



Oil prices also affect oil costs

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I suspect that few of our readers have to buy a lot of the materials that go into an oil drilling operation. But those that do can tell you that the same rise in prices that is hitting your pocket is also hitting a lot of theirs. (And supply lead times are getting to be beyond a year for some metal stock). In this regard I am delighted to turn the podium back to J, for some comments both on this and the rock that oil is found in.

I plan on using that part of his post to help me explain, this weekend, why just making a hole in the oil-bearing rock does not turn out to be a good idea. Over to J:

In a comment by gabor on my last guest post was this comment

"But the profit margin is the function of the oil price! therefore if the well becomes uneconomical at \$60 it will reenter production at \$120! Therefore there will be backside curve. I think what you should rather look at is thermodynamical balance of exploiting oil. When it becomes zero the well must be shut up, until that point the well will resume operations as long as the price rises enough."

OK - so now we have some non-engineer declaring that it is thermodynamics that controls oil exploration. AAARRRRGGGGHHHHH!!!!

However, even beside that point, the major points of the comment are that people really do believe that if it isn't economical to produce oil at \$60, then at \$120 it will become profitable again, and poof! - the field is back online!

Sadly, they are skipping this one, all-important fact: once the oil is gone, it is gone, and no increase in price will make it reappear.

And they are missing the point that there are significant amounts of oil that simply will NEVER come to surface, because the permeability in the reservoir has changed since the oil first migrated, and as the rock moves it blocks the passages through which the oil was reaching the well bore! In many cases, this damage to the rock is due to the company using overly aggressive high volume production methods.

Changing the price for the oil, even to \$200/bbl, simply cannot fix these changes in permeability and free the trapped oil. The methods that can be used to fix the problem are already available and have been used at today's prices, but they require the one thing that is in short supply - TIME. And even when the well is restored, the recovered oil flow will never provide the high volumes of oil that we are currently operating with and used to. As a result these techniques, and the wells they are used in, are no longer qualified for the portfolios that the large corporations want to pursue.

Have any of you guys ever seen a "Christmas tree" depletion drawing? When you place a well in the middle of oil and start pulling oil out, the oil moves to the lower pressure around the well. This moving oil looks kind of like a Christmas tree, with the midline being the producing well. As pumping continues, branches get disconnected from the tree, and isolated from the rest of the big mass of oil.

Water flooding can chase some of these isolated patches to the well, but it is usually a 7/10 to 1 chase ratio – in other words it takes between 7 and 10 barrels of water to be pumped in in to produce every barrel of oil that comes out. And the barrel out is coming out WITH the 7 to 10 barrels that we used to flush it out with. Each of these gallons of now-contaminated water must be disposed of by being pumped into another, specially drilled well, which usually means it must also be trucked from the first well to the disposal one. And in-between times, the produced water must be separated from the oil, and that requires further energy input.

Due to the random nature of permeability and porosity within any sandstone reservoir, there is a certain percentage of oil that will always remain trapped. There are entire volumes of oil that will never flow to the well, because there is no effective path for them to reach it. This structural reality effectively divides the reservoir into compartments. To reach the larger, and more valuable ones, we have to drill a separate well into each compartment, and as the cost to drill climbs, larger and larger parts of the oilfield get left behind.

People will argue that CO₂ injected fields CAN be put on stripper production. And yes, they just might be able to do that. But stripper wells operate at a lower than surface pressure, and the oil is manually pumped out, just like the water from a water well. What happens to the injected CO₂ that we used to renew the reservoir pressure and drive the remaining oil to the producing wells? It doesn't just disappear - it has to be released into the atmosphere or injected elsewhere at high cost!! Frankly, this is a climate disaster waiting to happen.

What those who see oil production just as a process limited by price, are NOT getting is that rigs and pipe and cement and energy are all costs that oil producers have to pay. And that additional cost is also reflected in the new higher prices for everything made with oil. As we look harder and harder for more oil, this demand drives prices for the equipment and materials we use through the roof. For example the loss of the 5 jackup rigs leaving the GOM and heading for Saudi Arabia will we are estimating, drive prices for these rigs from \$65,000 per day to \$100,000 per day, and last year they were at \$35,000!! This does NOT make the production of smaller fields more economical, because the price for oil is still too low to pay the new price for the rigs!!

When old equipment is retired, the new equipment, built with higher costs, must be purchased to replace it. With steel at a premium due to demand, these costs have risen 300%! Today, our basic costs have doubled in a single year, which matches what has happened to oil prices. So the net return on our investment is back to the same level - no change in overall extraction economics. All new projects now reflect the higher energy price inputs, and these basically equal the current price change of oil! We need a 300% increase in oil prices just to match the increased price we have to pay for steel!! (And there is a LOT of steel in the platforms like Thunder Horse).

Yes, moving the minimum price of oil from \$30 to \$50 for our calculations will help, but with a (roughly) 65% increase in drilling costs, it is just not a big enough offset to make companies drill for every little stranded drop. Oil prices are still too low for that.

To be blunt, no modern oil company is going to move their internal calculated price significantly

until they are satisfied that Saudi Arabia is honestly into major depletion. There must be no possibility of a price collapse. This is why the oil companies are not going crazy with mega-projects and chasing every little bit of oil just yet. They are all sensing that there might still be a major collapse in the oil price, but they are unsure what it might take to trigger it.

Why are they so nervous? Because historically, EVERY SINGLE TIME oil prices have increased dramatically to this sort of relative level, they have then been followed by a severe price collapse. As the increased energy and transport costs filtered into the economy, the price pass-through led to a forced widespread inflation. When oil booms, the economy busts. This has been our bitter lesson for the entire era of oil.

When oil becomes priced like gold, then the smaller fields will become economical. At that point there may be somebody chasing every little speck of oil in every little field. But by that time, demand may be destroyed by the global economic collapse. Because OUR WORLD IS BUILT OF CHEAP OIL! If oil had been priced according to its intrinsic value as a fuel, we would not be where we are today.

So, what/who is to blame?

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