

UDC 33

Qilimuge, Gerelmaa J. A study of the current status of export transportation at Gashuunsuhait port

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***Abstract.** A well-developed transport hub and network reduces logistics costs and increases service levels. It can be seen from here that transportation is not limited to only one function of logistics, and has grown and developed, and has traditionally been called the transportation industry. The field of social production is nowadays known as logistics or transport logistics. Coal plays an important role in meeting our global energy needs. Coal is used for 38 percent of energy production and 71 percent of steel production. According to the World Coal Association, coal will remain the main fuel for electricity and energy production in developing countries for decades to come. Therefore, it is an important issue to organize coal transportation activities efficiently for the stakeholders.²⁵*

***Keywords:** logistics, terminals, cargo flow, transportation services, costs, coal*

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I. INTRODUCTION

Logistics is developing methods for planning and managing the flow of inventory and information so that an enterprise achieves maximum economic efficiency. Enterprises that use logistics planning methods are more productive in a shorter period of time. Their competitiveness is reflected in the cost of goods, reliability of supply, quality of products and services. Transport and logistics can be defined as the simple relationship between drivers and vehicles on the road and other vehicles, as well as the infrastructure network that plays a key role in regional economic relations, as well as the complex relationship between owners, users, and legal and technical regulatory stakeholders. These passions are two extremes in the scope of transportation and logistics. Any transport and logistics system lies between these two extremes and is entirely engineering, economic and social in nature. The spatial and temporal transitions considered in transportation are studied in the context of inventory and information flow through nodes and networks in logistics. This means that time is a spatial factor as well as a flow factor through nodes and networks. By improving the organization of transportation and logistics, it is possible to cover longer distances in the same time or reduce costs by covering more distances in a shorter time.

²⁵ World Coal Association, <https://www.worldcoal.org/coal>, 2019

II. THEORETICAL REVIEW

When transportation is considered separately from logistics, decisions about freight are made separately from logistics. In this case, when measuring the efficiency of transportation, the output or the quantity of products and services is considered by the amount of transported cargo and cargo turnover. However, these are only measures of direct output and do not fully reflect the performance of transport work in the broad scope of production and consumption. In other words, performance is measured in ton-kilometers alone, regardless of the type of transportation, mode, or type of service provided. Therefore, it is not accepted by transport experts as not a real result. For example: the fact that the volume of freight carried by road transport is higher than that carried by railway transport does not mean that road transport is relatively good in terms of performance. Blanquart²⁶ et al. said that an important component of logistics in cargo transportation is carried out by 4 main activities: material activities, information activities, communication activities, and methodological activities. In material operations, it was considered the traditional transportation operation of transporting goods from one point to another. In addition to loading, shipping, and unloading, this process includes packing, storage, and labeling. At the same time, the method of transferring information about the cargo, coordinating and coordinating the relations between the parties performing the work is a logistics activity.

At the international level, researchers are widely using the terms transport logics and transportation logistics. It is called transportation, logistics or transportation logistics, and researchers Lai et al. (Lai K. N., 2002) say that transportation logistics is an intermediate activity that facilitates the material flow between the point of origin and absorption of cargo. Mongolia's sustainable development concept-2030 policy document defines the reduction of foreign and domestic trade transport costs and time. However, in the Three-Pillar Development Policy, the goal of "developing integrated transport, logistics and infrastructure supporting economic growth and creating a favorable environment for citizens to work and live" was put forward. In this context, the objectives of the policy of intensive development of mining, heavy industry, intensive animal husbandry, agriculture, tourism, transit transport and logistics in the central region, development of trade, transport and logistics infrastructure based on modern information technology have been reflected.

Researchers (Stephen C.H. Leung, 2006) and (Banomyong, 2010) also use the term cross-border logistics. Cross-border logistics also includes port logistics. While a country has relative control over national logistics, cross-border, international logistics cannot have relative

²⁶ <https://ru.wikipedia.org/w/index.php>

control over space, demand, and shipping documents. These activities depend on additional environments. In general, the operating environment of national and international logistics is quite different.

