

# Analysis of the problems and development prospects of the oil refining industry of Russia

Liubov Nikolaichuk

Leonid Sinkov

Anastasia Malisheva

Department of Economics, Accounting and Finance  
Saint-Petersburg Mining University, Saint-Petersburg, Russia

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Oil refining industry, development, management, investments.

## Abstract

*Present article is dedicated to the analysis of problems of the oil industry of Russia and is aimed at the development of a mechanism for its growth. The research is based on the results of the economic analysis that has been carried out on the basis of statistical data from the government and major oil companies as well as on the basis of analytical reports of independent companies. Among the main identified problems of the oil refining industry it can be mentioned following problems: insufficient volumes of raw material processing, lack of refinery capacities, remote location of oil extraction and refinery plants from the end users and unbalanced tax system in the industry. Specified problems are being solved on the level of companies and the state that brings results, however, there is no clear development mechanism of the oil refining industry so far. The authors suggest a development scheme for the Russian oil refining industry implying cooperation of businesses and the state. The implementation of the proposed scheme will ensure the investments for the extension of production and obtaining a product with a higher added value as well as increasing the competitiveness of the Russian oil products.*

Corresponding author: Liubov Nikolaichuk

Email address for corresponding author: [9464717@gmail.com](mailto:9464717@gmail.com)

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## 1. Introduction

Fuel and energy industry is one of the most important industries of the mineral resources sector and it has a significant impact on the world economy. Increase of the demand for the energy resources takes place due to the development of the energy and transport industries. Revealed background determines hydrocarbons as the exceptional factors of the economic development of the state.

Currently, oil and gas industry is the main source of energy in the world fuel and energy balance. In the year 2015 according to the general state of consumption of energy resources, the share of hydrocarbons amounted to 56.7%, 32.9 % of which was oil in general market conditions (BP Statistical Review of World Energy, 2016). Extraction and consumption of hydrocarbons increase every year.

Russia is one of the world's top three oil producers along with the United States and Saudi Arabia. Oil often becomes the main factor of economic, political or social development. Any significant change in the oil industry leads to the global change in all spheres of public life. Oil and oil products are widely used in various industries apart from energy sector; this is production of plastic materials, medicine, cosmetology, fabrication of synthetic fabrics. The use of oil as a fuel

requires its processing which results in production of black oil, straw oil, kerosene, diesel, ligroin and gasoline.

At the moment Russian oil refining companies mainly export the extracted raw material, while oil processing is developed at a low level. At the same time, refining enables companies to get a new finished product with a higher added value, moreover high quality oil products are in a high demand on internal and external markets.

Growing demand for fuel, increasing prices for light oil products, reduction of high quality oil reserves lead to the fact that business needs to invest in technological development of the raw material processing. Today oil refining efficiency in Russia amounts to just over 70%, while the industry's development strategy states such numbers as 85-90% (The Russian Government, 2009). Development and use of new technologies can play a crucial role in order to diversify the income of the oil companies by going to more global markets of liquid oil as well as to increase the profitability of their activity.

## 2. Materials and Methods

### 2.1. Existing problems analysis

Main problems hindering the development of the oil refining industry are considered by a number of Russian and foreign authors.

Chernysheva E.A. (2011) in her work "Problems and ways of development of the advanced oil refining in Russia" mentions the need to upgrade the oil industry in order to fight for global markets. Refining in Russia in terms of its development is far behind from industrialized countries, while its enhancement requires the development of science and technology in the field of oil refining.

Analysis carried out by Solomonov A.P. (2015) is of a particular interest. In his research the author emphasizes the need to produce fuel corresponding to the world's quality standards. Low processing depth does not constrain the export of competitive fuel to the far-abroad countries.

The work of the Research group "Petromarket" led by Khomutov I.A. (2016) mentions the hidden subsidizing of the oil refining companies by the state which appears due to the differences between the export duty rates for oil and oil products as the main constraint of the industry's development.

Thus, the oil-refining problem in Russia, which occupies the minds of scientists and is being discussed at the national level, is actually a pressing problem.

