Green hydrogen in Latin America: A new era has started

By Nicolas Borda and Karim Alhassan

Takeaways

- Hydrogen use does not emit CO_2, but most methods of producing it do
- Latin American countries are making a concerted effort to produce green hydrogen
- Natural gas supply is becoming precarious, which may increase reliance on hydrogen

Today, no international market exists for pure green hydrogen. However, Latin America may play a prominent role in developing such a green market. Latin America is one of the geographic regions with the most renewable energy potential to help produce green hydrogen and achieve a future with net-zero emissions. The International Energy Agency (IEA) recently produced a report on the potential of low-carbon hydrogen in Latin America, stating that Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Panama, Paraguay, Trinidad and Tobago, and Uruguay are preparing national hydrogen strategies. The report also provided a list of low-carbon projects in development in the region.

Hydrogen has become a familiar term. It is the most common element in the world, and it has tremendous potential as a clean energy source. Hydrogen even makes up around 10 percent of the human body by mass. It is always adhered to other molecules, like oxygen (as it is in water).

Hydrogen does not emit carbon dioxide when used by the end user; however, the production process, with the exception of green hydrogen and pink hydrogen, does produce CO_2.

All countries in Latin America will need to decarbonize their transportation to be able to meet their clean energy objectives. Since 2008, there have been several low-carbon pilot projects in Argentina, Chile, and Costa Rica. In Chile, using green hydrogen rather than diesel for copper production will also have a very positive impact in terms of greenhouse gas reduction.

Types of hydrogen

1. Green hydrogen is produced using mainly solar and wind energy, resulting in no greenhouse gas emissions.
2. Blue hydrogen is produced using natural gas and steam.
3. Black and brown hydrogen are produced using coal.
4. Yellow hydrogen is produced exclusively using solar energy.
5. Turquoise hydrogen is produced using methane pyrolysis.
6. White hydrogen occurs naturally in underground deposits (there are currently no strategies to exploit this type hydrogen).
7. Pink hydrogen is produced using nuclear energy.

These color codes are used by the energy industry to differentiate between the types of hydrogen produced.

Uses

The main uses for hydrogen include:

- **Industrial processes** – Refining oil (upgrading heavy oil and desulphurization), producing fertilizer (25 percent of ammonia was used to produce urea), treating metals, and processing foods.
- **Space exploration** – NASA began using liquid hydrogen as rocket fuel 70 years ago.
- **Transportation** – Hydrogen is considered an alternative fuel under the Energy Policy Act of 1992. There is an increasing desire to use hydrogen in aircraft, trucks, cars, and vessels primarily to power fuel cells. Japan and California are leaders in hydrogen charging stations.
- **Electricity generation** – Hydrogen is used as fuel in power plants. Some natural gas turbines also use a hydrogen/gas mix.

Countries in Latin America have different levels of industrialization. Argentina, Brazil, Chile, Colombia, and Mexico are the largest economies in the region, and these five countries, together with Trinidad and Tobago, account for almost 90 percent of the demand for hydrogen in the region. Trinidad and Tobago alone accounts for around 40 percent of the demand in Latin America for use in its huge chemical industry that produces large volumes of ammonia, methanol, and urea produced for export.

In Mexico, oil refining consumes 60 percent of the local demand, followed by steel production where hydrogen-rich synthetic gas is used for direct iron reduction (DRI). In Brazil, oil refining accounts for around 80 percent of the demand, followed by ammonia-based fertilizer production. In Argentina, hydrogen is in demand for three industrial uses (oil refining, ammonia and methanol production, and DRI). Chile and Colombia account for about 10 percent of the total hydrogen demand for the region.

Latin American and Caribbean countries form a new platform

November 30, 2021, marked the official launch of H2LAC, a collaborative platform that seeks to promote the development of green hydrogen in Latin America and the Caribbean, bringing together representatives from more than 19 countries.

