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The Truth About Oil and the Looming World Energy Crisis

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World: Oil And Gas Industry

- Peak Oil: an Outlook on Crude Oil Depletion - C.J.Campbell - Revised February 2002

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Preface

This paper was first presented by MBendi in October 2000, just before the end of a cycle of rising prices and dwindling capacity. It recognised the resource constraints and presented a scenario of the natural consequences, foreseeing soaring prices, imminent shortage and recession. While this general picture remains valid in resource terms, events did not unfold as expected but took a different turn. The limits to production capacity were indeed reached at the end of 2000 and prices did soar, but the economy reacted more quickly than expected by plunging the world into recession, which cut oil demand and reduced pressure on prices, which have remained weak.

Most of the points made in the paper remain valid, but an update of the study to incorporate the latest data and new understandings does call for some revision. A new scenario is proposed.

The paper has been revised to better reflect current understanding.

Introduction

This paper is about Peak Oil. It truly is a turning point for Mankind, which will affect everyone, although some more than others. Those countries, which plan and prepare, will survive better than those that do not. It is a large and difficult subject, but the essentials are clear.

In summary, these are the main points that have to be grasped:

- Conventional oil - and that will be defined - provides most of the oil produced today, and is responsible for about 95% all oil that has been produced so far.
- It will continue to dominate supply for a long time to come. It is what matters most.
- Its discovery peaked in the 1960s. We now find one barrel for every four we consume.
- Middle East share of production is set to rise. The rest of the world peaked in 1997, and is therefore in terminal decline.
- Non-conventional oil delays peak only a few years, but will ameliorate the subsequent decline.
- Gas, which is less depleted than oil, will likely peak around 2020.
- Capacity limits were breached late in 2000, causing prices to soar leading to world recession.
- The recession may be permanent because any recovery would lead to new oil demand until the limits were again breached which would lead to new price shocks re-imposing recession in a vicious circle.
- World peak may prove to have been passed in 2000, if demand is curtailed by recession.
- Prices may remain weak in such circumstances but since demand is not infinitely elastic they must again rise from supply constraints when essential needs are affected

Background

Peak oil is a turning point for Mankind. The economic prosperity of the 20th Century was driven by cheap, oil-based energy. Everyone had the equivalent of several unpaid and unfed slaves to do his work for him, but now these slaves are getting old and won't work much longer. We have an urgent need to find how to live without them.

It is stressed that we are not facing a re-run of the Oil Shocks of the 1970s. They were like the tremors before an earthquake, although serious enough, tipping the World into recession. Now, we face the earthquake itself. This shock is very different. It is driven by resource constraints, not politics - although of course politics do enter into it. It is not a temporary interruption but the onset of a permanent new condition. The warning signals have been flying for a long time. They have been plain to see, but the world turned a blind eye, and failed to read the message.

Our lack of preparedness is itself amazing, given the importance of oil to our lives. The warnings were rejected and discredited as if they were words of soothsayers and prophets. But the warning was not prophecy - it simply recognised two undeniable facts:

- You have to find oil before you can produce it
- Production has to mirror discovery after a time lag

Discovery reached a peak in the 1960s - despite all the technology we hear so much about, and a worldwide

News: 21.Jan.2006
- UK's BG Group signs Nigeria production sharing deal
- Australia's Woodside to export liquefied natural gas to U.S
- Schlumberger announces fourth-quarter and full-year 2005 results
- Sweden offers support to Angola
- Other News

Upcoming Events
- 09.Mar.2006: Oil Africa 2006 - Cape Town, South Africa
- 07.Jun.2006: UEMOA Mining, Petroleum and Telecom Conference & Showcase - Niger
- 30.Oct.2006: 2nd Chad International Oil & Gas Conference - N'Djamena, Chad
- 06.Mar.2006: Asian Independents Forum - Singapore, Malaysia
- Other Events

search for the best prospects. It should surprise no one that the corresponding peak of production is now upon us. This simple reasoning has, however, been rejected by flat-earth economists and others with a blind faith in technology and markets forces. Worse still, governments have listened to bad advice. There are many vested interests bent on confusion and denial.

It is worth briefly recalling what occurred in Europe in late 2000, as a foretaste of what happens when oil supply becomes short and expensive. The French fishermen blockaded the Channel Ports because their fuel costs had doubled, even though their fuel was already tax-free. The dispute spread rapidly to England and other countries. Schools were closed. Hospitals had red alerts because staff and patients could not reach them. Supermarkets started rationing bread. Trade and industry was seriously interrupted: the cost was huge. People lost confidence in their governments, whose popular support fell sharply. If an interruption in supply lasting only a few days could cause such havoc, it surely demonstrates how utterly dependent on oil we have become.

Depletion is an easy concept to grasp. Think of an Irish pub full of happy people. Think of their pleasure at the first sip from a full glass. Think of the frowns that begin to cross their faces when their glasses are half-empty. They know they have drunk more than is left. It is the turning point. Watch them savour the last drops. While they can order another round of drinks, they know in the back of their minds that eventually closing time will come when there are no more to be had. That is the meaning of depletion. We need to know how big each glass - or oilfield - is, and we need to think of closing time, and judge how many oilfields are left to find.

We are not about to run out of oil, but production is about to reach a peak, if it has not done so already. When peak comes depends on the issue of Rates:

- Discovery Rate - we now find one barrel of conventional oil for every four we consume
- Extraction Rate is controlled by the physics of the reservoir

Demand is driven by economic growth and price. Remember that price is not the same as cost. The cost of producing oil remains low, but its price has to reflect tax, scarcity and control of the main sources of supply.

Before measuring something, the first step is to decide what exactly to measure. It is a question every butcher asks. Does he weigh the meat or the bones as well? There are many different kinds of oil. Each has its own endowment in Nature, characteristics, costs, and rate of extraction that follows a general and inevitable zero-peak-zero profile. Each type contributes differently to peak. Some types rise to peak quickly, others slowly. We need to identify and measure each type carefully.

It is convenient to identify so-called Conventional Oil. It is the meat not the bones. It has contributed most oil to-date and will dominate all supply long into the future. We may concentrate on it, as it controls the date of peak. But there is no universal agreement on how to define it. Here, it is defined to exclude:

- Oil from coal and “shale”
- Bitumen and Extra-Heavy Oil
- Heavy Oil
- Deepwater Oil
- Polar Oil

Natural Gas liquids from gasfields are also excluded because they belong to the gas domain.

Understanding the Data

We should at least define what we try to measure, even if the database is not up to doing it so accurately in all cases. We may start by asking two simple questions:

- How much oil has been found? and
- When was it found?

They sound simple, but they are difficult to answer because the data are weak. There is no consistency in what is reported. There is a large range even for production, which is simply reading the meter. Reserve estimates are still less reliable. The treatment of gas liquids ranges widely.