Performed analysis shows that the main problems of the Russia's refinery industry are insufficient number of oil refining plants, lack of refinery capacities and remote location from outside markets. Refining provides a new finished product with higher added value. Deeper processing of hydrocarbons is the main task of the near future.

### 2.2. Processing and export

Half of the oil produced in Russia is exported, while a significant share of produced oil is exported as fresh raw materials, which is shown in table 1.

Indicator	2010	2011	2012	2013	2014	2015	2016
Production of oil, mln t	505,2	511,4	518,1	523,4	526,7	534,1	547,5
Export of oil, mln t	236,6	219,0	240,0	236,6	223,4	244,5	254,8
Oil export share, %	46,8	42,8	46,3	45,2	42,4	45,8	46,5
Refining output, mln t	248,8	256,5	265,4	274,5	288,9	282,4	274,0
Refining share, %	49,2	50,2	51,2	52,4	54,9	52,9	50,0

Table 1. Production, refining and export of oil in Russia for the years 2010-2016 (The Ministry of Energy of the Russian Federation, 2016; The federal Customs Service, 2017)

The Russian oil industry is focused on the export of crude oil, which requires a large amount of investment at the current level of development of the oil refining industry. One evidence of the

raw material orientation of the oil complex is a "tax maneuver" of year 2014. The essence of the reform is to lower the marginal rates of export duties on oil and increase the basic rate of tax on the extraction of mineral resources (Ministry of Finance of the Russian Federation, 2015). Initially, the following export duties on crude oil were established: 42% for year 2015, 36% for year 2016 and 30% for year 2017. However, because of the threat of shortfalls in the federal budget, the export duty rate was set at 42% in the year 2016. Therefore, it is hard for business to make strategic plans under a context of uncertainty and risks on the level of legislation.

The main oil products produced in Russia are black oil, diesel, gasoline and kerosene. Oil companies need to strive for a deeper oil refining and production of finished products with a greater added value. The primary task for the oil refining companies is to provide the sufficient supply to the internal consumers. In the year 2016 274 million tons of crude oil were processed in Russia, out of which only 156 million tons were exported. As can be seen in Figure 1, in recent years the share of export of oil products remains at the level of 55-60% of the total volume of processing.

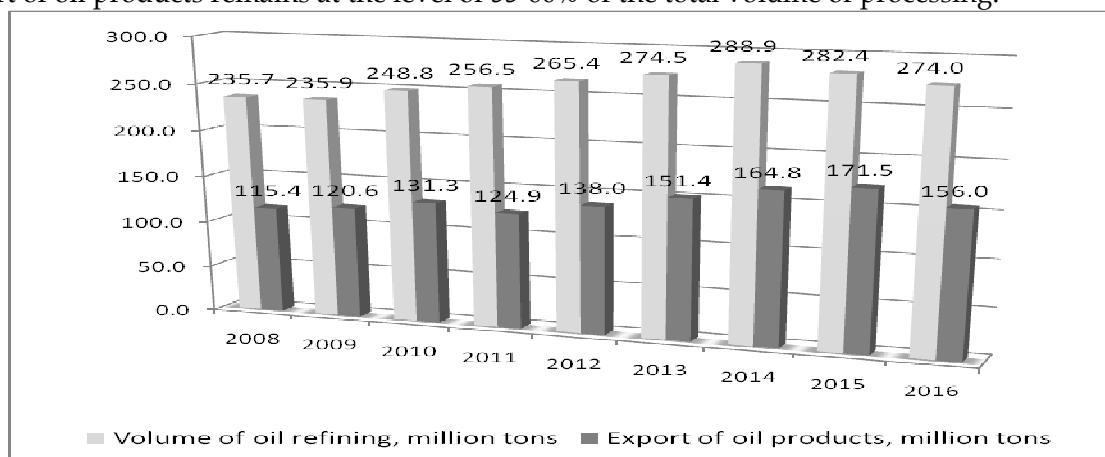


Figure 1. Export of oil products in the total volume of processing for years 2008-2016 (The Ministry of Energy of the Russian Federation, 2016; The federal Customs Service, 2017)

Thus, refineries buy more expensive raw materials, that is caused by the increased tax rates on mineral extraction, and this has a negative impact on the level of profitability of their production. Reuters' analysis of the data showed that in the year 2015 the sale of crude oil on the world market was more favorable than the sale of the crude oil primary processing products by \$ 6 per ton.

