

SPECIFIC FEATURES OF LEGAL REGULATION OF HYDROGEN ENERGY IN FOREIGN COUNTRIES

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Ekaterina M. Kologermanskaya

PhD (Law)

■ ekaterina.kologermanskaya@gmail.com

Currently, most countries and large energy companies base their activities on the principles of decarbonization, transition to low-carbon energy sources, and use of energy-saving and energy-efficient technologies. This focus gives rise to the development of alternative energy sources, which, in particular, include hydrogen. Despite the fact that hydrogen energy is not the newest idea for the energy sector, this type of energy is now at the boom of its relevancy. Nevertheless, the lack of a specific legal framework is a major challenge for the timely and full development of this energy source. Thus, elements of hydrogen production, transportation, storage, and distribution process are often covered by various norms and laws, while other aspects remain unregulated. This article examines certain specific features of legal regulation of hydrogen energy in foreign countries in order to optimize national legal regulation.

Keywords: energy law, international energy law; energy law of foreign countries.

Introduction

Since 2015, most countries of the world community as well as major energy companies have been experiencing the trend of economy decarbonization and transition to low-carbon supply of the energy sector. The above-mentioned as well as related trends (e.g., energy efficiency, energy-saving technologies, transition to renewable energy sources, etc.) are becoming fundamental for the development of national energy sectors.

As additional stimuli for the development of various branches of science and technology, such provisions reveal problems of a certain energy domain, expand the range of solutions for fuel and energy sector actualization, and broaden the scope of application of certain

types of energy resources. For example, hydrogen energy, as one of the most environmentally friendly and low-carbon ways of energy supply, represents a modern and topical area of energy sector development. With that in mind, a lot of governments are now adopting hydrogen strategies describing how they intend to use low-carbon hydrogen in their economy. These important steps provide some clarity for investors as to what future laws and support for hydrogen might look like in different jurisdictions.

First of all, let's define the concept of "hydrogen".

The Energy Law of Bulgaria (Закон за Енергетиката) as amended on February 12, 2021, provides the very first legal definition of

hydrogen as part of green energy within the definition of “green hydrogen”. [1]

The draft Energy Law of the People’s Republic of China published on April 10, 2020, focuses on various energy sources. However, unlike other energy sources such as electric power, thermal energy, and refined oil products, hydrogen was not mentioned separately, but was only categorized as “other new energy sources”. [2]

In Mexico, the Electric Power Law (Ley de la Industria Eléctrica) [3] and the Energy Transition Law (Ley de Transición Energética) [4] consider hydrogen to be part of the State’s energy sector and classify its output power as potential “clean” energy for the purposes of clean energy certificate granting.

Portugal offers an independent version of the legal nature of the definition of “hydrogen” having adopted on August 28, 2020, a special regulatory act on hydrogen use regulation, Decree-Law No. 62/2020 [5], which referred green hydrogen to the competence of the Portuguese National Gas System and defined it as gas of renewable origin.

Thus, the current national and foreign laws have different approaches to the terms “hydrogen”/“hydrogen energy”. On the one hand, the gaseous nature of this energy resource is a uniting feature, on the other hand, the attribution of hydrogen to renewable energy sources (inter alia, in the context of clean energy certificates) or new (alternative) sources remains disputable.

Keeping in mind the ways of hydrogen production, it should be noted that hydrogen has its differences. Today, gray, blue, and green hydrogen produced using gaseous methane and gaseous methane with carbon capture and storage technologies and renewable energy sources, respectively, is relevant. However, there are other types. [6] Consequently, the question arises whether various legal regimes need to be formalized for different hydrogen “colors”.

(1) legal regime of hydrogen energy facilities

The legal regime of hydrogen-based energy facilities should include all the elements found in the regime of energy facilities that are examined in detail in V.V. Romanova’s works taking into account the natural features of specific energy sources. [7]

Foreign legal experience is also represented by different view of the legal regime of energy (hydrogen) facilities.

