

Refinery Upgrades to Cause Dramatic Reduction in Russian Fuel Oil Exports

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The Russian refining system is the third largest in the world, ranking only behind the USA and China with approximately 275 mt of total capacity and 2011 throughput of 257 mt. However, despite this high output and capacity utilisation, the majority of Russia's refineries are of significantly lower quality than their global peers, with an average Nelson complexity index of just over 5 compared to a European average of 6.5 and a US average of 9.6. The fundamental reason for this difference is that all but one of the refineries in Russia were built during the Soviet era to service the USSR's enormous military and industrial complex, with more than 75 percent being constructed before 1970 and with a focus as much on producing fuel oil to power tanks and other military equipment as on producing light products for other transport needs. Power generation was also a major user of fuel oil in the Soviet era, with bunker fuel and demand from the railways accounting for the remainder of demand. As a result, by the end of the Soviet era approximately 45

percent of Russia's output of major oil products was accounted for by fuel oil, with 98 mt being produced in 1991.

The trends in Russia's refining sector during the 1990s mirrored the overall collapse in the country's oil industry, with product output falling by more than 40 percent between 1991 and 1998 in line with the country's economic decline. Almost no investment was made in upgrading refining capacity during this time, and therefore fuel oil output, although significantly reduced (to a low of 48 mt by 2000), continued to account for approximately 40 percent of the product mix. This continuing preponderance of lower quality products did not have a major impact on the economy, however, as the country's vehicle fleet continued to be relatively small and largely made up of Soviet-era vehicles using low-octane gasoline. The key problem was felt in the oil sector itself, where refinery utilisation fell to below 50 percent (and in some remoter refineries to much lower levels), meaning that the industry was running at a significant loss.

The economic problems for the refining industry were exacerbated in 1999 by the introduction of an export tax on oil products that was in line with the crude oil export tax introduced at the same time. The level of the tax was set on a relatively ad hoc basis until it was formalised in 2003 at 90 percent of the level of the crude export tax. This essentially meant that exports of fuel oil were very sub-optimal, given the lower price that they could generate compared to other oil products. This commercial issue for Russian refiners, combined with growing domestic demand for oil products as the Russian economy rebounded from the 1998/99 economic crisis, highlighted for the first time a growing problem of product imbalance in the sector. With the military and industrial complex in continuing decline and with the power sector increasingly switching to gas rather than fuel oil as its major fuel input, demand for fuel oil had also continued to fall, while at the same time demand for lighter products, in particular gasoline, had started to rise. Indeed, the biggest challenge was

meeting the demand for high octane gasoline, which was emphasised by the fact that Russia was exporting lower quality 92 Research Octane Number (RON) gasoline while importing higher RON products. Furthermore, given the lack of investment in the Russian refining system, every extra tonne of gasoline or other light product produced domestically necessitated the additional production of a tonne of fuel oil, for which there was a declining market. This fuel oil could not be sold domestically and had very marginal economics on the export market (where it ultimately had to be sold) due to the high export tax, leaving refiners with a dilemma – satisfy domestic demand for light products but generate poor returns on fuel oil exports, or reduce refinery throughput to lower the output of fuel oil but then fail to meet domestic demand for light products.

The debate between the oil industry and the Russian state over this issue lasted for two years, with the government making an initial concession to reduce the export tax on products to 65 percent of the crude oil levy in July 2004, before finally introducing a formal export duty scale for refined products based on the price of crude oil but offering significant discounts to the crude export tax. This change to the tax rules in favour of product exports was catalysed not only by the need to provide a more profitable outlet for Russian fuel oil but also by the intention of the Russian Administration to see the extra profits generated then re-invested in the upgrading of the country's refining system. From his earliest days in office President Putin had stated his desire to see Russia exporting less raw materials and more finished goods, and in the oil sector this was meant to be reflected in increased oil product sales as opposed to crude. A further implication of the lower product export tax was to reduce the pressure on domestic product prices, with light products now effectively being priced on an export netback basis. As a result a lower export tax meant a lower netback

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and a lower wholesale price in Russia.

