

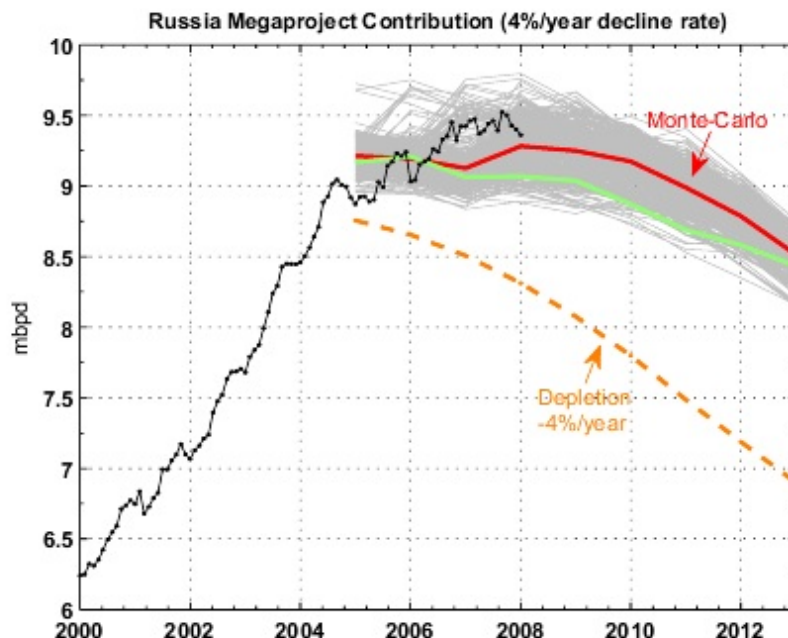


Russia's Oil Production is About to Peak

Posted by [Sam Foucher](#) on April 24, 2008 - 10:00am

Topic: [Supply/Production](#)

Tags: [megaprojects](#), [oil](#), [peak oil](#), [russia](#), [sakhalin](#) [[list all tags](#)]



Megaproject contribution from 2005 to 2013, the decline rate is 4%/year with a linear transition period of 6 years starting in 2005. Historical crude oil + condensate production from the [EIA](#).

When Will Russia Decline?

Since 2005, the Russian oil industry has been in constant turmoil. Production growth has also slow down significantly maybe as a result. The Exxon [Sakhalin-I](#) project has now reached its peak and production is experiencing a steep decline since. On the upside, many projects are expected to come online and the IEA [forecasts](#) that oil production in Russia will increase by 90,000 bbl/d in 2008 and 300,000 bbl/d in 2009, following growth of 200,000 bbl/d in 2007.

