# THE ASSOCIATION FOR THE STUDY OF PEAK OIL
# &
# THE OIL DEPLETION ANALYSIS CENTRE
ASPO-ODAC

# NEWSLETTER No 18 – JUNE 2002

**ASPO is a network of European institutions and universities with an interest in determining the date and impact of the peak and decline of world's production of oil and gas, due to resource constraints.**
**It presently has members in: Austria, Finland, Germany, Ireland, Norway, Portugal, Sweden and the United Kingdom**

**ODAC is a charitable trust in London that is dedicated to raising awareness of peak oil and the serious consequences.**

***Mission:***
1. ***To evaluate the world's endowment of oil and gas;***
2. ***To model depletion, taking due account of economics, technology and politics;***
3. ***To raise awareness of the serious consequences for Mankind.***

***Newsletters on Website***
This newsletter and past issues can be seen on the LBSystemstechnik website http://www.energiekrise.de
(Press the ASPONews icon at the top of the page)

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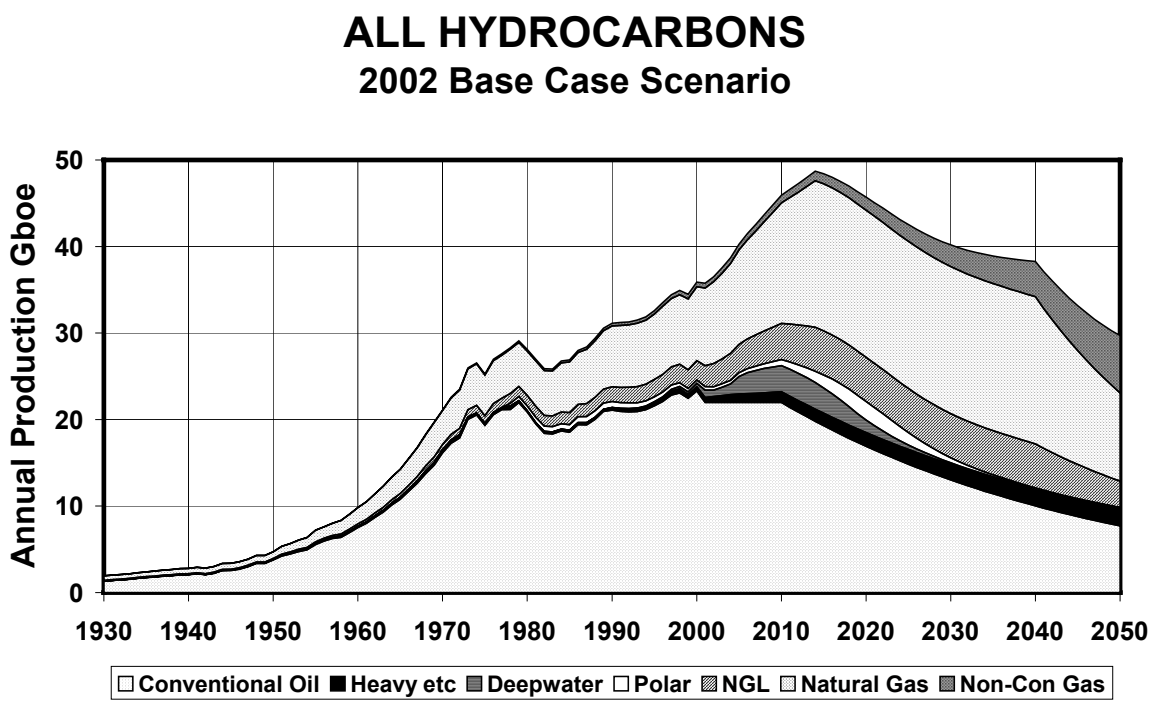



***Frontispiece – the general depletion picture***
(Gas taken at a value equivalence of 10 Tcf = 1 Gboe)

### *60. Oil and Gas Equivalence*

Some readers have questioned to use of the 10:1 factor for the conversion of gas into oil equivalent, when the calorific equivalence is about 6:1. The whole issue of units and equivalents is a complex one. Oil is sometimes measured in volumes and sometimes in weight, despite varying density. Gas has to be measured at given temperature and pressure, and it is not always clear whether the reported values relate to raw or marketable gas after the removal of non-flammable gases such as carbon dioxide and nitrogen, which are often also present. The treatment of flared gas and re-injected gas is also confusing. Furthermore there is the issue of monetary value and net energy value after removing the energy used in transport etc.

