

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

NEWSLETTER No. 63 – MARCH 2006

ASPO is 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. Independent national affiliates are in existence or formation in Australia, Canada, Egypt, France, Germany, Ireland, Italy, Netherlands, New Zealand, Portugal, South Africa, Spain, Sweden, 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 ASPO IRELAND at www.peakoil.ie

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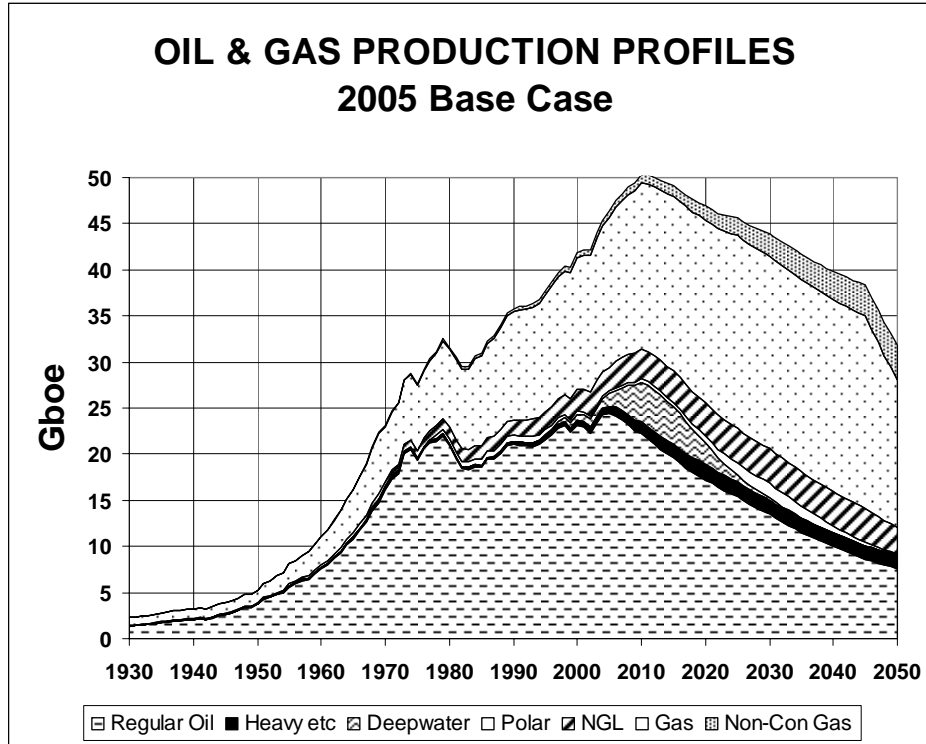
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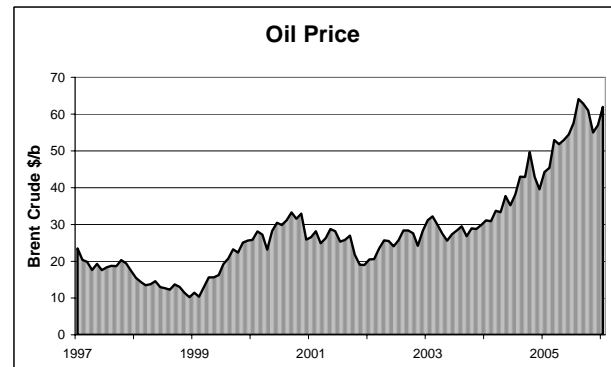
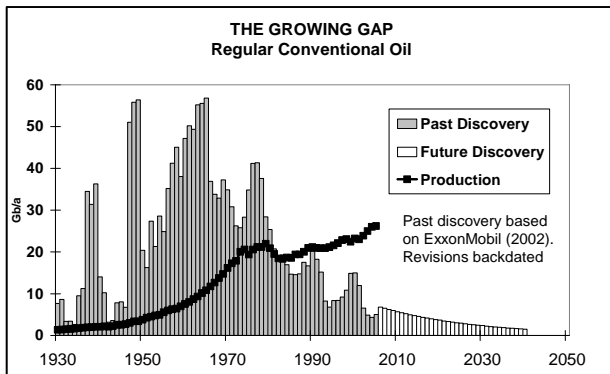
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The General Depletion Picture



ESTIMATED PRODUCTION TO 2100								End 2005			
Amount			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
Known Fields	New		Europe	5.2	3.6	2.5	1.7	0.2	75	2000	
968	759	123	Russia	9.2	8.4	6.8	5.5	1.5	220	1987	
	882		ME Gulf	20	20	20	20	11	680	1974	
All Liquids			Other	29	26	22	18	7	675	2005	
1074	1326	2400	World	67	61	54	47	21	1850	2005	
2004 Base Scenario			Annual Rate - Other								
M. East producing at capacity (anomalous reporting corrected) <i>Regular Oil</i> excludes oil from coal, shale, bitumen, heavy, deepwater, polar & gasfield NGL			Heavy etc.	2.3	3	4	4	4	151	2021	
			Deepwater	3.6	12	11	6	4	69	2011	
			Polar	0.9	1	1	2	0	52	2030	
			Gas Liquid	6.9	9	9	10	8	276	2035	
			Rounding						-2	2	
Revised	25/12/2005		ALL	80	86	80	70	35	2400	2010	



679. ASPO-5 Conference: 1st Announcement - Feb 3 2006

ASPO-5, the Fifth International Conference of the Association for the Study of Peak Oil and Gas (ASPO) will be held in San Rossore (Pisa), Italy, on July 18-19, 2006. Previous international ASPO conferences were held in Lisbon (2005), Berlin (2004), Paris (2003) and Uppsala (2002).

The main objective of the conference is to raise the awareness of the impending peak of oil extraction, as well as the general phenomenon of depletion of all mineral resources. For this purpose, international experts will evaluate the consistency of the resources; assess the effects of depletion on society and the economy; and discuss dynamic models able to help us understand the present and future situation. The Conference will also examine the need for political action to reduce the impact of depletion, such as the "depletion protocol" proposed by Colin Campbell.

