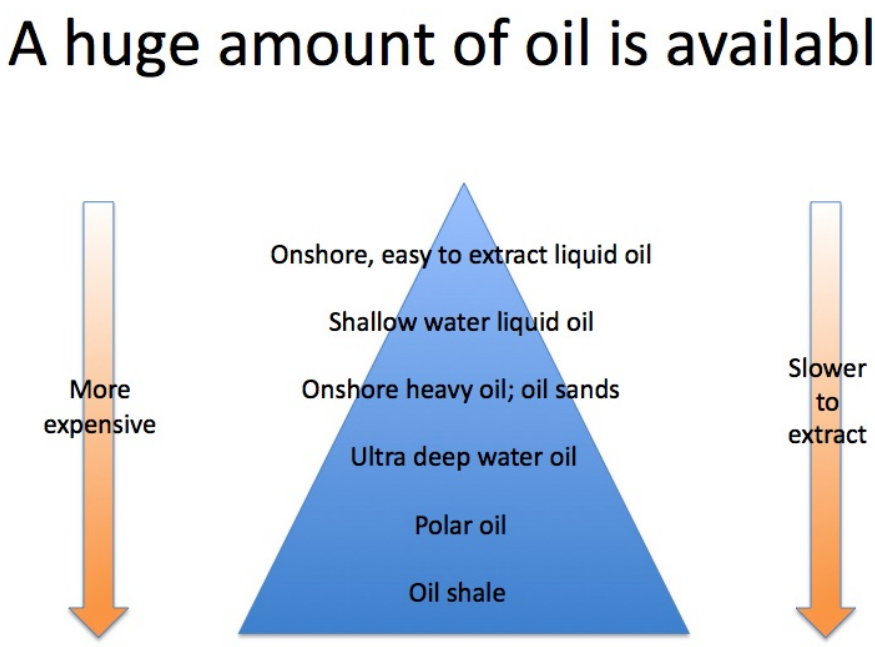
The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

Gulf Oil Spill: With so many oil resources, can't we just drill somewhere else?

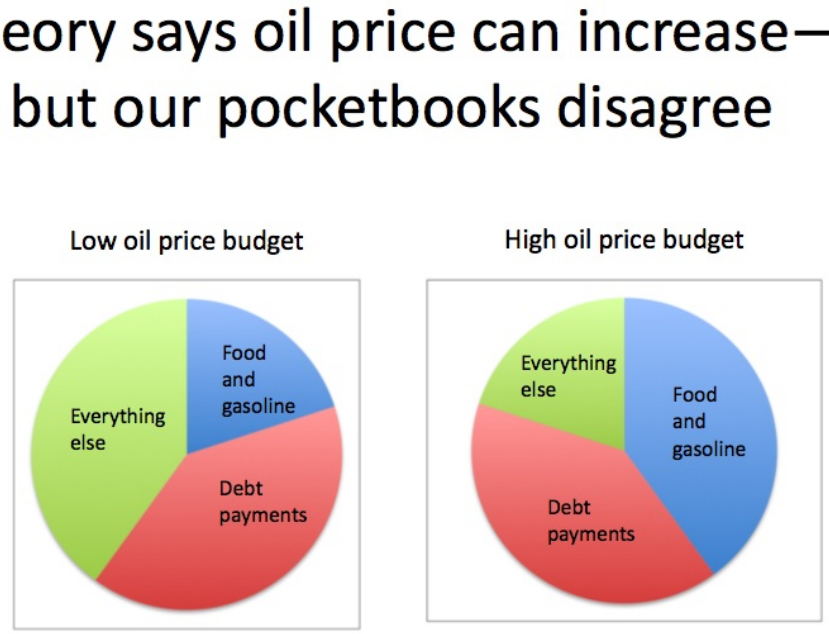
Posted by Gail the Actuary on May 29, 2010 - 5:00pm
Topic: Supply/Production
Tags: oil, oil production, peak oil [list all tags]

This post is an adaptation of one posted in December 2009, relating to a talk given at that time. A PDF of the talk can be found here.

There is a huge amount of oil which theoretically can be extracted. The question isn't whether it is there--the question is whether the cost to extract the oil will be cheap enough for us to be able to afford the oil. If oil is too expensive, the high prices seem to cause a recession, similar to what we recently have been experiencing.



