

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

## NEWSLETTER No. 96 – DECEMBER 2008

ASPO started as a European 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, associates are active in **Argentina, Australia, Austria, Belgium, Canada, China, Croatia, Denmark, Egypt, Finland, France, Germany, Hong Kong, Ireland, Isle of Man, Israel, Italy, Luxembourg, Japan, Korea, Kuwait, Malaysia, Mexico, Netherlands, New Zealand, Portugal, Russia, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, United Kingdom, USA** and Venezuela.

(Formally constituted entities are 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](http://www.crisisenergetica.org)

French: [www.oleocene.org](http://www.oleocene.org) (press “Newsletter”)

### CONTENTS

**1100. Imaginative Data Reporting**

**1101. U.S. Election.**

**1102. Non-Conventional Oil and Gas**

**1103. Major Oil Company Production**

**1104. A Prestigious Peak Oil Taskforce**

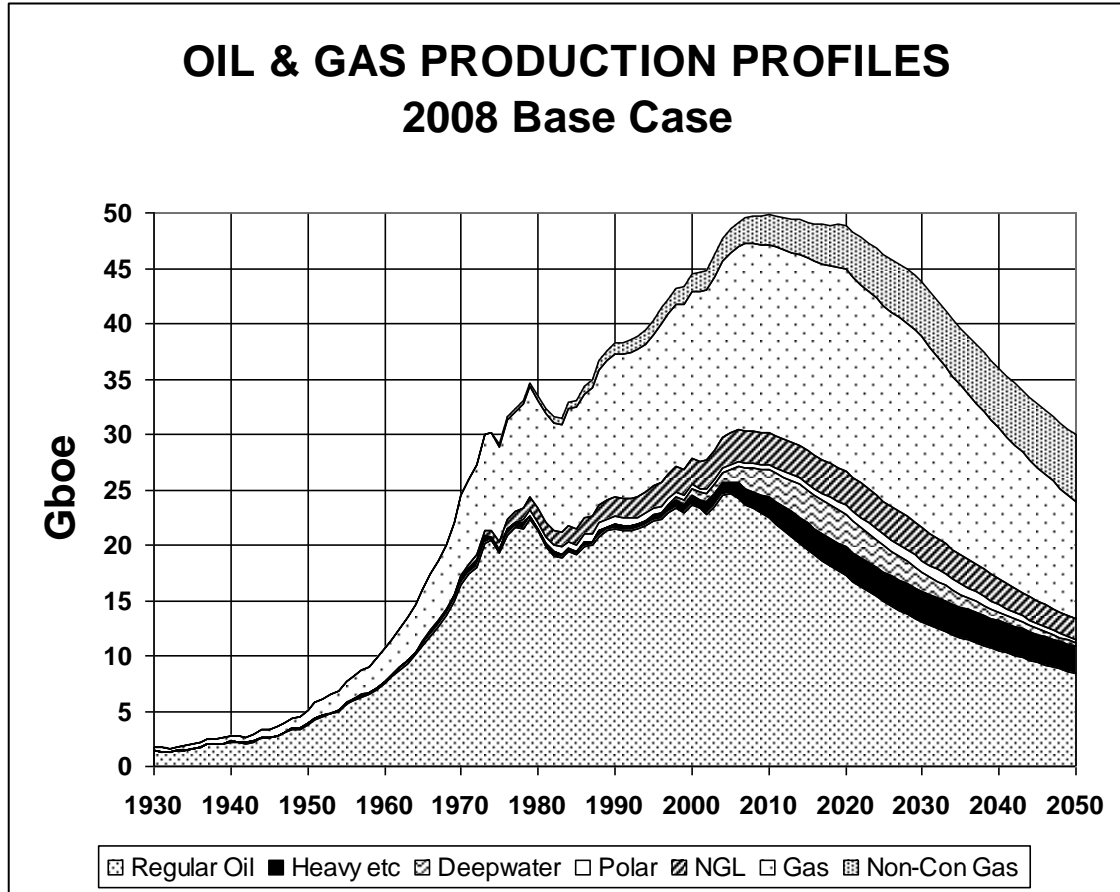
**1105. Iraq re-visited**

**1106. The Energy Challenge facing the United States**

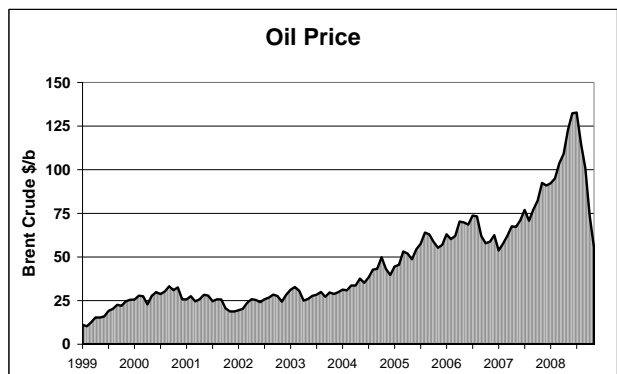
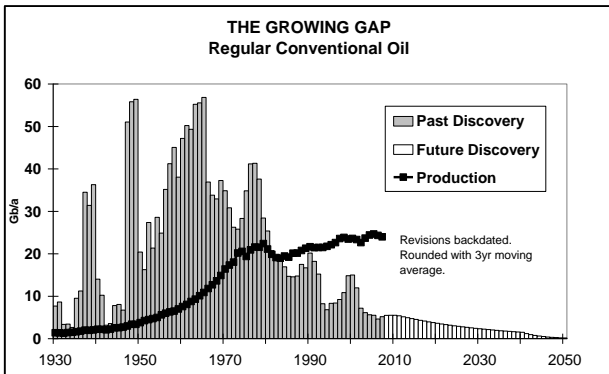
#### Index of Country & Regional Assessments with Newsletter Reference (\*revised)

Abu Dhabi	42	China	*89	Kazakhstan	49	Qatar	58	<b>REGIONS</b>	
Algeria	41	Colombia	*62	Kuwait	38	Romania	55	AFRICA	68
Angola	36	Denmark	47	Libya	34	Russia	*93	EURASIA	69
Argentina	33	Ecuador	29	Malaysia	51	Syria	*60	EUROPE	70
Australia	*94	Egypt	30	Mexico	35	S. Arabia	*66	L.AMERICA	71
Azerbaijan	44	Gabon	50	Netherlands	57	Trinidad	37	N.AMERICA	72
Bolivia	56	India	52	Neutral Zone	84	Turkey	46	THE EAST	73
Brasil	*85	Indonesia	*61	Nigeria	*92	UK	*68	M.E. (Minor)	74
Brunei	54	Iran	32	Norway	*87	USA	*95	M.E.GULF	75
Canada	48	Iraq	*96	Oman	39	Venezuela	*67	Deepwater	76
Chad	59	Italy	43	Peru	45	Vietnam	53		