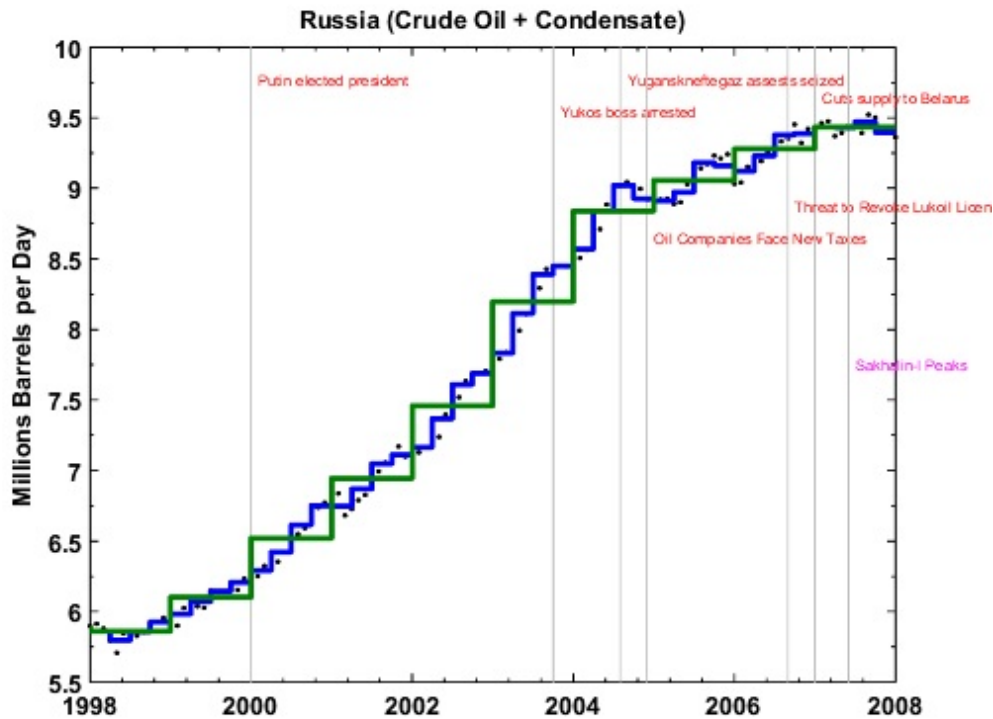


Figure 1. Monthly crude oil + condensate production (from the EIA). The blue and green lines are 12 and 3 months average respectively. [Click To Enlarge](#).

The dramatic drop down in production growth observed by [Stuart](#) is still going on and is now close to 0 (i.e. flat production). Several trend lines can be drawn, in particular the trend for 2007 in purple would imply an immediate decline in 2008. However, several decline acceleration periods have occurred in the past (similar lines could have been drawn in 2001 and 2004) so it is unlikely that the rapid decline observed in 2007 will continue in 2008.

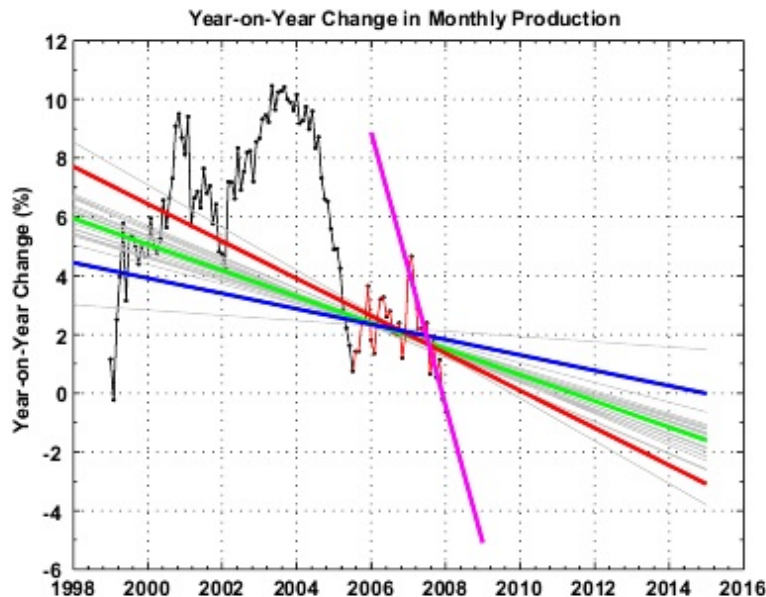


Figure 2. year-on-Year change in monthly production for crude oil + condensate. The magenta line is based on 2007 data only, the green line is the average trend using 2005-2007 data and the blue and red lines are the low and high case respectively (95% confidence interval for the fit).

From the above linear trends, we can derive different oil production scenarios as shown on Figure

3 where peak production is seen between 2010 and 2015 with a peak production between 9.5 and 10 mbpd.