There is a certain pragmatic merit in the 10:1 factor used in the above plot, but there are other valid approaches too. There would be great merit in standardising the units and practices of measurement, but for the present we live in a world of great confusion concerning these important matters.

### *61. The ASPO Workshop at Uppsala*

The papers and presentations of the workshop are being posted on the Uppsala website www.isv.uu.se/iwood2002 , and are attracting keen interest from around the world. A start has been made in assembling the ASPO Statistical Review of Oil & Gas to try to correct the misleading impression of another widely booklet with a similar title. Much more work on it is however required. It too has now been posted on the above site.

### *62. Middle East production constraints*

Matt Simmons reports

> Today's Oil Daily had a very interesting story on the oil production woes of Kuwait which has been forced to rely overly on the output from Burgan, the world's number two producing oilfield. According to the story, Kuwait has been forced to close three of its four crude centers over the past few weeks in the western part of the country, cutting production there by 243,000 b/d. The shut-ins resulted from a variety of bad problems, including toxic fumes, a collapsed line, a gas plant needing a redesign and routine maintenance, etc. This all highlights how old the major oil producing centers of the Middle East really

> are. We all know this, but most of the world still thinks Middle East oil is almost free.
>
> According to the story, Burgan is now producing 1.35 Mb/d of its assumed 1.8 Mb/d output capacity. Everyone should remember that Burgan was discovered in 1938. As young kids in America often say, "it is no spring chicken!!" The cost of merely maintaining flat production in the Middle East is now on the rise. The days of cheap Middle East oil are a distant memory. Most people have not a clue about all this.

Based on discussion with a key Middle East expert at the Uppsala Workshop, it transpires that some of the national Middle East oil companies are managed by ageing executives who are reluctant to retire. They have little understanding of their reservoirs or the status of depletion, having been brought up in an age of plenty. It may be not so much that valid information on Middle East reserves is difficult to access, but rather that does not actually exist. Possibly, the OPEC secretariat is planning its strategy on information no more reliable than that in the BP Statistical Review of World Energy, which draws on the Oil & Gas Journal. It in turn relies on a questionnaire sent to foreign governments to which many do not reply, leaving the reserve reports implausibly unchanged, sometimes for years on end.

We have long suspected that Middle East reserves are greatly exaggerated. It begins to look as if we were right. Even if the reserves in the ground are there, the management and political environment suggests that these countries will have great difficulty in offsetting the natural decline of their ageing fields. It is not just a case of opening the valve, but calls for a great deal of skilled and careful reservoir management, nowhere more so than in Iran with its sensitive fields prone to gas coning.

### *63. The Peak of the Industrial Revolution*

Chapter 10 of *Europe – A History* by Norman Davies is entitled *Dynamo – Powerhouse of the World 1815-1914.* It makes interesting reading as the following extracts from the opening paragraphs confirm:

> There is a dynamism about nineteenth-century Europe that far exceeds anything previously known. Europe vibrated with power as never before: with technical power, economic power, cultural power, intercontinental power. Its prime symbols were engines – the locomotives, the gasworks, the electric dynamos. Raw power appeared to made a virtue in itself, whether in popular views of evolution, which preached the 'survival of the fittest', in the philosophy of historical materialism, which preached the triumph of the strongest class, in the cult of the Superman, or in the theory and practice of imperialism……...
>
> Seen in detail the process of modernisation can be broken down into an apparently endless chain of sub-processes and new developments, each interacting with each other…….
>
> Agricultural production benefited from the gradual introduction of machines, from McCormick's horse-drawn reapers (1832) to steam-driven threshers and eventually petrol driven tractors (1905)…….
>
> New sources of power were brought in to supplement 'King Coal', first with gas, then with oil, and later with the commercial use of electricity…….Oilfields were opened up in Europe at Boryslaw (Galicia), at Ploesti (Romania) and at Baku on the Caspian. With time, the internal combustion engine (1889) was to prove as revolutionary as the steam engine. Electricity became widely available only in the 1880s……..
>
> Capital investments multiplied in proportion to growing returns. Private firms reinvested growing profits; governments invested a growing proportion of rising taxation. A bottomless demand for capital exhausted the possibilities of private borrowing, and revived the potential for joint-stock companies……
>
> Domestic markets were boosted by population growth, by the greater accessibility of population centres, by expanding affluence, and by the creation of entirely new sorts of demand…….
>
> In the purely economic sphere, the growth of the money economy turned self-sufficient peasants into wage-earners, consumers and taxpayers, each with new demands and aspirations.

