

Transport Component of the «Yenisey Siberia» Megaproject as an Element of the Integral Eurasian Transport System

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Abstract—The article examines the conjugations of the transport component of the «Yenisey Siberia» megaproject with the integral Eurasian transport system and the possibility of achieving network effects based on the cooperation-network interactions of the participants of the megaproject and the state. The possibilities and directions of development of individual components of the megaproject in five cluster groups, the main directions of interactions in clusters of the megaproject are shown.

Keywords—transport component, megaproject “Yenisey Siberia”, cooperative-network interactions, clusters, network effects.

I. INTRODUCTION

The trans-continental geography and significant territories of Russia, which has spread out from Central Europe to the Pacific coast in Asia, in their mid-southern, northern and subpolar parts, create both difficulties and form a number of significant opportunities for the current stage of development.

We will continue to study the transport component of the Russian economy, based on the study of research experience in this field, including the Yenisey Siberia megaproject [1-5].

The studies of the resource potential of Siberia show that significant factors of increasing attention to the transport component in Russia as a whole, and especially Siberia, are:

- active development of the economic potential in the regions of Siberia, including the growth in the transport of bulk cargo and population mobility;
- the priority development of the regions of the Pacific coast of Russia, including the formation here of large Russian and international hubs and trade;
- a new geo-economic area of Siberia, located in its southern and southeastern part, in the vicinity of the largest economies of the world - the People's Republic of China, Japan, the Republic of Korea, the rapidly developing countries - Singapore, Taipei, Vietnam, Thailand, Indonesia, etc., are actively developing their new directions for delivery of goods to the regions of mass consumption through the transport corridors of Siberia;
- active movement of mass production of oil, gas, non-ferrous metals and timber products to new regions of Siberia and the formation of enterprises of their primary processing, as well as the active development of the production of grain, animal products, wild plants, which together create the need for the integrated use of all types of modern transport, especially, for their delivery to world consumption centers [6-8].

A new approach to the implementation of complicated multifunctional complex projects in Siberia is the «Yenisey Siberia» integrated investment megaproject announced by the territories of the Krasnoyarsk Territory, the Tyva and Khakassia republics and supported by the country's leadership as a part of separate 32 major projects. [9].

Based on modern Russian and international experience in the implementation of complicated complex projects, one of the determining factors for their successful realization is the project-oriented cooperative-network method of system interaction - business - the state and the community. The forms of implementation of concerted actions are strategic alliances of participants based on the recognition of common goals, independence, cooperation and on this basis the best use of available resources, voluntary connectivity and integrated levels of interaction, including cooperation based on the capabilities of the state [6, 7, 10].

In such a cooperative-networked interaction achieved using digital technologies, participants of strategic alliances systematically sharing information, knowledge, experience in achieving results and mastering the practice of networking interactions receive significant network effects, which, as shown by the authors' research, give an increase in results depending on the contribution of everyone to such interaction [6-8].

II. RESULTS AND DISCUSSION

Let us consider the transport component of the «Yenisey Siberia» megaproject and its integration into the Eurasian transport system, taking into account that the cost of transportation and logistics services on average is 6.5% of the company's revenue and 44% of logistics costs [11].

One of the central projects of «Yenisey Siberia» is the formation of the «Krasnoyarsk technological valley» based on deep integration with the Krasnoyarsk and Sayanogorsk aluminum plants «RUSAL» and its factories for the production of alloys and rolled products. The construction of a plant for the production of alloy wheels for automobiles and cooperation with major automotive manufacturers, active development of rolled profiles for components of many industries, thin films for packaging and food industry, products from aluminum and its alloys for wide consumption in everyday life and most industries are envisaged.

The development of the Angara-Yenisey industrial region (the Lower Angara region), with its numerous mining and processing enterprises, gold, and forest products, will continue. A high-quality element of this development will be the construction of a road bridge across the Yenisey, forming a new accessibility and transport infrastructure of this development area, where the development of the Bogolyubsky, Udereysky and Gorevsky fields, the construction of a pulp and paper mill will continue.

In the eastern part of the region, the development of mining and processing plants will continue, on the basis of the Ak-Sug copper-porphyry deposit and the Kingashsky and Verkhnekingashsky copper-nickel deposits, which also form new transport hubs.

The project includes both approved and newly proposed formations of agro-industrial and forestry clusters. In the Sharypovsky district in the south of the region, the formation of the «Siberia» agro-industrial park begins with the use of excess heat in this part of the territory for the production of greenhouse vegetables and the deep processing of agricultural products, including the production of bioethanol, lysine, starch, and their related products, which should serve the import substitution of these products demanded in animal husbandry.