The Conference will be held in the open air, in the park of San Rossore, near Pisa, an area conveniently located near the international "G. Galilei" airport and a few kms from the leaning tower. It is organized by the Italian section of ASPO (ASPO-Italia, www.aspoitalia.net) with the support of the University of Firenze and of the Tuscan Regional Government. The Attendance Fee will be Euro 120 (Euro 25 for students, negotiable for non profit associations).

The submission of scientific contributions for oral presentation or posters is welcome (deadline for submission May 31st, 2006). The Conference language will be English. More details and a pre-registration form can be found at the Conference web site at: <http://tinyurl.com/c9b38>. If you wish to be placed in the conference mailing list and receive further announcements, just reply to this mail. For any question, please contact the organizers at aspo5@aspoitalia.net

ASPO-5 Conference

The 5th International Conference on Oil and Gas Depletion

Organized by the Association for the study of Peak Oil and Gas (ASPO)

San Rossore (Pisa) Italy, 18-19 July 2006

Conference web site: <http://tinyurl.com/c9b38>

ASPO web site: www.peakoil.net

Italian section of ASPO: www.aspoitalia.net

Contact person: prof. Ugo Bardi

Dipartimento di Chimica, Università di Firenze

aspo5@aspoitalia.net

It is planned to form an affiliation of all the many new "peak oil" organisations that have been formed (or are in formation) around the world, and the organisers thereof are asked to send contact details to C.J.Campbell at aspotwo@eircom.net It is planned to arrange a meeting of representatives at ASPO-5.

680. Shell Confession

The Chairmen of some large oil companies evidently have some difficulty in explaining Peak Oil, most preferring the oblique inference to direct statement. The Chairman of Shell is no exception. He recently announced record profits of \$22.9 billion dollars derived from refining margins and profiteering from shortages. According to the Financial Times, he responded to Press queries about peak oil with the words

The theory of peak oil, that oil production has peaked, is correct if you look at easy oil close to markets, like west Texas and the North Sea," he said. "But think about deep water drilling, think about the Arctic."

If we take his advice and think about deep water and polar oil we might conclude that the former holds about 70 Gb and will peak around 2011 at 12.5 Mb/d while the polar regions are mainly gas-prone and out of reach.

He admitted that Shell replaced only 70-80% of its reserves but said that it planned to be in balance by 2008. He has two ways by which to achieve that goal : to find more or produce less. It sounds as if the latter will be the easier option. The financial community reacted by selling Shell shares.

681. Country Re-Assessment – United Kingdom

The United Kingdom had a strong Neolithic culture, highlighted by the famous astronomical observatory of Stonehenge, long before falling to the Romans in 55 BC. That occupation lasted only a few centuries, but left an indelible mark. It was followed by the dark ages of Viking and Saxon incursions, culminating in the arrival of recycled Danish Vikings from Normandy in 1066, the last military invasion.

General stability brought political and economic progress, including the creation of Parliament, as one of the earlier democratic institutions. The diverse people of the British Isles were absorbed into a single monarchy at various points in history, becoming the United Kingdom and Ireland in 1801. Seafarers stimulated trade and exploration throughout the

world, paving the way for the British Empire. At its peak in the reign of Queen Victoria, Britain had become the premier world power, reaping great rewards from the use of the pound sterling for world trade. Great achievements were recorded in the fields of science, literature and culture.

Britain also led the Industrial Revolution during the 18th Century with mills powered by water to make cloth for export to its colonial markets. The wealth, so created, led to the rapid growth of capitalism, banking, usury, investment and a financial economy. Self-sufficient peasants became wage-earners, consumers and tax payers, many working in gruesome industrial slums. Mechanisation based on iron and steel took many directions. Iron smelting made new demands for energy: first from firewood and later from coal. It was at first collected from beaches and outcropping seams before mining commenced. The development of steam driven pumps made it possible to deepen the mines below the water tables. The pumps evolved into steam engines that were later used to power transport, opening the age of the railway that further stimulated trade.

Britain successfully resisted and eventually defeated an epoch of French expansion under Napoleon, but during the 19th Century found itself increasingly threatened by a newly united Germany that was overtaking it in industrial prowess, although lacking the benefit of the pound sterling, the world trading currency that delivered a handsome hidden tribute to the banks in the City of London. These pressures eventually led to two world wars during the 20th Century. One outcome was the break-up of the Middle East into independent countries whose oil rights were shared by the victorious allies. The oil was needed to fuel the internal combustion engine, invented in Germany, which was replacing steam power. Although victorious, Britain was mortally weakened by the wars and voluntarily gave up its once splendid Empire that had brought order and fair administration to much of the world. It half-heartedly joined a newly united European community, preferring to retain its particular financial links with the United States, which eventually replaced the old empires of France and Britain with a new global economic, and now military, hegemony driven by, and for, the dollar.

Massive immigration from the former Empire followed the Second World War, being permitted at first in a sense of colonial responsibility, but later exploited as a source of cheap labour. The indigenous population aged and declined from falling fertility due to affluence, but the overall population expanded to 60 million with the immigrants and their descendants making up more than ten percent.

Most of Ireland had seceded in 1922, with 26 of its counties becoming a Republic in 1947, leaving a form of civil war to fester in the remaining six counties in the north of the island. Scotland and Wales are now recovering earlier autonomies with independent legislatures. Various immigrant cities have developed, some becoming almost small replicas of Karachi or Kingston, Jamaica.

Britain has had a long oil history, both within its own territory, and through the early prominence of its oil companies in the Middle East, Mexico and Venezuela. BP was the flagship with major holdings in Iran, Iraq and Kuwait, while Shell, an Anglo-Dutch enterprise, had a strong position in the Western Hemisphere. BP was once almost a national oil company with a 51% government shareholding and corresponding responsibilities. Formerly the World's largest vendor of crude oil, it now secures its needs more by merger and acquisition, exemplified by the take-overs of Arco and Amoco. Its Chairman and Chief Executive now sit on the board of Goldman Sachs, underlining its new financial priorities. It is the least forthright of the major oil companies on the issue of depletion but does nevertheless now claim that BP stands for *Beyond Petroleum*, which carries an oblique message.

