

LEGAL REGULATION OF THE USE OF GAS PIPELINES FOR HYDROGEN TRANSPORTATION

DOI 10.18572/2410-4396-2021-2-93-96



Kotousov Valentin A.

Postgraduate Student of the Center for Energy Law
of the Saint Petersburg State Economic University

energylaw211@unecon.ru

At present, there are no scientific studies in the field of legal regulation of hydrogen transportation through the existing gas pipelines. However, there seems to be an urgent need for such research projects. At the moment, there is practically no legal regulation on this issue. There are technical, regulatory, and legal risks associated with transporting hydrogen in the form of a methane-hydrogen mixture through the existing gas pipeline system. The influence of hydrogen on various metals has not been fully studied yet; there are no international safety standards or rules for the operation of the hydrogen infrastructure. A separate special certification of main gas pipelines is required. It is advisable to adopt technical regulations of the national standardization system in the field of transportation of hydrogen and methane-hydrogen mixtures, which shall determine, among other things, the admissible concentration of hydrogen in natural gas pumped through pipelines. The author has worded the priority tasks for improving the legal regulation of relations concerning the transportation of hydrogen through main pipelines.

Keywords: energy law, legal regulation of hydrogen transportation, legal regime of main pipelines.

In the context of the development of the global “green agenda” and the trend towards decarbonization of the world economy, there is a clear tendency towards replacement of hydrocarbons with other, more environmentally friendly types of energy resources, the use of which entails no direct emissions of polluting substances into the atmosphere. The international community views hydrogen energy as one of the ways to achieve carbon neutrality.

In order to combat climate change and its negative consequences, 197 countries, including the Russian Federation, adopted the Paris Agreement on December 12, 2015, based on the results of the 21st conference of the Framework Convention on Climate Change. [1]

On July 8, 2020, the European Commission published a Hydrogen Strategy (Building a Hydrogen Economy for a Climate-Neutral Europe). [2] According to this strategy, the

share of hydrogen fuel in the EU energy balance should grow by 2050 from less than 2% that we have today to 13 to 14%.

The German hydrogen strategy assumes that the hydrogen demand should double and reach 90 to 110 TWh by 2030. Germany alone will be able to produce about 14 TWh of “green” hydrogen by electrolysis of water. The rest (76 to 96 TWh) will be obtained using other low-carbon hydrogen production technologies, including from natural gas, or import. [3]

In June 2020, the Hydrogen Energy sector was for the first time included in the Energy Strategy of the Russian Federation until 2035.

The action plan *The Development of Hydrogen Energy in the Russian Federation until 2024* was approved by Order of the Government of the Russian Federation No. 2634-p of October 12, 2020. This plan stipulates the areas for the development and support of hydrogen energy, the establishment of the production potential and the implementation of a number of pilot projects in hydrogen energy, scientific and technical development and the development of high-tech solutions and human resources. Besides, it provides for the measures aimed at the development of international cooperation in the field of hydrogen energy.

Thus, from the standpoint of energy security, the Russian Federation has to be ready for a change in the structure of the demand for energy resources, including the replacement of a part of hydrocarbons with hydrogen.

The Energy Strategy of the Russian Federation until 2035 approved by Order of the Government of the Russian Federation No. 1523-p of June 9, 2020, sets a task of becoming one of the world’s leaders in the production and export of hydrogen to the Russian Federation.

Russia plans to export 0.2 million tons of hydrogen by 2024 and 2 million tons of hydrogen by 2035.

The set of key measures that contributes to the accomplishment of the hydrogen energy task includes, among other things, the creation of a regulatory framework in the field of hydrogen energy security.

Considering the implementation of a large-scale program of gasification of regions of the Russian Federation, low-carbon economic development will take place on the account of the increasing use of natural gas. Thus, in prospect, hydrogen energy will be aimed mainly at export.

The issue of the hydrogen transporting method gains relevance in the production of hydrogen for export.

There are several options for the pipeline transportation of gaseous hydrogen:

- Through special hydrogen pipelines;
- Through existing natural gas pipelines.

One of the important competitive advantages of our country is the availability of a functioning transport infrastructure for transportation of natural gas.

Oliver Hermes, Chairman of the Board of Directors of the Eastern Committee of German Business, has stated that the Nord Stream 2 gas pipeline could begin to be used for hydrogen supplies indicating that the pipeline is being built in accordance with the world’s most advanced environmental and safety standards. Oliver Hermes has also emphasized that Nord Stream 2, unlike old pipelines, can be filled with hydrogen by 70% as early as in the coming decades due to the materials used. [4]

Foreign energy companies are also exploring the possibilities of transporting hydrogen using their existing infrastructure, for example, Elshad Nasirov, Vice-President for Investment and Marketing of the SOCAR state oil company of Azerbaijan, said that 20% of the capacities of the Trans-Anatolian Natural Gas Pipeline (TANAP) could be used to transport hydrogen to Europe without any additional investments. [5]

The German Association of Gas Transmission Operators (FNB Gas, Vereinigung

der Fernleitungsnetzbetreiber Gas e.V.) presented a concept of a nationwide hydrogen infrastructure proposing to use more than 90% of the existing gas networks for hydrogen pumping. [6]

The deputies of the European Parliament's Committee on Energy have adopted a report encouraging the European Union to think about redesigning gas pipelines into an infrastructure for hydrogen supply. [7]

There are technical, regulatory and legal risks associated with transporting hydrogen in the form of a methane-hydrogen mixture through the existing gas pipeline system.