The H2LAC initiative is endorsed by the German Society for International Cooperation (GIZ), the Economic Commission for Latin America and the Caribbean, the EUROCLIMA+ Program, the World Bank, and the Hydrogen Alliance.

At the launch, Gonzalo Muñoz, high-level climate action champion of COP25, highlighted "the importance of the sector for increasing the ambition of reaching a maximum of 1.5º Celsius temperature increase set by the Paris Agreement and the important opportunity that the development of H2V represents for the region to 'sow a seed' for the rest of the world; opening opportunities for collaboration not only North-South but also South-South."

Max Correa, director for fuels and new energies at the Chilean Ministry of Energy, stressed that *"the H2V strategy generated by the Chilean Government will be implemented as a state policy, through serious and rigorous work, covering all possible areas so that this industry can be born."*

Chile aims to become a leading hydrogen exporter and operate as a hub to establish a green fuel supply chain for the world, alongside other countries in Latin America and the Caribbean.

Rainer Schröer, director for renewable energy and energy efficiency at GIZ Chile, pointed out that *"[T]he objective of the platform is to host a repository of green hydrogen projects at regional level in Latin America and the Caribbean in order to position the discussion at global level, since, so far, the discussion has been very focused on Europe."*

Each of the participants involved in the H2LAC initiative will perform different roles in the development of the platform based on their institutional nature.

Costs of green hydrogen

The costs associated with renewable energies continue to decrease, especially in large-scale wind and solar projects. Therefore, the costs associated with green hydrogen is also expected to decrease in the near future.

Current geopolitical events and climate change

Countries in Europe and Latin America want greater energy independence. Mexico imports a significant amount of natural gas from the United States. The freezing temperatures in Texas in February 2021 significantly impacted the flow of natural gas to Mexico, and prices in the spot market became incredibly expensive. Europe is trying to reduce its dependency on natural gas from Russia in response to the current crisis in Ukraine.

Conclusions

Reliability of supply (including price), the fight against climate change, and the need for energy security will all bolster the use of alternative fuels such as hydrogen. Latin America is perfectly positioned to produce green hydrogen and become a hydrogen export hub. Mexico City, in particular, would greatly benefit from green hydrogen for mass transportation to reduce pollution and avoid price increases, such as the recent increase in diesel and gasoline prices due to higher oil prices resulting from the crisis in Ukraine

Authors

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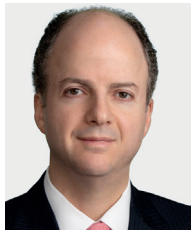

Nicolas is based in Reed Smith's Houston office and is an international business transaction lawyer with a focus on energy and natural resources, infrastructure, and Latin America. Nicolas focuses his energy practice on all facets of oil and gas (upstream, midstream, and downstream), power and renewable energy projects. He advises clients on international and cross-border transactions, regulatory matters, mergers and acquisitions, corporate, joint ventures, energy infrastructure project development, government procurement, public policy, anticorruption, compliance, HSE, NAFTA, USMCA, international trade, and dispute resolution in the energy sector. Nicolas has been involved in many energy projects and transactions throughout Latin America. Nicolas is ranked by Chambers Global and Chambers Latin America. Nicolas advises U.S. and international companies in all kinds of business and cross border transactions regarding natural resources.

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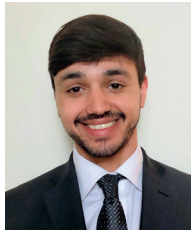

Karim is based in the Washington, D.C., office and focuses his practice on assisting clients with their compliance obligations regarding data privacy and security. More specifically, he has experience advising clients on their regulatory obligations stemming from emerging state privacy laws, as well as assisting in the defense of companies subject to regulatory investigations and actions by the Federal Trade Commission. Additionally, Karim has experience navigating the emerging and rapidly changing regulatory landscape in connection with digital assets, assisting on matters related to cryptocurrency advertising and under the federal securities laws.