*The General Depletion Picture*



ESTIMATED PRODUCTION TO 2100									End 2008			
Amount			Gb	Annual Rate - Regular Oil					Gb	Peak		
Regular Oil				Mb/d	2007	2010	2015	2020	2030	Total	Date	
<b>Past</b>	<b>Future</b>	<b>Total</b>		US-48	3.0	2.6	2.1	1.7	1.1	200	1970	
Known Fields	New			Europe	4.3	3.5	2.5	1.8	0.9	75	1999	
1053	734	114	1900	Russia	8.7	8.2	6.8	5.7	4.0	230	1987	
	848			ME Gulf	20	20	20	19	16	673	1974	
<b>All Liquids</b>				Other	28	27	23	19	14	722	2005	
1177	1323	2500		<b>World</b>	<b>65</b>	<b>62</b>	<b>54</b>	<b>47</b>	<b>36</b>	<b>1900</b>	<b>2005</b>	
<b>2008 Base Scenario</b>				<b>Annual Rate - Other</b>								
M.East producing at capacity (anomalous reporting corrected)				Heavy etc.	4.0	5.0	6.5	7.2	7.7	226	2030	
				Deepwater	5.2	6.6	8.1	8.1	4.7	89	2013	
<i>Regular Oil</i> excludes Heavy Oils (inc. tarsands, oilshales); Polar & Deepwater Oil; & gasplant NGL				Polar	1.2	1.3	1.7	2.2	3.0	52	2030	
				Gas Liquid	7.9	7.9	8.1	8.5	8.0	230	2020	
<i>Revised</i>				<i>Rounding</i>			2	1		3		
01/11/2008				<b>ALL</b>	<b>83</b>	<b>83</b>	<b>78</b>	<b>75</b>	<b>60</b>	<b>2500</b>	<b>2008</b>	



### ***1100. Imaginative Data Reporting***

Those investigating natural processes with a scientific training aim to define what to measure carefully, collect the relevant data and then try to draw logical conclusions.

It is not particularly difficult to define an oilfield, measure its size and measure its production, but the reporting of such information is another matter being subject to all sorts of political, commercial, financial and economic pressures. The ambiguous definitions and lax reporting practices explain the wide range of published estimates regarding depletion and hence conceal the reality of Peak Oil.

It seems however that such practices are by no means confined to oil statistics. Ladies have long been known to report their age conservatively. More important however is the reporting of economic parameters: the official US numbers are apparently also highly suspect. The US Bureau of Labor Statistics (BLS) reports that US Consumer Price Inflation (CPI) is running at 5%, having changed the procedure for doing so in 1990. According to *shadowstats.com*, a more realistic estimate would be 13%. The Federal Reserve Bank no longer reports the so-called M3 for the creation of new money, but the same source suggests it is currently running at 13%, contributing to inflation. Officially, Gross Domestic Production (GDP) has increased by 2%, whereas the alternative source suggests that it is declining at 3%. Likewise, official estimates of unemployment at 6% contrast with the alternative estimate of 15%. Added credibility for the alternative assessment comes from no less than General Motors, which reports that global passenger car sales fell by 6% during the Third Quarter of this year.

Apparently, various hidden agencies related to the Federal Reserve Bank may be manipulating gold and silver prices, which have fallen since the financial crisis broke. The fall does not seem a natural response, given that gold is the traditional safe haven in times of stress and growing inflation. Indeed according to the August issue of the Bank Participation Report, Bear Stearns had a large short position on COMEX silver at the time of its forced merger with JP Morgan in March. The transfer was undertaken by the US Treasury under somewhat dubious procedures. No doubt gold holdings are also involved in the labyrinthine dealings.

One is led to conclude that the entire Stock Market, including especially the oil market, has become a thoroughly debased speculative institution. In earlier years, investors clubbed together to build a specific project, such as a canal or railway, with the resulting dividend being the prime motivation. Things seemed to have gone wrong when such investments were traded on markets by financial institutions which naturally can have no serious knowledge of the underlying business or the true value to be placed upon it.

*(Reference furnished by Virginia Abernethy)*

### ***1101. U.S. Election.***

The election of Mr Barack Obama seems to have been greeted with rapture in the United States and around the world. Certainly he projects an attractive personality and speaks fluently and well, but the main enthusiasm seems to lie in his mixed racial background. Part of his family emanates from Kenya, possibly having some Arab blood, and the Irish stake claim to other antecedents.

Some observers hope that his election will spell regime change and the end of the so-called *War on Terror*, which seems to have failed to extend global economic hegemony. On the other hand, his election, which required massive funding, suggests that he relied on more than the simple ballot box. Indeed, the financier, Rahm Emanuel, who has apparently served in the Israeli Army and is the son of a former member of the Irgun Zvai Leumi terrorist movement, has been appointed as Chief of Staff, suggesting that the established influences will remain in power.

But by all means, most people welcome the change, and look forward with enthusiasm to new policies with which to face the unfolding situation, imposed ultimately by dwindling oil-based energy.

The new Presidency will certainly have to work a radically new situation for which no one is truly prepared. Even the leading American intelligence organisation, the National Intelligence Council (NIC) has issued a report entitled *Global Trends 2025: A World Transformed* which concludes that the days of US global economic and military power are over, foreseeing an end to the *western model of economic liberalism*, as the State is forced to take a more active role.

Meanwhile, desperate efforts are being made around the world to shore up the crumbling financial system. For example, the Bank of England has radically reduced interest rates in a country facing a severe recession, effectively taking money from savers to give to spenders. The Government has evidently failed to grasp the underlying causes of recession and hopes that pumping a bit of money into the system will restore it to its previous condition. That was premised on eternal economic growth, which is a somewhat unrealistic proposition for a Planet of finite dimensions, but Governments subject to re-election are by nature short-term in their thinking.