The performed analysis shows the importance of strengthening of the competitive position of Russian products both on the domestic and foreign markets. It is necessary to meet the demand for high-quality refined products which correspond to the world standards, while reducing the export of primary processing products. It is required to ensure the diversification of production of high quality products by refinery plants.

### 2.3. The role of the state in oil refining

According to the decree of the RF Government N 1771-p (The Russian Government, 2011) the planned modernization of Russian refineries has been launched in Russia. Implementation of these measures yielded results: the volume of oil refining increased over the past five years by 7%, despite the decline in years 2015-2016 due to reduction of state tax subsidies under conditions of low prices.

Also, a four-party agreement was signed in 2011 (the Federal Antimonopoly Service of Russia, Federal Service for Ecological, Technological and Nuclear Supervision, Federal Agency on Technical Regulation and Metrology, as well as oil companies) for the modernization of existing and construction of new refineries in order to increase processing capacity. It is worth noting that the implementation of the agreement is undergoing some adjustments due to the fall in oil prices. However, currently the average depth of oil refining has been increased from 71% to 74% and the product quality has been improved.

Nevertheless, the average depth at Russian refineries is still at a low level, as it can be seen in Figure 2, while in the USA the similar indicator equals to 96% and in the EU to 85% (Business Journal Neftegaz.RU, 2016). Accordingly, it is hard for Russian oil products to compete with foreign products. In addition, the markets set high environmental standards for finished products, which are difficult to meet for the Russian products.

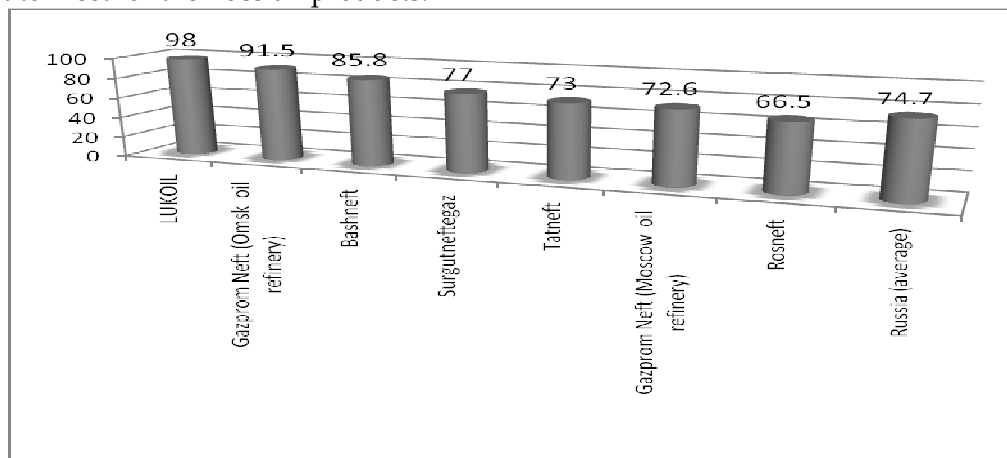


Figure 2. The depth of refining by large Russian companies in the year 2015, % (compiled based on reporting documents of companies)

Russia has every opportunity to increase the capacity of export of oil products with higher added value. To date, the proceeds from such supplies amount to 10% of the federal budget. Therefore, it is important to increase the pace and depth of oil refining.

The state is the biggest stakeholder interested in the development of the oil refining industry. To achieve objectives set in the government programs one needs to stimulate the development of innovation technologies and techniques in the field of processing of raw materials, as well as to improve customs and tax legislation, including by creation of stable conditions for the activities of the oil companies.

#### 2.4. Development of the oil refining industry

External factors play a special role in the development of the oil refining industry in Russia. It is possible to mention the following factors as well: the increased competition on international sale markets; risks of long-term saving sanctions from the western countries for access of the companies to technologies and market of borrowed funds; violation of the international coordination and cooperation in the form of the ban of investments and participation in the international projects. As the result, the investment mechanism is broken for Russian companies and development of technological potential of industry are limited.

