Financial and legal mechanisms of newly industrialized mining: Case study of diamond mining sector

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***Abstract* - This article examines the financial and legal mechanisms of newly industrialized mining using diamond mining as an example. As an economic sector, mining continues to be largely dependent on overseas technologies. Mineral resources are seen as an asset crucial to the development of many industries.**

Keywords - neo-industrialization, new industrialization, economy, diamond mining, import dependency, mineral resources, reserve replacement, deposit exploration.

I. Introduction

In the Soviet times, there existed "territorial production complexes" (or manufacturing units), defined as interrelated and interdependent pools of productive industries that are concentrated on a certain territory, which, in turn, forms part of the entire national economy or any of its economic regions. Unlike non-pooled industries, the territorial production complexes offered a number of advantages such as resource and labor efficiency; lower capital investments; lower transportation costs; shorter working capital turnover period; and infrastructure-related saving" (Financial Dictionary: dic.academic.ru). In the 1990s, a study was undertaken by one of the contributors to this article, into the socio-economic vehicle for the said territorial production complexes using the example of diamond mining industry. [1]. Currently, Russia's diamond mining industry is represented by a number of diamond mining companies operating in the Republic of Sakha (Yakutia) (with 79.66% of the country's total diamond reserves); Arkhangelsk Region (with 20.27% of the country's total diamond reserves); and Perm Region (with 0.07% of the country's total diamond reserves).

The process known as "new industrialization" suggests progress in such essential industries as machine engineering, instrument making, and zero-waste captive production. The core challenge faced by Russia's mining sector relates to the loss of its domestic manufacturing and the use of foreign manufacturers. [2]. Russia's diamond mining industry remains heavily dependent on imports: the only non-imported asset it employs is Belarus-made mining vehicles. Even though the Republic of Belarus is a member of CIS, in setting the price range for its vehicles is it largely dependent on the US dollar exchange rate.

Russia's diamond mining industry is led by partially government-owned ALROSA, a global industry leader. [4].

The produced ore and overburden are transported by Caterpillar trucks CAT-785B and SAT-740B; high-capacity Unit Rig MT3300s (40 t to 136 t); SCANIA and VOLVO truck trains; and 91-ton capacity Terex TR 100s. In 2015, ALROSA's fleet of large dump trucks numbered 240 vehicles, including 74 ones with the capacity between 120 t and 136 t. The 42- to 45-ton capacity trucks are Belarus-made BelAZs – 99 BelAZ-75473s and 7 BelAZ-75137s with the capacity of 136 t.

Geologically, the operational conditions in the quarries of Yakutia are rather challenging, leading to a significant increase in the cost of mining operations.

The enrichment plants of Aikhal and Nyurbinsk are installed with the automated control systems designed to:

- locate mining vehicles and report their status;
- dispatch excavating equipment;
- control truck loading and cruising speeds;
- monitor maintenance schedules; fuel consumption; and tires;
- keep record of equipment and quarry performance.

Once implemented, the system automation efforts ensured:

- improved performance of mining and transportation vehicles;

- reduced downtime and fuel consumption;

- improved operational discipline and safety;

- reduced cost of mined rock production and transportation.

ALROSA's 2015 cargo size amounted to 127,355.8 K tons and cargo turnover to 595454.6 tonne-kilometre. (PJSC ALROSA, 1992-2018).

One more area that underwent, over the course of 25 years, the process of new industrialization is Republic of Kazakhstan, which boasts the unique reserves of the mineral raw materials (4th largest in the world) and ranks the 12th among the global producers of raw materials (300 mln t per year). [5].

The main stages in the new industrialization of the Ural economy are explored by Tatarkin et al. (2014), based on its existing potential. [6].

In Arkhangelsk Region, the mineral raw material base numbers 25+ minerals. As of January 1, 2017, the following mineral reserves are listed in The State Mineral Reserves Register of Arkhangelsk Region: diamonds (284.3 million carats, or 21.4% of the country's totals reserves); bauxites (253.3 million ton, or 17.5% of the country's totals reserves). A total of more than 4 million carats of diamonds have been produced in Arkhangelsk since the beginning of 2018. In 2017, AGD DIAMONDS and ALROSA's Severalmaz (PJSC) contributed to Arkhangelsk's budget more than RUR 3.6 bln in tax. Being Russia's newly industrialized companies, AGD DIAMONDS and ALROSA's Severalmaz (PJSC) operate new-generation mining equipment. [7].

The year 2019 will see an increase in VAT rate from 18% to 20%. On the one hand, this increase is expected to generate higher revenues to the federal budget. On the other hand, mining companies will be running higher costs, which is likely to affect their fleet optimization schedules.

The goals of massive refurbishment and intersectoral projects require that close cooperation should be in place not only between authorities and sector-specific business associations, but also among such associations [8]. This is particularly true when it comes to diversification of economy towards increased manufacturing.