The last sentence is the most telling. What is so striking about this account is that it reminds us that the beginning of the modern world was so recent – my father, who was born in 1874, only one generation ago, witnessed it. Is it possible that the first tractor ploughed its furrow less than 100 years ago? The Industrial Revolution was built on power from fossil fuels, and it exploded during the 20th Century as more and more were tapped. Now as the 21st Century dawns, we face the peak and decline of these essential drivers. Logic proclaims that the entire economic, social and political fabric of the modern world is at risk, especially since the pace of change seems to have been accelerating.

It seems, further, that we are generally moving from the nation-state to a form of global kleptocracy, in which corporate and political leaders co-operate to their mutual advantage, although a few anachronistic ultra-nationalistic states remain under increasing pressure and violence. A remarkable website touches on the kleptocracy. The message will be too blunt for most tastes, but there is no smoke without fire
http:/www.scoop.co.nz/mason/stories/HL0206/S00071.htm

***64. Country Assessment Series***

Continuing the series started last month, we take a look at Indonesia. It is intended that the series will stimulate an interest in tracking down more data and insight so that the assessments can be improved and assembled into a useful compendium.

## INDONESIA

Indonesia is an archipelago, stretching for about 3000 km from Asia to Australasia and including the large islands of Java and Sumatra as well as much of Borneo. It has a diverse ethnic population of 200 million, of which about 3% are Chinese, who have traded and settled in the area for centuries. It is a predominantly Muslim country.

It has had a long history being settled by peoples from Malaya and Oceania, but was also influenced by Arab traders in the Middle Ages. From 1602 until 1798, most of the territory was controlled by the Dutch East India Company, before it passed into Dutch colonial rule. It was occupied in the Second World War by the Japanese, whose motive for going to war was partly access to oil.

A move to independence followed under the leadership of Sukarno, being finally granted in 1949 under less than amicable terms. The western end of New Guinea, with its very different ethnic people, was added to the new republic in 1963, later being renamed Irian Jaya. The former Portuguese territory of East Timor, with its predominantly Catholic population, was annexed in 1976, but has recently successfully seceded.

Sukarno, who had Communist leanings, ruled in an authoritarian style until 1965 when he was ousted by General Suharto in a bloody conflict costing 500 000 lives. His rule was endorsed by popular elections in 1968, having adopted more Western-oriented policies, seeking overseas investment. Since his departure, the country has lurched from one political crisis to another under a somewhat uncertain administration. Further difficulties are likely to be experienced as economic conditions deteriorate, with the possibility of successful separatist movements in various islands.

Indonesia has had a long oil history, being the birthplace of Royal Dutch/Shell, with its early fields in Borneo. Sumatra, however, has the largest fields, Duri and Minas, which were found in the 1940s but not developed until after the Second World War. Duri contains heavy oil (20° API), being produced with low net energy yield by steam injection, putting it on the borderline of *Non-conventional.*

The country joined OPEC in 1962 and effectively nationalised the oil industry in 1965 with the creation of a state company Pertamina. It, in turn, entered into production-sharing contracts with foreign companies, bringing about a very successful and active co-operation.

