



A Simple Oil Production Estimate for 2007

Posted by [Prof. Goose](#) on March 6, 2007 - 11:30am

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The following is a guest post by Phil Hart, a petroleum facilities engineer and member of ASPO-Australia. Phil worked for Shell in the UK for five years, before returning home to Melbourne in late 2006. Phil's blog can be found [here](#).

Following a summary of [EIA data for 2006](#), I thought I would make a more detailed country-by-country estimate of the potential for 2007.

Starting with the headline EIA figures for last year:

Crude Oil and Condensate: 73.5 Mb/d (down 0.2)

Natural Gas Liquids (NGLs): 7.9 Mb/d (up 0.14)

Other Liquids: 3.3 Mb/d (up 0.08)

Total Liquids: 84.6 Mb/d (up an insignificant 0.02)

Mb/d = million barrels per day

kb/d = thousand barrels per day

Numbers for November and December suggest real OPEC production cuts in Algeria, Libya, Qatar and UAE. The total cut could be 230kb/d which knocks around 50kb/d off annual average production. I did not expect to find evidence for cuts, but that's how the data looks to me - four small cuts made at the same time by countries that otherwise increased their production last year through announced projects. Thus, I believe those four OPEC members, but only those four, have the ability to restore that production. Without those cuts, crude and condensate production would still be clearly down, but total liquids would have shown a somewhat more significant increase.

To establish the potential for 2007, for each country identified by the EIA, I have estimated the balance between depletion of fields in production and new project capacity expected this year. Not yet having mastered Hubbert Linearization, I have used simpler mathematical techniques: addition and subtraction.

To estimate underlying decline, I have considered the net change between 2005 and 2006, and also the production trend in 2006. Countries on a rising trend in the last twelve months start the year above their average last year. They stand a better chance of achieving the same average even without new projects this year (the rising trend is often due to fields developed recently that may still be expanding production). Conversely, countries on a declining trend start the year handicapped below their average for 2006. New projects would need to come on stream early for them to achieve or improve on their 2006 average.

Expected project capacity is based on Chris Skrebowski's Megaprojects report "*New capacity*

fails to boost 2006 production - delays or depletion?", Petroleum Review, February 2007
(should be available at [ODAC](#) soon).

Summary

- 15 countries contribute to a gross decline of 1.1 Mb/d.
- 15 identified countries plus 'Others' and 'NGLs' contribute to a gross increase of 1.7 Mb/d.
- The net result is a possible increase in capacity of nearly 600 kb/d.

Don't get excited about the final figure suggesting an increase this year. This represents what we might call 'increased capacity', but that level of production could only be achieved in an almost ideal world. There is very little upside here, but many risks.

If peace breaks out in Nigeria or Iraq, production could improve significantly. Neither appears very likely. Brazil, Angola and Canada have the potential to exceed the estimates listed here. But potential downsides are everywhere.

Disruption in Iran or perhaps just the impact of sanctions, hurricanes in the Gulf of Mexico or other producing regions, accelerating declines in Saudi Arabia and Mexico - any one of these could wipe out most of this net production gain. Production could easily fall short of the significant gains estimated for the aforementioned Brazil, Angola and Canada.

New capacity, while substantial, may not be enough to offset increasing declines and real world performance.

Estimating New Capacity in 2007

(thousand barrels per day)

Country	Production 2006	Change from 2005	Trend in 2006	Project Capacity 2007	Forecast for 2007
Algeria	1,814	17	Increase. Max in Q4	65	50
Indonesia	1,019	-47	Decline	na	-50
Iran	4,028	-110	Decline. Offset by new projects	150	-50
Iraq	1,995	117	Increase. Max in Q3	na	50
Kuwait	2,535	6	Decline. Max in Q1	110	-25
Libya	1,681	48	Increase. Max in Q3	40	25
Nigeria	2,440	-187	Decline through disruption.	na	-25
Qatar	850	15	Increase. Max in Q3	65	50
Saudi Arabia	9,154	-396	Decline	500	-400
UAE	2,635	100	Increase. Max in Q3	na	50
Venezuela	2,511	-54	Decline	75	25

