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# **HYDROGEN SECTOR** **IN POLAND**

**FLANDERS INVESTMENT & TRADE MARKET SURVEY**

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# HYDROGEN SECTOR IN POLAND

Publication date / 17.10.2022

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# 1. INTRODUCTION

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One of the greatest challenges Poland is facing today is ensuring energy security and the related diversification of energy sources. Increasing the share of electricity generated with the use of renewable energy sources (RES – renewable energy sources) in the energy balance is a determinant of the development not only of Poland, but of most advanced economies in the world. This is mainly due to the instability of renewable energy sources, with the lack of properly developed methods of large-scale energy storage and services for balancing power systems. The way to solve these problems may be hydrogen as a storage of energy, including energy generated from renewable energy sources, which will give the opportunity to participate in increasing the degree of RES integration in the energy system on global scale.

A dynamic growth in the hydrogen economy is observed in Poland. Undoubtedly, this is supported by the adoption of the "Polish Hydrogen Strategy until 2030 with a perspective until 2040". Poland is the 3rd in Europe and 5th in the world producer of hydrogen, but does hydrogen have a chance to become a dominant energy source in Polish conditions?

However, the Polish Economic Institute's analysis of hydrogen economy in Poland, published in 2020, noted that Poland, compared to highly developed countries, has little technological potential in the area of hydrogen economy. The authors of the report argue this thesis, among others, by the fact that in Poland there are few specialized companies in this field.

The challenges ahead of Poland will focus on building the competences of entrepreneurs and their employees, which are required by the modern labour market, which is becoming more and more competitive every day. The transition to a green economy will act as an impulse for the creation of new investments and jobs in such industries as: energy (e.g. renewable energy), transport (e.g. low-emission mobility), construction (e.g. green construction), agriculture (e.g. the use of biomass), IT (e.g. software, systems), R&D (e.g. projects, new products) or in the science sector. The demand in this area will concern the entire supply chain and values, i.e. from simple components to finished products or services.





2.1 GOAL 1: IMPLEMENTATION OF HYDROGEN TECHNOLOGIES IN ENERGY AND HEATING SECTOR

In the next 5 years the main objective for implementation of hydrogen in the Polish **energy and heating sector** is to support research and development in the field of co- and poly-generation systems for residential blocks, office buildings, small estates and public buildings using fuel cells and in the field of P2G and G2P systems. Further activities are planned in a span of 10 years. In this perspective, the research work carried out earlier and the first implementations of the technology should enable the development of larger investments. It is estimated that implementation of hydrogen technologies in Poland in such a way will support effective cooperation of the gas system and electric power system operation in accordance with the concept of sector coupling and will enable energy storage.

2.2 GOAL 2: USAGE OF HYDROGEN AS AN ALTERNATIVE FUEL FOR TRANSPORT

Hydrogen is seen as a mean to reduce emissions in **transport**, especially in urban transport (buses), road transport (heavy and long-haul transport), light fleet vehicles (forklifts, vans, cabs), non-electrified rail (where electrification is not an economically viable option), maritime and river transport, and in the longer perspective also in aviation, including unmanned vehicles (drones). Hydrogen will become an alternative for those branches of transport where electrification is unprofitable or impossible. **By 2025, 100 to 250 zero-emission buses powered by hydrogen are expected to be in operation, at least 32 hydrogen filling stations will be built, and hydrogen purification plants** complying with the EU purity standard will be constructed. At the same time, work will begin on the first vessels and the construction of hydrogen trains and locomotives with hydrogen propulsion systems. In the perspective of 2030 about 800-1000 hydrogen buses should be in operation, gradually replacing combustion vehicles. A network of refueling stations will continue to develop and production of hydrogen-based fuels will set off (such as ammonia or methanol).

