stored at sea and therefore did not enter official OECD inventory statistics. As the market tightened in 2010, floating storage was withdrawn first, because it is more expensive. In other words, the relatively modest movement of inventories onshore masked a much larger overall inventory correction over the course of 2010.

In response to the loss of Libyan exports, which removed 1.4 million b/d of supply, other OPEC members have increased production, but in aggregate this increase has not been sufficient to offset the Libyan loss. To date, OPEC production remains below pre-disruption levels, and so far this year, we have seen a continued decline of commercial storage. Futures markets have moved into backwardation for the first time since mid-2008 – yet another sign of a tighter supply-demand balance.

Cumulative consumption and production



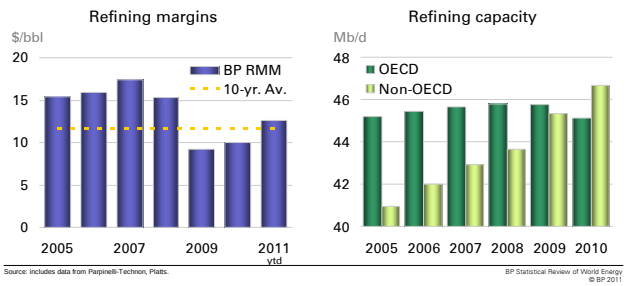
It is worthwhile to step back at this point. Over the last five years, global oil consumption has increased by 3.3 million b/d, with non-OECD growth (+19% or 6.8 million b/d) partly offset by a decline in OECD consumption (-8% or 3.6 Mb/d). Over that same period, non-OPEC output has increased by 2.5 million b/d (including a 1.2 million b/d increase in biofuels production). Meanwhile, OPEC production in 2010 was 600,000 b/d below the level of 2005, despite an increase in production not subject to the organization's production sharing agreements, such as natural gas liquids (1.3 million b/d) or Iraqi production (600,000 b/d). The differences between production and consumption are refining gains and inventory withdrawals.

In response to higher oil prices, rig counts in non-OPEC countries have increased sharply, while activity levels in OPEC countries have been muted.

This then is how we enter 2011. If unexpected events (such as this year's Japanese nuclear outages or the losses of exports from Libya) further tighten markets, debates over Peak Oil or the impact of financial investment are likely to resurface. But, once again, the movements in global oil consumption, production, and inventories that we have discussed appear to explain the broad movements of oil prices in recent years – including 2010 and so far in 2011.

Refining

Refining capacity and margins

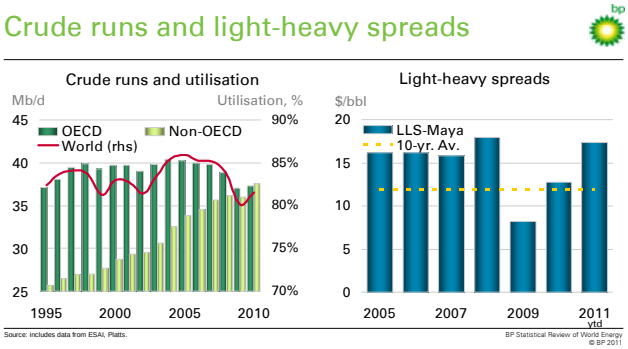


The refining environment benefitted from the resumption of demand growth in 2010 as well. Utilisation levels and margins both improved. However, the industry is still living with 5 million b/d more unused capacity than was the case five years ago, despite a growing list of plant and site-wide closures.

Global refining margins, as measured by BP's new refining marker margin [RMM], averaged $10 per barrel in 2010 – well below the "golden-age", but an improvement on 2009's $9 per barrel. The margin upswing began during the first quarter of 2010, as cold weather allowed product stocks in the OECD to be drawn down.

Global refining capacity increased by 720,000 b/d last year. However, additions were concentrated in the non-OECD, while the OECD experienced a net reduction [620,000 b/d]. China [640,000 b/d] accounted for almost 90% of the global increase and installed non-OECD capacity now exceeds that of the OECD by 1.5 million b/d.

Crude runs and light-heavy spreads



Global refinery utilisation improved to 81.5% last year as global crude runs grew by 1.8 million b/d, comfortably above net capacity additions. Economies outside the OECD accounted for 85% of the crude run growth and, for the first time, for more than 50% of global throughputs. But OECD crude runs also increased for the first time since 2004. The challenge remains to bring capacity in line with local refinery throughput.

