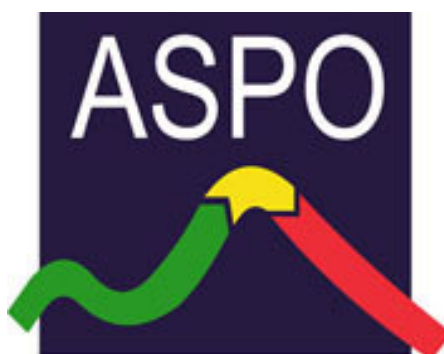


NEWSLETTER No. 69 – SEPTEMBER 2006



ASPO started as a network of scientists and others, having an interest in determining the date and impact of the peak and decline of the world's production of oil and gas, due to resource constraints. Now independent national affiliates are in existence or formation in Australia, Austria, Canada, China, Egypt, France, Germany, Ireland, Israel, Italy, Japan, Korea, Mexico, New Zealand, Norway, Portugal, South Africa, Spain, Sweden, Switzerland, United Kingdom and the United States.

Missions:

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

Newsletter: The newsletter is currently compiled under the auspices of ASPO IRELAND, which maintains a full and searchable archive of past issues at www.peakoil.ie.

Foreign language editions are available as follows:

Spanish: www.crisisenergetica.org

French: www.oleocene.org (press "Newsletter")

Newsletter communications should be addressed to Katie Buckley (k.buckley@aspo-ireland.org)

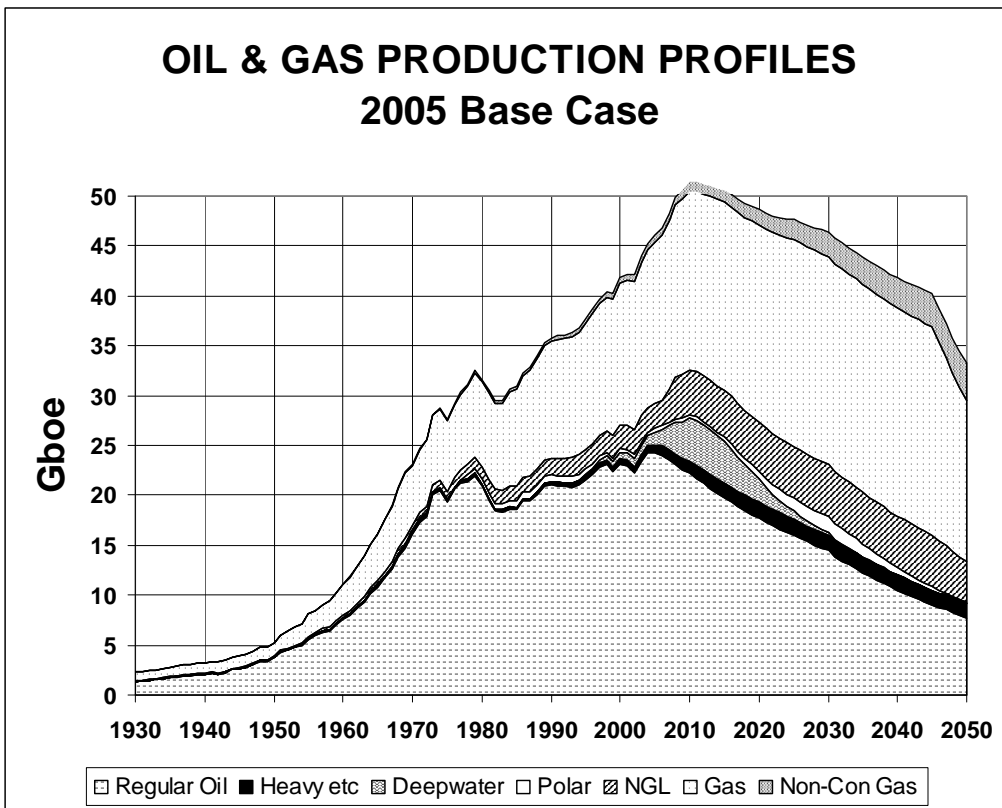
CONTENTS

- 739. War***
- 740. Regional Assessment- EURASIA***
- 741. ASPO Database***
- 742. ASPO-6 International Conference***
- 743. Thoughts on the future mission of ASPO***
- 744. Climate Change***
- 745. Review of an oil supply forecast by CERA***
- 746. The Retreat from Marketing***
- 747. Review of ASPO-5: The Fifth International Conference on Oil and Gas Depletion***
- 748. Peak Oil and the Oil Industry***
- 749. The Oil Depletion Protocol – Adopt it Today!***

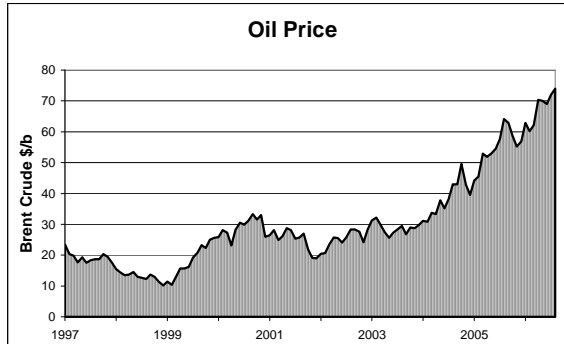
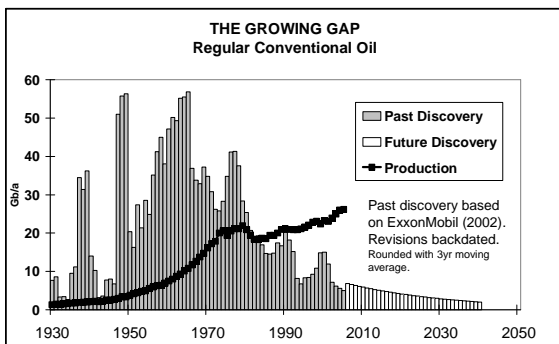
Index of Country & Regional Assessments with Newsletter Reference (*revised)

