Can an energy melt-down be avoided in the United Kingdom?

Written by Hugh Sharman, sharman@incoteco.com

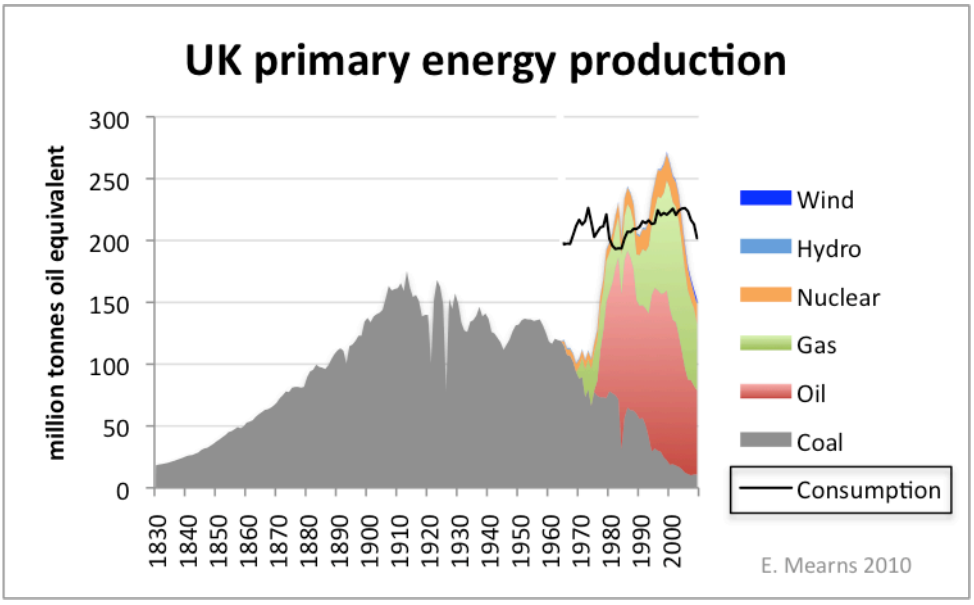
Summary

After hundreds of years of imperial and industrial power and recent energy self-sufficiency, the UK has suddenly become more or less powerless as a world player. With its North Sea resources fast depleting just when it seems that the world's upstream energy producers of oil, coal and gas are struggling to meet rising global demand, saddled with a public debt of £ one trillion, and a massive and worsening trade deficit, its leading role as an innovative, world-class centre of scientific and manufacturing know-how long ceded to Germany, Japan - and now China, it is ill prepared to become a net energy importer.

Its aging primary electricity infrastructure was designed for its days as a low-cost, energy producer. Its technically illiterate, if financially canny politicians and civil service do not appear to understand that the world's financiers are not likely to be attracted to placing the estimated £200 billion of long-term investment into their vision of a "low carbon" infrastructure while this concept remains so extremely wooly and badly-defined.

The UK's freedom for technical and financial manoevre is deeply restricted by passing into law the Climate Change Act in 2008 and its shared but impractical and expensive commitment to the EU's 20-20-20 targets. Something must give as it heads, almost willfully, toward certain failure.

The end of energy self-sufficiency



Euan Mearns' dramatic chart[i] illustrates how the UK has run through most of its hydrocarbon inheritance within the lifetime of anyone over fifty years old today.

Can an energy melt-down be avoided in the United Kingdom?

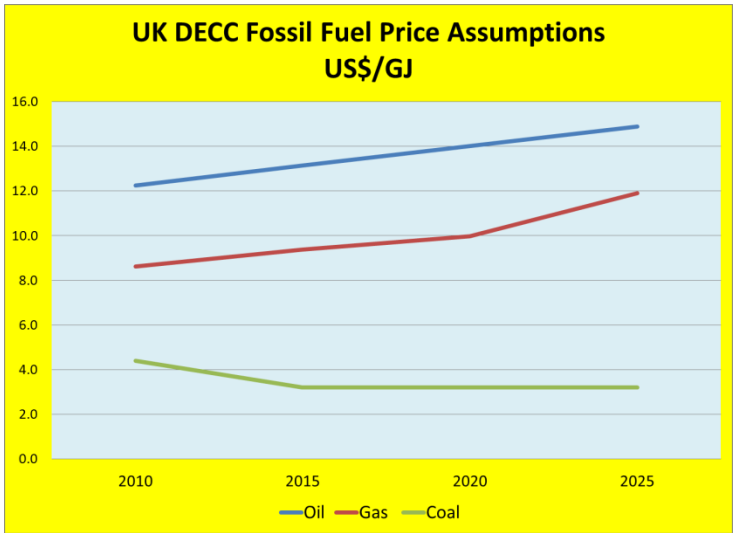
In one way or another, Britain has been energy self-sufficient for most of the last five hundred years. The destruction of its forests for ship building and fuel, prior to the industrial revolution, came to an end with the invention of the steam engine and the exploitation of coal. Until then, with the exception of water and windmills and the use the wind for sea transport, all products on the World market were manufactured and delivered by human and animal labour. The industrial revolution changed all that, energized by abundant cheap coal and a certain carelessness over the environmental effects of coal-mining and coal combustion.

The empire-builders of the 19th century ensured secure commodity supplies, including hydrocarbons, by planting the Union Jack on an unprecedented fraction of the World's land surface. Two of the world's top oil companies are still domiciled in UK.

Its luck held out even as the Empire was dismembered during the period from 1947 to 1970. By then, the technology of finding and producing oil and gas in stormy, exposed seas enabled the UK to replace oil and gas imports from its colonies and protectorates, with supplies from reservoirs under the North Sea. Very briefly, around the turn of the last century at a period of unprecedented low energy prices, Britain once more became a net energy exporter.

Hundreds of years of energy independence and trading experience appear to have instilled much unrealistic optimism over the sharply changed circumstances in which it now finds itself. Enunciated UK energy and economic policy relies on assumptions that are completely unrealistic in today's multi-polar world.

The "central" fossil energy price projections (UEP) for 2010 prepared by the Department of Energy and Climate Change (DECC) are summarized below[ii].



For readers who prefer to think in traditional market trading units, the conversion factors for these are shown below.