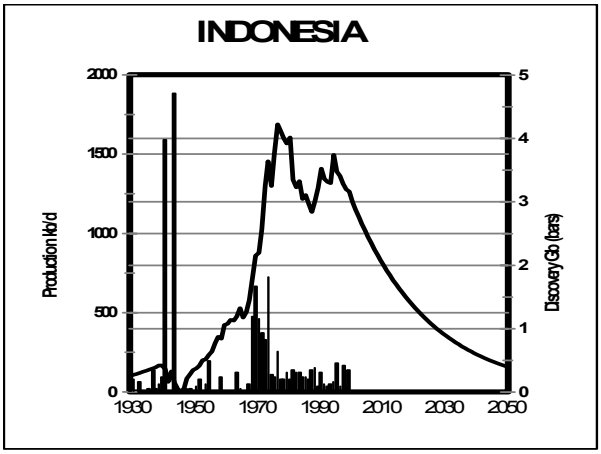
It is bordered by a large continental shelf, but in geological terms, much of the country is strongly deformed and volcanic, so that its petroleum prospects are confined to a few well-known Tertiary sedimentary basins in Sumatra, the Java Sea, S.E. Borneo and locally in Irian Jaya.

Exploration is at a mature stage having commenced in the last century. Some 3400 wildcats have been drilled, but drilling rate has been falling for some years, pointing to an end to exploration by about 2040. Even so, it is estimated that more than a billion barrels await discovery, coming mainly from ever smaller fields in the established producing areas. The country has some *Non-conventional* deepwater oil potential, as already confirmed by Unocal's work off Borneo, but generally the source-rock conditions for such are adverse. Whereas the prolific deepwater tracts of West Africa and the Gulf of Mexico are underlain rifts containing rich source-rocks, the possibilities in Indonesia are confined to the delta-fronts themselves that are likely to be lean and gas prone.

The production profile exhibits the typical OPEC saddle due to quota restrictions. Production accordingly peaked in 1977, fifteen years before the midpoint of depletion in 1992. A secondary peak was passed in 1995, partly making up what would have been produced naturally save for the OPEC saddle and partly coming from a second smaller cycle of discovery in the 1970s. Production has now commenced its terminal decline at a Depletion Rate of about 4 percent a year.

Consumption is 89% of production, meaning that the country is set to become an importer by 2004, assuming flat demand. Its continued OPEC membership must accordingly be increasingly in doubt. .

| INDONESIA | | |
|---|---|---|
| ***Rates Mb/d*** | | |
| Consumption | 2001 | 1.065 |
| Production | 2001 | 1.200 |
| | Forecast 2010 | 0.83 |
| | Forecast 2020 | 0.56 |
| Discovery 5-year average (Gb) | | 0.29 |
| ***Amounts Gb*** | | |
| Past Production | | 19.41 |
| Reported *Proved Reserves* | | 5.00 |
| Estimated Future Production to 2075 | | |
| From Known Fields | | 9.00 |
| From New Fields | | 1.59 |
| Future Total | | 10.59 |
| Total Production to 2075 | | 30.00 |
| Current Depletion Rate | | 4.0% |
| Depletion Midpoint Date | | 1992 |
| Peak Discovery Date | | 1955 |
| Peak Production Date | | 1977 |




## *65. Caspian oil reserves estimate revised down*

Mr McKillop sends the following press report confirming that Caspian oil potential has been greatly exaggerated. While the press release is not quite clear about what precisely the 7..8 billion barrels refers to, the thrust of the article to dismiss earlier exaggeration and question the geopolitical strategies to gain control of a possibly empty target is valid. This is further confirmed by another statement from Agip reported in Energy Day of May 30th , stating that the recoverable reserve potential of Kashagan is only 1.2 Gb. In short, it begins to look as if the once glorious Caspian turns out to be a bust, confirming the old adage that distant fields are green.

> Boston, 10 April 2002 (RFE/RL) -- A new estimate of Caspian Sea oil resources suggests that the region will see significant growth in production by 2010. But the numbers may also dampen some expectations and serve as a reminder that the area will not assume the strategic importance of the Middle East. One of the largest oil companies in the Caspian Sea region recently sounded a note of reality with a new and more modest estimate of the area's oil reserves. Speaking on 8 April in Almaty at the Eurasian Economic Summit, Gian Maria Gros-Pietro, chairman of Italy's Eni oil company, said the Caspian contains 7.8 billion barrels of oil, the Interfax news agency reported.

The good news for Kazakhstan is that it is believed to hold nearly 70 percent of the Caspian total, Gros-Pietro said. The bad news may be for political analysts, because the numbers are far smaller than those that many have used.
Since the first foreign oil deal in the Caspian was signed in September 1994, analysts have pumped up the region's importance as a strategic issue. Early estimates claimed that the Caspian could hold as much as 200 billion barrels, a figure that was soon trimmed to 115 billion or less.