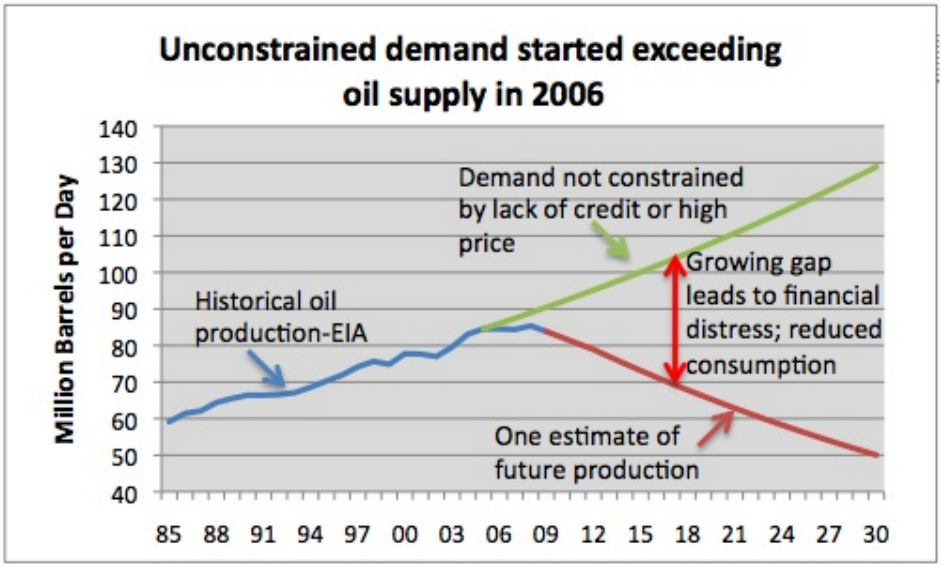
In many ways, people who say we have lots of oil are correct. All one has to do is include the oil which is extremely expensive and slow to extract. Much of the cheap, easy-to-extract oil has already been removed.



Economic theory talks about oil prices rising, and substitutes being found, which will tend to bring prices back down. When oil prices rose, we found substitutes, but they were poor substitutes--generally more expensive, and hard to scale up. Corn ethanol requires huge land use and imported fertilizers. Wind isn't a transportation fuel--it is a substitute for natural gas and coal in electricity production. Making sufficient electric cars and trucks to replace our current fleet would be a huge expensive project, requiring many years, at best.

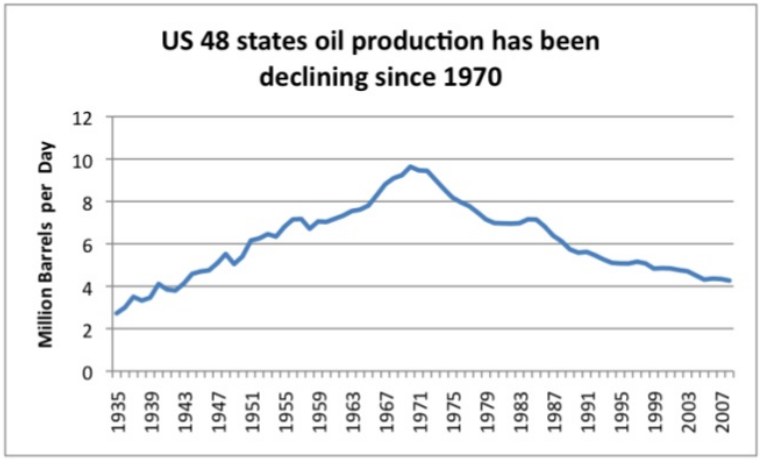
In the above slide, I purposely exaggerated the impact of an oil price rise on food and gasoline. The effect would be greatest on a low income individual. It would also be very great, if the price rise were to something like $400 barrel.

This is pretty obvious, if you think about it. Does it sound like anything we have run into in the last few years?



