



Hall and Gagnon: "A Very Bad Idea"

Posted by [Prof. Goose](#) on April 25, 2007 - 7:40pm

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[ED by PG: **Comments are now turned on for this post, and I am repromoting it. Apologies--a setting was missed.**]

This is a guest op-ed by Charles Hall and Nate Gagnon.

[Dr. Charles Hall](#) is a Systems Ecologist who has written seven books and 200 scholarly articles; Professor Hall teaches Systems Ecology and Geographical Modeling courses and workshops at SUNY-ESF and in many locations in Latin America. Nathan Gagnon is a graduate student in the Graduate Program in Environmental Sciences at the State Univ NY College of Environmental Science and Forestry; his interests are the changing EROI of global and US oil.

The recent front page article "[Oil innovations pump new life into old wells](#)" by Jad Mouawad (March 5 page 1) is dangerously misleading. The author would have us believe that technological innovations will increase the proportion of oil recoverable from known fields sufficiently to compensate for the dearth of new discoveries. It gives a false sense of security about our difficult oil situation based on a very selective interpretation of data.

For example, the graph used to support the article undermines the author's main thesis. It shows that steam injection is not new but has been used in the Kern River field since 1965 and also that oil production in this field peaked in 1984 and has been declining sharply since about 1997. In fact most of the "oil innovations" mentioned in the article, including the injection of steam and various gases, are old technologies, first implemented in the 1920s. Innovations have always been occurring in the oil industry. The important question is whether these technologies are increasing production more rapidly than depletion is decreasing it.

Considerable information indicates that depletion is a more important force in petroleum extraction than is technological development. The increases in production from the Kern River and Duri fields that the article mentions, and indeed even from the much larger Alberta and Orinoco Tar sands deposits, are small relative to the far larger production declines from many of the world's most important oil fields, including the North Sea, Cantarell in Mexico (recently the world's second largest producer), America's largest fields including Prudhoe Bay, East Texas and Yates, Samotlor in Russia, Yibal in Oman, Rabi-Kounga in Gabon, probably Burgan in Kuwait and so on.

All of these fields have been subject to the kind of technologies mentioned in the Mouawad article, sometimes for many decades, and all except possibly Burgan are clearly in steep decline or have virtually ceased production. The best oil field technology in the world has not stopped the US production from declining by 50 percent since its peak in 1970. Likewise clear peaks in oil production have occurred in such important producers as Argentina, China, Egypt, Indonesia (a

founding member of OPEC), Mexico, Norway and the United Kingdom, even while prices were increasing. It is not clear yet whether modern technologies such as horizontal drilling will principally increase total yields or simply increase rates of extraction.

Furthermore, many of the technologies mentioned in the article tend to be extremely expensive. This is so not only in dollars but also in energy. The importance of the increasing energy cost has been documented in reports, published in quality journals, that show that the energy return on investment (EROI) for US domestic oil production has dropped from greater than 100 Btu returned per Btu invested in the 1930s to about thirty to one in the 1970s to perhaps 15 to one in 2000. Our research indicates a similar declining trend for world oil. Making steam and pumping it into the ground, or moving gases from their source points to dispersed oil-field sites, requires enormous investments of energy. Thus while increasing prices can indeed make more low-quality resources economically available they generally also mean that more energy is being expended relative to production returns. Eventually we may reach the energy break even point. Thus much of the oil cited as "probable" or "contingent" reserves is unlikely to be worth exploiting regardless of price

The article's dismissive comments about peak oil theory and its advocates are ill informed and ignore the importance of the message coming from a sophisticated and growing community that includes many hundreds of geologists, other scientists, environmentalists, financiers and citizens who see a serious situation ahead of us for oil and, especially in North America, natural gas. Whether peak oil production (or as has been suggested an "undulating plateau") has occurred, is occurring now or will not occur for several years or possibly decades makes little difference from the perspective of the life times of our children. Hiding our heads in the sand and putting our faith in technological developments that so far have been unable to compensate for most depletion seems to us to be a very bad idea.



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