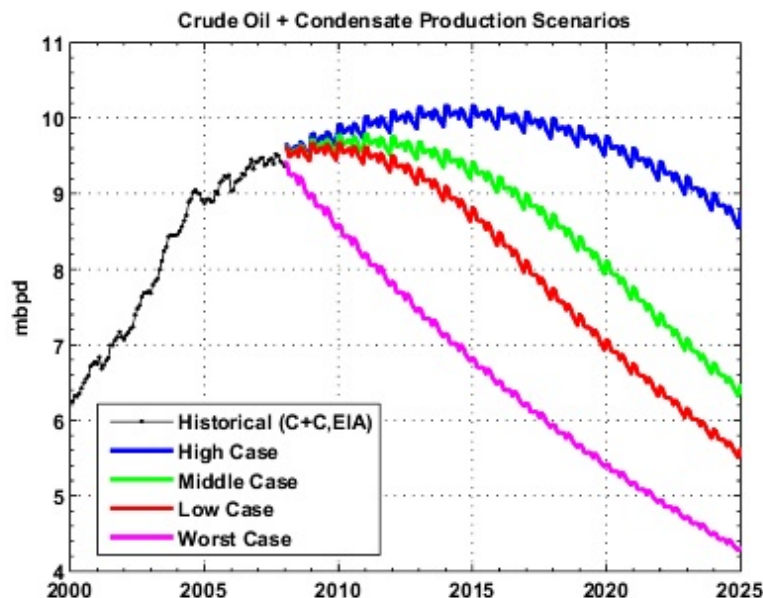


Figure 3. Oil production scenarios based on the trend lines shown on Figure 2

In terms of corresponding oil reserves, these scenarios are consistent with published reserve numbers. Using various reserve estimates gathered by [Dave Cohen](#), I derived an empirical reserve cumulative distribution function (CDF). We can see that the dotted green line (Middle case) around 105 Gb is close to the median estimate at 116 Gb (F50).

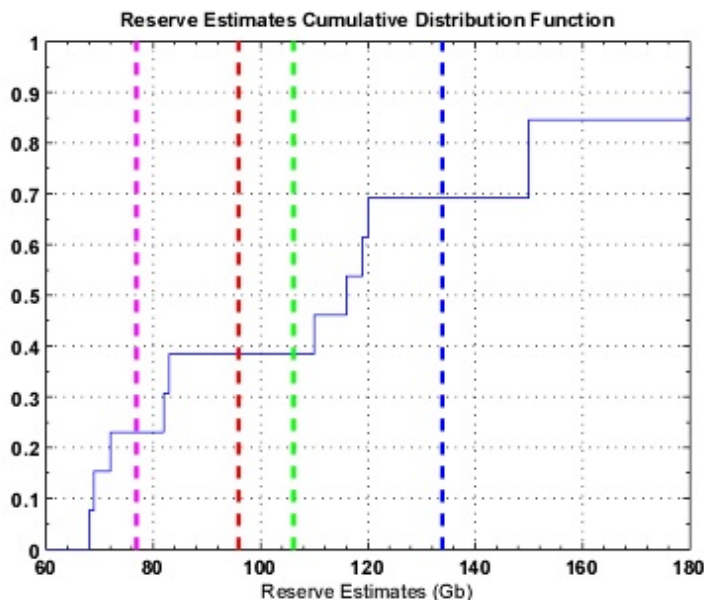


Figure 4. The thin blue line represents the CDF of available reserve estimates for Russia. The vertical dotted lines indicate reserve figures corresponding to the different scenarios on Figure 3.

Impact of Future Megaprojects

There are quite a few projects for Russia listed on the wikipedia [Oil Megaproject list](#). I assumed an ultra-simple triangular shape for each project with a linear ramp-up until the peak year and an

immediate exponential decline (decline rate at 5% on the figure below). When the peak year is not available, the year following the starting year is taken as the peak year. The most important project in terms of flow rate is the Vankorskoye that could reach between 0.4 and 0.6 mbpd in 2015-2017 and therefore will probably offset production decline in existing fields and not really contribute to maintain production growth in the near future.