Implementation of a four-party agreement on development of the oil refining industry is directed to increase technological capacity of diesel production that focused on export. At the same time the demanded in diesel fuel is less than a gasoline in Russia. In the near future the companies can face a problem of excess capacities for diesel production. The competition in the European market between Russia and countries of the Middle East and the USA will increase.

About half of all the oven units in Russian refinery plants have performance factor of 50-60%, while the average rate in foreign plants is 90%. To ensure high quality of fuel and other oil products corresponding to today's global level it is required to build and modernize dozens of technological units based on the significant investments into the sector. This will be possible only with extensive development of production of all types of fuel in Russian refinery plants in order to meet the modern demand of the global market. It is worth noting the importance of tightening of legislative requirements for fuel in Russia and abroad. One of the main issues in this field is protection of the environment, namely the reduction of greenhouse gas emissions (Tcvetkov P., Cherepovitsyn A.,

2016 ). Competitiveness of the Russian oil products in the European market is at a low level. The main volume of the made production at the Russian oil refinery's doesn't conform to the European standards.

It should be noted that growth of the competition in the foreign markets is also caused by the policies employed recently in some countries. Their main goals include increase in energy efficiency of national economies, decrease in dependence on external sources of energy and reduction of environment pollution.

The remoteness of Russian refineries from foreign consumers also affects their profitability in a negative way. High logistics costs significantly increase the price of the final product. At the same time, in the countries with a high level of development of the refining industry, despite the collapse in oil prices in 2014, the cost of oil products declined with a much slower pace, or even increased. Foreign companies bought cheap raw materials and produced expensive fuel, yielding high profits. Problems of long distances matter not only for foreign customers with their yield drops, but also for Russian producers within the country. Now oil production is displaced from traditional regions gradually to the new remote regions of the country, including those near the sea shelf. It increases distance between the centers of oil production and processing, costs of transportation increase. In different regions of the country oil refining depends on quality of oil and on those types of fuel which are demanded in local conditions.

In the current economic and political situation, international banks are reducing transaction limits for the Russian companies. Given that, the opportunities of Russian banks are limited. It is clear that in the environment where liquidity is decreasing, credit terms are reducing and credit interest rates are increasing, the investment plans of companies are changing. A large share of projects has been stopped, the pace of modernization and introduction of new technologies slowed down. Under such circumstances, many optimistic priority projects are not being implemented as scheduled.

A large share of projects on modernization of refinery plants is built on the implementation of foreign technologies. High-tech and sophisticated equipment is being imported, including control systems of production and modern industrial refining. Today the gap in the scientific and technical base of Russian and foreign research and development centers is quite significant. Western companies have been investing in research and development work in petrochemical industry for years that allowed them to create a special infrastructure for further development of innovations. Russian companies are currently lagging behind their competitors.

Imposition of specialized equipment and technologies sanctions on the Russian companies plays a secondary role in development of the oil refining industry. In the end, Russian companies buy the necessary equipment through China, paying more due to resale costs. But due to increased amounts of financing in domestic technologies and the equipment they gain multiplicative effect in connected industries and a services sector.

High level of wear of the key assets in refineries is also a serious problem. For example, explosion at the Achinsk refinery in 2014 was caused by the tear and wear of the column, which led to a massive release of gas when the pressure increased. The cause of the explosion at the Kirishi refinery in 2008 was a wear of a rod, which led to the destruction of the gland, which caused the release of hydrogen-containing gas into the compressor room.

Thus, in order to develop the industry, the oil companies need to invest in innovations, modernize existing production, regardless of the state support, step up the pace of increasing the depth of processing of raw materials, and diversify production according to demand and geographic location.

### **3. Results and discussion**

At present, it is necessary to design a mechanism of development of the oil refining industry in order to attract investments to expand production, increase the depth of processing of raw



materials, and improve the competitiveness of Russian oil products. Carried out analysis shows: it is clear that the detected problems should be solved by the businesses with the active participation of the state.