In years ahead, analysts may look back on the current crisis and identify its causes. They may conclude that oil demand had begun to outpace supply around 2005, when the production of *Regular Conventional Oil*

passed its peak. The shortfall was however relatively small and was partly met without undue difficulty by a modest reduction in demand. But as prices began to firm, oil traders and other speculative financial institutions began to take a position in the market, which had the effect of driving up the price. Gradually the process built momentum as huge notional profits were reaped from the appreciating asset. In a conventional market such movements would soon be countered by increased production, but in the case of oil, there was no spare capacity to release, and the speculative surge fed on itself leading to an extreme escalation in price which reached about \$150 a barrel by July 2008. However as this peak was approached, the traders began to conclude that a limit was close and began to buy future options at lower prices, which began to undermine the price in a self-fulfilling process. In parallel the high prices began to undermine many other aspects of the economy with for example airlines and motor manufacturers facing difficulties. They themselves relied heavily on debt, which itself was traded between banks without adequate genuine collateral, and were forced to unload their speculative oil positions in order to try to shore up their failing businesses. Gradually the whole edifice collapsed, and oil prices fell to around \$50 a barrel, although nothing particular had changed in the actual supply/demand relationship. The flaw in the system was to treat a finite resource whose production was largely controlled by the immutable physics of the reservoir as if it were a normal commodity capable of responding to ordinary market pressures. If the price of potatoes increases, farmers can grow more and the market responds, but oil is different.

Governments responded to the crash by pouring yet more money, itself lacking genuine collateral, into the system in the mistaken belief that this would restore the position of assumed eternal growth, and quite possibly the stock market will respond positively as traders sense a new upward direction. They have no real interest in reality: their job being to try to reap rewards from short term movements. But if there is an economic recovery, that would serve to increase the demand for oil, which is in a sense the bloodstream of the modern world, and oil prices would again begin to surge. Probably, it will take several such vicious circles before governments and, more important, people at large at last come to grasp the reality of the situation, which will likely prompt radical changes in the human condition.

### ***1102. Non-Conventional Oil and Gas***

The high price of oil prompted the rapid expansion of non-conventional gas in the United States. Three different categories are involved comprising *Coalbed Methane* derived from coal deposits; *Shale Gas* obtained by fracturing gas-bearing shales; and *Tight Gas* derived from thin sandstone beds with low porosity and permeability. The resources in the ground are large but the extraction is slow and costly, and may accordingly be adversely affected by the recent fall in oil price.

<b>US Non-Conventional Gas (Tcf/a)</b>				
	<b>CBM</b>	<b>Tight</b>	<b>Shale</b>	<b>Total</b>
1990	2.0	4	0	6
2000	2.2	6	1	9
2010	2.3	8	5	15
2020	2.5	10	10	23

The CIBC bank of Canada has published production data suggesting that US production is rising as shown in the table. It is very difficult to estimate the World totals, but an upward revision has been made to the Depletion Plot on Page 2 above, suggesting that production may rise from about 10 Tcf/a in 2000 to about 30 Tcf/a by 2030. The estimate for Heavy Oil production from Canada has also been increased on the basis of new forecasts from CAPP, although they may prove somewhat optimistic, given that the recent fall in price has prompted the suspension of several tarsand projects, which evidently depend on oil price of at least \$90 a barrel to be viable.

### ***1103. Major Oil Company Production***

Although it is too soon to be sure, it appears that the major international oil companies may have passed the peak of their production in 2004, experiencing an overall subsequent decline of 5.2%. The table shows the approximate positions as of end 2007. It would be better to consider *Regular Conventional Oil* only, and look at a longer range, excluding production acquired by purchase or merger, but the data to do so has not yet been collected. The long-term discovery record of the companies would be even more significant. Shell's record was examined a few years ago and, to the credit of the company, showed a very close fit with the optimal hyperbolic projection, with the larger fields coming in first.

	<b>Peak Date</b>	<b>Decline</b>
Chevron	2002	6%
Shell	2003	20%
Total	2004	11%
BP	2005	6%
Exxon	2006	2%
Combined	2004	5%

It would not be surprising if there were further mergers. It might indeed make good sense for BP, Shell and Total to combine, and withdraw from overseas markets in order to try to protect Europe's consumers from the worst effects of falling supply. At times of high oil price, it may be assumed that the companies

produce at the maximum rate possible under normal market pressures, although the interests of their customers might be better served by efforts to conserve more for the future. This would itself raise prices and help cut demand which would also be in the consumers' best long term interest.

The position of BP is particularly strange. As mentioned in Item 1094 in Newsletter 95, its Chief Economist goes so far as to say that there will *never* be a peak of oil production, and yet the company places the following advertisement in the UK national press :

<p><b>One way out of the Energy Fix is an Energy Mix</b></p> <p>It is going to take a menu of energy sources to ensure we have supplies that we can rely on. That's why, as the largest single producer of oil and gas in the UK North Sea, BP is using the latest technology to find new reserves and to increase recovery from existing fields. We are also investing in a major biofuels facility in Hull; expanding our global production of solar panels; and on target globally to generate wind electricity equivalent to the annual needs of some 700,000 average UK households. It all adds up to a more dependable energy future. Learn more at bp.com</p> <p style="text-align: right;"><i>BP – beyond petroleum</i></p>
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By speaking of an *Energy Fix*, it certainly does not sound as if the company expects its oil production to increase in the future, which implies it accepts a peak in its production. If oil were as abundant as its Chief Economist maintains, why would the company bother with the alternatives, especially as they deliver less profit, especially at times of high oil prices? The slogan implying that BP stands, not for the venerable *British Petroleum*, but for *Beyond Petroleum*, delivers the same message.

John Busby, writing for Sanders Research, which is a financial institution, has also commented on the curious position of company's Chief Economist - see

[http://www.sandersresearch.com/index.php?option=com\\_content&task=view&id=1378&Itemid=103](http://www.sandersresearch.com/index.php?option=com_content&task=view&id=1378&Itemid=103)

#### **1104. A Prestigious Peak Oil Taskforce**

A new organisation has been formed in Britain entitled the *UK Industry Taskforce on Peak Oil and Energy Security* (ITPOES). It has published a splendid report entitled *The Oil Crunch*, which explains the situation clearly and thoroughly. Perhaps the most significant aspect is that the task force is made up of eight important UK companies, including the Virgin Group, operating a well known airline.