In the mineral extraction plan until 2032 issued by the Government of Mongolia, it is estimated that the economy will develop based on the extraction of coal, copper, iron, gold and oil. Also, by 2030, it is expected to export about 80 million tons of coal per year. Since 1995, the share of the mining and quarrying industry in the production of our country has been more than 50 percent. According to the statistics of 2018, 57.4 percent of the industrial production was produced by mining products. However, 20.8 percent of the mining output was made by the coal sector alone. In addition, the export of mining products accounted for the majority of foreign trade income, and the export of mineral products accounted for 88.4% of the value of the total exported goods, and the export of coal accounted for 39.7% of the value of the main export goods. According to a study conducted by the International Energy Union, the demand for coal on the world market began to grow sharply in the second half of 2016 and will remain stable for the next 5 years.

III. PART OF THE RESEARCH

It is essential to determine the organization of transport and logistics from a social, environmental and economic point of view. Each logistics chain is unique and has a different operating environment. Therefore, the transportation and logistics chain should be modeled based on the detailed information that is important to the chain. As of 2021, Mongolia is among the top 10 countries in the world in terms of guaranteed coal reserves and among the top 20 countries in terms of coal production. Mongolia exports 95 percent of its total coal exports to China, which is the world's largest coal consumer. This represents about 14% of the country's total imported coal, which shows that it is possible to increase the amount of exports to the country in the future.

The contribution of coal exports to the economy continues to increase. More than 90% of Mongolia's coal exports are carried out by road transport, depending on the location of coal deposits, the characteristics of the area and the products to be mined, the development of infrastructure, and the landlocked state. According to the indicators of the last 5 years, cargo flow and cargo turnover have increased. However, despite the goal of increasing exports, the capacity of coal mining, and the capacity of the purchasing market, the export volume is low, which shows the poor implementation of Mongolia's development policy and the poor organization of coal export transportation and logistics.

In the southern part, Mungogov province shares a 798-km border with Alshaa and

Bayannuur provinces of the People's Republic of China, while in the northern part, it borders with Bayankhongor, Uverhangai, Dundgov, and Dornogovi provinces. The province has a vast area of 165,000 square kilometers.

For Mongolia, being a neighbor of the world's largest coal consumer is an advantage. According to Bloomberg, Mongolia exports 14 percent of China's total imported coal, and the export volume has been increasing in recent years.

In terms of climate, Baikal has an extreme continental climate. In the summer season, the temperature is 30-38 degrees, the wind speed is 5-15 meters/sec, sometimes it reaches 34-45 meters/sec. Droughts occur every 2-3 years, and desertification is intensifying, which has been clearly felt in recent years.

The number of settled population of the province reached 73,235 by the end of 2022, an increase of 1442 people or 2.01 percent from the previous year. 14.1 percent of the population of the central region and 2.1 percent of the national population live in Mungogov province.

With more than 80 mineral deposits and more than 200 occurrences in Mungogov province, 3 large deposits of strategic importance have been identified in Tavantolgoi, Oyu Tolgoi, and Narynsukhait, and 14 companies such as Oyutolgoi, Tavantolgoi, Erdenes Tavatolgoi, Energy Resources, Terra Energy, and Javkhlant Ord have developed mineral deposits in the entire territory. mining operations are underway.

According to the preliminary results, in 2022, Umnogov province produced 2.3 percent of the total domestic product of Mongolia and 21.7 percent of the central region, or 1002.4 billion MNT. As of the end of 2022, the gross domestic product of Umnogov province has reached 1002.4 billion MNT, a decrease of 5.0 percent from the previous year. Considering the gross domestic product of the province in 2022 by sector: agriculture, hunting and forestry sector accounts for 14.0 percent, industry and construction sector for 47.3 percent, and service sector for 38.7 percent.