2.3 GOAL 3: SUPPORT FOR DECARBONISATION OF INDUSTRY

The use of low-carbon hydrogen will significantly reduce greenhouse gas emissions from **energy-intensive industries**. Currently, hydrogen is used in Poland primarily as a feedstock in the chemical, petrochemical and refining industries, and it is from these sectors that the majority of demand for low carbon hydrogen will come. The industrial sector has the potential to become the largest user of low-carbon hydrogen due to the lack of alternative decarbonization options. Sub-sectors requiring very high temperatures (>200°C), such as steel or chemicals, due to the specifics of their processes, present a significant challenge in the decarbonization of industry due to the lack or limited potential for large-scale electrification of their processes with renewable energy. Hydrogen represents an opportunity to reduce emissions from chemical feedstocks and reactants i.e. ammonia, methanol, iron reduction and petrochemical products. To develop industrial applications of hydrogen, public support will be provided to pilot technology projects for sectors where climate neutrality is difficult to achieve - in particular steel, refining and chemicals. By 2030, at least 5 hydrogen valleys,  
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understood as centers of excellence for the implementation of the hydrogen economy, sector integration, industry climate transformation, and infrastructure construction, are planned.

2.4 GOAL 4: HYDROGEN PRODUCTION IN NEW INSTALLATIONS

Poland’s strategic goal for hydrogen production by 2030 is to provide the conditions for launching **hydrogen production facilities from low- and zero-emission sources**. The Polish government intends to support only low-carbon hydrogen, i.e. from renewable sources and produced using zero-emission technologies. Obtaining support for the production of hydrogen from fossil fuels will be possible provided that technologies efficiently limiting CO2 emissions are used (e.g. CCS/CCU). The PHS, by making support conditional to the level of emissions associated with the production of hydrogen rather than specific technologies, adopts a technology-neutral approach. In the next 5 years, the government will support research and development of low-emission processes and technologies for obtaining hydrogen, as well as launching such installations with a total power of min. 50 MW. In 2030 the aim is to achieve an installed production capacity of 2 GW from low- and zero-emission sources and processes.

2.5 GOAL 5: EFFICIENT AND SAFE HYDROGEN TRANSPORT, DISTRIBUTION AND STORAGE

For the harmonious development of a hydrogen-based economy, it is necessary to deliver hydrogen efficiently from the production site to the end user and to store it safely. In terms of transmission and distribution, it will be possible to transport hydrogen in existing natural gas networks if they are or will be adapted to transport a hydrogen admixture. In the initial years of market development, hydrogen will be primarily transported by road and rail (tankers, tank trucks). Over time, as customer demand for hydrogen increases, existing gas infrastructure or dedicated hydrogen pipelines will be used for transportation. Amongst the potential big scale hydrogen storage facilities, salt caverns were considered to be the most optimal solution. Hydrogen storage in large aboveground tanks may become necessary if hydrogen technologies start to be implemented on a mass scale.

2.6 GOAL 6: CREATION OF A STABLE REGULATORY ENVIRONMENT

Creation of a stable regulatory environment is a priority for the Polish Government and administration. It is necessary to create regulations that will remove barriers to the development of the hydrogen market and encourage a gradual increase in the use of RES for electrolysis.

The implementation of the Polish Hydrogen Strategy until 2030 with an outlook until 2040 requires the allocation of approx. 0,93 bln PLN (approx. 201 million EUR) by 2025 and another 10,81 bln PLN (approx. 2,34 bln EUR) by 2030, what amounts up to the total of over 11 bln PLN. Expenditures foreseen in this period will include hydrogen technologies in the energy, transport, and production sectors.



The Strategy provides for funding sources both from national and EU sources as well as dedicated programs:

- Hydrogen Technologies Support Programme (2021) under the National Centre for Research and Development (Narodowe Centrum Badań i Rozwoju/ NCBR). This programme in particular aims to provide financial and technical support for hydrogen valleys feasibility studies and preparing and announcing new financial programmes provided by POIR+ and national funds.
- New Energy Programme (2021) under the National Fund for Environmental Protection and Water Management (Narodowy Fundusz Ochrony Środowiska i Gospodarki Wodnej/ NFOŚiGW) to support Polish entrepreneurs in launching technologies of production, transport, storage and utilisation of zero-emission hydrogen.
- Green Public Transport Programme (Phase I in 2021), which aims to reduce emission produced by the public transport sector by increasing share of BEV and PHEV buses.
- The Hydrogenation of the Economy Programme (2021) under NFOŚiGW will be dedicated to business, research and academic institutes as well as public administration in order to commission innovative hydrogen technologies projects.
- The Support for electric vehicle charging and hydrogen refueling infrastructure (2021) under NFOŚiGW will be dedicated to local governments, entrepreneurs, housing associations, housing communities and individual farmers.

