

The Polish hydrogen market is at a sharp turn. 2024 year will be crucial

Hydrogen should help Poland decarbonize industry, heating and increase energy independence. However, the construction of this new branch of the economy is progressing - so far - slowly.

We started over two years ago with great momentum - we were the first country in the region with a draft national hydrogen strategy. The goals contained therein, with a few exceptions, still remain on paper, and what is more, today, in a dynamically changing environment, they are becoming... unambitious.

2023 is a lost year for the hydrogen market. Hydrogen strategy goals at risk?

The past 12 months have not accelerated work on the hydrogen economy, especially in creating the necessary regulations and support framework for companies investing in hydrogen.

- Certainly not much has happened to believe that in 2030 Poland will even come close to achieving the main goal - adopted over two years ago - of the government's hydrogen strategy: 2 GW of installed capacity for the production of low-emission hydrogen. For context: according to analyzes by the European Commission, 2-3 GW of renewable energy will be required to meet the hydrogen needs of just one steelworks! – says Ryszard Pawlik, advisor to MEP Jerzy Buzek, one of the two rapporteurs and main negotiators of the European Parliament regarding the so-called hydrogen and gas package (i.e. regulations and directives on the EU market for hydrogen, natural gas and renewable gases).

According to our interlocutor, we currently have two problems in Poland. Firstly, the assumptions for 2030 are rather unambitious, especially considering the country's potential, but also the needs of, for example, energy-intensive industries. And it is not even known whether these assumptions will be able to be implemented.

- We must start acting decisively and immediately - primarily in the field of development of renewable energy sources, if we do not want to lose another race, this time in hydrogen. The stakes are high: the future of the industry and tens of thousands of jobs in Poland, warns Ryszard Pawlik.

Maciej Malski-Brodzicki, an expert in innovation support in the 3W department of Bank Gospodarstwa Krajowego, also draws attention to the slow pace of development of the hydrogen sector in Poland.

- Hydrogen has gained attention as a potential means of decarbonizing industry, transport and heating systems. So far, however, hydrogen projects in Poland (trigeneration installation in Gaj Oławski, PESA hydrogen shunting locomotive, green Sanok or hydrogen housing estate in Śrem) have been among the few. The large scope for development is evidenced by, among others: only two commercial hydrogen refueling stations in the entire country - says the expert.

The hydrogen market has entered a spiral, and there are many problems

Business is affected by the lack of action to build a hydrogen economy.

- The entire global market, like a peloton, has entered a twist and it is not really known today who will come out of this turn in the lead. Many advanced hydrogen projects still struggle with the problem of bankability or guaranteeing the receipt of the product. This situation leads to delays in final investment decisions, caused by numerous risks related to the safety and profitability of this type of investment, says Tomoho Umeda, president of Hynfry, a Polish company specializing in technology integration, project development and process implementation in the renewable hydrogen and ammonia industry.

As he emphasizes, this is a common problem on the global market, but a global one whose initial great optimism collides with the demanding reality. Poland can emerge from this turn in a high position.

- Currently, these investments cannot be financed by the sale of hydrogen alone. Therefore, it is important to note that hydrogen is not the only target. In our company, projects are modeled - with polygeneration in mind, so that profitability results from many different revenue streams. I believe that only such a model will ensure full energy and business efficiency of the project. Poland has a great advantage here, which, if used wisely, will allow us to emerge from the global turn in a strong position, says Umeda.

Polish companies operating on the hydrogen market are doing their own thing and implementing projects

Hynfra is working on dozens of hydrogen projects around the world, offering production and decarbonization solutions for both industrial customers and local governments.

Last year, the company became an investor in the first local government hydrogen company, Hydro Sanok, whose goal is the complete transformation of Sanok's energy system with the use of

renewable energy sources and renewable hydrogen. The agreement on this matter was signed during last year's European Economic Congress in Katowice. Hynfra is planning the same investment together with Japanese partners in the Ukrainian city of Bucha. Hynfra's partnerships also cover the Middle East, where - using renewable energy and electrolysis to produce hydrogen - a large-scale green ammonia plant is to be built in Jordan.