A direct transport infrastructure project is the construction of the Kuragino-Kyzyl branch, which will pave the way for high-quality coal products, enriched ores, timber products produced in the Tyva Republic and in the southern regions of the Krasnoyarsk Territory and in the Khakassia Republic to Russian and international markets. Traffic volumes will constantly increase. A new transport artery with a length of 410 kilometers creates conditions for its development in Mongolia-PRC, development of small and medium-sized businesses in the adjacent areas, especially for the production of forest products, wild plants, breeding of deer and the formation of opportunities for year-round recreation.

Mongolia is building a railway to Tuva [12].

The implementation of the project «International transport and logistics hub» based on the airports of Krasnoyarsk and Chermshanka can provide annual cargo turnover of 800 thousand tons of air cargo and 165 thousand containers.

The development of the northern territories of «Yenisey Siberia» will actively continue. First of all, the development of oil and gas fields will continue there, which creates the largest oil and gas producing territory with all transport solutions - trunk pipelines with a transition to intercontinental pipelines, development of sea, river and air transport, active development of the Northern Sea Route and the Subarctic High-Latitude Course, development of a new icebreaking fleet and LNG gas carriers to work in northern conditions, the construction of the «Port Bay North» terminal, to develop the Payakhsky field, building the new HPP with a capacity of up to 1,200 MW on the Angara River and others. The Norilsk industrial region receives special development, with investments of more than 110 billion rubles.

The only 32 projects that are included in the list of the Governmental Orders that are scheduled for implementation by 2027 are estimated at the current stage of 1.9 trillion. rubles, which will be directly mastered by at least 60 organizations, where at least 70 thousand jobs will be created, including new modern professions and engineering specialties. Small and medium-sized projects of regional and inter-district importance such as wood processing, agricultural products, building materials, biotechnological on waste processing and harvesting, recreational, etc. begin to join these large-scale opportunities. Part of the districts and cities of the «Yenisey Siberia» included some of these projects in their «Development Strategies ... until 2030», which creates an opportunity for their implementation. [9]

The analysis of the «Yenisey Siberia» megaproject shows that the main centers for their implementation are concentrated in its southern, middle Yenisey, eastern and northern parts, with special transport conditions. Projects implemented in the

southern part are adjacent to a developed transport structure - the Trans-Siberian Railway, the Abakan-Taishet road with access to the BAM, a branch to the middle part of the Yenisei at Lesosibirsk-Boguchany, a river and airport, and a developed network of federal and inner regional roads.

In the first stage, development and primary processing projects for copper-nickel ores at the Kingashskoye and Verkhnekingashskoye deposits are carried out on the basis of road transport to the nearest railway stations of the Abakan-Taishet road with access to the BAM and the Trans-Siberian Railway. It is envisaged to expand and strengthen the existing roads for the use of a large dumping park, build bridges across local rivers, create conditions for accepting, storing and transferring large amounts of primary -enriched ore to the railway, developing its delivery to further processing sites. All this creates conditions for the development of food production, logging and processing of wood and wild plants.

Transport conditions for the population and those working in both the southern and eastern groups of the «Yenisey Siberia» projects are developed, comfortable and ready to work with an increasing number of workers and their families.

The territories of the middle Yenisey - Lower-Angara region receive a qualitatively new development. During the construction years of the Boguchanskaya HPP, several mining and timber processing enterprises, and then the metallurgical enterprise (Boguchansky Aluminum Plant), the Abakan - Taishet BAM railway line — the Russian Pacific coast from Lesosibirsk to Boguchany — was developed, and the construction of the highway to the North – Yenisey district and the southern part of Evenkia. Technological roads are actively developing within enterprises tens of kilometers long.

Special transport situation is in the implementation of projects in the north of the region. The development of the capacities of the Norilsk Nickel companies, the increase in oil and gas production, and other projects of this macro-region are also associated with the further development of the integrated Eurasian transport system, primarily the Northern Sea Route, the Northern Latitudinal Railway and the active use of river and sea ports on the Yenisey River and its tributaries the airports of Norilsk, Khatanga, the development of small aircraft. The need for active development of the Northern Sea Route and the Northern Latitudinal Route is associated both with the implementation of projects included in the megaproject «Yenisey Siberia», and with the further development of additional transport corridors for trade in South-East Asia (China, Japan, the Republic of Korea and other countries APR) with the countries of Europe.

As it was shown, at the Arctic Forum in St. Petersburg in 2019, the volume of transported cargo is actively growing in these areas, and their volume has already become higher than it was in the best years during Soviet times. Northern shipping will significantly increase as well in connection with the development of the largest projects for the production of liquefied gas and its further supplies to all regions of the world. Already operating gas liquefaction facilities ensure the possibility and necessity of sending SEC gas carriers weekly [13].