To convert from $/GJ		
Oil	to Dollars per barrel multiply by	5.7
Gas NBP	to pence per therm, multiply by	6.7
Coal ARA	to $ per tonne, multiply by	25.0

So the central planning scenario with which the new Coalition Government started out in May 2010, inherited from an equally blithe Labour Government, was for oil to rise from $70 then to $85 per barrel by 2025. It assumed that the price of gas would rise from 58 to 71 p per therm in 2025. And that coal would actually get cheaper over the next 15 years, falling to $80/t.

Just one year later, a snapshot of the present (June 2011) shows Brent oil comfortably over $100/b, gas pushing 70 p/therm this coming winter and coal already 50% more expensive than its assumption for 2025! There is an uproar in the national press about commodity-related energy price rises, some already announced and now expected across the board, during the approaching winter 2011 – 2012.

Similar, unrealistic assumptions are used by Bank of England, the newly formed Office for Budget Responsibility and the UK Treasury, as key inputs for their economic models, forecasting inflation and economic growth.

Even the “high, high” assumption for the oil price in 2010 is $103 per barrel. Can it be any wonder that the Bank of England seems unable to forecast, let alone affect, inflation by playing around with interest rates?

No one can claim that all this was not and could not have been foreseen. A small, vociferous if disunited group of energy experts all over the world, generally and often patronizingly disparaged as “peak oilers”, had for years been warning, from irrefutable data, that growing demand could not endlessly and affordably be met by supply. But a little common sense should have given the same message.

Despite continuously rising oil prices since 2001 and huge global investments in upstream hydrocarbon extractive capacity, global liquid extraction rates have remained more or less the same since 2004. Briefly, during the summer of 2008, just prior to the financial melt-down, all hydrocarbon liquid demand could not be met by supply at 88 million barrels of oil per day (bopd) and the price of crude soared above $140/b. At this unaffordable and ruinous level, some demand destruction was inevitable. The global economy today has still not recovered

from the toxic consequences of high commodity prices and banker-fueled indebtedness from this period.

Its ostrich-like reluctance to see the world as it is, rather than how it wishes the world to be, is pretty much shared by many of today's energy-importing members of the OECD, gathered under the auspices of the IEA. This was set up by the OECD in the wake of the 1973 oil supply crisis. Its primary duty has been to advise its client governments about oil supply and to coordinate oil stocks in the event of supply disruptions. The IEA's own record of energy demand, supply and price forecasting has been dismal, especially in recent years.

It has been consistently optimistic - and serially wrong - both as regards the availability and price of crude oil (as well as gas and coal). The following is a table imported from its WEO 2000.

Table 1.1: **Fossil Fuel Price Assumptions** (in year 2000 dollars)

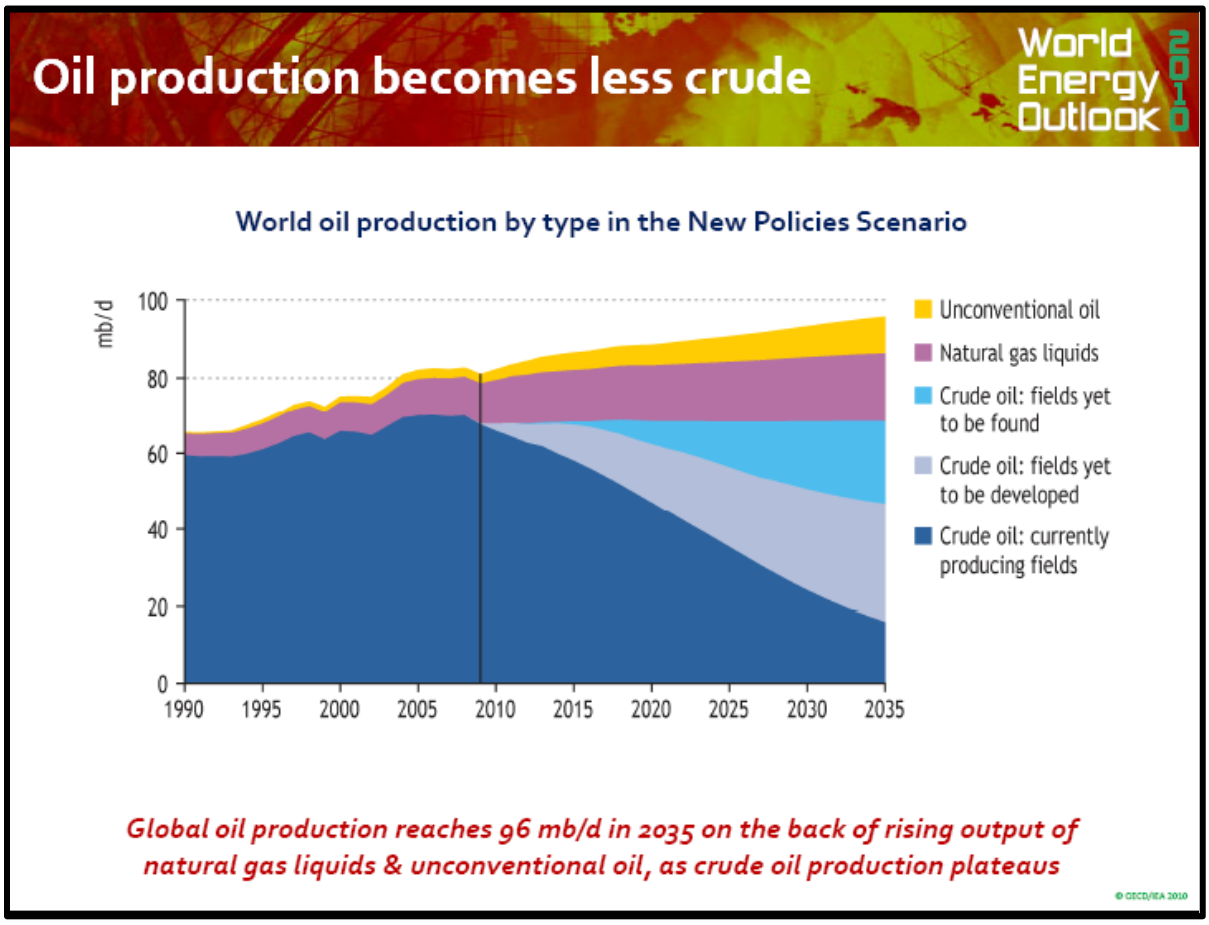
	2000	2010	2020	2030
IEA crude oil imports ($/barrel)	28	21	25	29
Natural gas ($/MBtu):				
US imports	3.9	2.7	3.4	4.0
European imports	3.0	2.8	3.3	3.8
Japan LNG imports	4.7	3.9	4.4	4.8
OECD steam coal imports ($/tonne)	35	39	41	44

Note: Prices in the first column are data. Gas prices are expressed on a gross calorific value basis (MBtu: million British thermal units).

