

THE ASSOCIATION FOR THE STUDY OF PEAK OIL AND GAS “ASPO”

NEWSLETTER No. 81 – SEPTEMBER 2007

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 associates are active in **Australia, Austria, Belgium, Canada, China, Denmark, Egypt, Finland, France, Germany, Hong Kong, Ireland, Isle of Man, Israel, Italy, Luxembourg, Japan, Korea, Mexico, Netherlands, New Zealand, Norway Portugal, Russia, Singapore, South Africa, Spain, Sweden, Switzerland, United Kingdom and the United States.** (Those formally constituted being shown in bold face)

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 of oil and gas decline for Mankind.*

Foreign language editions are available as follows:

Spanish: www.crisisenergetica.org

French: www.oleocene.org (press “Newsletter”)

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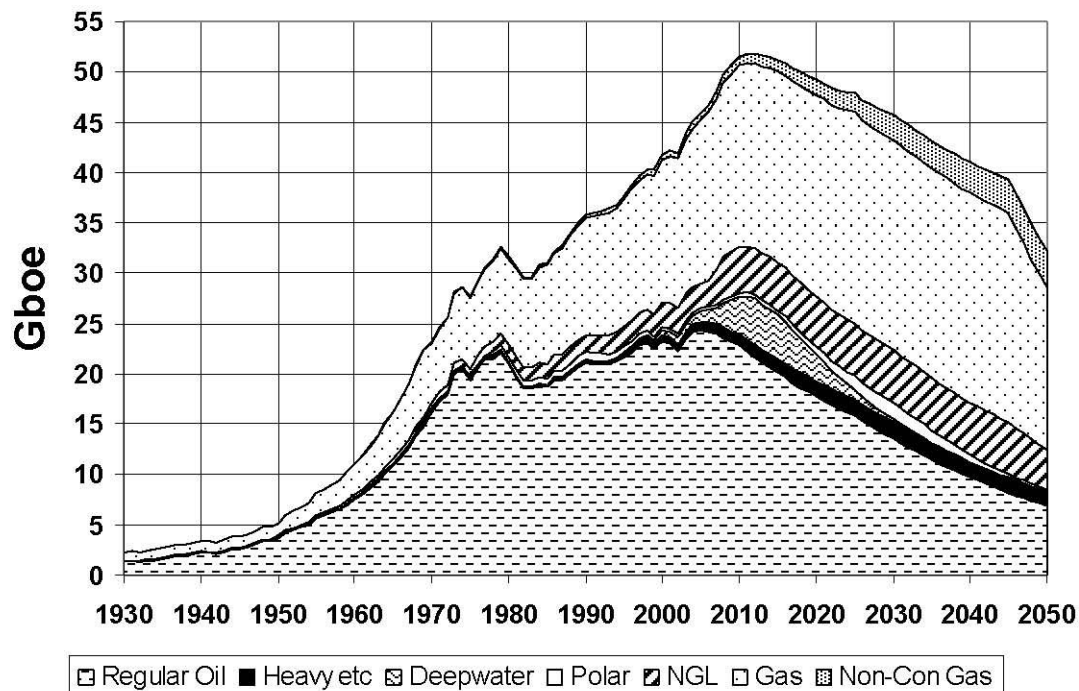
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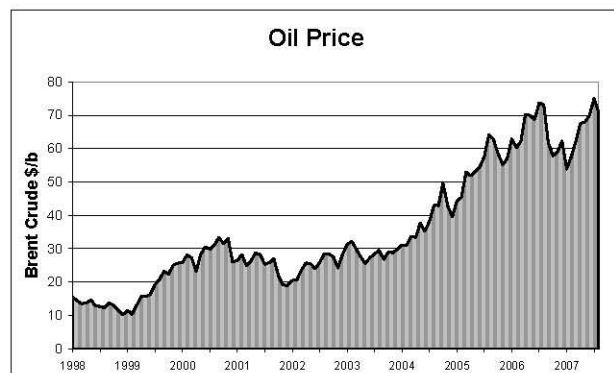
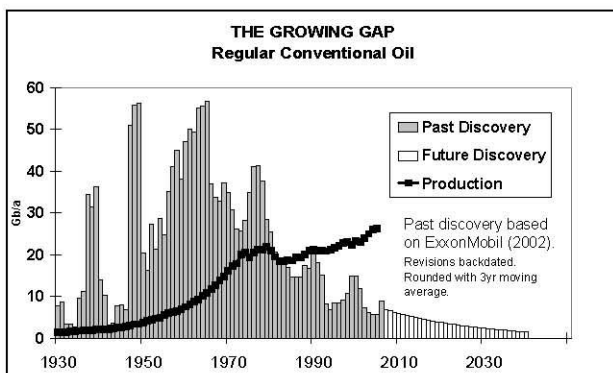
The General Depletion Picture