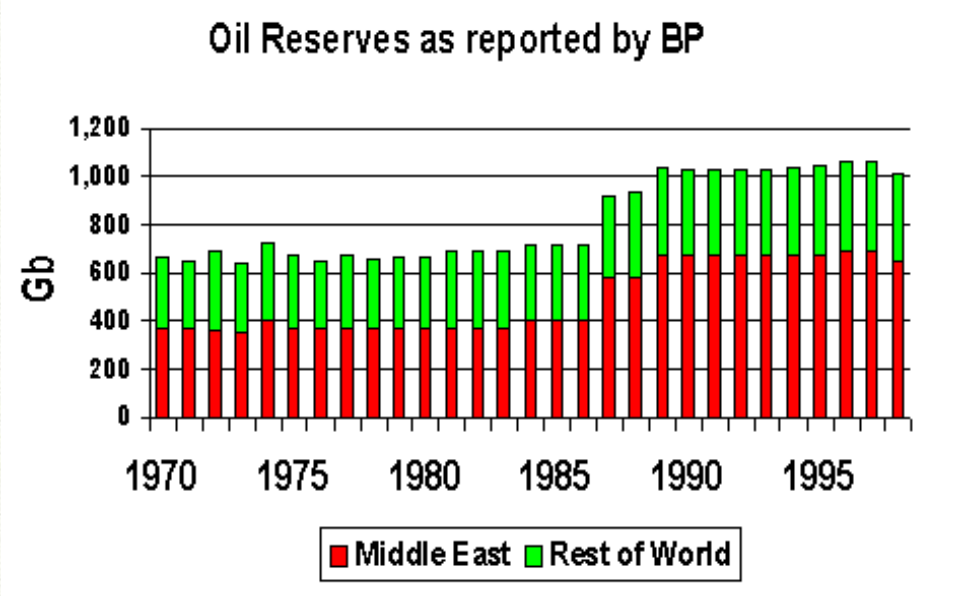
There are two main sources of public data: the Oil & Gas Journal and World Oil, which are trade journals that compile information given to them by governments and others. They are not in a position to assess the validity of the information supplied to them. Another widely used source is the BP Statistical Review of World Energy. BP is in a position to evaluate the data, but prefers to reproduce the Oil and Gas Journal numbers, understandably not wanting to involve itself with sensitive issues that might affect its relationship with the host governments of the countries where it works. Lastly is the industry database, which is relatively reliable, but too expensive for most analysts to access. All these sources provide different numbers.

The industry is required to furnish estimates of so-called Proved Reserves in its financial reports to governments and the stock-exchanges. These estimates relate to what the wells in the current stage of development are expected to produce, but say little about what the field as a whole may eventually deliver. The industry has accordingly systematically under-reported the size of discovery. It has good commercial reasons for doing so rather than booking all their reserves up front because it smoothes their assets, presenting a better image. It is not its job to forecast the future. For most purposes, it does not matter, but we need to know the real record of the past if we are to use the trend to forecast the future. Governments variously under-report or over-report, or simply fail to update their estimates. As many as 64 countries reported unchanged numbers in 2001, which is utterly implausible.

We need the "best estimate" of the size of the field, namely its Proved & Probable reserves, such that any revisions are statistically neutral.

An oilfield contains what it contains because it was filled in the geological past, but knowledge of how much it

contains evolves over time. If we want a genuine discovery trend, we need to backdate revisions to the discovery of the field. Failure to backdate gives the illusion that more is being found than is the case. It is a cause of great misunderstanding

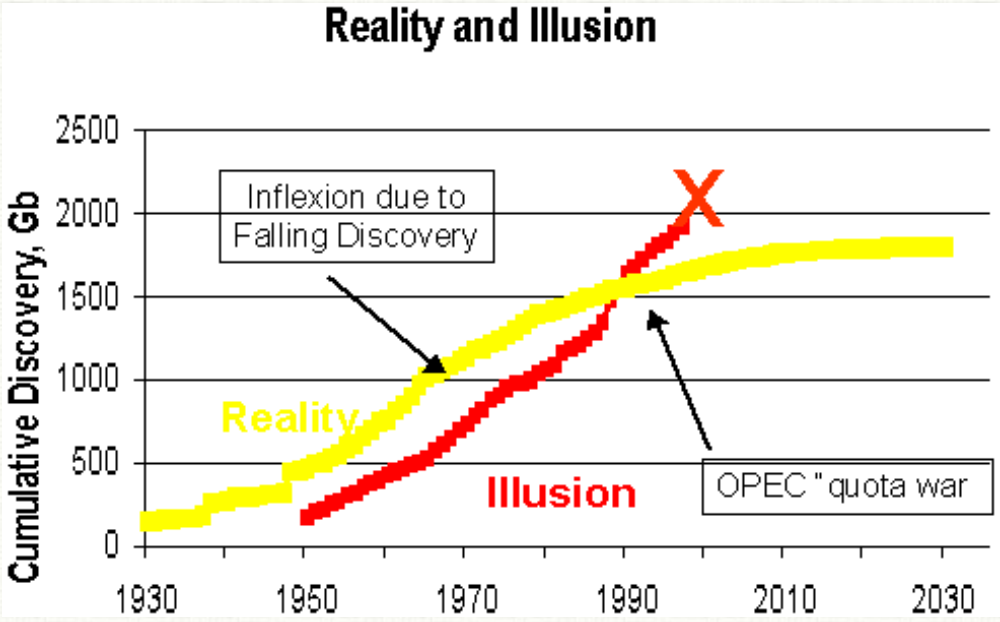


This demonstrates how BP reports reserves, failing to backdate the revisions. It has misled many analysts. The large increases in the late 1980s were simply due to the OPEC quota wars. Nothing particular was actually added. Kuwait added 50% in 1985 to increase its OPEC quota, which was based partly on reserves. No corresponding new discoveries had been made. Nothing particular changed in the reservoir. Venezuela doubled its reserves in 1987 by the inclusion of large deposits of heavy oil that had been known for years, forcing the other OPEC countries to retaliate with huge increases. Note too how the numbers have changed little since despite production.

But it is not quite as simple as that, because the early numbers were too low, having been inherited from the companies before they were expropriated. Some of the increase was justified but it has to be backdated to the discovery of the fields concerned that had been found up to 50 years before.

The failure to backdate gives this misleading popular image of growing reserves. It is widely used by flat-earth economists in support of classical economic theories of supply and demand

By no means all economists believe in a flat-earth. There are enlightened economists who now relate economics with resources, and they are coming to the fore. Financial institutions too are beginning to understand the inevitable reality of the depletion of oil.



This shows the effect of proper backdating. The discovery trend shown in yellow is falling not rising.