The northern sea transportation in connection with the further active development are of a particular importance of the Russian Arctic, including the production of oil and gas on the shelf of the northern seas. According to a number of specialists, this is the place where the main hydrocarbon reserves of Russia are concentrated.

At the same time, the northern transport arteries are becoming necessary for the development of the entire Pacific coast of Russia. (The authors consider it is desirable to abandon the definitions of the «Far East», which is historically developed in Russia and is used in its documents of state planning, management, and spatial development strategies. The phrase «Far East» forms the perception of something remote and difficult to live. «The Pacific Coast of Russia», on the contrary, creates an understanding of the unity of a great country and its attitude to these territories as one of the most comfortable for life and economic development).

The analysis shows that the territorially megaproject «Yenisey Siberia» includes projects of different branches distributed across five territorial clusters of concentration. All this means that in the execution of projects both separate for these territorial clusters, and in general, all 32 defined in the Order of the Government of the Russian Federation, as well as those that will adjoin and come to light in the process of their implementation, the initiative business must be corrected and interrelated.

As the modern, including author's studies, show, the most productive are the cooperation-networking interactions of businesses built on the unity of goals, independence of participants, cooperation of the resources at their disposal, mutual responsibility and cooperation with state and municipal authorities [6-8].

All these factors in the system of businesses that will implement the megaproject «Yenisey Siberia» are available and can be actively involved in order to achieve quality results in the interests of each participant and the territories as a whole.

As our research shows, it is possible to coordinate complex projects implemented by various authors in order to better utilize the resources of all participants of the «Yenisey Siberia» megaproject based on their cooperation and network interactions built on the basis of strategic alliances and the use of common digital business platforms and authorities.

The initiator of the formation of strategic alliances for the implementation of the «Yenisey Siberia» megaproject both from the standpoint of modern theories and practical influence should be regional authorities in collaboration with authorized persons from the relevant Ministries of the Russian Federation and businesses implementing the projects. To coordinate the megaproject, the state corporation «Yenisey Siberia» was formed in the region, which can become a center for building cooperative-network interactions of megaproject participants. One of the most important partners of a comprehensive development project is becoming the Association «Siberian Research and Education Consortium», which unites universities, institutes of the Academy of Sciences, innovative development structures capable of scientific support and

training specialists for most of the projects of «Yenisey Siberia».

Modern digital transformation of transport, construction and other technologies in such a complex interaction can be fully realized on the basis of digital transformation of operators of various types of transport and related companies on a single platform, primarily in the formed clusters and the megaproject as a whole. The corresponding directions of development are formulated in the Decision of the Supreme Eurasian Economic Council of October 11, 2017 No. 12 [14].

The formation of such a single platform is extremely difficult, first of all, due to the lack of the practice of cooperative-network interactions of both transport and all other operators of the megaproject. Even the transport operators in the face of PAO «Russian Railways», several air transport operators operating in the region, several river operators and many of them in road transport build their work independently and competitively with other carriers. Perhaps the most coordinated may be the transportation of certain goods along existing and under construction pipeline transportation systems.

According to the estimates of individual transport operators, even the digitization of their business processes brings significant advantages. Thus, according to expert estimates, the introduction of digital technologies in the UK rail transport will increase traffic by 40% [15]. There are no estimates of network effects obtained from the cooperation-network interaction. According to the results of the activities of individual economic structures, it can reach 10-12% [6].

The need for active participation of the state is shaped primarily by the fact that it is the state that finances infrastructure projects that all participants of the megaproject use for the implementation of these projects both in general and in individual clusters. Thus, in the Northern Cluster, the state assumes all elements of the development of the Northern Sea Route, the Northern Latitudinal Route, the development of ports, navigation and pilotage services, the construction of icebreakers, the regulation of the passage of foreign ships, the creation of modern communications systems, positioning, including groupings of communication satellites, the formation of energy supply, rescue services, training of specialists, etc.

Thus, in the Northern Cluster, the state develops one of the components of the integral Eurasian transport system, its Russian part and provides all the possibilities for its use by the participants of the «Yenisey Siberia» megaproject and forms a new corridor for cargo from South-East Asia.

Similar approaches can be implemented in the remaining territorial clusters of this megaproject. Thus in the Lower Angara region, the state develops railway construction and arrangement, creating opportunities for the rapid and systematic movement of goods from production sites to the Trans-Siberian Railway, as the basic element of the Russian part of the integral results in the economy”.

Eurasian transport system, expands the conditions for receiving and processing the relevant goods, servicing the company car fleet, the creation of a modern legally valid electronic document management partners, the conditions for the work of customs and sanitary services.