Norway	2,491	-208	Decline. Offset by new projects	85	-100
UK	1,490	-159	Decline. Offset by new projects	180	-50
Angola	1,419	163	Increase. Max in Q4	490	250
Argentina	696	-7	Variable	na	-10
Australia	433	-12	Increase. Max in Q4	na	50
Brazil	1,722	89	Increase. Max in Q4	610	300
Canada	2,525	156	Variable increase. Max in Q4	270	150
China	3,686	77	Variable. Max in Q2	190	50
Colombia	531	5	Decline. Max in Q2	na	-10
Ecuador	536	5	Decline. Max in Q1	na	-10
Egypt	639	-19	Variable decline. Max in Q1	na	-25
Gabon	237	-29	Decline. Max in Q1	na	-10
India	689	24	Increase. Max in Q4	na	25
Malaysia	684	-65	Decline. Max in Q1	120	25
Mexico	3,256	-78	Decline. Max in Q1	na	-300
Oman	738	-36	Decline. Max in Q1	na	-25
Russia	9,244	202	Increase. Max in Q4	na	100
Syria	406	-26	Decline. Max in Q1	na	-25
States	5,143	-36	Variable increase. Max in Q4	180	100
Other	6,231	254	Increase. Max in Q4	120	200
NGLSs	7,938	139	Increase. Max in Q4	480	200
Total	81,397	-54		3,730	585

Some comments on key countries:

Russia

Russia provided the largest single production increment in 2006 of 200 kb/d. Production in December was close to the maximum for the year so they begin 2007 in a strong position to maintain their average, but posting another similar gain seems less likely. Clearly one to watch.

Brazil

With 610 kb/d of new projects on the books, Brazil looks set to post by far the most significant gain for the year. Many of the projects are expected in the first half and at least one has already started. 300 kb/d as estimated here would be a huge annual increase but they could even exceed that. They also start the year above their average for last year. Without Brazil, peak oil would

already be moving clearly into sight in the rear view mirror.

Angola

With another two megaprojects expected, one in each half of the year, Angola looks set to repeat last year's strong performance and should post the second largest gain in 2007. Again, we will need it.

Natural Gas Liquids

Strong growth looks set to continue in this category as well.

Saudi Arabia

The decline of 400 kb/d compared to 2005 had nothing to do with quota cuts and was not anticipated by any energy agency. [Stuart's post](#) shows that the massive Haradh III project presented itself as a little bump on the ski slope. The Khursaniyah/Abu Hadriya/Fadhili development is larger again but not expected until the end of the year and will therefore not impact the figures much. Until then, we should get a long clear look at decline. Surely, sometime this year, the world will make a strong call on Saudi 'spare capacity', which could finally put that notion to bed. Or perhaps we will be proven wrong?

In their defense, Saudi Aramco have delivered and continue to work on the world's largest oil and gas projects. They have an enviable project delivery reputation within the industry. The economists, however, will show little gratitude. Expect to hear the phrase 'lack of investment' soon.

Mexico

Decline here is estimated at 300 kb/d. It could be worse.

Project Notes:

Figures in brackets are maximum capacity and not necessarily what could be achieved this year.

Saudi Arabia [Khursaniyah](#): Not expected until end of 2007. Reading between the lines suggests even that may be a challenge. (500kb/d plus 250kb/d NGLs).

Venezuela [Corocoro](#): Expected mid-2007.

Angola Greater Plutonio: Expected first half of 2007 (240kb/d) Rosa: Expected second half of 2007 (250kb/d)

Brazil [Espadarte](#): Started production in January (100kb/d). [Golfinho](#): Production to expand 100kb/d in June with arrival of additional FPSO. [Polvo](#): FPSO expected to arrive in February.

China Bohai Bay: Production expected at low levels in 2007.

Malaysia [Kikeh](#): Production started in January.

United States Atlantis: Expected end of 2007 (150kb/d).

NGL Projects Are counted under corresponding EIA column and not allocated explicitly to country columns, which are crude and condensate projections only. Two main projects in 2007 are Saudi Aramco and QatarGas.

Updates on particular projects or the potential in specific countries are of course welcome.

The net positive result achieved in this analysis is not all that surprising. The Megaprojects report identifies 3.2 Mb/d of capacity arriving in 2006, while EIA data show the net result was a slight loss (for crude and condensate and NGLs). After allowing for project delays and production below

capacity, an approximate guess would suggest that net new production for the year was around two million barrels per day. Production declines absorbed all of that.