Gashuunsuhait Transshipment Terminal transfers narrow-gauge (1435 mm) and road cargo exported to China from wide-gauge wagons to narrow-gauge (1435 mm) wagons and cars using lifting and handling mechanisms. Also, cargo coming from the Chinese railways in narrow-gauge (1435 mm) wagons and containers is transferred to wide-gauge wagons for loading, unloading, and delivery. In addition, it is a facility with 24-hour continuous operation for the purpose of receiving, loading and unloading imported goods transported by car from China to local transport.

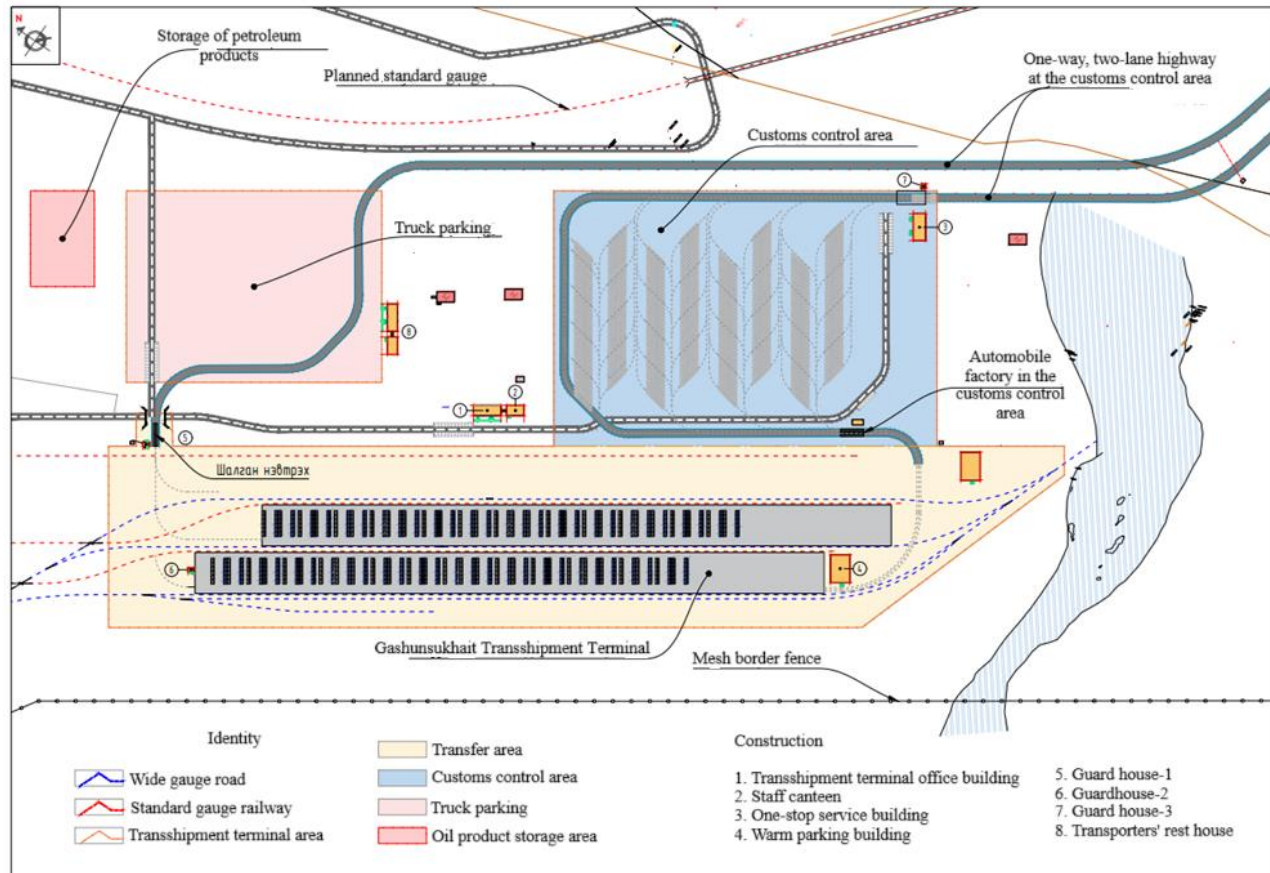


Figure 1. Arrangement of the terminal area of Gashuunsukhait logistics center

According to the technical and economic basis, the logistics terminal is planned in the 1st phase with a total of 285 employees, 6 container loaders and 3-4 other equipments with an annual cargo processing capacity of 10-12 million tons. Currently, with 25-30 employees, 2 container loading mechanisms can store 1,680 TEU containers at the same time in the area, and it is currently operating with an average annual handling capacity of 4.7 million tons.

Table 1

Amount of cargo imported through Gashuunsukhait port, gross weight, 2022

Types of goods	Quantity	The price
Trailers, semi-trailers, other vehicles other than self-propelled vehicles, parts and pieces/	12,159.0	70,317,562.6
Other articles made of iron and steel, in kilograms	23,978,000.0	27,238,690.4
Trucks, units	1,680.0	126,474,619.8
Products made of cement, concrete and artificial stone, bricks, building, road tiles, in kilograms	13,145,181.0	4,002,073.5
Cement, in kilograms	10,341,628.0	1,360,351.8