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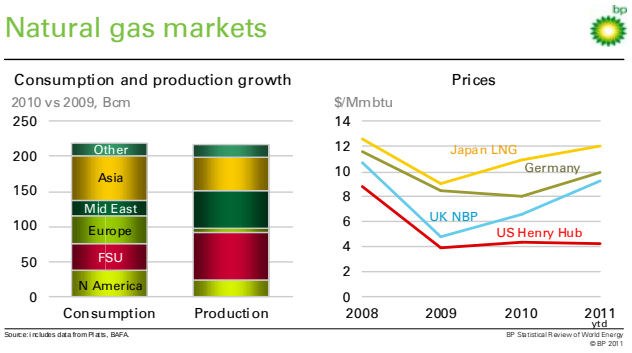
In 2011, the loss of sizeable Japanese refining facilities, and substitution of light sweet crude supplies from Libya with heavier Middle Eastern crudes contributed to the widening of light-heavy spreads already underway since late 2010. This favours highly upgraded refineries that make very little fuel oil; over the longer run, less sophisticated sites must decide whether to invest to improve feedstock flexibility. But both groups continue to face the twin challenges of global excess capacity and growth in competing product supplies, such as biofuels and non-refined natural gas liquids.

Natural Gas



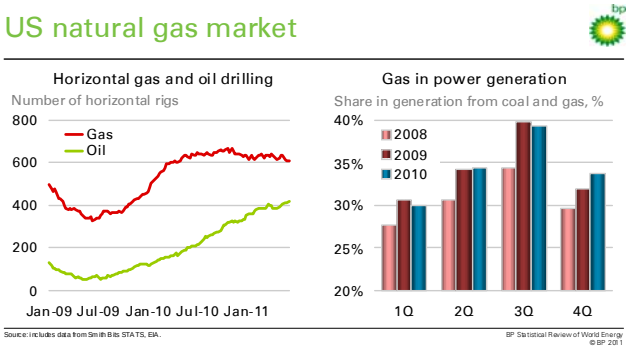
Global natural gas production and consumption both grew exceptionally last year. Demand was driven by the economy, the continued shift towards non-OECD consumption, and weather conditions. The supply side is shaped by unconventional gas and LNG. Underneath the surface we see rapid global integration, competition between spot and contract priced gas, and price-induced fuel switching.

Global gas consumption rose 7.4%, the strongest volumetric gain on record. Non-OECD economies expanded their share to over 51%; China solidified its role as Asia's largest gas market. But OECD markets grew rapidly too [6.4%, +93 Bcm], with consumption attaining all-time highs.

Production rose 7.3%, also a record increment. 31% of this global growth originated in the former Soviet Union, followed by the Middle East.

Spot prices mirrored market dynamics: Amidst plentiful supply, US prices remained the lowest of any liberalised market. European spot prices surged on the economic recovery and weather, with further gains this year. But abundant global supply held spot prices below oil-indexed prices on average. The behaviour of oil-indexed prices appears more of a mystery: Japanese LNG prices rose by 20% last year, while the Average German Import Price fell by 6%, despite being mainly oil-indexed too.

The shale gas revolution in the US and massive changes in LNG markets are reshaping the world of natural gas. I turn to the US first.



North America has become largely self-sufficient in gas. Due to cheap domestic shale gas, US production grew by 4.7% [28 Bcm] to the highest level since 1973. Shale gas related horizontal drilling surged in early 2010 and shale gas output rose to account for 23% of total US production, up from 4% in 2005.

This has kept prices low. Henry Hub gas traded 54 $/boe below crude oil in 2010 and at even steeper discounts so far this year. Producers and consumers are reacting.

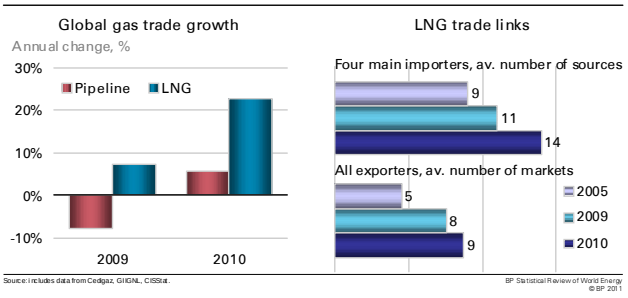
On the supply side, producers are shifting activity towards shale gas deposits with high liquids content – or directly to oil. Drilling for drier gas is falling and technology perfected for shale gas is being transferred to oil. The horizontal oil rig count has increased strongly. As a result, onshore oil production in the Lower 48 has increased to levels not seen since 2001.

