



Russian Oil Production to 2020

Posted by [Rembrandt](#) on November 30, 2012 - 12:39pm

Uncertainty whether Russia can maintain its high level of oil production continues - 10.7 million b/d in 2012 to date on average. A new more benign tax regime recently put into place and significant industry investments may plausibly enable the Russian Bear to extend its “plateau production” to 2020.

The post below outlines how this impressive achievement has been made possible, given that the decline of existing production is plausibly [6% or more every year](#) for most old giant fields in West Siberia. In other words, the Russian oil industry needs to invest substantially in pushing more oil from existing fields (lowering decline rates) and new field developments to keep production steady.

How long production levels can be maintained beyond 2020 is a difficult question, and one that I have left to answer another day. A view of ongoing developments and things to come up to 2020 is available below the fold.

This post was informed by a presentation by TNK-BP’s Oleg Mikhailov held at [the unconventional gas conference 27-28 November](#) in Aberdeen, with additional information from investor presentations of major Russian oil companies, a few peer-review studies, and a recent [study on the Russian Oil & Gas Sector](#) by Wojciek Kononczuk of the Center of Eastern Studies in Warsaw which I recommend reading.

Although TNK-BP recently became a part of Rosneft, making Rosneft the biggest oil company in the world, ([see investor presentation](#)) it will be referred here as TNK-BP.

The current state of Russia's oil production

The background of Russian oil production is a story of rapid increase from 3 million in the 1960s to an enduring plateau ± 11 mb/d in the 1980s, a rapid drop to 6 mb/d in mid-1990s due to the collapse of the Soviet Union, followed by a revival as investment began flowing again.

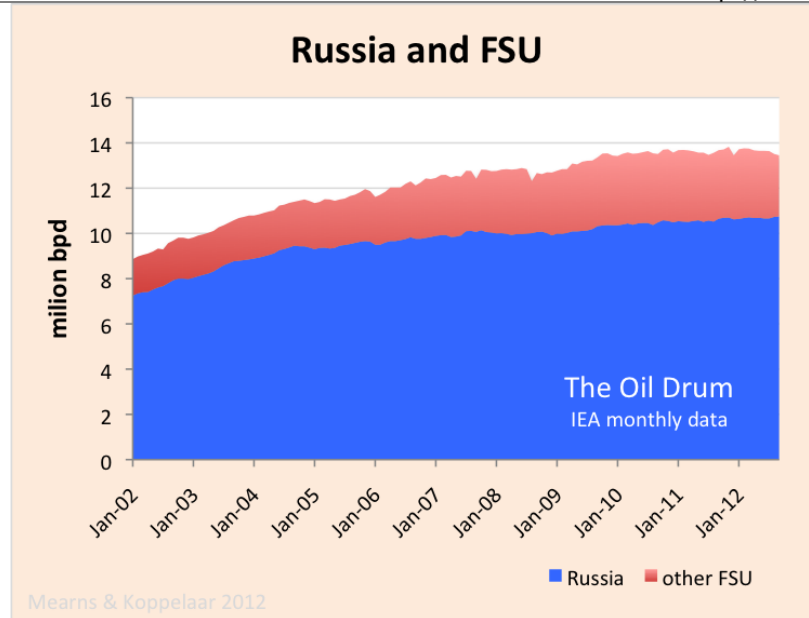


Figure 1 - Russian and former FSU oil production Jan 2002 to Oct 2012, including condensates and NGL. Datasource: IEA

Today Russia is at the point where the production output of many older giant oilfields in West Siberia is declining. It is not an easy job to maintain production given the maturity of these reservoirs. Significant continued investment is required in more difficult to produce reservoirs in West-Siberia itself, in more costly techniques to pour more oil out of mature fields, and in new regions. Thereby costs are driven up due to increasing distance (infrastructure needs), harsher climate, and more challenging reservoirs. To enable investment, favourable financial and oil price conditions are required.

Region	millions of tonnes	%
Western Siberia	318.3	63
Volga-Ural	111.5	22.1
Timan-Pechora	31.5	6.3
Eastern Siberia and northern Krasnoyarsk Krai	19.7	3.9
Far East	14.8	2.9
Northern Caucasus	9.3	1.8
TOTAL	505.1	100

Table 1 – shares of Russian regions in oil production in **2010**. Source [Wojciek Kononczuk 2012](#)



Figure 2 – map of Russian oil production. Source: [Wojciek Kononczuk 2012](#)

Keeping West Siberian declines in check

To ensure continued high flow rates, the industry is venturing into remote oil regions and investing in difficult reservoirs to keep production flowing. In the words of Mikhailov, “*We are relying more and more on either tight reservoirs or even venturing into unconventional and shale type plays.*” Two key developments, investment in difficult reservoirs and tax regime changes, show that the industry and government are indeed making a substantial effort.