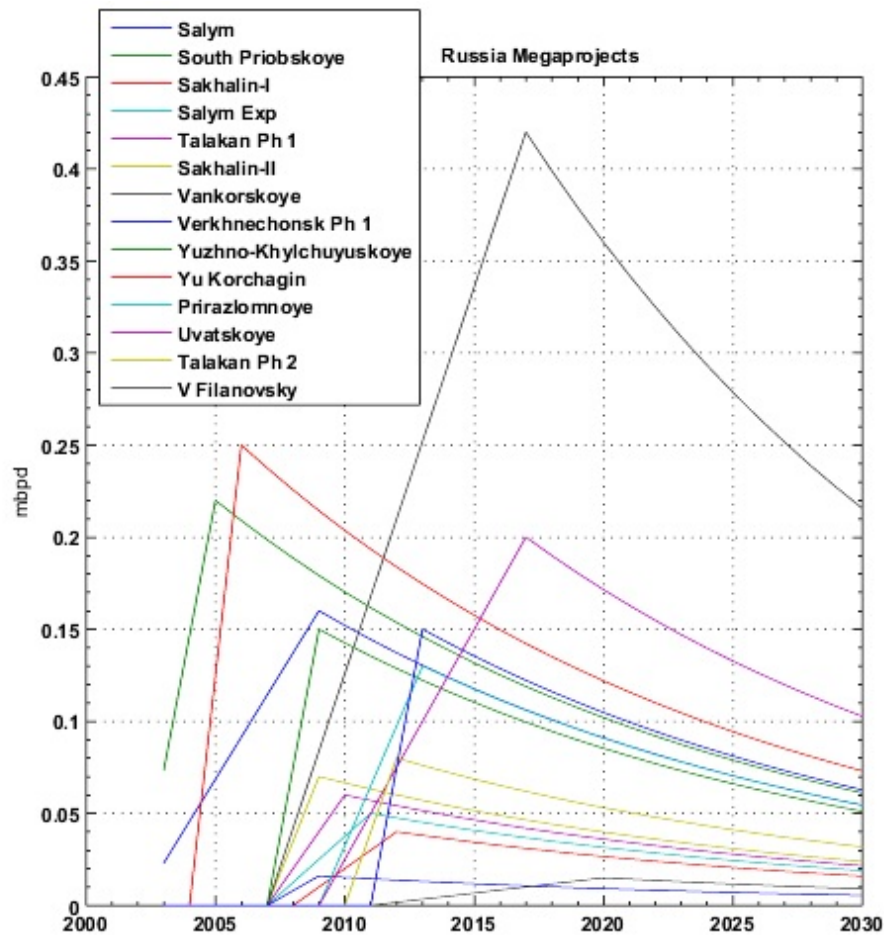


Figure 5. Hypothetical megaproject contributions for Russia (source: [Wikipedia Oil Megaproject project](http://en.wikipedia.org/wiki/Oil_megaproject)).

The gross new supply addition is shown as a blue bar on Figure 6, the above field model (therefore including depletion) gives an equivalent net annual supply addition shown as the green bars. In addition, a Monte-Carlo procedure is applied on the field models shown on Figure 5. Parameters for each field model (time of the peak, post-peak decline rate and duration of the production plateau) are chosen randomly based on empirical probability density functions derived from the UK/Norway dataset (the Monte-Carlo runs are shown in gray on Figure 6).

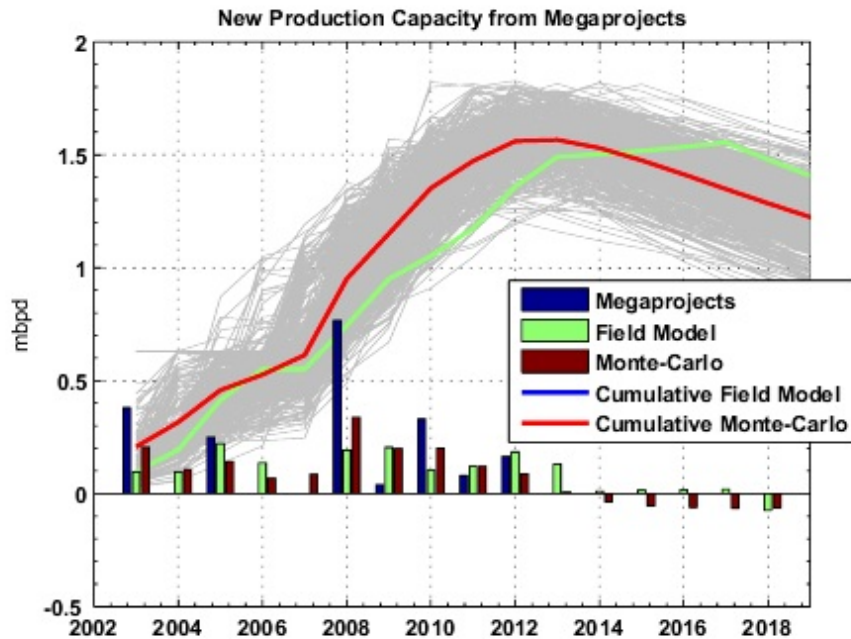


Figure 6. The blue bar is the gross oil megaproject contribution attributed to the project starting year, the green bar is the annual supply addition from megaprojects based on the field model shown on figure 5. In gray are the Monte-Carlo runs and in red is the average production.

Below, I assumed an ultimate decline rate for the existing production post-2005 at 4%/year and 3%/year (EIA estimate). In addition, because fields online prior to 2005 won't go into decline immediately (see this [post](#) for an detailed analysis), the decline rate is set to increase linearly from 0 to 4% between 2004 and 2011. Current production seems to be well within the Monte-Carlo uncertainty interval and at best, a production plateau is seen in the near future.