OIL & GAS PRODUCTION PROFILES 2006 Base Case



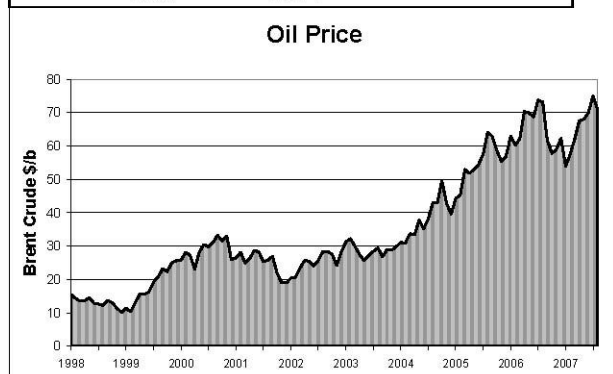
2006 Base Scenario		Annual Rate - Other							
M. East producing at capacity (anomalous reporting corrected)		Heavy etc.	2.8	4	5	5	6	212	2030
		Deepwater	3.6	12	11	6	1	66	2011
Regular Oil excludes Heavy Oils (inc. tarsands, oilshales); Polar & Deepwater Oil; & gasplant NGL		Polar	0.9	1	1	2	4	52	2030
		Gas Liquid	6.9	12	13	14	14	355	2035
		Rounding		-2			2	15	
Revised	8/12/2007	ALL	81	90	85	75	65	2600	2011

NB	Chew 2006 all categories
	Disc 2328
	CP 1077
	Res 1251



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NB	Chew 2006 all categories
Disc	2328
CP	1077
Res	1251



855. Peak Oil is not Alone

Regular Conventional Oil flows out of the ground relatively easily and quickly; and gas, being a gas not a liquid, flows from the wellhead even faster. Both are therefore subject to rapid natural depletion, with the peak of production in a country coming more or less when half the total has been extracted, save where production has been constrained for some external reason.

But if we turn to *Non-Conventional* oils, such as occur in tarsands or oil shales, we find a different situation with the resource itself being very large, but the extraction rates slow, more costly and in some cases environmentally damaging. Coal is step further down the ladder, having to be mined and dug up with pick and shovel, in a process that itself consumes a lot of energy. Still another step down the ladder is uranium used as a fuel for nuclear power, but takes much concentration and processing.

Professor Rui Rosa of ASPO Portugal has covered the subject in an interesting paper, of which there is room only to quote the introduction.

Exergy Cost of Extracting Mineral Resources

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Abstract

Mineral deposits are considered as natural capital whose value can be assessed in exergy terms. Historical industry experience provides evidence that discovery and exploitation of mineral deposits are essentially energy intensive and that the persisting decline of the grade of the developed deposits demands increasing exergy replacement costs. The results demonstrate how far processed ores and concentrates are from ideal behaviour, and technologies from reversibility conditions.

1 Introduction

Hydrocarbon reservoirs and ore deposits are natural bodies which hold exceptionally highly concentrated exergy. However, further exergy has to be spent in extracting and concentrating the raw materials from Earth, in order to produce commodities, final goods and services to the economic sphere. For mineral commodities in general, the increasing exergy cost of extraction and production is an indicator of depletion. In extracting or capturing energy resources, an increasing exergy cost per unit product also indicates depletion, but in this case the exergy expenditure per exergy delivered becomes a limiting factor of energy availability.

Exergy accounts for the thermodynamic distance from a state of reference representing the environment. It comprises physical and chemical exergy. The latter accounts for the energy stored in the atomic bonds of molecules in relation to the binding energy of every constitutive element in the reference state; but when different minerals or substances are mixed, besides the chemical exergy of each component, a mixing exergy has to be considered too.