In the same cluster, on the basis of a public-private partnership, a bridge is being built across the Yenisei and road approaches to it, a similar practice is being worked out for the construction of a new hydropower station, a modern communication system and the Internet, and a customs service system have been formed.

The combination of the new development with the Russian part of the integral Eurasian transport system in the cluster of the metallurgical valley in its part in the city of Krasnoyarsk is being implemented the most comprehensively. Here, all the components of the integral Eurasian transport system are actively developed and continue to improve. In Krasnoyarsk there are unlimited possibilities to form cargo flows of various cargoes on the Trans-Siberian Railway, access to all river ports of the Yenisey and its tributaries, access to sea ports of the Northern Sea Route (Dudinka, Khatanga, Dickson, etc.), active use of air and road transport. The general scheme of interaction, including transport support on the basis of a multimodal integration, platform approach can be represented in Fig.1.

III. CONCLUSION

Thus, the analysis shows that all territorial clusters of the Yenisey Siberia megaproject are adjacent and can use actively the Russian components of the integral Eurasian transport system and, moreover, the implementation of this megaproject serves the active development of all elements of the transport infrastructure of Siberia. The realization of the studied megaproject, expanding the capacity and providing modern equipment of transport services due to digital navigation created by a satellite communications satellite grouping, the formation of legally authentic electronic document exchange, modern cargo positioning systems, customs and sanitary support of all types of transport and goods serve the substantial development of all parts of the Eurasian integrated transport system. All these aspects, by the efforts of the state and transport companies, also creates conditions for the qualitative use of new opportunities for attracting goods from the countries of Southeast Asia to Russian transport and their delivery to consumption regions and to carry out mutual supply of goods in the opposite direction.

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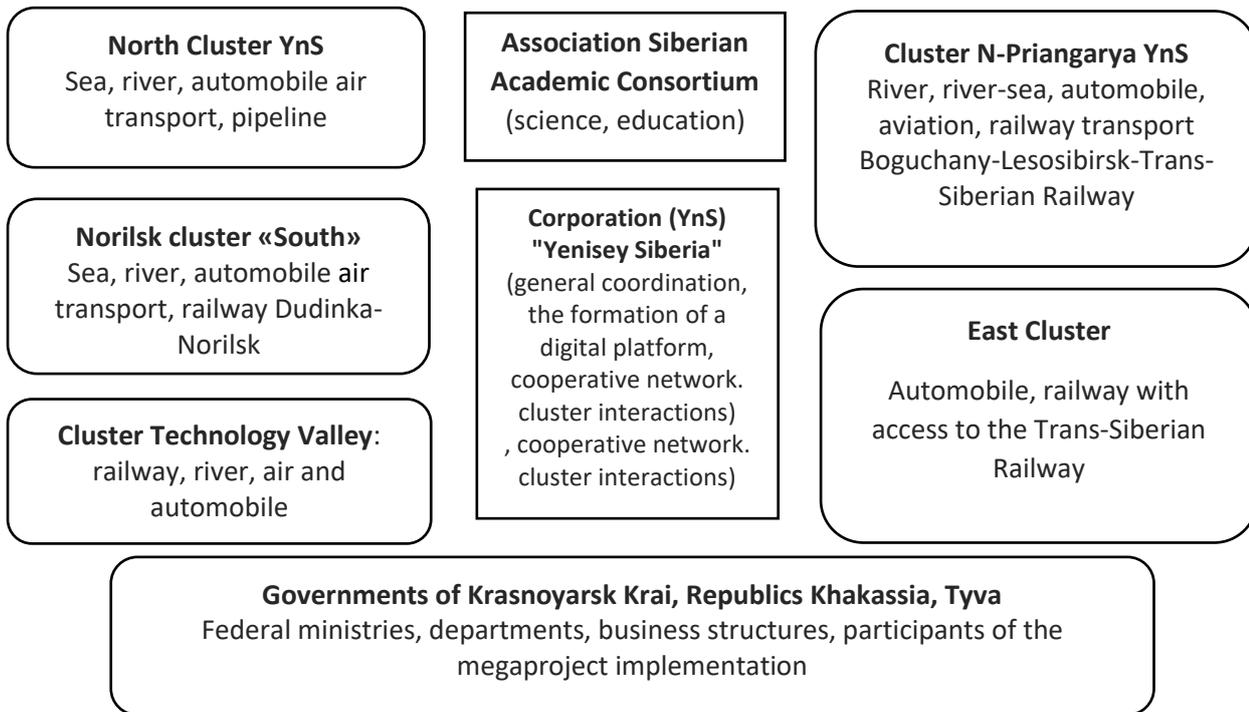


Fig 1. Scheme of the general interaction and types of transport along the clusters of the megaproject «Yenisey Siberia».

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