Non-conventional oil shale had been mined in Scotland in the 19th Century, leading to pioneering refinery processes, and minor oilfields had been found onshore during and before the Second World War. But the breakthrough came during the 1960s, with the development in the southern North Sea of a prolific belt of gas fields, derived from the natural coking of deeply buried coal, first discovered in the Netherlands in 1957. Exploration moved northwards to be rewarded by the discovery of Jurassic rifts, containing prolific source rocks, deposited in one of the prime epochs of generation 150 million years ago, which yielded one giant field after another, extending into Norwegian waters.

Britain had a series of socialist governments to deal with post-War reconstruction, such that the early stages of its oil boom were dominated by State entities, principally the British Gas Council and the British National Oil Company. That ended as a reaction to excessive Trade Union demands, especially from the coal miners, leading to an eruption of new capitalism under Mrs Thatcher, who came to power in 1979 and was able to undermine the miners' control of energy by the new indigenous oil supplies that were coming ashore. The State entities, which could have managed long-term depletion to the national interest, were disbanded, and the major international oil companies, along with many small independents, were given every encouragement to deplete the resources as fast as possible. Production soared as the giant fields were brought on stream with the help of impressive advances in offshore engineering. An early peak was reached in 1987 at 2.6 Mb/d, before production fell partly as a consequence of a major accident at Occidental Petroleum's substandard Piper Field that called for widespread revisions to operating practices and installations. Production growth later resumed, partly also reflecting a second cycle of smaller discoveries, before the country reaches its overall peak in 1999 at 2.7 Mb/d.

Although the rich deposits of the North Sea dominated production, some other lesser finds were made elsewhere. Lean Lower Jurassic source-rocks gave a solitary large field in Dorset in the otherwise barren English Channel and Western Approaches, and a Carboniferous gas field was found in the Irish Sea. Efforts to find another oil play on the Atlantic margin continue but are likely to be doomed, because the essential prolific Jurassic source-rocks, if present at all, are now too deeply buried to generate oil. The isolated large deposits, West of the Shetlands, are effectively freak occurrences depending on unique re-migration from earlier accumulations. The scope for gas in this province is more promising, but it will not be cheap.

Britain's brief oil age is in decline. The major companies are withdrawing to be replaced by smaller companies, mopping up satellite fields and step-outs, as well as scavenging tail end production from ageing platforms.

Oil production is set to decline at 7-8% a year on the basis of the current depletion rate, falling to less than half its present level by 2010. Britain currently consumes 1.75 Mb/d, making it a net importer on a steeply rising trend. With a population of 60 M, per capita consumption stands at about 11 b/a. Britain exported much of its flush production at a time of depressed oil prices, to which its exports contributed, but now faces buying imports at high prices. It furthermore may find some of its production being exported by the foreign companies who own it, despite growing domestic needs. It would be hard to imagine a less appropriate policy by which to have managed the depletion of a national resource.

Gas production is more difficult to forecast due its very different depletion profile. About 100 Tcf have been discovered, of which about 80 Tcf have been consumed. Production reached a peak of 3.8 Tcf/a in 2000 and is now falling at about 12% a year. The compressors are running flat out on the old southern North Sea fields. At this rate, production will end around 2020 as confirmed by the Government Department responsible. Accordingly, the demand for imports is set to rise radically in the years ahead, but the rest of Europe (except Norway) is in the same predicament relying on ever more distant sources, including especially Siberia. Recent events in the Ukraine underline the control exercised by the transit countries which may prefer to meet their own needs first and gain financial rewards from the control they exercise.

The original assessment, written in this newsletter in 2000, correctly anticipated soaring energy costs from around 2010 *or sooner in the event of a US attack on Iraq*. Gas and electricity prices have already almost doubled over the past year.

It is difficult to imagine how the country will survive the Second Half of the Age of Oil. Even in the present conditions of affluence, it seems to be subject to a high level of crime and violence with growing tensions from the large immigrant factions, some of whom deeply resent the Government's decision to invade Iraq. The newspapers are full of the threats of Terrorism, although there has in fact only been one incident. There is an old political adage for the successful politician *if you don't have an enemy, make one*, but it does not seem to have served the present government. There are plans for the re-introduction of Identity Cards, last seen in the Second World War.

Failure by the Government to recognise natural depletion until too late has left the country unprepared, although it now speaks of the re-development of nuclear power, unpopular as it is. Re-commissioning old abandoned coal mines will prove difficult and costly. The growing contribution of solar, wind, wave, and tide power will be useful, indeed vital, but insufficient so support anywhere near the present population in its current condition.

In these circumstances, the United Kingdom may become less united as Scotland and Wales gain greater control of their destinies with their own legislatures, and as ethnic groups rediscover their identity for survival. Pressures against further European integration are likely to mount, as the outdated nature of its economic and financial principles become more evident. If the dollar faces a massive devaluation as seems increasingly likely, funds would at first flow to the euro, which in turn would then come under pressure. Stirling might accordingly reap at least a temporary benefit. Perhaps the best hope is that Europe, including Britain, should rediscover the Treaty of Maastricht which encourages regionalism under the slogan that no decision should be taken at any level higher than it need be.

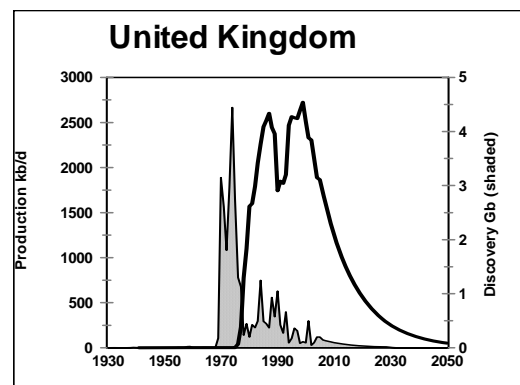
682. Oil and Politics.