Abu Dhabi	42	Canada	48	Indonesia	*61	Netherlands	57	S. Arabia	*66
Algeria	41	Chad	59	Iran	32	Nigeria	27	Trinidad	37
Angola	36	China	40	Iraq	24	Norway	25	Turkey	46
Argentina	33	Colombia	*62	Italy	43	Oman	39	UK	*68
Australia	28	Denmark	47	Kazakhstan	49	Peru	45	USA	23
Azerbaijan	44	Ecuador	29	Kuwait	38	Qatar	58	Venezuela	*67
Bolivia	56	Egypt	30	Libya	34	Romania	55	Vietnam	53
Brasil	26	Gabon	50	Malaysia	51	Russia	31	AFRICA	68
Brunei	54	India	52	Mexico	35	Syria	*60	EURASIA	69

The General Depletion Picture



ESTIMATED PRODUCTION TO 2100								End 2005			
Amount			Gb	Annual Rate - Regular Oil					Gb	Peak	
Regular Oil				Mb/d	2005	2010	2015	2020	2050	Total	Date
Past	Future	Total									
			US-48	3.6	2.8	2.2	1.7	0.4	200	1971	
			W.Europe	5.0	3.4	2.3	1.6	0.2	75	2000	
			Russia	9.2	8.5	6.9	5.7	1.5	220	1987	
			ME Gulf	20	19	19	19	11	680	1974	
			Other	29	27	23	20	8	725	2004	
All Liquids			World	66	61	54	48	21	1900	2005	
1043	1457	2500									
2005 Base Scenario			Annual Rate - Other Categories								
M.East producing at capacity (anomalous reporting corrected) Regular Oil excludes Heavy Oils (inc. tarsands, oilshales); Polar oil; Deepwater oil, & gasplant NGL			Heavy etc.	2.3	3	4	4	4	150	2021	
			Deepwater	3.6	12	11	6	0	69	2011	
			Polar	0.9	1	1	2	0	52	2030	
			Gas Liquid	6.9	12	13	14	11	354	2035	
			Rounding		1	2		-2	-25		
Revised	20/08/2006		ALL	80	90	85	75	35	2500	2010	



739. War

The following article from Alexander's Oil & Gas Connections sums up the position well.

War on hold?

As the year is plodding on, and the weather is going from extreme to extreme in many places in the world, another war just has been put on hold, one of the many that are currently plaguing the human race. The 6th War, as it is called in the Middle East has proven again how volatile the human situation currently is. This war, again, knows no winners and only losers, in most cases the populations of the countries involved, the people whose villages and houses have been bombed or rocketed, causing fear and destruction on both sides of the border, giving rise to another generation of haters if not something substantially is changed.

Much has been written about the war and its contexts. It was said the actual causes had little to do with what was happening, that it was an outplay of a geopolitical power struggle. It has also been said that it possibly had to do with water-rights, or with securing a pipeline-corridor for several oil and gas-pipelines from Central Asia to the Middle East. There will be many other reasons that can be found to explain what has happened.

It is extremely difficult to get a balanced view about the underlying causes for this mutual destruction, it being that news and propaganda are hardly anymore discernable from each other and so many news-channels are in the hands of so few people.

From here, in the still very safe countryside of Germany, I wish all those who have suffered innocently from this clash much healing and all strength to overcome the damage done.

Alexander Wöstmann

740. Regional Assessment- EURASIA

Continuing the series of regional assessments, we take a look at the Eurasia Region below. As herein defined, it comprises China and the ex-Communist bloc of the former Soviet Union and Eastern Europe. It is not accordingly a clear-cut geographic region but is a useful grouping insofar as its oil and gas industries developed under very different economic and political circumstances. That said, it is remarkable that the discovery trends are so similar to those of the non-communist world, with the larger fields being found first.

EURASIA

The Eurasia Region, as here defined, covers an area of about 35 million km², ranging from the Arctic wastes of Siberia to the Himalayan Mountain Ranges in the south, being also cut by the Urals Mountains of Russia. Extensive deserts and semi-deserts extend westwards from China. The land mass is drained mainly by rivers flowing northwards into the Arctic, by the Yangste and Yellow Rivers of China which drain eastwards into the Pacific, and the famous Volga River flowing south through Russia into the Black Sea. To the east of it lie the Caspian and Aral inland seas, together with Lake Baikal, which are subject to such high levels of evaporation in the hot, dry climate that they lack outlets. Extensive tracts, north of the Caspian, are below sea-level. A number of sizeable barren islands lie in the largely ice-covered Arctic Sea to the north.

The Region supports a population of about 1.75 billion people, living in thirty countries, some of which are now joining the European Union. The current population density varies widely from 1.5/km² in Mongolia to 136/km² in China, but averages about 50/ km². It has an average life expectancy of about 70 years, and a fertility rate of 1.6 children per woman, which is below replacement level. In population terms, the region is of course dominated by China with about three-quarters of the total, that being one-fifth of the World's total.

The Region has had a turbulent political history. During the 18th and 19th Centuries, Russia had imperial ambitions under the Czars to extend its dominion both eastwards and into the partly Muslim south around the Caspian. The Bolshevik Revolution of 1917, led in part by Josef Stalin, an oil worker's leader from Azerbaijan, cemented a new empire under the Communist system, later adopted in China. The Region suffered greatly in the two world wars, but emerged victorious. Western opposition to the Communist system led to the so-called Cold War, which came to an end with the fall of the Soviets around 1990. China, although still run on Communist lines, has evolved into a commercial and industrial power house with a soaring, and probably unsustainable, demand for energy.