The industry has focused development in mature regions on what is called “*challenged reserves*” (TNK-BP now Rosneft) or “*Hard to Recover reserves*” (Gazprom Neft) which were previously uneconomic. These can be classified into various categories including:

- Low permeability formations with highly irregular reservoir properties
- Under saturated reservoirs in low-permeability reservoir rocks
- High-viscosity oil deposits with gas caps
- Remaining oil reserves in high water cut fields
- Unconventional reservoir rocks
- Thin reservoirs (couple of meters thick)

To recover more oil from these poor quality reservoirs, a range of technologies is deployed that combine multiple leg horizontal drilling, multi-stage hydrofracking, and other technologies. TNK-BP alone has about 10 billion of technically recoverable resources in such fields, and is targeted to exploit 4.5 billion of these under its new “*challenged reserves*” recovery program, which focuses on 7 development projects. To give an order of magnitude, TNK-BP was the third biggest oil producer in Russia, and total Russian annual oil production is equal to approx. 3.8 billion barrels.

The combination of these technologies with brute drilling force (many wells with lots of rigs in use) is what allows production in West Siberia to not decline as rapidly as would otherwise be the case. To make this happen, technical expertise is drawn from service companies like Halliburton and Schlumberger by TNK-BP, and joint ventures with players like ExxonMobil and Statoil by other players. “*TNK-BP had 130 multi-stage fracking operations versus 15 last year, and going forward, need to do 1000 well drilling operations or even more per year to access these reserves. Such drilling requires 30%-40% growth in drilling activity. A factor of 5 - 10 for*

multi-stage operations. We need contractors to invest in this equipment. To expedite this we are working with key oilfield service providers Schlumberger, Halliburton and others,” as stated by Mikhailov. For an example of such projects, [here is an interesting news item with quantitative bits](#) on the Severo-Khokhryakovskoe field being developed by TNK-BP and Schlumberger.

The development of these projects is enhanced by a recent change in the tax regime of Russia. Historically this has been a huge problem because the Russian state obtains the majority of its income from oil and gas wealth, the biggest driver of the economy. In 2011 [50% of state income](#) came from oil & gas.

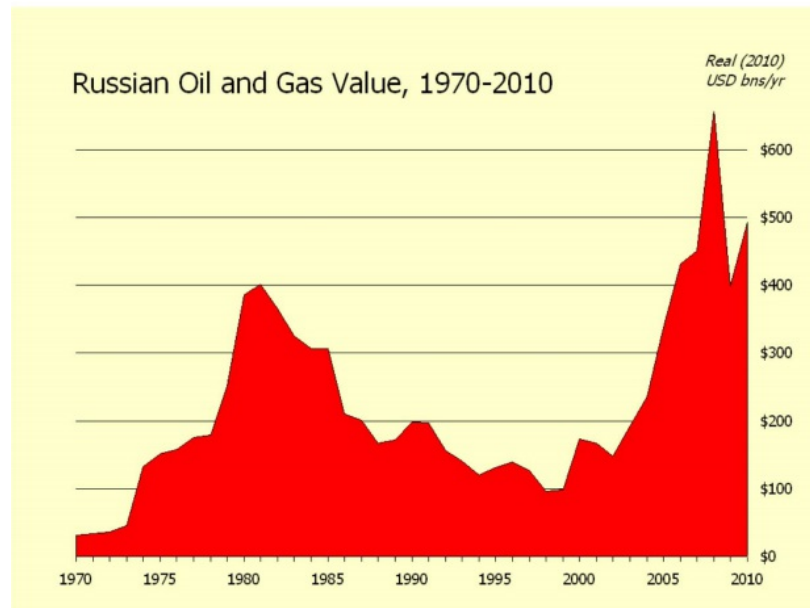
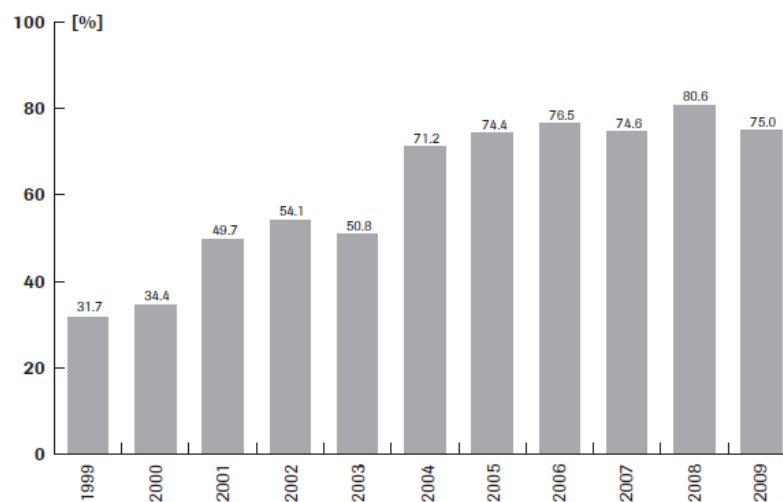