The library of books related to Peak Oil continues to grow. An impressive new contribution is Lester Brown's *Plan B 2.0 – Rescuing a planet under stress and a civilization in Trouble* (ISBN 0-393-32831-7)

Other books reviewed by Kellia Ramares below seem to confirm the old adage that Oil and Politics are never far apart. www.onlinejournal.com

UNITED KINGDOM		Regular Oil
Population M		60
Rates Mb/d		
Consumption	2005	01.76
per capita b/a		11
Production	2005	1.86
	Forecast 2010	1.25
	Forecast 2020	0.57
Discovery 5-yr average Gb		0.21
Amounts Gb		
Past Production		21.8
Reported <i>Proved Reserves*</i>		4.5
Future Production - total		8.2
From Known Fields		7.0
From New Fields		1.2
Past and Future Production		30
Current Depletion Rate		7.7%
Depletion Midpoint Date		1997
Peak Discovery Date		1974
Peak Production Date		1999

*Oil & Gas Journal



War and Globalisation: The Truth Behind September 11

By Michel Chossudovsky *Global Outlook* ISBN: 0-9731109-0-2 158 Pages. List Price US \$14.95

Reviewed by Kéllia Ramares *Online Journal Associate Editor*

What were Rep. Porter Goss and Senator Bob Graham and other members of the Senate and House intelligence committees doing, together with the alleged money-man behind 9-11, at breakfast on Capitol Hill on the morning of September 11? –Michel Chossudovsky

June 7, 2004—Last Thursday, George Tenet resigned as director of Central Intelligence. Rep. Porter Goss is one of the favorites to succeed Tenet. If he is nominated, will any of the senators at his confirmation hearing have the guts to ask the above question? And if he is not nominated, will it be because of what the answer to that question is?

This reviewer knows from personal experience that many Americans reflexively enter a state of denial when confronted with questions such as the one above, which Prof. Michel Chossudovsky posed on page 151 of his book “War and Globalisation: The Truth Behind September 11.” Certain Americans, including prominent leftist analysts, are quick to denounce as “conspiracy theorists” anyone who says, as Chossudovsky, I and others have done, that the United States government was complicit in the September 11 attacks. They prefer to think that simultaneous multi-agency incompetence and failure ruled the day. In other words, they prefer to adopt the government’s position rather than to accept the fact that the same government that supports all manner of assassinations, death squads, wars, and coups abroad is behind mass murder at home.

The United States government foments terrorism against its own people. Prof. Chossudovsky’s book, “War and Globalisation: The Truth Behind September 11,” deftly tells how and why.

In a mere 158 well-referenced pages, Chossudovsky, a University of Ottawa (Canada) economics professor who studies globalization, explains how Washington has supported Islamic terrorism since the Carter administration. He links Osama bin Laden to the CIA and shows that the Pakistani intelligence agency—the ISI—has close ties to both the CIA and al Q’aeda. Chossudovsky dispatches “The Blowback Thesis,” i.e. the notion that Osama and his allies have turned against the United States, and he shows how Islamic terrorism actually benefits Washington’s agenda.

“War and Globalisation” draws on official government papers, political statements, reports from major national and international press, and important independent research, including some of Chossudovsky’s own, to document many reasons why the U.S. government supports Islamic terrorism. Internationally, there’s the conquest of oil, control of the drug trade, and continued antagonism toward and competition with Russia and China. Domestically, there’s the suppression of dissent and the militarization of U.S. politics and economics.

Ultimately, Chossudovsky’s book presents its readers with a harsh reality: terrorism is a tool used to maintain and expand the growth of corporate capitalism, led by the U.S. dollar and backed by U.S. military might; true democracy, and the Rule of Law, domestic and international, be damned.

“War and Globalisation: The Truth Behind September 11,” is one of those “connect-the-dots” works that should be required reading, especially for media-misled, history-starved Americans.

Anti-globalization activists of all nations will find Chapter IX “Disarming the New World Order” of particular interest. Its first sentence is the bedrock on which dissent against the New World Order must rest: “The war on terrorism is a lie.” But, in this chapter, Chossudovsky also critiques the methods of the dissenters. He states that “Labour leaders and leftist politicians have been co-opted... Demands, petitions and declarations are formulated to little avail...The organization of counter-summits cannot constitute the basis of this struggle.”

In light of the fact that 15 million people worldwide marched against the invasion of Iraq only to see it happen about a month later, political activists would do well to read Chossudovsky’s critiques of social protest before embarking on their next effort. In fact, a more thorough treatment of the challenge of creating effective dissent would be a worthy subject for another Chossudovsky book.

Michel Chossudovsky is director of the Centre for Research on Globalisation.

“War and Globalisation: The Truth Behind September 11,” which has been translated into 10 languages, is available from the [centre’s website](#). A companion video is also available.

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Oil, Power & Empire: Iraq and the U.S. Global Agenda

By Larry Everest

Common Courage Press; ISBN 1-56751-246-1

392 Pages, \$19.95USD

The U.S. government has mustered a dizzying and often shifting assortment of “reasons” for invading and occupying Iraq. At one time or another—sometimes in the next breath—it cited weapons of mass destruction and imminent threats to America, links to terrorism and al Qaeda, liberating the Iraqi people, and transforming the entire Middle East. Yet, as it was going on ad nauseam about such nonexistent

threats, phantom connections, and hollow promises, there was one real issue that the Bush team adamantly refused to discuss at all: oil.

--Larry Everest, *Oil, Power & Empire* p. 248

December 17, 2004—Two days ago, the Boston Globe published an article titled: “War Funding Request May Hit \$100 Billion.” The article concerned White House plans to ask Congress for \$80 to \$100 billion dollars for next year’s military operations in Iraq and Afghanistan. If such a request goes through, the total cost for operations in Iraq alone will exceed \$200 billion since the invasion was launched in March 2003. Ask yourself where all this money is coming from; federal deficits are at record levels.

Ask yourself where it is going; soldiers are complaining that they lack sufficient armor. Then ask yourself when the U.S. first got involved in Iraq. If your answer is 1990 and Gulf War I, it behooves you to learn the history of U.S. involvement in Iraq, especially if you are one of those people who thinks we are there to liberate the Iraqi people and help them set up a democracy. Reading Larry Everest’s *Oil, Power & Empire: Iraq and the U.S. Global Agenda* will help you track U.S. “interest” in the region from the 1920’s through mid 2003.