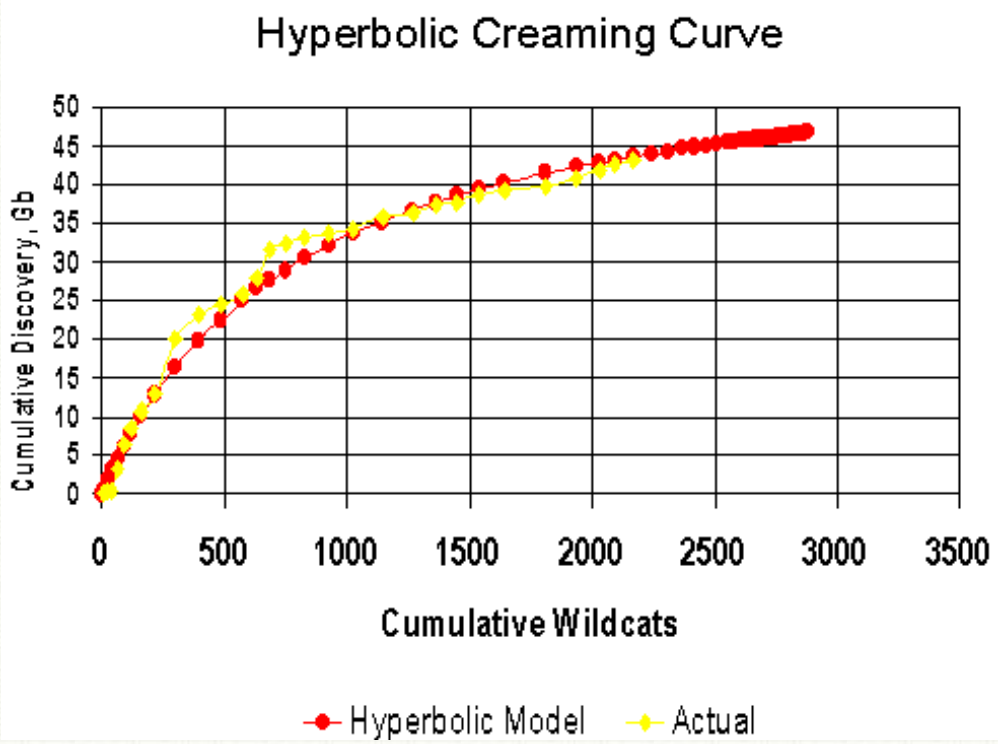
You will hear many claims for technology. No one disputes the huge technological advances of the industry. But, what has been the impact? In exploration, it shows better both where oil is and where it is NOT - thus allowing better estimates of the potential to be made. In production, it keeps production rate higher for longer, but has little impact on the reserves themselves. Note that much of the oil in a reservoir cannot be extracted because it is held there by capillary forces and natural constrictions. The percentage recovered can be improved in some cases by injecting steam and other well-tried methods, but by no means all fields are susceptible to treatment. Most modern fields are produced to maximum efficiency from the outset.

This is well illustrated by the Prudhoe Bay field. It is the largest field in North America. The Operator internally estimated its reserves at 12.5 Gb in 1977, but reported 9 Gb to comply with stock-exchange rules. Various techniques, such as gas injection followed by horizontal drilling, were started in 1982, but decline commenced in 1988. Gas injection did arrest decline for one year, but then the decline became steeper. It is now evident that the field will barely make the original estimate of 1977. Nothing was added by technology. This is a quite typical example, with many large fields showing the same pattern. Such plots are incidentally a good way to estimate genuine reserves.

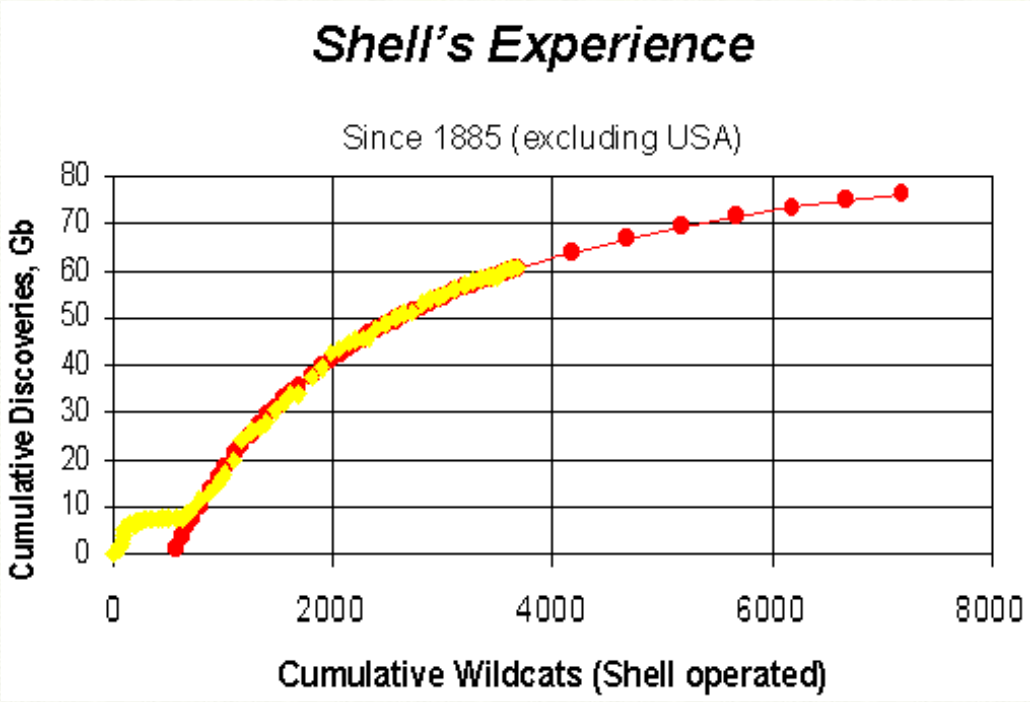
Now let us turn to how much is yet-to-find. A geochemical breakthrough in the 1980s made it possible to relate the oil in a well with the rock from which it came. It became possible to identify and map the generating belts. They are few and far between because prolific oil was formed only under very rare geological circumstances. In fact, most of it comes from no more that three or four epochs of intense global warming. We now know where most of the generating areas are.

Great advances in seismic technology make it possible to see the smallest and most subtle trap. In general, this better knowledge has reduced the perceived potential, because it shows a dearth of large prospects. In other words, we can find a needle in a haystack, but it is still a needle. We did not need the resolution to find the giant fields of the past holding most of the world's oil. It means we have a much better knowledge of the endowment in Nature than we used to have.

