

## ARTICLE

## Energy cooperation between Mongolia and Russia: past, present, and future

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**Abstract:** The paper showcases the experience of energy cooperation between Mongolia and Russia and it gives a brief description of the current state and outlines strategic directions of energy cooperation between the two countries from the perspective of current energy cooperation priorities in the Northeast Asian countries, and active mutually beneficial participation of Mongolia and Russia in this process. Prerequisites for cooperation and conditions for successful intercountry projects in individual industries of the energy sector are considered in the study.

**Keywords:** Fuel and energy complex; Energy cooperation; Intercountry fuel and energy projects; Countries of Northeast Asia; Energy policy;

### INTRODUCTION

Mongolia is located in the heart of the Asian Continent and its location has a very important geopolitical and geoeconomic significance in international relations between Russia, China and some NEA countries. This feature has traditionally played and largely determined Mongolia's participation in the developments in this important region of the world. In economic cooperation between Russia and China, it is vitally important for

Mongolia to participate in this cooperation with due consideration of primarily protecting its vital interests and cooperation in the energy sector is no exception. Traditionally, Mongolia and Russia have close partnership in this area and the Unified Energy System of the Russian Federation continues to remain an important external factor promoting the reliable operation of the Mongolian Energy System.

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A new stage in the history of trilateral relations began in 2014 at the first meeting of the heads of our states in the new conditions and an important starting point was the subsequent signing of the Programme for the creation of the Russia-Mongolia-China Economic Corridor in 2016. In this important and articulated specific aspects of economic cooperation, the document provides for the creation of an energy corridor between the two neighbouring countries running through Mongolia.

## MATERIALS AND METHODS

The study of the priority areas of energy cooperation between Mongolia and Russia discussed in the article, takes into account energy cooperation in Northeast Asia, and existing reporting statistical material and forecast data are used for the development of the economies and industries of the fuel and energy complexes of Russia, Mongolia and

The documents on the development of the economy [1], including Mongolia's energy [2,3], are designed at strengthening the country's energy systems by introducing new generating capacities and strengthening inter-system ties, and thus forming an integrated electric power system. The Government of Mongolia is also implementing an energy policy to expand external ties to open up the possibility of importing electricity and then entering the Northeast Asia economic and energy space with its rich fuel, energy and mineral resources.

## RESULTS AND DISCUSSION

### 1. Analysis of the past and present energy cooperation between Mongolia and Russia

The national interests of Mongolia and Russia call for a much more active mutually beneficial cooperation. Historically, the former Mongolian People's Republic (MPR) and the Union of Soviet Socialist Republics (USSR) had close economic and energy ties. We can distinguish (with some conventionality) three stages of Mongolian-Russian energy cooperation:

- 1) The stage of socialist optimism;
- 2) The stage of post-socialist romanticism;
- 3) The stage of capitalist pragmatism.

**1) The stage of socialist optimism (until 1990):** The USSR contributed immensely to

China and some other NEA countries. Using the available methodological mechanism of systematic research in the energy sector in the form of mathematical methods and models, the authors have carried out assessments of existing proposals for energy cooperation between Mongolia and Russia, and has attempted to formulate new proposals.

shaping and developing Mongolia's energy sector, with the main focus on [4]:

- conducting exploration surveys;
- building estimates;
- participating in the construction of energy facilities;
- supplying equipment;
- training of scientific and technical personnel, etc.

By the end of this stage, Mongolia's energy sector had been one of the most advanced sectors of the national economy. It accounted for more than 37 per cent of fixed assets, produced almost about 16 per cent of gross domestic product, and involved about 11% of the country's work force.

<sup>1</sup> Meeting on the sidelines of the SCO (Shanghai Cooperation Organization) submit in Dushanbe on 11.09.2014.

In 1985, MPR generated 2.8 billion kWh of electricity and 5.4 million Gcal of heat. To cover the growing demand for electricity and oil products, Mongolia imported them from the Soviet Union, which included 163 million kWh of electricity and 1.1 million tce<sup>2</sup> of fuel oil and light oil.

For reference: according to available estimates [4], the annual Soviet economic assistance to the MPR at that time contributed to almost 30 per cent of the country's GDP.

**2) The stage of post-socialist romanticism (1991–2010):** The collapse of the USSR and the formation of the Russian Federation as an independent state in new political and economic contexts necessitated the revision of previously accepted priorities in the country's economic and energy policy.