Four years later, in its *WEO 2004*, the IEA confidently forecasted that by 2030 global demand for hydrocarbon liquids would be 123 million bopd and that this would be delivered in 2030 at an expected price of $55 per barrel (in 2004 dollars).

In a welcome break from this record past, *WEO 2009* was based on a fundamental reassessment of its data base. Instead of accepting third-party, for example OPEC, assertions as if these were true, it examined the real data of over 800 of the world's largest oil fields during 2009. In the light of this, it saw fit to sharply reduce estimates for demand in 2030 to what it saw might possibly be supplied, i.e. 106 million bopd.

Just one year later, this estimate was further reduced to less than 100 million bopd, only ten million bopd short of what may be demanded in 2012, if supply can be met. The following presentation slide comes from the IEA's *World Energy Outlook (WEO 2010)*, published in November 2010.



The graphic shows how rapidly depletion is eroding today's crude oil extractive capacity and how the IEA foresees such depleting capacity being replaced. In order to maintain liquids extraction into the future, at flow rates that will satisfy estimated demand growth, new oil fields must be found, developed and commissioned at the rate of about 2 million barrels of oil per day, per year. This is equivalent to discovering, developing and commissioning a new "North Sea" every year. Or in other words, simply to raise the rate of hydrocarbon extraction during the next nine years, the global upstream industry must develop the new productive capacity equivalent of two "Saudi Arabia's", more or less from scratch.

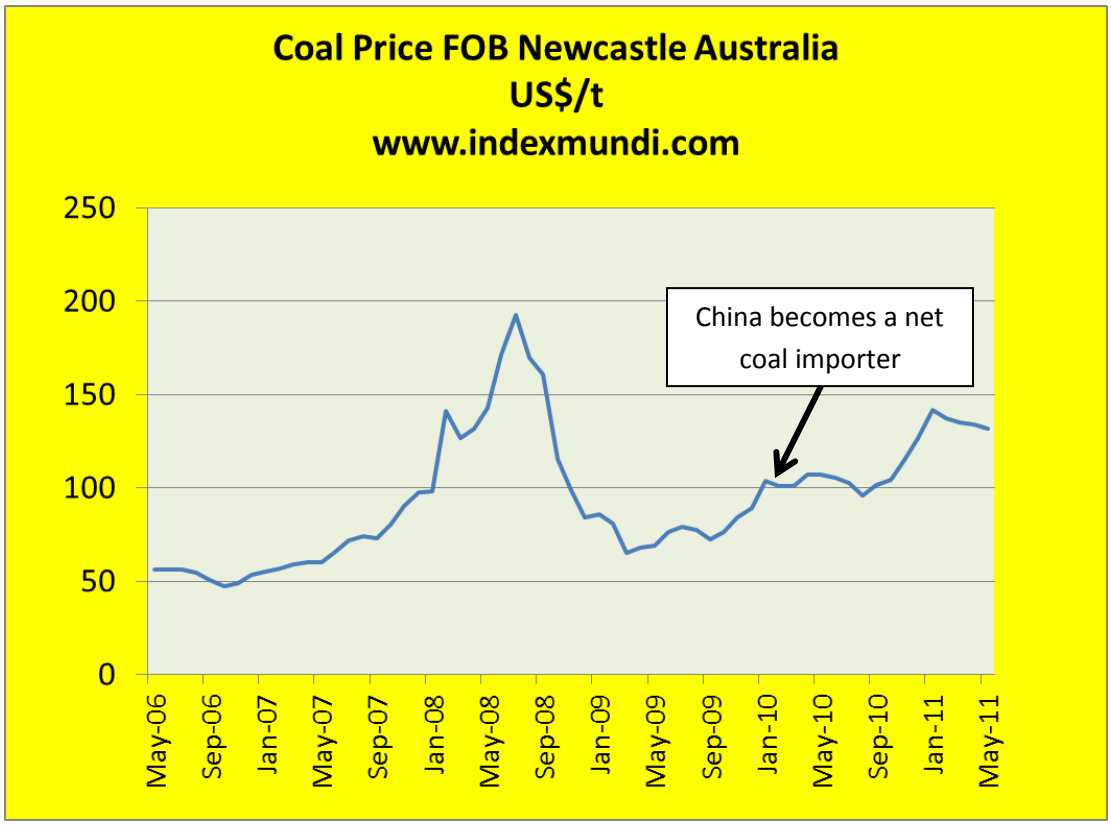
This is unlikely at best and probably impossible. It painfully demonstrates the extreme weakness of the assumptions on which OECD (and UK) energy policy is constructed.

The same optimism applies to coal availability and price. Until 2008, China, the world's largest coal miner and consumer, burning around 3 billion tons per year (42% world demand), was a net exporter of coal. In 2010, for the first time in history, it imported 130 million tons of coal from the global ship borne market. In 2010, this amounted to approximately 700 million tons.

Can an energy melt-down be avoided in the United Kingdom?

China's annual consumption of coal has been increasing at the rate of between 150 and 200 million tons[iii].

A question that should be obsessing the minds of all coal importers right now is how much longer China (and India) can supply their incremental growth from this relatively small global pool of exported coal without causing an international coal-supply crisis? No wonder that the price of coal has recovered from 2009 lows of $60/t and has increased during the last ten years from roughly $30 per ton to $130 today FOB Newcastle (the one in Australia, of course!).