Once we have secured valid data on the amounts and dates of discovery, we can use it to project future discovery



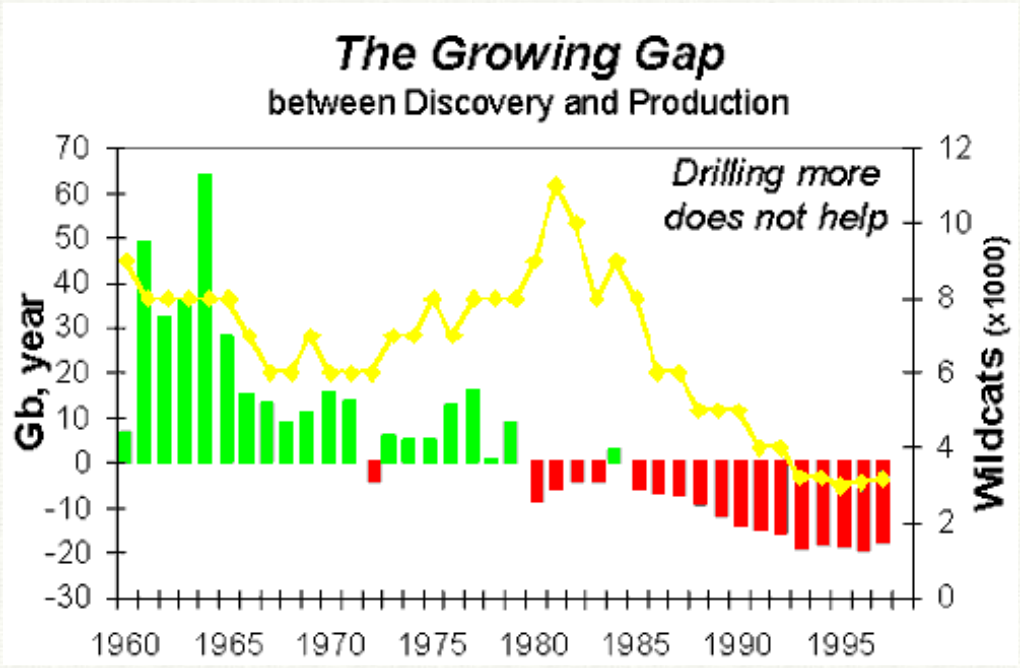
This is the so-called creaming curve. It plots discovery against exploration wildcats. They are the wells that either do - or do not - find a new field. The larger fields are usually found first for obvious reasons, being too large to miss. The curve flattens until new discoveries are too small to be viable. It gives a good idea of how much is left to find. There are other statistical techniques that evaluate the size distribution of fields and correlate production with the corresponding earlier discovery trends.



The same applies to an individual oil company. Shell has found about 60 Gb with almost 4000 exploration wells, drilled over its entire history since 1895. If it drilled as many again, it could expect to find only 16 Gb. Other companies have not had such a successful record.

Measurement	Measure
Produced-to-date	873 Gb
Reserves	928
Discovered-to-date	1801
Yet-to-Find	149
Yet-to-Produce	1077
Ultimate recovery	1950
Current consumption (2001)	22 Gb/y
Current discovery rate	6 Gb/y
Current depletion rate (ann. prod. as % of Yet-to-Produce)	2%

To sum up, these are the main parameters for Conventional oil. The numbers are shown as computed but should be generously rounded. We have produced almost half what is there, and we have found about 90%. We consume 22 Gb a year but find only 6 Gb. That is to say, we find one barrel for every four we consume from our inheritance of past discovery. The current depletion rate is about 2 % a year. These estimates are broadly consistent with those presented in 2000, but we now take a different view of the treatment of Condensate, including that from the gas-caps of oilfields with oil. It largely explains the increase in the estimated ultimate recovery.

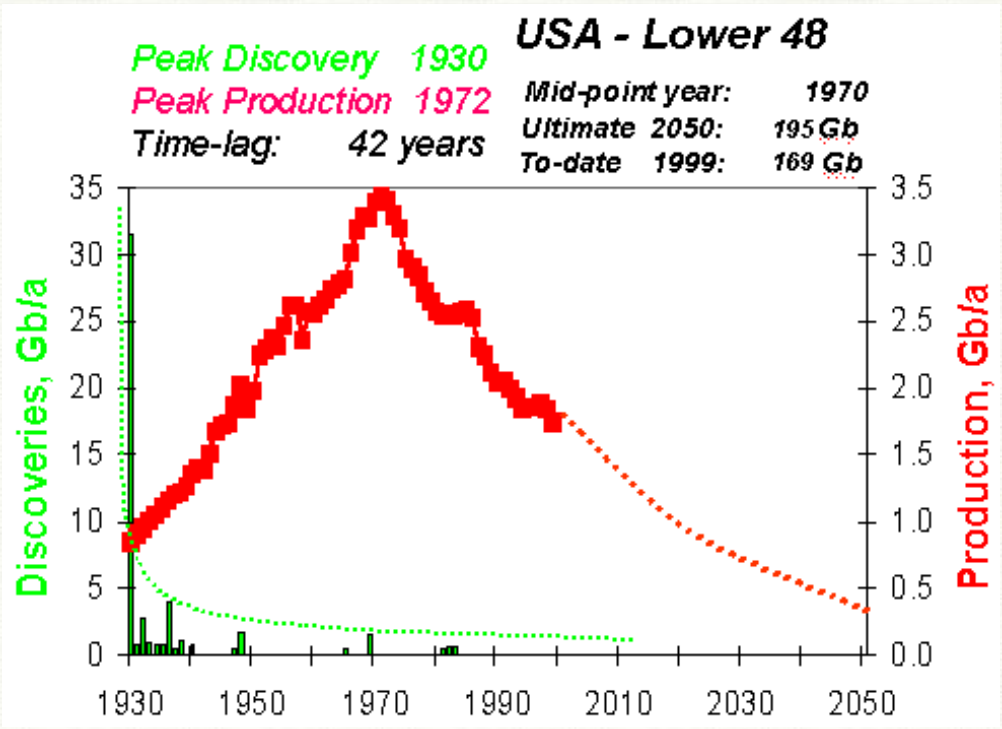


This shows the growing gap between discovery and consumption as we move from surplus to deficit. The yellow curve shows exploration drilling. Note that the level of activity barely affects the discovery trend. It destroys the flat earth economists' claim that discovery is driven by market forces.

But in year 2000, we did have an exceptional discovery spike from two large finds in the Caspian and Iran, which had hitherto been areas closed to the industry. These exceptions apart, underlying general trend is down to about 6 Gb, with perhaps as much again coming from new deepwater discovery, here treated as Non-conventional. The new deepwater areas are yielding an early crop of giant fields, as is to be expected, but discovery there is set to decline too.

Depletion

A few examples illustrate the nature of depletion. Remember that the peak of discovery has to be followed by the peak of production, which generally comes close to the midpoint of depletion when half the total has been used.



Let us start with the US-48, the most mature oil country of all. It had plenty of money, every incentive with the oil rights in private hands and soaring imports, and it had a large prospective territory. We can be sure that if more could have been found, it would have been found. So what did Nature deliver? Discovery, shown in green, peaked in 1930 at the edge of the chart. Production peaked 40 years later. It is the same pattern in the North Sea (UK, Norway and Denmark), which peaked in 2001. Advances in technology have reduced the time lag from peak discovery in 1974 to 27 years. We are getting better at depleting our resources.