Over the years, many officials who tried to create a "great game" with various Caspian pipeline strategies also played a numbers game, largely ignoring industry experts who argued that the Caspian would never affect the oil market as much as the Middle East.

Most analysts now agree that future flows of oil from the Caspian will make only a marginal difference to world prices, perhaps ranking in importance with Britain's and Norway's production from the North Sea.

Gros-Pietro seemed to endorse that view in estimating that in 2010, the Caspian region will produce 3.8 million barrels per day, or about 60 percent of North Sea output. While his comments may have been intended to stress the region's importance, they may have underscored the fact that it will not rival Saudi Arabia or Russia, which each produce about 7 million barrels per day.

Political strategists have never made a distinction between possible, probable, and recoverable oil reserves. In a recent report, the U.S. Department of Energy estimated that the Caspian may hold up to 233 billion barrels of possible reserves, which means those with a 50 percent probability. But the report said there may be only 17 billion to 33 billion barrels of proven reserves, meaning those with a 90 percent likelihood.

The Eni figures, which are less than half of the smaller estimates, may represent recoverable reserves, those that can actually be developed and brought to market. These are still large, but far more modest than the headlines in 1994 claimed.

The comparison may be useful at a time when Iraq has tried to put pressure on both politics and the market by announcing on 8 April that it would halt oil exports for 30 days to protest Israel's crackdown on Palestinians in occupied territories. The move, which may take 2 million barrels per day off the market, caused a brief spike in prices before assurances from Saudi Arabia drove the market back down again on 9 April

.Saudi newspapers quoted Oil Minister Ali al-Naimi as saying, "I believe there is no threat to the reliability of worldwide oil supplies, and the reliability of Saudi Arabian supplies in particular," Reuters reported. The comments were seen as a signal that Saudi Arabia would use its spare capacity to keep prices from killing economic recovery. Interfax quoted a Russian government official as calling the Iraqi move "a mistake," a remark that the ITAR-TASS news agency attributed to a spokesman for the Foreign Ministry.

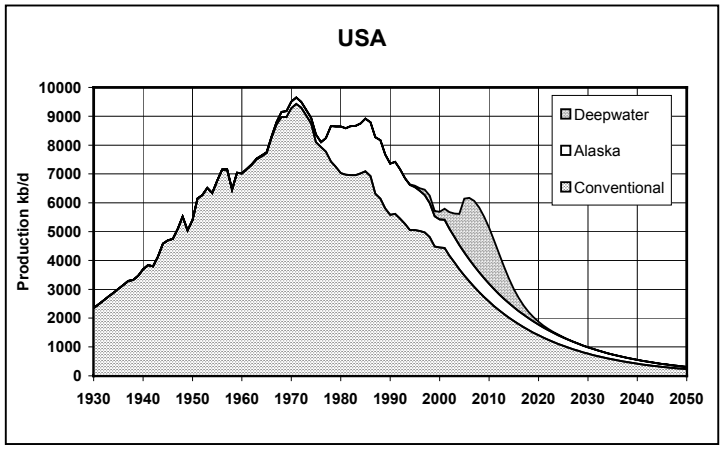
Attention also focused on Iran, with daily exports of about 2.5 million barrels. On 5 April, Iranian Supreme Leader Ali Khamenei urged Islamic countries to suspend oil exports to countries that support Israel. Although Iraq invited Iran several days earlier to take such a step co-operatively, Tehran did not seem prepared for Baghdad's sudden decision. On 9 April, Iran's parliament speaker, Mehdi Karroubi, said a boycott would "prove effective only if other countries follow suit," the official news agency IRNA reported. The remarks suggested that Tehran believes that even a combined stoppage of over 4 million barrels per day would not be enough to drive events. In any case, the United States does not buy oil from Iran.

For the Caspian countries, the events may be a reminder that oil is no guarantee of security or sustainable development. The Caspian countries now export a total of about 1 million barrels per day, but they may be more reliant than ever on petroleum income, which rises or falls unpredictably.