The Strategy assumes that, due to the application of support mechanisms, the demand for green hydrogen will grow. It is also expected that the growing popularity of hydrogen, also on a global scale, will result in a decrease in its price and an increase in its market attractiveness. As a consequence, this may lead to further increase in demand and create needs to expand production capacity.

Additionally, it should be indicated, that the **Strategy does not address the issue of the future model of the green hydrogen market and its exact structure**. Thus, the Strategy does not contain, for example, an explicit declaration that the future hydrogen market will be based on a liberalized gas market model. Thus, the issue of the price formation mechanism for hydrogen remains to be resolved, including whether it will be based on a market mechanism, e.g. on an exchange, or whether the price will be formed within a strict regulatory framework supervised by a market regulator.

At the same time the Document presents **the main technological and business obstacles that could hinder the development of green hydrogen in Poland**. The key challenges for the Polish Government regarding the establishment of this Strategy will be to:





- competitiveness,
- market regulations,
- measures of financial instruments supporting market development,
- under-developed market,
- high production costs,
- infrastructural limitations,
- quality and safe transmission and distribution system integrated in the common European infrastructure.

Given the foregoing, an important element in overcoming the barriers is the need for support and ongoing investment in research, development and deployment of new solutions to further reduce the costs and increase the overall efficiency of production, transport and storage systems, which in turn will help to reduce the end-use costs of hydrogen, giving it a competitive edge in the market. For this purpose, pilot and demonstration projects are needed for full deployment, to best match future regulations with actual market conditions and needs.

**UPDATE OF POLAND’S ENERGY POLICY UNTIL 2040 IN THE CONTEXT OF THE INVASION OF THE RUSSIAN FEDERATION IN UKRAINE - 29.03.2022**

The Polish government decided to cut off supplies of energy resources from Russia as soon as possible. Actions related to the diversification of supplies of raw materials to Poland taken in previous years and decisions taken recently make it possible to end imports from this direction as early as the end of 2022.

On March 29, 2022, the Council of Ministers adopted the assumptions for the update of the "Poland's Energy Policy until 2040" (PEP2040) - Strengthening energy security and independence, submitted by the Minister of Climate and Environment.

The updated energy policy of Poland will take into account the fourth pillar - energy sovereignty, a special element of which is to ensure the quick independence of the domestic economy from imported fossil fuels from the Russian Federation. The assumptions provide for increased technological diversification and expansion of capacity based on domestic sources, including further development of renewable energy sources and consistent implementation of nuclear energy and improvement of energy efficiency, but also further diversification of supplies and providing alternatives to crude oil and natural gas. The undertaken activities will be focused on the development of new low-emission technologies and their integration in the system. Measures to strengthen the development of power grids and energy storage remain a priority, while at the same time in the situation of uncertainty on the natural gas market, the use of coal-fired units may be periodically increased. Poland will also undertake negotiation efforts to reform the mechanisms of the European Union (EU) climate policy so that it is possible to carry out a low-emission and ambitious transformation, contributing to the achievement of EU goals, taking into account the temporary increased use of conventional generation capacities.



3. COMPANIES ACTIVE IN HYDROGEN PROJECTS

The leader of hydrogen production in Poland is **Capital Group Grupa Azoty S.A.**, which annually produces about 420 thousand tons of hydrogen (32,3% of domestic hydrogen production), followed by:

- **ArcelorMittal Poland SA Zdzeszowice and Koksownia Przyjaźń S.A. (JSW)** with a total production of 149 thousand tons/year (11,5% of domestic production),
- **PKN Orlen S.A.** with a total production of 140 thousand tons/year (10,7% of domestic production),
- **Grupa Lotos** with a total production of 59 thousand tons/year (4,5% of domestic production),
- the remaining share of domestic hydrogen production (41%) comes from other producers.

The refining industry is one of the leading industries using hydrogen in the production process in Poland. Other industries for which hydrogen is produced are: ammonia, methanol and steel production.