When extracting a raw-material from the crust or the sea-water, one cannot ignore that the whole separation process is a chain of technical procedures in which molecular or atomic bonds have to be broken at progressively smaller scales before the desired separation is achieved; exergy has to be spent at every step in the process.

In the mining of ore deposits, rock blasting, crushing, grinding and milling are mechanical steps in a size reducing process, required to liberate mineral species. But in general substances occur mixed and separation is a very exergy intensive process. Physical or chemical methods - such as inertial, magnetic, aerodynamic, hydrodynamic, flotation, ion-exchange or other - are used to separate the mineral species of interest. When the final product is a chemical element, pyro-metallurgical (smelting or roasting) or hydro-metallurgical (leaching or dissolution, precipitation, ion-exchange, electrolysis and so on) processing assisted by chemical reagents break the final bonds and liberate the desired element.

Separation or un-mixing exergy is often referred to either as a serious limitation or rather an irrelevant contribution to the extraction of particular mineral commodities. This point ought to be clarified. Mixing entropy and the correspondent separation exergy reflect the proportion of the constitutive substances in the mixture; they both exhibit a logarithmic dependence on the relative molecular contents or grades, but this applies strictly to ideal gases or ideal solutions, in the absence of molecular interactions. When the substances are interacting like solutes in a strong solution or minerals in a rock, the binding energy is also reflected in the entropy of the mixture, through the ionic activity or the interfacial energy, and separation exergy becomes therefore larger.

Actual separation processes are not perfect at all, and the exergy actually required can be quite larger than the theoretical limit. The reason is that in the technical separation one has to work far away from ideal state and equilibrium conditions, in order to maintain economic throughputs, so that molecular or atomic interactions cannot be avoided and dissipative losses are always present. Moreover, the species to be separated can have rather similar properties, such that the separation factor of an individual step might be very low and accordingly the un-mixing process might require a multistage long procedure. For instance, separating water in desalination is less exergy demanding than enriching uranium (for equivalent molar amounts); but in both cases the exergy expenditure per unit product increases sharply with increasing degree of attained separation.

Breaking bonds down to crystal grain or to atomic levels requires the expenditure of exergy; some of this spent exergy might be recovered (by means of heat regeneration or reagent recycling and so on) but all stages are irreversible to some extent and some of them are entirely irreversible (such as crushing rock). This paper emphasises how far ores and concentrates are from ideal behaviour and technologies from reversibility conditions. One should realize the limits to the growth of production of certain mineral products.

856. Wide-ranging Energy Review

The website *Oil Drum* of August 4th carries an excellent, wide-ranging interview with Jean Laherrère of ASPO France, who reviews the other main sources of energy apart from oil. He presents a number of his telling analytical graphs. Seemingly the reporting of coal reserves is even less reliable than is the case for oil.

The flat-earth community commonly likes to console itself with the notion that if oil production should decline contrary to their faith in market forces, it would be a simple matter to turn to some other energy source such as coal. But it looks as if the alternatives have their own constraints. Perhaps there is only one option left: namely to use less. But that offends modern economic financing, whereby more has been lent than was on deposit assuming perpetual economic growth. Declining energy supply suggests economic *Contraction* not *Expansion* which perhaps explains why debt already seems to be going sour, as the following comments, as reported by the Daily Telegraph of 8th July, confirm

Suki Mann, a credit analyst at Societe Generale, said virtually all refinancings and leveraged buyouts had been frozen as investors stood on the sidelines. "Everything is on hold. We're not going to see any deals done until there is some clarity."

The Dow Jones rose 73 points to 13,225 in early trading as markets began to settle after the resignation of Bear Stearns co-president Warren Spector, who stepped down on Sunday after the collapse of two in-house hedge funds that set off the global bond bust two months ago.

The group's chief financial officer, Sam Molinari, alarmed Wall Street late on Friday by comparing the credit debacle to the dotcom denouement in 2001 and even the 1987 crash.

"I have been a mortgage banker for 20 years and have never seen such a severe reaction to credit risks in the marketplace, and things may even get worse before they get better," he said.

Similar fears have begun to emerge in Germany where Jochen Sanio, head of the financial watchdog Bafin, said the credit squeeze threatened Europe with the most serious banking crisis since 1931.

IKB Deutsche Industriebank stunned the markets last week with an admission that it had taken a massive \$24bn bet on the US property market without fully informing the board, and suddenly faced imminent collapse. Just 10 days earlier it had claimed to be in rude good health.