It indeed faces a major task in convincing the Government, whose Prime Minister in a recent speech to the nation spoke of seeking prosperity from a new ultra-globalism without mention of the energy issue that calls for localism not globalism. (see [www.peakoiltaskforce.net](http://www.peakoiltaskforce.net)).

#### **1105. Iraq re-visited**

Iraq was last covered in Newsletter No 24, so it is time to review this most difficult of evaluations. The following is based partly on the *Atlas of Oil and Gas Depletion*. Iraq is one of the OPEC countries that increased its reported reserves in the 1980s when they were vying for quota based on what they reported. Responding to actions by Kuwait, it increased its reported reserves from 47 to 100 Gb in 1988 although nothing particular had changed in the oilfields. Although some former Iraq officials support the higher estimates, we have come to think that reported reserves of 115 Gb might be a reasonable estimate of the country's total endowment, not the remaining reserves. This view is partly confirmed, political considerations notwithstanding, by the exceptionally low Depletion Rate of 0.91%, which would be even lower with a higher estimate of the endowment. The estimates are uncertain, but even so it makes sense have a *base case*, albeit one subject to revision as new information and insight come in.

IRAQ						MIDDLE EAST			2008	
Production						Peak Dates			Area	
Amount	Oil	Gas	Rate	Oil	Gas		Oil	Gas	'000 km <sup>2</sup>	
	Gb	Tcf	Date	Mb/a	Gcf/a	Discovery	1928	1953	Onshore	Offshore
PAST	32	17	2000	938	530	Production	1979	2030	440	0
FUTURE	83	108	2005	685	620	Exploration	1978		<b>Population</b>	
Known	71	92	2010	761	651	<b>Consumption</b>	Mb/a	Gcf/a	1900	2.0
Yet-to-Find	12	16	2020	1124	1060	2007	220	90	2007	29
DISCOVERED	103	109	2030	1124	1567		b/a	kcf/a	Factor	14.5
<b>TOTAL</b>	115	125	<b>Trade</b>	+541	+530	Per capita	7.5	3	Density	66

### Essential Features

Iraq is a landlocked country of 440,000 km<sup>2</sup> in the centre of the Middle East. Relatively fertile regions along the valleys of the Euphrates and Tigris Rivers, which drain into the Persian Gulf, are bordered by an arid plateau to the north and by extensive deserts to the south and west. It is home to almost 30 million people, of whom about 60% belong to the *Shi'ia* sect of Islam. An important Kurdish minority live in the north of the country.

### Geology and Prime Petroleum Systems

Iraq covers the axis and western flank of the Persian Gulf Basin as well as the outer foothills of the Zagros Mountains to the east. Precambrian rocks of the Arabian Shield lies at relatively shallow depth in the western part of the country but are overlain eastward by a thickening sequence of gently deformed sedimentary rocks offering two prime petroleum systems. In the west, Silurian source-rocks have charged the overlying Permian sandstones with oil, passing into gas-condensate where deeply buried to the east. This platform has received only a modest exploration effort, but the results to date are probably sufficient to conclude that its potential is limited.

The main system lies in axial part of the basin where Upper Jurassic and mid-Cretaceous prime source-rocks have charged intervening sandstone and limestone reservoirs with substantial amounts of oil and gas. Other leaner source-sequences are also present. Some of this oil has re-migrated upwards into Miocene fractured carbonate reservoirs in the Zagros Foothills, and some may have migrated long distances westward into the bordering platform.

In structural terms, the basin is cut by transverse faults, related to the earlier Hercynian structural configuration, giving highly prospective uplifts separated by less promising structural depressions. In general, the basin rises and thins to the north where it swings into Turkey.

Oil migration was primarily vertical giving rise to multiple productive reservoirs containing oil of varying density, reflecting the particular conditions of generation and migration. Multiple seals of salt and other evaporites form an important part of the trapping mechanism.

### Exploration and Discovery

The first recorded exploration boreholes were drilled in 1903 and 1905 making small discoveries. Exploration resumed after the First World War and was rewarded by the discovery of the giant Kirkuk Field in 1927 holding some 16 Gb of oil. It is located on a huge surface anticline in the outer ranges of the Zagros Foothills, whose prospects were obvious to the naked eye. A number of other finds were made in the vicinity over the ensuing years, bringing total discovery to almost 20 Gb by the outbreak of the Second World War. This was achieved by the drilling of some fifty exploration boreholes.

Operations resumed after the War as attention turned to the southern end of the country in front of the Zagros fold-belt where seismic surveys were needed to identify and delineate the prospects. It was rewarded with a string of giant finds, starting in 1949, as listed in the table, illustrating the normal pattern of the larger being found first.

Exploration has been substantially reduced over the past decade because of the political difficulties with no more than five exploration boreholes, out of a total of 140, having been drilled since 1990.

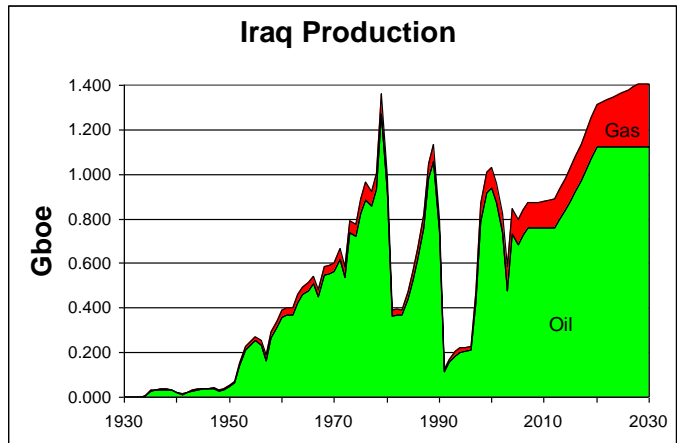
Almost 110 Tcf of gas have been discovered in the course of the oil exploration, most of which remains to be produced, save in the case of Kirkuk, where the gas cap was depleted to provide for local electricity generation during the UN embargo, which has adversely affected the recovery of the underlying oil.

Despite the political constraints, it is evident that the larger fields of Iraq have already been found, with the scope for future discovery being here assessed at about 12 Gb. Much media attention has been directed at the little drilled western platform, but the results are likely to be disappointing as it lacks the merits of the prime trend to the east.