This book is a thorough, well-researched history of U.S. interference in the affairs of Iraq, which is sitting atop the world’s second largest known oil reserves, and its neighbors. Among other things, the book documents how the U.S. has suppressed indigenous liberation efforts, played Iraq and Iran off each other (resulting in an 8-year war that killed over a million people), and overlooked Saddam Hussein’s brutality when it suited the larger U.S. agenda of minimizing Soviet influence in the Middle East. Looking at current events, Everest shows how the U.S. is trying to maintain dominance in the region against France, Germany, Russia and China, none of which favored the US invasion of Iraq. The book also makes clear that “regime change” in Iraq was not just a Bush policy. The Democrats have favored that policy as well: In October 1998 Congress passed the “Iraq Liberation Act of 1998” which declared,

“It should be the policy of the United States to support efforts to remove the regime headed by Saddam Hussein from power in Iraq.” The next month, the Clinton administration adopted regime change as its stated policy. p. 212.

As readable, albeit infuriating, a history as this book is, I think Everest has the premise for current U.S. interference in Iraq backwards. In Chapter 10, which is titled “Oil, Power and Empire,” he states:

Most broadly, the 2003 invasion and occupation were designed to solidify American political/military dominance of the energy heart of the world—the Middle East/Central Asian region, and are part of broader efforts to secure control of global energy sources and use that control to ensure the smooth functioning of U.S. capitalism, strengthen its competitive position in world markets, and increase U.S. leverage against potential rivals. In short, oil is a powerful instrument of hegemony, which is what the new Bush II National Security Strategy is all about.

Controlling Persian Gulf oil and dominating world energy markets has been a prime U.S. strategic objective for over 60 years...However, the global energy picture does not remain constant...Two trends stand out today: the precarious nature of the global economy and the possibility that growing energy demand will outstrip the global capacity to meet it. p. 249.

In this chapter, Everest mentions declining oil production. He offers some important statistics on the growing demand for oil and natural gas. He quotes from some documents, most notably the Baker Report (Strategic Energy Policy Challenges for the 21st Century) and the Cheney report (National Energy Policy), which show that the U.S. government is very much aware of the supply/demand crunch. But none of the sources quoted in that chapter are the “peak oilers” who are telling us that global peak of oil production, and hence terminal production decline, are near. Everest describes well how the Iraqi oil infrastructure has fallen into grave disrepair, due to over a decade of sanctions and bombings. But the problem with future oil supplies, from Iraq and elsewhere, is not insufficient investment in oil infrastructure; it’s the declining supply of cheap crude.

Yes, the United States has been an imperialist state for decades. But is oil needed to fuel the growth of empire, or is empire now needed to ensure the supply of oil? I think the latter is the current situation. The distinction is critical because people are killing and dying for a mirage: the benefits some people in the United States may gain from U.S. predominance in a global economy will disappear without cheap oil. (The NYMEX futures contract for light, sweet crude ended this week at \$46.21/bbl). Such glories as empire fade away when the empire outstrips its energy base.

Thus, astute as much of Everest’s reading of history is, I came away from reading the book thinking that his understanding of current events has not kept up with the changing times. Notwithstanding our analytical differences, I recommend Larry Everest’s “Oil, Power and Empire: Iraq and the U.S. Global Agenda.” To paraphrase Santayana, those who fail to learn the lessons of history are condemned to repeat the government’s propaganda.

683. *Net Energy*

The following article by William Stanton draws attention to the net energy issue. By all means, renewable energies of all sorts will be desperately needed and deserve every support, but it would be a mistake to imagine that they are substitutes for the cheap and abundant energy from the oil and gas that drives the modern world.

Net Energy

The Presentation referred to in Item 653 promoting renewable energy as a major alternative to fossil fuel and nuclear energy fails to address realistic energy budgets. Various claims are made for “payback time”, which is the time that elapses, usually a few years, until the cost of purchasing and installing the renewable energy generator is exceeded by the total value of the electricity it has produced, suggesting that the electricity generated from then on is virtually cost-free.

Others will argue that this fails to take into account the cost of the backup generators or energy storage facilities that must cut in to provide electricity when the wind doesn't blow, the sun doesn't shine, the sea is calm, the tide is turning, or a drought empties the reservoir.

My contention is that such payback times are misleading also because they are calculated in terms of current financial costs, not energy availability. Suppose, for example, you need 100 tonnes of steel, today, to construct a wind turbine. The price of the steel is based on the cumulative cost of mining the iron ore, concentrating it, transporting it in bulk carriers, usually across oceans, converting it first to iron and then to steel in smelting works, manufacturing the components of the turbine and transporting them to the site. Today the steel price is not prohibitive because the energy used in all these procedures comes from cheap abundant fossil fuels.

The wind turbine will also need smaller tonnages of other metals for alloys, cables, coatings, finishes etc. These metals are even more energy-expensive, coming mostly from low grade ores in deep mines that must be drained and ventilated. Again, the costs today are borne by cheap abundant fossil fuels.

Insulating materials and plastics and carbon fibre for the turbine blades are produced mainly from a fossil fuel, oil. The other bulk constituent of the turbine is concrete. Rock is quarried, crushed and graded. Sand is dug and cleaned. Cement is made by excavating limestone and clay, and roasting them together. Then everything is transported to the site or the factory, mixed, and cast. Hard access roads must be constructed to on-shore sites, and the turbine assembled and erected. Maintenance visits must be paid, especially to off-shore sites where the environment is corrosive and violent. These activities are affordable today because the energy involved comes from plentiful easily transported fossil fuels.

Finally, to the energy used in the above activities and processes must be added “upstream” or ancillary energy inputs, the energy used - proportionately - in constructing and maintaining the machines that do the work, in building and maintaining the factories and works where the processes are carried out, and in providing for the human operators of machinery and premises.

Today, when fossil fuel energy is still plentiful and cheap, the financial budget: energy output value vs. energy input cost, is positive.

Now do the same sums for the year 2100 AD, when fossil fuel energy is very scarce and expensive. You have one wind turbine and you want to construct another like it using no more energy than the first one can produce in its lifetime.