Russia's national interests necessitated an increasingly active mutually beneficial energy cooperation between Russia and Japan, China, Korea, and other countries of Northeast Asia<sup>3</sup>.

This priority line of the country's energy development, officially called the "Eastern Vector of the Energy Policy of Russia", was quite clearly stipulated in the Energy Strategy of Russia until 2020. The main points of this strategy are [5, 6]:

- the creation of new energy centers in Eastern Siberia and the Far East that would enhance Russia's energy security, restore and strengthen the disrupted fuel and energy ties between regions, accomplish many important tasks at the federal, interregional and regional levels;
- the rapid and large-scale energy development in eastern Russia and access to the energy markets of Japan, China and other countries of Northeast Asia was considered as an important means of timely ensuring the proper positioning of Russia in this strategically important region of the world;

- the development of energy infrastructure formed by the interstate gas and oil pipelines, and power lines in the East of Russia and Northeast Asia would reduce the cost of energy, increase the reliability of energy and fuel supplies to consumers in different countries, and help address environmental problems;
- the eastern regions of the Russian Federation - Eastern Siberia and the Far East - with their powerful economic and energy potentials, are at the forefront of pursuing Russia's national interests in this strategically important region of the world.

For some internal and external (international) reasons, Russia at that time was outside the main process of economic cooperation development in the Asia-Pacific region. Russia's foreign economic relations with the Asia-Pacific countries, especially with the NEA countries, were immeasurably small compared to those between Russia and European countries. In 1995–2000, Russia's turnover of trade with the NEA countries was on an average 11–12 per cent of the total trade volume between Russia and the non-FSU countries (compared with 69–70 per cent between Russia and European countries) [6].

The lack of coordination in the actions of companies, constituent entities of the Russian Federation and the federal center was especially evident in the numerous proposals for the supply of Russian energy resources (electricity, oil, natural gas) to the Chinese markets that were made at that time. At the same time, for political reasons, the export routes of some projects for the supply of energy resources from Russia's Eastern Siberia to Chinese markets did not go through the territory of Mongolia, despite their fairly obvious economic and geographic advantages.

<sup>2</sup> tce- tons of coal equivalent

<sup>3</sup> Countries of Northeast Asia (NEA) - Russia, Mongolia, Japan, North Korea, South Korea and China

Here are examples of such projects [6]:

- The project for the construction of an export power line Irkutsk Region - People's Republic of China (1998), with a transfer capability of 18 billion kWh, developed by the Russian Electric Network Company "Irkutskenergo" and the Chinese National Electric Network Company;
- The project for export gas pipeline Irkutsk Region - China - Korea, which was jointly developed by the Russian company "Russia Petroleum", the Chinese National Oil Company and the Korean Gas Company, and submitted to the Government of the Russian Federation in 2004. This project annually supplied 20 billion m<sup>3</sup> Kovykta gas to Chinese consumers and 10 billion m<sup>3</sup> to South Korean consumers.

After the collapse of the Soviet Union and CMEA – Council for Mutual Economic Cooperation (also known as Comecon, which was an economic organization from 1949 to 1991 under the leadership of the Soviet Union that comprised the countries of the Eastern Bloc along with a number of socialist states elsewhere in the world) in 1990, Mongolia was forced to go through a period of restructuring and transforming the previously centrally planned economy. The transition of the country's economy to market relations had a positive outcome, but the progress was slow. However, at the end of this stage, despite the crises of 1997–1998 and 2008–2009, average annual growth rate of GDP per capita was about 10 per cent.

The key challenges facing the development of the economy at that time were associated with a limited domestic market for goods and an underdeveloped infrastructure.

Mongolia liberalized prices, privatized state property, established a two-tier (state and private) banking system, and diversified foreign trade. As a result, the basic prerequisites for the development of market relations were put in place.

In 2005 – 2007, China ranked first in Mongolia's total exports (more than 40 per cent), the USA ranked second (about 30 per

cent), and Russia was the third (8–10 per cent). Whereas in the total volume of imports, Russia ranked first (30 per cent), China was second (20–25 per cent), and Japan was third (8 per cent). Moreover, more than one half of Russian-Mongolian trade was with the neighbouring Irkutsk region [7].