The authors propose to implement the scheme of development of the oil refining industry presented in Figure 3.

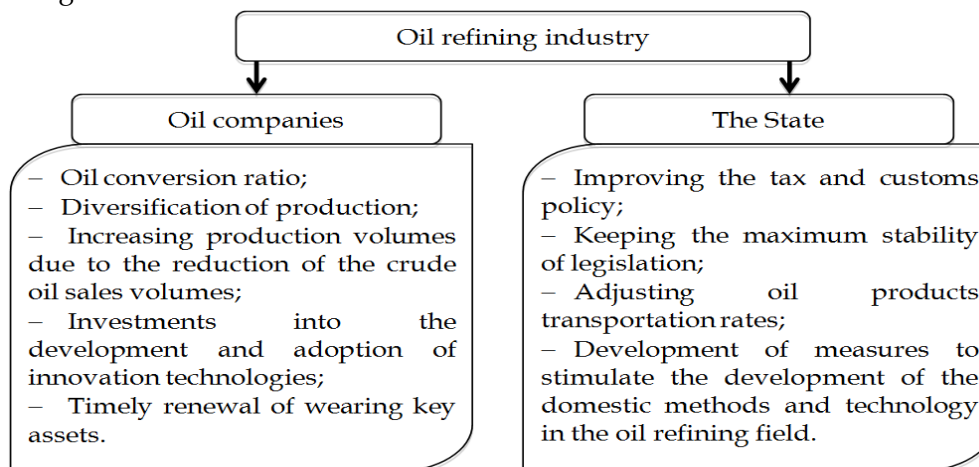


Figure 3. Scheme of the oil refining industry development

The state with minimal interference in the business needs to create conditions for its prosperity. The tax system should be improved taking into account the interests of all parties involved. Adjustment of tax concessions will allow companies to reach a new level of activity. Stimulating production and sales of high quality oil products will not only allow obtaining products with higher added value, but will also reduce the volume of crude oil export in order to involve it in the processing. Perhaps, in the first couple of years the stimulation of the development of oil refining will lead to the reduction of budget revenues, but in the future this will lead to a sharp increase in government revenues due to the increase in sales volumes of final high-quality products, development of national science and technology, as well as increase in the number of jobs.

The stability of the legislation will help to minimize the number of risks and uncertainties, which will increase the investment attractiveness of the industry. From 2010 to 2014 the volume of investments into the oil refining increased from 141 to 290 billion rubles, in 2015 there was a drop down to 214 billion. Without increased funding it is not possible to increase the depth of refining to the planned values.

Remoteness of oil extraction and processing sites from the main consumers leads to higher transportation costs, which affect the final price. It is necessary to revise the tariffs for transportation of oil products inside the country by various means of transport in order to reduce logistics costs.

Companies need to accelerate the pace of modernization and expansion of refineries under the conditions of small but stable growth of oil prices. Expansion of production and increasing the depth of processing of raw materials will reduce dependence on the export of equipment, provide internal demand for high-quality products and increase competitiveness of Russian companies in the international market.

#### 4. Conclusion

The need for improvement and development of the oil refining industry in Russia is not in doubt. The main tasks of the sector are to meet the domestic demand for high quality oil products and increase competitiveness of products on the world markets. International sales of finished products will increase the income of companies and the state, not only because of the higher added value, but also due to the possible changes in the export structure of raw materials and oil products by increasing the latter.

The development of the oil refining industry is feasible by solving the existing problems, which hinder it. This is possible with the active efforts of oil companies and assistance of the state. Ongoing activities are bringing results, but not always within specified time frame or in the planned volumes.

On the basis of available statistical data from the government and major oil companies as well as on the basis of analytical reports of independent companies we have carried out the analysis and have developed the scheme of the oil refining industry development which directed to attraction of investments into expansion of production and increase in competitiveness of the Russian oil products. It should be noted a possibility of expansion of researches in the future with use of the internal reporting of the oil companies, the analysis of costs of production of oil products and their transportation, and also on development of the equipment and technologies.

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