Stones prepared for the purpose of monuments and construction, and articles made from them, in kilograms	10,120,573.6	2,889,516.1
Gypsum, in kilograms	9,647,090.0	2,164,380.0
Black iron structures, their components (assembly parts), building materials, in kilograms	8,256,704.6	14,359,122.5
Unglazed ceramic items for flooring, cladding and inlay, by m2	386,112.7	2,281,819.7
Gravel sorting, sifting, crushing, kneading, mixing machinery and pieces	16,622.0	20,651,882.7
Bulldozers, scrapers, graders, graders, mechanical shovels, excavators, road graders, etc.	122.0	32,143,299.3
Black metal structures and components for fixing and connecting rails and rails	4,568,570.8	8,191,043.0
Items made of steel, such as banks, ties, buckles, brackets, checks, gaskets.	4,413,279.7	8,728,555.6

Source: General Department of Customs

Mongolia's total coal exports have been growing for the past 5 years, and the total export volume has also increased every year. According to the research, the share of coal exports in total exports has decreased to 28% in 2020 and 30% in 2021 due to the impact of the Covid-19 pandemic, but it will increase to 51% in the expected performance of 2022.

Table 2

Survey of cargo exported through Gashunsukhait port

	2019	2020	2021	2022
Total export volume	7,619.63	7,576.31	9,247.10	12,010.53
Total coal exports	3,078.82	2,126.61	2,774.07	6,138.44
Share of coal exports in total exports	40%	28%	30%	51%

Source: United Statistical Database

The export of copper ore and concentrate has decreased every year from 2016 to 2022. In 2016, 904,635 tons were exported, and in 2022, it was 798,789 tons, or 24 percent.