The first consideration is that the renewable energy available to you comes as electricity, which is convenient for use in its immediate vicinity, but travels inefficiently, whether in batteries or along miles of cable. If you convert it to a petrol substitute such as hydrogen, some 60% of its intrinsic energy is lost in the processes of electrolysis, compression or liquefaction, and reconvert it to power a vehicle by means of a fuel cell.

Walter Youngquist states (1999) “A gallon of gasoline has the same energy content as one ton of conventional electric storage batteries”. So, lacking a readily transportable cheap liquid fuel, the alternative might have to be electricity, a bit at a time, from a host of renewable generators, strategically located along the route from mine to steel works to final site. Transport across the oceans would be another problem. Perhaps, given the shortage of steel, it would have to be in wooden ships propelled by sail or kite, a small tonnage at a time. Tonne for tonne, compared to a bulk carrier, the crew of a wind-powered ship would be numerically large.

I cannot quantify in hard figures the energy inputs and outputs outlined above, or their financial equivalents, but their complexity and vast energy requirement convinces me that what is possible today, thanks to fossil fuels, will be practically impossible when the only energy available is the meagre supply produced, as electricity, by wind turbines and their like.

However, if the materials, especially the metals, were recycled or reconditioned from a turbine at the end of its lifetime, the budget would be much improved. If the population in 2100 AD is smaller than today's, steel and other metals will be available for recycling, if they have not been sold abroad for short term profit.

The one form of renewable energy with a proved history of providing the energy needs of populations is biomass, especially wood. Before 1750, for example, England's population of less than 6 million kept

warm, cooked food and carried out a few manufacturing processes such as working metals and firing pottery, using wood. This and other forms of biomass such as fibres and edible plants sustained them and their animals for thousands of years before the Industrial Revolution.

Our scientific and technical inheritance will enable us to manipulate biomass more efficiently than our ancestors did, but even so, given the low efficiency of photosynthesis, renewable biomass could only support in reasonable comfort a smaller population than that of 1750. I addressed this problem, suggesting a UK population of 2 million, in Newsletter 55, Item 573.

(See Youngquist, W. 1999. The Post-Petroleum Paradigm. Population and Environment, v.20, No. 4).

684. Industrial Civilization

Writing in the winter issue of *The Social Contract*, Richard Duncan examines the fate of what he terms the Industrial Civilization based on per capita energy consumption. World energy consumption per capita grew exponentially at 3.9% a year from 1700 to 1909, but then slowed respectively to 1.4% a year to 1930; 0.5% from 1930 to 1945; 3.7% from 1945 to 1970; and 1.7% to 1979, since when it has been about flat. It is expected to decline steeply in the years ahead following *Peak Oil* such that by 2030 it will match the level of 1930, so defining the *Industrial Century*. The article concludes that the world population will reach a maximum of almost 7 billion by 2015 before declining in parallel with the energy needed to sustain it.

685. Facing Reality

Facing reality is never easy, least of all for governments, but the following article suggests a strategy.

Peak Oil and Social Change: learning from the Peace Movements

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The starting thought of the present article is that people and organizations who actively seek to raise consciousness on the peak oil issue can learn something valuable from the conflict resolution and peace movement.

Global public opinion is slowly becoming informed about the issue of peak oil. Indeed, the perspective of a “second half of the oil age”, when energy becomes scarce and costly, is scary. However, scary news does not seem to activate people and governments in order to avoid what could become a major catastrophe. This should come as no surprise. The experience of the peace and social change movements shows that alarming news does not necessarily lead to an increase in action. In fact, the contrary effect may rather be the case. Confronted with issues like climate change, nuclear proliferation, the spread of AIDS and similar global phenomena, people often feel paralyzed and demoralized. Neurosis, cynicism and pure denial are more common responses among people than activism and conscious effort towards change.

Yet, too often, organizations advocating social change think that they should provoke even more alarm amongst the public, by conveying “scary news”, perhaps by eloquent pictures or video footage: this way, people behaving passively should get scared enough and start to take action. Action would thus follow alarm. Swedish psychologist Lennart Parknas has studied this problem very carefully. He concludes that the “alarm-action model” simply does not work, particularly if the issue is complex and of some magnitude, suggesting an alternative model.

In order to encourage people to go from alarm to action, a number of intermediate “psychological stepping stones” should be provided. An alarming message is OK, because people have to face the truth; after we have received the “bad news”, we need time to get in touch with our own feelings – neither denying them nor just panicking - and to share them with others. Dialogue is very important at this stage, so that each individual can feel being taken seriously. A further step is to invite people to think of themselves as deeply interconnected with everything else in the universe: this links with the dimension of transcendence and faith, but also to such powerful images of our world ecosystem like “spaceship earth”, splendidly symbolized by pictures of our planet taken from space.

At this point of the journey, the once frightened and passive individuals may have changed their attitude towards the issue of taking action: but what to do? What is needed now is “to recharge”, collecting fresh energy and motivation by looking at examples of successful change in similar issues. Finally, the time to effect change has come: here it is important to stress that people tend to act inasmuch as they feel the ownership of action and goals of change. Therefore, strategy planning and goal setting should be a collective effort.

What works, according to Parknas, is not simply jumping from an “alarm” message to a request of action. In between we should give opportunities for dialogue, encourage interconnectedness, recharge people and their motivation to act, and finally take care that plans for change are widely discussed and elaborated.

This model proved powerful for planning whole social change campaigns, and is particularly important to reach empowerment of victims in conflict where severe violence is widespread. On the basis

of this model training events can be organized. Its usefulness goes all the way down to delivering effective, energizing speeches.

Organizations engaged in raising awareness on the issue of peak oil could well use this kind of experience in order to optimize their impact among societies and governments. Parknas' suggestions could prove useful in planning external communication as well as designing educational and training events in order to raise awareness and empower public opinion to be proactive in front of the coming global oil crisis.

Literature

Unfortunately, Parknas' work has been published so far in Swedish and Italian only. I based my article on the Italian translation of his text, "Attivi per la pace", Molfetta 1998, as well as on my own experience as a trainer and conflict transformation catalyst.

686. USGS Study Revisited

Two new works by the authors of the US Geological Survey's study of future oil and gas discoveries prompt a re-examination of this influential work, published in 2000. The first is AAPG Memoir 86 which reproduces the study; and the second is a paper in the AAPG Bulletin 89/8 of August 2005 which compares the forecast with the actual results, eight years into the study period.

