

The Hirsch Report

Following is a short summary of the report:

"Peaking" is the point where production reaches its max and begins to decline, whether we are describing a single oil field or the world's oil fields as a whole. Peaking is a reservoir's maximum oil production rate, which typically occurs after roughly half of the recoverable oil in a reservoir has been produced. This concept is important because satisfying increasing oil demand not only requires continuing to produce older oil reservoirs with their declining production, it also requires finding new ones, but we have declining finds for the past 30plus years.

Robert L. Hirsch is a Senior Energy Program Advisor for SAIC. Previous employment included executive positions at the U.S. Atomic Energy Commission, the U.S. Energy Research and Development Administration, Exxon, ARCO, EPRI, and Advance Power Technologies, Inc. Dr. Hirsch is past chairman of the Board on Energy and Environmental Systems at the National Academies. He has a Ph.D. in engineering and physics from the University of Illinois.

- The peaking of world oil production presents the U.S. and the world with an unprecedented risk management problem.
- To manage the problem we face we need 10-20 years of accelerated efforts including conservation.
- Peaking will result in dramatically higher oil prices
- Time table of peaking is unknown but many studies and experts believe we are in the decade that will see "peaking", some predicting peaking before 2010.
- The problem of the peaking of world conventional oil production is unlike any yet faced by modern industrial society. The challenges and uncertainties need to be much better understood. Timely, aggressive risk management will be essential.

The Hirsch Report asks the following question: With a history of failed forecasts, why revisit the issue now of world oil shortages. Here is their answer.

- Extensive drilling for oil and gas has provided a massive worldwide database that is much more extensive than in years past.
- Seismic and other exploration technologies have advanced dramatically, nevertheless oil reserves discovered per exploratory well began dropping worldwide over a decade ago. (see charts at bottom of page)
- Many credible analysts have become much more pessimistic about the possibility of finding the huge reserves needed to meet world demand.
- Because oil prices have been high for the past decade oil companies have conducted extensive exploration, yet results have been disappointing. This is but one of a number of trends that suggest the world is fast approaching the inevitable peaking of oil production.

Following is a summary of what the Hirsch Report has to say about Natural Gas.

A dramatic example of the risks of over-reliance on geological resource projections is our experience with Natural Gas. N. Gas supplies roughly 20% of the US energy demand and was plentiful at real prices of roughly \$2/Mcf for almost two decades. *It is now at \$14/Mcf.*

As recently as 2001 credible groups, (National Petroleum Council (NPC), Cambridge Energy Research Associates (CERA), and the US DOE Information Administration, were predicting huge increases in Natural Gas Production over the next decade. But 5 years later these groups and others have changed their predictions dramatically.

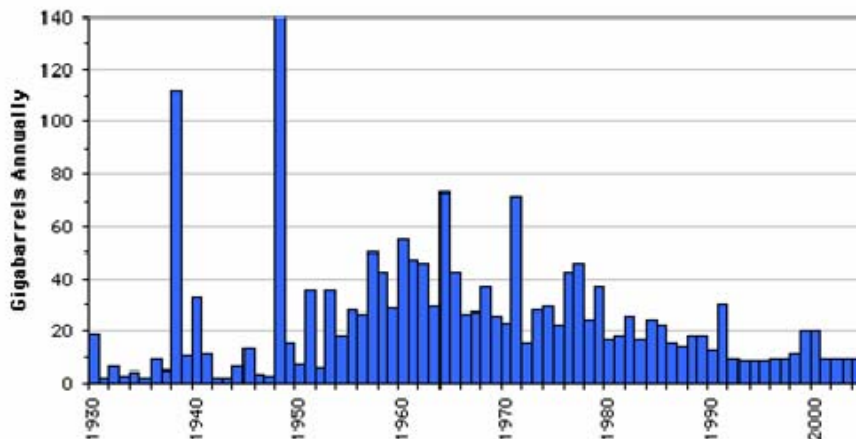
- CERA now is saying because of disappointing drilling results they have revised their numbers. Gas production in the US now appears to be in permanent decline
- Raymond James & Associates finds that "natural gas production continues to drop despite a 20% increase in drilling activity since April of 2003.
- Lesson Learned? - High prices do not a priori lead to greater production. Geology is the limiting factor.

The Hirsch Report has a large section devoted to Mitigation Options & Issues. Conservation is at the top of the list of options.