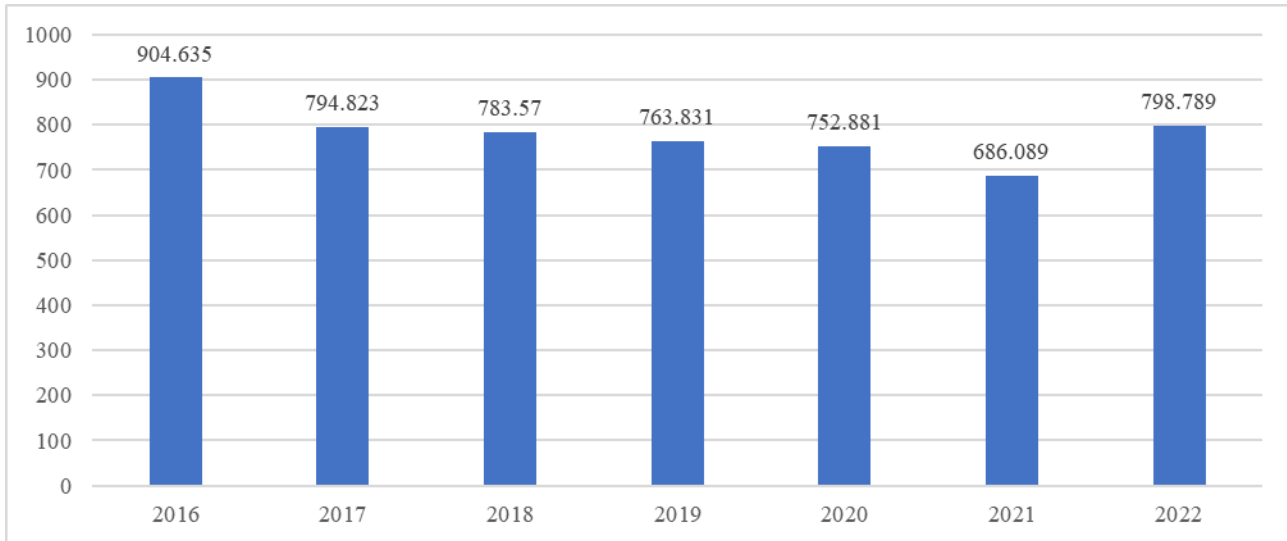


Figure 2. Copper ore and concentrates exported through Gashuunsukhait port.

The amount of hard coal exported through Gashuunsukhait-Gantmod port was 20.4 million tons in 2019, but due to the Covid-19 pandemic, it has decreased every year, and in 2020, it decreased by 14.7 million tons, and in 2022, it decreased by 7.1 million tons or 8 million tons. has indicators

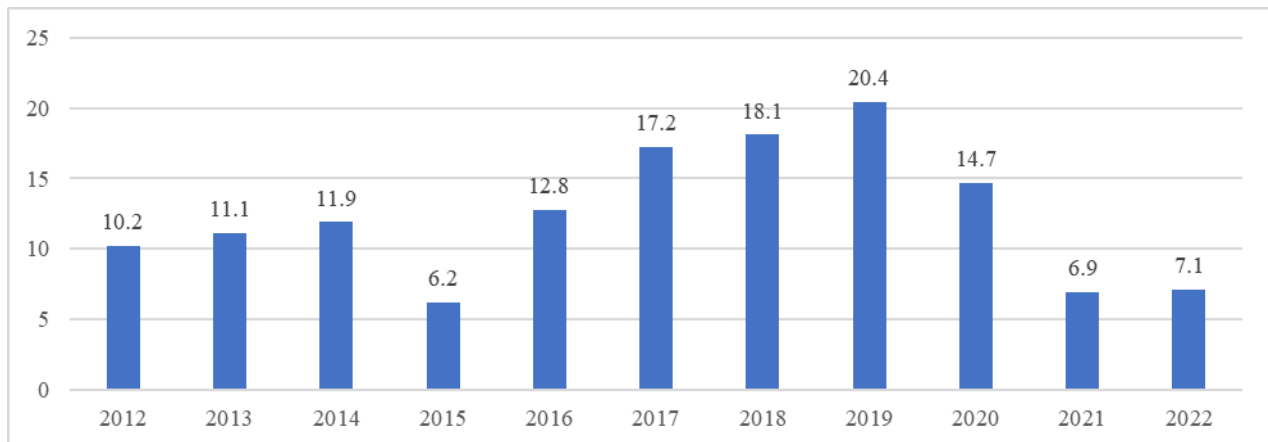


Figure 3. Amount of hard coal exported through Gashuunsukhait port, million tons

The main driving force of Mongolia's economy is the export of mineral resources, which is increasing year by year, including coal export, which is the main foreign trade product and source of foreign currency income.

