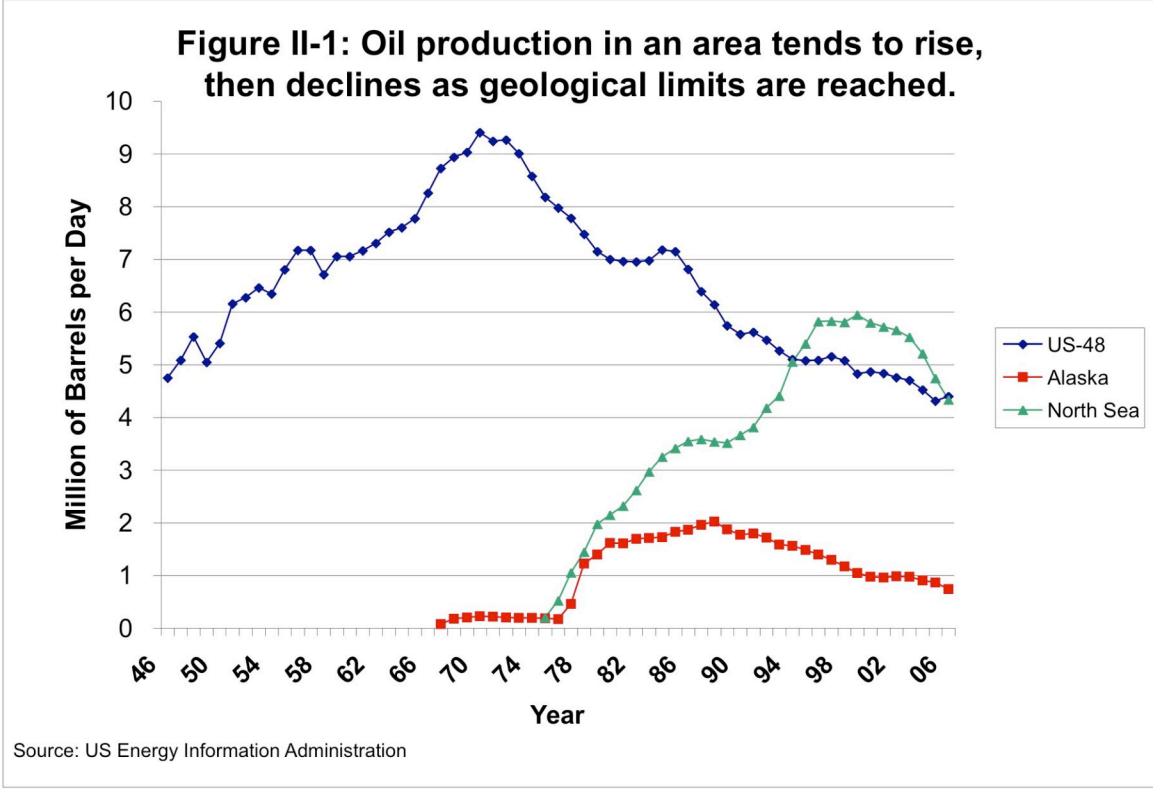
Chapter 2: Is This a False Alarm?

As we look at the answers to these questions, we will see that the production decline discussed in Chapter 1: What Is Peak Oil? appears to be nearly immediate. Available methods for offsetting this decline appear to be too little, too late. This time the alarm is *real*.

1. It seems like people thought we were running out of oil in the 1970s, and then all of our problems went away. Why is the situation different now?

Let's look again at the graph of oil production for the US-48 states, Alaska, and the North Sea:



When US oil production began decreasing about 1970, there were still several sources of oil that could be ramped up:

• Saudi oil production could be increased, in a very short time frame.

• Alaskan production could be ramped up, once the pipeline was finished

• North Sea production could be started

Now we have reached the point where both Alaskan and North Sea production are declining. Saudi production also is declining, and there is suspicion that this is for geological reasons as well.

Discoveries in recent years have been mostly small fields or have been in places where oil is very difficult to obtain. In either of these situations, huge expense is required for very modest payback. We are running out of reasonable places to drill more wells.

2. What is the situation with current world oil production? Are major oil-producing regions having problems with production?

Six out of seven of the major oil producing areas are either reporting declining production, or have reported problems that are expected to lead to declining production in the near future. These six areas account for nearly half of world oil production. There are many other smaller areas with declining production as well. Thus, it appears that peak oil is very near at hand, and that large production increases from new sources will be needed in the next one to four years to prevent peak oil.