South Korea has the most comprehensive version of the legal regulation of hydrogen energy in general with the Hydrogen Economy Promotion and Hydrogen Safety Management Act (Hydrogen Act) [8] and the Act on the Promotion of Development, Use, and Distribution of New Renewable Energy (RES Law) [9] being the basic regulations, that stipulate that hydrogen energy-related activities are subject to licensing. Thus, a company willing to produce gaseous fuels shall obtain a license from the mayor of the city or the governor of the district that will host the generation facility. There is also a requirement to obtain a license in order to apply for the establishment of a fuel cell supplier.

As provided for in Article 36 of the Hydrogen Act, companies willing to produce hydrogen fuel cells or hydrogen-related components shall obtain a permit from local district authorities. In particular, foreign companies (or South Korean companies domiciled abroad) that would like to export hydrogen fuel-related components to South Korea, shall register their business with the Ministry of Energy in accordance with Article 38 of the Hydrogen Act.

Hydrogen transportation is regulated by the High-Pressure Gas Safety Control Act, [10] which stipulates that dangerous gases, including hydrogen, should be transported via trailers and special pipes.

Section 6 of the Hydrogen Act details the safety regulations to be followed

by the manufacturer of hydrogen-related components. Section 7 of the Hydrogen Act governs the handling, import, and export of hydrogen-related components such as fuel cells and hydrogen extractors.

Article 10 of the Hydrogen Act stipulates that the South Korean government will subsidize or grant loans aimed at the development of hydrogen-related projects (including joint efforts with foreign organizations).

Besides, addressing the lack of investment in hydrogen infrastructure due to short-term earning power can be an interesting example. The South Korean government is considering a “Build-Transfer-Lease” model where the private sector will build infrastructure, transfer the ownership to the government, and then lease it for 30 or 50 years. [11]

Norway the energy market of which is regulated by the Act on the Production, Conversion, Transmission, Trading, Distribution, and Use of Energy, etc. (Lov om produksjon, omforming, overføring, omsetning, fordeling og bruk av energi m.m. (energiloven)) [12] provides one more example. It is interesting that hydrogen production, storage, and transportation are not subject to the Energy Act. However, hydrogen production facilities shall comply with the Energy Act and its regulations. For example, facilities that generate electric power using hydrogen as an input, such as fuel cells or any gas turbines, require an installation license under Section 3-1 of the Energy Act if the installation exceeds the license obligation threshold.

According to Annex 1 4.2 to the Pollution Control Regulations (Forskrift om begrenning av forurensning (forurensningsforskriften)), hydrogen production is an activity subject to the permit requirements of Section 36-1 (2).

Besides, the Planning and Construction Act (Plan- og bygningsrett) covers all real estate-related activities. [13]

According to the provisions of the Act on the Prevention of Fires, Explosions, and Accidents Involving Hazardous Substances and the Fire-Fighting Service (Lov om vern mot brann, eksplosjon og ulykker med farlig stoff og om brannvesenets redningsoppgaver (brann- og eksplosjonsvernloven), [14] hydrogen is classified as a combustible gas, therefore this activity as well as central and local organization and fire and explosion protection works are subject to general fire and explosion prevention obligations.

At present, the prospects of blending hydrogen with natural gas and using pipeline networks designed to transport natural gas are examined. [15]

Some countries also establish regulatory requirements for construction and operation of hydrogen-fueled gas filling stations. For example, Bulgaria adopted Order No. РД-02-20-2 dd. September 28, 2020, *On the Conditions for Design, Construction, Commissioning, and Control of Hydrogen-Powered Vehicle Charging Stations* (Наредба За условията и реда за проектиране, изграждане, въвеждане в експлоатация и контрол на станции за зареждане на автомобили, задвижвани с гориво водород). [16] The Order regulates the following aspects: technical requirements for the design, construction, and commissioning of charging stations for hydrogen vehicles, hereinafter referred to as “hydrogen charging stations”, for stationary application; control of hydrogen charging stations by minimum design safety characteristics during design, construction, and operation.