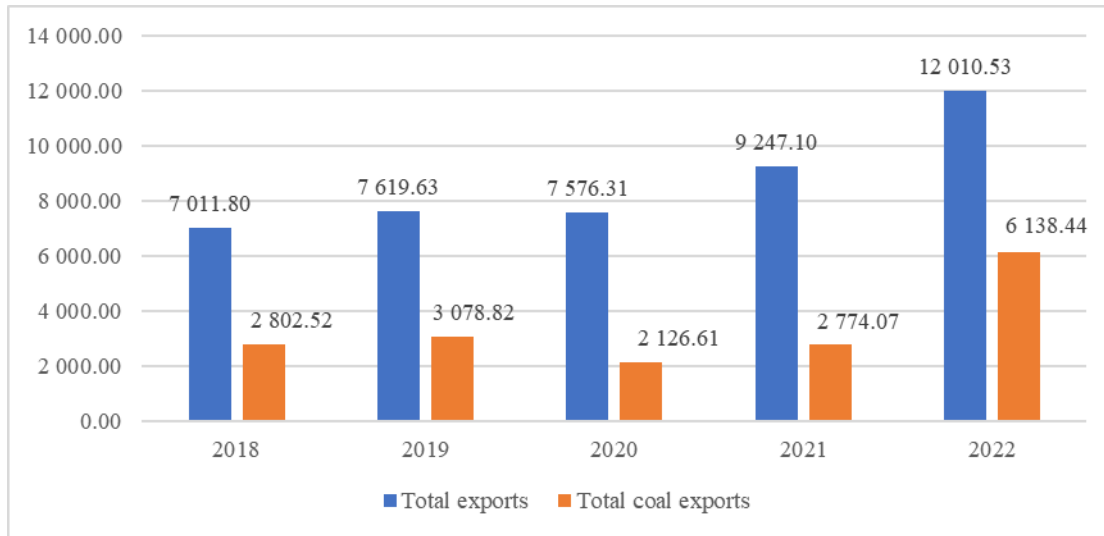


Figure 4. Total exports and total coal exports / million US dollars/

Coal export forecast

The following results were obtained when the coal export forecast was calculated based on statistical data for 2012-2022. Many factors will influence the forecast, and the table below shows the short-term export forecast until 2028 based on statistical methods or data from the previous 10 years, and the result is 17.9 million tons and 26.3 million tons with a high confidence interval.

Table 3

Coal export forecast

Time	Value	Assumptions	Believing interval /small/	Believing interval
2012	10.2			
2013	11.1			
2014	11.9			
2015	6.2			
2016	12.8			
2017	17.2			
2018	18.1			
2019	20.4			
2020	14.7			
2021	6.9	6.9	6.9	6.9
2022		15.0	6.6	23.4
2023		15.5	7.1	23.9
2024		15.9	7.5	24.3
2025		16.4	8.0	24.8
2026		16.9	8.5	25.3
2027		17.4	9.0	25.8
2028		17.9	9.5	26.3

These results include the impact of the Covid-19 pandemic. In the Feasibility Study of the Tavantolgoi-Gashuunsukhait railway line, the mining and export plan of the mines in the Tavantolgoi Basin in 2020-2051 was considered to be 63-86 million tons, of which 10-50 million tons will be transported by rail.²⁷

IV. CONCLUSIONS

1. As of 2018, Mongolia is among the top 10 countries in the world in terms of guaranteed coal reserves, and among the top 20 countries in terms of coal mining, and the coal mining sector alone accounts for 20.8 percent of production. In addition, coal exports accounted for 39.7 percent of the income value of the main export goods, the world's largest coal consumer, neighboring China, supplied 95 percent of the total exported coal to the country's market, but this constituted only 14 percent of the country's total imported coal.