On the demand side, competition with coal in the power sector is setting the floor for gas prices. Favourable prices encouraged switching from coal to gas in the second half of 2010; we are seeing further coal displacement so far this year.

Abundant supplies may trigger further consequences. Producers have started re-exporting previously received LNG cargoes from the US to markets with greater demand; some are seeking permits to export North America-produced gas as LNG. Talk about GTL, gas use in transport and other sectors is surfacing. Expect this to continue, while efforts to explore unconventional resources get underway in the rest of the world.

Already, the reduced need for imports in the US freed up LNG for other markets and affected contract prices across the Atlantic. To see how this happened, we need to look at LNG markets.

Global natural gas trade

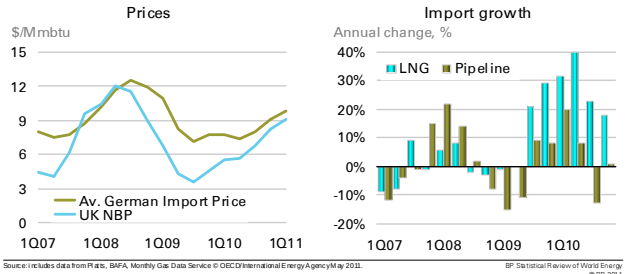


Over the last five years, global LNG supply grew by a cumulative 58% – three times faster than total gas production. Last year, the supply of LNG expanded by an unprecedented 22.6% (55 Bcm). Qatar strengthened its position as the world's largest LNG supplier. Its LNG exports rose 53% [26 Bcm] in 2010, with further growth in 2011.

Not only volumes, also the density of trade increased in response to growing opportunities: Qatar exported LNG to 19 countries in the world in 2010, four more than just a year earlier. And the four largest importers are now tapping into 14 supply sources on average, compared with 9 in 2005.

Integration proceeds rapidly. In 2010, the rate of expansion of LNG was four times higher than in pipeline trade. The share of LNG in international gas trade moved up to 31%, from 23% in 2005. Such growth can be transformational. Some of the consequences are on display in Europe.

OECD Europe natural gas market



European gas consumption rose to new heights last year [+7.7%, 39 Bcm], propelled by the economic recovery and two cold winters. Nonetheless, intense competition persisted between alternative sources of supply.

In 2010, Europe's net import requirement increased by 8.8% [22 Bcm]. Yet oil-indexed pipeline gas remained uncompetitive, despite negotiated discounts. With an average spread between spot (UK NBP) and oil indexed contract (AGIP) prices of 22% for the year, spot priced LNG continued displacing pipeline gas, and Russian exports to Europe declined for a second year [-1%, 1.5 Bcm]. European buyers imported an unprecedented 87 Bcm of LNG [+18 Bcm, 27% on 2009]. Flexibility thus improved, lowering prices in Europe.

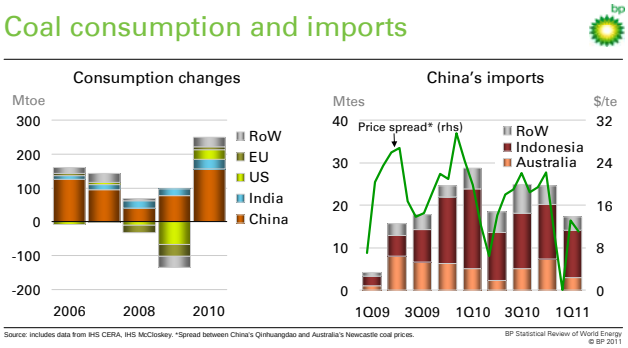
Gas-on-gas competition has been more subtle elsewhere. Asian buyers increased spot purchases; and Japanese utilities benefitted from abundant LNG by entering into medium-term contracts at more advantageous links to oil prices. But overall, spot prices have yet to make significant inroads and utilities are typically still sheltered from the need to compete for alternative supplies.

Globally, gas markets are integrating and the flexibility to manage external shocks is increasing: Russia in pipeline gas and Qatar in LNG are holding spare capacity. This has enabled gas markets to deal well with the Libyan supply outage and the aftermath of the Japanese earthquake. Markets expect this to continue: Spot gas prices are trading below contract parity so far in 2011.