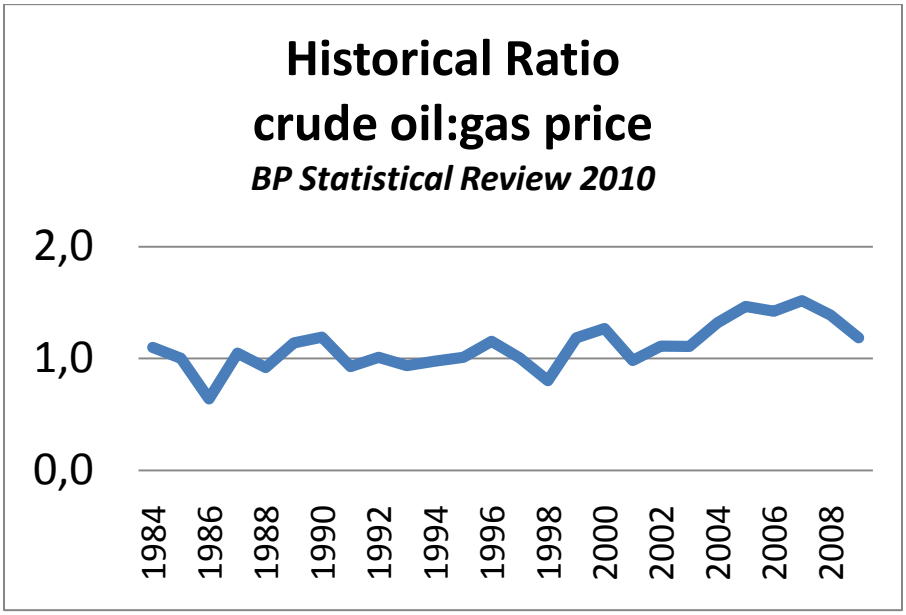
One strange solution for dealing with high priced coal is simply to restrict generation. Rolling blackouts on the east coast of China are already happening[iv] in the name of "controlling inflation". But an unintended consequence of this action by the power companies, whose tariffs are controlled but cannot afford to generate at a loss, will be a huge burn of even more costly diesel fuel in the many standby power plants at private and industrial facilities in all the affected areas.

One thing is certain. Everyone who can invest in increasing global coal extractive capacity is piling into the market. It remains to be seen whether the rest of the world can develop new mining capacity fast enough to meet China's foreseen demand, let alone the demand of traditional coal importers such as India, the UK and much the rest of the EU.

Yet, the "central" price assumption of the UK for 2025 (no less) is just $80 per ton.

"Happy talk" about gas

All over the world, there is much "happy talk" about the wonders of shale gas and how the link between oil and gas prices will (finally) be broken by the abundance and low price of this new "wonder" fuel. The following chart maps the oil/gas price ratio from 1984 until 2009. The gas prices used in the calculation are the annual average of LNG CIF Japan and CIF gas into the EU.



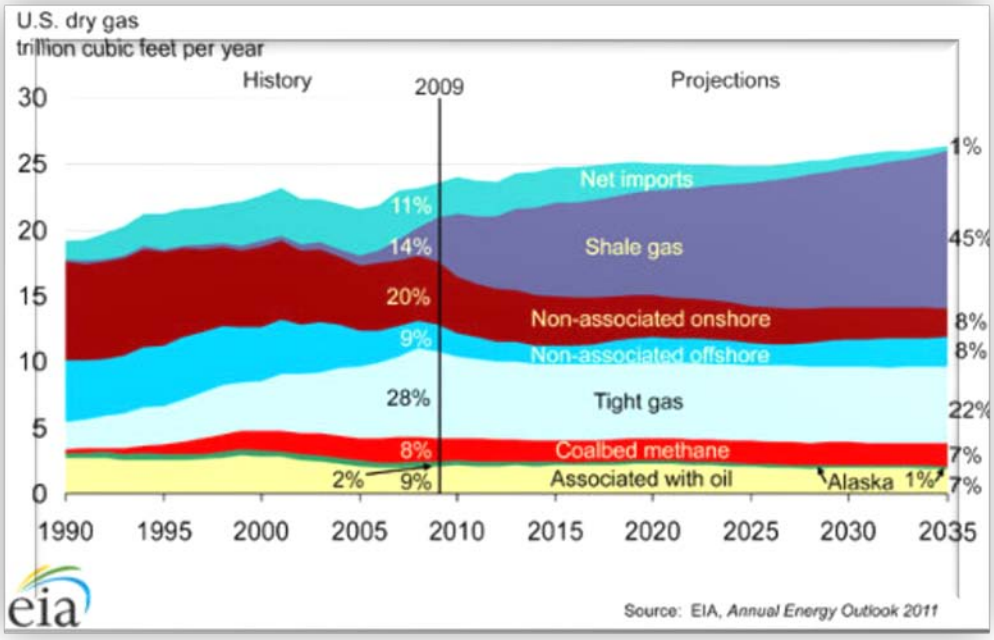
Unfortunately, such "happy talk" is not justified by the facts. Firstly, many pure (dry) shale gas plays in the USA are losing money at the low prices that cause such a high level of false consumer optimism in the US. Because of this, shale gas drilling in the USA has more or less halved since 2008 and new drilling this year is focused on areas where the gas comes up with lots of much more profitable, associated hydrocarbon liquids[v].

As the Editor's recent interview with Frank Umbach in the *European Energy Review* [vi] made clear, and for all the reasons just enunciated, ***of course*** it is important to look for, and where economically and environmentally feasible, extract shale gas. Given the looming energy shortages, this would be worth doing at almost any cost so as to reduce Europe's increasing and potentially crippling reliance on large and near-monopolistic gas exporters like Russia, Qatar and Algeria. These suppliers have no rational interest in reducing the price of their gas and every reason to pursuing and maintaining their target of price parity with oil. But we in Europe must to be clear eyed. The technology is not cheap when all its external (in particular, environmental) costs are fully taken into account. So the future of shale gas as a World and UK

source of primary energy must, for planning purposes, be regarded as marginal at best, until its full costs of extraction and use are better understood.

Furthermore, natural gas is highly fungible. Faced this year with $4 per gallon gasoline, US engineers, companies and consumers are today exploring ways of using new-found "cheap" natural gas as a transport fuel. Many millions of vehicles, all over the world, have already been using compressed natural gas in cars and taxis for many years[vii]. Its use as a speedily adapted transport fuel by the US, will rapidly erode any perception of surplus.

Any way, there is no surplus. Note how the USA remains a net importer of natural gas and is likely to be for many years to come. Take especial note of how fast its *truly cheap*, conventional natural gas resource is depleting.



In conclusion, the UK's optimistic energy price projections, showing how imported gas will be so much cheaper than oil, so far into the future, are badly justified.