2. The demand for coal in the foreign market is stable, and policy goals have been set to increase exports. However, the problem of transport and logistics organization, such as the fact that exports are not maintaining their growth rate, and on the other hand, the logistics performance indicators at the international level have fallen by 22 places compared to 2016, reflect the situation.

3. Mongolia's coal export logistics chain includes 22 major coal mines, about 250 transport companies, 5 road border ports, the main hubs, transport infrastructure owners, Mongolian border, customs, professional inspection agencies, licensing, control, and safety monitoring agencies., involved various service providers along the route. The loading, unloading, storage, resource control facilities and technical equipment belonging to the activities of each of the above organizations are participating and operating together.

4. Due to landlocked and underdeveloped transport network for heavy-duty transport, coal export is carried out by road transport. Cargo turnover and cargo flow are growing, but depending on the state of transportation and logistics organization, the delivery is delayed due to the loss of a large amount of time, which is the basis for reducing the level of service, which increases the cost of logistics.

5. Each coal export logistics chain has its own characteristics. The main components of the logistics chain of cargo transportation from Tavan to Gashun Suhait border crossing are 3 cargo generating mines, more than 160 transport companies with more than 11,000 vehicles, the hubs of Gashuun Suhait border crossing with permanent operation, Gashuun Suhait highway, Tsagaankhad customs control. Regional, transport, border,

²⁷ Consulting service for clarifying the technical and economic basis of the construction of the Tavantolgoi-Gashuunsukhait railway, April 2020, Chapter 16.4, page 338

customs, and professional inspection will be attended by policy and regulatory units to improve coal export transportation and logistics organization.

6. Congestion has arisen due to the current organization of transportation and logistics on the Tavantolgoi-Gashuunsukhait route, and in connection with this, the quality of life, social and health problems of transporters have become acute. The negative impact of coal transport on the environment is increasing, polluting Gobi's protected areas, increasing logistics costs, and causing loss of weight and quality of cargo. In this regard, the government and other stakeholders explain it differently for various reasons and try to solve it, but there is no significant change.

7. There is a requirement for coal to be unloaded and transshipped in the coal customs guaranteed area near Tsagaankhad, firstly to limit the length of the queue, and secondly, to reserve it so as not to interrupt the flow. However, it is clear that the volume of transport from Tsagaankhad to Gashuunsuhait port will not decrease, so the first task of limiting the length of the queue at the port will not be fulfilled. Also, since all the coal is landed there, it cannot be considered as a safety reserve. Due to the deliberate creation of repeated shipments, Tavantolgoi is the most inefficient route for coal export transportation and logistics.

8. The International Energy Union says that the weight loss during the transportation of coal by rail is similar to transportation by road, and depending on the conditions of transportation, it can be higher in road transportation. The association estimated the loss of coal weight to be 0.4 percent on average and at least 0.1 percent in the normal supply chain, and it will increase depending on the organization of transportation and logistics (Baruya, Losses in the coal supply chain, 2012). In this study, there is no information about the loss of coal in countries such as China, India, Indonesia, Australia, and Mongolia, which produce and sell large quantities of coal, and it is noted that Kazakhstan and the United Kingdom report that they lose 1.2-1.3 percent of their total coal production due to weight loss.

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9. https://www.combine-project.com/sites/default/files/content/resource/files/identification_of_measures_to_improve_terminals_in_bsr.pdf Холимог тээврийн терминалын үйл ажиллагааны шинжилгээ
10. Тавантолгойн нүүрсний ордыг ашиглах зарим асуудлын тухай УИХ-ын 2010 оны 39 дүгээр тогтоол
11. Боомтуудын ерөнхий төлөвлөгөө, концессын зүйлийн жагсаалт батлах тухай Монгол Улсын Засгийн газрын 2010 оны 102 дугаар тогтоол