



FREQUENTLY ASKED QUESTIONS ABOUT GREEN HYDROGEN



Launched in February 2021 by the Pecém Complex, the Federation of Industries of the State of Ceará (FIEC), and the Federal University of Ceará (UFC), the Green Hydrogen (H2) Hub aims to transform the territory of Ceará into a major global supplier of this type of fuel, generating jobs, income, and contributing directly to the decarbonization of the planet, one of the goals set by several countries in the world until 2050. The idea of these nations is to build a more accessible, efficient, and sustainable world, powered by clean energies such as H2.

But do you know what green hydrogen is and why Ceará has so much potential to be a world reference in the production of this fuel? To answer these and other questions, we prepared this compilation of frequently asked questions (FAQ) about the Pecém Complex Green Hydrogen HUB.

FREQUENTLY ASKED QUESTIONS



What is green hydrogen?

Considered a universal fuel, hydrogen in its "green" version can be obtained by using renewable energy, such as wind and solar/photovoltaic energy - abundant sources in Ceará, in the process of separating the H2 molecule from the oxygen molecule in water. This technology is based on the generation of hydrogen - a universal fuel, light and very reactive - through a chemical process known as electrolysis.

By using hydrogen as a fuel, replacing the use of non-renewable sources, the emission of carbon dioxide (CO2) into the atmosphere is eliminated, something that is considered a priority by European countries seeking sustainable progress. In this way, it also meets the requirements of the Paris Agreement, which foresees the reduction of the emission of pollutant gases in the environment by the participating nations.



What is the potential of Ceará for this type of business?

Ceará has a wide potential for renewable energy generation, which is primordial to enable the development of a Green Hydrogen market. Taking into account the installed capacity and the already calculated potential of new installations of renewable sources (wind or photovoltaic), besides the great treasure of the State, which is the combination between solar and wind sources, in a hybrid process, there is a very favorable environment for this kind of business.



Would the Pecém Complex be the ideal place for this?

No doubt about it! There is a great potential in the State of Ceará, specifically in the Pecém Complex, for the development of the production chain, distribution, storage and transport of green hydrogen.

Factors such as a port infrastructure with new docking berths in a future port expansion area, with adequate operational capacity and draft for H2 operations, a robust electrical grid with transmission line infrastructure compatible with the demands of the electrolysis plants, a broad gas distribution network that connects the entire complex, from the port terminal (pier 2) to the industrial areas, which can be used to transport H2 between the production and industrial consumption areas, and an ecosystem that is totally favorable to the development of this chain.

In addition, the Pecém Complex has, in its large industrial area, the first Free Trade Zone to come into operation in Brazil, ZPE Ceará, being a powerful competitive differential for export-oriented business, in view of the tax incentives that ZPE Ceará offers.



What differentials does the Pecém Complex have?

Let's mention some, besides the ones already mentioned above? They are:

- ✓ Proximity to consumer markets with its ideal geographical location for the production of this energy vector, connected to the main sea routes that link Pecém to Europe and the United States;
- ✓ Industrial areas and on Export Processing Zone (EPZ) land, offering EPZ tax benefits and bringing savings of 30% to 40% to the investor's opex and capex;
- ✓ Partnership with the Port of Rotterdam, which is becoming the main Hydrogen Hub in Europe;
- ✓ The Pecém Complex is an industrial park installed with companies in the hydrogen consuming market: steel, fertilizers, cement, mining, and a future refinery;
- ✓ Integration of industrial and port activities and logistic infrastructure.



What would be the benefits for Ceará?

The future investments in Green Hydrogen can help to generate a bigger technological, industrial and socioeconomic development in all the Northeast region, especially in Ceará, creating qualified jobs and attracting new industries. Another benefit would be the attraction of renewable energy companies and companies that produce, store and transport hydrogen, using the "know how" and influence of the Port of Rotterdam, thus generating more revenue, which would increase the GDP of the state and, in the case of exports, would bring positive impacts to the trade balance at state and national level.



And what does the world think of green hydrogen? Is it a trend?

The external scenario is favorable, because hydrogen started to be seen no longer as a simple fuel, but as "the solution" for the decarbonization of the world economy, also called energy transformation. Green hydrogen as a fuel is already a reality in countries like the United States, Russia, China, France, and Germany, being a sustainable alternative to reduce CO2 emissions and take care of the planet.



Which would be the main consumer markets?

Besides the potential exports to the Port of Rotterdam, to European countries, there are also opportunities to move this energy source/vector to countries like China, Japan and South Korea, which have already defined their plans to decarbonize their energy matrix, with plans to import Green Hydrogen.



Is green hydrogen a fuel that can change the way the world deals with CO2 emission?

Green hydrogen has the potential to revolutionize the current energy system towards a cleaner, safer and more sustainable path due to its versatile characteristics from production to use. The proposed worldwide energy transformation should use H2 as a substitute fuel for its fossil fuel counterparts and can indeed present a viable solution for achieving a low-carbon society.