However, this change of affairs did not produce quite the impact that the Russian government had been expecting. The profitability of the Russian refining system certainly improved, and economic activity in the refining sector was therefore encouraged, with a particular impact on export sales but with benefits to the domestic fuel economy too. Refinery utilisation increased sharply from 72 percent in 2004 to a post-Soviet high of 93 percent in 2011 as Russian oil companies diverted as much crude oil as possible towards the lower tax environment enjoyed by product sales, with many of the major companies seeing close to 100 percent refinery utilisation in 2011. Unfortunately, one of the major failings of the new oil product tax regime was that, although oil companies were incentivised to produce more products and increase refinery activity, there was no real incentive to invest in upgrading capacity. Indeed the major commercial incentive over the period since 2004 has been to exploit the tax break to its fullest extent, and oil product exports rose from 71 mt in 2004 to around 130 mt in 2009–2011, with a particular emphasis on fuel oil exports. In contrast, although there were isolated examples of upgrading work being carried out, the overall complexity of Russia's refining sector remained remarkably stable. The average Nelson Complexity Index of a Russian refinery has only risen from 4.4 in 2004 to 5.1 in 2011, while the share of fuel oil as part of the output of major oil products has actually increased from 38 percent to 40 percent on the same timescale.

This lack of upgrading investment has been in direct contrast with the demands of the Russian domestic market, where a combination of increasing car ownership and an upgrading of the car fleet has led to a sharp increase in demand for higher quality oil products, in particular high octane gasoline. This trend is set to continue, as highlighted by LUKOIL CEO Vagit Alekperov in a recent strategy presentation, with vehicle ownership in Russia forecast to increase by 4 percent p.a. to 2021 while demand for gasoline is expected rise by 3.5 percent p.a. (the lower rate reflecting increasing vehicle efficiency), with premium gasoline accounting for the majority of this growth. In response to this situation, then Prime