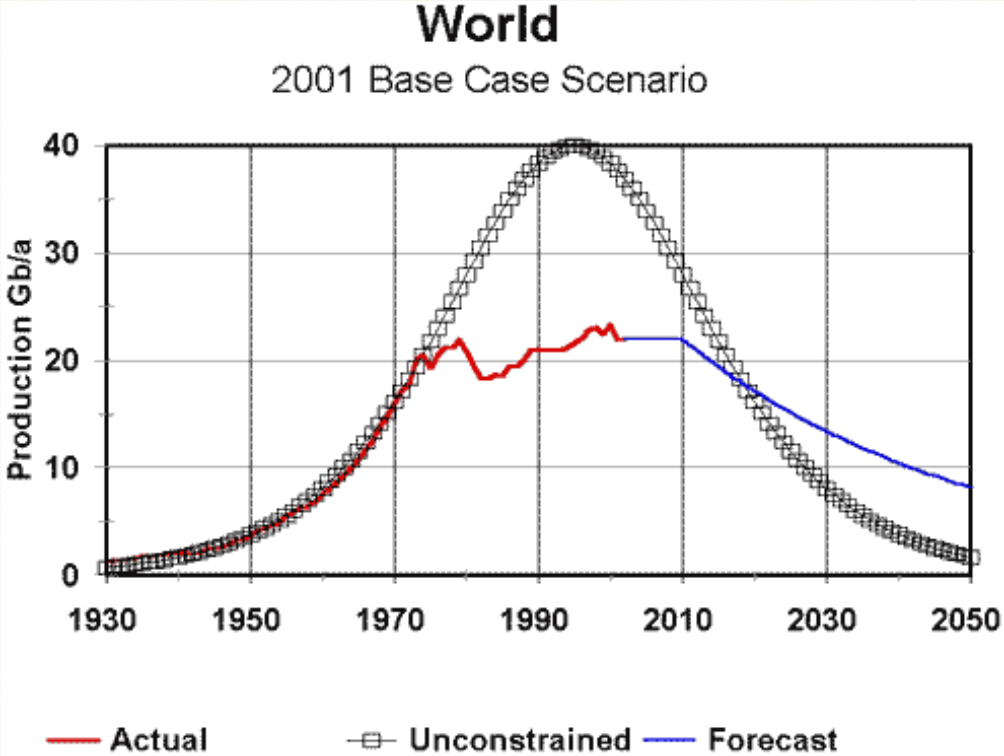
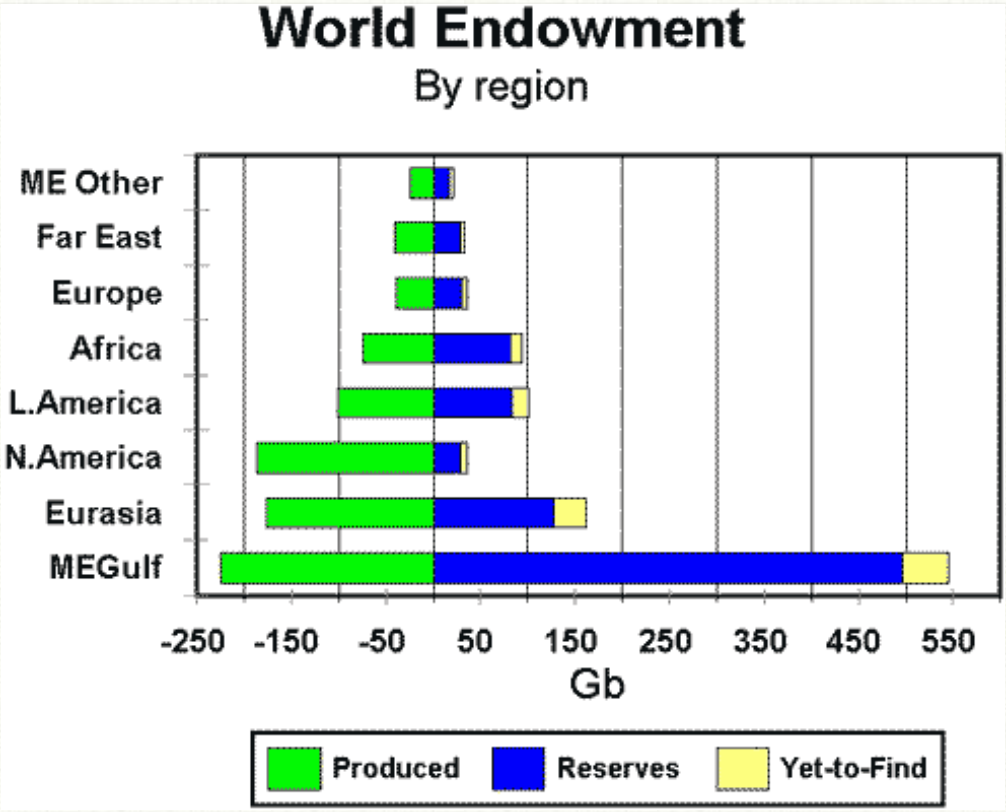
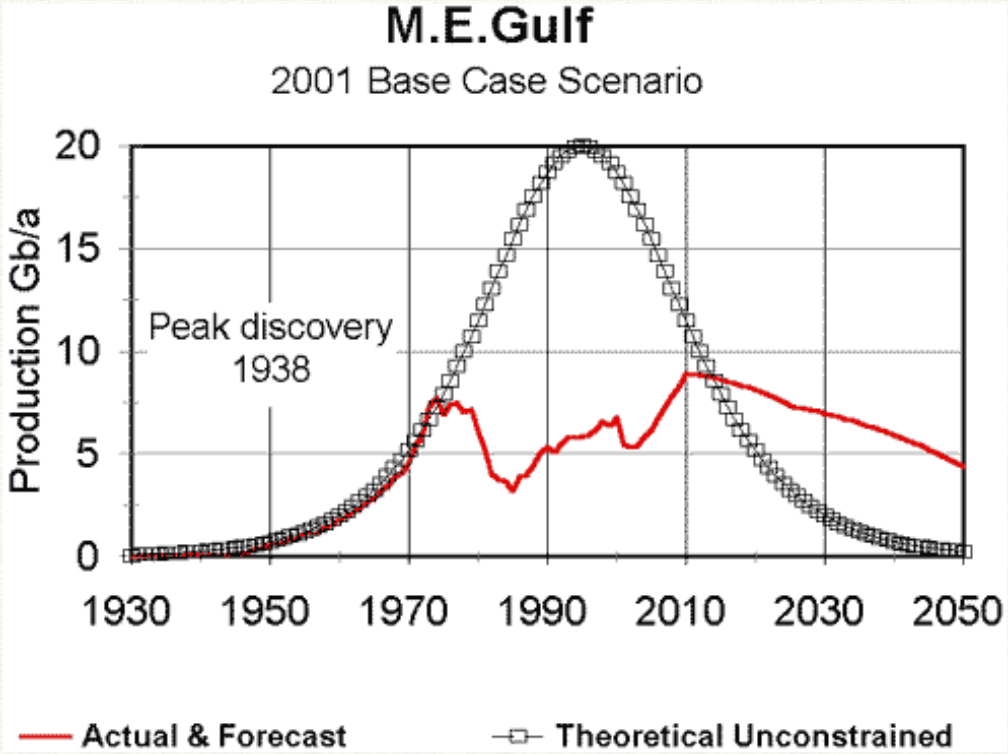


