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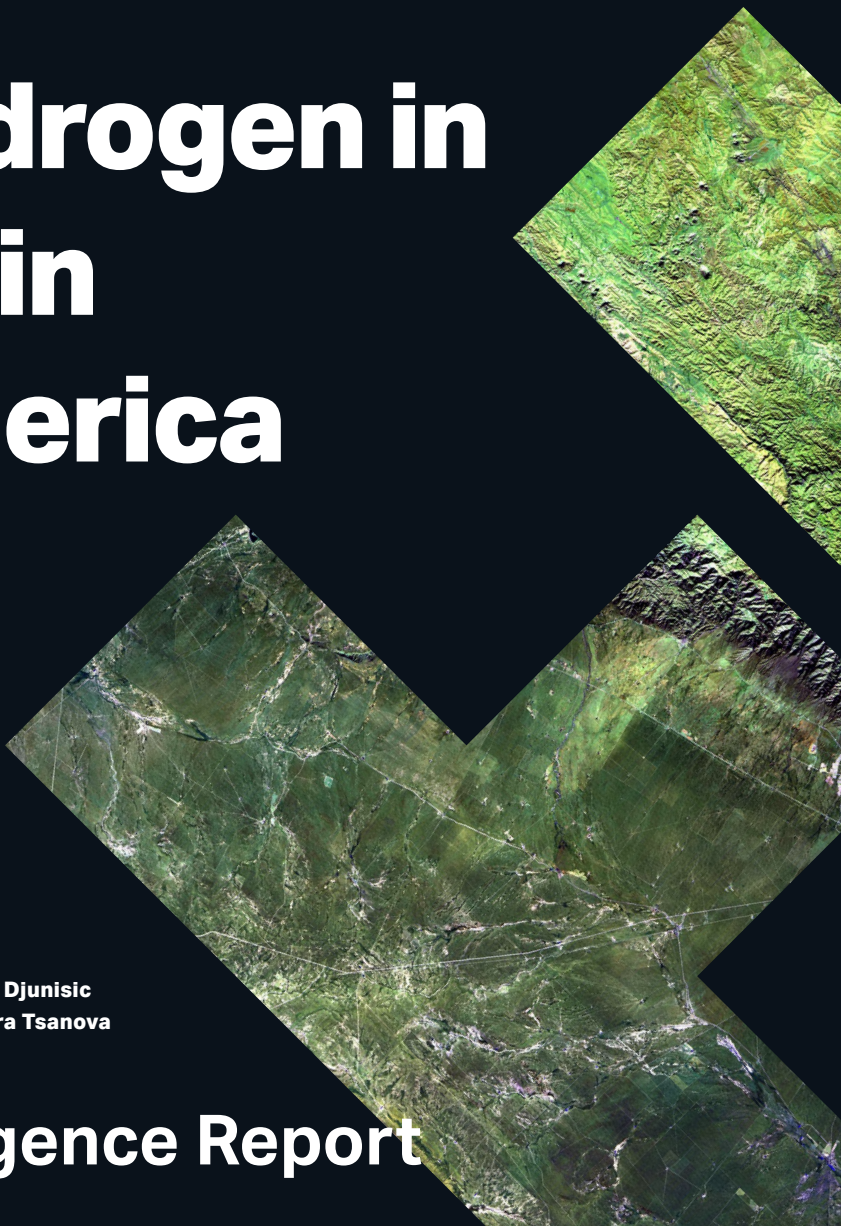

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Intelligence Report

CONTENT

Introduction 3

Chile 4

The First Call for Green H2 Proposals 5

International MoUs 7

Notable projects 7

Haru Oni 7

Quintero Bay Green Hydrogen Project 8

Colombia 9

Notable projects 10

Uruguay 11

State support for first green H2 pilot projects 12

Ancap to offer offshore wind areas for H2 studies 13

Notable projects 13

Brazil 14

Notable projects 15

Argentina 16

Notable projects 17

Mexico 18

Notable projects 19

Costa Rica 20

Other Development in the LATAM Region 21

References 22

1. INTRODUCTION

Latin America stands apart as a region with abundant hydropower potential and clean energy that is also an industrial and oil-and-gas refining global force. In the traditional paradigm, these two forms of energy wealth contrast each other, but in the context of the emerging hydrogen economy, they can now go hand in hand. The versatility of hydrogen, especially low-carbon hydrogen, promises to add new value to any economy, enabling countries to be more flexible with their resources and energy transition strategies.