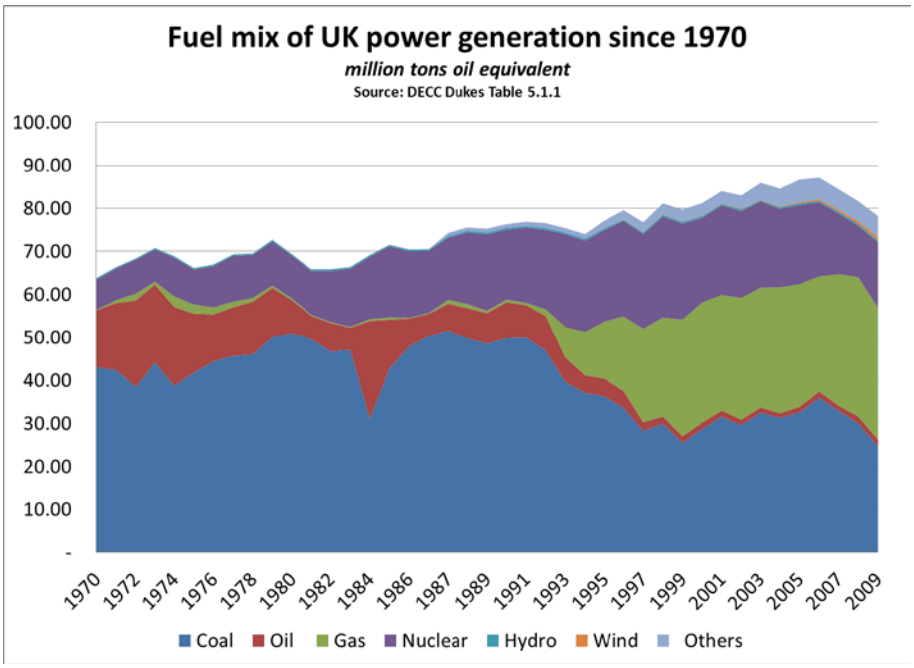
We may all deplore shameless rent-seeking by monopolistic suppliers until we are "blue in the face" but we can hardly blame them for seeking to squeeze the maximum for a depleting product which they (and we) know our consuming societies cannot survive without. They learned that trick from us!

Consequences arising from optimistic energy price assumptions

Over-optimism over the future availability and price of fossil fuels has characterized UK energy policy since the discovery of North Sea oil and gas. This reached a peak under the Thatcher Government in the early 1980s which set the UK on the path of deregulating almost all activities concerned with energy production and use. An excellent paper by Oxford energy economist, Dieter Stern[viii] can be recommended for those interested in the history of "light touch" UK energy regulation during the years since.

Nevertheless, Thatcher's government, bruised and made wary by the risk of further coal-mine strikes during the 1980s, pursued the construction of another nuclear power plant at Sizewell on the south-east English coast that was commissioned in 1993. This was the last major power plant built in the UK that does not rely, more or less entirely, on burning natural gas.

The composition of the fuels used by the UK's fleet of power plants has been revolutionized during the past 40 years, particularly by the arrival of "cheap" North Sea gas and its use in power generation from the early 1990s, as illustrated in the following chart[ix].

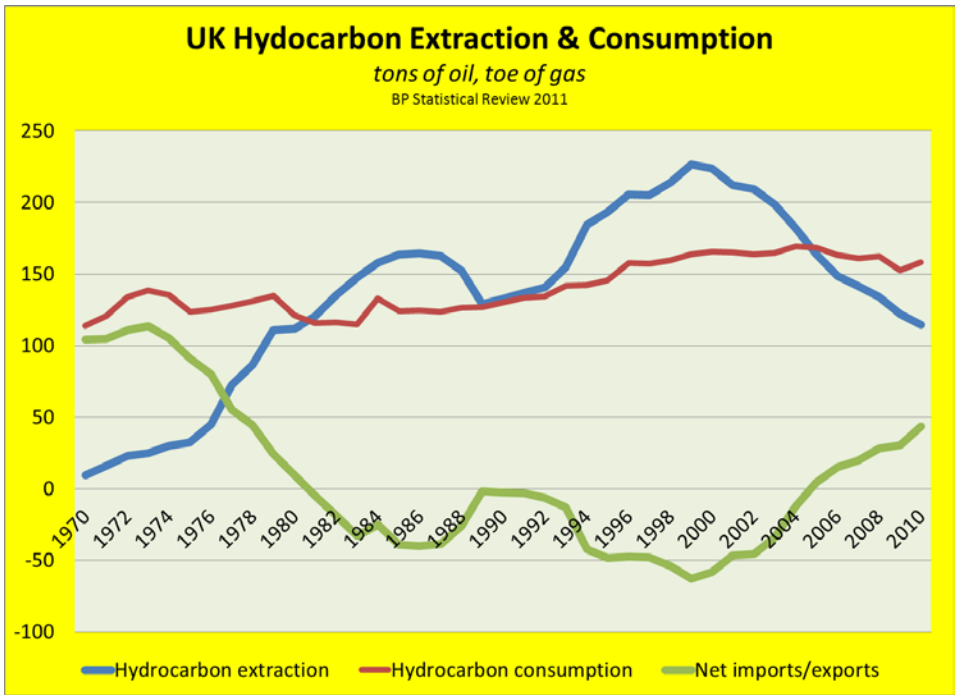


Beside the massive reduction in coal use, note how rapidly the contribution from nuclear has been diminishing of late.

The direct consequence of the hydrocarbon extraction policy, sometimes but inaccurately spun by politicians of all stripes, as a positive contribution by the UK to CO_2 reduction, is the loss by

evacuation of almost an entire, World-class hydrocarbon basin within the lifetime of a normal adult.

The UK was never obliged to do this. Both the Netherlands and Norway have regulated the rate at which their oil and gas fields have been emptied more rigorously - and so will remain in the extraction business considerably longer, and will most likely obtain a higher extraction fraction from their reservoirs than on the UK side.



Net hydrocarbon exports, peaked at over 60 million tons per year in 2000, ironically at the bottom of the market. Since 2005, the UK has become a net hydrocarbon importer. Import dependency has grown by an average of 10 million toe per year over the past decade, so by 2015, net imports are likely to be roughly the same as they were in 1970, around 100 million tons oil and oil equivalent per year.

If the price of gas once more converges with the price of oil, the addition to the trade deficit, with oil at $750/t ($100/b) will be an additional and unaffordable $75 billion per year. More if oil rises. It is hard to see how the cost of the hydrocarbon trade deficit can possibly be covered by increased exports in goods and services.

The UK has become one of the largest gas consumers in the world. Only the USA, Russia, Iran, China and Japan consume more gas. Most city-dwellers use gas for heating and the country's electricity infrastructure has seen a huge increase in gas-fired power plants since 1990, now totaling 29 GW.