Based on **data** of the US Energy Information Administration, the largest oil producing countries / areas in 2006 were

- Russia - Increasing production, but future problems expected (9,247,000 barrels per day)
- Saudi Arabia - Declining production (9,152,000)
- United States – Long-term declining production (5,136,000)
- Iran - Declining production (4,028,000)
- China - Slight increase in production (3,686,000)
- Mexico - Largest oil field peaked in 2006 (3,256,000)
- North Sea (Norway, Great Britain) - Declining production (4,343,000)

Saudi Arabia used to be the world's largest oil producer, but its production has been declining since late 2005, so it is now second to Russia. Its production decline is supposedly voluntary, but analyses such as **this one** and **this one** suggest that there is a geological basis to its decline.

Russia is now the world's largest oil producer. The fact that its production has been increasing is one of the reasons we are not yet in deep decline. Russia's Alfa Bank is **now warning** that "production stagnation is unavoidable" reflecting "a higher proportion of water in the declining output", so it appears that this source of increase will be disappearing soon.

Mexico's production is now declining because of the decline in its largest field, Cantarell. The one country not included as having production problems is China. Even this classification is borderline. Oil production in China for the first three months of 2007 increased by only 0.3% over the corresponding period a year ago--hardly enough to matter.

With six of the seven major oil-producing areas having production issues of one type or another, a huge amount of oil from new sources is needed very quickly if worldwide production is to continue to increase. This oil is needed in a short time-frame -- the next one to four years. Production later will help mitigate the decline in production but is unlikely to prevent peak oil.

3. If we really want more oil, can't we just increase production in the areas where we have been drilling? I've heard that there is still quite a bit of oil left in the ground when we finish drilling.

Yes, there is still quite a of bit oil left in the ground - generally at least 50%, and sometimes as much as 90%, of the oil originally in place. But wanting to get more oil out doesn't seem to have a big impact. This is a graph from a **report** prepared for the US Department of Energy by Robert Hirsch, Roger Bezdek, and Robert Wendling in 2005. It shows that US energy oil production in the lower 48 states continued to decline between 1970 and 2004, regardless of external events.

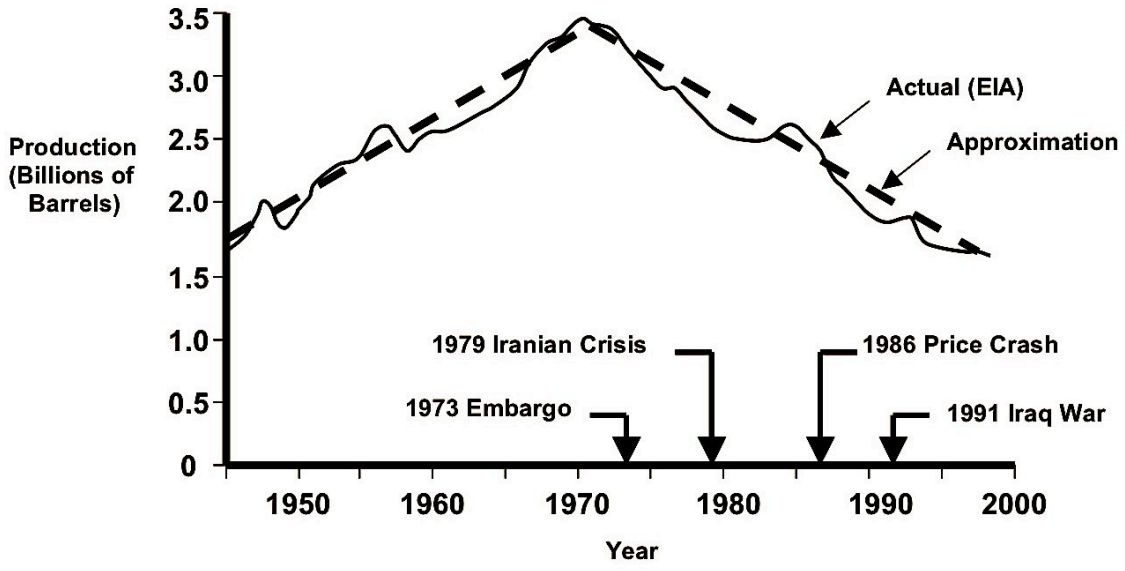


Figure II-2. U.S. Lower 48 Oil Production, 1945-2000

4. Won't higher prices result in greater production?

This is another graph from the report mentioned above by Hirsch, Bezdek, and Wendling.