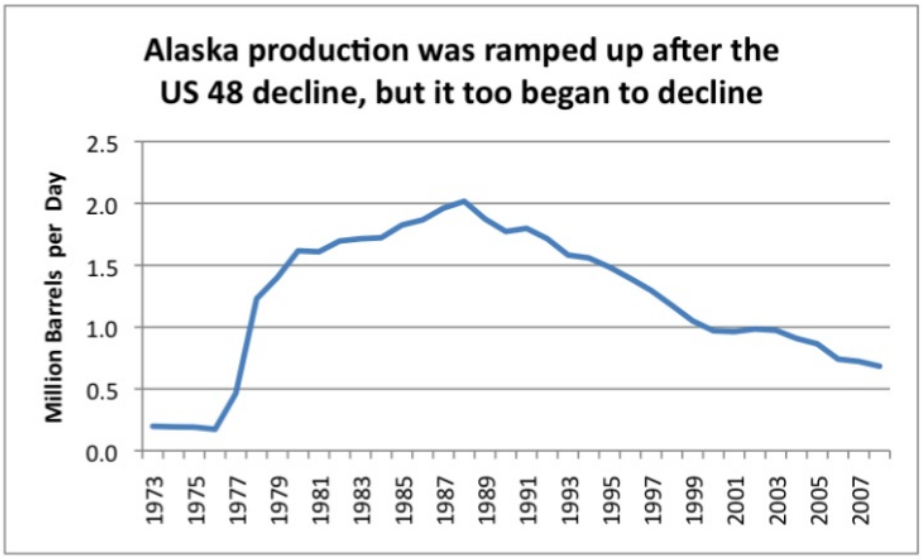
Many people think of the effects of peak oil as a future event. But we are really experiencing them here and now. Oil production stopped rising in 2005, so by 2006, we were feeling the effects of the squeeze. The effects were being felt as early as 2004, when oil prices began to rise.

We know from experience that oil production tends to rise, then decline:



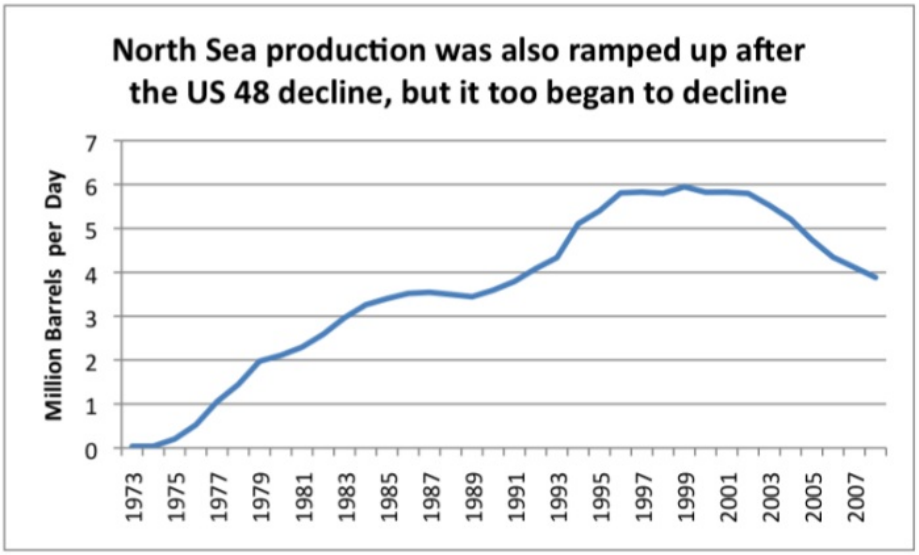
The US was the earliest place where drilling for oil, and the earliest place where production began to decline, in spite of technological improvements and increased drilling. But fortunately, when oil begin declining in 1970 there were other places that were not too hard to reach.

Similarly for Alaska



After the US 48 states production began to decline, production was ramped up in a number of places, including Alaska, shown here. It production began to decline only a few years later.

Similarly for the North Sea



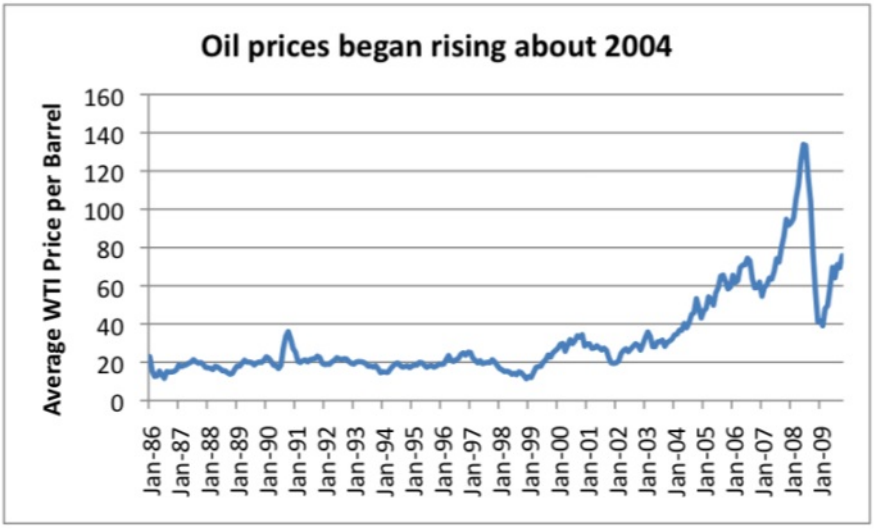
The North Sea was another place where production was ramped up after US production began to decline. It too began to decline rather quickly. I didn't show Mexico, but it was another nearby location that was ramped up, but then began to decline, after US 48 states production began to decline.