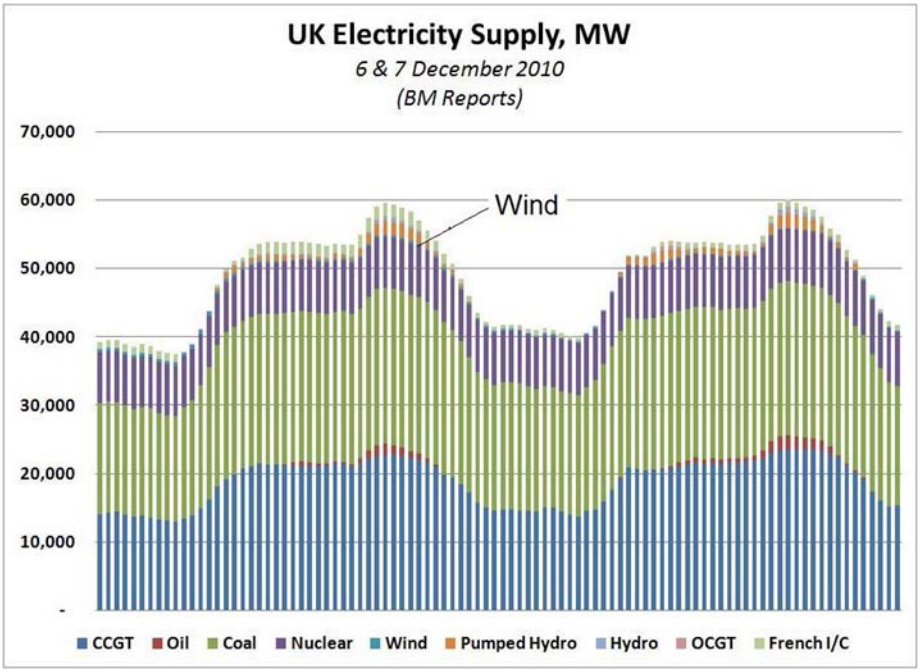
This is bad enough. Worse is to follow.

Can the UK keep its lights on?

By or before the 1st January, 2016, under a treaty with its EU partners, the UK will lose 8 GW of ancient, polluting and inefficient, if well-functioning coal capacity and 3 GW of 1980s era oil capacity that is routinely used to cover peak demand. These must close because in 2008 their owners chose not to add flue gas desulfurization equipment that is demanded of all EU power plants that burn coal or sulfur-containing oil.

By 2018, the roughly 10 GW of nuclear power capacity that was available in 2010 will shrink through obsolescence to 3.6 GW with further closures taking place in 2023.

The financial crisis of 2007 – 2009 resulted in a relatively small overall reduction in energy use, much of it in manufacturing. By 2010, with a weak financial recovery taking hold, energy demand picked up more or less to normal while peak electricity demand during the third cold December in a row, returned to levels last seen during the boom years prior to 2007.



It can be seen from the foregoing chart and from many similar instances all over NW Europe, that winter peak power often coincides with very large, slow-moving anti-cyclones that bring extreme cold weather and almost no wind, therefore little or no wind power output.

Further south, similar events in summer coincide with peak air-conditioning loads.

The foregoing chart shows that all the "doomed" nuclear, oil and coal-fired plants played a major role in keeping the lights on during the winter 2010 – 2011. Total "firm" generating capacity stands today at around 72 GW. Clearly, no matter how much wind power is built, if the wind does not blow during periods of peak power demand, its capacity is worth more or less nothing.

The loss of 11 GW of reliable capacity during the next four years, along with 3,4 GW nuclear, almost 15 GW in all, risks precipitating a real capacity (keeping the lights on) crisis by the middle of this decade.

In such a "free market" and with such obvious signs of coming, extreme stress in the system, one would expect generators to be lining up to deliver the obviously needed new capacity. There are, indeed, an impressive number of planned power stations, nearly all of them gas-fired and some with licenses to generate power.

The major generators claim to be ready to build new nuclear power and "clean coal" power plants to replace obsolete capacity. A bright new future beckons during which the figure of £200 billion is regularly cited as the amount of money that "must" be spent to make the UK's tatty energy infrastructure fit for the 21st century. So why are so few new power stations actually being built?

Regulatory confusion, muddle and uncertainty

Contrary to any impression that may have been given hitherto, that the UK energy market is truly "open and free", this is not at all the case. Electricity and energy equals big money and big taxes, not to mention cushy jobs following retirement from Parliament and the civil service. Politicians may pay lip service to chatter about the openness of the UK's energy market but the temptation for political and fiscal interference into energy matters has always been irresistible.

When Mrs. Thatcher's government privatized the energy and power industries, it put in place an independent regulator, OFGEM[x] to "protect" the consumer from the power of natural monopolies like the gas pipeline operators, transmission and distribution companies. The original idea of energy liberalization was to separate power generation away from transmission and distribution, so creating a "free" market in which energy would be treated without concern for long-term planning because energy was considered so abundant. Then Energy Minister, later Chancellor (Economics Minister) Nigel Lawson famously said that "*energy (should be) a traded good like any other commodity and its supply was to be settled in the market place*"[xi].

This already long paper will not delve into a detailed history of why it all turned out so different. But today there is effectively a monopolistic if privately-owned transmission company, National Grid[xii], that owns the country's high voltage transmission system. (Mysteriously, it also owns the country's high pressure gas transmission system and is therefore, ipso facto, an active player in the generation business, even owning gas importation facilities; it has a huge say in all new energy developments.)

Almost all the major thermal power stations, fossil fueled and nuclear, are owned by six large energy corporations, being *EdF*, *Centrica*, *E.On*, *RWE*, *Iberdrola* and *Scottish & Southern Energy (SSE)*. Until divestment very recently, two of these, *EdF* and *E.On,* also owned large distribution system companies

(DSOs). *Iberdrola* (through its wholly owned subsidiary *Scottish Power*) and *SSE* still own a large fraction of the country's distribution business.

In theory, energy customers are free to buy their gas and electricity from a wide range of retail suppliers and move their accounts freely in pursuit of the best prices. In practice, the choices they face are made difficult by the extreme (and deliberate) complexity of tariff choices from the retail energy market, essentially controlled by the "big six". So the churn of customers is small and consumers, almost twenty years after privatization, certainly do not feel "empowered" by choice.

