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**HYDROGEN COOPERATION BETWEEN RUSSIA AND GERMANY: PROBLEMS AND PROSPECTS**

Research article

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**Abstract**

Both domestic and foreign scientific literature has so far focused on the study of Russian-German cooperation on the extraction and supply of traditional types of fossil raw materials, as well as on the regulation of European Union's energy market and its interaction with external actors. Insufficient knowledge of the issues of "energy transition" and the subsequent development of global energy confirms the scientific novelty of the current research. The aim of this paper is to build prospects for innovative hydrogen cooperation between Russia and Germany. The article is also aimed at increasing knowledge about Russia's capabilities in the global hydrogen policy. Within the framework of this study, a comparative analysis of the Hydrogen Strategies of the European Union, Germany and Russia was carried out. The general provisions of game theory were applied to calculate the most profitable strategy of action for Russia and the most acceptable one for Germany. In 2022, the report that became a foundation for this research was presented by the author and recognized as the best at the 10th International conference of young international relations researchers "Russia in the Global World: New challenges and opportunities" in Saint-Petersburg, Russia.

**Keywords:** hydrogen, cooperation, Russia, Germany, energy transit.

**ВОДОРОДНОЕ СОТРУДНИЧЕСТВО РОССИИ И ГЕРМАНИИ: ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ**

Научная статья

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**Аннотация**

В отечественной и зарубежной научной литературе основное внимание до сих пор уделялось изучению российско-германского сотрудничества в области добычи и поставок традиционных видов ископаемого сырья, а также в области регулирования энергетического рынка Европейского Союза и его взаимодействия с внешними акторами. Недостаточная изученность вопросов «энергетического перехода» и последующего развития глобальной энергетики подтверждает научную новизну данного исследования. Целью данной статьи является определение перспектив нового водородного сотрудничества между Россией и Германией. Статья также направлена на расширение знаний о возможностях России в глобальной водородной политике. В рамках данного исследования были применены общие положения теории игр для расчета наиболее выгодной стратегии действий для России и наиболее приемлемой для Германии. Был проведен сравнительный анализ Водородных стратегий Европейского Союза, Германии и России. В 2022 году доклад, ставший фундаментом для настоящего исследования, был представлен его автором и признан лучшим на 10-й Международной конференции молодых исследователей международных отношений «Россия в глобальном мире: новые вызовы и возможности» в Санкт-Петербурге, Россия.

**Ключевые слова:** водород, сотрудничество, Россия, Германия, транзит энергоносителей.

**Introduction**

The history of Russian-German energy cooperation dates back decades. It is a solid foundation for economic cooperation between these two countries. However, today, international tensions and strained intergovernmental relations are holding back possibilities of forecasting. Over the past five years, the Russian Federation and Germany have not signed a single interstate agreement [1]. Furthermore, Germany is searching for new partnerships to overcome this complex reality. On March 20, 2022, the German Federal Republic concluded a long-term energy agreement with Qatar. At the same time, the President of the European Commission, Ursula von der Leyen, announced plans for an accelerated phase-out of Russian energy sources. It is worth noting that some European leaders, including Olaf Scholz, the German Federal Chancellor, expressed their disagreement with this document.

A successful partnership in the field of hydrogen energy can give a new impetus to economic relations between the two countries in the future, taking into account Russia's raw material export orientation and Germany's achievements in the field of high technologies.

It could be argued with some degree of confidence that despite numerous obstacles, Russia will, after all, continue to act as an energy partner with the greatest potential for European countries and one of the leading energy partners of other major subjects of world politics in the next decade. Nevertheless, the decline of the world "oil era" is inevitable. Professor of Economics, expert of the Valdai Club S. L. Tkachenko, in an interview with the Sputnik media agency, forecasts that the peak of oil demand is expected to be left behind in the 2030s [2]. In addition to that, the Minister of Scientific Research of Germany in 2018-2021, A. Karlicek, figuratively called hydrogen the "oil of the future". In this situation, the best course of action for

Russia is to seize leadership in the field of hydrogen production and start exporting it as early as possible, before the demand for hydrogen energy exceeds the demand for other types of fossil fuels.