Among financial levers of new industrialization are governmental programs (oriented also towards modernization), and measures to generate cash flows and credit resources as vehicles towards neo-industrialization. Any measure to reduce the cost of borrowed capital and foster favorable investment climate will only contribute to the efforts of refurbishment and modernization.

Crucial to such sectors as metallurgy, power engineering, machine engineering, construction, electronics, and chemical production, the subsoil resources are what facilitates the economic progress. Complemented by ample production potential, their abundance in the Russian Federation calls for a solid governmental policy for and control over the mining operations across the country.

Currently, Russia faces the challenge of mineral resource replacement, a time- and effort-consuming task. Unless work is started to deal with it today, the country may soon have to face the shortage of raw materials [9]. Any exploratory drilling is costly, its duration depending on a variety of factors, including the effectiveness of methods and technologies applied. In this sense, financial mechanisms play an important role in ensuring that mineral resource replacement efforts and exploratory drilling continue.

Until 2002, all funding in the RF of the mineral resource replacement efforts (prospecting and exploratory drilling) was allocated on a target basis. Exempt from the 'replacement contributions' duty were those mining companies that would conduct the exploration operations using their own resources. Such companies would report to the government on their previously agreed exploration scopes, as well as the discovered reserves on their books.

When Russia updated its taxation system on January 1, 2002, it abolished the "subsoil use fee" (graded tax) and the "mineral resource replacement contribution". Instead, royalty, or mineral production tax, was introduced. What happened as a result of this change is amalgamation of the subsoil use fee, the replacement fee, and the excise duty, which differ from one another in their economic purpose, into the mineral production tax. This, in turn, made mining companies no longer able to cover their mineral resource replacement needs with their own funds. In return, mining companies received the right conduct geological exploration without prior approval from the Geological Survey. In general, the ample availability of discovered reserves cannot be said to have led an increase in investment in exploration.

II. Current activities

Currently, the government-supported geological exploration and mineral resource replacement take place withint the framework of the governmental programme "Subsoil Use and Reproduction" (GP SUR) (with sub-programme "Mineral Resource Reproduction and Geological Exploration"). According to the Ministry of Natural Resources and Environment's analytical review "Federal Subsoil Use Agency 2017 Performance and Plans for 2018", the annual updating of the activities and indicators of the sub-programme is conducted in connection with the emergence of new tasks and a decrease in budget allocations.

In 2017, the governmental program "Subsoil Use and Reproduction" allocated RUR 19.85 bln, of which RUR 13.67 bln went to the needs of "hydrocarbon replacement", whereas the extra-budgetary allocations (subsoil users' own and borrowed funds) accounted for RUR 350 bln, of which RUR 302 bln were channeled to "hydrocarbon replacement".

As for solid minerals – the liquid and highly sought-after gold, diamonds, silver, platinum metals, copper, chromites, and uranium – the prioritized areas remain, as in previous years, the Siberian and the Far Eastern Federal Districts. The solid minerals growth targets have been achieved for 21 minerals out of the 30. In 2017, subsoil users' geological exploration expenditure increased by a third

compared to the previous year, amounting to RUR 48.4 bln, which is much more than in previous years. It should be noted that the growth was achieved largely through re-evaluation, re-calculation and the associated works conducted with the subsoil users' own money.

In 2017, the Federal Subsoil Use Agency (RosNedra) issued 3 certificates confirming the discovery of solid mineral deposits, and 10 confirming the discovery of hydrocarbon deposits.

At the same time, the quality of ores from a number of previously discovered deposits cannot be said to guarantee profit – by reason of the lack of cutting-edge technologies, among others.

One more grave challenge faced by Russia's mining sector is the imbalance between localized forecast resources, proven reserves growth, and recovery rates. Especially acute is the shortage of high-grade resource forecasts, and of the blocks promising in terms of exploratory drilling, which is mainly due to the lacking scopes of early stage geological exploration. [10].

A lever that looks most promising in terms of stimulating more investment in the nation's mineral resource base, is granting the subsoil user who discovers a mineral deposit at their own expense, the right to alienate, for compensation, all exploration and production rights to another subsoil user (mining company).

III. Conclusion

Russia's diamond mining industry is represented by a number of diamond mining companies operating in the Republic of Sakha (Yakutia) (with 79.66% of the country's total diamond reserves); Arkhangelsk Region (with 20.27% of the country's total diamond reserves); and Perm Region (with 0.07% of the country's total diamond reserves). The core challenge faced by Russia's mining sector relates to the loss of its domestic manufacturing and the use of foreign manufacturers. [2]. The nation's diamond mining industry is led by partially government-owned ALROSA, a global industry leader. [4]. The implemented system automation efforts have ensured improved performance of mining and transportation vehicles; reduced downtime and fuel consumption; improved operational discipline and safety; and [11] reduced cost of mined rock production and transportation. ALROSA's 2015 cargo size amounted to 127,355.8 K tons and cargo turnover to 595454.6 tonne-kilometre. (PJSC ALROSA, 1992-2018).

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