The "monopoly" businesses, including the DSOs, are regulated by *OFGEM* which approves which investments in their monopolistic businesses may or may not be charged back to the consumer.

A natural and unsurprising consequence of having a powerful and highly proactive energy regulator like *OFGEM*, *National Grid* (owning all the country's key energy transmission assets) and the Government's *Department of Energy & Climate Change (DECC)* is much noise but not much light.

Who is really in charge? Which of these players can actually cause a difference? Who among them can actually and does cause something to happen? The answer in practice is "no one". No person will actually take any responsibility for what will happen from here on.

In trying to imagine a way out of this mess, one is irresistibly reminded of the famous Irish joke where a local is asked directions for a destination by a passing, lost motorist. The local replies, "*Well sir, I would not be starting from here*".

To be fair, all the energy importers of the OECD, as well as the UK, have become more or less helpless bystanders rather than proactive players in the hunt for primary energy resources, ceding the role of "chief exploiters" to cash-rich, nationalized energy companies from the rising powers of Asia and the international oil companies (IOCs). Resource-rich OECD countries like Canada and Australia, though still militarily and culturally allied to the USA and EU, are much more focused these days on trade with these new powers. Similarly, the USA gazes to the Pacific and beyond to India and Africa. Resource-rich Russia as ever looks to regain past glories, whether real or imagined, playing the EU off against its southern neighbours.

Nominally, the UK Government is in charge of UK policy. It has been extremely busy during the last fourteen years, holding numerous "public consultations" and publishing numerous energy and global-warming related "white papers". In 2003, for example, it decided that no new nuclear power would ever be needed as renewable energy would fill the gap left by retired nuclear. This position was completely reversed by 2006, when, quite suddenly the Labour Government decided that new nuclear was "vital" to "fight global warming and provide energy security". This all came to a head in 2008 when, during a single year, the UK Parliament voted through the Climate Change Bill and thus made swingeing CO_2 emission reduction a legal requirement for the Nation, not just for its own remaining tenure ***but all the way through to 2050!*** During the same year the UK Government agreed to implement the EU's 20-20-20 targets. These require that the UK will deliver 20% of its energy demand from renewable energy and reduce CO_2 emissions by 20% by 2020, just eight years from now.

Can an energy melt-down be avoided in the United Kingdom?

The Labour Government was not too busy to introduce an expensive and immensely complicated subsidy, called the Renewable Energy Obligation. This obliges electricity companies to purchase an ever increasing fraction of their power from OFGEM-approved renewable energy resources. A Renewable Obligation Certificate (or ROC) rewards the wind turbine or biofuel generator with an agreed number of ROCs, between 0.5 and 2 per MWh generated, over a pre-agreed number of years, depending on which renewable resource the Government wishes to incentivize. The cost is met by the consumer to whose electricity account all of this is charged. The typical value of a ROC to any renewable energy generator since it was launched has been between £30 and £50; it is the subsidy the generator receives on top of the market price. So far, this subsidy has cost consumers £5 billion, with £1 billion in 2010 alone.

This is set to rise exponentially to £7 billion per year by 2020, representing an accumulated transfer from consumers to (mostly) wind developers of roughly £40 billion which would be enough money to pay for a respectably sized nuclear capacity.

So far this incentive is delivering only 6.5% of the UK's electricity whereas the target for 2010 was 10%[xiii]. It goes without saying that this would have been better spent on creating dispatchable capacity, needed in any case because of wind power's extreme intermittency.

The transparent failure of this incentivization programme to achieve its targets should have given the in-coming Government some warning lights. Instead, it ploughs on regardless, introducing continental – style feed-in tariff (FITs) for roof top PV (annual capacity factor about 6%) costing consumers anything up to 40p/kWh. This is a great way to further transfer funds from poor consumers to rich house owners. None of these renewable energy sources will deliver any firm capacity, of course.

In 2009, OFGEM belatedly realizing that the "energy-only" electricity trading system that it set up in 2002, was no longer fit for purpose. This trading arrangement (called NETA) replaced the "energy + capacity" trading system put into place at privatization. Under NETA, the generators are motivated to keep spare capacity to a minimum – and are certainly not motivated to diversify away from low cost, fast-build gas turbines. Too late, OFGEM and the Government has realized that a completely new tariff structure will be needed to fund a properly diversified mix of privately owned, dispatchable generating capacity needed to meet the extraordinarily ambitious targets of the Climate Change Bill and the 20-20-20 targets – while also delivering energy security. Far too late, they are slowly realizing, that dispatchable "low carbon" capacity does not come cheap.

The technology options for capacity that can operate when the wind is not blowing and the sun is not shining is limited, more or less, to electricity storage, nuclear power and coal-fueled generation where the CO_2 is captured and buried, so-called carbon capture and storage – or CCS. This new generating capacity, together with the 33 GW of offshore wind and the transmission equipment needed to transport the power to market is variously and estimated to cost between £100 and £200 billion.

As this paper is being written, two years later, the new Coalition in the UK is studying the results of yet another consultation, this time into the shape and form of Electricity Market Reform (ERM) that will determine the new tariff structure.

The effect of all these U-turns, consultations and loose chatter has been to make the market extremely wary of committing money into the generation sector. The "money men" have not forgotten the

introduction of today's (NETA) energy trading system when many £billions were lost by private generators who had invested into the UK generating sector under the old rules which the new rules made value-less. The nuclear industry was bankrupted and had to be nationalized. Europe's largest generator, Drax Power, was only saved by its bankers taking a longer view but at a huge, £billion cost to its then owner, AES.

The Coalition is about to publish its proposals for the new electricity market trading rules at a time when the UK news media are full of "shock horror" stories about 10% - 20% inflation in consumer gas and electricity tariffs while literally £millions per month that are being spent by National Grid for compensating wind turbine owners whose output is being curtailed because of network congestion[xiv].

To succeed, the future electricity tariffs will have to contain a new "generation capacity" payment that does not exist in current tariffs. The timing of the announcement of the new trading rules, during the autumn of 2011, with global energy (and food) prices likely to escalate even further will be unpopular to say the least and might be regarded as unbearable.

Under these circumstances, what is the chance of separating £200 billion of private capital from its owners in long term, unsecured investment in the UK's "low carbon" vision?