New tensions and conflicts seem to be developing as the European Union expands its hegemony eastward not only to the countries of Eastern Europe that were occupied by the Soviets at the end of the Second World War, but to members of the former Soviet Union itself. A subtext may be the hope that the euro might develop into a new trading currency to rival the dollar, and deliver a massive hidden tribute.

The oil-rich countries bordering the Caspian become a new flash point, subject to internal factional conflicts, while seeking to escape from Russian influence. For perhaps not unrelated reasons, some of them have accepted US military bases, located to control oil supply. The United States armed a nationalist movement in Afghanistan to oust the Soviet Army, but later invaded the country, possibly to secure an

export route for Caspian oil and gas, by-passing the Persian Gulf. The strategy was no doubt premised on unfulfilled hopes that the Caspian would become a major new oil province, rivalling the Middle East.

New political strength comes to Russia, as Europe increasingly depends on it as a supplier of Natural Gas, following the decline of North Sea production. It is likely to resist Western pressure to admit foreign capital to exploit and deplete its reserves rapidly, seeing no good reason to subsidize its commercial competitors with cheap energy, while its own domestic demand grows. The existing western companies operating in the country are likely to find the going hard, while Mr Khordokovsky, the entrepreneurial head of the former Yukos Oil Company that came to prominence on the fall of the Soviets, finds himself in jail.

It is difficult to summarise the geology of this large diverse area. Much is formed of ancient non-prospective Shield rocks which are cut by the Hercynian fold-belt of the Urals, and flanked by the Tertiary Carpathian and Himalayan belts. In terms of petroleum geology, the Region is dominated by a productive belt, west of the Urals, which runs from the Timan-Pechora Basin in the North to the Caspian in the South. The principal source-rock is the Domanik Shale of mainly Devonian age, which has yielded oil trapped in Palaeozoic and overlying Mesozoic reservoirs. The trend becomes gas-prone northwards to the Yamal Peninsula and offshore, due to the deep burial of the sources-rocks. It is also worth mentioning in particular the North Caspian region, onshore and offshore, where Silurian source rocks have charged Carboniferous reefal carbonate fields with sulphur-rich crude in structures sealed by Permian salt.

Another important province develops to the east of the Urals, known as the West Siberian Basin, where Upper Jurassic source rocks have charged overlying Cretaceous sandstones in rift structures. These two areas have been intensely drilled, yielding a fairly dense patchwork of oilfields, including the giant fields of Romashkino, found in 1948 with about 17 Gb, followed by Samotlor in 1961 with about 20 Gb.

A third important province lies on the Pacific Margin, providing a number of productive basins in China and offshore Sakhalin, which rely on Tertiary source-rocks, some of which are of non-marine origin, yielding waxy crudes.

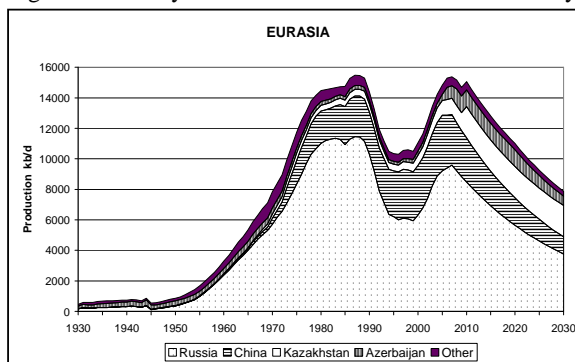
Lastly comes a series of Tertiary oil provinces in the foothills of the Carpathian and Himalayan chains from Romania to Turkmenistan, including the important fields of Baku and the southern Caspian.

Hopes have been expressed by Shell and the IEA that the vast relatively under-explored tracts within the Arctic Circle, including the offshore, might yield substantial amounts of oil and gas, but there are serious doubts that they will be fulfilled. First, rich source-rocks, whose deposition was limited to tropical regions, have only locally been transported to high latitudes by Plate Tectonic movements. Secondly, experience from the Barents Sea and elsewhere, shows that the Earth's crust in the polar regions has been subjected to vertical movements of as much as 2000m, due to the weight of fluctuating ice-caps in the geological past. Such movements have in many cases destroyed the petroleum systems, depressing the source rocks into the gas-window and adversely affecting seal integrity. On balance, it appears to be a gas-prone region, as amply demonstrated by experience to-date, although oil occurrences may still be found in local exception structural settings.

The past and forecast production of *Regular Conventional* oil in the Region comes primarily from Russia, China, Kazakhstan and Azerbaijan, as illustrated in the above graph.

The birth of the oil industry in fact took place in Azerbaijan in the middle of the 19th Century, when that was part of the Russian Empire: drilling having been underway some years before Colonel Drake sank his famous well in Pennsylvania. But political events, including the Bolshevik Revolution of 1917, impeded further development until after the Second World War, when systematic exploration under the Soviets began to deliver successful results. The major producing basins were identified, along with the giant fields within them, delivering an overall peak of discovery for the Region in 1964, by which time some 140 Gb had been found. Production is, as everywhere else, dominated by that coming from the early giant fields of which the two largest are in Russia, together hold some 37 Gb, followed by Daqing in China, found in 1959 with about 13 Gb. It remains to be seen if Kashagan in the Caspian off Kazakhstan will take the fourth place.