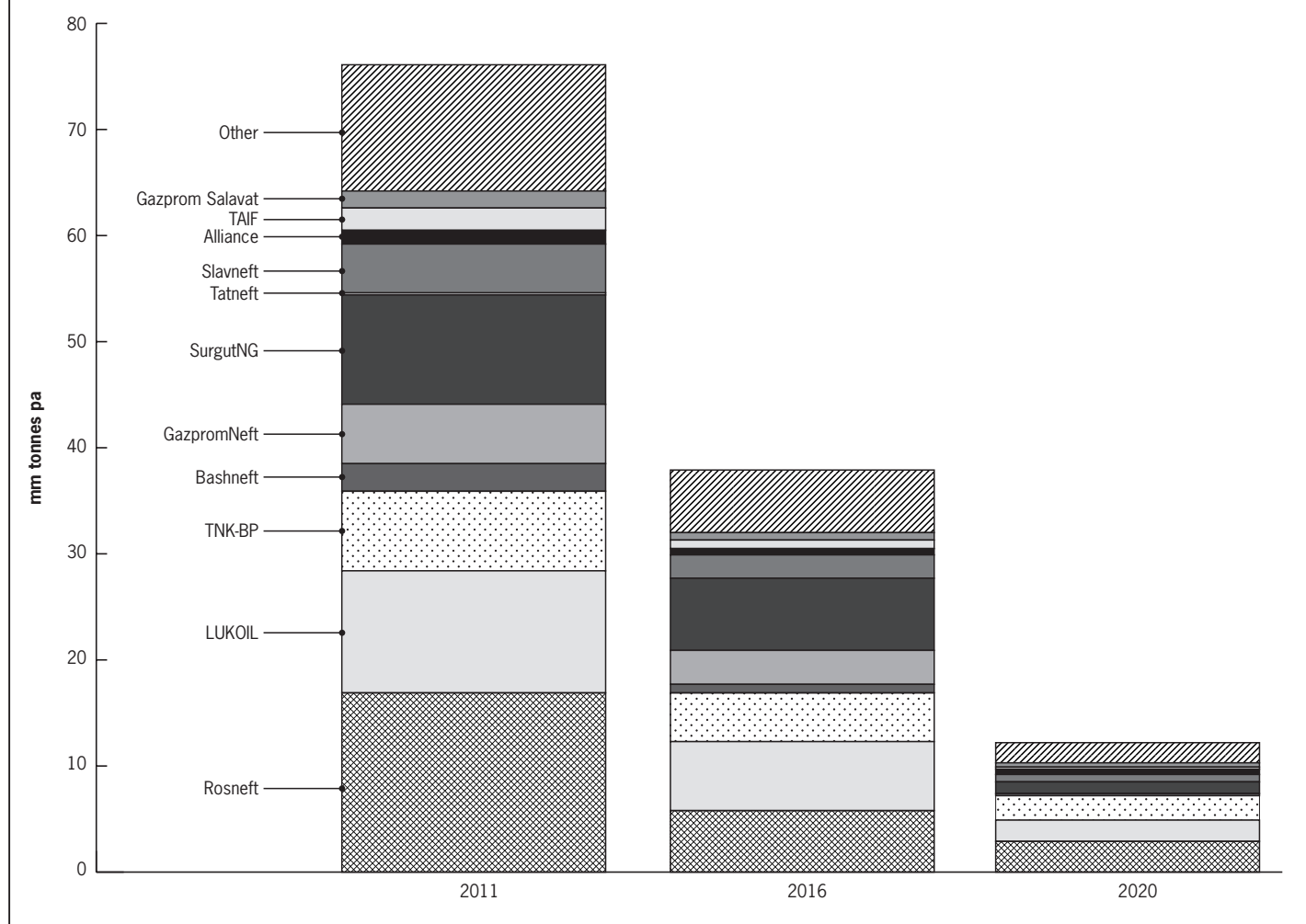
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Minister Putin responded by temporarily increasing the gasoline export tax and more fundamentally calling a meeting of the leaders of Russia's major oil companies to discuss the strategic priorities for the country's refining industry.

This meeting, held in Kirishi near St Petersburg in July 2011, saw Putin express his dissatisfaction with the progress being made in the Russian refining sector and demand improvements catalysed by a further change in the tax regime. While the exact details of the commitments extracted from the companies have not been made public, Putin made clear that he wanted to see the implementation of the main targets of the Russian Energy Strategy to 2030 (published in 2009), which involved raising Russia's overall refining capacity to 285 mt, increasing overall refining depth from 72 to 85 percent by 2015 and decreasing fuel oil production by at least 17 percent.

In order to catalyse progress from the Russian oil companies, two spurs to action have been created. The first is an implicit threat that if the formal upgrading commitments are not met then the Federal Anti-Monopolies Service (FAS) will not allow oil companies to profit at the expense of Russian consumers, and will, in President Putin's words, ‘respond with appropriate measures, including the appropriation of windfall profits’. A further incentive for oil companies to complete their refinery modernisation plans has been provided by the implementation of the new ‘60/66’ tax regulation, which has increased the export tax on oil products while reducing the burden on crude oil exports.

Essentially the new rules, introduced in October 2011, have increased the export tax on fuel oil to 66 percent of the level of the crude export tax, have formalised the export tax on diesel at the same level and have increased the export tax on gasoline to 90 percent of the crude export tax. Furthermore, it has been proposed that the tax on fuel oil exports should

Figure 1: Forecast of Russian Fuel Oil Output by Company to 2020

Source: Company Data and Forecasts

rise gradually to a level of 90 percent, and perhaps even 100 percent, of the crude oil export tax by 2015, thus completely changing the commercial incentives for Russian refiners within four years. Under the new tax rules the export tax on fuel oil now accounts for 38 percent of the export price, underlining the incentive for Russian refiners to start to reduce their fuel oil output, especially as at lower oil prices there is a significant risk that product exports could now become unprofitable.