Hydrogen is heavily consumed in Latin America, with the region's industrial and oil refining sectors using more than 4 million tonnes in 2019, or around 5% of global demand, according to the International Energy Agency (IEA). The five largest economies, Argentina, Brazil, Chile, Colombia and Mexico, together with Trinidad and Tobago accounted for around 87% of Latin America's hydrogen demand in 2019. Gas-rich Trinidad and Tobago alone was responsible for around 44% of the total regional demand for hydrogen, IEA stated in its 2021 report.

Having built-in industrial demand will certainly be an asset for these countries as project sponsors take stock of policies, incentives and opportunities in each of them and the low-carbon hydrogen economy develops. However, opportunities will not be lacking in nations without huge industrial and mining centres as they too will have to look towards hydrogen, but for uses such as heavy-duty transport, shipping and aviation.

Chile, Colombia, Uruguay and Brazil are already positioning themselves to take advantage of the hydrogen era, and produce enough low-carbon fuels, gases and other hydrogen carriers for domestic use and exports, while other countries are testing the waters with small pilot projects.

2. CHILE

Chile was the first Latin American country to release its national green hydrogen strategy when it unveiled its goals for the next decade in November 2020. The Chilean government understood that the country's incomparable climate conditions for clean and renewable energy could well make up for its lack of fossil fuels, and came up with a strategy that endorses only hydrogen production via electrolysis.

Chile set the target to have 5 GW of electrolysers in operation or under development by 2025, and up to 25 GW of electrolysis capacity in 2030. By 2030, Chile projects that it would be able to produce green hydrogen for less than USD 1.5/kg, and have enough of it to meet the needs of the domestic industry and become an exporter of hydrogen, ammonia, green methanol and synthetic fuels.

The development of green hydrogen opportunities and the expansion of its uses is expected to follow three waves:

- In the short term, green hydrogen would replace imported ammonia and grey hydrogen already used in oil refineries, and would be an attractive solution for some heavy-duty and long-distance transport.

- The second wave could begin as early as 2028 when opportunities for green ammonia exports become more visible. During this medium-term phase, the green hydrogen production is expected to be more competitive. Hydrogen will be increasingly used in the domestic land transport, and its blending into gas grids is more economical.

- Around 2030 and the years that follow, more countries will have set decarbonisation targets and new technologies will be developed. Chile expects to welcome this era as a leader in the production of cheap green hydrogen and its derivatives and a major exporter.

The government highlights Chile's potential for hosting over 1,800 GW of renewable energy capacity, or enough to meet the current demand 70 times over, on its narrow strip of land. The bet is placed not only on solar PV and onshore wind, but also on concentrated solar power (CSP) and run-on-river

hydroelectric plants. Geographical areas identified in the strategy document as having the highest capacity factor for solar PV and wind energy are:

- Chile's north, specifically the Antofagasta region, where capacity factors of 35% can be achieved in monofacial solar PV plants with 1-axis tracking;
- The central part of Chile (Santiago Metropolitan region), described in the green hydrogen strategy as boasting competitive solar power generation and having potential to site power plants close to large consumption centres, gas grids and logistics hubs, such as ports;
- Chile's southern end, the Magallanes region, where land-based wind farms could achieve a capacity factor that is comparable to offshore wind farms in some countries.

Cheap and abundant renewable energy coupled with expected lower costs of electrolysers in the future would pave the way for Chile to create a healthy green hydrogen sector that could be as large as its mining industry, the government estimates. Such an ambition will require cumulative investments totalling around USD 8 billion to have 5-8 GW of renewable energy installed in 2025, and USD 45 million to reach 40 GW in 2030.

In the policy area, the Chilean government plans to roll out necessary regulation and guidelines in three stages, depending on project development and based on international norms, and update the green hydrogen strategy every five years. The policy adjustment process started with a draft proposal for safety regulation for hydrogen installations put forward by the Chilean ministry of energy. The public consultation on the draft proposal was finalised in early February 2022.