The Ministry of Climate signed a Letter of intent agreement to establish a partnership to build a hydrogen economy and conclude a sectoral hydrogen with 17 companies and organizations from the energy and transport industry, incl. Polskie Górnictwo Naftowe i Gazownictwo, PKN Orlen, Grupa Azoty, Grupa Lotos, Tauron Polska Energia, JSW, Gaz-System and PKP Energetyka.

3.1 GRUPA AZOTY

The Grupa Azoty Group is one of the leading players on the European fertilizer and chemical markets. The Group comprises a number of entities, including: Grupa Azoty S.A. (the Parent, based in Tarnów), Grupa Azoty Zakłady Azotowe Puławy S.A, Grupa Azoty Zakłady Chemiczne Police S.A., and Grupa Azoty Zakłady Azotowe Kędzierzyn S.A.

Grupa Azoty’s active participation in the development of the European hydrogen market will be one of the pillars of the ‘[Green Azoty project](#)’. As the largest hydrogen producer in Poland and a major hydrogen processor in Europe, Grupa Azoty is conducting research and development work related to the production and use of green hydrogen. The Group is carrying out economic studies and technical analyses of electricity production from its own renewable sources. The aim is to reduce the carbon footprint and to ultimately produce ‘green hydrogen’ using electrolyzers powered with this renewable electricity. Work will also be continued on fuel cell development and the launch of a quality accreditation laboratory

testing hydrogen for fuel cell applications in transport. As a member of the European Clean Hydrogen Alliance, in the coming years Grupa Azoty will actively participate in the work on European regulations regarding the classification of green hydrogen.

<https://grupaazoty.com/en>

3.2 ARCELOR MITTAL POLAND ZDZIESZOWICE

ArcelorMittal Poland SA, Branch in Zdzieszowice, is the largest coke producer in Poland, producing approximately 3.5 million tonnes of coke annually. In addition to heating and metallurgical coke, the plant also produces coke oven gas, benzene and tar. Most of the coke is exported. Since 2016, the plant has also been producing liquid sulfur, which is a by-product of coke oven gas treatment.

The coke plant in Zdzieszowice is carrying out a set of initiatives, which will reduce its environmental footprint. The value of all the projects amounts to almost PLN 90 mln. The efficiency of the air-tight sealing installation of the by-products department will be increased by the end of this year; the cost of the project is PLN 25 mln. The modernization includes the construction of the coking tar treatment installation, which will allow for replacement of one of the currently working unsealed installations for tar storage. The project also includes the reconstruction of the main collectors, which will improve the efficiency of gas exhaustion. It shall limit the intensity of smells in the area of by-products department.

<https://poland.arcelormittal.com/>

3.3 PKN ORLEN

The Orlen Group is the largest producer and distributor of petroleum and petrochemical products in Poland. It deals with the processing of crude oil into such products as: unleaded gasoline, diesel oil, heating oil, aviation fuel, plastics and petrochemical products.

PKN Orlen Group is launching Hydrogen Eagle, an investment program to develop an international chain of hydrogen hubs powered by renewable energy sources and build innovative facilities to convert municipal waste into zero- and low-emission hydrogen. The project also provides for the construction of more than 100 hydrogen refueling stations for individual, public and cargo transport.

The scheme, covering Poland, the Czech Republic and Slovakia, will allow Orlen Group to achieve annual hydrogen production capacity of approximately 50,000 tonnes by 2030. The program provides for the construction of six new RES-powered hydrogen hubs: two in Poland, two in the Czech Republic, and one in Slovakia, including plans to build a hydrogen electrolysis plant to which electricity will be supplied from the Baltic Power offshore wind farm. The capacity of the RES-powered electrolysis plants will ultimately total approximately 250 MW. The scheme also envisages the construction of three innovative plants for converting municipal waste into low-emission hydrogen, to be located in Płock and Ostrołęka in Poland and in the Czech Republic, as well as an international network of more than 100 hydrogen refuelling stations.