The USGS set up a team under the late C.H. Masters to evaluate the world's oil and gas endowment after the oil shocks in the 1970s and published reasonable results over the years. A new team produced a radically different study in 2000, covering also the subject of so-called *Reserve Growth*, which it saw as a technological dynamic. It was an influential work being widely used by other institutions, such as the International Energy Agency, lacking their own expertise and knowledge.

It is a useful study insofar as it identifies most of the world's prospective areas, but the assessment itself attracts less confidence, as the actual results in the real world have come in far below forecast. This issue is to some extent clouded by the application of *Probability Theory*, which calls for some comment. We may imagine that the assessor studying a particular area made a confident evaluation of his best estimate of the number and size of fields to be found. But under the *Probability* procedure he was required to describe that as having a high probability (F_{95}), before speculating on the outside chance of much higher results, having lower probabilities. A Monte Carlo simulator was then spun to deliver a plot of every combination, from which a *Mean Probability* value was generated.

The results have come in far below the *Mean* calculation, which forecast that 732 Gb could be discovered over the 30-year period from 1995, or an average of 24 Gb a year. The first eight years should have delivered more than the 195 Gb, so indicated, because the larger fields normally come in first. The authors in their second paper state that in fact only 69 Gb were found, adding an excuse that some key areas were effectively closed to exploration. This is an important qualification because the study did not forecast actual discovery, but merely the amounts available for discovery under a very wide range of *probability*. If in fact we take the *High Probability* (F_{95}) value of 400 Gb, it would provide an estimate for the first eight years of at least 107 Gb, which although still high is much more realistic. Perhaps it is no surprise that the case described as having a *High Probability* turns out to be the best one, whatever the dictates of *Probability Theory*.

The original study discussed the issue of *Reserve Growth*, debating whether to ignore it; consider it in certain cases where there was particular knowledge; or assume that the US experience, which was well documented, would apply to the world. It also ranked it in probabilistic terms as contributing between 192 and 1031 Gb, with a *Mean* value of 688 Gb. It is understandable that, lacking actual oil company experience, the authors saw it as a technological dynamic rather than an artefact of reporting, which in fact it mainly is. The OPEC countries added some 300 Gb in the 1980s when they were competing for quota based partly on what they *reported* as reserves, although nothing particular had changed in the oilfields. The oil companies, for their part, tended to develop the large fields in steps, reporting the reserves of each as it was committed giving upward revisions and apparent *Reserve Growth*. Clearly, genuine revisions have to be backdated to the discovery date of the field concerned to obtain a valid discovery trend, which in turn means that, if the giant fields were larger than initially reported, the subsequent decline in discovery would have been that much steeper, affecting by extrapolation the estimation of the yet-to-find.

The authors in the AAPG Memoir seem to try to vindicate the original study albeit in somewhat obtuse language, describing the results as *somewhat reasonable* (p.157), an expression which evidently means *less than reasonable*, if not *unreasonable*. No particular criticism is implied, because estimating discovery is not an easy task given that the underlying data are so weak being subject to ambiguous definitions as well as commercial and political reporting practices. The risk is that governments and others may have been misled, for as the Memoir itself perceptively states on Page 5.

Policy decisions made in the US and elsewhere depend on detailed knowledge of petroleum resources and their distribution in the world.

It is a case of learning from the mistakes and improving the forecast over time as better information and understanding come in. The second paper by the authors is a good step in this direction.

687. Middle East Reserves

The following article is reproduced from the *Peak Oil Review* published by ASPO-USA. It is by Mr Bakhtiari, who is based in Tehran and is an acknowledged authority on Middle East oil.

ON MIDDLE EASTERN OIL RESERVES By A.M. Samsam Bakhtiari

It is now common knowledge that the lion's share of remaining conventional oil reserves is concentrated in the Middle East (ME). All major reserves' assessors agree on this crucial point, as shown in Table 1 below. Table 1. Middle East's share of global conventional oil reserves

<i>Assessor</i>	<i>Middle East's share of worldwide oil reserves</i>
Oil & Gas Journal (1)	57.5%
BP Statistical Review (2)	61.7%
Dr. Colin Campbell (3)	51.8%

References:

[1] *O&GJ*, December 19, 2005 (for January 1, 2006). [2] *BP*, June 2005 (through end of 2004).

[3] *Dr. Campbell*, fifth revision, February 2, 2005 (end of 2004).

If the above assessors generally agree on the ME's predominant share, they tend to disagree on specific estimates of both global and ME reserves. It goes without saying that when assaying ME oil reserves, one should tread carefully. Because, on the one hand, oil reserves' estimation is both a science and an art; and, on the other hand, seen from the point of view of most ME countries, oil reserves are more political than geological. Thus, non-scientific views come to prime over science and further enhance the various types of shades that have led to an overall opaque situation in the Middle East.

Middle East reserves

Focus here will be on the five major ME oil producing countries, the so-called 'ME Five' --- namely: Iran, Iraq, Kuwait, Saudi Arabia and the United Arab Emirates. Four of the latest available estimates for these major producers are presented in Table 2.

Table 2. Remaining proved oil reserves for "ME Five," according to the major assessors

Country	Oil & Gas Journal [1]	BP Statistical Review [2]	Colin Campbell [3]	Author's range [4]
Iran	132.5	132.5	69.0	35-45
Iraq	115.0	115.0	61.0	80 - 100
Kuwait	101.5	99.0	54.0	45 - 55
Saudi Arabia	264.3	262.7	159.0	120 - 140
U.A.E	97.7	97.8	44.0	40 - 50
TOTAL:	711.0	707.0	387.0	320 - 390

References: [1] & [2] As in Table 1. [3] ASPO Newsletter #62, February 2006. [4] February 2006.

Whereas O&GJ and BP mainly rely on published 'official' figures (which are usually bloated and highly political), Dr. Campbell has based his estimates upon geological evidence. Thus, he roughly cuts by half the 'official' figures. Overall, his estimates are the very best available worldwide and they proved their worth in my 'World Oil Production Capacity' (WOCAP) model.