As a result of these tax changes the Deputy Head of the FAS Anatoly Golomolzin has noted, 'For the first time in many years Russian companies have begun to seriously attend to oil refining.' Although the exact timing of this investment is somewhat uncertain, being dependent on the development of government policy as well as the Russian product market, it nevertheless now seems inevitable that a significant upgrading of

the Russian refining system will have occurred by the end of this decade. Indeed, the overall conclusion is that thanks to the improvements planned by all the Russian oil companies fuel oil output is set to decline sharply while production of gasoline, diesel and jet kerosene will increase to meet the changing needs of the Russian economy.

Figure 1 summarises just how dramatic the decline in Russian fuel oil production could be, showing an estimate based on individual company forecasts but adjusted in an attempt to reflect a likely outcome given the potential for delays and missed targets. Nevertheless, the overall conclusion is that fuel oil output could fall from 76 mt in 2011 to 38 mt in 2016 and to only 12 mt by 2020, with the potential for the latter number to be brought forward if all the companies meet their most aggressive targets.

This decline in fuel oil output will feed

directly through to export sales, depending upon the trends in domestic demand. On the assumption that targets outlined in the Government's Energy Strategy are met it is possible to estimate Russian fuel oil demand of 9.5 mt in 2016 and 8.2 mt in 2020, down from around 12 mt in 2009. When these estimates are combined with the sharp anticipated fall in fuel oil production the impact on the potential decline in fuel oil exports becomes clear. Despite an estimated 5 mt fall in domestic demand by 2016, the current upgrading plans for Russia's refineries mean that supply could fall by more than 30 mt compared to 2009 levels (and more than 35 mt compared to the higher production in 2011), meaning that fuel oil exports could fall below 30 mt by 2016. These trends are then set to continue to 2020, with the gradual decline in domestic demand swamped by the continued fall in fuel oil output to an estimated 12 mt, meaning

that fuel oil exports could collapse to as low as 4 mt.

In short, the Russian government has provided a clear fiscal incentive to encourage its domestic oil industry to upgrade the country's refining complex and reduce fuel oil production. The key lever has been the export tax on fuel oil, which has already been increased by 71 percent and is set to rise further if plans to make it equivalent to the crude export tax by 2015 are implemented. At this point the economics of fuel oil exports would become very marginal at best, and would be likely to be loss-making, suggesting that the upgrading plans outlined above have strong economic rationale and that their implementation is very probable, if not guaranteed. If anything, this analysis has understated the potential for the fall in fuel oil production because it has taken into account the possibility of construction delays and uncertainty about the

ability of all the Russian oil companies to implement their plans within such a short time period.

Furthermore, the potential exists for unintended consequences to undermine the speed of the overall shift in the shape of the refining industry in Russia. One example would be the concern expressed by a number of companies that if all the targeted increase in refinery complexity is achieved on the current timescale, there could well be a 4–7 mt gasoline surplus in Russia by 2016, a possibility confirmed by former Energy Minister Sergei Shmatko in April 2012 when he noted that gasoline consumption in 2015 could reach 39 mt compared with a targeted output of 44 mt. Clearly such an oversupply would not be attractive for Russian refiners, especially as the profitability of gasoline exports has been undermined by the new higher export tax, and this potential scenario could cause some companies to

attempt to delay upgrading investment. A further complication could also be an excess production of diesel, of which Russia already has a surplus and where the export market in Europe would also be difficult. This would lead to the conclusion that, in tandem with Russia's refinery upgrading programme, a further drive to increase the domestic use of diesel-fuelled cars is also required, as highlighted by a recent study from the Skolkovo Energy Centre in Moscow. Nevertheless, the Russian government's firmly stated commitment to the regeneration of its country's refining industry and its determination to ensure that domestic demand for higher quality products is met would suggest that, although the exact timing of a reduction in fuel oil production may be unclear, a sharp decline in exports by 2016 seems inevitable, while by 2020 Russian fuel oil may have almost disappeared from global markets. ■