Figure 7 shows the World as a whole. The oil shocks of the 1970s cut demand so that the actual peak came later and lower than would otherwise have been the case. It means that the decline is less steep than it would otherwise have been. It reminds us that if we produce less today, there is more left for tomorrow. It is a lesson we need to relearn as a matter of urgency.



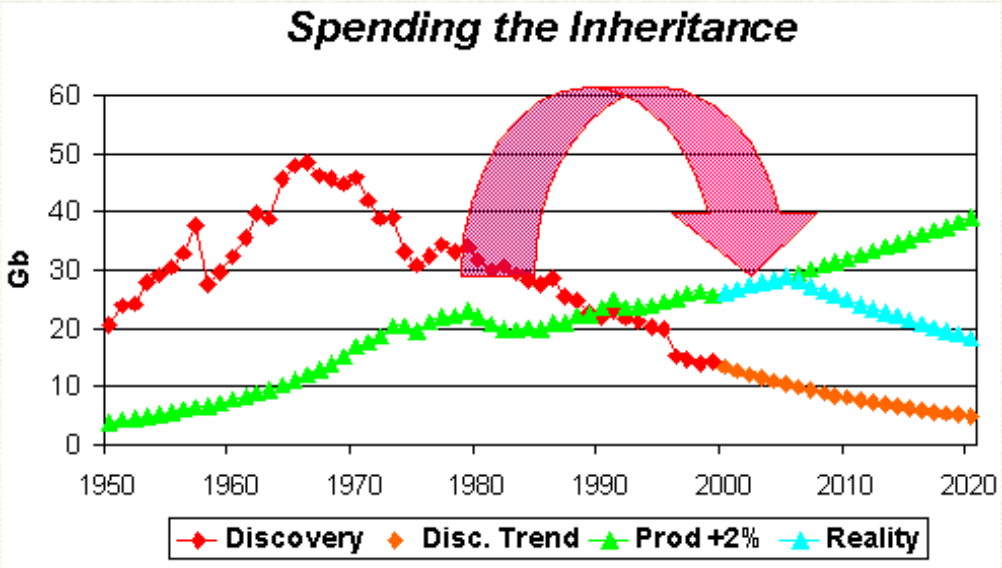
This shows the distribution of oil. Note how North America has consumed most of its oil, and how the Middle East has most of what is left. It introduces the notion of Swing Share. The five Middle East major producers countries have been forced into a certain swing role around peak, whereby for a certain limited period, they can - at least in resource terms - make up the difference between world demand and what the rest of the world can produce. Swing Share was 38% in 1973 at the time of the first oil shock. It had fallen to 18% by 1985 because new provinces in the North Sea, Alaska and elsewhere started to deliver flush production from their giant fields, which are usually found first. It is stressed that these new provinces had been found before the shock and were not a consequence of it, as is so often claimed by flat-earth economists. Swing share reached 29% in 2000, before falling to 25% in 2001 in response to falling demand. Under the new scenario, discussed below, it is set to reach 40% by 2010, which will likely represent the limit of capacity. Unlike in the 1970s, this time there are no new major provinces waiting to deliver, or even in sight.



This shows the depletion of the Middle East swing countries. Production matched the theoretical unconstrained model well until the shocks of the 1970s when it was artificially restricted by OPEC quota. Actual production has been far below what was possible. Even though World demand is assumed to be flat under the 2001 Scenario, discussed below, the Middle East swing countries will be under pressure to increase their production rapidly to offset the decline elsewhere. The scenario assumes that they can reach 24 Mb/d by 2010 but it may prove to be beyond their ability, given that weak prices for the next few years curb incentive.

It is worth digressing briefly to explain the impact of expropriation. It started with BP in Iran in 1951 but had spread to the other main producers by the 1970s. The major companies lost their main sources of supply. Had they remained in control, they would have produced the cheap and easy oil before turning to the expensive and difficult, offshore and in remote areas. It would have given a gradual transition as depletion began to grip. But when they lost their main supplies, they moved to the expensive and difficult areas and they worked flat out. The main OPEC governments were left with the cheap and easy stuff. It was contrary to normal economic practice and one of the causes of the impending crisis

Facing the Future



This is a very compelling graph. The red line is discovery smoothed with a ten-year moving average. It shows a clear downward trend, easy to extrapolate, as shown in orange. The green line is production, extrapolated at a 2% growth in demand to match the past trend. The inheritance from past discovery is the area between the red and green lines. The inheritance is being increasingly consumed because future discovery is insufficient, but like all inheritances, it does not last for ever. There just is not enough to sustain growth, or even hold current production for long. The blue line shows the inevitable decline.

New Scenario

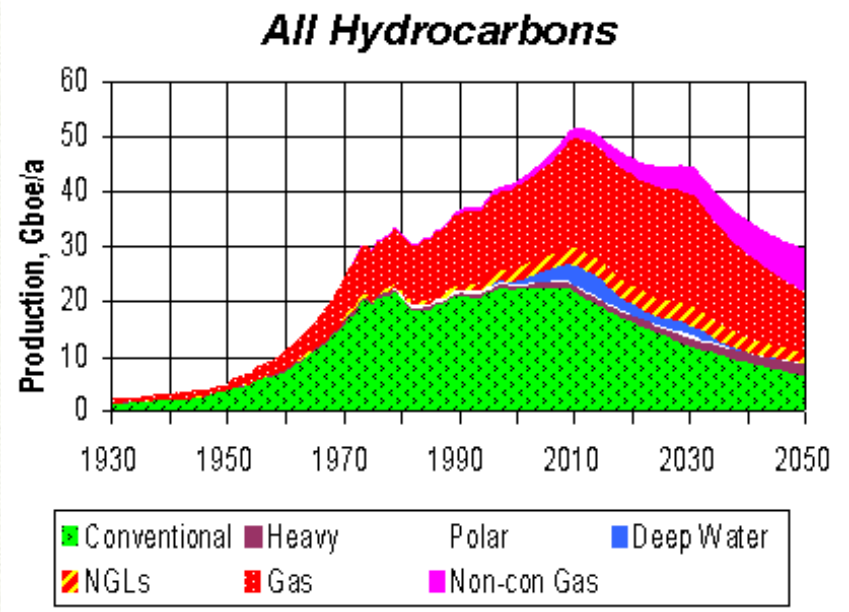
Previous studies evaluated alternative scenarios of supply and demand, based on various assumptions of demand

and oil price. Generally, they depicted a plateau of production, starting when Swing Share reached a critical threshold triggering an oil price shock, and ending when the Swing share reached 50% of world demand, which was held to be maximum Swing capacity. But as we approach closer to these critical times, we can see the unfolding picture with greater clarity.

