

IN CONFERENCE

Russian Fuel Oil and VGO Production and Exports:

The View from Petromarket Research Group

This Issue's "In Conference" is based on a presentation by Yakov Ruderman of Moscow-based Petromarket Research Group at World Fuel Oil Summit VIII on May 19-21, 2015 in Athens, Greece. Dr. Ruderman is general director of the Petromarket Research Group, which consults on energy markets to the Russian government and Russian oil companies. The fuel oil summit was organized by Axelrod Energy Projects and hosted by Greece's Public Power Corporation.

In assessing the Russian fuel oil and VGO exports, this issue's "In Conference" begins with Russia's modernization program and the key challenges facing this program. Next, there is a forward assessment of crude throughput and refinery upgrading as well as fuel oil and VGO production. Finally, there is a forward assessment of fuel oil and VGO exports.

Challenges to the Russian Refining Industry

An ambitious oil refinery modernization program has been under way in Russia since mid-2011. The program was designed to improve the degree of feedstock conversion and the quality of motor fuels produced. The modernization program was launched as part of the so-called Quadripartite Agreement of IQ 2011 between 18 Russian oil companies and three government authorities (namely, the Russian Federal Antimonopoly Service; the Federal Service for Ecological, Technical and Nuclear Supervision; and the Federal Agency for Technical Regulation and Metrology). Among the Russian oil companies were ten vertically integrated companies, namely:

- Rosneft,
- Gazprom
- Gazprom Neft
- Lukoil
- Bashneft
- Slavneft,
- Alliance
- Surgutneftgas
- ForteInvest
- Tatneft

and eight independent Russian refineries, namely:

- TAIF-NK
- Antipinsky
- Mariinsky

- Novoshachtinsky
- Afipsky
- Ilsky
- Krasnodarsky
- Yaisky

The Quadripartite Agreement, which covered the vast bulk of the Russian refining industry, provided for the construction of more than 120 upgrading projects by 2020. In addition to the upgrading projects, Russian refineries planned to boost their atmospheric distillation capacity by 13.5 million Mt/year and vacuum distillation capacity by 22.5 Mt/year.

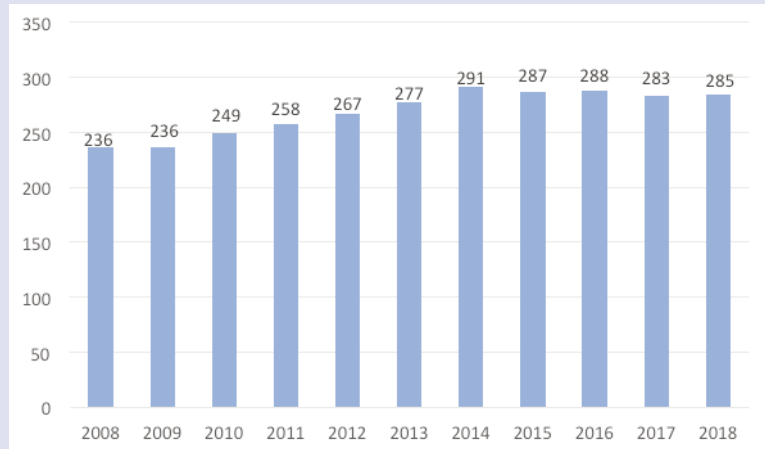
Although 17 of the upgrading projects have already been completed, the refinery modernization program faces several significant challenges. These challenges include —

- the collapse in world oil prices,
- the changes in the Russian taxation system, and
- the international sanctions, which serve to limit access to foreign capital markets.

In 2013-2014, with crude oil prices at around \$100/bbl, the average Russian refinery margin was above \$10/bbl at a crude oil price of around \$100/bbl. This level of refinery margin was based in part on the difference between the crude oil export duty and product export duties, with the government in effect subsidizing the refining industry by dint of this gap. One of the goals of the 2014 tax reform was to withdraw part of this subsidy to the benefit of the Russian government. The tax reform was based on an assumed crude oil price of around \$100/bbl. At a crude price of \$50-60/bbl the reform puts oil refineries in a more difficult position due to a substantial reduction in refinery margins. Under the circumstances, oil companies seek to change the terms of the Quadripartite Agreement.