Coal, hydro and nuclear

I'll be brief with respect to the remaining "classical" fuels – and the tune will start to sound vaguely familiar.

Coal consumption and imports



Like all other fuels, coal production and consumption grew above average in 2010 – by 6.3% (220 mtoe) and 7.6% (250 mtoe) respectively. The shift toward non-OECD consumption continued, with China and India increasing coal use by 10% (157 mtoe) and 11% (27 mtoe). As with other fuels, OECD coal consumption also shot up – by 5.2% (54 mtoe), the fastest rate for 31 years and hard on the heels of a decline of more than 10% in 2009. Among all the fossil fuels, coal consumption grew the fastest.

Estimated international coal trade grew by 17.5% in 2010 – more than twice as fast as consumption. Trade flows showed major regional swings, mirroring price differentials and demonstrating the competitive nature of international coal markets.

China remained the world's second largest importer (after Japan), because of relatively high domestic prices. Meanwhile in Europe, steam coal imports fell because

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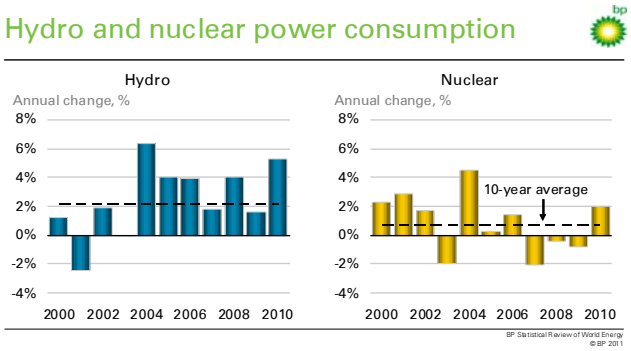
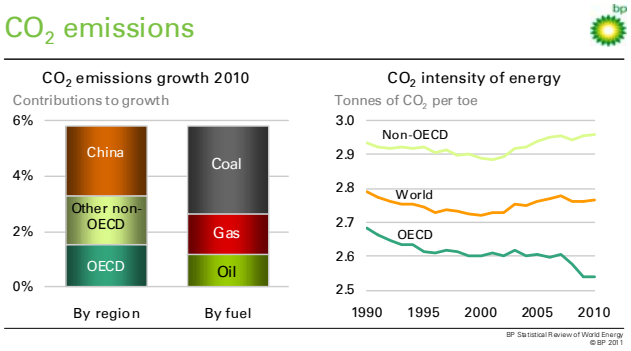
of competition from gas, and coking coal imports rose, on the back of recovering steel production. Within those imports, very large swings took place by country of origin, adjusting demand to higher prices in Asia – but without much public attention.

Coal markets worked, quietly and efficiently.



Hydroelectricity (5.3%) and nuclear power (2%) both grew above their ten year trend in 2010. In terms of average global precipitation, 2010 actually was the wettest year since 1900; little surprise then that in absolute terms, hydroelectricity saw its biggest increase ever. Nuclear generation had been hampered by a high number of outages in recent years, even before the Japanese incident. After three consecutive years of decline, it returned to growth in 2010.

Carbon emissions



Unsurprisingly, the general picture of strong energy growth translates into bad news for carbon emissions.

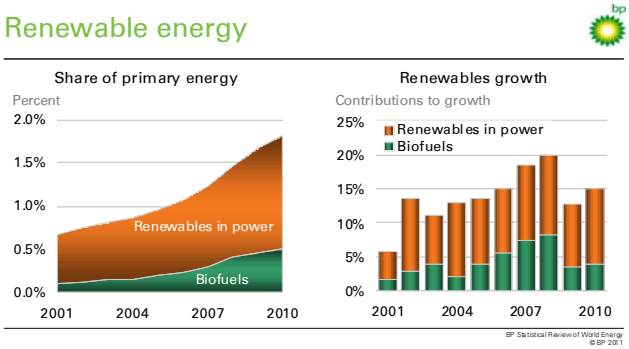
In aggregate, all the non-fossil sources of power combined grew by 4.9%, less than the growth of primary energy. With coal consumption growing at the highest rate among fossil fuels, global CO2 emissions from energy – measured by standard conversion rates – grew by 5.8% in 2010, faster than total energy consumption, and the fastest rate of growth since 1969.