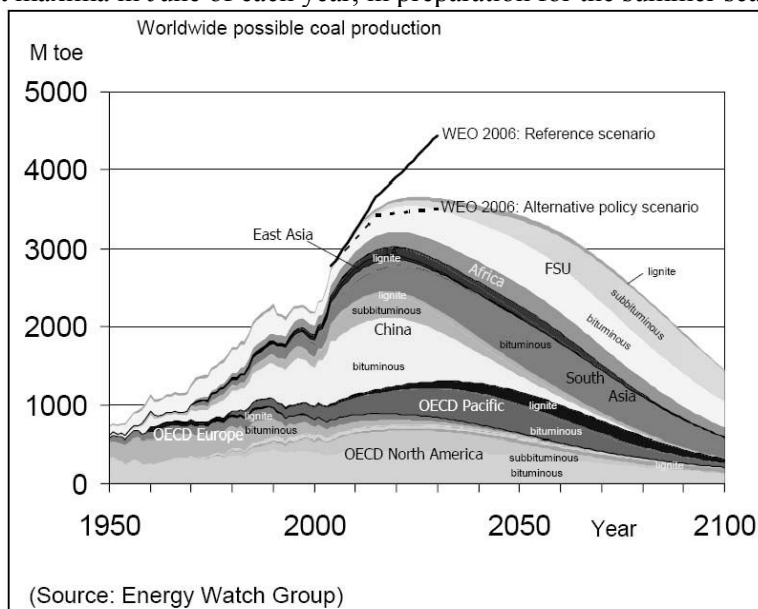
IKB is being rescued by a consortium of banks offering a \u20AC3.5bn (£2.4bn) credit line, while the state-owned KfW bank has provided an \u20AC8bn guarantee for bad debts. The bail-out, orchestrated by the German government, is facing a Brussels probe for alleged violation of EU state aid rules.

Dresdner Bank yesterday admitted to \$1.4bn in US sub-prime exposure, but said it was well cushioned by business at home. Germany's Union Investment has had to freeze redemptions from an \$1.1bn fund invested in sub-prime loans, and even the Pharmacist and Doctors' Bank admitted \$115bn in exposure.

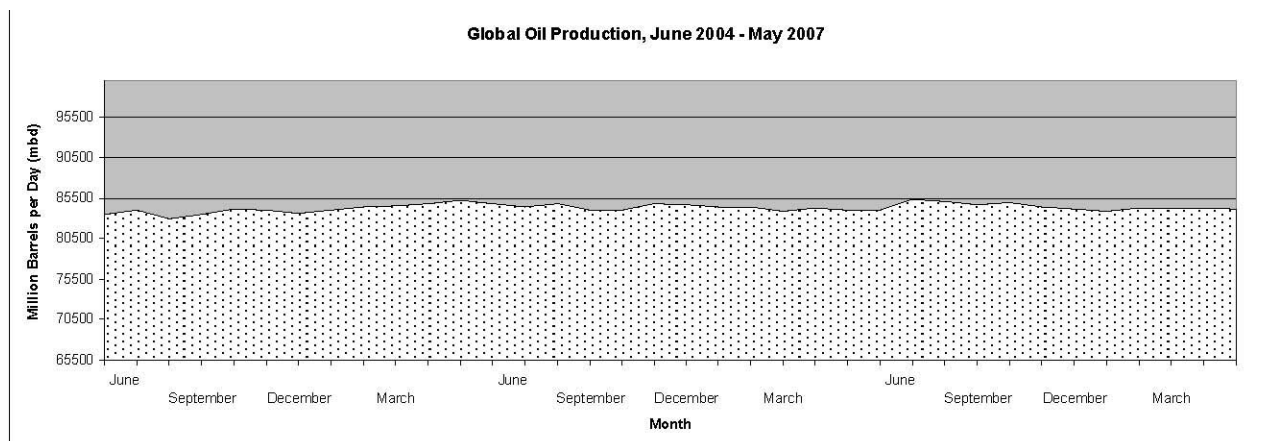
In France, Oddo & Cie is to close three funds making huge losses in sub-prime CDOs, saying it had been "caught out by the sub-prime dilemma". Insurance group AXA has closed two funds hit by the credit turmoil after a rash of redemptions in July. (Reference furnished by J.N.von Glahn)

857. Not Necessarily a High Peak

The Energy Information Agency publishes monthly global oil production statistics, presumably on a consistent basis. The following plot shows its record from June 2004 to May 2007. While it is too soon to identify a peak as such, which, in any case, is here not expected until about 2011, at least production does not appear to be growing. There appears to be slight maxima in June of each year, in preparation for the summer seasons.