Production reached an initial peak of 15.5 Mb/d in 1987, but then collapsed due to interruptions associated with the end of Soviet Government, falling to a low of 10.3 Mb/d in 1996, before recovering to 14.8 Mb/d in 2005. It is now likely to remain at about this level until around 2010 before long-term decline sets in at about 3.5 % a year. The growth of production in Kazakhstan and Azerbaijan will fail to offset the decline in Russia and China. The recent construction of a new pipeline from the Caspian to the Mediterranean coast of Turkey provides an important new export route, although passing through several transit countries, which may be inclined interrupt supply from time to time.



The following table gives a general indication of past and future production for *Regular Conventional Oil*, together with consumption (including that in the unlisted countries of the Region lacking significant production) but many uncertainties remain, as the input data are far from reliable. It is noteworthy that the Region is only a minor net exporter of about 2 Mb/d, due principally to the high level of consumption in China.

The position with Natural Gas is more obscure, although there are very considerable deposits, principally in northern Russia and around the Caspian. In some areas, permafrost conditions have acted as a seal for the gas. Production is dominated by Russia with 21 Tcf/a, which is about 75% of the Region's total, but its consumption is also relatively high at 14.2 Tcf/a., meaning that it is a net exporter of about 7 Tcf/a. It claims reserves of about 1650 Tcf. If production and consumption rise on average at 5% a year over the next few years, exports could increase to plateau at about 10 Tcf/a year by around 2012 for another ten years or so, provided that additional pipeline capacity is installed. However, various reports suggest that Russian gas production may in fact be running at capacity already. In any event, growing domestic demands both within Russia and the Region as a whole will soon to put pressure on exports, albeit partly mitigated by new discovery. We may note in passing that Turkmenistan is also an important net exporter, although smaller by orders of magnitude.

Gb	Regular Oil Production								Con- sumption kb/d
	Present		Past	Future		Total	Peak		
	kb/d	Gb/a		Known	New Finds		Disc.	Prod	
Russia	9215	3.36	134	73	18	225	1960	1987	2753
China	3635	1.33	32	25	2.8	60	1959	2005	6988
Kazakhstan	970	0.35	7.0	32	5.7	45	2000	2020	208
Azerbaijan	400	0.15	8.5	11	1.9	21	1871	2015	103
Romania	100	0.04	5.9	1.5	0.6	8.0	1857	1976	240
Turkmenistan	220	0.08	3.2	1.8	0.6	5.5	1964	1973	110
Ukraine	85	0.03	2.8	1.1	0.6	4.5	1962	1970	294
Uzbekistan	160	0.06	1.2	1.0	0.5	2.8	1992	1998	161
Hungary	20	0.01	0.7	0.2	0.6	1.0	1965	1987	151
Croatia	18	0.01	0.5	0.3	0.2	1.0	1950	1988	96
Albania	6	0.00	0.5	0.2	0.1	0.8	1928	1983	25
EURASIA	14829	5.41	196	147	31	375	1964	1987	12574

Gazprom, the Russian gas undertaking, emerges as a major force in the gas business, buying up other Russian companies, and expressing interest in acquiring marketing companies in Europe. A particularly significant development involved negotiations with Algeria to exercise greater control over European gas supply. Gerhardt Schroeder, the former Chancellor of Germany, finds himself on the Gazprom Board in what may prove to be the more important job.

The above estimates are however clouded by market factors, especially low domestic sales prices, which are politically sensitive, yet give incentives for export. The issue is further complicated by internal tensions between Russia and its neighbours within the Region, including recently the Ukraine and Chechnya, some of which are able to apply pressure by virtue of being pipeline-transit countries.

The Region is also endowed with *Non-Conventional* resources, comprising large deposits of tar sand in Eastern Siberia, as well as possible the polar oil and gas potential discussed above, whose production is not however likely to rise to significant quantities for many years to come and until easier resources have been depleted. The production of Natural Gas Liquids from gas plants amounts to about 500 kb/d, and is probably set to rise in parallel with gas.

It is of course impossible to predict the future, but it would not be unreasonable to expect a certain new golden age to dawn for Russia with its abundant energy and its relatively undeveloped industrial base, which is less vulnerable to adverse world economic conditions. China, by contrast, faces a dire energy supply situation which is likely to draw a curtain on the economic prosperity it has enjoyed over the past decade.

Overall, it would be reasonable to expect the Region to evolve in relative isolation, as it endeavours to meet its own energy needs, and resolve the many internal simmering conflicts, especially in the Caspian borderlands. Probably, authoritarian governments will prove to offer the best practical political framework for development or survival. The Russian rouble may gain in strength relative to the euro and dollar as global trade declines during the Second Half of the Age of Oil.

741. ASPO Database

ASPO organisations, which have been, or are being, established in over twenty countries, have the opportunity for assembling an improved oil and gas database for their own and neighbouring countries which could be built into a considerable new asset for the organisation as a whole. It is well said that the issue of Peak Oil would be entirely self-evident were valid information available to the public. As it is, the reporting

of Reserves is substantially a *political* act, being much influenced by commercial, financial and political factors, which may be valid in their own contexts but distort the real picture.

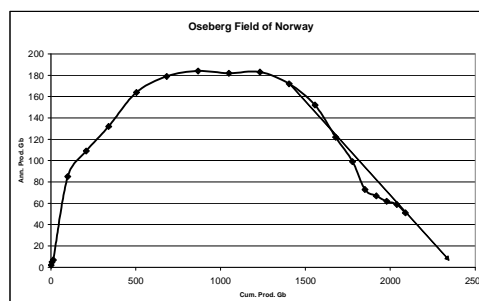
Local ASPO organisations may have opportunities to secure genuine information from official sources within their countries and develop useful off-the-record contacts with oil companies and others, willing to support the initiative. They may even enlist the support of their own governments and institutions interested in obtaining a valid basis for national energy policies.