Now the "easy oil" is mostly gone

- There is plenty of oil left
  - But it is expensive, slow-to-extract oil
- There are lots of substitutes
  - But they are generally more expensive than oil
  - Examples: Ethanol; electric cars powered by wind generated electricity
- If we could all get raises, everything would be fine! (And the economists would be right)

At this point, most of the fields that are in easy to access locations are in decline, and we are "stuck" with what is left--the slow to extract, expensive oil from difficult locations. Deep water oil is one of the kinds of oil we have left, but it is expensive to extract, and, as we have just seen, if there are oil spills, they can be very difficult to stop.

Many people thought the problem disappeared when prices dropped



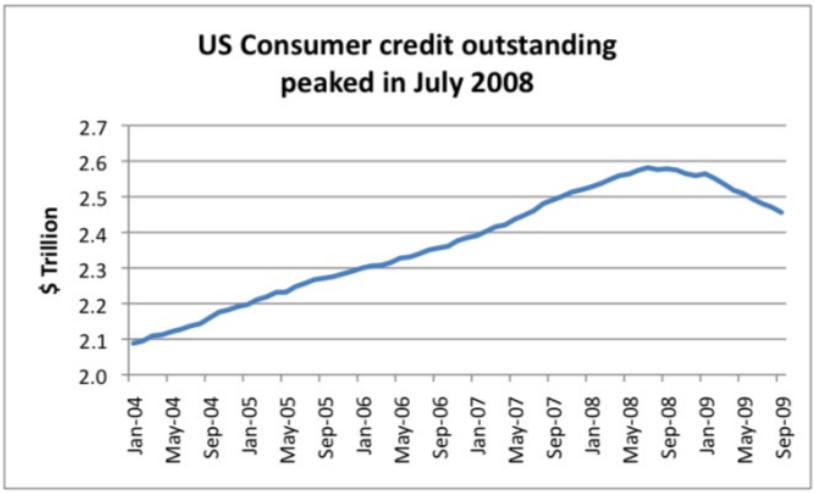
So many people have equated high prices with oil shortages, that people have come to believe that if prices are low (or at least relatively low, compared to recent past prices), everything is OK. But we really need lots of quite inexpensive oil to fuel the economy, or it goes into a recession. Reduced credit reduces demand, and has the effect of bringing oil prices down.

But people's incomes couldn't stand higher oil prices

- Mortgage defaults rose
- Banks reported poor results
  - Cut back on new loans
- Suddenly, cut back on credit started affecting oil prices
- Less credit -> less demand -> lower oil prices