The First Call for Green H2 Proposals

In April 2021, the Chilean government announced it would grant state funds to support green hydrogen production projects, specifying that their capacity would have to be greater than 10 MW and that they should come into operation no later than December 2025. In late December 2021, six green hydrogen initiatives were selected to receive a portion of the USD-50-million financing allocated to the funding round.

The awarded projects are listed in the table below:

Project name	Promoter	Funds awarded (in millions)	Electrolysis capacity	Project description	Location in Chile
Faro del Sur	Enel Green Power Chile	USD 16.9	240 MW	Production of around 25,000 tonnes of H2/year via wind-powered electrolysis. Off-taker is e-fuels producer and exporter HIF Chile	Magallanes
HyPro Aconcagua	Linde	USD 2.4	20 MW	Output of 3,000 tonnes/year of green H2 to replace some of the grey hydrogen at ENAP's oil refinery in Aconcagua	Valparaiso
HyEx - Produccion Hidrogeno Verde	Engie	USD 9.5	26 MW	Pilot plant to produce 3,200 tonnes/year. Off-taker Enaex to convert green H2 to ammonia	Antofagasta
Antofagas-ta Mining Energy Renewable (AMER)	Air Liquide	USD 11.8	80 MW	Green H2 to be combined with captured CO2 for the production of 60,000 tonnes of e-methanol per year	Antofagasta
Quintero Bay Green Hydrogen	GNL Quintero	USD 5.7	10 MW	Green H2 plant to produce around 430 tonnes/year. Output to be sold to industrial companies in Quintero Bay area	Valparaiso
H2V CAP	CAP	USD 3.6	20 MW	Green H2 plant to produce 1,550 tonnes/year for green steel making	Biobio

Data compiled by Renewables Now. Sources: the Chilean energy ministry, Corfo, Enel Green Power, GNL Quintero, CAP.

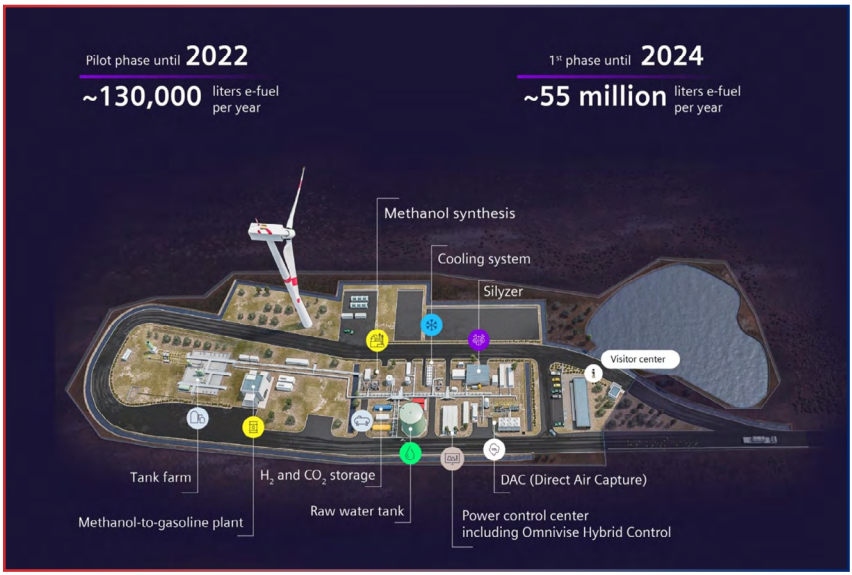
International MoUs

To further demonstrate its support to the green hydrogen development, the Chilean government, through the energy ministry, signed memoranda of understanding (MoUs) with several governments and European ports to exchange knowledge and build relationships. During 2021 agreements were signed with Singapore, Germany, South Korea and the ports of Rotterdam, Antwerp and Zeebrugge.

Notable projects

Haru Oni

The most advanced green hydrogen development in Chile is the Haru Oni pilot project, a German-Chilean multi-stakeholder initiative to produce e-fuels for exports. The project entails the installation of a 3.4-MW Siemens Gamesa wind turbine, the Silyzer 200 PEM electrolyser from Siemens Energy, CO2 direct air capture (DAC) equipment supplied by Global Thermostat, a methanol synthesis reactor, and a methanol-to-gasoline plant based on technology licenced by ExxonMobil.