At the end of this stage, in 2010, Mongolia's total foreign trade turnover was estimated at US\$ 6.1 billion, including exports – at US\$ 2.9 billion, and imports – at US\$ 3.2 billion. Of the total exports, 30.3 per cent was coal, 26.5 per cent was copper concentrate, 8.7 per cent – iron ore, 6.1 per cent – gold, 5.3 per cent was oil, and 4.6 per cent was zinc.

In 2010, Russia supplied 826 thousand tons of oil products and 262.9 million kWh of electricity to Mongolia.

**3) The stage of capitalist pragmatism (2011-present):** In this stage, the concept of energy cooperation between Russia and NEA countries entered a new phase. New factors emerged, old ones became clearer, and these factors had to be taken into account in the study of the energy cooperation in NEA.

Essentially, Russia had become aware of the fact that there should be a long-term strategy for mutually beneficial energy cooperation between Russia and Mongolia, China, and other NEA countries.

The Baikal region, among other regions of Russian Asia, could play a key role in enhancing energy cooperation between Russia and Mongolia, and Russia could have direct access to the dynamically developing energy market of China through the territory of Mongolia.

At present, Russia, more than any other country, supplies electricity and petroleum products to Mongolia. The supply of liquefied natural gas (LNG) has been begun in 1999. For example, according to customs statistics, in 2015 Mongolia imported 93.1 per cent of oil products from Russia, 4.6 per cent from Korea, 1.6 per cent from China and 0.7 per cent from other countries.

National energy development forecasts available in both Mongolia and Russia indicate

the need to strengthen energy cooperation between the two countries in the context of objectively ongoing globalization processes of the world economies.

## **2. Priority areas of mutually beneficial energy cooperation between Mongolia and Russia.**

Coal and electric power industries continue to remain priority areas for mutually beneficial energy cooperation between Mongolia and Russia. An important area of cooperation between the two countries is the participation of Russian partners in expanding the resource base of Mongolia's energy sector and processing it.

In the coal industry, bilateral cooperation can be significantly developed through the implementation of a joint project for the development of the world's largest Tavan-Tolgoi deposit of coking coal [8].

The Mongolian Parliament approved [9] the construction of a railway line from the Tavan-Tolgoi deposit to the Russian border extending 1.1 thousand km for the possible export of coking coal from the deposit to markets in the Asia-Pacific region countries through the Russian Far Eastern seaports.

A mutually beneficial area of cooperation between the two countries in the coal industry entails the establishment of joint ventures for integrated and advanced processing of Mongolian brown coal [8]. There can be two avenues for Mongolian-Russian cooperation in the electric power industry: the construction of new power plants and the creation of an interstate electric power system.

Studies carried out by the mining and energy ministries of Mongolia indicate [6] that in the period from 2015 to 2030, national demand for electric power may range from 1,500 to 3,000 MW, i.e. it will increase in comparison with the present level by 2 to 4 times respectively. Even for a scenario with a minimum level of economic development, energy consumption will increase almost five fold by 2025 as compared to 2010. According