FIGURE 1
RUSSIA, CRUDE (AND GAS CONDENSATE) THROUGHPUT AT REFINERIES

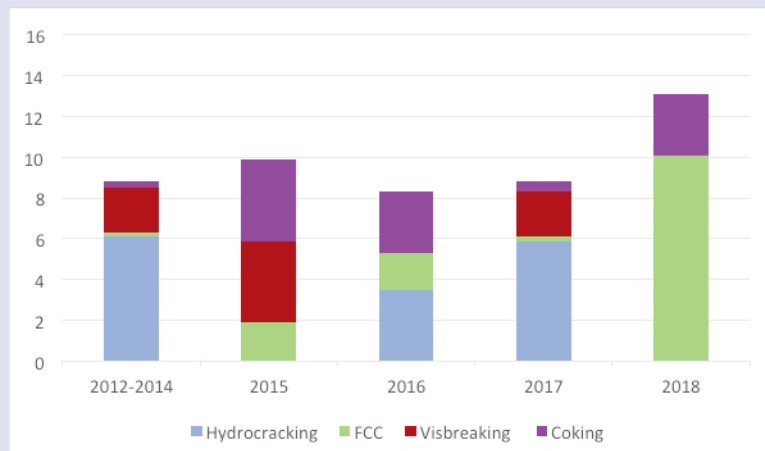
(Million Metric tons)



Source: Petromarket RG.

FIGURE 2
RUSSIA, PLANNED GROWTH OF REFINERY CONVERSION CAPACITY

(Million Metric Tons per Year)



Source: Petromarket RG.

FIGURE 3
RUSSIA, FUEL OIL YIELD OF REFINING

(Percent)



Source: Petromarket RG.

In particular, oil companies want to reduce the number of upgrading projects and extend construction deadlines.

Fuel Oil and VGO Production

Crude (and gas condensate) throughput at Russian refineries grew at a strong pace of 4.2 percent per annum from 2009 to 2014. At the beginning of 2015, the aggregate capacity of Russian refineries stood at 315 million mt/year. Based on runs of 291 million mt/year, capacity utilization in 2014 was 92 percent. A realistic estimate of refining throughput in 2015 is 287 million mt, with a further expected drop to 283-285 million mt/year by 2017-2018 (see the accompanying chart).

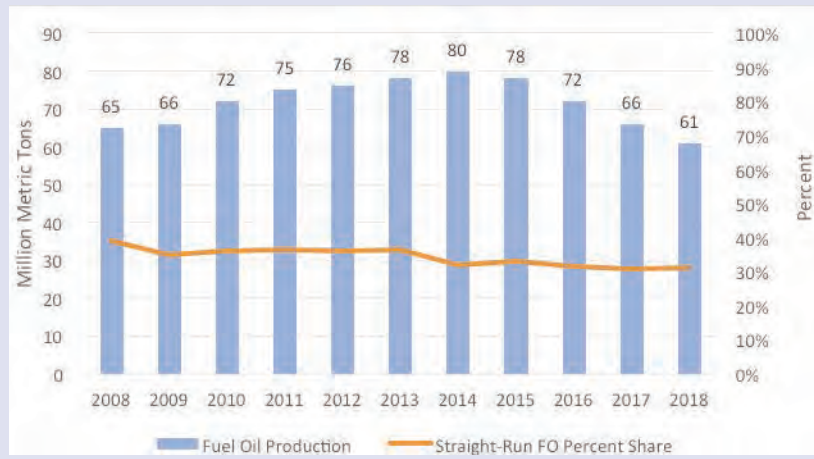
The tax reform, it should be noted, makes fuel oil and VGO production gradually less profitable from 2015 for Russian refiners. Besides the tax reform, fuel oil and VGO production will be also affected by the ongoing refinery modernization program. A number of relevant secondary units are expected to begin operation 2015-2018. These secondary units include:

- hydrocracking of VGO (7 units with total capacity of 16.6 million mt/year),
- hydrocracking of tar (3 million mt/year),
- FCC (4 units with a total capacity of 6.1 million mt/year),
- delayed coking (6 units with total capacity of 10.1 million mt/year),
- flexicoking (1.5 million mt/year),
- visbreaking of vacuum distillation residue (5 units with a total capacity of 7.3 million mt/year), and
- vacuum distillation (8 units with a total capacity of 17.9 million mt/year). See the accompanying chart.

As a result of the new conversion units, the fuel oil yield at Russian refining will continue to dip dramatically. The fuel oil yield at Russian refining had already fallen from 30.3 percent in 2011 to 28.1 percent in 2014. The fuel oil yield is seen falling to 22.1 percent in 2018 (see the accompanying chart).

Based on these fuel oil yields and assumed crude runs, Russian fuel oil production will fall from substantially from a peak of 80 million mt/year in 2014. By 2018, fuel oil production will have fallen to

FIGURE 4
RUSSIA, COMMERCIAL FUEL OIL PRODUCTION



61 million mt/year. The straight run share of Russian fuel oil production will dip from around 35 percent in 2014 to less than 30 percent in 2018 (see the accompanying chart).

Of the 80 million mt/year of fuel oil produced in 2014, Rosneft accounted for 31.4 percent. Other leading fuel oil producers were Lukoil (12.4 percent), Surgutneftegaz (10.6 percent), and Gazpromneft (5.1 percent) (see the accompanying chart).