### Production and Consumption

Oil production commenced in 1928 but did not reach significant levels until the mid-1930's, and did not pass 100 kb/d until 1945. It then rose steeply to an overall peak on 3.5 Mb/d in 1979, after which it became volatile in response to various political constraints. It currently stands at about 2 Mb/d and is here predicted, political conditions permitting, to rise from 2012 to a plateau at about 3 Mb/d from 2020 until around 2030 when terminal decline sets in.

Consumption stands at 220 Mb/a, giving a per capita consumption of 7.5 barrels a year. The country can accordingly remain a substantial exporter for many years to come. Gas was flared in earlier years, with recorded production commencing in 1950. It remained at a modest level thereafter not passing 500 Gcf a year until around 2000. Production is expected to increase in the future if political conditions so permit. Plans for a new gas pipeline from the Middle East to Europe are under consideration, which, if constructed, could tap Iraq's large gas resources.



Name	Date	Size Gb
Rumailia	1953	22
Kirkuk	1927	16
E Baghdad	1976	11
W.Qurna	1973	6
Majnoon	1977	6
Zubair	1949	4
Nahr Umr	1949	4
Jambur	1954	3
Bai Hassan	1953	2
Subba	1977	2
Khabbaz	1976	2

### The Oil Age in Perspective

Some of the world's ancient civilisations developed in this area. Indeed, the Garden of Eden, where Adam and Eve disported themselves, is supposed to have been located here. Cyrus the Great of Persia conquered the place in 539 BC, before it fell to Alexander the Great in 331 BC. Greek and renewed Persian dominion followed until it was overrun by Muslim Arabs in the 7<sup>th</sup> Century. It was later subject to Mongol invasions and further attentions by Persian and Turkish rulers, before the Ottomans established a firm grip in the 17<sup>th</sup> Century, operating through three local administrations (*vilayets*) having a fair degree of delegated authority. Various nomadic Arab tribes were never fully integrated, and the Kurds in the north, being descendants of the ancient Medes, have long sought their independence.

The area began to attract the conflicting commercial and political attentions of Britain and Germany during the latter part of the 19<sup>th</sup> Century. Britain, as a trading sea-power, was interested in the coastal areas, including what is now Kuwait, and also established a shipping company on the Tigris to serve the interior. Germany, being a land-power, proposed building a railway from Berlin to Baghdad, recognising its importance in a military context. The Middle East itself seems to have been of limited interest to Britain, apart from having a strategic importance as a bastion against Russian expansion threatening communications with India, the jewel in Britain's imperial crown.

Oil had been known in the area since antiquity, being used as a form of mortar in the construction of Babylon. New interest developed in the early years of the 20<sup>th</sup> Century, when engineers came across oil seepages in the course of surveying the concession granted by the Ottoman Sultan for the proposed German railway. The Sultan then called in a young Armenian oilman, by the name of Calouste Gulbenkian, to investigate, launching him on what became his life's work to develop Iraq's oil. To this end, he established the Turkish Petroleum Company in 1912. It was owned by the Deutsche Bank (25%), which controlled the previous railway concession that conveyed the mineral rights, Shell (25%) and the Turkish National Bank (50%). The latter had been set up by British financial interests, with Gulbenkian holding 30%. The British Government then intervened to secure a holding for what is now BP, reducing Gulbenkian's share to 5%, which he famously hung on to.

The rights to the concession were confirmed on June 28<sup>th</sup> 1914, a few days before the outbreak of the First World War, in which Turkey sided with Germany, already having had close links. The importance of oil became evident during the war, and France and Britain, followed by the United States, began to discuss the eventual carve up of the Middle East while hostilities were still in progress.

Negotiations in the peace treaties following the war, eventually gave Britain mandated administrative control of the territory whose frontiers were drawn in a somewhat arbitrary manner, partly on the advice of Gertrude Webb, an aristocratic British lady who enjoyed travelling in the region, but did not necessarily fully reflect ancient tribal and historical factors. It was declared a Kingdom, with the crown being placed on the head of Prince Feisal, the son of the Grand Sharif of Mecca. He had been Britain's premier ally in the war, and had been promised an Arab Kingdom in return for his contribution. In fact, Feisal had first been put on the throne of Syria, but was recycled when that country came into the more republican French sphere of influence.

As one of the spoils of war, it was agreed that Iraq's oil, which had become a central issue, would be produced exclusively by the Iraq Petroleum Company (IPC) with the shareholding given in the following table.

The companies also agreed not to compete with each other throughout most of the previous Turkish Empire, including Saudi Arabia, although Exxon and Mobil later reneged on the agreement when they joined Aramco in Saudi Arabia in the 1930's.

As mentioned above, exploration soon commenced, and was richly rewarded with the discovery of the Kirkuk Field in 1927, holding about 16 Gb of oil in the northern, Kurdish, part of the country. Production rose only gradually to the Second World War, reaching 100 kb/d by 1947. Iraq was not, accordingly, a particularly important exporter to that point.

Company	%	Comment
Shell (Anglo-Dutch)	23.75	
BP (British)	23.75	previously Anglo-Persian & Anglo-Iranian
CFP (French)	23.75	now TotalFinaElf
Exxon (US)	11.875	now Exxon-Mobil
Mobil (US)	11.875	now Exxon-Mobil
Gulbenkian	5%	Independent

The post-war epoch was characterised by growing nationalism throughout the region, which was given more encouragement when the United States opposed an Anglo-French military strike to prevent Egypt sequestering the Suez Canal in 1956. Most of the producing countries nationalised the holdings of the foreign oil companies over the ensuing years: Iraq doing so in 1972.

Saddam Hussein was born in 1937, and joined the Ba'athist Party twenty years later. It had been formed in Syria in 1943, adopting authoritarian socialist principles, being opposed to colonialism. In the following year, the then King, Feisal II, was beheaded in a coup led by a Colonel Kassim, who was backed by Egypt. He in turn fell in another coup that brought the Ba'athists to power in 1968, appointing Saddam Hussein as President in 1979. As described above, the country was a somewhat artificial construction, comprising Kurds - who have long sought independence - in the north, *Shi'ites* with links to Iran in the south and *Sunni's* around Baghdad, the capital. Evidently, it took a strong leader to hold these disparate groups together as a nation. It previously had a substantial, well-integrated Jewish community in Baghdad which had been one of the great centres of Judaic culture in the 5<sup>th</sup> Century, but it was driven out by popular outrage on the creation of the State of Israel in 1948.