The Haru Oni plant layout. Image source: Siemens Energy

The construction of the Haru Oni facilities at a site in the Magallanes region started in September 2021.

The project lead and developer is Chilean firm Highly Innovative Fuels (HIF). Other stakeholders include Enel Green Power, ENAP, Empresas Gasco, Siemens Energy, and Porsche as the primary off-taker of the e-fuel.

In the demonstration phase, the Haru Oni plant will produce around 750,000 litres/year of e-methanol by 2022. Part of the e-methanol will be converted to 130,000 litres/year of e-gasoline during the first phase. The plan for the next phases is to increase the wind energy capacity to around 280 MW, and expand the plant to increase its e-gasoline production to 55 million litres/year by 2024 and over 550 million litres/year by 2026.

Quintero Bay Green Hydrogen Project

Plans for the Quintero Bay project in the Valparaiso region, central Chile, were unveiled in August 2021 by the developer, Chilean liquefied natural gas (LNG) terminal operator GNL Quintero. Other partners in the development are Spanish companies Acciona Energia and Enagas. The three companies plan to invest around USD 30 million to build an electrolysis plant with 10 MW of capacity and produce around 500 tonnes of green hydrogen per year. The facilities will be located at GNL Quintero's regasification terminal, with the developer planning to supply green hydrogen to industrial complexes in the bay area.

3. COLOMBIA

The Colombian government presented its hydrogen road map in late September 2021, with a vision to capitalise on its vast natural resources to produce both green and blue hydrogen. The national goal for 2030 is to install 1 GW to 3 GW of electrolysis capacity for the production of green hydrogen, and take advantage of Colombia's fossil fuel reserves and carbon capture, utilisation and storage (CCUS) technologies to produce at least 50 kilotons of blue hydrogen. The government expects that the nation will be able to achieve the levelised cost of hydrogen (LCOH) of USD 1.7/kg in 2030 for green hydrogen produced in exceptionally windy areas of the Northern Caribbean region.

According to the government's road map, the wind farm capacity factor in the northern department of La Guajira can reach up to 63%, so carefully selected wind project sites in this region can further bring down the green LCOH to USD 1.5-1.1 per kilogram by 2050.

Solar plant factors can reach 21% in the Northern Caribbean and Northern Andes regions. The government's projection is that solar-powered electrolysis in these areas can help put Colombia on the path to lower the green LCOH to USD 2.7-2.5 per kilogramme by 2030 and to USD 1.7-1.6/kg by 2050.

Investments in Colombia's electrolysis targets for 2030 are expected to total between USD 2.5 billion and USD 5.5 billion, and will be provided primarily by the private sector, with public support contributing where needed.

The hydrogen deployment and uptake will follow a familiar pattern of three phases:

- In the short term, by 2030, blue hydrogen is more competitive than green, and is used in existing hard-to-decarbonise industrial processes to replace grey hydrogen;
- Between 2030 and 2040, blue and green hydrogen coexist in Colombia depending on natural resources available at hydrogen production sites. During this period, the green hydrogen emerges as more competitive, and export activities can begin;
- From 2040, green hydrogen becomes the most competitive and in demand in the domestic and international markets.

The government trusts that Colombia's position between two oceans and port infrastructure in the Caribbean and the Pacific will enable it to become a major exporting hub for the nascent industry. The first steps to create a favourable regulatory environment for the hydrogen development were taken in July 2021, before the hydrogen road map was unveiled, when the Energy Transition Law N° 2099 came into force. The Law N° 2099 recognises green hydrogen as a non-conventional renewable energy (NCRE) source, while blue hydrogen is considered a non-conventional energy (NCE) source. With the new labels, investments in goods, machinery and equipment used in the manufacturing, storage, packaging, distribution, re-electrification, research, and final use of both green and blue hydrogen became entitled to the same tax benefits that applied to all other NCRE projects, such as wind and solar. The tax benefits include:

- an income tax deduction equivalent to 50% of the investment, over a 15-year period,
- accelerated depreciation rate of 33.33%,
- value-added tax (VAT) exclusion,
- tariff exemption.

For investments, goods, machinery and equipment used for CCUS technologies, the law establishes an income tax deduction of 25% of the investment, an VAT exclusion and the accelerated depreciation rate of 33.33%.