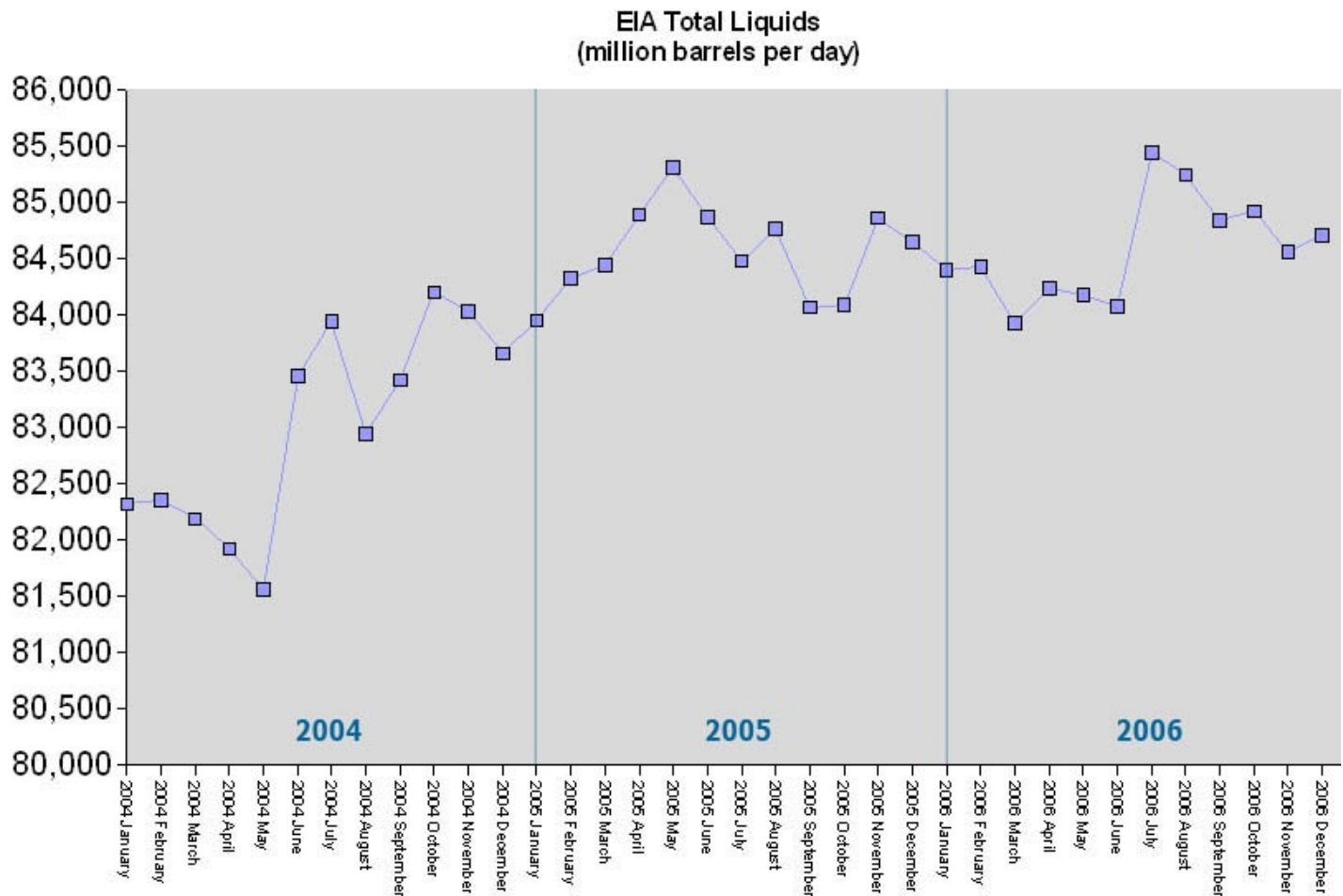
For 2007, new project capacity rises to a massive 4.6 Mb/d, more than 40% higher again than last year (some of that is from last year's projects that are still expanding). Even allowing that several of the largest projects only arrive late in the year, it is possible that net new production will increase, even above last year's historically high levels.

For 2007 production to fall relative to 2006, depletion must also increase substantially. Plenty of evidence supporting that notion has been presented on TOD. This analysis is somewhat conservative in that regard. If Saudi Arabia continues declining at 8% as in Stuart's analysis, then they will lose 700 kb/d. The extra 300 kb/d compared to my estimate would wipe out half of my net 'possible' gain. A similar case for Mexico could wipe out the rest, and that's before allowing for major disruptions anywhere else.

Khebab's analysis of [countries already suffering Type III depletion](#) is another, more refined way of illustrating the challenge outlined above. It will be interesting to see an update of that with 2006 data. But I also know Khebab has lots of other requests and no doubt ideas of his own to work on :-).

Let me finish with a chart of EIA Total Liquids for the last three years. The obvious feature is the 1.5 Mb/d jump from June to July last year. This set some alarm bells ringing but reviewing the data, it is hard to fault. The month-to-month increase was provided by UK and Norway (270), Angola (180), Australia (120), Brazil (100), Canada (170), NGLs (300), OPEC (200) and 'Other Liquids' (190). It seems remarkable that all these increases should arrive at once, although it did occur as prices were approaching their record highs. The jump in production helps to explain why prices steadily retreated afterwards - a world that had learned to live with 84 million barrels per day suddenly had another 1.5 to play with. So, despite the large jump, average changes for the year for all these countries look reasonable in the context of delivered projects, so I don't believe it is an attempt to delay peak oil by massaging the figures.

We started 2007 with production just slightly higher than the average for 2006. A few steps upwards early this year would put us within striking distance of matching the average again. But, will those steps materialize or will the line continue the downward trend?



cheers!

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