In our data, emissions grew strongly in the OECD (3.4%) and non-OECD (7.6%) alike. By country, China had the world's largest emissions increment. It accounted for 43% of the global increase, followed by the US with 13%. There are a few countries where emissions declined, but these either had special circumstances to claim – for example Australia, where strong hydro generation replaced coal – or they failed to participate fully in the economic recovery.

Global emissions intensity – the amount of CO_2 released per unit of energy – increased in 2010. It is a problem familiar from the discussion of energy intensity: The increasing weight of carbon intensive countries (such as China) in global energy consumption may result in an increase of global emission intensity, even though most of these countries (including China) actually achieve declines in their own emissions intensity. It shows how joined-up the world has become.

Renewables

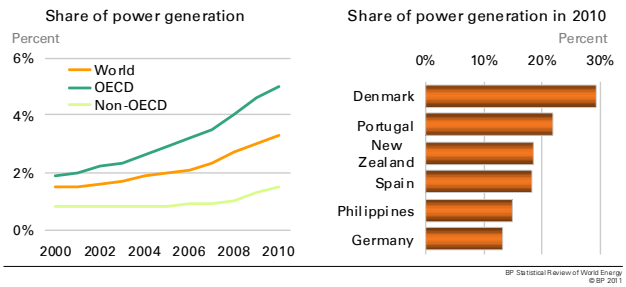
Not to end on a depressing note, I left the promised detailed discussion of renewables for last.



Just when progress on carbon emissions appears difficult and the public purse is empty, renewables– finally – are clawing their way into the statistics on global energy consumption. They still have far to go; but limitations and prospects are becoming clearer along the way.

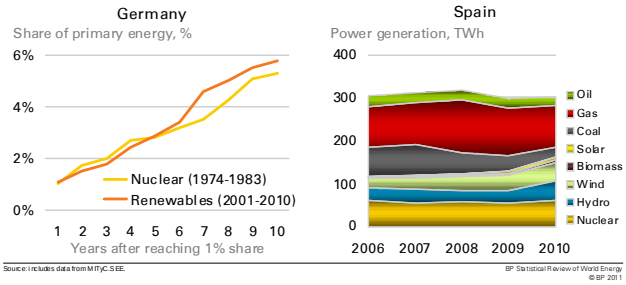
We record renewables in power generation – wind, solar, geothermal, biomass and waste; and biofuels in transport, i.e. ethanol and biodiesel. Together, they accounted for 1.8% of global primary energy last year – 1.3% from renewables in power generation and 0.5% from biofuels. This is not much but over the last ten years, their share has almost trebled; and over the last five years, their contribution to primary energy growth was almost 10% – that is, higher than the contribution of petroleum-based products.

Renewables in power



Renewables in power generation grew by 15.5% in 2010, with OECD growth returning above trend from a hefty dent in 2009. They accounted for 3.3% of global power generation in 2010 – widely dispersed across countries, and with 78% of all renewables consumed in the OECD. European countries traditionally took the lead in this sector. Still today, 9 out of the top 10 countries in per capita consumption and 8 out of the top 10 by share are in Europe – with windy Denmark having the highest share of renewables in power generation, at 29%.

Renewables in Germany and Spain



There is evidence now to study how renewables behave as they scale up, what their prospects and limitations are. The best examples are Germany and Spain. Both have been leading contributors to wind and solar growth. In Spain, wind contributes 14.5% to power generation and solar 2.4%; in Germany the numbers are 5.9% and 1.9%. Last year the output of solar power in Germany almost doubled, accounting for 57% of the growth of global solar power production.

Their experience allows for a few observations.

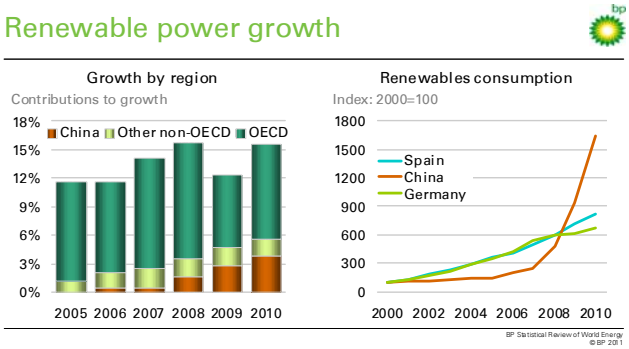
The first concerns the speed of deployment. It is instructive, if somewhat ironic, to compare the rate at which renewables have gained market share in Germany over the last ten years with the rate at which nuclear power penetrated the energy market thirty-five years ago – both are examples of a new energy technology deployed at scale with public sector support. The path looks remarkably similar: Starting from the year in which the new technology reached a 1% share of primary energy, their shares increased to more than 5% over ten years. Both grew at about 20% pa for ten years, meaning they doubled every four years. Even at those rapid rates of growth it takes time for a new technology to change the energy mix.