### **An overview of three hydrogen strategies & game-theoretic approach**

So, it could be clearly traced that the plans for the creation of the European Union hydrogen market differ from those of individual European countries. The EU Hydrogen Strategy, adopted in July 2020, contains a list of countries that are to be included in the export-import relations on hydrogen energy. It is said that the EU aims at promoting cooperation with Southern and Eastern Neighbourhood partners and Energy Community countries, notably Ukraine, on renewable electricity and hydrogen.

Russia is not among these states [3, P. 19]. In Germany, however, many condemned Russia's absence from the list. In contrast to the EU's plans, German politicians, who have formed a tandem with business and science on this issue, declare that Russia is almost the only possible permanent exporter of hydrogen to European countries. Matthias Schepp, Chairman of the Board of the Russian-German Chamber of Commerce, noted with regret that the Russian Federation was not mentioned as a potential partner. In his opinion, Russia's involvement in the implementation of the hydrogen strategy of the future meets the interests of businesses and consumers interested in low energy prices [4].

Slightly ahead of the EU, Germany approved the National Hydrogen Strategy in June 2020. The Federal Ministry of Economy and Energy noted that this strategy provides that Germany will strengthen international cooperation in this area. Germany is still supposed to prefer grasping the existing opportunities. Both Nord Stream, already applied, and Nord Stream-2 were built on the assumption that they may double as a transportation channel not only for natural gas in liquefied form but also for lighter hydrogen. Consequently, this could ensure reliable cooperation between Russia and Germany. In May, the Association of German Gas Transport Operators presented the project "H<sub>2</sub>-Startnetz 2030". According to the outlined plan, by 2030, part of the German gas pipeline system should switch to H<sub>2</sub> transportation.

However, it is important to note that the Russian Federation, today the largest supplier of energy carriers, is not mentioned in the document of the FRG. But the list of planned measures says that the German government is committed to "intensify dialogue with current fossil fuel exporters in favor of a gradual global energy transition, including hydrogen. By at least partially replacing fossil fuels with hydrogen, important participants in energy policy should also take advantage of new opportunities" [5, P. 29]. In the long term, in any case, Germany will depend primarily on the import of hydrogen, as well as other energy carriers, thereby ensuring the sustainability of Russia's export supplies.

From the view point of game theory, the Russian government should be the first to offer to the leaders of Germany a hydrogen cooperation that is enshrined in interstate acts. The rationale for this is as follows. Firstly, Russia is the only "non-coalitional" actor in this multilateral normal coalitional game. Even the situation is presented as a Prisoner's Dilemma, the United States act here as an investigator helping Germany to "get out of jail", and only Russia is again trying to play a non-coalition game. Secondly, it is Russia that is interested in not being left overboard of this game [6, P. 37–39] (i.e. the game of global energy relations). In addition, Schelling's considerations from the time of the containment policy are relevant that the main thing is to convince the opponent to play the classic game with a non-zero-sum – "get into the same boat with you", then the opponent, in addition to the opposite, has common interests (not to "capsize the boat") and additional obligations associated with them. This is how the signing of a comprehensive agreement on hydrogen energy by Russia and Germany could be regarded at the suggestion of the Russian side. However, the application of game theory to the energy relations between Russia and Germany deserves a more thorough consideration in a separate article.

The potential of Russian-German cooperation is partially reflected in the Hydrogen strategy of the Russian Federation. In the document, hydrogen is designated as a fuel with high export potential. According to this Strategy, the potential volumes of hydrogen exports from Russia to the world market may amount to 0.2 million tons in 2024, until 12 million tons in 2035 and around 50 million tons in 2050 [7].