The post-peak decline of *Regular Conventional* is at no more than 2-3% a year, so it will probably take a few years before it is possible to look back and identify which little bump marked the overall peak. Meanwhile, the flattening may reflect both production capacity limits and static demand from high prices (Reference furnished by Daniel Davis)



858. Oil Price Falls

Oil prices weakened during August. This may be partly be a seasonal adjustment as refineries anticipate a minor fall in demand at the end of the holiday season, but it may also reflect the onset of economic recession, having a greater impact. There are no doubt also speculative pressures from storage-tank owners: it makes sense for them to keep the tanks full while prices rise, and then at a certain point to empty them and buy forward to benefit from the consequential fall in price. It must be a money-maker's dream.

It seems so obvious that world debt is premised on perpetual economic expansion, which in turn relies on an abundant flow of cheap energy that now comes to an end. Logically it follows that the economy now faces contraction not expansion, of which signs are already appearing, especially in the United States.

As mentioned in Item 856 above, the housing mortgage business is already in serious difficulty worldwide, leading to collapse of various speculative funds. An additional factor is the holding by the Chinese Government of 1.33 trillion dollars. It is under pressure to revalue its currency to balance trade, which it might achieve by selling its dollars, which would lead to further dollar devaluation, strengthening the relative value of the Chinese currency. (This is discussed by a former Assistant Secretary of the US Treasury on *Counterpunch* of 8th August).

A plausible scenario for the future few years might comprise a series of vicious circles made up of Oil Price Shock – Recession – Oil Price Collapse – Economic Recovery – Oil Price shock. Falling oil productive capacity after peak means that the wave length of the cycles would diminish until some new general trend of managed contraction establishes itself.

The scale of the unfolding crisis is highlighted by the fact that the European Central Bank has been forced to support member banks with 130 billion dollars in an unprecedented move. It has led to soaring interest rates and falling stock markets in Europe, which can be construed as the opening stages of an economic recession, if not The Second Great Depression. Time will tell.

Meanwhile, the Cool War seems to be warming up with large scale joint Russian-Chinese military exercises involving the countries of central Asia, and talk of a new Russian naval base in the Mediterranean.

Oil Production (barrels per capita)		
	USA	World
1900	1.0	0.1
1920	4.0	0.4
1940	10.0	1.0
1960	14.5	2.5
1980	13.6	4.5
2000	7.0	4.0
2020	2.2	2.7
2040	0	1.4

859. Statoil confirms Peak Oil

The Chief Executive of Statoil, the national oil company of Norway, which has a dominant position in Norwegian production as well as interests around the world, recently confirmed Peak Oil on Norwegian television. It is curious however to hear him claim that Norway's production can be maintained until 2015, given that its oil production peaked in 2000 at 3.2 Mb/d and has since fallen to 2.5 Mb/d, but perhaps he was referring to oil and gas together. This is often a cause of confusion. A summary of the interview is reproduced below:

Statoil and Peak Oil

In the presentation of Statoil's Second Quarter financial results on 30th July, its Chief Executive, Helge Lund, commented upon Peak Oil in a manner which prompted the Dagens Næringsliv newspaper to bring out a two-page report.

Lund stated: *The oil production outside OPEC can reach its peak in 2011-2012.* Analysts are surprised. Lund also expressed that *the Norwegian Statoil fields can hold the production level until 2015.* He continued: *IEA's talk of a top in oil production in 2011-2012 is Peak Oil for conventional oil outside OPEC. Our (Statoil's) view is relatively similar to IEA's view.* The fact that Helge Lund used the concept of Peak Oil is being noticed here as remarkable. It is considered a novelty that a CEO from an oil company here should start talking of Peak Oil. One financial analyst commented: *The reason they do not normally talk of Peak Oil is that the consequence for them is that they have to start doing something new.*

(Reference and translation by Harald Rostvik)