The second observation concerns a potential conflict between subsidisation and scale. There is such a thing as too much success. Both countries have seen renewables take off rapidly but, of course, it wasn't (yet) sunshine or technology which caused that advance but attractive feed-in tariffs. The unexpected success of such policy programs (or over-generous incentives, depending on your point of view) in the face of falling unit costs and rapid growth has prompted them to roll back financial incentives in 2010 and in 2011 – a roll-back which is widespread across Europe.

Finally, there always is the law of unintended consequences shadowing energy policy. In this case, unintended consequences may arise from the forced change in the fuel mix. Many European countries have policies in place, for example, to protect employment in coal mining. The growth of renewable power in Spain, the easy access to relatively cheap natural gas and, on top of this, a strong year for hydro have squeezed coal in the power sector fuel mix. The squeeze has become so acute that the government has intervened to protect coal-fired power generation. It incurs additional cost to protect employment in exactly those sectors which are under pressure because of subsidies elsewhere.

What can we draw from this? First, renewables can be scaled up, but it takes time. Second, success in scaling up may overwhelm the support system. Third, renewables policy may clash with other policy objectives.

Renewable power growth



Fortunately, renewable energy growth is no longer just a topic for mature and well-to-do economies. Total renewable power consumption grew by 15.5% last year, but OECD growth (12.4%) remained below the peak years of 2007 and 2008, while non-OECD growth has continued to accelerate, reaching 27.7% in 2010. As a result, the non-OECD now accounts for a much larger share of the growth than it did before 2007.

China accounts for most of the acceleration in non-OECD renewables growth. In wind power, China has

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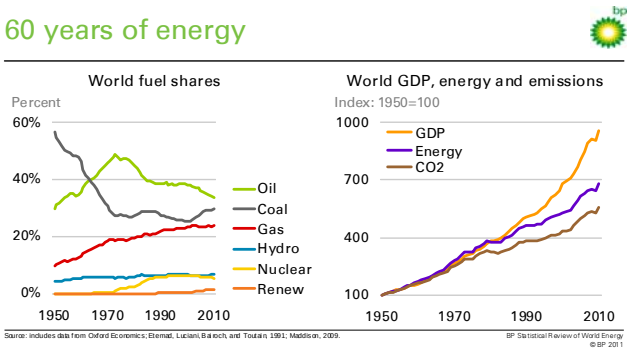
overtaken the US to become the world leader. China accounted for nearly half (48.0%) of all the new wind capacity added globally in 2010 and more than trebled capacity since 2008. Despite this rapid growth, wind still plays only a minor role in Chinese power generation, with a share of 1.2%.

4. Conclusion



It's been sixty years since Jamie Jamieson and Dusty Miller drew up their first statistics. Where does this leave us? How does 2010 fit into the bigger picture?

There are a few things we can say.

2010 was a year of exceptionally strong demand growth for all fuels – but a return to trend, not a break with the past. This trend itself is now increasingly shaped by the rapid ascent of industrializing economies and their rising share in global GDP, a process which has accelerated during the years of crisis and recovery. This ascent inevitably makes it harder to translate gains in energy intensity – or in emissions intensity, for that matter – into slower global energy (or emissions) growth.

Overall, then, the gap between improvements in economic well-being and energy consumption continues to open slowly – and the gap between energy consumption and carbon emissions, too slowly.

Market prices are guiding this system well. From man-made restrictions to access oil, to expanding interfuel and gas-on-gas competition in natural gas, to the quietly efficient trading of coal across borders, prices have played their role of conveying the information needed to direct resources.

Renewable fuels need and have received policy support. But the market place is one great discovery mechanism. It brings things into the open, whether we like them or not. We often dub it "the law of unintended consequences", and it does apply, however sensible the cause. As decarbonised fuel supplies scale up, this great discovery machine can be used to see what sinks and what swims. Not to introduce competition could soon become costly.

Knowing today's numbers, Jamie Jamieson and Dusty Miller, most likely, would agree.

60 years
BP Statistical Review