

Entering the Tough Oil Era - The New Energy Pessimism

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When “peak oil” theory was first widely publicized in such path breaking books as Kenneth Deffeyes’ *Hubbert’s Peak* (2001), Richard Heinberg’s *The Party’s Over* (2002), David Goodstein’s *Out of Gas* (2004), and Paul Robert’s *The End of Oil* (2004), energy industry officials and their government associates largely ridiculed the notion. An imminent peak — and subsequent decline — in global petroleum output was derided as crackpot science with little geological foundation. “Based on [our] analysis,” the U.S. Department of Energy confidently asserted in 2004, “[we] would expect conventional oil to peak closer to the middle than to the beginning of the 21st century.”

Recently, however, a spate of high-level government and industry reports have begun to suggest that the original peak-oil theorists were far closer to the grim reality of global-oil availability than industry analysts were willing to admit. Industry optimism regarding long-term energy-supply prospects, these official reports indicate, has now given way to a deep-seated pessimism, even in the biggest of Big Oil corporate headquarters.

The change in outlook is perhaps best suggested by a July 27 article in the *Wall Street Journal* headlined, “Oil Profits Show Sign of Aging.” Although reporting staggering second-quarter profits for oil giants Exxon Mobil and Royal Dutch Shell — \$10.3 billion for the former, \$8.7 billion for the latter — the *Journal* sadly noted that investors are bracing for disappointing results in future quarters as the cost of new production rises and output at older fields declines. “All the oil companies are struggling to grow production,” explained Peter Hitchens, an analyst at the Teather and Greenwood brokerage house. “[Yet] it’s becoming more and more difficult to bring projects in on time and on budget.”

To appreciate the nature of Big Oil’s dilemma, peak-oil theory must be briefly revisited. As originally formulated by petroleum geologist M. King Hubbert in the 1950s, the concept holds that worldwide oil production will rise until approximately half of the world’s original petroleum inheritance has been exhausted; once this point is reached, daily output will hit a peak and begin an irreversible decline. Hubbert’s successors, including professor emeritus Kenneth Deffeyes of Princeton, contend that we have now consumed just about half the original supply and so are at, or very near, the peak-production moment predicted by Hubbert.

Since the concept burst into public consciousness several years ago, its proponents and critics have largely argued over whether or not we have reached maximum worldwide petroleum output. In a way, this is a moot argument, because the numbers involved in conventional oil output have increasingly been obscured by oil derived from “unconventional” sources — deep-offshore fields, tar sands, and natural-gas liquids, for example — that are being blended into petroleum feedstocks used

to make gasoline and other fuels. In recent years, this has made the calculation of petroleum supplies ever more complicated. As a result, it may be years more before we can be certain of the exact timing of the global peak-oil moment.

On Tap: The Tough-Oil Era

There is, however, a second aspect to peak-oil theory, which is no less relevant when it comes to the global-supply picture — one that is far easier to detect and assess today. Peak-oil theorists have long contended that the first half of the world's oil to be extracted and consumed will be the easy half. They are referring, of course, to the oil that's found on shore or near to shore; oil close to the surface and concentrated in large reservoirs; oil produced in friendly, safe, and welcoming places.

The other half — what (if they are right) is left of the world's petroleum supply — is the *tough* oil. They mean oil that's buried far offshore or deep underground; oil scattered in small, hard-to-find reservoirs; oil that must be obtained from unfriendly, politically dangerous, or hazardous places. An oil investor's eye-view of our energy planet today quickly reveals that we already seem to be entering the tough-oil era. This explains the growing pessimism among industry analysts as well as certain changes in behavior in the energy marketplace.

In but one sign of the new reality, the price of benchmark U.S. light, sweet crude oil for next-month delivery soared to new highs on July 31, topping the previous record for intraday trading of \$77.03 per barrel set in July 2006. Some observers are predicting that a price of \$80 per barrel is just around the corner; while John Kildruff, a perfectly sober analyst at futures broker Man Financial, told Bloomberg.com, "We're only a headline of significance away from \$100 oil." New disruptions in Nigerian or Iraqi supplies, or a U.S. military strike against Iran, he explained, could trigger such a price increase in the energy equivalent of a nano-second. [1]