860. Energy Crises already strike many countries

These pages have endeavoured to alert people to a looming energy crisis, following an imminent peak of oil supply due to natural depletion. It transpires however that many countries are already experiencing serious energy shortages, as listed in the Energy and Capital Newsletter (eac-eletter@angelnexus.com). The list is a long one, comprising Nepal, Pakistan, Iraq, Iran, Bangladesh, Sri Lanka, Philippines, China, India, Vietnam, Uganda, Zimbabwe, Ghana, Nigeria, Senegal, Kenya, Argentina, Nicaragua, Chile, Costa Rica, Dominican Republic. The effects range from electricity blackouts to shortages of transport fuel, which in some cases have sparked popular demonstrations and disturbances of one sort or another. The high prices that have arisen as world productive capacity limits are breached is part of the problem, but climatic factors, reducing for example hydro-electric power, have also been responsible. The scale of the problem must grow and spread exponentially in the years ahead as physical oil supply declines. Ironically, the poor countries, which have faced the problem first, may soon come to find themselves better placed than the industrial countries that continue to operate on out-dated economic principles, premised on perpetual growth.

(Reference furnished by Hugh Sharman)

861. Per Capita Consumption Trends

Professor K.E. Watt of Davis, California, has produced an interesting paper, entitled *Two Views of the United States in 1919*, plotting the trends of oil production per capita with mathematical best fits. The table shows the approximate numbers read from the graphs. The peak for US indigenous production in barrels per capita was in

1973, and for the world as a whole in 1980. The soaring cost for US citizens and the impact on the economy are also discussed. The pace of change is noteworthy: a teenager of today will have to face the new world before reaching middle age.

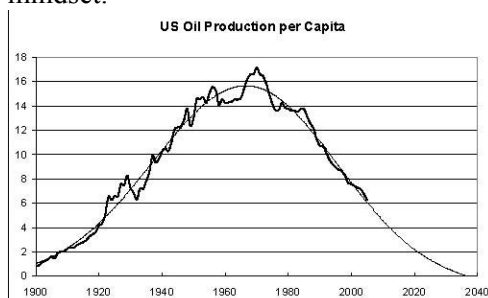
862. *Climate Change in the Geological Past*

The August issue of *Geoscientist* reports on a Presidential Address to the Geological Society entitled *Back to the Future* by Richard Fortey, FRS. It includes a plot of temperature over the past 80 million years. Apparently, the World was largely ice-free and more than 4°C hotter than today until 35 million years ago, when ice-sheets developed and the Planet cooled to its present level. Predictions of a 2°C rise this century would return the World to the conditions it last experienced, some 12 million years ago.

Another article in the same issue by Jonathan Cowie describes an early epoch of extreme global warming in the Eocene, 55 million years ago, when Britain was covered in tropical rain forest and palm trees grew in Alaska. Today, there is much concern about how man-made emissions are affecting the climate. So what caused the Eocene event? It is speculated that volcanic activity might have ignited organic-rich sediments which in turn could have caused methane-hydrates in the ocean depths and polar regions to release massive amounts of methane to the atmosphere. Exploration geologists, working the North Sea, are well familiar with the Eocene Balder Formation, a volcanic ash deposit, some 30m thick. It can be traced from north Norway to France, which was evidently derived from volcanoes from Iceland to the Hebrides, caused by the opening of the North Atlantic. It is easy to imagine its impact on the climate.

863. *The Winds of Change*

Lord Rees-Mogg is a distinguished member of the British Establishment who has long had a prestigious column in the Times. He has been supportive of the Anglo-American *special relationship* and was positive towards the invasion of Iraq, possibly out of a sense of loyalty, but now identifies not only its hidden oil agenda and recognises that there is an Oil Age. The title of his article slightly overstates the case, as we are only half way through the Oil Age, but the message is clear enough. For an Establishment figure of his standing to start discussing Peak Oil represents a change of official posture. Evidently, the benefits of denial have expired. Lord Rees-Mogg is co-author of books entitled *Picnics on Vesuvius* and *The Great Reckoning*, whose titles may reflect a certain perceptive mindset.