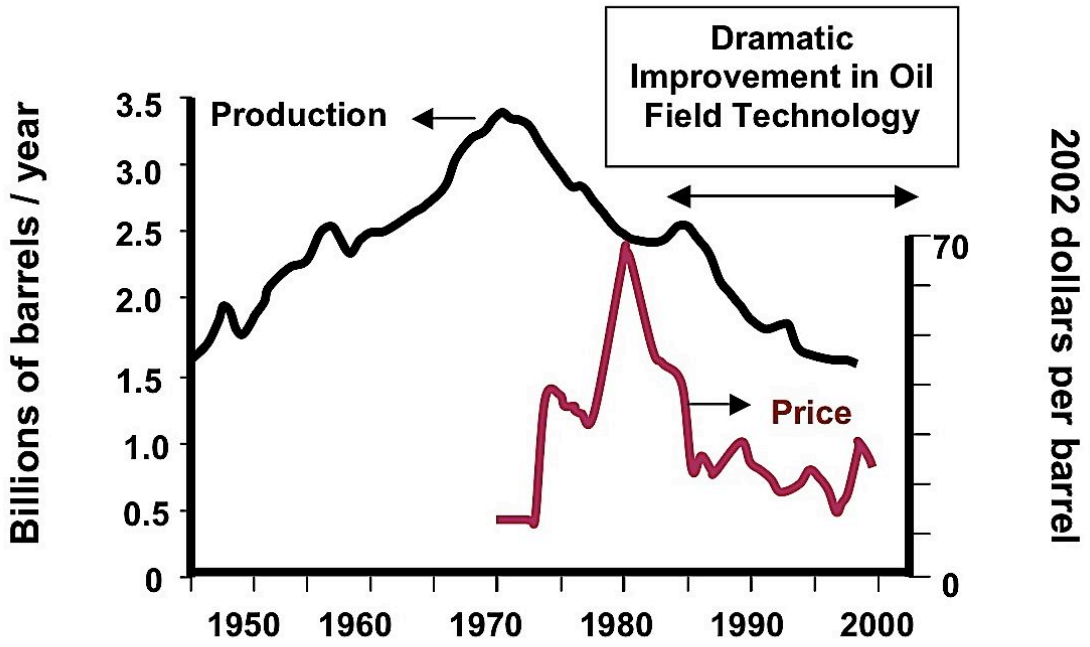


Figure II-3. Lower 48 Oil Production and Oil Prices

This graph seems to indicate that for US-48, price changes have had very little impact on oil production.

Also, if we look at world oil production in Chapter 1, Figure 3, we see that volumes have been approximately flat over the past two years, even though prices have been in the $60 to $75 per barrel range - very high by historical standards. With these high prices, OPEC has not offered to raise production and, in fact, reduced production targets effective November 2006.

5. Won't better technology solve our problems?

Given where we are today, it seems unlikely that technology will prevent peak oil. It may help mitigate the down-slope after peak. Some considerations in saying this:

• Technological changes seem to have had relatively little impact on US 48 states production, as shown in the graph in Q4 above.

• Liquid fuel substitutes for oil all have challenges of their own. All are expensive using today's technologies and are expected to be slow to scale up. Biofuels tend to be very land intensive; coal to liquid has serious climate change issues.

• Technological advances are having some benefit (for example, deepwater drilling), and this is reflected in the numbers we are seeing. We need much, much more, however.

• If a major technological advance is made, such as inventing a way to extract significantly more of the oil that has been left behind, it will almost certainly take several years to produce the new equipment to implement the solution widely. Because of the likely timing of peak oil, such a new solution is much more likely to affect the down-slope after peak, than to prevent it. If the technological advance is significant enough, it is possible that it will permit oil production to increase again at some point in the future.

6. How about the Canadian oil sands? I've heard that production may triple by 2020.

While we hear a lot about the oil sands, the amount of oil they produce is not all that large. In 1997, oil sands accounted for 0.8% of world production. By 2005, production had grown to just under 1 million barrels per day, or 1.2% of world production. Even if production tripled, it would still be small compared to what is needed.

One factor impeding growth is the fact that current production methods require large amounts of natural gas, and this is in short supply. **One idea under consideration** is to build nuclear plants - eight would be required if production were to scale up to 4 million barrels a day. Given the time and expense of building nuclear plants, development is likely to take several years.

7. How about oil shale in the western United States? I have heard that there is a huge amount of this available.

Extraction of oil shale appears to be a very slow and expensive process. The methods under consideration require large amounts of energy plus a lot of water. In the West, the shortage of water is likely to be a major issue, even if the required energy can be obtained by building nuclear power plants, or by some other approach. At this point, no one is able to produce oil from oil shale in commercial quantities. It seems likely that it will take many years before even the level of production of the Canadian oil sands can be achieved.

8. How about the Jack 2 field? Newspaper articles in September 2006 seemed to say it would solve a lot of our problems.

The **Jack 2** field is located in a very difficult-to-service location, five miles below the surface of the Gulf of Mexico and 175 miles from the Louisiana coast. It represents, at best, a small contribution to the oil needed to prevent a decline in world production. Newspaper production estimates of 3 billion to 15 billion barrels are for the whole region (rather than just Jack 2) and include natural gas as well as oil. If the estimated 3 to 15 billion barrels is actually oil, rather than mostly natural gas, it corresponds to 5 months to 2 years' oil usage by the US.