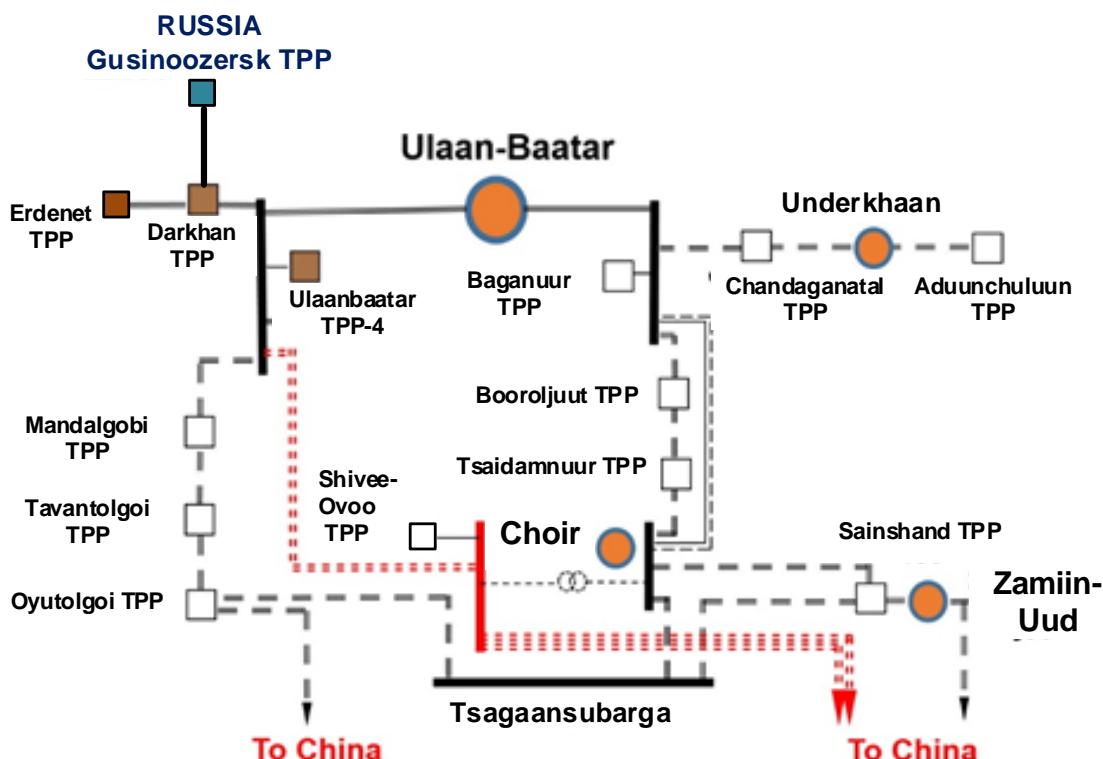
to the forecast balances, the increase in electrical loads in certain periods even before 2020 will outstrip the increase in generating capacities.

Currently, the Government of Mongolia is considering the possibility of building several large thermal power plants (TPPs) and a couple of hydroelectric power plants (HPPs), namely [3]:

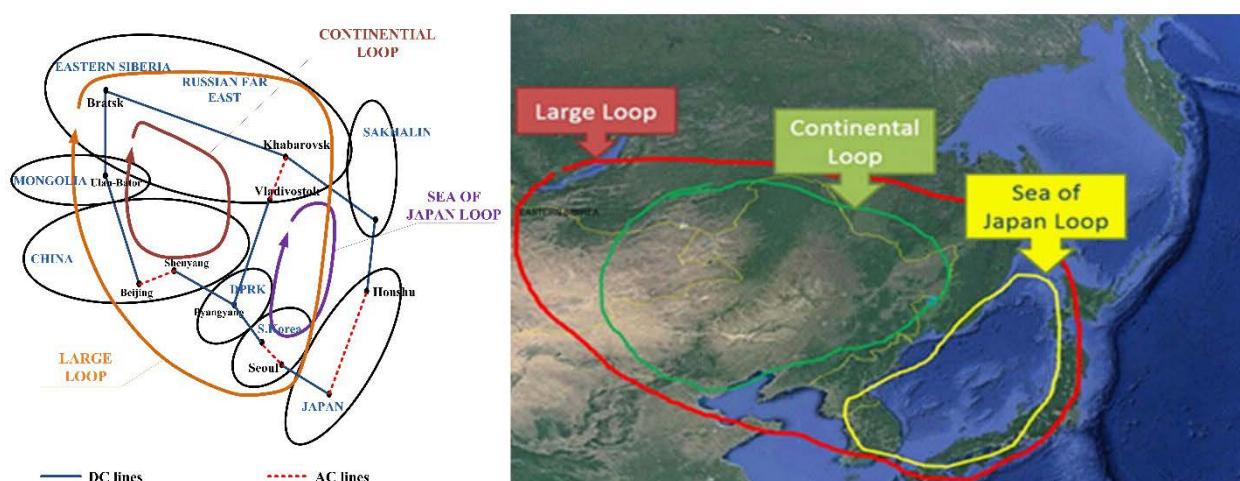
- TPP at Baganuur coal mine (700 MW);
- TPP at the Tavan-Tolgoi coal deposit (450 MW);
- TPP at the Booreljuut coal deposit (300 MW);
- Egiin-Gol HPP in the central region (315 MW);
- Export-oriented TPP at the Shivee-Ovoo coal mine (5280 MW)
- Erdeneburen HPP in the western region (100 MW), etc.

Projects for large thermal and hydropower plants in Mongolia suggest the involvement of highly qualified specialists from around the world, including Russia. Besides, they envisage cooperation in the supply of modern energy equipment. Another area of cooperation between Mongolia and Russia in the electric power industry is the establishment of an interstate Russia-Mongolia-China electric power system [10, 11] (Figure 1), and the formation of the Asian Super-grid [12].