Are these the last days of the Oil Age? Lord William Rees-Mogg *London Times*, 16 July 2007

Oil ruled the 20th century; the shortage of oil will rule the 21st.... Last Tuesday the lead story in *The Financial Times* was the latest report from the International Energy Agency. The FT quoted the IEA as saying: 'Oil looks extremely tight in five years' time,' and that there are 'prospects of even tighter natural gas markets at the turn of the decade'. For an international agency, that is inflammatory language.... 27 of the 51 oil-producing nations listed in BP's Statistical Review of World Energy reported output declines in 2006. One projection of world crude oil production actually forecasts a 10 per cent reduction in total world output between 2005 and 2015. That would be a revolution.... Some analysts think that the peak oil moment has already been reached; some still think that it will not come until 2020 – which is itself only 12 years away. Market trends and the statistics both support the IEA's view that consumption is accelerating and supplies falling faster than expected. Of course, if the 'crunch' point is only five years' away for oil, and closer for natural gas, it has, for practical purposes, already arrived.... The shortage of oil and natural gas, relative to demand, had already changed the balance of world power. Historians may well conclude that the US decision to invade Iraq was primarily motivated by the desire to gain physical control of Iraq's oil and to provide defence support to other Middle Eastern oil powers. Political motivations are always mixed, but oil is an essential national interest of the United States. If the US is now deciding to withdraw from Iraq, the price will have to be paid in terms of loss of access to oil.... The world is coming to the end of the age of oil, which produced its own technology, its balance of power, its own economy, its pattern of society. It does not greatly matter whether the oil supply has peaked already or is going to peak in five or 12 years' time. There is a huge adjustment to be made. There will be some benefits, including higher efficiencies and perhaps a better approach to global warming. But nothing will take us back towards the innocent expectation of indefinite expansion of the first months of the new millennium. *(Reference furnished by Natural Law Publishing, Wessex)*

864. Peak Phosphorus

An article by Déry and Anderson in the Energy Bulletin of 13th August finds that the production of phosphates, essential to agriculture, has passed its peak. Much came from the small Pacific island of Nauru, where production peaked in 1973, leaving a desolated land surface. Production in the USA evidently peaked in 1988 and the world as a whole a year later.

Phosphates have increased crop yields enormously allowing the population to expand. The phosphorus is not destroyed being apparently excreted by those who eat the food grown on it. This would seem to be a strong justification for the construction of anaerobic digesters, which can treat sewage and other organic waste, yielding methane gas from which electricity can be generated, and returning rich nutrients, including phosphorus, to the soil.

The issue of population is a sensitive one, to which some people take offence, but in logic it does rather look as if the six-fold increase in population during the First Half of the Oil Age may be matched by a corresponding decline during the Second Half. *(Reference furnished by William Tamblyn)*

865. Federal Outlays

Countries levy taxes and print money supposedly for the benefit of their citizens. The US Office of Management and Budget publishes how US revenue has been spent. The total outlay in 2006 was 2709 billion dollars. The principal items are shown in the table, of which Defense was the second largest, posing the question of the identity of the enemy from whom the citizens are being defended. The net interest on treasury debt is not explained, but perhaps reflects sums in some way paid to the banks of the Federal Reserve. Education comes fairly low on the list, and energy hardly features at all. This may have to change.

(Reference furnished by Prof. K.E Watt)

Item	G\$
Health	612
Defense	536
Pensions	361
Net Interest	220
Education	110
Energy	2.6

866. ASPO-6 International Conference in Ireland

The 6th International ASPO Conference, which will be held in the city of Cork in Ireland on September 17th and 18th. Registration is well underway and seats are filling up fast, register now to secure yours.

ASPO-6 INTERNATIONAL CONFERENCE : Time to React ?			
Day One		Day Two	
OPENING ADDRESS			
Dr. James R Schlesinger Former US Secretary of Energy		Lord Ron Oxburgh Former Chairman, Shell UK	
Supply Side		Risk Management	
Jeremy Gilbert Ex BP	James Buckee Talisman Energy Inc	Jeremy Leggett SolarCentury	Matt Dempsey IFJ
Mike Rodgers PFC Energy	Gareth Roberts Denbury Resources	Alfredo Curbelo GEPROP Cuba	Mary Graham Practical Small Projects
Ray Leonard Kuwait Energy Co.	Chris Skrebowski Petroleum Review	Michael Dittmar ETH, CERN	Gerard O'Neill Amárach
PR Bauquis IPF	Eddie Walshe Poten Partners	Nate Hagens Gund Institute	Philip Walton BENE
Demand Side		Policy & Environment	
George Lee RTE	Jim Barry NTR Plc	Eddie Hobbs	Micheál Martin TD Minister (Enterprise)
Herman Franssen International Energy Associates	Richard Douthwaite Feasta	Debbie Cook Huntington Beach Local Government	Michael Meacher Labour MP
Prof. Pang China Petroleum Uni.	Dr. David Fleming The Lean Economy	Rob Hopkins Totnes Town	Eamon Ryan TD Minister (Energy)
Jeff Rubin CIBC World Markets	Carlos Rossi AVHI, Venezuela	Eddie O'Connor Airticity	Edward Schreyer The Rt. Hon.
Day's Review – Prof. Kjell Aleklett President of ASPO		CLOSING ADDRESS Ireland's Energy Future Eamon Ryan , Minister of Communications, Energy and Natural Resources	