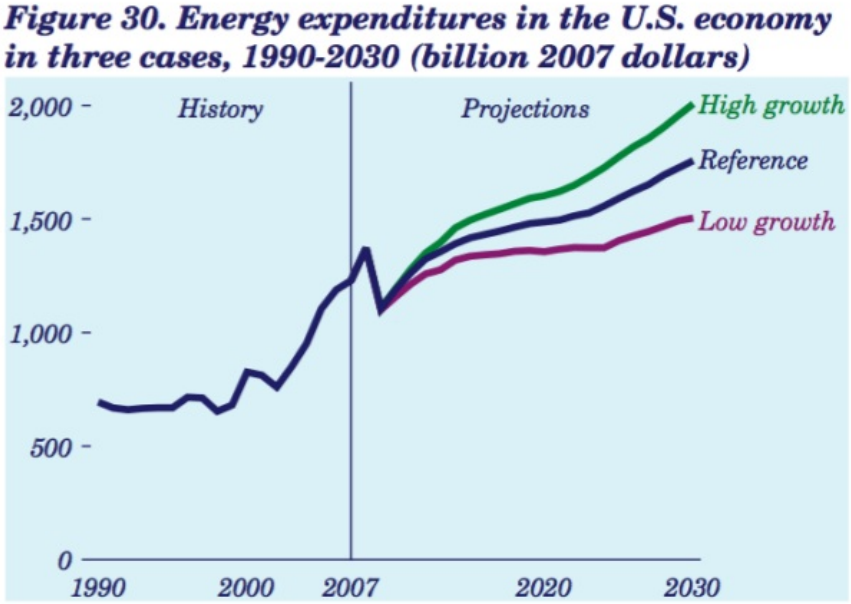
In the above slide, the cutback in credit is especially important. Without credit, many people cannot buy new cars, new houses, or expensive Christmas presents. All of these use oil in their manufacture and distribution, and keep oil prices up.

US consumer credit "peaked" the same month as oil prices – July 2008



US consumer credit (including things like credit card loans and auto loans) peaked the same month as oil prices. Mortgage loans peaked about the same time, and many types of commercial credit have been affected. The government has tried to pick up the slack with additional borrowing, but this is not the same.

US EIA View of Energy Costs



http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2009).pdf

The EIA indicates that on a constant dollar basis, energy expenditures more than doubled between 1990 and 2008. Going forward, the EIA sees more increases in energy expenditures, on an inflation adjusted basis.

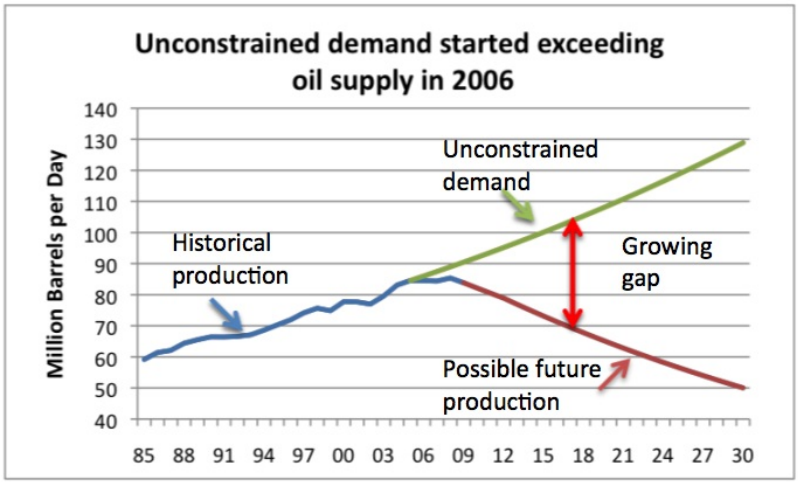
I might mention that one of the major uses of new technology is to bring down prices. There are limits to what can be done--if oil is very deep in the ocean, it is likely never going to be cheap to extract. The need for new technology to bring down prices is probably as great or greater with fossil fuels as it is with things like wind, solar, and biofuels. Fossil fuels are at least well adapted to running our current infrastructure. Anything that is very different will require huge expenditures for conversion.

Where do we go from here?

- We are in uncharted territory
- Economists aren't much help
  - Didn't see the problem coming
  - Expect oil prices will rise, without $ to pay for oil
- Things are in a "lull" now
  - Oil prices are down somewhat from their high
  - But debt problems persist
  - New flare up is likely

In my view, the big question is how debt (and financial institutions holding the debt) will fare. The front page story on today's Atlanta Journal Constitution is "Troubled banks find it hard to stay afloat". How long will bailing out failing banks with printed money work?

Gap between production and unconstrained demand will likely grow



The growing gap is the concern. Regardless of whether oil production remains flat, or declines fairly steeply, we have a major problem. With many people from around the world interested in using oil products, and many new cars in places like China and India, the gap between production and what we would normally consume (if prices were low and credit were available) is likely to continue to grow, even if somehow oil production could be kept flat. If we intentionally decrease deep water drilling, it will tend to make the gap worse.

