Patterns and Features of the Formation of New Oil and Gas Provinces in the Russian Arctic (on the Example of the Nenets Autonomous Okrug)

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Abstract. The article presents the results of the development of the Strategy for socio-economic development of the Nenets Autonomous Okrug until 2030, in which the authors took part. The fundamental difference between the latest oil industry development of the Nenets Autonomous Okrug and the Soviet model is substantiated, and the proximity of the development algorithms, schemes and actors with foreign analogues of the NAO is substantiated. The most important result of the transition to a new corporate-state development scheme was the new, more economical, transport logistics of cargo delivery and oil export; the transition from a stationary scheme to a rotational method of organizing work and, at the same time, wasteful duplication of infrastructure efforts by each large company. The conclusion is made on the fundamental role of innovation, including in the field of telecommunications, for the success of the new development model of the Nenets Autonomous Okrug.

1. Introduction

In the 1990s, the Nenets Autonomous Okrug became a unique platform from scratch, pioneering, oil development on new, market principles, new, non-state actors [1-5]. The efforts of subsoil users who came to the oil production assets of the Nenets Autonomous Okrug were limited by the total absence of “export” infrastructure - that's why risky experiments / various import-export schemes were carried out here: with the export of products through the winter roads, with helicopter delivery of material and technical cargo, and so on.

In the second half of the 1990s, Lukoil came to the Nenets Autonomous Okrug, which gradually became the largest actor in local subsoil use. Strengthening the influence and economic role in the subsoil use of the non-road Nenets Autonomous Okrug was possible only with the development of effective transport routes for the export of oil.

Lukoil proposed a systematic solution to this problem, the “northern route”, relying on the new Varandey marine terminal and the new ice-class tanker fleet, which he then began to build. The implementation of the new northern oil transportation route has become a key factor in Lukoil’s continued dominance (about 45%) in oil production of the Nenets Autonomous Okrug. The Kharyaginskoye field located in the south relies on the traditional southern export scheme with access to the Transneft pipeline network in the Komi Republic.

The weakness of state regulation in the 1990s, on the one hand, and the objective exceptional diversity of fields in the Nenets Autonomous Okrug, on the other hand, led to fragmented solutions to
the problem of transporting produced hydrocarbons to foreign markets, and partly to duplication of the pipeline network. If the development of the region’s oil resources had begun earlier, in Soviet times, the transport scheme for exporting hydrocarbons from the region would have been more centralized, unified and monopolistic, and all local subsoil users would be connected to it.

At the present, state-corporate stage of development, which began with the advent of state corporations Rosneft and Gazpromneft, which had taken shape by the time the zero corporations had taken shape at that time, the competition for access to the hydrocarbon export system was added to the traditional competition for new license areas, and the struggle to reduce export costs.

The hydrocarbon export problem could follow one of two scenarios: either an agreement was reached on prices for the use of Lukoil’s created infrastructure, or each large company creates its own alternative infrastructure. Events began to unfold in the second scenario.

The “dramaturgy” of the stopped expansion of Lukoil has unfolded, which managed to create an integrated and innovative production and transportation system here, on the one hand, and, on the other, the activities of the state-owned corporations Rosneft and Gazpromneft, which clearly were not satisfied with their role as latecomers to the division of the Nenets natural assets and therefore put forward initiatives for new infrastructure superprojects based on the investment resources of the federal budget - for example, ha the pipeline to the port of Indiga, the Barentskomur railway, etc.

The new players here have obvious successes: Gazpromneft was able to implement the most difficult project for developing the Prirazlomnoe shelf offshore field, Rosneft was able to form, as a result of acquiring the medium and small companies that worked here, a very concentrated corporate production and transport cluster in the south of the okrug - its Vala Gamburtseva fields are connected by an independent pipeline with the infrastructure of Transneft.