Hydrogen Eagle marks another stage of investment in low-emission hydrogen transport at the Orlen Group. In Germany, pilot hydrogen refueling points are in operation at the Group’s service stations in Wolfsburg and Müllheim. Automotive-grade hydrogen production plants with the total production capacity target of over 1,000 kg per hour are being built in Włocławek, Trzebinia and Płock. The hubs will supply hydrogen to HR stations for individual and public transport. PKN Orlen has launched a tender procedure for the construction of Poland’s first hydrogen refueling stations, to be located in Poznań and Katowice. There are also plans to build six HR stations in the Czech Republic.

<https://www.orklen.pl/en>

3.4 GRUPA LOTOS

Grupa LOTOS is ultimately to be acquired by PKN Orlen to build a strong multi-utility group. In 2021 completed a project to construct a hydrogen recovery unit designed to reduce adverse environmental impacts. The unit enables the combustion of cleaner natural gas instead of refinery gases. It has also helped to enhance oil processing efficiency. The new unit will deliver to the market an additional 70 thousand tonnes of LPG, 43 thousand tonnes of naphtha, 39 thousand tonnes of light gasoline and almost 9 thousand tonnes of hydrogen per year.

<https://www.lotot.pl/en>

3.5 PGNIG

Polskie Górnictwo Naftowe i Gazownictwo (PGNiG) is a Polish company engaged in the exploration and production of natural gas and crude oil, gas imports, and through key subsidiaries, the storage, sale, distribution of gaseous and liquid fuels and the production of heat and electricity.

Blue H2 is one of the research projects implemented by PGNiG as part of the company’s hydrogen program announced in 2020. It includes a number of initiatives in the area of fuel storage and distribution, manufacturing processes and technological innovations. In this way, the PGNiG Group implements the strategy related to the diversification of its operating sectors and the commitment adopted last year under the Sector Agreement to build a Polish hydrogen economy.

The “Blue H2” project - assuming the development of blue hydrogen production technology, will include the construction of a pilot production installation, which will be located in Zabrze (Silesia). Ultimately, in the event of a successful research project and a decision to build a demonstration plant, blue hydrogen obtained by the reforming method will be used by partners in production processes. The installation is to be based on three technological nodes - the so-called SMR (Steam Methane Reforming), i.e. Natural Gas Steam Reforming, carbon dioxide capture and hydrogen purification. The solutions used in the project are modern and affordable. The raw material they are based on is natural gas, which reduces the cost of



production and promotes the implementation of hydrogen technologies in many locations throughout the country. The technical readiness of the research installation is planned for 2023.

<https://en.pgnig.pl/>

### 3.6 TAURON POLSKA ENERGIA

The Tauron Group is a key player in the energy sector and an important link in Poland's energy security system. The core business of the Tauron Group is coal mining, generation, distribution and sale of electricity and heat.

Hydrogen will be used to supply electricity and heat to the Scientific and Research Institute of Sebastineum Silesiacum in Kamień Śląski. The raw material will be produced from water fed to an electrolyser - a device that uses electricity to decompose water into hydrogen and oxygen.

Hydrogen in turn, during the time of the highest demand for energy, will go to the PEM (proton exchange membrane) cell, i.e. a device in which hydrogen is combined with oxygen, and the reaction products are electricity, heat and water. PEM cells with a membrane made of polymeric materials are characterized by high efficiency in energy production, as well as a short start-up time associated with low reaction temperatures in the device (60-100°C). According to Tauron's estimates, about 2,000 MWh of electricity will be generated annually in this way. Thanks to the installation in Kamień Śląski, experts from the energy company will gain experience needed to implement the solution on the market.

[https://en.tauron.pl/?sc\\_lang=en](https://en.tauron.pl/?sc_lang=en)

### 3.7 JSW (KOKSOWNIA PRZYJAŻŃ S.A.)

The JSW Group is the largest producer of high quality hard coking coal in the European Union and one of the leading producers of coke used for smelting steel. Production and sale of coking coal and production and sale of coke and hydrocarbons constitute JSW Group's core business.