Lower oil production will likely mean continued recession / depression

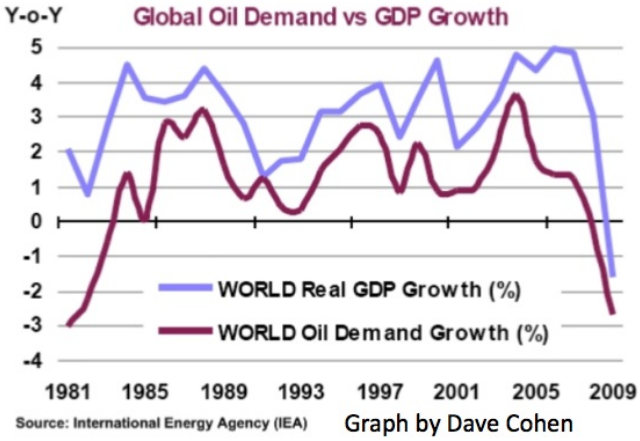
- Prices likely volatile
- May rise for a while
  - Then higher oil and food prices will cause more loan defaults and more recession
  - Oil prices will drop; and there will be more lay offs
- International trade may be impacted

The advanced economies have in the recent past been able to "offshore" their energy intensive industries to places like China, giving the illusion that countries can get along with only non-energy intensive services like finance. But for the world as a whole, there seems to be a close relationship between growth in oil consumption and GDP growth. Since finance and some other services don't need much oil to grow, the relationship is not exactly 1:1. Efficiency growth would also tend to make GDP growth higher (but declining energy return on investment would tend to

lower it).

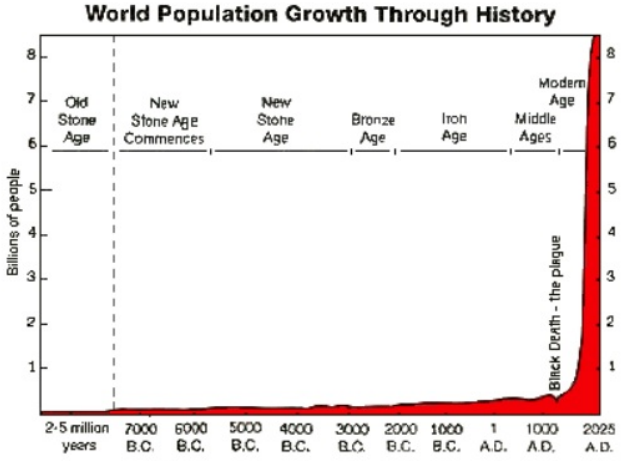
Reason for continued recession is close tie between GDP and oil production

Oil Demand Correlates With Global GDP



My big concern is international trade. If debt defaults are a problem, this could interfere with the workings of the whole system, especially if it leads to major countries (perhaps Greece) defaulting on their debts.

World population has grown greatly since discovery of fossil fuels



http://www.susps.org/overview/numbers.html

In the years since fossil fuel use has developed, world population has greatly expanded.

One concern is the ability to continue feeding everyone

- Food is very oil dependent
  - Pumps for irrigation
  - Fuel for tractors
  - Transport food long distances
  - Pesticides, herbicides, fertilizer
- Higher costs alone would be a problem
  - If food becomes unavailable in some places, there will be a real problem

We are already seeing problems with people in some of the poorer nations having adequate food. Even in the US, there are people at the margins who are "food insecure". Currently, there are government programs to help, but states are finding it increasingly necessary to cut back, because of falling tax revenue.

No one is telling us about our predicament

- No good solution in sight
- Probably too late for huge technology changes
  - But may be some partial mitigation
- Most alternatives are too expensive
- My view:
  - Need to re-localize food and manufacturing
  - May need local financial systems
  - Need to completely change educational system

It would be a lot easier to get politicians to talk about the situation if there were a good solution in sight. There are some partial mitigations, but they likely don't get us back to "business as usual". Voters are likely to be very unreceptive to such news.

We are in the midst of a predicament, even if we continue to ramp up deep water oil from the Gulf of Mexico. If there is less oil from the Gulf of Mexico, it will make our predicament even worse.

The world doesn't really have many more good, cheap places to drill any more. Any place we do drill, requires substantial capital investment and long lead times. Much of the remaining oil is in

solid form, like the oil sands, and oil shale. Such resources will be very slow to extract, so it is very difficult to ramp them up, even if we decided we wanted to. There may be other limiting resources as well, such as water, meaning that this obstacle needs to be overcome as well. So there are no easy substitutes for oil from the Gulf of Mexico.