The First Step would be to build an inventory of oil and gas fields, resolving any confusion over nomenclature arising for example from cases where a field, straddling a frontier or concession boundary, has different names, or where it has minor satellites to be included.

The Second Step would be to obtain the record of past production by field, which is commonly reliable and not particularly confidential. The following graph plots annual against cumulative production for the Oseberg Field in Norway. It is a simple matter to extrapolate the trend to determine the size of the field. In this case, the exercise confirmed the official estimate, but in many cases it would not do so, calling for further evaluation.

The Third Step would be to list exploration boreholes (“wildcats”) by year. Plotting cumulative discovery against cumulative wildcats normally provides a clear trend which can be extrapolated to show what is left to find in the country, for the simple reason that the larger fields tend to be found first.

The basic evaluation would be a relatively straightforward task which could yield useful results, to be co-ordinated into an independent global assessment. Further, more detailed, evaluations could follow where needed and feasible.



742. ASPO-6 International Conference

ASPO-IRELAND is working towards the next international conference, to be held in Killarney in May 2007. It has still to secure the full necessary sponsorship to make it possible but a successful start has been made. It welcomes ideas for speakers and themes. Killarney is a beautiful lakeside resort mid the mountains of the West, but is conveniently located for Shannon and Cork airports to which shuttle services will be provided. It is planned to make it both an informative and enjoyable occasion.

743. Thoughts on the future mission of ASPO

The Association for the Study of Peak Oil and Gas was born following a lecture at Clausthal University in Germany in 2000, and initially was no more than a loose network of scientists in European universities and government departments. The perception of *Peak Oil* went much farther back, having been obvious to international petroleum geologists for at least thirty years from the simple observation of declining discovery rates and the diminishing size of finds. However, the notion of finite limits imposed by Nature has run counter to classical economics, which holds that supply must meet demand in an open market. Accordingly, any serious consideration of the impact of *Peak Oil* has been widely dismissed as the raving of a doomsayer. Although some fifty countries are producing less than in the past, the global peak of oil production will probably be fully recognised only several years after it has passed, meaning that precious time will have been lost in finding ways to adjust to the new situation. It is ironic that if valid information on reserves were available in the public domain, the whole issue would have been entirely self-evident long ago.

Things have however changed over the past year or so, partly as a result of the invasion of Iraq, which has been widely seen as having an oil-based subtext, followed by soaring oil prices. High prices have at least led the flat-earth community to conclude that there are no ready alternatives to prime Middle East supply, even if they persist in believing that this region has infinite resources to be tapped if invasions should succeed. In a sense, ASPO could consider this new recognition as *mission accomplished* as it has contributed to it with the help of this newsletter, international conferences, and websites.

It seems that there is now wide acceptance that the *First Half of the Oil Age* comes to an end. The flat earth community, assisted by vested interests in the oil industry as well as political and institutional obfuscation, however persists in the proposing that production can be maintained, if not increased, during the *Second Half of the Oil Age*, by tapping non-conventional oil in tar sands and oil shales, and converting coal and gas into liquid with the help of new miracle technology.

There is probably still merit in ASPO endeavouring to improve the database (see Item 741 above) and continuing to raise awareness of the nature of depletion, but perhaps a new mission comes into sight at the dawn of the *Second Half of the Oil Age* in trying to analyse the net energy yield of non-conventional oil and

gas, liquefying coal and gas, and bringing in the full spectrum of alternative energy from tide, wave, wind and biomass, as well as solar, geothermal and nuclear sources. It might also be worth evaluating and drawing attention to the new more enlightened principles are being proposed by the intelligent economists presently on the fringe. To do so, however, would call for tapping new expertise, especially in compiling the newsletter.

744. *Climate Change*

An interesting article in the August issue of *Geoscientist* reports on the Vostok ice cores of Antarctica, in which past climate over 400,000 years is recorded. It seems that there is a direct link between sea-level and the concentrations of carbon dioxide, methane and dust, the latter reflecting the expansion of deserts for climatic reasons. The record is distinctly cyclic with sea-level having successive lows at about 100m below present levels during ice ages which occurred about 15, 130, 340 and 430 thousand years ago. The pattern is for sea-levels to decline gradually over a long period of cooling before rising sharply following a fairly sudden epoch of global warming. It is noteworthy however that the present day concentration of greenhouse gases is unprecedented over 440,000 years, having risen almost off-scale over the last 150 years, which perhaps significantly corresponds exactly with the *First Half of the Age of Oil*. The evidence seemingly suggests that present high concentrations of greenhouse gas will in due time trigger another ice age.

745 *Review of an oil supply forecast by CERA*

Daniel Yergin, the Chairman of CERA, wrote *The Prize* which is a brilliant history of the oil business full of proper facts and references, but the following review suggests that history remains his strongpoint.

