

## Report

# EU – Pacific Talks: H2 – Hydrogen Hype

David Plhák

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In recent years, hydrogen has gained momentum in the energy sector and industry. Many countries are counting on hydrogen through the national hydrogen strategies as an essential part of their plans to achieve carbon neutrality. Among the first to pin its hopes on hydrogen was Japan, which formulated the Basic Hydrogen plan in 2017 outlining a road map for including hydrogen into its energy mix. The importance of hydrogen as an energy carrier grew even more with the Russian aggression against Ukraine. This is for instance reflected in the recent plan REPowerEU issued by the European Commission that would see to quadruple the supply of hydrogen by 2030.

This year's sixth debate in a series of expert discussions on the EU's relations with the Pacific took place online on Thursday 17 March. Guests outlined the current state of hydrogen use as well as its role in the pursuit of climate neutrality and lowering the energy dependence of the EU, Czechia, and Japan. The hosts addressed the challenges of using hydrogen and ammonia (also carrying hydrogen as part of it) as an energy carrier and storage medium that the EU and Pacific countries face. Particular attention was paid to the challenges associated with the deployment of hydrogen technologies.

As Joana Fonseca analyst for Intelligence Hydrogen Europe pointed out, hydrogen has long been used in industry in many areas such as fertiliser production, oil refining or metal production. However, most of the hydrogen used in these industries today is produced by processing natural gas during which CO<sub>2</sub> is emitted. There are also alternative methods of hydrogen production that are more environmentally friendly (from water, splitting it into hydrogen and oxygen), but they only consist of a small part of the total hydrogen production.

Hydrogen is currently the focus of attention due to its potential use as an energy carrier and fuel for mobility, energy storage or hard-to-abate sectors. The main means to rapidly accelerate the decarbonisation of the energy mix is electrification using renewable energy, which should gradually replace the use of fossil fuels. However, it can prove to be very difficult

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and only achievable in long-term for many countries to reach the goal of a carbon-free economy only through electrification using renewable energy.

This can be partially solved by interconnecting the power grids and increased collaboration in the energy sector. However, as Fonseca argue this can help only to a limited extent. Hence, hydrogen is seen as an ideal complement to the energy transformation. The most promising in this regard is so-called „green hydrogen”, which is produced by electrolysis with the use of electricity from renewable resources - water is split into hydrogen and oxygen. The issue with green hydrogen is that its production is still quite costly. Thus, current efforts seek to decarbonize the production of hydrogen and scale up the production to benefit from economy of scale.

Bunro Shiozawa, an associate at Sumitomo Chemical and coordinator of the SIP's "Energy Carriers" program, added that the significance of hydrogen is of importance, especially for countries such as Japan that depend heavily on foreign energy supplies and cannot be connected to the grid. The aim is to use hydrogen and ammonia as a carrier and storage for energy. In this respect, Japan is focusing on the transportation of ammonia as it has a relatively higher volumetric energy density compared to hydrogen. Moreover, there is already existing infrastructure that can be used. The use of ammonia also limits unnecessary transformations of hydrogen during transportation, which can lead to additional energy losses. This is particularly advantageous for countries that cannot transport hydrogen through pipelines. Promising in this regard are recent findings suggesting that ammonia itself can be used as an energy source, which could lead to decreases in costs for transferring ammonia to hydrogen.

According to Petr Mervart, plenipotentiary Representative of the Ministry of Industry and Trade for hydrogen technologies, Czechia is in many respects similar to Japan in its limited ability to rely fully on renewables. It is therefore in the interest of Czechia to increase hydrogen imports and its use in the energy mix. In order to ensure a steady supply of hydrogen the gas system operators of Czechia, Slovakia, Ukraine, and Germany launched in 2021 joined

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initiative to create a Central European Hydrogen corridor in an effort to create a supply of hydrogen from Ukraine. Unfortunately, given the Russian aggression on Ukraine, this project must be stopped, until Ukraine will be free of war again.

One might argue that security issues could pose problems also in other regions coming into consideration as suppliers, such as North Africa. Czechia can also solve this partially by importing hydrogen from the West. Mervart sees the issue of hydrogen imports as one of the main challenges Czechia faces in introducing hydrogen into its energy mix. As Fonseca points out, this problem also needs to be addressed at the European level by linking infrastructures and establishing cooperation in this area with countries neighbouring the EU.

Among the general public, hydrogen is most often mentioned in regard to the mobility sector, more specifically as an alternative fuel for cars. Although hydrogen cars can play the role of complement to electric cars (although it is effectively also an electric vehicle, just with the fuel cells to use hydrogen for electricity generation), it is not seen as a priority for passenger cars. Petr Mervart rather sees the future of hydrogen in the use for heavy trucks and buses, for which electric batteries do not seem very suitable and would be hard to upscale it.

Jan Sochor, an analyst at the Czech Hydrogen Technology Platform, adds that the idea that hydrogen will help reduce dependence on other countries is not entirely correct, as raw materials such as nickel still need to be imported to produce hydrogen through electrolysis. Sochor expects a rapid increase in the use of hydrogen in Czechia. However, the use of hydrogen as an energy carrier is likely to come a little later. Currently, a legal framework for hydrogen use in the Czechia and the EU needs to be established, as there is no clear definition of "green hydrogen". Sochor also warns against too much regulation, as it could hamper efforts to expand hydrogen production. The overarching goal should be to outline the use of hydrogen produced from renewables for the private sector.

Guests of the debate agreed that the fundamental problem with hydrogen use is the lacking infrastructure and the cost of producing „green hydrogen” using electrolysis. For „green

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hydrogen” to be competitive, governmental support and coordination are needed in order to increase supply and demand. Production needs to be expanded to achieve economies of scale. Another bottleneck of implementing hydrogen as an energy resource is its complicated transportation.

"If you missed the debate, you can watch it on the Facebook page of the EUROPEUM Institute for European Policy, which hosts the EU-Pacific Talks debate."

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## Contact

Web: [europeum.org](http://europeum.org)

Prague Office address: Staroměstské náměstí 4/1, 110 00, Praha 1

Tel.: +420 212 246 552

E-mail: [europeum@europeum.org](mailto:europeum@europeum.org)

Brussels Office address: 77, Avenue de la Toison d'Or. B-1060 Brusel, Belgie

Tel: +32 484 14 06 97

E-mail: [brussels@europeum.org](mailto:brussels@europeum.org)

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