



## Future Challenges

Posted by [Heading Out](#) on April 21, 2005 - 12:44pm

Courtesy of the [Energy Bulletin](#), I was guided to listen to [Chris Skrebowski's interview](#) on the Megaprojects situation. The key phrase that came out of that, I felt, may be something we are going to have to learn to live with much earlier than we would like, and it is "Demand Destruction", the driving down of demand to match available supply. Most likely this will be achieved by price control, and as I noted earlier, going up to \$100 a barrel oil is not going to have much effect on that.

But, with your indulgence, I will instead, today, return to my theme from yesterday on the people resource. This is brought about, in part, by the comment to that post from "The Dad." At the end of his note he said

There was never any question about following up with the undergrad petroleum background or working in industry for Shell or Mobil or Exxon et al. That would have burned him out as quickly as the bomb research did. Petroleum is old science, pursued simply for the easy bucks.

In my reply I tried to point out that any starting job of much value places high demands on its entering workforce, to make sure that they can carry the load, when they in turn become responsible as managers for that operation. The demands that must be met for an academic to achieve tenure are, for example, documented through examples broadly scattered across the whole blogworld.

What I would like to comment on here is his last sentence, because it is absolutely wrong. Unfortunately that assumption, and its logical progression, cost us a lot of wasted talent and people energy the last time we had an Energy Crisis, and likely will again.

To give but one example of why "petroleum is NOT old science" consider what Aramco are doing in trying to maintain production from Ghawar and Abqaiq. And to explain why I am going to have to steal another slide from Matt Simmons. If you go to [his speech site](#) and download the pdf for the July 2004 speech he made at the Hudson Institute, and turn to figure 13, you can see the process being developed to reduce the water cut at Ghawar. The picture shows the planned exploitation of the Haradh increment in the Ghawar field. Because they are pumping water into the oilfield to push out the oil, they have had to:

- a) develop a way of drilling oilwells horizontally rather than vertically.
- b) develop a way of creating a lot of lateral branches off from the main horizontal well
- c) find ways of controlling the inflows from different points along these wells so that they can still get oil out of most of the well, when water reaches part of it.

They have to do all this in pipes that can be miles long, and less than six inches in diameter, and with all the controls coming from just one end.

These are all fairly complex problems, but have been recently solved, with some new science. Now, as we need to find ways to get oil out of the ground that is currently left in place because it is too difficult or too expensive to get out, there will be more challenging problems. They will cover issues that may include finding faster, simpler methods of drilling. If Howard Hughes Dad could pay for all the things his son got into in "The Aviator", based on one innovative drilling bit design, just think what you could do if you could invent its successor. We currently, in some places, leave up to 70% of the oil in a reservoir in place, we need to find ways of getting that out. And that is just one aspect of the huge challenges that will have to be met as we move to using fuel sources from all the fossil supplies (including coal and uranium) in acceptable ways to meet our needs.

But here is my caveat from history. Last time around, when this became an issue, the big money went to the National Labs, and then a large part of the rest was spread to any university that could corner its congressional delegation and carve out a slice of the pie. The problem with this is that is not concentrating the resource where the current experts are. There are relatively few schools that still have energy producing departments, and these have not fared well in the battles over budget cuts that are ongoing across this nation. These schools, however, are where a lot of the experts currently sit. They are the resource for generating the engineers that will be employed to find the answers to the problems we are going to have to address. Just sending money to "our brightest scientists and engineers" as was largely done last time, means that a lot of money will be wasted, since these folk, albeit brilliant, do not understand the harsh limitations that currently exist in getting fossil fuels out of the ground. And if you don't understand that cost, you should look at the current death rates in the mines of Russia and China.

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