Further information, including the subjects covered by the speakers, is available on www.aspo-ireland.org

The organising committee, led by Richard O'Rourke, is grateful for the commitment from the prestigious speakers who have agreed to participate, and for the generous local support and sponsorship that has made the conference possible.

Representatives of the ASPO organisations from around the world will also meet to discuss future plans and co-operation on September 19th.

A three day Post-Conference event, termed *Apres-Pic*, in Killarney has also received much interest. It will give participants a chance to see something of the scenic beauties of the west of Ireland as well as to meet and converse in a relaxed and convivial lake-side atmosphere. Golf, fishing and other tourist attractions are available. A bus will leave Cork on September 19th and return early to Cork Airport on 22nd. Places are limited but contact the hotel direct for reservations ([www. info@lakehotel.com](mailto:info@lakehotel.com))

866. ASPO-USA Peak Oil Conference in Houston, TX October 17-20, 2007

Steve Andrews, and Jim Baldauf ASPO-USA

In response to the requests of our members, and in casting a wider net beyond the peak oil community, we are pleased to announce three "Investing in a Post-Peak-Oil World" sessions featuring (in different sessions) **T. Boone Pickens, Charles Maxwell, Matt Simmons, Henry Groppe, Leslie Haines, Marshall Adkins**, and others.

<http://www.aspousa.org/>

Wed., October 17, 1:30 - 5:00, - Smart Money & Peak Oil, Moderated by Leslie Haines of Oil & Gas Investor Magazine A panel of experts, including Marshall Adkins, head of energy research for Raymond James & Associates, leads an Interactive Round-Table discussion about investing in both conventional and unconventional energy sources in a peak oil world. For individual and institutional investors.

Fri., Oct. 19, 3:45-5:20 - T. Boone Pickens / Interview / Roundtable Charles T. Maxwell, Senior Energy Analyst, Weeden & Co., makes introductory comments, then interviews T. Boone Pickens, Founder, BP Capital Management, L.P. Maxwell and Pickens are later joined by Matthew R. Simmons and Henry Groppe for interactive Q&A with audience.

Sat., October 20, 8:30- 12 Noon - Smart Money & Peak Oil, Moderated by Leslie Haines of Oil & Gas Investor Magazine A panel of experts, including Charles T. Maxwell, leads an Interactive Round-Table discussion about investing in both conventional and unconventional energy sources in a peak oil world. (This is a repeat of the Wednesday afternoon session, but with different panelists.)

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.

2007

Sept. 5 Simmons & Co Offshore Europe Conference, **Gleneagles**, Scotland [Alekklett, Campbell, Simmons]

Sept. 10-12 Geological Society bi-Centennial Conference, **London** [Campbell]

Sept. 17-18 ASPO-6 International Conference, **Cork**, Ireland

Oct. 17-20 ASPO-USA Conference, **Houston**, Texas (See Item 823 June Newsletter and Item 866)

Nov. 8-9 ASPO-SOUTH AFRICA, **Johannesburg**, South Africa [Ratcliffe]

Nov. 14 Institute of Energy, **London** [Campbell]

Nov. 15-16 OECD International Transport Forum, **Paris**, [Alekklett, Bentley]

Dec. 4-5 Vorarlberg Sustainability Conference, **Bregenz**, Austria [Campbell]

NOTE

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Compiled by C.J.Campbell, Staball Hill, Ballydehob, Co. Cork, Ireland.

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Multi-Science Publishing Co. (Sciencem@hotmail.com) wish to advise that copies of the book *Oil Crisis* by C.J.Campbell, providing background reading, are still available for purchase.