In early February 2022, the Colombian ministries of energy and transport signed a MoU with the Port of Rotterdam to start discussions about creating a corridor for the export and import of low-carbon and green hydrogen between Colombia and the Netherlands.

Notable projects

The Colombian ministry of mining and energy expects three hydrogen pilot projects to be in operation before the Ivan Duque administration finalises its term in office in August 2022. Two of these projects are aimed at decarbonising transport, while the third is an initiative led by Colombian oil-and-gas company Ecopetrol to produce green hydrogen for oil refining. Ecopetrol's project will install a 50-kW electrolyser at a refinery in Cartagena in partnership with the Colombian Petroleum Institute. Ecopetrol announced in December 2021 it would invest USD 6 million in green and blue hydrogen projects and studies in 2022.

4. URUGUAY

Uruguay's draft hydrogen strategy was presented by the government in June 2022 with a focus on green hydrogen only. It represents the second stage of Uruguay's energy transition - the first being achieving a 97% renewables share in the energy mix in 2017-2020 - and an opportunity for further decarbonisation of the economy.

The government highlighted Uruguay's potential to develop cheap renewables, including offshore wind, and the availability of freshwater, biomass for biogenic CO2 and other resources and infrastructure needed for the low-cost production of green hydrogen and its derivatives. Based on research that went into the strategy, the country's green hydrogen industry could generate annual revenues of up to USD 2.1 billion by 2040, and create over 30,000 jobs.

Uruguay's hydrogen goals are expressed in three familiar phases summarised below:

- Phase I (2022-2025) - during this period, regulation, safety and technical standards are to be defined; 200 MW to 500 MW of renewable energy should be under development alongside around 50 MW of hydrogen production capacity for small-scale uses, such as heavy-duty vehicles. One synfuels project is expected to be under development;

- Phase II (2026-2030) - the domestic market is expected to expand, and with the right port infrastructure in place, the first export projects will be developed; as projects scale up, 2 GW to 4 GW of new renewables and 1 GW to 2 GW of hydrogen production capacity will be needed to support the goals;

- Phase III (2030 and beyond) - hydrogen projects gradually go from medium to large scale; the ramp-up will require around 20 GW of renewables capacity and some 10 GW of electrolysers; during this period, Uruguay works on developing larger projects aimed at exports of synfuels, hydrogen and ammonia.

Uruguay plans to pull strength from its geography to compete in the hydrogen arena, banking on vast areas with high potential for quality wind and solar energy, which in turn would yield a lower levelised cost of electricity (LCOE). According to the draft strategy, it will be possible for Uruguay to achieve solar and onshore wind LCOEs of USD 16/MWh to USD 19/MWh by 2030. As technologies improve, Uruguay's solar LCOE could drop further to USD 11/MWh in 2040, with onshore wind LCOE coming down to USD 15/MWh. For offshore wind energy, LCOE is estimated at between USD 26 and USD 28 per MWh in 2030, and down to USD 21/MWh in 2040.

With onshore renewables as cheap as estimated, Uruguay could achieve an LCOH ranging between USD 1.2/kg and USD 1.4/kg in the west region and between USD 1.3/kg and USD 1.5/kg in the east region in 2030. These prices would enable Uruguay to compete with top net exporters such as Chile, Saudi Arabia, Oman, Namibia or Australia, according to the strategy. At the same time, the LCOH of offshore wind-derived hydrogen is estimated to reach USD 1.7-USD 1.9/kg in 2030, which would make this alternative less competitive compared to onshore resources.

State support for first green H2 pilot projects

At the end of March 2022, the ministry of industry, energy and mining, alongside Uruguay's national research and innovation agency ANII and national technology laboratory Latu set up the Hydrogen Sectoral Fund to finance research, innovation and training in green hydrogen technologies.

Several days later, ANII launched a call for proposals for projects that would pilot production and uses of green hydrogen and its derivatives. The aim of the invitation was to award up to USD 10 million of non-refundable financing to electrolysis set-ups of at least 1.5 MW that would produce hydrogen for uses in transport, blending with natural gas or for the purpose of processing it to obtain e-kerosene, e-methanol and green fertilisers. The funds would be distributed over a period of no more than ten years from the start of operations.