Coke oven gas is a by-product of the production of coke. JSW are taking intensive actions to implement a technology for separation of hydrogen from coke-oven gas, which is a by-product of the coking process. Hydrogen may be used in fuel cells for environmentally-friendly and emission-free generation of electricity, environmentally-friendly public transport, powering electrical devices and emergency power supply stations (hospitals, schools, government buildings). The implementation and development of zero-emission urban transport based on hydrogen fuel cells will improve air quality significantly and offer a number of other benefits, such as reduced noise and pollution and lower CO2 emissions. Separation of hydrogen from the coke oven gas will become an important step towards cleaner air and therefore coking coal could be considered to be a clean energy source.

<https://www.jsw.pl/en>



3.8 GAZ.SYSTEM

Gaz-System plays a strategic role in the Polish economy. The company is responsible for natural gas transmission, operates major gas pipelines in Poland and controls the LNG Terminal in Świnoujście.

As part of the 2015-2025 investment programme, GAZ-SYSTEM is developing over 2000 km of new gas pipelines in western, southern and eastern parts of Poland. Currently, the company is implementing one of the most important infrastructural projects in Poland – the Baltic Pipe, which consists in the construction of a bidirectional offshore gas pipeline connecting Poland and Denmark as well as the expansion of the local transmission network and three gas compressor stations.

The construction of gas interconnections with Lithuania and Slovakia and the engineering of onshore gas pipelines that will connect the planned FSRU terminal in the Gulf of Gdańsk with the national transmission system are also underway. The LNG Terminal in Świnoujście is also being expanded, which will increase its regasification capacity by more than half.

Gaz-System acts as a coordinator of the working group responsible for efficient and safe transmission, distribution and storage of hydrogen in Poland.

<https://www.gaz-system.pl/en/>

3.9 PKP.ENERGETYKA

PKP Energetyka has been active on the Polish market since 2001. Their main objective is to sell and supply electricity to traction and business customers. PKP Energetyka also specializes in power engineering services.

As part of the research and development project, an energy storage system based on hydrogen produced using energy from a solar farm will be built at the Garbce traction power substation. This is another step towards the development of a railroad based on renewable energy sources. PKP Energetyka has just signed a contract with a supplier of a set of components for the construction of this hydrogen system. The commissioning of this facility is scheduled for 2023.

<https://www.pkpenergetyka.pl/EN#>

3.10 WESTA INVESTMENTS – H2 ENERGY

Westa Investments, operating in the real estate sector, plans to implement a renewable energy investment through its special purpose vehicle, H2 Energy. It plans to create an energy hub in western Poland, where ecological hydrogen will be produced, stored and distributed using a special terminal.

The investment of the H2 Energy company is to be built on 700 hectares of land on the Polish-German border - in the Górzycza commune in the province. Lubuskie - where the





international railway line, which is part of the Trans-European Transport Network TEN-T and the Yamal-Europe gas pipeline, runs.

The representative of H2 Energy emphasizes that the location of the investment 3 km from the border with Germany is not accidental. German authorities estimate that by 2030 a maximum of 16 percent of the hydrogen consumed in the economy will come from local electrolyzers, which means that the country is dependent on imports of green hydrogen. H2 Energy plans to create a powerful intermodal terminal that will allow the transmission of hydrogen via pipelines, tanks, barges and rail.

<https://h2energy.com.pl/en/start/>

3.11 SOLARIS & JELCZ – HYDROGEN BUSES PRODUCERS

In Poland, hydrogen buses are manufactured by Solaris and Ursus, supplying such vehicles for the needs of public transport in many cities in Europe, where there is currently a high demand for hydrogen buses; the popularization of such vehicles in Poland will create an opportunity for industrial companies as hydrogen suppliers. It is estimated that a hydrogen bus running about 300 km a day consumes about 8 kg of hydrogen per 100 km.

The first hydrogen buses for public transport are in use in Wrocław, Gdynia and Kraków. In addition, the first mobile hydrogen station in Poland is located in Krakow.

<https://www.solarisbus.com/en>

<https://jelcz.com.pl/en/home/>

3.12 ZE PAK – ZESPÓŁ ELEKTROWNI PAŃNÓW-ADAMÓW-KONIN SA

ZE PAK is the second, volume wise, Polish producer of electricity generated from brown coal and the fifth electricity producer in Poland.