A signal of another sort was provided by the government of Kazakhstan in oil-rich Central Asia on August 7. It warned the private operators of the giant offshore Kashagan oil project — in the Kazakh sector of the Caspian Sea — to cut costs and speed the onset of production or face a possible government takeover. In an interview, Prime Minister Karim Masimov said threateningly: "We are very disappointed with the execution of this project. If the operator can't resolve these problems, then we don't exclude their possible replacement." [2]

Kashagan, it must be borne in mind, is not just any oil project: it is the largest field to be developed anywhere in the world since the discovery of Alaska's Prudhoe Bay some 40 years ago. With estimated oil reserves of 9-13 billion barrels, it is crucial to the hopes of its principal developers — Exxon, ConocoPhillips, Shell, Total (of France), and Eni (of Italy) — to increase their output in the years ahead. Consistent with the "tough oil" aspect of peak-oil theory, Kashagan is, however, proving dauntingly difficult to turn into a successful font of petroleum. The oil reservoir itself is buried beneath high-pressure strata of gas, making its extraction exceedingly tricky, and it contains abnormally high levels of deadly hydrogen sulfide; moreover, the entire field is located in a shallow area of the Caspian Sea that freezes over for five months of the year and is the breeding ground for rare seals and beluga sturgeon.

As a result of these and other problems, the Kashagan operating consortium has seen the price-tag for launching the project nearly double — from \$10 billion to \$19 billion — and has postponed the onset of initial production from 2005 to 2010, infuriating the Kazakh government, which had hoped to be earning billions of dollars in taxes and royalties by now.

A Demanding World

And then there are those reports from high-level agencies and organizations on the global energy picture, all coming to the same basic conclusion: Whether or not the peak in world oil output is at hand, the future of the global oil supply in a world of endlessly growing demand appears grim.

The first of these recent warnings, entitled the “Medium-Term Oil Market Report,” was released on July 8 by the International Energy Agency (IEA), an arm of the Organization for Economic Cooperation and Development (OECD), the club of major industrial powers. Although filled with statistics and technical analyses, the report, assessing the global oil supply-and-demand equation through 2012, seemed to leak anxiety and came to a distinctly worrisome conclusion: Because world oil demand is likely to keep rising at a rapid tempo and the development of new oil fields is not expected to keep pace, significant shortfalls are likely to emerge within the next five years.

The IEA report predicts that world economic activity will grow by an average of 4.5% per year during this period — driven largely by unbridled growth in China, India, and other Asian dynamos. Global oil demand will rise, it predicts, by about 2.2% per year, pushing world oil consumption from an estimated 86.1 million barrels per day in 2007 to 95.8 million barrels by 2012. With luck and substantial new investment, the global oil industry may be able to increase output sufficiently to satisfy this higher level of demand — but, if so, just barely. Beyond 2012, the production outlook appears far grimmer. And keep in mind, this is the best-case scenario.

Underlying the report’s conclusions are a number of specific fears. Despite rising fuel prices, neither the mature consumers of the OECD countries, nor newly affluent consumers in the developing world are likely to significantly curb their appetite for petroleum. “Demand is growing, and as people become accustomed to higher prices, they are starting to return to their previous trends of high consumption,” was the way Lawrence Eagles, an oil expert at the IEA, summed the situation up. This is clearly evident in the United States, where record-high gasoline prices have not stopped drivers from filling up their tanks and driving record distances.

In addition, oil output in the United States and most other non-members of the Organization of Petroleum-Exporting Countries (OPEC) has peaked, or is about to do so, which means that the net contribution of non-OPEC suppliers will only diminish between now and 2012. That, in turn, means that the burden of providing the required additional oil will have to fall on the OPEC countries, most of which are located in unstable areas of the Middle East and Africa.

The numbers are actually staggering. Just to satisfy a demand for an extra 10 million or so barrels per day between now and 2012, two million barrels per day in new oil would have to be added to global stocks yearly. But even this calculation is misleading, as Eagles of the IEA made clear. In fact, the world would initially need “more than 3 million barrels per day of new oil each year [just] to offset the falling production in the mature fields outside of OPEC” — and that’s before you even get near that additional two million barrels.

In other words, what’s actually needed is five million barrels of new oil each year, a truly daunting challenge since almost all of this oil will have to be found in Iran, Iraq, Kuwait, Saudi Arabia, Algeria, Angola, Libya, Nigeria, Venezuela, and one or two other countries. These are not places that exactly inspire investor confidence of a sort that could attract the many billions of dollars needed to ramp up production enough to satisfy global requirements.