In August, nine proposals submitted by seven entities were short-listed to go into the next phase of the selection process. The entities are Ingener SA, CIEMSA, Compania Sudamericana de Empresas Electricas, Mecanicas y de Obras Publicas SA, MontevideoGas, Linde Plc (NYSE:LIN), the Palos Blancos Project and Kahiros, a company that proposed three projects for forestry transportation solutions.

Other projects consider using hydrogen for hydrogenation of vegetable oils, blending with natural gas, transport, and production of ammonia and fertilisers, the ministry of industry, energy and mining said.

Ancap to offer offshore wind areas for H2 studies

Uruguay's state-owned energy company Ancap has developed a programme called H2U Offshore, the main feature of which will be tenders of offshore wind areas in the south Atlantic Ocean for feasibility studies and the potential development of green hydrogen infrastructure by private companies.
Interested parties will be invited to bid for ten 500-square-kilometre sites located some 20 km to 100 km from the coast, each with a potential to generate at least 2.1 GW of electricity and 187 kTons of hydrogen per year, according to Ancap's presentation of the programme.
Winning bidders will have ten years to conduct the studies and even build a pilot hydrogen plant, with an option to relinquish the rights to the areas after any of the three sub-periods during the decade. After ten years, the companies can submit a development plan for hydrogen production. According to a news report by Bloomberg in early September 2022, Ancap could have the bidding terms ready this year and selected winners in the second quarter of 2023.

Notable projects

In May 2022, German renewables company Enertrag announced a project to develop the Tambor Green Hydrogen Hub in Uruguay's department of Tacuarembo to produce large amounts of hydrogen and its derivatives. The first phase of this undertaking will involve construction of 350 MW of wind and solar farms, an on-site electrolyser and conversion facilities. The goal is to produce around 15,000 tonnes of green hydrogen per year and convert it to e-methanol.

5. BRAZIL

Brazil plans to embrace all "colours of hydrogen" it can produce using its natural resources as part of the national strategy to secure a solid position in the global hydrogen market.

In December 2020, the Brazilian ministry of mines and energy released the Brazilian National Energy Plan 2050, declaring hydrogen as a disruptive technology and addressing its link with natural gas. The 2050 Energy Plan suggested that the regulatory framework for hydrogen should take into account sectoral changes that would follow after the passing of the new gas law, which occurred in March 2021. The law opened the domestic natural gas space to new players by ending the dominance of the state monopoly and simplified authorisation procedures for gas projects.

The recommendation under the 2050 Energy Plan is that a technical regulation is to be put in place to govern hydrogen blending with natural gas, while more studies should be conducted to address the safety aspects of hydrogen and to understand obstacles related to infrastructure for transport, storage and supply. Efforts in this direction could help Brazil arrive in the green hydrogen era with infrastructure and logistics in place.

In February 2021, the Brazilian National Council for Energy Policy (CNPE), through a resolution, directed the National Oil, Gas and Biofuels Agency and the National Electric Energy Agency to prioritise investments in research, development and innovation (RD&I) projects in the hydrogen sector. Also in February, Brazil's Energy Research Office (EPE) published a technical note titled "Baseline to support the Brazilian Hydrogen Strategy" in which it affirmed the country's commitment to the "rainbow" hydrogen strategy and highlighted the need for continued investment in RD&I and a predictable regulatory framework.

In June 2022, CNPE published the Resolution No. 6 to establish the National Hydrogen Programme (PNH2) and define the structure of its governance. The conception of such a programme arose from the need to strategically direct actions aimed at the development of the hydrogen economy in Brazil, allowing harmony with other sources of the nation's energy mix, the Brazilian ministry of mines and energy explained.

The main actions of the PNH2 should simultaneously consider the development of public policies, technologies and the market, according to the text of the Resolution. The Programme will be governed by the management council (Coges-PNH2), made up of representatives from several government ministries, national agencies and other entities and tasked with producing three-year plans for hydrogen.The representatives of the ministries will be in charge of coordinating works of five thematic groups that will address issues related to: strengthening the scientific-technological foundation; training and human resources; energy planning; legal and regulatory framework; market opening, growth and competitiveness.