Kuwait

In the special case of Kuwait, Dr. Campbell has lately been vindicated when *Petroleum Intelligence Weekly* (dated January 20) reported that a senior Kuwaiti oil official had hinted at national reserves of 'only' some 48 billion barrels [bnb] --- in stark contrast to the official 99 bnb. The fresh estimate came from adding up the following reserves:

- Burgan field : 20 bnb.
- Northern fields : 17 bnb.
- Western fields : 8.5 bnb.
- Neutral Zone : 2.5 bnb [for 50% share].

Undoubtedly, this halving of Kuwait reserves is a welcome revision, and all other ME producers should be encouraged to duly follow suit.

Saudi Arabia

The Saudi Arabian case has been masterfully exposed by Mr. Matthew Simmons in his "Twilight in the Desert" and Dr. Campbell's 159 bnb estimate looks far more realistic than the official one of 260 bnb. My own opinion stands even lower than that --- at roughly half the official figure.

Iran

As for Iran, the usually accepted official 132 bnb is almost one hundred bnb over any realistic assay. If the higher figure was for real, its oil industry would not be struggling day in and day out to keep output at between 3.0 and 3.5 million barrels per day (inclusive of Persian Gulf offshore).

Iraq

To the contrary of my estimated range for Iran, which is lower than Dr. Campbell's, the Iraqi one is markedly higher. The reasons behind this last divergence are twofold:

(1) The eleven Iraqi oil fields awaiting development spearheaded by the three supergiants of 'Majnoun', 'West Qurna II' and 'Nahr Umar'.

(2) The almost untouched 'Western Desert' which could provide momentous surprises ---based upon the 'Golden Horseshoe' theory I have written about in the *Oil & Gas Journal* (dated July 7, 2003).

Reserves' Twilight

Notwithstanding the importance of conventional oil reserves, their days might now be numbered (both in the ME and elsewhere).

Oil reserve estimates were useful in the era before 'Peak Oil'. But, in the aftermath of the mighty Peak (as, for example, in the present 'Transition One' period), they tend to become stale and rather useless, as field-by-field analysis and prediction takes over (eg., Ghawar, Cantarell).

So, it will not be long now before we will have to say goodbye to all these mesmerizing oil reserve figures and dump the whole reserves file into the all-encompassing 'dustbin of history'.....

Dr. Samsam Bakhtiari is a senior expert with the National Iranian Oil Company (NIOC), with some 35 years experience in the international oil and gas industry. He is among the pioneers of the global 'Peak Oil' theory.

688. Peak Oil Sites

The number of websites addressing Peak Oil continues to increase around the world. A useful listing is to be found on www.peak-oil-news.info/links/php

689. Beyond Peak Competition

Beyond Peak announces a Peak Oil Scenario Competition

Napa Valley, California (PRWEB) February 25, 2006 – BeyondPeak.com, a guide to living sustainably with Peak Oil and economic collapse, announces its First Annual “Who Knows? Things Might Get Better” Peak Oil Scenario Competition.

Is there light at the end of the Peak Oil tunnel? Most Peak Oil activists see nothing but negative results from Peak Oil—the decrease in worldwide production of oil. Most apparently feel that Peak Oil will lead, in one way or other, to The End Of The World As We Know It (or as commonly referred to during Y2K days, TEOTWAWKI).

Some Peak Oil observers predict returning to the semi-rural days of the early 1900s. Other suggest we could return to pre-industrial and even early-agricultural days. Still others suggest a return to Paleolithic times, where necessary skills include making your own obsidian knives and starting fires with a flintstone. But are these really our only options? Is this the best humanity can do? Beyond Peak hopes there are other, more positive, possible futures. Unfortunately, as Beyond Peak founder Mick Winter says, *even if we can see a better future, it's very hard to see how we'd logically get from here to there.*

That's why, says Winter, Beyond Peak invites all those interested in Peak Oil and the future to enter the website's scenario competition. To enter, entrants simply write a scenario and submit it to BeyondPeak.com. There is no minimum length required. Write whatever length is appropriate to your scenario, though entrants should keep in mind that this is an essay contest and not a book competition. When in doubt, check with [BeyondPeak](http://BeyondPeak.com).

Scenarios must be submitted electronically on or before March 31, 2006. First place winner will receive \$100 cash, second place \$50, and third place \$25. Fourth and fifth places get glory and an Honorable Mention. All of the top five scenarios will be posted on the Beyond Peak website and shared with other websites as well. As Winter reluctantly admits, it may be that no one concerned about Peak Oil actually has any optimism. But he hopes that some do. In fact, he encourages pessimists to write an optimistic scenario—just as an intellectual exercise, if for no other reason. They don't even have to believe it themselves.

For full information and suggestions on scenario content for the competition, visit: www.beyondpeak.com.

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

March 1	Farming and garden conference, Alnarp, Sweden [Alekklett]
March 6	Countdown of Oil Production..... CERN Genf, Netherlands [Zittel]
March 9	Environmental Board, Uppsala , Sweden [Alekklett]
March 10	City of Huntington Beach, California [Gilbert]
March 13	University of Groningen, Groningen , The Netherlands [Alekklett]
March 16	Citibank International, Flims , Switzerland [Alekklett]
March 22	Conquering New Frontiers in Oil & Gas Exploration, London , UK [Alekklett]
March 29	Business & Environment Seminar, Cambridge , England [Campbell]
April 3	Energy Foresight Symposium, Bergen , Norway [Alekklett]
April 5	Ireland's Response to Peak Oil, Dublin [Campbell],
April 12	The Future of Oil and Beyond. Austrian biomass. Vienna [Zittel]
April 20-24	Peak Oil, Limerick University, Limerick , Ireland [Campbell]
April 24	CERI, Calgary , Canada [Gilbert]
May 18-21	Ankelohe Conversations Symposium, Hamburg , Germany [Campbell, Leggett]
June 2	The End of Cheap Oil.....Swiss Energy Foundation, Zurich [Zittel]
June 21-22	Global Commodity Markets, Zurich [Campbell]
July 18-19	ASPO-5 International Conference, San Rossore , Italy

Note

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