It now appears that the world capacity limits were about breached at the end of 2000, and oil prices began to soar when it became clear that the historic trend of growth at about 2% could not be maintained. As in all previous cases, the high prices triggered economic recession, although there may have been other contributory factors. A highly inflated stockmarket, built on the cheap energy supply of the past and illusions of perpetual growth was evidently due for a radical readjustment. The demand for oil plummeted, falling 5% between 2000 and 2001 according to the Oil & Gas Journal, and prices accordingly crumbled.

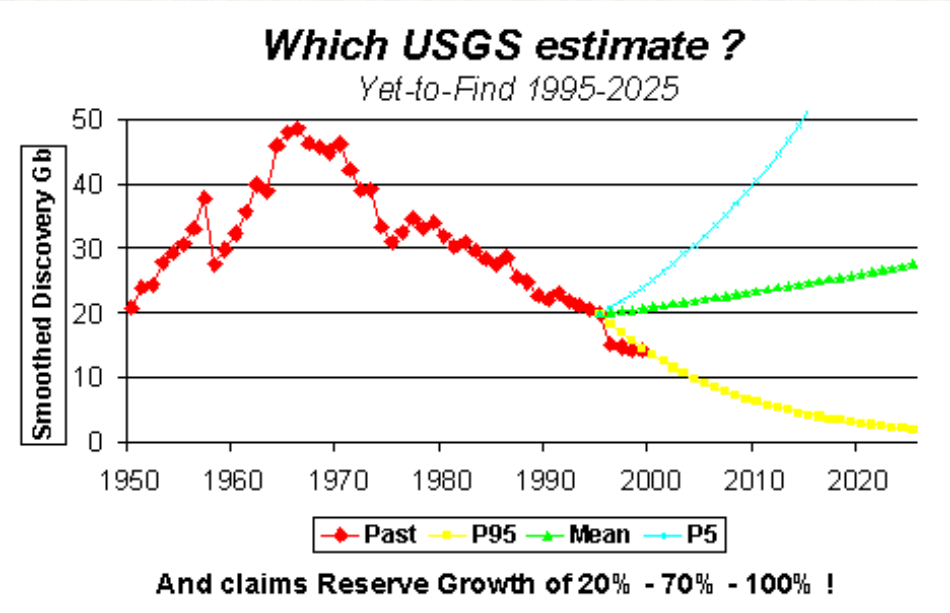
OPEC found itself unable to react lest any action were perceived to be hostile to the United States in its conflict with Afghanistan, while the US grand fleet was anchored off the coast of Middle East. Iran and Iraq have been declared enemies by the US President, prompting fears that a new American invasion in the region may be contemplated. It would be a brave man to forecast the future in such circumstances, but the underlying resource constraints do give a basis for a new scenario. It assumes that if the world economy were to try to recover, the demand for oil would rise in parallel until it again hit the ceiling of falling capacity. High prices in a volatile market would follow, re-imposing recession. In these circumstances, it is reasonable to contemplate flat average demand and production until the Swing countries reach their assessed capacity limit of 24 Mb/d by 2010. Soaring prices and growing shortage will then initiate the long-term decline of oil production at the then depletion rate of about 2% a year. Although the model pictures a plateau of production to 2010, it is unlikely to be a very flat one, as great fluctuations in a highly volatile market may be anticipated. It seems therefore that we may look back and find that world peak was passed in 2000, six years before the midpoint of depletion.

The above scenarios refer to Conventional oil only, as herein defined. Deepwater oil with an estimated endowment of about 60 Gb is expected to peak at about 8 Mb/d around 2010, although weak prices in the meantime may curtail investments somewhat. The production of heavy oils and tarsands of Venezuela and Canada are expected to increase slowly with the added incentive of strategic supplies in the United States. Gas is expected to peak around 2020.



These resource constraints are all very obvious from even a cursory examination of the resource base and its depletion, which poses the question of why this important subject is not better understood.

People once believed the earth was flat. Scientific observations to the contrary were treated as blasphemy. The same pressures manifest themselves to-day in a different guise. We might almost call some of them conspiracies of denial and obfuscation. The United States seeks to exaggerate the world's oil endowment to reduce OPEC's confidence. It pretends that it does not depend on Middle East oil. It puts out very flawed studies by the US Geological Survey and the Department of Energy. OPEC, for its part, exaggerates its resource base to inhibit non-OPEC investments and moves to energy savings or renewables. It fears losing its oil market on which it utterly depends, with its rapidly rising population. Companies conceal depletion because it sits badly on the investment community



The US Geological Survey has failed to live up to its scientific reputation. It has assessed the Undiscovered Potential of each basin with a range of subjective probabilities. It has a Low Case for the most sure and a High Case for the least sure. The High Case itself has little meaning, being little more than a wild guess. The Low Case is consistent with the discovery trend, but The Mean value, which is the one publicised is meaningless because it is influenced by the High Case. This has been confirmed by experience in the real world because the Mean estimate is already 100 Gb short, five years into the study period. Its notion of "reserve growth" is also flawed. It is depicted as a technological dynamic when it is simply an artefact of reporting practice, not to be extrapolated into the future.

Source	2010	2020
NGLs	11.3	15.2
Unconventional	2.4	2.4
Refining/Processing gains	2.1	2.5
Middle East (now 18 M/d)	40.9	45.2
Non-Middle East (now 45 M/d)	38.0	27.0
Unconventional	0	19.1

The International Energy Agency was established by the OECD countries in the aftermath of the oil shocks of the 1970s. In 1998, it succeeded in delivering a coded message. It showed how a "business as usual scenario" could not be fulfilled without inventing a so-called balancing item of Unidentified Unconventional, which miraculously rises from zero in 2010 to 19 Mb/d in 2020, when the identified makes a ceiling of only 2.4 by 2010. Since the identified deposits are huge but constrained by low extraction rates, no one needs to find more. The so-called Unidentified Unconventional is accordingly a euphemism for rank shortage. It is also not realistic to imagine that oil price will still be $25/b when the Middle East supplies 62% of the world's needs. Now, two years later a new study appears in which the mythical balancing item has disappeared, and non-Middle East production by 2020 is shown to almost double the previous estimate. The IEA evidently was influenced by the flawed study by the USGS. No credence can be given to such fluid pronouncements, yet most governments build their energy policies on them.