Construction of cross-border transmission lines in NEA is one of the important part of energy cooperation in this region. The strategy outlines the development of interstate electric ties between the eastern regions of Russia and "neighbouring" countries: Mongolia, China, Japan and North Korea. The operation area of such an interstate power super interconnection may include different types of power plants (thermal, hydraulic, nuclear, wind, etc.) with a total installed capacity of more than 450-500 million kW. Possible scenarios for the interstate interconnection of power systems of NEA countries can be seen in Figure 2.



*Figure 1. Interstate Russia – Mongolia – China electric power system*



*Figure 2. Possible scenario of interstate interconnection of power systems in NEA countries*

The cross-border power transmission lines to be built for this purpose can be used both for exporting electricity from Russia, integrating the electric power systems of the countries for joint (or parallel) work, and creating common electricity and capacity markets. This issue was considered at a meeting of the Intergovernmental Commission on Trade, Economic, Scientific, and Technical Cooperation of the two countries in May 2019 [13].

In recent years, Mongolia has paid much attention to the development of renewable energy [14]. The country has significant potential for renewable natural energy resources. An important aspect of development in this area is the use of solar energy. According to Mongolian experts, the country has the resources to annually generate 2.6 billion kWh of electricity by solar plants.

The most promising site for the deployment of a solar power plant is the Gobi region [15] in the south of Mongolia. One of the priority areas of Mongolian-Russian cooperation in the field of renewable energy could be the development of joint projects and feasibility studies for the construction of small-scale hydropower plants.

Joint research into the possibilities of using renewable energy in the conservation zone of the Baikal-Khuvsgul basin, which has significant wind and solar potential, is another promising area to be considered [16].

Prospective cooperation between Mongolia and Russia in the country's oil and gas sector can be associated not only with the growing supply of oil products and liquefied petroleum gas from Russia to Mongolia, but also with the establishment of joint ventures for production and mutually beneficial product sharing.

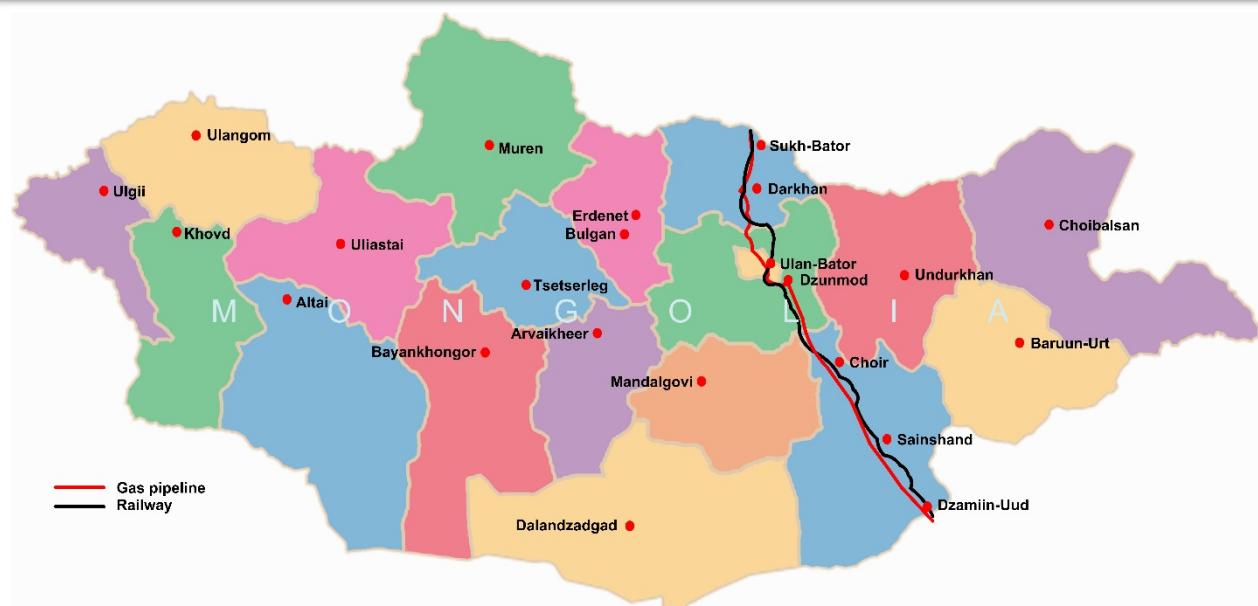
Mongolia can be a convenient transport corridor for the supply of natural gas from the Baikal region (Irkutsk region) of the Russian Federation to the People's Republic of China. The construction of the export gas pipeline *Russia (Irkutsk region) – Mongolia – China*, apart from the economic benefits, will also provide the opportunity for the consumers living in the areas of the Irkutsk region, the Republic of Buryatia and Mongolia, which are located along the route of the export pipeline, to switch to gas. Moreover, after the construction of the branch pipeline, the number of gas consumers will also increase in the Trans-Baikal Territory.