Read between the lines and one quickly perceives a worst-case scenario in which the necessary investment is *not* forthcoming; OPEC production does not grow by five million barrels per day year after year; ethanol and other substitute-fuel production, along with alternate fuels of various sorts,

do *not* grow fast enough to fill the gap; and, in the not-too-distant future, a substantial shortage of oil leads to a global economic meltdown.

The Missing Trillions

A very similar prognosis emerges from a careful reading of “Facing the Hard Truths About Energy,” the second major report to be released in July. Submitted to the U.S. Department of Energy by the National Petroleum Council (NPC), an oil-industrial association, this report encapsulated the view of both industry officials and academic analysts. It was widely praised for providing a “balanced” approach to the energy dilemma. It called for both increased fuel-efficiency standards for vehicles and increased oil and gas drilling on federal lands. Contributing to the buzz around its release was the identity of the report’s principal sponsor, former Exxon CEO Lee Raymond. Having previously expressed skepticism about global warming, he now embraced the report’s call for the taking of significant steps to curb carbon-dioxide emissions.

Like the IEA report, the NPC study does claim that — with the perfect mix of policies and an adequate level of investment — the energy industry would be capable of satisfying oil and gas demand for some years to come. “Fortunately, the world is not running out of energy resources,” the report bravely asserts. Read deep into the report, though, and these optimistic words begin to dissolve as its emphasis switches to the growing difficulties (and costs) of extracting oil and gas from less-than-favorable locations and the geopolitical risks associated with a growing global reliance on potentially hostile, unstable suppliers.

Again, the numbers involved are staggering. According to the NPC, an estimated \$20 trillion in new investment (that’s *trillion*, not billion) will be needed between now and 2030 to ensure sufficient energy for anticipated demand. This works out to “\$3,000 per person alive today” in a world in which a good half of humanity earns substantially less than that each year.

These funds, which can only come from those of us in the wealthier countries, will be needed, the council notes, in “building new, multi-billion-dollar oil platforms in water thousands of feet deep, laying pipelines in difficult terrain and across country borders, expanding refineries, constructing vessels and terminals to ship and store liquefied natural gas, building railroads to transport coal and biomass, and stringing new high-voltage transmission lines from remote wind farms.” Adding to the magnitude of this challenge, “future projects are likely to be more complex and remote, resulting in higher costs per unit of energy produced.” Again, think tough oil.

The report then notes the obvious: “A stable and attractive investment climate will be necessary to attract adequate capital for evolution and expansion of the energy infrastructure.” And this is where any astute observer should begin to get truly alarmed; for, as the study itself notes, no such climate can be expected. As the center of gravity of world oil production shifts decisively to OPEC suppliers and to state-centric energy producers like Russia, geopolitical rather than market factors will come to dominate the energy industry and a whole new set of instabilities will characterize the oil trade.

“These shifts pose profound implications for U.S. interests, strategies, and policy-making,” the report states. “Many of the expected changes could heighten risks to U.S. energy security in a world where U.S. influence is likely to decline as economic power shifts to other nations. In years to come, security threats to the world’s main sources of oil and natural gas may worsen.”

Read from this perspective, the recent reports from pillars of the Big- Oil/wealthy-nation establishment suggest that the basic logic of peak-oil theory is on the mark and hard times are ahead when it comes to global oil-and-gas sufficiency. Both reports claim that with just the right

menu of corrective policies and an unrealistic streak of pure luck — as in no set of major Katrina-like hurricanes barreling into oil fields or refineries, no new wars in Middle Eastern oil producing areas, no political collapse in Nigeria — we can somehow stagger through to 2012 and maybe just beyond without a global economic meltdown. But in an era of tough oil, the odds tip toward tough luck as well. Buckle your seatbelt. Fill up that gas tank soon. The future is likely to be a bumpy ride toward cliff's edge.

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P.S.

* From TomDispatch:

http://www.tomdispatch.com/post/174829/klare_tough_oil_on_tap

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Footnotes

[1] <http://www.bloomberg.com/apps/news?pid=20601087&refer=home&sid=aYjwn7IqTlHQ>

[2] <http://online.wsj.com/article/SB118651154406490713.html?mod=bolcrnews>