

## **PROSPECTS OF INTRODUCING HYDROGEN TRANSPORT IN THE REPUBLIC OF BELARUS**

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The state of the planet's atmosphere is deteriorating noticeably every year, and the effects are already being felt worldwide. As a result, mankind has been looking for alternative sources of energy in recent years. Electricity and various gases are gradually taking the place of petrol and diesel fuel because they are more environmentally friendly, easier to produce and often cheaper.

In the Republic of Belarus, there is an increasing number of electric cars and buses, charging stations. The gradual introduction and popularization of hydrogen fuel should also be noted. It is important to know that natural gas is an import product for the Republic of Belarus. As a result, the development of natural gas as a transport fuel is limited. At the same time, the country has recently introduced several government programmes and regulations aimed at stimulating electricity consumption. One of the main directions is the development of electric transport, which is a competitor to hydrogen. However, the more active introduction of electric vehicles is less promising, as their charging batteries have limited capacity.

Hydrogen power is an energy industry based on the use of hydrogen as a means of storing, transporting and consuming energy.

Hydrogen is used in the transport industry as the following sources: fuel source for internal combustion engines and power source for electric vehicles.

Hydrogen fuel is a fuel that is delivered to refuelling stations in solid, gaseous or liquid aggregate states. The approximate time to refuel this fuel is 3-5 minutes.

The environmental friendliness of hydrogen transport is a key advantage, as it does not emit carbon dioxide, which contributes to better

air quality in cities. Moreover, the use of hydrogen fuel reduces energy dependence on oil and gas by offering an alternative and more sustainable source of energy.

There are certain problems with the development of hydrogen. Hydrogen is an explosive and flammable gas, so preventing its leakage and explosion is of the utmost importance. During the creation of hydrogen filling stations, the following problem was identified: fire safety of hydrogen refuelling stations was not developed. Another problem is the high cost of producing hydrogen.

Modern technologies still require significant financial investment, which makes mass deployment difficult. The issue of training for hydrogen technology is also relevant. Belarus should organize training of specialists, starting with universities, to provide qualified support in this area.

There are 28 hydrogen fuelling stations in the Republic of Belarus. Experts predict that by 2030, the share of gas-powered fuel will be 10% of total global fuel consumption [1].

In the Republic of Belarus, the issue of the use of gas-powered fuel has been studied since the 1980s. The country is a leader in the CIS region in the development of electric transport.

Holding “Belkomunmash” claims that the demand for hydrogen equipment exists, and the company is considering developing an electric model running on hydrogen fuel.

The use of hydrogen fuel in the Republic of Belarus is an important solution for the development of a decarbonized economy and for increasing the energy independence of the country.

Hydrogen energy is a promising vector of development in the Republic of Belarus. Some enterprises already use hydrogen in technical processes, which in the future will make it possible to solve the issue of hydrogen production and ensure its use in personal and public transport.

In general, hydrogen energy provides the Republic of Belarus with new opportunities for sustainable development and contributes to global efforts to combat climate change.

## References

1. Hydrogen transport: Belarusian realities and perspectives. – URL: [https://mlyn.by/22102024/vodorodnyj-transport-belorusskie-realii-i-perspektivy\\_\(date\\_of\\_access: 19.03.2025\).](https://mlyn.by/22102024/vodorodnyj-transport-belorusskie-realii-i-perspektivy_(date_of_access: 19.03.2025).)