Based on new vacuum capacity, Russia's VGO production will rise from 12 million mt in 2014 to 13 million mt in 2016. On the basis of new cracking units, VGO production will dip to 10 million mt by 2018 (see the accompanying chart).

FIGURE 6
RUSSIA, VGO PRODUCTION

(Million Metric Tons)

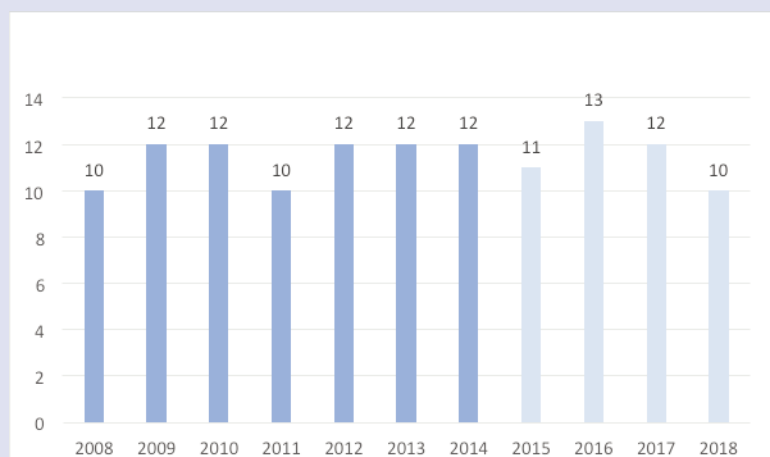
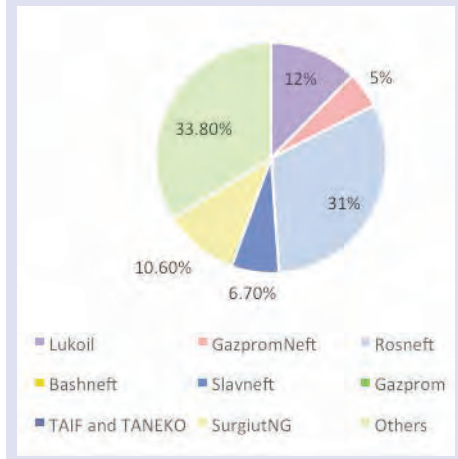


FIGURE 5
RUSSIA, FUEL OIL PRODUCERS, 2014



Fuel Oil and VGO Exports

With only limited demand for fuel oil in Russia, the bulk of Russian fuel oil production must be exported. On the back of higher crude runs and higher fuel oil production, Russian fuel oil exports to the West surged from 47 million mt in 2008 to 58 million mt in 2013. Fuel oil exports to the West ran 57 million mt in 2014 (see the accompanying chart). In line with refinery upgrading and the expected drop in fuel oil production, fuel oil exports to the West are seen falling from the 56-58 million mt level in 2015 to 39-42 million mt in 2018. Straight-run fuel oil exports to the West are seen falling from 15-16 million mt in 2015 to 4-6 million mt in 2018.

In recent years, foreign ports have accounted for a declining share of Russia's fuel oil exports to the West (see the accompanying chart). For the exporting company, Russian ports are more attractive from both the logistical and political perspectives. In 2010, foreign ports accounted for 55 percent of the 56 million mt total of fuel oil exports to the West while in 2014 foreign ports accounted for only 9 percent of Russia's fuel oil exports to the West. The key foreign ports still handling Russian fuel oil exports are the Estonian port of Muuga and the Latvian ports of Ventspils. With respect to Russia's fuel oil exports to the West from Russian ports, Ust Luga has been taking a rising share in recent years. Ust Luga's share has risen from 17 percent of the 6.69 million mt exported from Russian ports to the West in 2011 to 29 percent of the 14.522 million mt of fuel oil exported to the

TABLE 1
RUSSIA, FUEL OIL EXPORTS TO THE WEST BY RUSSIAN PORT*

(Million Metric Tons)

Year	St. Petersburg	Vysotsk	Novorossiysk	Tuapse	Ust Luga	Taman	Caucasus	Murmansk	Taganrog	Others
2008	11.57	3.24	2.19	3.96	–	–	1.55	0.36	0.91	0.61
2009	11.91	4.08	2.37	4.00	–	–	1.93	1.08	1.18	0.34
2010	12.13	4.35	3.22	3.40	–	–	1.67	1.21	1.39	1.66
2011	10.55	5.88	3.87	3.37	6.69	–	1.60	1.48	1.59	2.52
2012	10.12	6.54	5.77	3.93	12.55	–	0.77	0.96	1.00	1.60
2013	8.92	5.93	7.69	4.24	13.18	0.75	0.92	1.03	0.74	1.54
2014	8.62	6.35	7.51	5.57	14.52	4.12	1.18	0.65	0.70	2.79

*Including Crimean port of Kerch in 2014.
Source: Petromarket RG.