CERA's Report is Over-optimistic

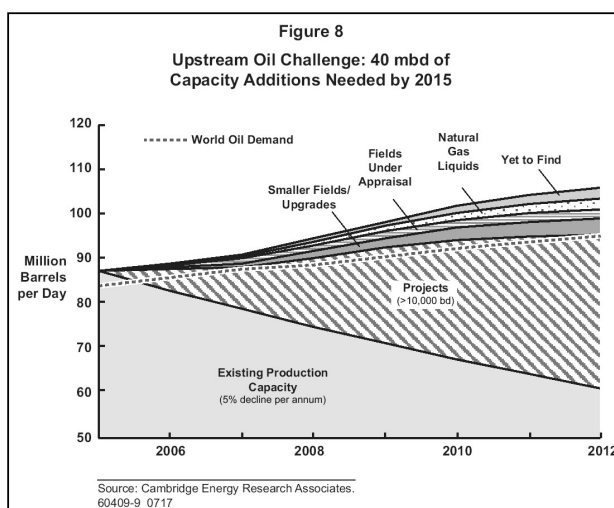
By Professor Kjell Aleklett

Uppsala Hydrocarbon Depletion Study Group, Uppsala University, Sweden

Association for the Study of Peak Oil & Gas (ASPO)

On August 8, 2006, CERA (Cambridge Energy Research Associates) released a new report entitled "*Expansion Set to Continue – Global Liquids Capacity to 2015*", being offered for sale for only \$2,500. Rather than being audited or refereed as is the case in normal scientific articles, CERA holds its data confidential, evidently hoping that its conclusions can be taken on trust. In the press release, it presents onto two of the 31 figures in the report, both of which show very optimistic assumptions about the growth in global productive capacity. A key conclusion of the report is that it *reinforces CERA's view that the spectre of "peak oil" is not imminent*, directly contradicting ASPO's position. In the overview of the report, Daniel Yergin also announces a forthcoming report, entitled *Myths and Legends Concerning Peak Oil*. In this, yet to be released, report, he directly confronts *Peak Oil* claiming that it is not imminent, adding that we are not even near the start of the *undulating plateau* presented previously by CERA.

When discussing different opinions, it is always useful to look for common ground, so Figure 8 is a good starting point. Both ASPO and CERA agree that production from existing oilfields is declining on average at about 5% per annum. CERA accordingly concludes that 40 million barrels per day of new extra capacity is needed by 2015. It has evaluated planned projects from now until 2012, assuming that all will be successfully completed, with 30% delayed for one to two years. But even this optimistic assumption does not yield enough, and the report has to rely on additional production from smaller fields, field upgrades, fields under appraisal, NGL, and yet-to-be-found new fields.



Extrapolating production for individual fields to 2015 provides some revealing insights. Any increase in global production would require highly successful exploration, with the new discoveries being put into production very quickly.

For Saudi Arabia, CERA supposes that new yet-to-be-found fields can provide as much as 2 Mb/d. Production from the Shaybah Field, which is the latest giant field brought online in Saudi Arabia, started in 1998 and has a current capacity of 500 kb/d. It follows that CERA's forecast assumes that four such fields will be found and put into production during the next nine years, which seems most unrealistic

given the results of past exploration which was always aimed to test the larger and more promising prospects.

When it comes to Russia, the number two global producer, CERA forecasts that production will rise to 11.2 Mb/d, which is 1.3 Mb/d more than that claimed even by the Russian Government itself.

Some consider that ASPO's forecasts of future supply are too low, although we have evaluated the details of the world's fields and depletion profiles as realistically as possible. By contrast, CERA's analysis can only be described as very optimistic, when, for example it states that it expects OPEC production capacity to increase by 12.9 Mb/d.

Figure 11 in the report shows significant liquid discoveries for 2005-06. One of the listed discoveries is Noxal in Mexico. It is true that, earlier this year, President Vicente Fox did announce that Noxal-1 was a major new discovery in the order of 10 billion barrels on the basis of preliminary results, yet, by May, press reports from Mexico revealed that the test well had failed and that there was no hope of the structure holding reserves of this size. CERA believes that Mexico will have a more or less constant production of 4 Mb/d until 2015 even though the Cantarell Field, that today accounts for close to 60% of the country's production, is expected to decline by 50% over the next few years. This is yet another example of the unrealistic optimism.

The global consumption of oil is now around 30 billion barrels per year. According to CERA, total discovery in 2005 was only 8.95 billion barrels, having averaged 11.5 billion barrels per annum over the last eleven years. Most of these discoveries lie in regions that were opened for exploration after the collapse of the Soviet Union and in deep water. We can now see a decline in discovery in these regions which will no doubt impact the worldwide trend.

These criticisms by no means exhaust those that could be levelled against the latest report by Daniel Yergin's Cambridge Energy Research Associates. The report suffers particularly from the failure to provide the data upon which it is based, thus denying critical analysis. Oil production and reserve data are of paramount importance for the future of the world, and ASPO believes that they should be available in the public domain as is currently the case in, for example, Norway and the United Kingdom.

746. *The Retreat from Marketing*

As world oil supplies decline during the *Second Half of the Age of Oil*, it seems inevitable that the major companies will withdraw from marginal markets to concentrate on prime areas, mainly in their home countries. So far, independent marketing companies have found it easy to buy surplus product from the refineries of the major companies, but as the throughput declines in the years ahead, the major companies will no doubt limit the available supplies to their own marketing chains.

In fact, to judge from reports in the *Petroleum Review*, it looks as if this trend has already begun. Norsk Hydro is to sell its 50% holding in Hydro-Texaco in Norway and Denmark ; Statoil wishes to sell its Irish marketing arm to a local company, which has already acquired Shell's position ; Shell is selling its downstream operations in Fiji and Tonga.

747 *Review of ASPO-5: The Fifth International Conference on Oil and Gas Depletion*

Professor Ugo Bardi reviews the content of the conference, held on July 18th and 19th in San Rossore, (Pisa. Italy)

ASPO-5

The Fifth International Conference on Oil and Gas Depletion (ASPO-5) took place on July 18-19 2006 in the park of San Rossore, not far from the leaning tower of Pisa. Sponsored by a number of organizations, private and public, including the Presidency of the Tuscan regional government and the Italian Ministry of the Environment, the meeting attracted more than 250 participants, including 25 experts from all over the world presenting their views, and more than 20 poster presentations. It was attended by more than 30 journalists and several media teams.