In 1974, heavy fighting broke out between government forces and Kurdish separatists, who were being backed by Iran, but the conflict was settled when Iran withdrew its support in return for resolution of a long-standing boundary dispute, related to the key Shatt al-Arab estuary of the Tigris-Euphrates river system, Iraq's main trade route. Tensions

with Iran erupted again due to the fall of the Shah in 1979, when unrest among the Iranian Kurds spilled over into Iraq. It soon developed into a full-scale war, which dragged on for almost eight long years with colossal loss of life to both sides. Although nominally neutral, the United States backed Iraq during this conflict, still smarting from an incident in which American citizens were taken hostage in Tehran, in an effort to bring the Shah, who had fled the country, back for trial. During the late 1980's, the United States supplied Iraq with substantial bank credits and technology to rebuild its military strength. The Soviets, not to be outdone, also developed close ties, furnishing credit and weapons.

Meanwhile, President Reagan of the United States and Mrs Thatcher, Britain's Prime Minister, resolved to bring down the Soviet regime, ending the policy of co-existence. The first step was to rearm the Afghans to end the Soviet occupation, and undermine its military credibility. This was achieved with the help of King Fahd of Saudi Arabia, who funded the covert purchase of arms in Egypt for shipment to none other than Osama bin-Laden, who was backing the Taliban with CIA support.

The next step was to persuade King Fahd to step up Saudi oil production to undermine the global price of oil. The Soviets relied on oil exports for foreign exchange, which they now needed in greater amounts, to buy equipment with which to counter the new US *Star Wars* initiative. It was a successful strategy, which contributed to the fall of the Soviets, but was achieved at a cost as the low price of oil was bankrupting not only King Fahd but the Texan oil constituents of Mr Bush Sr.

While all this was going on, Kuwait arbitrarily increased its reported reserves by 50% in 1985 although nothing particular had changed in its oilfields. It did so in order to raise its OPEC production quota, which was based on reported reserves. It also began pumping from the southern end of the South Rumaila field that straddles the somewhat ill-defined and arbitrary border. Iraq complained bitterly, filing a law suit, both about what amounted to the theft of its oil across the border, and the subsequent loss of oil revenue as prices fell consequent upon Kuwait's failure to observe its contractual OPEC agreement.

Now, US strategy moved to strengthen the price of oil by dispatching an emissary, Henry Shuyler, to encourage its ally, Saddam Hussein, to intervene in the councils of OPEC and bring Kuwait to heel so that quota agreements would sufficiently followed to raise the price of oil. It was recognised that words might not be enough to concentrate the minds of the OPEC ministers. Exactly what was proposed is not known, but it seems clear that a border incident to stop Kuwait producing from the southern end of the shared oilfield was contemplated. This interpretation is confirmed by the words of April Glaspie, the US ambassador to Baghdad, who, on the eve of the invasion of Kuwait, made a statement to the effect that boundary disputes between Arab countries were of no concern to the United States. It was clearly an authorised statement, being released simultaneously in Washington under the signature of James Baker, the Secretary of State.

However, Saddam Hussein, possibly misunderstanding a wink and nod, did not stop with a border incident, and mounted a successful full-scale invasion of Kuwait on August 2<sup>nd</sup> 1990. April Glaspie, on being woken by journalists with the news, while on vacation, reportedly responded "*Oh My God, they haven't taken the whole place, have they?*" which hints at least of fore-knowledge.

US policy now changed to condemn its former ally. It secured a series of UN resolutions calling for Iraq to withdraw from Kuwait by January 15<sup>th</sup> 1991, leading to a US aerial bombardment when it failed to comply. Ground forces, led by General Schwarzkopf, crossed the frontier, killing tens of thousands of Iraqis and destroying most of its military capability, before being ordered to halt at the gates of Baghdad when a cease-fire was agreed. The dissident *Shi'ites* in the south and the Kurds in the north saw this as their moment to rise, but were successfully suppressed by remnant government forces. Hundreds of thousands of Kurdish refugees fled into neighbouring Turkey and Iran, where they were not exactly welcome.

The United Nations was then persuaded to impose a trade embargo on Iraq, making it effectively swing oil producer of last recourse, which provided a useful mechanism for stabilising the world price of oil at no cost to anyone else, it being relaxed from time to time for *humanitarian* reasons when the price of oil rose to uncomfortable levels.

In common with many countries, Iraq had made certain progress in developing modern nuclear, chemical and biological weapons, but by 1998, UN inspectors had reported that virtually all such facilities had been closed. Yet the United States and Britain invaded in 2003 on the pretext of these alleged weapons which were not in the event found. President Bush later justified the invasion with the words: *Our energy supply was at risk*, the attack evidently having been planned some years before possibly as part of some wider strategy.

Saddam Hussein was executed in 2006 for ordering the execution of 148 *Shi'ites* taking part in a revolt in the town of Dujail in the 1980's, albeit a small number compared with the million or so innocent people who directly and indirectly lost their lives as a consequence of the invasion. It looks now as if Britain and the United States plan to withdraw their occupying forces as soon, and as diplomatically, as possible, leaving the new *Shi'ia* government to deal with difficult situation resulting from the invasion.

It is very hard to foresee how Iraq will fare during the Second Half of the Age of Oil. On balance it seems likely that it will fragment into *Shi'ia*, *Sunni* and *Kurdish* communities facing much internal conflict. Different regions may also try to protect themselves and find a sustainable future on what are, for the most part, barren lands. Several European, Russian, and Chinese companies signed agreements to develop oilfields as soon as the embargo were lifted, committing over \$1.7 trillion to do so, but such agreements were subsequently nullified to make way for the eventual entry of US companies. They are unlikely to be very welcome, and the Chinese and Russian companies may yet find a preferential position. Probably, such efforts as are made will be directed to re-developing existing fields, with exploration having a



low priority in the tense political situation. But notwithstanding all the difficulties, production is expected to increase to a plateau in the years ahead and yield a high income as oil prices again rise in the face of growing world shortage.

### ***1106. The Energy Challenge facing the United States***

The following article by Professor Klare, who has studied the political aspects of oil depletion issue long and hard, is penetrating. It proposes local solutions in North America far from the globalistic notions of the British Prime Minister, mentioned above in Item 1104.

#### **The Energy Challenge of Our Lifetime**

By Michael T. Klare, Tomdispatch.com.

Posted November 10, 2008.