Notable projects

While the government is working to develop a regulatory framework for the many colours of hydrogen, the Brazilian market is becoming more and more appealing to green hydrogen developers. The champion in attracting investors is the northeastern state of Ceara, which by early August 2022 had signed 20 MoUs with interested parties for hydrogen in the Port of Pecem complex. Some of the investors include AES Brasil, Engie, EDP, Linde and Hydrogene de France (HDF Energy), which has several hydrogen projects in the works across the region.

Australian renewables firm Enegix Energy in early 2021 announced its plans to build a green hydrogen plant within the Pecem complex. The proposed Base One plant would be capable of producing 600 million kg of green hydrogen per year once in operation, while the port's location will enable the company to gain access to major international markets. Enegix hired Black & Veatch to conduct the feasibility study for the Base One project. The USD-5.4-billion green hydrogen plant could be fully operational in 2025.

In February 2022, the Ceara state government signed a MoU with Brazilian firm Cactus Energia Verde. The document outlines the cooperation between the parties on establishing a green hydrogen production project at the Port of Pecem. The production would be supported by a future 1.2-GW offshore wind farm and a 2.4-GW solar PV park. Cactus would use the renewable energy to produce 10,500 tonnes of hydrogen and 5,250 tonnes of green oxygen per month, the Ceara government said at the time.

6. ARGENTINA

Argentina is considered a hydrogen pioneer in Latin America for setting up the region's first experimental hydrogen plant in the town of Pico Truncado in 2005, and then sanctioning the law on promoting hydrogen in 2006, although its provisions were programmed to last for 15 years. In 2008, Argentine oil-and-gas company Capex SA installed the Hychico hydrogen plant to demonstrate the feasibility of water electrolysis in the country. Since 2011, two wind farms have been erected in the plant's area to power the electrolysers with wind energy.

Electrolysers at the Hychico plant. Image source: Hychico SA

In the years that followed, the country focused on adding renewable energy capacity, but stalled on plans to update the hydrogen law despite the developments in the sector and Argentina's own needs to use hydrogen in industrial processes.
According to IEA, Argentina's demand for hydrogen reached some 350 kt in 2019, with the country being the only one in the region to demand hydrogen for all four main current applications in industry – oil refining and the production of ammonia, methanol and direct reduction of iron (DRI).

In May 2021, it was announced that an inter-ministerial group had been formed by Argentina's Economic and Social Council with a task to put together a hydrogen road map and consider not just the blue and green varieties of hydrogen, but also pink. Days later, the Economic and Social Council organised the forum "Towards a National Hydrogen 2030 Strategy" attended by industry stakeholders, research institutions and government representatives, during which Argentina's president Alberto Fernandez announced that the national strategy would be ready by the end of 2021.

In December 2021, a senator submitted to Congress a draft law on renewables and green hydrogen, which contained a proposal to eliminate import duties on goods used for hydrogen production and research projects.

Notable projects

Australian green energy company Fortescue Future Industries is interested in building an USD-8.4-billion green hydrogen project in the province of Rio Negro, it announced on the sidelines of the COP26 climate summit in Glasgow. The company's plan is to invest USD 1.2 billion in a pilot stage of the project, which would produce 35,000 tons of green hydrogen in 2022-2024. In the later stage, a USD-7.2-billion investment would propel the production of around 215,000 tons of hydrogen. At the time of the announcement, Fortescue Future Industries was planning to conduct an analysis into local resources, including the available wind energy, which would power the hydrogen production.

7. MEXICO

Mexico does not yet have a national hydrogen strategy despite boasting resources to produce both green and blue hydrogen and an advantageous geographical position. The nation's green hydrogen potential is estimated at 22 TW of electrolysis capacity, which could churn out hydrogen at an average cost of USD 1.4/kg in 2050 mostly thanks to solar PV power, a study commissioned by German development agency GIZ highlighted. With the right policies in place and favourable conditions for industry adoption, Mexico could roll out over 670 MW of electrolysis by 2030, according to the study, titled "Green Hydrogen in Mexico: towards a decarbonization of the economy".

Hydrogen business opportunities in Mexico lie in the road transport sector, specifically in fuel-cell heavy-duty vehicles, production of synthetic fuels and the mining industry, which would use hydrogen to fuel mining trucks, for DRI and thermal applications.