Following are three charts that lend credence to the idea that Cheap Oil is a thing of the past. The first chart represents Oil discoveries in billions of barrels. The second chart from the Hirsch Report overlays production with discoveries and as you can see we began producing more oil than was being discovered in the mid 1980's. The last chart shows that the decline in discoveries continued even though there was unprecedented drilling during the 1980's. I (James) added the first and last chart to clarify the second chart found in the Hirsch Report. These charts represent a very sobering view of world oil production.

Oil Discoveries in Billions of Barrels 1930-2005

This chart, not part of the Hirsch Report but available on many oil statistic websites shows the oil discoveries in Billions of Barrels over the past 75 years. The big spikes are: late 30's Texas, late 40's Saudi Arabia, last tall spike in early 70's is the North Sea.



Oil Discoveries minus Production, we started using more that we discovered in the mid 80's

This chart, from the Hirsch Report and found on many oil statistics websites, shows production and consumption combined. As the chart shows for years the worlds oil companies found more oil than they were producing. But the picture goes into the red in the mid 80's. From that time to present we are using more oil than oil being discovered.

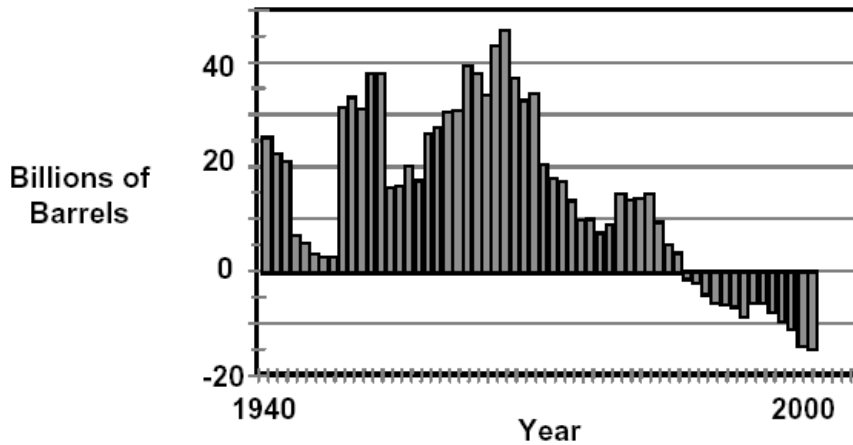
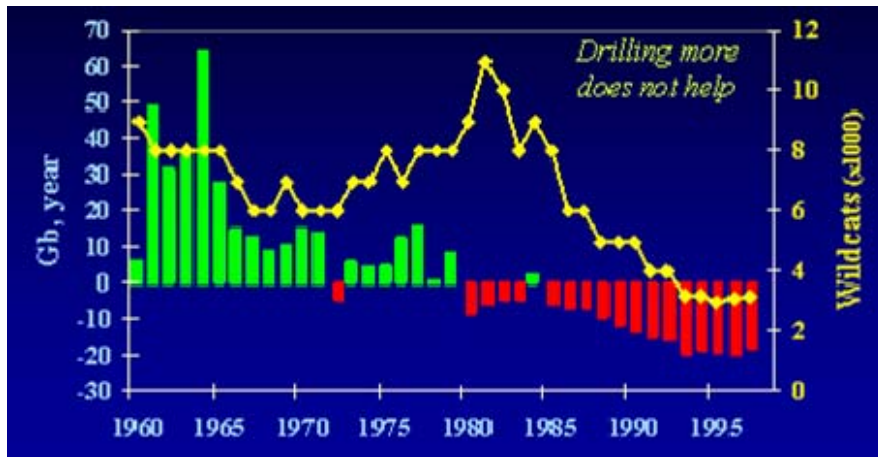


Figure II-1. Net Difference Between Annual World Oil Reserves Additions and Annual Consumption

Same chart with Drilling Overlay, Yellow line = drilling.

More drilling worldwide did not stop the negative numbers. This is the same chart as above but also showing the feet of wildcat drilling for oil. This chart is used by many to show that more exploration world wide did not stop the numbers from remaining in the red. This chart is used by many experts to validate the notion that we have passed the era of cheap oil.



****** Mr. Hirsch made the following statement to Congress on 12/7/05 before the House Subcommittee on Energy and Air Quality. A roughly 4 percent (sustained) global shortfall in daily supply of oil results in oil above \$160 per barrel. [Click Here for full speech.](#)**