An incoherent obsession with "Climate Change"

In the UK as with the rest of Europe these days, it seems that all energy policy is primarily driven by the so-called "climate change" agenda. I write "so-called" because if the rest of the World does not speedily comply with European demands, norms and standards, the EU's expensive and hubristic ambition of ever materially affecting global emissions of greenhouse gases will be fruitless. Last year, global emissions of CO_2 amounted to 30 billion tons[xv], of which the EU-27 emissions of greenhouse gases were 5.6 billion[xvi]. The UK's emissions of roughly 550 million tons of CO_2, are just 1.7% of global CO_2 emissions and continue to diminish. These numbers are flattered, of course, by off-shoring heavy industry and manufacturing in countries that do not penalize these activities (see EER's interview with Robert Jan Jeekel [xvii]).

While one must remain responsibly open to the possibility that rising CO_2 emissions may eventually result in some global warming, this will only happen if there are no fossil fuel supply constraints. But from the foregoing, it should be clear by now that if the main crisis that the whole of humanity (including the UK) faces is an imminent and desperately dangerous and damaging fossil fuel supply (and price) crisis, then run-away fossil-fuel caused CO_2 emissions will soon be curbed and reversed.

There will indeed be significant reductions in the use of fuels by the second half of this decade. The consequent reductions in emissions of CO_2, irrespective of anything that is connected with EU energy policy, the IPCC and the Kyoto process will follow, as night follows day.

Just look at what is really happening. The price shocks caused by physically limited and

expensive hydrocarbon (including coal) supply are already causing dangerous inflation, stalling growth and causing power blackouts in the BRIC countries, as well as food price inflation. They are an almost unbearable drag US and European economic growth, especially in the UK which is among the least culturally adapted countries of the “old” EU to real energy shortages.

The next phase of this, now very likely permanent, price and availability shock will be demand destruction. In a world of limited supply, only demand destruction can stabilize global energy prices. The number of the world’s hungry is rising rapidly and the dreaded spectre of “1970s-style stagflation” looms. Global warming is being cited as the cause whereas it is evident that population and economic growth, clogging commodity flows, are the real culprits.

Given this context, the lack of commercially available, affordable and deployable "green" technologies, especially on the supply side, makes the fossil fuel supply crisis especially alarming. That in the face of such an alarming failure of sufficient and affordable fossil energy supply, the “green” industry remains systemically almost entirely dependent on tax-paid subsidies is alarming.

Conclusions

It is said that an alcoholic cannot begin to address his illness before he himself recognizes his addiction and is prepared to take treatment, however difficult and painful.

The challenges described in this paper cannot be fixed as long as they remain unrecognized by the people that we in Europe elect to write and abolish legislation.

Elaborate roadmaps to 2050 and lofty-sounding calls for emission targets in the mid-2020s will be as pointless and useless to future generations as any such “road map” for the nation would have been if written in (say) 1910 or 1934.

Among the chief dangers that the UK faces in 2011 is the critical obsolescence of its electricity infrastructure, its essential bankruptcy and the absolutely unrealistic aspirations of almost all its political class, although not its population, for a new, low-carbon, high-growth, job-creating, tax-paying economy.

The imminent closure of 16 GW of coal, oil and nuclear power plants and the realization that these simply cannot be replaced by the equivalent - or even much greater - wind power capacity, (even if it could be built, which is doubtful) is widely recognized in most senior echelons of the UK’s financial, manufacturing and engineering companies. How soon this general recognition will seep through to those who make decisions but continue to evade this truth, is very much up to the population at large.

This problem is not only that of the UK. Major energy and concomitant trade deficits and even national bankruptcy are facing countries all over Europe. Europe cannot afford much more of the same.

It is probably pointless to try and get this message through to the EU's present energy establishment, fixated as it is on perpetuating Kyoto and writing endless "2050 road-maps". Sonja Ven Renssen's perceptive and witty blog in *European Energy Review*[xviii] , "*The Eurovision Energy Contest 2050*" made it plain that shifting Brussels's priorities will be more difficult than turning a fully-loaded oil tanker around on a sixpence; in other words, impossible.

But given the extreme fragility of the UK's economy, and the imminence of an electricity supply failure, it may still be possible to bring to the attention of the UK's financially embattled Coalition, the extreme danger of its chosen policies, before the financial plug is pulled and its emission-related targets are exceeded by industrial ruin.

There can be no doubt that the UK must evolve an energy strategy that will liberate the economy from hydrocarbons as fast as possible. But its resources and financial circumstances are increasingly modest. The energy aspirations of its politicians are incoherent and technically illiterate. All this is about to come to a head with the transparent reluctance of international financiers to invest in the "green" economy. A huge U-turn lies ahead when it will have to plead with its EU partners for a derogation on the closure of the coal capacity and with EdF to keep the old nuclear fleet on the road, while developing a more realistic energy plan. This must almost certainly require the electrification of almost everything and the speeding up of a nuclear capacity build, wherever possible innovating technically and reducing the costs by depending more on South Korea and China than our partners across the Channel in France.

The alternatives are so unpalatable, they hardly bear thinking about.

End

[i] Euan Mearns is an editor at www.theoildrum.com
[ii] http://www.decc.gov.uk/en/content/cms/statistics/projections/projections.aspx
[iii] BP Statistical Review of World energy, 2010
[iv] http://chinadigitaltimes.net/2011/05/chinas-looming-power-shortages-blackouts-or-blackmail/
[v] Oil and Gas Financial Journal, 3 June 2011
[vi] http://www.europeanenergyreview.eu/site/pagina.php?id=2998

[vii] http://www.cngnow.com/EN-US/Pages/default.aspx
[viii] http://www.oxera.com/cmsDocuments/Agenda_May07/25%20years%20on.pdf

[ix] http://www.decc.gov.uk/en/content/cms/statistics/energy_stats/source/electricity/electricity.aspx
[x] www.ofgem.gov.uk
[xi] http://fellsassociates.awardspace.com/site/LinkedDocuments/Pragmatic%20Energy%20Policy1.pdf
[xii] http://www.nationalgrid.com/uk/
[xiii] http://www.ref.org.uk/press-releases/230-2010-renewables-target-missed-by-large-margin
[xiv] http://www.ref.org.uk/publications/231-high-rewards-for-wind-farms-discarding-electricity-5th-6th-april-2011
[xv] http://iea.org/index_info.asp?id=1959
[xvi] European Environmental Agency, report to the UNFCCC, 2010
[xvii] http://www.europeanenergyreview.eu/site/pagina.php?id=3019
[xviii] http://www.europeanenergyreview.eu/site/pagina.php?id=3006