2. Relevance, scientific significance of the issue
Precisely because the Nenets Autonomous Okrug began to be actively developed in the industry in the new era of market reforms, it can be called the most “foreign” Arctic in Russia. The whole figure, the main territorial structures, drivers of the new oil industry development here were formed according to a similar algorithm with the Canadian, American, and North European Arctic.

Under these conditions, the search for foreign analogues for the subject definition of the features of the new development is very constructive. The closest analogous regions abroad are the provinces of Nunavut, the Northwest Territories, Yukon (Canada), the province of Finnmark (Norway), the province of Lapland (Finland), Greenland (Denmark) and the state of Alaska (USA) (table 1).

| Region                  | GRP region per capita, thousand rubles. | The region's place in per capita GRP in the country | Mining and / or exploration                        |
|-------------------------|-----------------------------------------|----------------------------------------------------|---------------------------------------------------|
| Nenets autonomous okrug | 5821.6                                   | 1-e                                                | Oil Gas                                           |
|                         |                                         |                                                    | Coal                                              |
|                         |                                         |                                                    | Manganese, Nickel, Copper, Molybdenum, Gold, Diamonds |
| Foreign regions-analogues NWT | 6141.7                                   | 1-e                                                | Oil Gas                                           |
|                         |                                         |                                                    | Diamonds, gold, copper ores, tungsten, silver, cadmium, nickel |
|                         |                                         |                                                    | Oil Gas                                           |
|                         |                                         |                                                    | Copper, iron, nickel, silver, lead, zinc, gold, diamonds |
|                         |                                         |                                                    | Uranium                                           |

1 In accordance with the dollar exchange rate for March 2018.
Oil and gas production plays a huge role in the economy of the Nenets Autonomous Okrug. The value of hydrocarbons in the Northwest Territories, Alaska is the same. Similarly, a significant contribution to the economic life of the region is made by the extraction of mineral raw materials in Nunavut and the Yukon, only in their case the leading industry is mining (mainly precious and other metals). However, in the Nenets Autonomous Okrug the share of extractive industry in GRP is the largest (table 2). The industry also prevails in the gross product structure of the region. Like the Nenets Autonomous Okrug, the highest share of GRP in mining is in Nunavut.

Table 2. The place of extractive industries in the economy of the region.

| Region          | Share, % | Leading branch                                      |
|-----------------|----------|-----------------------------------------------------|
| Nenets autonomous okrug | 74.5     | Oil production                                     |
| NWT             | 25.4     | Oil production                                     |
| Nunavut         | 43.7     | Mining industry                                    |
| Yukon           | 19.5     | Mining industry                                    |
| Finnmak         | 1.5      | Oil and gas production                             |
| Lapland         | N\A      | Iron ore mining                                    |
| Alaska          | 15.0     | Oil and gas production; diamond mining             |
| Greenland       | 10.1     | Mining, diamond mining                            |

Source: Rosstat

The system of resettlement of the Nenets Autonomous Okrug paradoxically turns out to be typical of the most severe regions of the foreign Arctic by natural conditions: the northern territories of Canada, Greenland, and the Faroe Islands. For example, the administrative centers of two of the three northern territories of Canada also concentrate more than half of the population - contrasting with extremely poorly populated spaces with rare national villages, shift camps or military bases in the rest of the territory of the administrative unit - and also with an extremely poorly developed transport network in sparsely populated areas (see table 3), and in Canada, the same population as in the Nenets Autonomous District is dispersed over a much larger area.
Table 3. Similarity of the Nenets Autonomous Okrug (as of January 1, 2017, current accounting) with the northern resource territories of Canada (2016, census data) on the characteristics of the resettlement system.

| Territory                  | Nenets autonomous Okrug | Yukon | NWT | Nunavut |
|----------------------------|-------------------------|-------|-----|---------|
| Name and population of the administrative center, people | Naryan-Mar 24 654 | Whitehorse 28 225 | Yellowknife 19 569 | Iqualuit 7 740 |
| The population of the entire territory, people | 43 937 | 35 874 | 41 786 | 35 944 |
| Area, thou sq. km | 176,7 | 474,7 | 1 143,8 | 1 877,8 |

Source: Rosstat, [10]

The local history of the pioneer oil industry development of the Nenets Autonomous Okrug in the 1990-2010s entered the general world picture of the development of similar oil and gas provinces, with a similar algorithm for the formation of new shift camps, duplication of infrastructure efforts of resource corporations, and numerous problems in the interaction of resource companies and the territory of presence.