**Of all the challenges facing President Obama, none is likely to prove as daunting, or important to the future of this nation, as that of energy.**

Of all the challenges facing President Barack Obama next January, none is likely to prove as daunting, or important to the future of this nation, as that of energy. After all, energy policy -- so totally mishandled by the outgoing Bush-Cheney administration -- figures in each of the other major challenges facing the new president, including the economy, the environment, foreign policy, and our Middle Eastern wars. Most of all, it will prove a monumental challenge because the United States faces an energy crisis of unprecedented magnitude that is getting worse by the day.

The U.S. needs energy -- lots of it. Day in and day out, this country, with only 5% of the world's population, consumes one quarter of the world's total energy supply. About 40% of our energy comes from oil: some 20 million barrels, or 840 million gallons a day. Another 23% comes from coal, and a like percentage from natural gas. Providing all this energy to American consumers and businesses, even in an economic downturn, remains a Herculean task, and will only grow more so in the years ahead. Addressing the environmental consequences of consuming fossil fuels at such levels, all emitting climate-altering greenhouse gases, only makes this equation more intimidating.

President Obama faces our energy problem, he will have to address three overarching challenges:

1. The United States relies excessively on oil to supply its energy needs at a time when the future availability of petroleum is increasingly in question.

2. Our most abundant domestic source of fuel, coal, is the greatest emitter of greenhouse gases when consumed in the current manner.

3. No other source of energy, including natural gas, nuclear power, biofuels, wind power, and solar power is currently capable of supplanting our oil and coal consumption, even if a decision is made to reduce their importance in our energy mix.

This, then, is the essence of Obama's energy dilemma. Let's take a closer look at each of its key components.

#### **Excessive Reliance on Oil**

No other major power relies on getting so much of its energy from oil. Making that 40% figure especially daunting is this: the world supply of oil is about to contract. The competition for remaining supplies will then intensify, while most of what remains is located in inherently unstable regions, threatening to lead the U.S. into unceasing oil wars.

Just how much of the world's untapped oil supply remains to be exploited, and how quickly we will reach a peak of sustainable daily world oil output, are matters of some contention, but recently the scope of debate on this question has narrowed appreciably.

Most energy experts now believe that we have consumed approximately half of the planet's original petroleum inheritance and are very close to a peak in production. No one knows whether it will arrive in 2010, 2012, 2015, or beyond, but it is certainly near. In addition, most energy professionals now believe that global oil output will peak at far lower levels than only recently imagined -- perhaps 90-95 million barrels per day, not the 115-125 million barrels once projected by the U.S. Department of Energy. (Here I'm speaking only of conventional, liquid petroleum; there are some "unconventional" sources of oil -- Canadian tar sands, Venezuelan extra-heavy crude, and the like -- that may boost these numbers by a few millions of barrels per day, without altering the global energy equation significantly.)

What underlies these more pessimistic assumptions? To begin with, the depletion rate of existing fields is accelerating. Most of the giant fields on which the world now relies for the bulk of its oil supplies were discovered 30 to 60 years ago and are now reaching the end of their productive life cycles.

It used to be thought that the depletion rate of these fields was about 4% to 5% a year, but in a study to be released November 12, the International Energy Agency (IEA), an affiliate of the Organization for Economic Cooperation and Development (the club of wealthy industrialized nations), is expected to report that the decline rate is closer to 9%, an astonishingly high figure. At this rate of decline, the world's major fields will be depleted of their remaining supplies of oil relatively quickly, leaving us dependent on a constellation of smaller, less productive fields, often located in difficult to reach or unstable areas, as well as whatever new deposits the oil industry is able to locate and develop.

And this is the second big problem: Despite huge increases in the funds devoted to exploration, the oil companies are not finding giant new fields comparable to the "elephants" discovered in previous decades. Only two such fields were discovered between 1970 and 1990, and only one since -- the Kashagan field in Kazakhstan's corner of the Caspian Sea. True, the companies have discovered some large fields in the deep waters of the Gulf of Mexico and off the coasts of Angola and Brazil, but these are neither on a par with the largest fields now in production, nor anywhere near as easy to bring on line. They will not be able to reverse the coming decline in global output.

Given these factors, it is clear that the global supply of oil is destined to begin contracting in the not-too-distant future, and that the global peak in production -- when it does arrive -- will be at a level much lower than previously assumed. The current global economic downturn and the sudden fall in energy prices may, for a while, mask this phenomenon, but they won't change it in any significant way.

Our excessive reliance on oil in good times and bad is made all the more problematic by the fact that, just as supplies are dwindling, global demand is expected to rise mainly because of increased consumption in China, India, and other developing nations.

As recently as 1990, the developing nations of Asia accounted for only a relatively small 10% of global oil consumption. Their economic growth has been so rapid, however, and their need for oil so voracious that they now consume about 18% of the world's supply. If current trends persist, that will rise to 27% in 2030, exceeding North American net consumption for the first time. This means -- if energy habits and present energy use don't change radically -- that Americans will be competing with Chinese and Indian consumers for every barrel of spare oil available on world markets, driving up prices and jeopardizing the health of our petroleum-dependent economy.

To make matters worse, more and more of the world's remaining oil production will be concentrated in the Middle East, Central Asia, and sub-Saharan Africa. That these areas are chronically unstable is hardly accidental: many bear the scars of colonialism or are delineated by borders drawn up by the colonial powers that bear no resemblance to often fractious ethnic realities on the ground. Many also suffer from the "resource curse": the concentration of power in the hands of venal elites that seek to monopolize the collection of oil revenues by denying rights to the rest of the population, thereby inviting revolts, coups, and energy sabotage of every sort.

As it has grown more reliant on oil deliveries from these areas, the United States has attempted to enhance its energy "security" by an increasing reliance on military force, even though such efforts have largely proved ineffectual. Despite all the money and effort devoted to enforcement of what was once known as the Carter Doctrine -- which stated that the uninterrupted flow of Persian Gulf oil to the United States is a vital national interest to be protected by any means necessary, including military force -- the Persian Gulf is no more stable or peaceful today than it was in 1980, when President Jimmy Carter issued his famous decree.

Our over-reliance on oil, then, is our greatest energy vulnerability. But what are the alternatives?

#### **The Problem with Coal**

The energy source which the United States possesses in greatest abundance is coal. This country has the world's largest reserves, 247 billion metric tons, and is second only to China in using coal. In this country, coal is primarily employed to produce electricity, but it can also be converted into a diesel fuel -- known as coal-to-liquids or CTL -- to power cars and trucks. Although CTL, widely used by Germany during World War II to power its war machine, is still in its infancy in the U.S., it could conceivably be used to supplement future declining gas supplies.