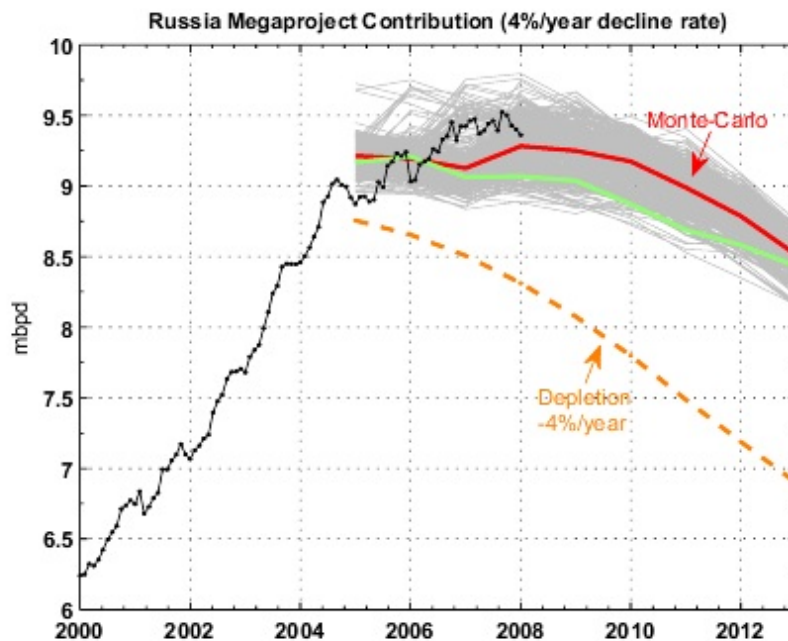


Figure 5. Megaproject contribution from 2005 to 2013, the decline rate is 4%/year with a linear transition period of 6 years starting in 2005.

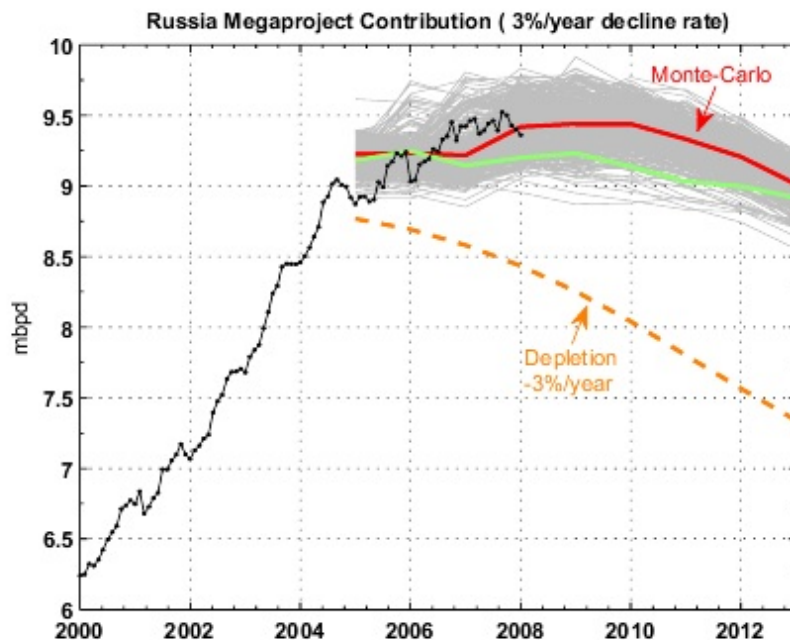


Figure 6. Megaproject contribution from 2005 to 2013, the decline rate is 3%/year with a linear transition period of 6 years starting in 2005.

	2007	2008	2010	2012	2008 - 2030 Cumulative Production (Gb)
Low Case	9.44	9.43	9.57	9.47	> 62
Middle Case	9.44	9.43	9.64	9.67	> 67
High Case	9.44	9.43	9.73	9.93	> 78
Megaprojects + 3% decline rate	9.44	9.42 +/- 0.17	9.44 +/- 0.15	9.21 +/- 0.12	> 64
Megaprojects + 4% decline rate	9.44	9.27 +/- 0.17	9.17 +/- 0.15	8.79 +/- 0.12	> 57

Production forecasts for Russia (Crude oil + condensate).

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