The influence of hydrogen on various metals has not been fully studied yet; there are no international safety standards or rules for the operation of the hydrogen infrastructure. A separate special certification of main gas pipelines is required.

Equipment designed for a specific gas composition is used to transport gas. A change in this composition may adversely affect the safety and durability of the unified gas supply system.

Taking into account the technical features of the gas transportation infrastructure, some countries of the European Union have adopted regulations that determine the admissible concentration of hydrogen during its transportation through pipelines. For example, German DVGW G262 standard determines that the composition of hydrogen in natural gas cannot exceed 10%. At the same time, European DIN EN 16723 standard limits the admissible concentration of hydrogen in natural gas pumped through a pipeline to 0.5%.

At present, there are no scientific studies in the field of legal regulation of hydrogen transportation through the existing gas pipelines. However, there seems to be an urgent need for such research projects. At the moment, there is practically no legal regulation on this issue.

Review of the use of gas pipelines for hydrogen transportation requires an interdisciplinary approach.

It is important to note the existence of studies substantiating that the transportation of hydrogen in the form of a methane-hydrogen mixture for export via the existing export gas pipeline system is economically unsubstantiated (foreign analysts at IHS Markit) and it is more profitable to organize the production of low-carbon hydrogen from the Russian natural gas directly in the EU. [8]

There is also a study stating that long-distance transportation of hydrogen is at a huge disadvantage compared to the long-distance transportation of natural gas in terms of reliability, safety, and economics due to its physical, chemical, and technical features. [9]

The Ministry of Energy of Russia together with the Ministry of Industry and Trade are working on the establishment of a special autonomous non-profit organization that will promote the development of hydrogen technologies in Russia. This organization will deal with the technological development and standardization of the production, consumption, and transportation of hydrogen. A scientific and technical council will verify all these operations.

Certainly, huge and important work remains to be done in order to solve the problem of legal regulation of hydrogen energy. It is necessary to adopt technical regulations of the national standardization system in the field of transportation of hydrogen and methane-hydrogen mixtures, which determine, among other things, the admissible concentration of hydrogen in natural gas pumped through pipelines.

After conducting technical studies, it will be possible to develop new or update the existing regulatory acts governing the relations for the transportation of hydrogen through gas pipelines.

The following priority measures seem advisable in order to develop legal regulation

in the field of using the existing gas transportation infrastructure for the export supplies of hydrogen:

To amend Clause 1 of Article 4 of Federal Law No. 147-Φ3 of August 17, 1995 *On Natural Monopolies* by adding a paragraph “transportation of hydrogen and methane-hydrogen mixtures through pipelines”;

To adopt a federal law establishing that the exclusive right to the export of hydrogen

and methane-hydrogen mixtures in a gaseous state belongs to an organization that owns the unified gas supply system or its subsidiary, where the organization owning the unified gas supply system holds the share of one hundred percent in the authorized capital;

Harmonization of national, interstate, and international standards in the field of hydrogen energy will also become an important component of international cooperation. ■

References

1. The Paris Agreement of December 12, 2015 (entered into force for the Russian Federation on November 6, 2019) // Official Internet portal of legal information. URL: <http://publication.pravo.gov.ru/Document/View/0001201911060026>.
2. European Commission. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A Hydrogen Strategy for a Climate-Neutral Europe. Brussels, 8.7.2020. COM(2020) 301 final. URL: https://ec.europa.eu/energy/sites/ener/files/hydrogen_strategy.pdf.
3. Die Nationale Wasserstoffstrategie. Bundesministerium für Wirtschaft und Energie (BMWi), 2020. 31 p.
4. The Importance of Nord Stream 2 for the EU is Growing // Oil Capital. 2020. December 7.
5. TANAP Will Be Able to Pump Hydrogen to Europe // Oil Capital. 2121. February 19.
6. Fernleitungsnetzbetreiber veröffentlichen Karte für visionäres Wasserstoffnetz (H2-Netz) // FNB GAS. 2020. 28 January.
7. Climate Change: MEPs Advocate Push for Renewable Hydrogen, Integration of Energy Systems // News European Parliament. 2021. 22 March.
8. Aksyutin O.E. The Role of Russian Natural Gas in the Development of Hydrogen Energy / O.E. Aksyutin, A.G. Ishkov, K.V. Romanov, R.V. Teterevlev // Energy Policy. 2021. No. 3 (157). P. 6–19.
9. Litvinenko V.S. Barriers to the Implementation of Hydrogen Initiatives within the Framework of the Sustainable Development of Global Energy / V.S. Litvinenko, P.S. Tsvetkov, M.V. Dvoynikov, G.V. Buslaev // Notes of the Mining Institute. 2020. Vol. 244. P. 428–438. DOI: <https://doi.org/10.31897/pmi.2020.4.421>.