However, Polish companies have shown that the past year was not wasted for hydrogen projects. The Polsat Plus Group, controlled by Zygmunt Solorz, and the ZE PAK Group have built and launched the first two publicly available hydrogen refueling stations for cars and buses. The first one started in Warsaw in September, the second one a month later in Rybnik.

Orlen also considers 2023 a successful year for hydrogen projects. For the company, it was a time of "operationalization" of the Orlen Group Hydrogen Strategy 2030 adopted in 2022 and the implementation of the first activities included in its scope.

- Last year was mainly about the implementation of projects related to the use of hydrogen as a fuel in transport. In March, we launched the first publicly available hydrogen refueling station in the Czech Republic in Prague. The second one - three months later in Litvinów - says WNP.PL Grzegorz Józwiak, director of Orlen's hydrogen technologies and synthetic fuels office.

In addition to the mobile refueling station in Krakow, which has been operating since 2022, Orlen has also been working on launching a publicly available refueling station in Poznań (it will service a total of over 25 hydrogen buses ordered by the city, and will also enable refueling for individual customers). The facility has already been launched on a pilot basis and its final tests are underway. It is planned to be put into operation in the first quarter of 2024. In the next step, the second publicly accessible station, which Orlen is finalizing in Katowice, will also be launched. The location of the hydrogen stations of the Płock-based concern is well-thought-out - they are located where the reception of this fuel will be ensured.

- Last year was a time of construction and gaining experience in the implementation of large investment projects - such as the installation of automotive-quality hydrogen production and hydrogen refueling stations. It is worth mentioning that another five hydrogen refueling stations with EU support are being prepared (under the CEF Transport Alternative Fuels Infrastructure Facility program), which will be located in Bielsko-Biała, Gorzów Wielkopolski, Kraków, Warsaw and Piła, as well as a station in Wałbrzych, for which we received funding from the National Fund for Environmental Protection and Water Management (National Fund for Environmental Protection and Water Management - ed.), with planned commissioning in 2025 - says Grzegorz Józwiak.

He adds that this is not the end, because a list of another 16 hydrogen station locations has already been prepared, for which the procedures for obtaining environmental decisions and selecting contractors will start this year, so that the facilities will be ready by the end of 2026.

- In accordance with the adopted hydrogen strategy, we plan to have over 50 hydrogen refueling stations in Poland and over 100 in Central Europe by the end of the decade. We have the ambition to achieve the status of a leader in the implementation of hydrogen mobility in Central Europe, actively supporting the decarbonization of the transport sector - points out Grzegorz Józwiak.

Last year, Orlen also bought the first hydrogen locomotive, produced by Pesa in Bydgoszcz. It will be located - in the first months of the year - in the port of Gdynia, where tests of its maneuvering functionality will be carried out. In the middle of the year, the locomotive should reach its destination, i.e. the Płock refinery, where it will work in the Orlen production plant.

- Last year, we also launched a research and development project with a high-temperature electrolyzer in a cogeneration plant in Elbląg. This is the first installation of this type in the world cooperating with a combined heat and power plant. Its task is - on the one hand - to produce hydrogen in the electrolysis mode, and on the other - to produce electricity in the fuel cell mode. This high-temperature electrolysis project, led by the Research and Development Center. Faraday from the Energa Group, has huge potential for use in industry and will allow for much higher hydrogen production efficiency with lower energy consumption; We also see the validity of its use in the production of synthetic fuels, says Grzegorz Józwiak.

On the list of hydrogen projects that Orlen completed last year, our interlocutor also mentions the automotive-quality hydrogen analysis laboratory launched in Włocławek. Also in Włocławek, the production of green hydrogen produced in the electrolysis process will soon start at the hub. The investment is nearing completion and automotive-quality hydrogen from this installation will be delivered to the market in the first quarter of 2024. And in the already operating hydrogen hub in Trzebinia, Orlen carried out a pilot process of assessing the compliance of hydrogen production with the EU taxonomy in order to offer an environmentally sustainable product on the market.

- Biomethane-based hydrogen produced in Trzebinia will be low-emission, so it will meet the taxonomy requirements. This is a great success, because it is currently the only such source of automotive-quality hydrogen production in Poland - emphasizes the director of Orlen's hydrogen projects office.