3. Theoretical (problem) part

The new model of oil development, which was first tested in the Russian Arctic in the Nenets Autonomous Okrug, is distinguished by:

- “external” registration of most companies operating in the district (respectively: institutional remoteness, which reduces the possibility of effective communication on the coordination of interests of the district and companies, as well as a system of distribution of tax revenues that is disadvantageous for the district);
- competition of oil and gas companies (not only for licensed areas, but also for the possibility of efficient export of produced hydrocarbons);
- uncoordinated main subjects of the resource economy. The multisubjectivity of the economic development of the Nenets Okrug leads to duplication of functions of individual infrastructure facilities - especially in the field of hydrocarbon production and transportation. So, for example, almost parallel to each other, but in different directions, oil is distilled through the Kharyaga - Varandey oil pipelines (Lukoil, from south to north) and from Vala Gamburtseva fields (Khasyreyskoye field) to Bagansky field (Rosneft, from north to south), breaking the existing structure of oil export from the northern fields of the okrug - through the Varandey terminal, from the south - through the structure of the Transneft oil pipelines.

Therefore, the problem of improving the efficiency of managing the territory of the Nenets Autonomous Okrug, in essence, boils down to establishing coordination of economic activities and sharing infrastructure between the authorities of the Nenets Autonomous Okrug, on the one hand, and resource companies, on the other, as well as between individual companies with the mediation of the government Nenets Autonomous Okrug.

- the contradiction between the corporate structure of the local economy and the vast undeveloped areas of the okrug through which each company needs to “break through” into the sales markets alone.

From the point of view of the interests of the territory and the possibilities of the regulatory influence of the state on companies in the okrug, the transport scheme duplicating the efforts of many corporations is unfavorable. It not only does not contribute to strengthening the integrity of the economic space of the district - but, on the contrary, it fragmentes it even more, cuts the corporate sector out of the local economy, turns it into a single shift enclave, completely devoid of any social roots.
Another major contradiction (and it is also characteristic of foreign analogues) is that - against the background of the fact that all oil-producing territories are forced to solve the problems of economic diversification - the mono-profile of the Nenets Autonomous Okrug has not only not decreased in recent years, on the contrary, it has increased significantly. Meanwhile, the level of dependence of the main economic and budgetary parameters of the Autonomous Okrug on oil production is already unprecedentedly high even for the resource region. Oil dependence determines the main problem of the Nenets Autonomous Okrug - the vulnerability of its welfare (gross product, income, investment, tax revenue) to changes in the oil market. The negative consequences of the price shock are exacerbated by the small size of the Nenets Autonomous Okrug, its small population and, therefore, a small domestic market, which deprives the district of the possibility of rapid diversification maneuver.

4. Practical relevance, suggestions and results
A drop in oil and gas prices could lead to the unprofitability of new projects and the curtailment of production at the fields with the highest production costs. The imposition of sanctions against Russian oil and gas companies affects their technological equipment. Other external factors for the district are the development of more active shipping along the Northern Sea Route (with an increase in demand for transshipment of goods, services), as well as possible global warming (fraught with a shortened service life of winter roads, as well as transformation of deer pasture landscapes) [11, 12].