When coal is burned in the conventional manner, however, it emits more climate-altering greenhouse gases than any other fossil fuel -- twice as much as natural gas and one-and-a-half times that of oil to produce the same amount of energy. As a result, any increase in our reliance on coal will lead to ever greater emissions of carbon dioxide, only accelerating the already perilous rate of global warming.

In addition, an increased U.S. reliance on coal would only flash a green light to China, India, and other countries eager to do likewise. The bottom line? Any hope of reversing the buildup of greenhouse gases in the atmosphere in time to avert the most severe consequences of climate change would go out the window (possibly quite literally).

During the recent election campaign, Barack Obama and John McCain both spoke of speeding the development of "clean coal technology." In the present context, however, clean coal is a deceptive term, if not an outright misnomer. It generally refers to pollution-free coal, not to coal free of carbon emissions. Coal that would burn without damaging the climate is best referred to as climate-friendly coal, or "safe coal." At present, there are no power plants anywhere on the planet capable of burning coal in a climate-safe manner.

Right now, there is only one technology being seriously discussed that would burn coal safely: carbon capture and storage, or carbon sequestration. Under this process, powdered coal is combined with steam and turned into a gas; then the carbon is stripped away and eventually buried. This is a tricky and costly technique that has yet to be fully tested. But at the moment, it is the only foreseeable path to using coal in a climate-friendly way. President-elect Obama has spoken of his interest in this technology, but without a

lot more support and investment -- no small matter in economically tough times -- it will never get the boost it deserves.

### **Consider the Alternatives**

So what's left to satisfy our future energy needs?

Natural gas is the next biggest source and it possesses a number of advantages. Of all the fossil fuels, it releases the least amount of carbon dioxide when burned. We possess substantial, if not overwhelming, reserves of natural gas in this country. But like oil, it is a finite substance. Eventually, it, too, will peak and begin a decline of its own. Energy experts are less certain about when exactly this is likely to occur, but most see it coming a decade or so after oil's peak.

Our biggest problem with natural gas is that we are gradually running out of North American reserves and so must increasingly rely on supplies from elsewhere -- in this case, in the form of liquefied natural gas, or LNG. Fully 45% of the world's remaining reserves are, however, held by just three countries, Russia, Iran, and Qatar, while large amounts are also held by Algeria, Iraq, Kazakhstan, Saudi Arabia, Turkmenistan, and Venezuela. This means, of course, that we face the same geopolitical problems relying on natural gas as we do with oil.

Some say we should increase our reliance on nuclear power. Nuclear power's attraction is that, once in operation, it does not emit carbon dioxide. It does, however, raise enormous safety issues and produces toxic radioactive wastes that must be stored for thousands, or even tens of thousands, of years in ultra-safe containers -- a technological challenge that has yet to be overcome. Given these problems, the rising costs and legal problems of building new reactors have deterred all but a few utilities from considering their construction, putting distinct limits on nuclear power's capacity to overcome America's energy crisis.

By far the most attractive alternative to oil and coal is obviously renewable energy, especially wind and solar power -- much praised but inadequately supported by politicians of both parties. These need no fuel source (save the sun and wind), are never used up, and emit no carbon dioxide. They seem the perfect solution to the planet's energy and climate crises.

The full potential of wind and solar power, however, cannot be realized until at least two other hurdles are overcome: the development of efficient storage systems to collect energy when the sun and wind are strong and release it when they are not, and the construction of an expanded nationwide electrical grid to connect areas of reliable wind (especially the mountain states and high plains) and sunshine (the Southwest) with the areas of greatest need. These are bound to be costly endeavors, but until they are fully funded, wind and solar power will not be capable of replacing more than a tiny fraction of oil and coal in the nation's overall energy mix. Unfortunately, against a backdrop of bad times in a new era of "cheap" oil that will not last, the likelihood of such funding at the levels needed has declined precipitously.

Much can be said about the potential of advanced biofuels (those not reliant on food crops like corn), geothermal energy, wave power, hydrogen power, and nuclear fusion, but these all remain in the same category as wind and solar (only more so): they show a lot of potential, but without substantially more research, development, and investment, they cannot help wean us from our reliance on oil and coal.

### **The Challenge to be Met**

If this assessment is accurate, President Obama will face a tough, if not overwhelming, challenge in attempting to get the nation's long-term energy crisis in hand. On coming into office in increasingly tough times, he will be besieged by a host of immediate crises and demands for funds. On energy, his natural inclination, given limited financial resources, will undoubtedly be to make a series of modest gestures toward "green energy independence." This coming crisis, the central one of our lifetimes and those of our children and grandchildren, cannot, unfortunately, be solved via small-scale course corrections.

Needed is a major White House-led initiative on the scale of the World War II Manhattan Project that produced the first atomic bomb or the Apollo Moon Project. The principal goals of such an epic undertaking would have to include:

1. Reducing oil's contribution to America's total energy supply by half over the next quarter century. This would require a comprehensive program of conservation, increased development of public transport, the accelerated development of electric-powered vehicles and advanced biofuels, and other technological innovations.

2. Gradually reducing U.S. reliance on coal, unless consumed in a climate-friendly manner, as well as providing government support for the development of carbon capture and storage technology.

3. Increasing the contribution of renewable energy sources to America's total energy mix from their current 6% to at least 25%, if not significantly more, by 2030. This would require substantial public investment in new technologies and electrical power lines.

4. Demilitarizing America's reliance on imported petroleum. This means repudiating the Carter Doctrine, dismantling the vast military apparatus created since 1980 to enforce that policy, and using the resulting savings -- as much as \$150 billion per year, says a new report from the National Priorities Project -- to help finance the initiatives described above.

Only by embracing such goals can President Obama hope to overcome the long-term, potentially devastating energy crisis now facing this nation.

*Michael T. Klare is professor of peace and world security studies at Hampshire College and the author, most recently, of *Rising Powers, Shrinking Planet: The New Geopolitics of Energy* (Metropolitan Books).  
(Reference furnished by William Tamblin)*

#### NOTES

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

#### PUBLICATIONS

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

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A privately printed booklet entitled *Living through the Energy Crisis* by C.J.Campbell and Graham Strouts is available from [www.zone5.org](http://www.zone5.org) (price €7 plus postage)

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