Mexico also has the potential to reduce green hydrogen production costs by up to 65% compared to other countries due to the advantages offered by the United States–Mexico–Canada Agreement, a successor to NAFTA, Israel Hurtado, president of Mexican hydrogen association AMH, has stated. Successful deployment would also require large volumes of renewable energy and a significant amount of mostly private investment.

However, the proposed reforms of the Mexican energy sector put forward by President Andres Manuel Lopez Obrador to strengthen state-owned electric utility CFE and curb the ability of private companies to sell power, have become a cause of concern for Mexico's renewable energy development.

As far as hydrogen is concerned, it does feature in the government's future plans for the Mexican electricity system. In June 2022, Mexico's ministry of energy published the National Electricity System Development Programme 2022-2036 (PRODESEN) in which it included the possibility of converting 5,513 MW of combined cycle gas turbine plants to use a mix of 70% methane and 30% green hydrogen between 2033 and 2036.

Nevertheless, Hurtado said that planned green hydrogen investments in Mexico total around USD 1.35 billion, according to a news report in June 2021. AMH is aware of projects happening in Baja California, Guanajato, Durango and Chihuahua, Hurtado was quoted as saying.

According to IEA's update from August 2021, three Mexico-based hydrogen projects were listed in its overview of the development in Latin America.

Notable projects

French firm HDF Energy is developing a power station in Los Cabos, Baja California Sur, based on its proprietary Renewstable type of a generation plant. The Energia Los Cabos project will integrate a solar farm and energy storage in the form of hydrogen and lithium-ion batteries. The whole set-up will be capable of producing 40 MW during the day and evening and 9 MW at night. HDF Energy sees the commissioning date sometime in 2024.

Dutch green hydrogen projects developer Tarafert BV is developing a large-scale urea fertiliser and green ammonia production project in Mexico, eyeing the annual output of up to 200,000 tonnes of green ammonia. In early September, the company ordered 343 MW of PEM electrolysers from US manufacturer Ohmium International Inc, which will deliver the equipment in three tranches. The delivery of the first 69 MW is expected in 2025.

Los Cabos project design. Image source: HDF Energy

8. COSTA RICA

The government of Costa Rica is preparing its national green hydrogen strategy with the support of the Inter-American Development Bank and funds from the Japanese government, and planned to have the document ready in the first quarter of 2022.

As of September, the strategy has not yet been released.

Costa Rica produces over 99% of its power from renewable sources, but electricity accounts for only 26% of energy consumed in the country, former Costa Rican president Carlos Alvarado has said. The bigger challenge for Costa Rica is the transport sector and the nation's use of petroleum derivatives, according to Alvarado. With no sizable grey hydrogen production to displace, Costa Rica has set its sights on electrolysis projects, such as AdAstra, to decarbonise road transport - the country's largest source of emissions.

In December 2021, the president signed a decree approving a policy to use surplus electricity from the national grid to advance green hydrogen projects.

In February 2022, state-owned utility ICE signed a MoU with Australian company Kadelco to identify electricity supply conditions for the production of green hydrogen in Costa Rica. The focus will be on the exchange of technical information on quality, power, availability, carbon content and seasonality of the electricity supply, and joint efforts to help Kadelco establish itself in Costa Rica. Kadelco is one of three foreign companies that have approached the Costa Rican government, expressing interest to build green hydrogen production plants powered by grid electricity, ICE said.

9. OTHER DEVELOPMENT IN THE LATAM REGION

DF Energy is working to install its Renewstable hybrid power-to-power station in Barbados to produce 13 MW during the day and evening and 3 MW during night time. The so-called RSB Barbados project will combine a solar farm, lithium-ion batteries, an electrolysis system and hydrogen storage in tanks. Commissioning is expected in 2024.

Norwegian fertiliser company Yara International is co-developing the NewGen hydrogen project in Trinidad and Tobago in partnership with the nation's government with the goal to produce ammonia. The project proposal is to install 170 MW to 185 MW of electrolysis capacity and commission the facilities in 2024. Yara co-owns two ammonia plants, known as Tringen I and II, in Trinidad and Tobago.

In December 2021, US contractor KBR announced that it had been awarded a contract to analyse strategies for establishing a green hydrogen economy in Trinidad and Tobago. KBR will work with state-owned agency National Energy Corporation of Trinidad and Tobago Limited and other stakeholders to identify areas for development in existing infrastructure and policy.

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