The policy of the oil companies themselves can also complicate the activities of subsoil users in the district. For example, between the companies of PJSC Lukoil and PJSC NK Rosneft the question arose about the price of transshipment of oil through the Varandey terminal, which is owned by PJSC Lukoil. In the absence of an alternative way of transporting oil from the fields to them, A. Titova and R. Trebs, NK Rosneft PJSC is forced to accept the conditions of high prices for oil shipment, which raises the cost of raw materials [13] and, accordingly, production for PJSC NK Rosneft becomes less profitable. Such a conflict can lead to a decrease in production, a reduction in tax revenues to the NAO budget, and, consequently, a decrease in the level of economic welfare of the district.

The most significant internal factors of the long-term socio-economic development of the region are the state of the resource base, the low degree of development of the territory and the development of transport infrastructure, problems of logistic efficiency, informatization, energy efficiency, demographic situation, insufficient human resources, problems of indigenous peoples, environmental degradation, including deer pasture conditions, relatively high tourism potential and low level of food security.

At the moment, there is an increase in hydrocarbon production in the Nenets Autonomous Okrug, and it is expected that reserves in the okrug will be enough for another half a century [14]. Thus, this factor ensures the development of the district in the long term. However, in the NAO there is an acute problem of underdeveloped transport infrastructure. Nenets Autonomous Okrug belongs to the regions of the Russian Federation with the lowest density of paved roads - 1.3 km of tracks on 1000 km² as of January 1, 2017 (lower only in the Chukotka Autonomous Okrug - 1 km / thousand km²) [15].

The eastern part of the okrug is practically “empty” from the point of view of official statistics, in fact it is a rather dense network of shift camps, winter roads and all-terrain (tractor) roads, energy infrastructure. The almost complete lack of information about this corporate NAO-2, and even more so the lack of coordination of development planning processes for individual companies and the district as a whole, significantly complicates the process of managing the region’s socio-economic development: in the Arctic, it would be advisable not to duplicate some infrastructure objects (roads, energy facilities and other life support facilities, medical services, etc.), but to bring them into joint use by corporate employees and the district’s population PPP and conditions and other agreements. The practice of "parallel worlds" of corporate and district networks of territory development (not to mention the practice of mismatching and duplication of infrastructure by different companies) cannot be effective; optimal planning of the territorial development of the district should include the “corporate” segment.
5. Conclusions
The main challenges facing the Nenets Autonomous Okrug are the realization of opportunities and the elimination of costs caused by prevailing external and internal factors in the development of the region. Large hydrocarbon reserves, as well as the volatility of oil and gas prices, the complexity and high cost of northern fuel delivery in an undeveloped transport system are significant factors for the development of processing industries (primarily gas chemistry).

An important role in improving the efficiency of the Okrug’s economy as a whole will be played by the coordination of companies and the optimization of the hydrocarbon transportation system. In many respects, the success of the Okrug’s future economic development will also depend on the ability to build a working cluster in Naryan-Mar for information and technological support for the further development of the Arctic, primarily offshore projects; to establish the provision of oil and gas services, training of specialized personnel.

One of the key challenges will be the ability of the district, the key subjects of its development to perceive new technologies that reduce costs and ensure efficient management in the Arctic: this is providing the entire territory of the district with high-quality cellular communications and Internet access (in connection with which there is a problem of cheaper satellite communications, so how the use of fiber optic networks is not always effective for remote settlements); the introduction of energy-efficient housing technologies, autonomous energy supply technologies.

The main threats to long-term development are the already mentioned negative factors: instability of oil prices and falling demand for Russian oil; decrease in investment attractiveness of the region due to unfinished legislation, underdeveloped infrastructure and conflicts of interests of companies; depletion of raw materials (in a very long term).

With the growth of hydrocarbon production in the western part of the Arctic shelf, the importance of the Nenets Autonomous Okrug and the state of infrastructure in it will play an increasingly important role. Thus, it is necessary to coordinate the development of port and other transport infrastructure. Due to the lack of trunk pipelines, the creation of marine transport infrastructure facilities is the most promising for the development of the regional economy.

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