Figure 3 – Oil & Gas Revenues from 2002 to 2011. Source: [Presentation by Barry Wicks of Pennstate department of economics](#)

To reduce revenue from your major source of income is always difficult to achieve politically. The rising oil price has led to increasing taxes on the oil industry in Russia on various fronts (including export levies, profit tax, oil transport tax).



Data: Neftegazovaya Vertikal, no. 5, 2010

Figure 4 - Russian profit tax. Source [Wojciek Kononczuk 2012](#)

Such high taxes create an environment in which more costly to develop fields are uneconomical despite oil prices above 100 dollars per barrel. However, several adjustments have recently been made to taxes on oil extraction to create investment incentives for the oil industry:

June 2012, [Reuters](#): *“The centrepiece of the package is a sliding scale of tax breaks for investors in tight oil which would grant a discount of 50 to 100 percent on mineral extraction tax depending on the permeability of the rock.”*

October 2012, [Russia & Industry Report](#): *“Energy Minister Alexander Novak announced that the government had decided to significantly lower customs duties for oil extracted from fields in eastern Siberia. Duties, he said, would be cut almost in half. Moreover, the cabinet of ministers intends to extend the zero percent tax rate already in effect for eastern oil fields. The tax break was supposed to end on January 1, 2017, but has now been extended to January 1, 2022.”*

Interestingly, the tax breaks are highly differentiated both by region and reservoir properties. An incomplete listing includes:

- Reservoir thickness used as a differentiation factor on tax incentives.
- Relief provided for formations with permeability under 2 milliDarcy.
- Export duty relief for extra-viscous oil fields (over 10000 cP).
- Availability of tax relief for reservoirs with an oil viscosity over 200cP.
- Highly depleted fields receive a tax cut.

With several large players and loads of ongoing activity, these development programs will help maintain Russian oil production at today's levels by slowing the decline in West-Siberia, and unlocking production in more difficult to access regions.

Moving eastwards, new fields on the horizon

A large share of new production in Russia is expected to come from East Siberia and the Far East. Exploration and development is ongoing in these regions but tackling the key problems, climate and lack of infrastructure, is not an easy task. Because of these issues, exploitation of these resources is so costly that it is only feasible under a favourable tax regime. In terms of infrastructure, the situation is rapidly changing. Several pipeline projects are underway or have been completed:

- In 2010 the Eastern Siberia Pacific Ocean (ESPO) oil pipeline was completed, which connects East to West Siberia from Tayshet to Skovorodino. It is the first in unlocking transport from East Siberia (2700 km, 0.6 million b/d capacity).
- The second phase of the ESPO project is to build a connection to the East coast of Russia for export to Asian markets (1763 km with capacity of 1 million b/d). The oil to the east coast from Skovorodino is currently transported by railway to the Kozmino terminal. The construction is partially financed by China who has loaned Transeft 10 billion USD. This second phase will also expand the capacity of the East to West Siberia link to 1.6 million b/d.
- A pipeline is under construction from Krasnoyarsk Krai with the first stage to be completed in 2013 (910 km, 0.5 million b/d capacity increasing to 1 million b/d by 2016).
- A pipeline is under construction from Tikhoretsk Tuapse-2 to the Tuapse refinery (247 km, 250,000 b/d capacities).



Figure 6 – Vankor oil field development from [presentation of Gazprom Neft](#)

Conclusions for future production

The total of new developments are such that as long as investment keeps flowing, production can be maintained at 10-11 million b/d. Total possible production from “challenged reserves” unlocked by the tax regime changes in the next 5-10 years is by some estimates of the order 2 million b/d, sufficient to compensate for declines in other fields. How long production levels can be maintained beyond 2020 is a difficult question to answer. This depends largely on whether new exploration will result in sufficient discoveries such as Sevastyanovo, and whether investment is there to develop these fields in the medium to long term.



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