West from Russian ports in 2014. Other key Russian ports for fuel oil exports include St. Petersburg, Novorossiysk, Vysotsk, and Tuapse (see the accompanying table).

The capacity to export heavy petroleum products from Russian terminals in the north slightly exceeds the capacity in the south. The northern terminals (on the Baltic and Arctic Seas) have aggregate capacity to export heavy petroleum products of 42.3 million mt/year. Of the northern terminals, three terminals account for the bulk of capacity to export heavy petroleum products: Ust-Luga (37 percent total capacity), St. Petersburg (27 percent), and Vysotsk (24 percent).

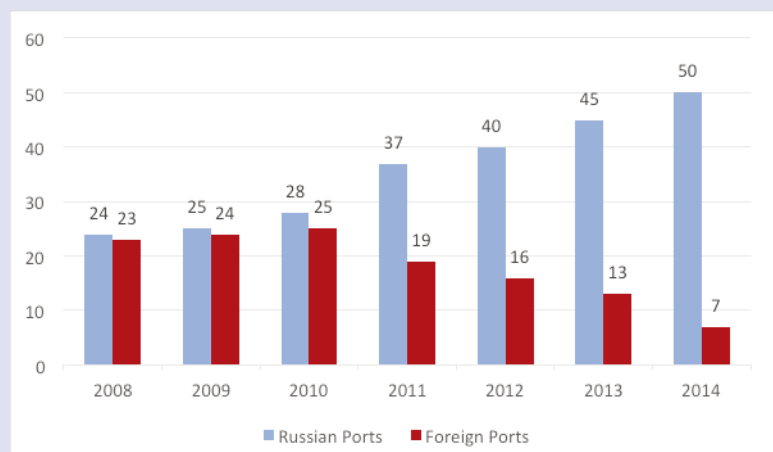
The southern terminals have aggregate capacity to export heavy products of 41.7 million mt. Of the southern terminals, the largest levels of heavy products export capacity are located at Novorossiysk (31 percent of total capacity), Tuapse (16 percent), Rostov (13 percent), and Taman (11 percent).

Two major terminal projects will significantly add to Russia's capacity to export heavy petroleum products. Ust-Luga Oil (ex-Rosneftbunker) will add over 4 million mt/year capacity to its Ust-Luga terminal on the Baltic Sea, with start-up of the new capacity by the end of 2015. OTEKO's terminal at Taman in the Kerch Strait will have over 4.5 million mt/year of new capacity, with start-up in 2017.

Russia's VGO exports jumped from 9 million mt in 2011 to 11 million mt in 2013-2014. In 2014, foreign ports accounted for about half of all VGO exports. The key ports for VGO export are Kerch, St. Petersburg, and the Estonian port of Sillamae. At Russian ports, VGO is mainly carried by sea/river tankers to offshore transshipment vessels (see the accompanying chart). With around 1 million mt of VGO production remaining in the local market, Russia's VGO exports will fall to 9 million mt by 2018.

FIGURE 7
RUSSIA, FUEL OIL EXPORTS TO THE WEST

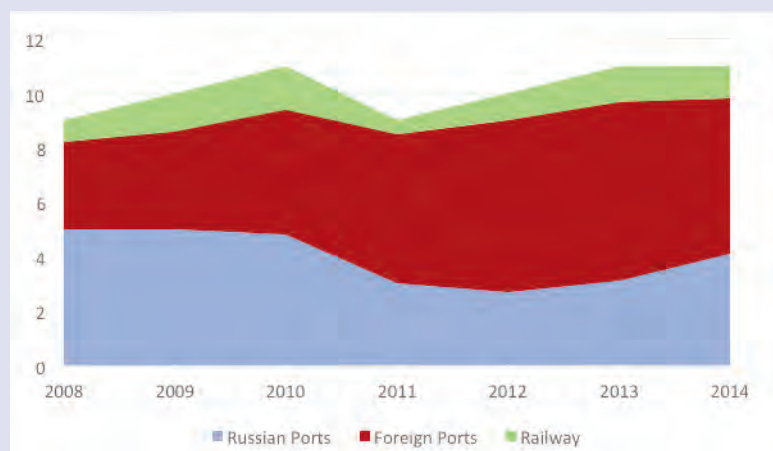
(Million Metric Tons)



Source: Petromarket RG.

FIGURE 8
RUSSIA, VGO EXPORTS

(Million Metric Tons)



Source: Petromarket RG.

Conclusion

Despite sanctions and reduced margins, Russian refiners are likely to continue with the refinery modernization program over the next few years. As a result of refinery upgrading, there looks to be

sharp falls in fuel oil and VGO production. (In line with the upgrading, straight run's share of total fuel oil production will decline substantially in the coming years.) Concomitantly, Russian fuel oil and VGO exports can be expected to decline sharply through 2018. ■