The EU is creating the foundations for the hydrogen economy. Poland must keep up with this pace

It is the EU taxonomy that determines whether a given method of hydrogen production is treated as low- or zero-emission, and sets the framework within which the entire economy and hydrogen investments will operate.

And in this respect (setting standards and frameworks for the hydrogen market), unlike the domestic market, a lot has been happening at the EU level. Over the past twelve months, key steps have been taken towards building this new branch of the economy.

The European Hydrogen Bank was established, the first auction - with a support amount of EUR 800 million in subsidies for the production of green hydrogen - started at the end of November 2023. After tedious negotiations, work on the so-called Hydrogen and Gas Package.

- It is worth emphasizing that the regulation and directive included in it are the first comprehensive legal framework of this type in history. They are intended to accelerate the construction of a cross-border hydrogen market in the EU and promote the production and consumption of this gas - especially in sectors where it will be difficult to eliminate CO2 emissions otherwise: in energy-intensive industries - steel, fertilizer or ceramics - and in transport - sea or air - emphasizes Ryszard Pawlik, the already quoted advisor to MEP Jerzy Buzek.

As our interlocutor explains, the new regulations introduce, among others: distinction between transmission system operators and hydrogen distribution system operators, as well as the principles of the so-called unbundling (i.e. separating the transmission and distribution of energy from its production and sale) - in line with what has been in force in the EU for natural gas and electricity for years.

- The idea is to eliminate - and not create - barriers to the efficient and cost-effective construction of hydrogen infrastructure. For the same reason, the regulation allows, firstly, discounts on transmission tariffs for green and low-emission hydrogen and, secondly, a mechanism for intertemporal cost allocation. It will make it easier to spread the initial costs of developing the hydrogen network over time, says Ryszard Pawlik.

He adds that, especially for countries such as Poland - where the possibilities of financing hydrogen investments from the state budget are limited - it may be important to allow the so-called cross-subsidization between users of gas and hydrogen infrastructure.

The package also establishes an independent organization for the hydrogen market - the European Network of Hydrogen Network Operators (ENNOH), similar to those that have existed for nearly fifteen years for the electricity markets (European Network of Transmission System Operators for Electricity - ENTSO-E) and gas markets (European Network of Transmission System Operators for Gas - ENTSG). At the same time - which was very important for the European Parliament - all three institutions are to cooperate closely with each other, in search of synergy and in the spirit of true integration of energy systems.

- We have also provided special support for the development of a green and low-emission hydrogen economy in mining regions in transformation - such as Silesia and Zagłębie. The Czechs have already started doing this, using EU funds; it is worth following their example, emphasizes Ryszard Pawlik.

Our interlocutor also draws attention to the issue of a pilot introduction in the regulation of the possibility of combining suppliers and recipients of hydrogen in the EU, which is to be the beginning of a mechanism for joint purchases of this gas in the EU in the future. This is important - especially for energy-intensive industries (e.g. fertilizer producers) in countries such as Poland, where the development of clean hydrogen will certainly take more time.

The emerging hydrogen market must be regulated so as not to overregulate it

The importance of hydrogen regulations for the emerging market is also emphasized by Maciej Malski-Brodzicki from BGK.

- It must be remembered that hydrogen is a flammable and highly explosive gas. The hydrogen economy cannot afford incidents that will worsen the image of the sector in the eyes of society. Additionally, they may slow down changes that will translate into a reduction in our share in the global hydrogen market. Considering such a scenario: technology import is certain. Therefore, appropriate legal and technical standards will make it easier for companies to plan investments correctly - they will standardize the characteristics and composition of gas in trade. The protection of both the manufacturer and the recipient is very important. Thanks to this, society will be the beneficiary of the changes and benefits arising from the hydrogen sector, says our interlocutor.

In his opinion, the next step must be to standardize the nomenclature used by stakeholders of the hydrogen economy. Hydrogen has been present in the heavy and food industry for nearly a hundred years. Over this period, each industry has developed its own understanding of hydrogen gas.

The creation of a regulatory framework for hydrogen at the European level is being closely monitored by companies operating in the hydrogen market.

- All the mechanisms that appeared last year are very important because they strongly define the direction of development of the renewable hydrogen market - says Tomoho Umeda.

Determining the definition of hydrogen in the delegated acts to the RED II directive is also of key importance for Orlen.