As evidenced by the Russian scientific and applied studies (for example, [17,18]), there are good socio-economic prerequisites for providing consumers of the Baikal region and Mongolia with network gas in the event the Russia-China export gas pipeline is constructed through their territories.

Mongolian experts have substantiated the long-term demand of Mongolia for natural gas and considered options for Mongolia's participation in the project for the construction of gas pipelines passing through its territory. Experts of the country have also analyzed political, institutional and infrastructure requirements for the implementation of this project; the issues of organizing and regulating future gas industry of Mongolia have been considered; and some environmental and socio-economic implications of introducing natural gas into the country's energy balance [19, 20, 21 and 22] have been highlighted. These studies show that large gas consumers are concentrated in the cities of Sukhbaatar, Darkhan, Ulaanbaatar, and their total annual demand for natural gas is estimated at 0.4–0.6 billion m<sup>3</sup>. According to studies conducted by the research team of Melentiev Energy Systems Institute, potential gas demand in the Baikal region in 2020–2030 is estimated at 7–8 billion m<sup>3</sup>, including 4.0–4.5 billion m<sup>3</sup> in Irkutsk region; 1.0–1.5 billion m<sup>3</sup> in the Republic of Buryatia; and 1.0–1.5 billion m<sup>3</sup> in Trans-Baikal Territory [18]. The potential annual demand for natural gas of Mongolian consumers, located along the export gas pipeline, is estimated at 2.0–2.5 billion m<sup>3</sup> [23].

The construction of a special gas pipeline system for increasing the number of gas consumers in the Republic of Buryatia, Trans-Baikal Territory, and Mongolia with the demand for gas of 4.0–6.0 billion m<sup>3</sup> per year is commercially inefficient. Moreover, this option can only be implemented with state support from Russia and Mongolia. The supply of Irkutsk natural gas to Mongolia is economically feasible only if the main large-diameter export gas pipeline passes through these territories [6, 17, 18, 19, 20, 22].

Gas pipeline route from Irkutsk region to China through the territory of Mongolia can be seen in Figure 3.



**Length of gas pipeline through Mongolia is about 1000 km**

**Figure 3. Gas pipeline route from Irkutsk region to China through the territory of Mongolia**

## CONCLUSIONS

The implementation of cross-country energy projects is a very challenging task. It is challenging in many respects: first of all, it is multifaceted, the implementation of the interstate projects will involve a large number of Mongolian and Russian stakeholders; these projects are extremely capital intensive, which implies close cooperation between the two countries at the federal (state), regional and interregional levels.

All of the above indicates the need for joint Mongolian-Russian comprehensive studies to identify a set of joint mutually beneficial energy projects for Russia and Mongolia. There is a need to develop a scientifically based strategy (roadmap) for energy cooperation between the two countries.

Currently, the main outlines of such a strategy for energy cooperation between Mongolia and Russia are quite clear. It is necessary to conduct joint studies, and based on their findings determine a list of mutually beneficial projects for energy cooperation, and develop mechanisms for their implementation.

Particular attention should be paid to the pricing formulas for fuel and energy products.

Such a strategy can only be developed relying on close cooperation between the teams of research and design institutes, companies, banks, etc. from both Russia and Mongolia with the active support of governments and regional authorities.

The authors of the paper consider it imperative to bring to the notice of the leaders of the Mongolian and Russian Academies of Sciences, and the governments of the two countries issues of development of the Strategy for Energy Cooperation between Mongolia and Russia until 2030–2035 and beyond until 2050.

The energy and economics institutions of Mongolia and Russia can take active part in addressing this challenging and important issue for our countries and for the entire community of NEA countries.

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