As production grows, the Caspian nations have shown signs that they are following the path of the Middle East in depending on oil and failing to diversify their economies. The new numbers suggest that countries like Kazakhstan are poised for growth, but they also point to the importance of becoming more than sources of oil.

### *66. US Production Forecast*

The following plot, taken from the ASPO Statistical Review of Oil and Gas, shows how US imports are set to rise unless the government can somehow rein in demand. It has every reason to be concerned about access to foreign oil, including whatever it can get from the Caspian.




### *67 Gas Hydrates*

Peter Gerling from the BGR draws attention to the following article on Gas Hydrates. There are good grounds for being very sceptical about the economic production of gas hydrates. The principal reason is that they mainly occur as thin laminae and disseminated granules such that the methane cannot migrate to accumulate in commercial deposits. Some of the reported thicker occurrences may be nothing more than seepages of normal gas on the sea floor. It is well said that they are *"the fuel of the future — and likely to remain so"*. Meanwhile they attract an enormous amount of unjustified research funding that continues to give equivocal results.

> **First qualitative assessment of the economic potential of offshore gas hydrate accumulations**
> Previously, the volume of the offshore gas hydrate resource was estimated – mainly based on data from Kvenvolden – in the range of 21 x $10^{15}$ $m^3$. In 2000, a Russian scientest came out with the number of 0.2 x $10^{15}$ $m^3$, approximately half of the world's conventional gas endowment. All these numbers are pure estimates without any economic consideration.
>
> A.M. Milkov and R. Sassen from Texas A&M University have published this year (Marine and Petroleum Geology, Vol. 19, 1-11) an article about offshore gas hydrates considering geological, technological and economic factors. The authors distinguish between structural accumulations, stratigraphic accumulations, and a combination of both. Only structural accumulations occurring in areas with rapid gas transport from great depth, e.g. in the northwestern Gulf of Mexico, may contain economic gas hydrate resources. However, the authors clearly state that their preliminary qualitative economic analysis is based on many assumptions. They assume that gas hydrate may be profitably recovered from some accumulations.

### *68. False Scenario?*

The base case scenario behind the depletion forecast of conventional oil depicted in the frontispiece of the Newsletter is that the world about ran out of spare capacity in late 1999, causing oil prices to soar, which helped trigger recession. The recession in turn cut oil demand, lessening pressure on price. Since depletion continues to reduce capacity, the scenario imagines that future price shocks are inevitable and that they will cause recurring recessions. Accordingly, the average production of conventional oil is assumed to be flat until 2010, when in practice the Middle East producers are no longer able to exercise their swing role, offsetting the natural decline elsewhere.

Mr McKillop, an economist, however questions that high oil prices trigger recessions, seeing them rather as a boost to liquidity, insofar as the high prices reflect revenue increase rather than rising production costs as such. Such a boost to liquidity may thus be a global economic stimulus rather than the converse, although there may be domestic set-backs in certain countries and time-lags in the effects. If this interpretation is correct, then perhaps a stimulated economy will after all lead to a rising demand for oil, which can only advance the peak and steepen the subsequent decline, making a bad situation much worse. (see McKillop A, 1989, On Decoupling: Int. Journ of Energy Research 14 83-105)

***69. The Fuel that Fires Political Hotspots***

An article by C.J.Campbell with the above title appeared in *The Times Higher Education Supplement* on May 17th 2002, referring to the ASPO Uppsala Workshop.

***70. More Evidence of Major Oil Company Downsizing***

Two recent articles in *World Oil* touch on downsizing. The April issue reports that BP has decided against making political contributions in the USA, $834 000 having been spent in this way in 2001. The directors of companies, who have a fiduciary duty to make money for their shareholders, have no reason or justification for making donations unless commercial advantage results. Political corruption, however elegantly packaged and euphemistically described, is universal, and indeed essential to business success, so to end the practice speaks less of a moral awakening than of reduced activity.

The May issue reports on the same company's replacement of staff by consultants, the total for various drilling functions being 31%. The declared aim is 30-40%: above that the Company loses essential expertise and continuity; below the level, its own staff have to be shed. It is not exactly the image of soaring future drilling activity.

The Newsletter very much welcomes contributions from ASPO members and other readers, who may wish to draw attention to items of interest or the progress of their own research.

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