### **Opinions of affiliated organizations and individual politicians**

The absence of mention of Russia in the documents on the strategic development of hydrogen energy in the EU and Germany forced the structures representing the interests of German business within the framework of Russian-German cooperation, namely the German-Russian Foreign Trade Chamber (AHK) and the "Eastern Committee" (OAOEV), to express their point of view officially and clearly on this issue. The AHK presented a vision of the prospects for hydrogen cooperation between Germany and the Russian Federation in the form of a report "The position of the AHK on the German-Russian hydrogen partnership". The purpose of this report is to concretize the idea of cooperation expressed in a general way by the Minister of Economy and Energy of Germany P. Altmaier and Minister of Industry and Trade D. Manturov at a conference in Berlin in February 2020. The main idea of the report is as follows: the Russian Federation and Germany should use their long-term and successful experience of energy and oil and gas partnership for close cooperation in the hydrogen technology sphere, which in the future will play a key role in the energy transition and the fight against climate change. It is high time to use the chances of the growing hydrogen market, take on technological leadership and shape the future of Russian and German energy companies [8].

On July 8, 2020, OAOEV published a document defining his position on the issue of hydrogen cooperation "For Hydrogen Partnership with Russia". In this document, the "Eastern Committee" calls on the German government to develop comprehensive cooperation with the Russian Federation. The press release to the document quotes the chairman of the "Eastern Committee" O. Hermes: "These ties, which were formed long ago, are an excellent starting point for cooperation in the development of CO<sub>2</sub>-neutral hydrogen technologies. Russia has all the prerequisites to become a global player in the international hydrogen market" [9].

### **Energy security and climate agenda**

It is also worth remembering about energy security, which obtained different interpretations within the European and Russian political traditions. Energy security is one of the most important terms of the neorealist concept of international energy; post-Western countries and especially Germany are actively adopting this concept.

The key point here is the German climate agenda, partly outlined in German Climate Action Plan 2050: The security of supply, affordability and environmental compatibility need to be combined with innovative and smart climate action [10, P. 20]. By 2035, Germany plans to have developed equipment with a capacity of 10 GW, based on water electrolysis for the production of "green hydrogen" in a less "harmful" way. An ambitious plan for the transition to hydrogen in Germany has been allocated 9 billion euros: 7 billion for the creation of competitive hydrogen technologies and 2 billion for international cooperation [10, P. 29]. This may threaten Russia with "energy isolation"; as a result, Russia will not be able to transit traditional "yellow" hydrogen to European countries. In this regard, Russia needs to prove its readiness to rebuild the scientific and technical base to meet the requirements of global security with a focus on the production of "clean" hydrogen. Possibly, if Russia switches to clean hydrogen production, it will no longer be perceived as a threat to both environmental and national security of Germany.

On the other hand, the attention has to be drawn to the following: Although the concepts of "green hydrogen" and "clean hydrogen" are used interchangeably in German documents and are seen as synonymous by the German public, this is inaccurate. That is due to the fact that an entire technological chain connected with climate-neutral equipment, which is mainly produced in China, is not exactly "green". It is still a so-called "dirty" process chain, starting with the extraction of rare earth metals. Thus, the environmentally unfriendly part of the technological processes aimed at generating "clean" RES electricity turns out to be relocated outside Europe, mainly to Asian countries. However, it is important to emphasize for the European partners that a global climate problem is not only intra-European, but the global one [11]. Whether or not hydrogen is clean, should not depend on the existence or lack of carbon used to produce hydrogen, but more on the scale of carbon dioxide emissions in the final stage.

### **Hydrogen cooperation already started**

Russian-German cooperation between scientific-research institutions and companies to bring the aforementioned technologies to market quickly could become a win-win option. This cooperation could expand the use of Russian gas in Germany and stimulate joint elaborations on setting up innovative plants for the production of clean hydrogen. This new fuel would be used by Great Energy Europe, including the EU and Russia in the short run – while in the long run the geographical coverage would be extended.

The first preliminary steps towards reaching agreements on hydrogen cooperation, including the establishment of the production of "pure, clean" hydrogen, have already been made. Russian and German businesses have been discussing possible cooperation in the field of hydrogen energy for several years at various events. In particular, the Russian-German Chamber of Commerce has established a working group on hydrogen, within which several large Russian and German companies are working together on all parts of the chain: from production and transportation to consumption and the use of hydrogen in order to create a hydrogen market and new areas of cooperation in the future [12]. For example, Wintershall Dea together with Gazprom are launching "clean" hydrogen production technology as part of the scientific and technical cooperation program. In December 2021, the Organization for the Development of Scientific and Technical Cooperation in the Raw Materials Sector, in collaboration with the Russian-German Raw Materials Forum, dubbed Rohstoff-Forum, held the second Russian-German Conference on hydrogen energy.