In July 2021 ZE PAK obtained a decision on environmental conditions for a project consisting in the construction of a hydrogen plant with accompanying infrastructure. The decision allows ZE PAK to implement an investment that covers the construction of a hydrogen plant with a target capacity of up to 50 MW, based on polymer and electrolyte membrane (PEM) electrolysis. This investment will be carried out within the area of the Konin Power Plant, where the existing 50 MW biomass unit is located, and another 50 MW biomass unit is under construction.

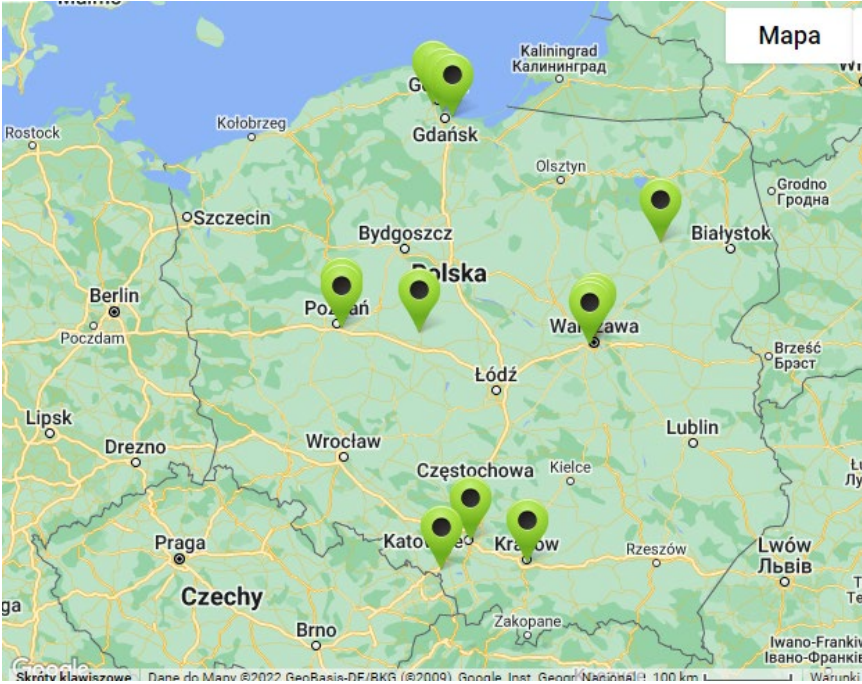
The operating biomass power unit is already a source of green thermal energy for Konin. Owing to the supply of green heat from this source, the district heating system in Konin is one of the few effective heating systems in Poland. The end-users of heat in Konin are not burdened with the costs of CO2 emissions, which must be borne by heat consumers using gas- or coal-fired district heating systems.

ZE PAK's investment projects for the production of green hydrogen are part of the process of energy transition of Eastern Greater Poland. The construction of a hydrogen plant along with the accompanying infrastructure at the Konin Power Plant is an element of the ZE PAK





cars. However, it all depends on whether the plans to build the infrastructure are in force and will be implemented.



Source: <http://gashd.eu/wodor-h2/stacje-wodorowe-w-polsce/>

## 5. EVENTS, FAIRS & ORGANIZATIONS ON HYDROGEN

### 5.1 ..... CLUSTER OF HYDROGEN TECHNOLOGIES - POMERANIAN HYDROGEN VALLEY

Research and development projects as well as joint investments for hydrogen economy are the Cluster’s key missions. Its members are cooperating in the fields of information exchange, building economic connections, services and technologies. Cluster establishes broad cooperation with domestic and foreign organizations and other cluster networks and conducts educational and promotional activities as well.

<https://klasterwodorowy.pl/home1.en>

Past event: Polish Conference on Hydrogen Energy - PCHET V 4-5.10.2022, Gdynia

### 5.2 ..... GREATER POLAND ENERGY VALLEY - GPEV

**Greater Poland Energy Valley** consists of five counties: City of Konin, Konin, Koło, Turek and Słupca counties and encompasses 43 municipalities and 15 cities. The region consciously enters the process of power transformation, moving further from coal-fired power and closer to renewable energy sources and new technologies. The actions undertaken to provide a clean and ecological industry is what drives local representatives and entrepreneurs.

