



Another look at the Kingdom of Saudi Arabia

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Topic: [Supply/Production](#)

Tags: [abqaiq](#), [ghawar](#), [manifa](#), [refineries](#), [saudi arabia](#) [[list all tags](#)]

As you may have noticed [President Bush](#) commented this past week on his (and apparently their) doubts that Saudi Arabia could significantly increase crude oil production. While this comes as no great surprise to those of you that have been reading [Stuart](#) and [Euan's](#) excellent articles, I thought I would try and summarize the situation as I see it, and expand a little beyond the short summary paragraphs that Leanan is providing, to give more of an overall picture.

To begin you should know that when the Kingdom of Saudi Arabia (KSA) talks about the size of their oilfields, they refer to the amount of oil that was there at the beginning, rather than that which is left. You can do this calculation for yourself, but I exemplified it with a small calculation on the amount of oil that originally existed in the [Abqaiq field](#), by making some simple assumptions.

(Essentially if you know the size of the field and the rock porosity - the amount of space for oil available - you can deduce [the maximum volume that can be there](#), only a certain percentage of that is oil, and only a certain portion of that can be counted as a reserve, and thus producible - this works out to about 17 billion barrels. Of this there is only a certain percentage that can be recovered, and when this is factored in, along with the production to date, that means that, at Abqaiq, they have less than 3 billion barrels left. If they produce this quite slowly they can likely sustain perhaps 250,000 bbl/day production, but if they try and increase the production it is likely that they will strand a lot of the remaining oil, and lose it.

If we go back and look at [the oilfields that produce oil for the KSA](#), many of them have been in production for a number of years, so that one begins to see the end of those historic sources. Nevertheless when this site began, this was the projection for reaching 11 mbd.

Current plans to reach a 12.5 mbd goal call for the following production numbers (according to [Cordesman and the CSIS \(pdf\)](#)

Abqaiq - 400,000 bd

Ghawar - 5,500,000 bd

Berri - 400,000 bd

Safaniya - 1,500,000 bd

Abu Sa'fah - 300,000 bd

Zuluf - 800,000 bd

Marjan - 450,000 bd

Haradh - 170,000 bd

Shaybah - 500,000 bd

Munifa - 1,000,000 bd

This gives the 11 mbd that they claim to be able to currently produce - though it includes Munifa, of which we have commented negatively [earlier](#).

To bring this up to 12.5 mbd they plan an additional

Haradh - 300,000 bd

Khursaniyah 500,000 bd

Shaybah - 500,000 bd

Khurais - 1,100,000 bd

Stuart, Khebab, and Euan looked at what is happening in the north end of the largest oilfield Ghawar – and came to the conclusion that it too was nearing the end of its major productive status, though it will, not doubt, continue to produce significant – though lesser – quantities of oil into the future. We can anticipate similar drops in production from the other older fields, although Abqiaq is the furthest along.

Saudi Aramco have historically added wells in a field to sustain production and to reduce the overall decline in field volumes as individual wells begin to drop out (I was going to say dry up, but since they produce with water flooding it won't work). But when you reach the point that the entire field is drilled, then new fields must be opened up to maintain overall country production. It is this increase that is shown at the [Megaprojects Wikipedia site](#).

The planned field expansion must include the drop in existing wells, and add to this if the overall country is to be able to increase the volume that it can deliver to the market. Overall current well depletion has been quoted at around 800,000 bd/year. If, for the sake of discussion, we say that a new well comes on stream at 4,000 bd, then we need some 200 new wells, just to maintain existing production levels. If there are 50 rigs drilling for oil, then each must create four successful new wells a year, just to maintain the status quo. (And even in KSA they are not always successful).

On Friday Leanan noted an update on the most recent projections, as carried in the [Economist](#). The news is not that optimistic. Consider:

It is not too often that Saudi Aramco announces a delay in project start-up. Thus, when it said that it was not yet ready to bring on stream the 500,000-barrel/day Khursaniyah oil field development, some eyebrows were raised. All major contracts on the estimated US\$6bn project—more properly known as the Abu Hadriyah, Fadhili and Khursaniyah (AFK) development—were awarded by third quarter 2005, after a relatively rapid tendering period, with completion and first testing due in late 2007.

After reports started to come out indicating that the deadline would be missed, Saudi Aramco put out a statement in late December indicating that pre-commissioning activities were underway and that work on most of the AFK facilities had been completed.

The new schedule calls for a late February start. For the next projects, the news is no better:

In Saudi Arabia, another major oil project, a 250,000-b/d expansion of the Shaybah field, located in the Empty Quarter, is also facing deadline pressures. SNC Lavalin, a Canadian engineering, procurement and construction (EPC) firm, is working hard to

make up some lost time on the project, but it is thought to be unlikely to meet its late-2008 completion date.

Further on, Aramco has also delayed issuing the tender for the pipeline package on the 900,000-b/d Manifa development, following requests from contractors who claim to be overloaded.

The Manifa/Munifa delay is perhaps, given its size, of the most concern. This is also the oil which gets counted as part of the KSA available supply, but which they cannot market until they have the refineries in place to handle it, since it requires special processing. The projects have become more expensive, and possibly delayed further than their initial 2011 start as reported on [Goliath](#).

In May 2006, Saudi Aramco signed a JV agreement with Total to build a 400,000 b/d heavy conversion refinery in Jubail, on the Gulf coast, at a then estimated cost of about \$6 bn, to start up in 2011. In the same month it signed a JV deal with ConocoPhillips for a similar 400,000 b/d plant at Yanbu' on the Red Sea coast. Under both deals, Saudi Aramco and Total will hold 35% stakes in the Jubail JV, with a similar shareholding between it and ConocoPhillips. The remaining 30% in each of the two JV are to be offered to local investors through IPOs. Since then the Petroleum and Mineral Resources Ministry has launched a 250,000-400,000 b/d refining JV to be built at Jizan, on Saudi Arabia's south-western coast. Although Saudi Aramco has not joined this JV, with the ministry having short-listed five IOCs to negotiate the partnership terms, major IOCs like ExxonMobil and Chevron refused to join the project.

All three projects, however, have since become problematic. Each of the Jubail and Yanbu' JVs now is said likely to cost over \$13 bn, more than double the May 2006 estimate. The Jizan JV is estimated to cost between \$7-12 bn. So the IOCs involved in the three JVs have delayed making a final investment decision and, as a result, project costs are likely to rise further in the coming months.

Part of the problem in delaying projects comes about because of the continuing decline in production from existing wells. That is pretty inexorable, so that if the 1 mbd of oil from Manifa is initially set to partially offset declining production, and partially to increase that available, if it is set-back a year then virtually all of the increase will go only to match existing decline, and there is no increase in overall production. In short it increasingly looks as the KSA is at plateau, which is pretty much what they appear to have told President Bush, and he then related on to us.



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