Most companies have to sing to the stockmarket, but the Italian national company is less concerned by stockmarket imagery. Its Chairman was able to tell the truth when he reported "New reserves are failing to keep up with growing output…… My forecast is that between 2000 and 2005 the world will be reaching peak". The French company, Total-Fina-Elf, has also published its view of a peak around 2010.

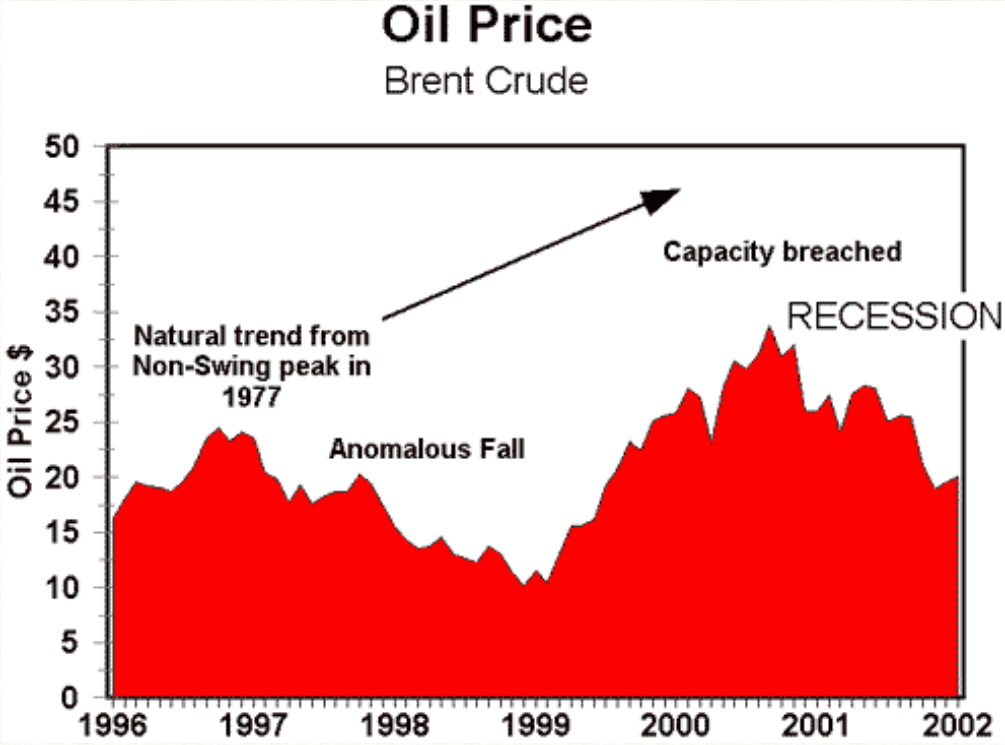
British Petroleum certainly wins the prize for the most oblique reference to depletion when it changes its logo to a sunflower and says that BP stands for Beyond Petroleum. But its executives sit on the board of Goldman Sachs, the bankers. They should accordingly know what BP actually thinks behind the lace curtains of corporate make-believe. What do the bankers say?

"The rig count over the last 12 years has reached bottom. This is not because of low oil price. The oil companies are not going to keep rigs employed to drill dry holes. They know it but are unable and willing to admit it. The great merger mania is nothing more than a scaling down of a dying industry in recognition that 90% of global conventional oil has already been found" (Goldman Sachs - August 1999)

Actions speak louder than words. The major companies and many others in the industry are merging and shedding staff. They are also buying their own stock. They conspicuously fail to invest in new refining capacity, which would surely be needed if production were set to rise as depicted. These are moves to downsize because there are no major investment opportunities left. Their past is worth more than their future - and they know it.

Conclusions

Some general comments may be offered in conclusion, starting with a oil price



Oil outside the Middle East peaked in 1997, as was easily foreseen. It should have heralded a gradual rise in price from growing Middle East control. But instead there was an anomalous fall. Price collapsed in 1998 because of the interaction of warm weather, an Asian recession, the devaluation of the rouble, events in Iraq, false supply estimates by the IEA that prompted higher OPEC production and perhaps some manipulation by insiders. Then, prices surged through 1999 in a staggering 300% increase, as the underlying capacity limits were breached, triggering recession. Demand fell and prices slumped.

Spare capacity can mean many things. A closed flowing well is the only form of spare capacity that can be restored at will. All the other elements take investment, work and, above all, time to deliver. OPEC had very little operational spare capacity, having to run ever faster to stand still, as it desperately tried to offset the natural decline of its ageing fields. It will be hard pressed to meet the demands made upon it even to maintain current world production, never mind growth.

We may look back and find that the year 2000 was the peak: a turning point when the prosperity of the past, driven by an abundant supply of cheap oil-based energy, gave way to decline in the future. A discontinuity of this magnitude is hard to grasp. The poor countries of the world will bear most of the burden. But the United States will be in serious difficulties. There is a danger of some ill-considered military intervention to try to secure oil, of which the Afghan War may have been a foretaste. That affair may be seen to have been more of an act of defiance to impose global economic hegemony by military means than a calculated action to reduce the level of so-called terrorism. The growing population pressures from declining wealth are manifested in new migration trends as are already being felt in Europe and the United States with human smuggling becoming a gruesome addition to the global market. As global order disintegrates, self-sufficiency at the local level may become a priority for survival.

An oil crisis is bad for politicians. Blaming OPEC or the oil companies will not wash much longer. It would be better to make a proper analysis of the true position and inform the people at large. No one blames the government for an earthquake. So they wouldn't blame it for an oil crisis either, if they realised it was a natural phenomenon.

"If you don't deal with reality, reality will deal with you"

But let us not be too alarmist. The roof does not fall in at peak. What changes are people's perceptions, as they come to realise that the growth of the past is set to become the decline of the future. It may herald the end of the US economic and cultural hegemony - which some people might think was no bad thing. Climate concerns may recede as the emissions, held responsible for change, dwindle. In the face of these pressures, we should use our current high oil supply intelligently while it lasts to ease the transition. For example, much more efficient vehicles have already been designed, awaiting only a mass market to be introduced. More could be done to penalise the wasteful use of energy.

Peak oil is a turning point for Mankind, when a hundred years of easy growth ends. The population may be about to peak too for not unrelated reasons. The transition to decline is a period of great tension when priorities shift to self-sufficiency and sustainability. It may end up a better world, freed from the widespread gross excesses of to-day.

The Truth About Oil & the Looming World Energy Crisis published by The Association for the Study of Peak Oil addresses the topic of Peak Oil in a novel and refreshing way.

Information Source: MBendi - Modified: 18.Feb.2002

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