- Thanks to this, we have clarity on how to produce hydrogen in accordance with the definition of RFNBO (Renewable fuels of non-biological origin). At the European level, we also have the RED III directive adopted, published at the end of the year - and this will certainly be a challenge for the coming months to transpose these regulations into Poland. This should take place as soon as possible - so that the requirements set out in it regarding the share of renewable hydrogen of the RFNBO type in both the fuel and non-fuel industries are clearly defined. This will allow projects to be properly prepared to meet the objectives of the directive, which will be in force from 2030. It has only been in force for 6 years, so we need clear guidelines at the national level as soon as possible, says Grzegorz Józwiak.

Another urgent issue for companies operating on the hydrogen market is the creation of a national program to support the construction of a hydrogen economy - parallel to the European mechanism currently being launched within the European Hydrogen Bank.

- This is an essential tool to implement increasingly larger projects for the production and use of renewable hydrogen at the national level. This type of programs, which unlock project financing opportunities, operate in other European countries - e.g. in Denmark. Support is also needed for projects that have already received EU funding under other programs, such as IPCEI (Important Project of Common European Interest - an EU instrument supporting the new economic policy and competition policy of the Community - ed.) - says Grzegorz Józwiak.

And Orlen has ambitious plans for next year. The company is starting work on the production of synthetic aviation fuels of the RFNBO type, i.e. e-jet fuel. This year is to be a time of preparation for the entire project, developing the technology itself, but also obtaining financial support for it.

- We intend to apply for funding for this project under the Innovation Fund - says Grzegorz Józwiak.

The development of the hydrogen market requires, above all, knowledge and dialogue. An important task for the government

So what is most urgently needed this year to kick-start the hydrogen market?

According to Tomoho Umeda, it is important to create well-designed hydrogen investments, based on solid financial foundations and - therefore - credible for banks, funds and investors. On the other hand, these institutions should develop their skills in assessing and analyzing hydrogen-related projects.

- The need for knowledge about technologies, the supply and demand side and risks on the hydrogen and its derivatives market. This is quite a complicated matter and time must pass before financial institutions develop appropriate competences, says the president of Hynfry.

The new government must also acquire competences. Hydrogen was practically absent from last year's election campaign, and the list of tasks for the new authorities is long...

- From Poland's perspective, it is necessary to update the entire energy policy until 2040 (PEP2040), also in the context of updating the integrated National Energy and Climate Plan for 2021-2030; in accordance with the regulation on the management of the Energy Union, we are obliged to do this by the end of June 2024. As part of this work, it would be good to also take a fresh look at the goals and assumptions of our hydrogen strategy, says Ryszard Pawlik.

Tomoho Umeda emphasizes that there is an urgent need for greater openness on the part of both MPs and the government to a broad dialogue with representatives of the energy transformation industry.

- Taxonomic challenges for Polish industry may have huge consequences for the Polish economy. Therefore, I believe that it is urgent to establish an intensive dialogue - for example through organizations such as the National Chamber of Commerce or the Lewiatan Confederation - says the president of Hynfra.

According to Maciej Malski-Brodzicki from BGK, the new year will be a period of verification of hydrogen valleys that have formed in Poland and Europe.

- The creation of the valleys was intended to create a supply chain on a local scale. A year has passed since their establishment, and it is high time to assess their effectiveness, says our interlocutor.

Access to green energy is also very important for the development of the green hydrogen area.

- Fortunately, the renewable energy sector is constantly developing; is also in very good condition - prospects for green hydrogen production may become a reality. On the way to sustainable development, we must diversify energy diversity - hydrogen, renewable energy, nuclear power plants, geothermal energy and energy storage. This arrangement should make it easier for us to quickly switch to the cheapest and safest sources at a given moment. We cannot return to the energy monopoly, emphasizes the BGK expert.

In his opinion, 2024 will be a period of research and nurturing the development of hydrogen projects.

- Following this version of events, in the years 2025-2030: the market will experience a phase of progressive development of the hydrogen economy. Increasing the share of the hydrogen sector, which will play a key role in the energy sector, will contribute to stimulating socio-economic development. Application? The times of hydrogen spring are coming - summarizes Maciej Malski-Brodzicki.

12.01.2024