ASPO-5 was the fifth in a series of conferences organized by the *Association for the Study of Peak Oil and Gas*. A feature of this year's meeting was the linkage with political institutions in the host country, being sponsored by the Italian Ministry of the Environment and the Tuscan Regional Presidency. It preceded and introduced another conference entitled the *New Global Vision* (NGV-2006) directly organized by the Tuscan Government, which this year had as its title *Energy: the problem and the solutions*. The President of Tuscany, Claudio Martini, declared that, in view of the problems of pollution and of dwindling natural resources, a priority for Tuscany is to exit from its dependency on oil by developing renewable energies, already producing about 30% of the region's electrical power.

The Conference addressed the following themes :

1. *Resource assessment*. The basis of all depletion studies lies in a geological database, with proper definition and consistency of the fossil fuel resources.

2. *Economics and modelling*. It is not enough to know what we have; we must go beyond primitive concepts such as the "reserve/production" (R/P) ratio, and model how and how fast the economic system

is going to exploit these resources. We also need to know how the dynamics of fossil fuel production is going to affect, and is being affected by, the economic system.

3. *Technology and mitigation.* There are several ways to mitigate the problem of the reduced availability of fossil fuels. They include accelerating the rate of discovery and improving the recovery from known fields; shifting from one fuel to another; and relying on new energy sources or new technologies, not based on fossils, i.e. renewables.

4. *Policy and politics.* The use of mineral resources is strongly affected by political factors, which can also bring solutions to the problem of depletion by encouraging the use of new resources and regulating the use of traditional ones. Substantial changes in lifestyle cannot be avoided, and need to be encouraged.

Resource estimations were reported by several speakers. The most comprehensive presentation was probably by *Laherrère*, who concluded that oil resources are poorly reported and probably overestimated. Data on oil resources were also reported by *Aleklett*, *Bauquis*, *Campbell*, *Skrebowski*, *Salameh*, and others. There seemed to be a general consensus that oil resources have been exploited to the point that “conventional” oil is becoming scarce. *Gerling* presented extensive data on global coal resources, which appear to be relatively abundant in comparison to oil, whereas *Kolodziej* reported on the North American Natural Gas which is likely to face a coming supply crisis owing to the regional nature of the gas market. *Bourdaire* compared the worldwide resources of oil, gas and coal arriving at the conclusion that all three resources could peak before mid 21st Century.

Modelling of the future use of the remaining resources was made using variations of the Hubbert approach by *Aleklett*, *Bourdaire*, *Campbell*, *Heinberg*, *Laherrere* and *Bauquis*. *Hirsch* used a simplified version of the model to address his mitigation scenarios. The Hubbert model was theoretically examined by *Michel*, while a more sophisticated curve-fitting model, based on the Bass model, was reported by *Guseo*; which incidentally showed 2005 as the peak date for conventional oil. Dynamic modelling of resource exploitation was presented by *Meadows* and *Trjissenaar*. In both cases, the models stress the need of a global view of resource exploitation, going well beyond oil alone. *Salameh* and *McKillop* discussed the effect of depletion on the world markets and prices, while *Barillaro* discussed the speculative elements of the oil market. *Hall* stressed how all models must take into account the concept of EROI (or EROEI), namely *Energy Return for Energy Invested*, and that the EROEI for oil extraction is becoming smaller with time, indicating serious troubles ahead. *Leggett* linked the depletion problem to that of climate change, emphasizing the potential threat to climate from switching to coal.

On the *mitigation* side, technological advances in Natural Gas extraction were reported by *Racheli*. *Hirsch* quantitatively examined the possibility of mitigating peak oil by means of various technologies based on other fossil fuels, concluding that the dwindling oil production cannot be countered in this way unless mitigation starts well before the peak. Some of the speakers (mainly *Bauquis*) favoured a return to nuclear energy, whereas *Hall* showed that the EROEI of nuclear fission is too low for making it a significant alternative to oil. *Rock* proposed another approach to engineering design based on the concept of net energy profit ratio (NEPR) to take into account depletion. Several new renewable technologies were presented in the poster session.

Policy solutions and political issues were examined from various viewpoints. All speakers invited governments and policymakers to consider the problem of resource depletion and to implement appropriate policies. *Campbell* and *Heinberg* reported on an *Oil Depletion Protocol*, which is a proposal to reduce imports to imports world depletion rate. *Heinberg*, *Hopkins* and *Gunther* examined a “bottom-up” response to peak oil, where dwindling resources are countered by cultural and economic re-adaptation; in particular *Gunther* spoke about “peak food” and the “ruralization” of the present urban agglomerates. *Morgan* reported on the reaction of the Cuban society to the local scarcity of oil. *Metz* described changes that could take place in the corporate world as the result of peak oil. *Sanders* examined in some detail how the economic and military system of the United States depends on oil resources whereas *Ward* drew attention to the geopolitical tension between Iran and the US, suggesting that an armed conflict may take place soon. Finally, *Prodi*, a Member of the European Parliament, stated that Europe should be more conscious of the problem and perspectives of peak oil. Other political representatives including *Ryan*, *Artusa* and *Roggiolani*, stressed the need of a society less dependent on oil.

Summarizing the results of the Conference, it is evident that there are different views on how serious the depletion problem is and on how fast depletion is taking place. However, when the field is freed from naïve misinterpretations, such as understanding peak oil as meaning that “we are running out of oil”, it seems that a remarkable degree of agreement is emerging. Most analysts admit that we are facing a depletion problem, and that the high prices of oil and of all mineral commodities cannot be attributed to contingent factors alone, such as speculation or politics. For several mainstream analysts, it still seems difficult to pronounce the words *Peak Oil*, but they do correctly describe the situation. For instance, Gerard Doucet, President of the World Energy Council (WEC,) who spoke at the NGV Conference immediately after ASPO-5, stated that we’ll have to get used to higher costs of energy and that these high costs are related to the progressive depletion of “easy” resources.