<https://www.wde.org.pl/en/>

Past event: Fair of Renewable Energy Sources ”New Energy in the Region” - 11-12.10.2022, Konin



5.3 .. H2 GREATER POLAND – H2 WIELKOPOLSKA

Project „Gospodarna 2050 – H2Wielkopolska” aims to increase the competitiveness of Wielkopolska /Greater Poland companies in the international arena, by creating a regional ecosystem for low-carbon economy. They engage micro, small and medium enterprises, local government units, science and all hydrogen enthusiasts to cooperate.

<https://h2wielkopolska.pl/en/homepage/>

5.4 .. MAZOVIA HYDROGEN VALLEY

In second quarter of 2022, 37 entities, institutions and universities have signed an agreement to establish the Mazovia Hydrogen Valley, the leader of which will be [PKN Orlen](#). The Educational Research Institute was also invited to participate in the project. The Mazovia Hydrogen Valley will be based on four pillars that will contribute to the effective development and dissemination of hydrogen technologies in the Polish economy. The other pillars are the implementation of research and development projects, the creation of systemic solutions for the training of specialized personnel and activities to support regulatory processes.

5.5 .. H2 POLAND – CENTRAL EUROPEAN HYDROGEN TECHNOLOGY FORUM

H2 POLAND is the first fair in Poland and Central and Eastern Europe entirely devoted to hydrogen technologies. The event is a platform for the exchange of knowledge during conferences and debates combined with an exhibition of the latest solutions devoted to low and zero-emission economy.

<https://h2poland.com.pl/en> - 16-17.05.2023 Poznań

5.6 .. NATIONAL FUND FOR ENVIRONMENTAL PROTECTION AND WATER MANAGEMENT - NFOSIGW

The National Fund for Environmental Protection and Water Management in cooperation with voivodeship funds for environmental protection and water management is the pillar of the Polish system of financing environmental protection.

The National Fund for Environmental Protection and Water Management in the matter of hydrogen has set itself two goals. The first is to promote the use of hydrogen in our country through programs for local governments supporting the purchase of zero-emission buses and the construction of hydrogen refueling stations. Among them, one can distinguish the New Energy program, Green Public Transport or Support for electric vehicle charging infrastructure and hydrogen refueling infrastructure, under which a total of PLN 100 million is allocated.

The National Fund for Environmental Protection and Water Management has adequate resources to start the implementation of the presented Hydrogen Strategy. Therefore, he wants to be the initiator of projects related to the production and use of hydrogen in Poland, ensuring a sales market for it.



The second task of the National Fund for Environmental Protection and Water Management for 2022, related to the hydrogenation of our country, is to support the development of the industry related to this gas by looking for investors for technologies allowing to obtain hydrogen in the zero-emission manner. In this case, the National Fund for Environmental Protection and Water Management does not exclude the fact that it will become an investor himself, as its president indicated that: “We want to avoid a situation in which, although in Poland, hydrogen will appear as fuel, it will be very small Polish component in the supply chain of devices for obtaining green hydrogen or its consumption”.

<https://www.gov.pl/web/nfosigw-en>

## 6. SUMMARY

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Poland has a chance to be one of the leaders and beneficiaries of this transformation on a global scale. Poland is currently in the third place in the European Union in terms of hydrogen production and fifth in the world. However, it is technological hydrogen produced and consumed in technological processes, e.g. by the Azoty Group or fuel companies.

Experts emphasize that the hydrogen market in Poland will not develop without strong **legal regulations**. He adds, however, that it is necessary for Poland to switch to the production of green, emission-free hydrogen, because foreign money from climate funds or the European Union will not be allocated to financing the production of hydrogen from natural gas or coal.

If a zero-emission hydrogen economy is to be created in Poland, Poland must have regulations that will allow it to build the largest possible green capacity in the energy sector, and secondly, will support the green hydrogen market. Companies wishing to invest in green hydrogen must have a guarantee that it will pay off.

In scope of all worldwide and European turmoil it seems the main activities in Poland in 2022 goes for discussions, events, strategies and new websites but not immediately into realization of the strategy. The next years will show if the plans and projects will turn into real and make Poland strong and important player on H2 scene.