### **Conclusion**

Unfortunately, the political elites of Germany are currently unable to develop an unambiguous attitude to gas cooperation with Russia. In Europe and, in particular, in Germany, there is a process of "political entropy". The pressure of the lobby groups, the excessive dependence on the trends in the world economy, the disparity between taken steps and developed political rhetoric [13, P. 53], an overreaction to the military situation in Eastern Europe – all this gives grounds to believe that in a situation of unprecedented pressure from the U.S. to Russia, especially against the background started in the territory of the DPR, the LPR and Ukraine and its armed forces, the ruling political class of Germany might not be ready to conclude new agreements on hydrogen cooperation.

Of course, there is a risk that Germany may completely abandon the import of Russian energy carriers. However, the probability of this is low. Only the Russian energy sector can provide full capacity utilization of German industry. The rhetoric about the need to diversify gas supplies not only from Russia, but also from the Middle East and China has been developing since the early 2010s, but these potential steps have not yet been implemented. Now that Germany is faced with the choice of either developing relations with Russia or looking for a solution in other regions of the world, it will be difficult for the Germans to start from the beginning. At the end of March 2022, Qatar's Energy Minister S. al-Kaabi notified O. Scholz that Qatar would not be able to supply gas to Germany in the required volumes. Certainly, there can be no talk of any "complete replacement of Russian energy carriers".

In addition to the objective prerequisites for the further development of energy relations between Russia and Germany, there are also subjective prerequisites. Both in Russia and in Germany, a significant number of direct participants in the development of energy relations find opportunities and desire to continue cooperation. Hydrogen can indeed become a new niche in Russian-German relations. A significant number of steps have already been taken that make it possible to start a direct hydrogen dialogue at the level of the governments of the two countries: National Strategies for the development of hydrogen energy have been adopted, negotiations have begun within the framework of Foreign Trade Chambers, the first pilot projects of hydrogen installations and transport have been launched, "tracks" for the development of relations between the Russian and German industrial complexes have been outlined. It is important to emphasize that, as in the situation with natural gas, Russia will have the opportunity to produce and export hydrogen, and Germany will have the opportunity to purchase it on a long-

term basis. However, in order to implement these projects, there must be an opportunity to develop "energy diplomacy" – a direct dialogue between the governments of Russia and Germany.

Not only German large entrepreneurs, but also some high-ranking officials do not give up hope for such a development of events. At the international conference "New Ways: Russian-German Energy Dialogue 2021", organized by the German-Russian Foreign Trade Chamber, all speakers from among German industrialists and government officials unanimously spoke in favor of further development of hydrogen interaction between the Russian Federation and Germany. Prime Minister of the Federal State of Saxony M. Kretschmer stated: "Not only we can develop hydrogen cooperation – I believe that we are obliged to develop it. Germany is abandoning coal and nuclear energy. Therefore, the future belongs to hydrogen ... and in the next 50 years we must establish an intensive diplomatic and technological exchange on this issue, despite the emerging political contradictions. As said Helmut Kohl, "we always held open the door leading from Germany to Russia on the way of renewal of economic dialogue." I think that for the last 50 years this has ensured peace not only in the Russian-German sphere, but also in the whole of Europe and should continue to ensure it" [14].

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### **Конфликт интересов**

Не указан.

### **Рецензия**

Все статьи проходят рецензирование. Но рецензент или автор статьи предпочли не публиковать рецензию к этой статье в открытом доступе. Рецензия может быть предоставлена компетентным органам по запросу.

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### **Conflict of Interest**

None declared.

### **Review**

All articles are peer-reviewed. But the reviewer or the author of the article chose not to publish a review of this article in the public domain. The review can be provided to the competent authorities upon request.

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