Thus, the foreign experience of legal regulation of hydrogen-based energy facilities is presented partially. Nevertheless, when studying provisions of regulations, the distinctive features of hydrogen as an energy source give rise to a lot of questions.

(2) State regulation in the area under consideration

As already stated above, a large number of countries have now turned their attention to hydrogen as an energy source capable of replacing natural gas and notable for its environmental friendliness and low-carbon nature. In this regard, a number of national strategic documents were adopted to establish the main stages and State and legal measures aimed at the regulation of this type of energy and its timely introduction into the national fuel and energy sector.

Thus, since 2016, the State Council of China has been adopting a series of strategic documents addressing measures for the state assistance to various hydrogen energy sectors, including the development of on-board hydrogen storage systems and hydrogen preparation, storage, transportation, and refueling technologies, and promoting the construction of hydrogen filling stations. [17]

As for investment support for hydrogen energy projects, the National Development and Reform Commission released the Catalogue of Encouraged Industries in the Western Region in January 2021 [18] that includes the processing and production of hydrogen and hydrogen fuel cells, the construction of hydrogen pipelines in Guizhou and Shanxi Provinces and Inner Mongolia Autonomous Region. The Catalogue of Industries for Foreign Investment [19] also defines the aspect of possible foreign investment and mentions that various hydrogen energy branches will be included in the “encouraging foreign investment” category.

Regarding the competence of Chinese public bodies in the field of hydrogen energy, the State Council published the Government Work Report, [20] which recommends that various public bodies responsible for a certain area of hydrogen energy, instead of one central body, should participate. This includes the National Energy Administration, which is a

competent energy authority in China, and other bodies, each having a regulatory and supervisory role to play for different stages or processes, such as hydrogen production, storage, or transportation.

A different experience of State regulation of hydrogen energy is offered by Austria that as of today has not presented an independent strategy. However, it proposed a rather promising option of subsidizing electrolysis plants producing green hydrogen. The construction of an electrolysis plant to convert electric power into hydrogen or synthetic gas with a minimum capacity of 1 megawatt (MW) can be subsidized through an investment grant if the plant is used for renewable gas production only and is powered by renewable electric energy only. The total annual funding for investment grants amounts to at least EUR 50 million. No funds are provided to plants that are built and operated by grid operators or that add hydrogen to natural gas in the public gas supply pipeline network. The investments are subsidized in the amount of up to 45 percent of investment directly required to build the plant (excluding land). [21]

Having studied some aspects of state regulation of hydrogen energy in foreign countries, we should mention that there are complex strategic documents developed for long-term planning of this energy branch. Despite the fact that Austria has not adopted this document, it can refer to the Hydrogen Strategy for a Climate-Neutral Europe as a member state of the European Union. [22]

Besides, the complex nature of hydrogen energy is confirmed by the work of an interdepartmental commissions and delegation of responsibilities to various public bodies. Both procedural aspects and the scope of investments for each of the studied states are considered individually. However, nowadays some issues remain unresolved at this level, such as tariff classification for hydrogen energy, applicable tax regimes, etc.

Conclusion

Nowadays, hydrogen energy is at the boom of its relevance which is confirmed by both policies aimed at the development of this type of energy adopted by different countries, including national guidelines, and analytical and statistical data of major energy researchers. For example, experts of the Hydrogen Council state in their recent report that hydrogen will cover 18% of the world's energy needs by 2050 [23].

Nevertheless, the lack of special regulations governing the social relations under consideration is a major problem of untimely and incomplete introduction of hydrogen into the national fuel and energy sector.

The aspects discussed in this article are certainly not exhaustive. The presented analysis is only focused on certain aspects of specific features of legal regulation of hydrogen energy. However, the findings can be useful for the development of national laws. ■

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