It is not yet clear that production will be economically feasible -- more appraisal wells are needed, and new equipment will need to be designed and built to handle oil in such a deepwater location. If production is possible, it will almost certainly come too late to prevent peak oil. The cost of oil from such a location will also be extremely high, considering the cost of all the special equipment and the cost of insurance against hurricane damage in such a vulnerable location.

9. How about drilling in the Arctic National Wildlife Reserve (ANWR) in Alaska?

According to **Wikipedia**, the US Department of Interior under Gale Norton estimated that ANWR contained 10.4 billion barrels of oil, and that the maximum production from ANWR would be 1.4 million barrels a day. The US currently uses about 7.5 billion barrels of oil a year, so ANWR represents the equivalent of 17 months oil usage by the United States. The actual production would be spread out over a long period - at least ten years, but not starting until several years after work is begun. Maximum production of 1.4 million barrels would equate to about 7% of current US oil usage (or about 1.4% of world oil production).

Thus ANWR's contribution is likely to be small and come after peak has arrived.

10. How about drilling on the outer continental shelf around the United States? I understand that there is supposed to be quite a lot of oil there.

Based on **this article** from TheOilDrum.com, the Outer Continental Shelf (OCS) seems unlikely to contribute much oil for many years, because of the long lead times required in deep water locations. Special equipment will be needed, which will need to be designed and built. Thus, nearly all production is likely to occur after peak oil arrives.

The amount of oil available on the OCS is very uncertain. The current estimated amount of 115 billion barrels is the equivalent of about 15 years of US oil usage, or

a little less than 4 years of world oil usage. It is not clear how much of this can be economically produced - production is expected to be very expensive. In some areas, ice cover for part of the year is expected to be a problem.

11. Aren't there quite a number of countries whose production is declining, simply because they are not investing in sufficient infrastructure and don't have modern techniques - for example, Iraq, Iran, Venezuela, and Mexico. If the US could help these countries with our techniques, wouldn't our oil problems be solved?

This would be great, but it is questionable whether it would work:

• The basic issue of peak oil is the fact that large oil fields that need minimal infrastructure are mostly tapped out. The remaining fields are less desirable for a number of reasons -- they are very small, are located in deep water or near the arctic, or involve very viscous oil or oil mixed with poisonous chemicals.

• In order to tap these remaining fields, a *huge* amount of infrastructure is needed. This will be *very, very* expensive.

• One of the major types of infrastructure needed is drilling rigs. Based on **a presentation of Matthew Simmons**, the supply of these is limited. Also, many of these are very old, and appear to be near the end of their working lives.

• US oil companies are very small in size compared to the National Oil Companies that are having difficulty developing the fields in question. With the lack of rigs, and the huge investment likely to be required, it is doubtful that our oil companies could do much to help these countries with lagging production, if they wanted. Furthermore, the petroleum engineers that would be needed to oversee such operations are **also in very short supply**.

• It is doubtful whether these countries would welcome our expertise. As a major purchaser of oil, it would seem to be in our best interest to abide by their preferences.

Links by question:

Q2-1: "International Petroleum Monthly-Oil Production" from US Energy Information Agency

http://www.eia.doe.gov/ipm/supply.html

Q2-2: "Nosedive Toward the Desert" by Stuart Staniford

http://www.theoildrum.com/node/2331

Q2-3: "The Status of North Ghawar" by Stuart Staniford

http://www.theoildrum.com/node/2441

Q2-4: "Alfa Report Sees Trouble Looming in Oil Sector", Moscow Times, 7/10/2007

http://www.themoscowtimes.com/stories/2007/07/10/042-full.html

Q3: R. Hirsch, R. Bezdek, and R. Wendling, "Peaking of World Oil Production: Impacts, Mitigation, and Risk Management", for US Department of Energy, February 2005.

http://www.hilltoplancers.org/stories/hirsch0502.pdf

Q6: Nuclear Power for the Oilsands

http://canada.theoildrum.com/node/2572

Q7: Oil Shale and the Future

http://www.theoildrum.com/story/2006/7/6/0472/48972

Q8: Jack-2 and the Lower Tertiary of the Deepwater Gulf of Mexico

http://www.theoildrum.com/story/2006/9/8/11274/83638

Q9: Wikipedia - Arctic Refuge Drilling Controversy

http://en.wikipedia.org/wiki/Arctic_Refuge_drilling_controversy

Q10: Deep Ocean Energy Resources-A Critical Analysis by Dave Cohen

http://www.theoildrum.com/story/2006/7/12/101236/478#more

Q11-1: The Peaking of OffShore Oil and Gas by Matthew Simmons

http://www.simmonsco-intl.com/files/Offshore%20Technology%20Conference%2...

Q11-2: "Labour and Skills Crisis Could Stall Oil and Gas Boom" by Booz, Allen & Hamilton

http://www.boozallen.com/media/file/Labour_and_Skills_Crisis.pdf