The main point emerging from ASPO-5, and from the discussions before and after it, is that *peak oil* is becoming such a commonplace concept that it may be time to de-emphasize it. The peak is an important event, but it is not, in itself, a major discontinuity and surely not the end of the world. It is, rather, an element of a continuously changing curve where the relevant parameter is the energetic cost (EROEI) of the mineral resource. The EROEI becomes gradually lower as the resource is extracted, and it is this change that leads to the gradual peaking and decline of production. There is no real discontinuity in the curve, other than that associated with the shift from growth to decline, but the EROEI of oil extraction (or of any mineral energy resource) becomes progressively smaller. In this process, Society becomes gradually poorer as it has to invest more and more resources in order to maintain the level of energy and materials input that that people are accustomed to use. This situation is placing a tremendous stress on Society, not the least result of which is the series of resource wars which we are seeing and which are hastening the decline.

http://www.aspoitalia.net/index.php?option=com_content&task=view&id=110&Itemid=88

748. Peak Oil and the Oil Industry

The July issue of the journal *Explorer*, published by the American Association of Petroleum Geologists, contains an excellent article on *Peak Oil*, including interviews with members of ASPO-USA.

At first it seemed that the mouthpiece of the establishment oil industry was finally willing to accept the reality of peak, some fifty counties now producing less than at some date in the past. Yet, turning a few more pages, comes another column, entitled *Director's corner*, which is curiously obtuse and contradictory with the words..... *The reality is that hydrocarbon usage probably is a temporary phenomena in the world's history. In the next 100 years hydrocarbon usage should plateau unless we are able to tap the huge resources trapped in methane hydrates. What will be the anthropogenic effect be during those years and what will happen when we decrease usage over time?*

(Methane hydrates are disseminated granules and laminae of methane in ice-like molecular structures found in certain deepwater and polar regions. A particular seismic reflector was previously thought to identify such deposits, suggesting that they are of huge extent, but the correlation was later disproved by drilling. It is well said that methane hydrates are the fuel of the future and likely to remain so).

While Chevron-Texaco leads in addressing the *Peak Oil* issue squarely, other oil companies find it expedient to suggest that the resource is near limitless although usage may decline from concerns over Climate Change. Lord Browne, the CEO of BP, adopts the latter position and has even been elected to be a Fellow of the Royal Society (Britain's most prestigious scientific society) on the strength of it.

But perhaps, over all, there is a gradual shift of position as the benefits of denial begin to expire and the threadbare cloaks of obfuscation become more transparent in the light of day.

749. The Oil Depletion Protocol – Adopt it Today!

Post Carbon Institute has officially launched the Oil Depletion Protocol project. Based on Colin Campbell's original 1996 Protocol, and working in conjunction with Richard Heinberg, Post Carbon Institute is laying the groundwork for the successful adoption and implementation of the Protocol.

The Protocol calls for a sensible and systematic reduction in world oil production and offers a way for nations of the world to cooperatively reduce their dependence on oil. We have recently launched the Protocol's official website, www.oildepletionprotocol.org, and in its first month over 300 people have signed up as Individual Adopters of the Protocol.

The website offers information on:

- oil depletion
- why we need an international Oil Depletion Protocol
- how you can personally adopt and support the Protocol
- how you can urge local, state, and national elected officials to endorse the Protocol
- ways to reduce your oil dependency
- what others are doing to reduce their oil dependency

You can also download one of our website buttons and link to the Protocol's website from your own, share tips, ideas, and experiences about transitioning to a less oil-dependent lifestyle, and sign up to receive email updates.

Do your part and adopt the Protocol today. Visit www.oildepletionprotocol.org.

Calendar - Forthcoming Conferences and Meetings

ASPO members and associates [shown in parenthesis] will be addressing the subject of Peak Oil at the following conferences and meetings. Information for inclusion in future newsletters is welcomed.

September 6-7	European Commission Workshop, Brussels [Campbell]
September 13	Irish Countrywomen's Association, Goleen , Ireland [Campbell]
September 14	Cork Environmental Committee, Cork , Ireland [Campbell]
September 21	Future Energy Supply, Uppsala , Sweden [Alekklett]
September 27	Biofuel for transport, Ornskoldsvik , Sweden [Alekklett]
Oct 30 – Nov 3	South Africa [Laherrère]
October 31	Energy & Environment, Shijizhang , China [Alekklett]
November 4	Univ. of Petroleum, Beijing , China [Alekklett]
November 7	Oil Depletion. Inst. Energy, London [Bentley, Skrebowski]
November 13-14	Oil Conference, Kuwait [Alekklett]
November 20-21	Conference, Groningen , Netherlands [Alekklett]
November 26-28	8 th SEGJ Int. Symposium, Kyoto , Japan [Alekklett]
November 27	Securing Our Energy Future, Edinburgh [Low]
November 27	Peak Oil Debate, Limerick University, Limerick , Ireland [Campbell]
November 29	Industry Leaders, Kyoto , Japan [Alekklett]
November 30	Seoul Nat. University, Korea [Alekklett]
November 30	Air Transport & Energy Challenge, Toulouse , France, [Bauquis]
December 1	National Assembly, Korea, [Alekklett]
2007	
January 20-24	Conference, Nairobi , Kenya [Alekklett]
January 24	Boole Lecture, University College, Cork [Campbell]
May	ASPO-6 International Conference, Killarney , Ireland