INTERNATIONAL PARTNERSHIP FOR
HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update November 2021: Chile

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1. New Initiatives, Programs, and Policies on Hydrogen and Fuel Cells

Funding

- The Ministry of Energy, in coordination with the Budget Office, proposed the creation of a new public program for 2022, the "Program to Promote Green Hydrogen in Chile" with $2,044M (Chilean Peso, CLP), to promote the development of the nascent industry in the country. (http://www.dipres.cl/597/articles-244772_doc_pdf.pdf).
- The Pontifical Catholic University of Valparaiso was awarded $CLP450M for the scientific and technologic project “Multidimensional study of the hydrogen value chain applications in the local industry”.
- Corporación de Fomento de la Producción de Chile (Production Development Corporation of Chile) (CORFO) Antofagasta launched a $CLP120M fund to develop public goods that enhance: 1) Development of the green hydrogen industry in the Antofagasta region, and 2) Circular economy applied to solar energy in the Antofagasta region. The Ministry of Energy supported the submission two green hydrogen projects: i) Baseline for the generation of a Roadmap for the transition to Green H2 in the Passenger Transport Vector. ii) Green Hydrogen Explorer for Antofagasta.

Assessments

- Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) Chilean office released the study “Hydrogen injection in natural gas networks”, that identifies and raise the materiality of natural gas networks in all their segments (transportation, distribution and service) for international comparison of its use or adaptation, for the injection and transport of hydrogen in different volumes in Chilean networks.

Power Systems

- The Ministry of Energy released the Preliminary Report for the Long-Term Energy Planning Process including the targets and impact of the Green Hydrogen Strategy goals on the electrical transmission and distribution system. This will become an input for the Transmission Planning Process, which later defines the construction of transmission lines and electrical infrastructure.

Transport

- Chile released our National Electromobility Strategy, which includes goals on green hydrogen and fuel cells applications such as; i) Chile will sell only electric vehicles in 2035, and ii) 100% of the sales of public transport (buses and taxis) will be zero emissions.

Overarching policies

- The Ministry of Energy will submit a project for an "Energy Transition Bill", including hydrogen blending in gas networks.
- The Ministry of Energy has released the preliminary document for the overarching "National Energy Policy", including goals such as i) increase the carbon price from 5 to 35 USD/tonCO2 by 2030, ii) increase the participation of zero emission fuels (such as green hydrogen) to 15% by 2035, and iii) 80% of electricity generation will come from renewable sources by 2030.
- The Environment, Science, and Energy Ministries released the "Long-term climate strategy" which seeks to give a long-term vision of Chile in the transition to sustainable and inclusive development no later than 2050. This strategy is based on science and 4 pillars that are: 1) Climate governance, 2) Cost / effectiveness of solutions, 3) Nature-based solutions, 4) a social pillar.

2. Hydrogen and Fuel Cell R&D Update

The Energy Ministry is working in collaboration with the Ministry of Science, Technology, Knowledge and Innovation in a number of initiatives pointing towards scaling up R&D in hydrogen-technologies, including:

- Conducting a mapping of all R&D efforts being conducted by local universities in green-hydrogen related topics through ANID's Database (the National Agency for Research and Development), to set up a network with researchers and universities, building on their current efforts.
- Submitting applications to secure funding in two R&D lines to the "Public Challenges" platform, related to (i) the retrofitting of existing railway and maritime transportation means on the demand side, and (ii) DC-DC coupling topologies to improve efficiency on the production side. (Funding is up to 400 M CLP per solution)

3. Demonstration, Deployments, and Workforce Developments Update

- The hydrogen production project, Haru Oni, signed collaboration agreements with public "Magallanes University" and "Magallanes Professional Technical Training Center" (CFT Magallanes). The agreements seek to evaluate and upskill labor, undertake R&D actions, and share knowledge.
- During September 2021, the Haru Oni project started its construction.
- GasValpo announced a demonstration project that aims to blend up to 20% of green hydrogen with natural gas. The project is set in Coquimbo Region and will involve more than 1,800 houses. La Serena University will monitor the project.
- Corfo opened to the public a free online course on green hydrogen. The course is completely instructed by women. (https://www.cursoh2vcorfo.cl/)
- Two green hydrogen production projects entered the environmental evaluation process, representing more than $US75M in investment.
- Anglo American generates the first Green Hydrogen molecule for zero carbon vehicles in Chile
- Hyundai communicated the plans to bring a green hydrogen truck during the first quarter of 2022.
- GIZ organized workshops about "Training on Green Hydrogen for the Financial Sector of Chile".
- To disseminate and educate the community on green hydrogen issues, the first illustrated manual was launched that summarizes through graphics, maps and

infographics, the fundamental contents of green hydrogen. This manual is a public resource for free download (available at https://www.ah2vbiobio.cl/) that was prepared within the framework of the project “Green Hydrogen Strategic Alliance for the Biobío”, financed by the regional government and executed by the University of Concepción.

4. Events and Solicitations

- Green Hydrogen Summit, 4th International Conference – January 19th 2022.

5. Investments: Government and Collaborative Hydrogen and Fuel Cell Funding

Ongoing

- The Ministry of Energy closed the call for a funding round of $US50M with CORFO for large scale (>=10 MW) green hydrogen production projects. The funding call received 10 applications, out of which 6 were considered admissible for funding. The companies are: Air Liquide Chile S.A; CAP S.A.; Copenhagen Infrastructure Energy Transition Fund I K/S; Enel Green Power Chile S.A.; Engie SA; GNL Quintero S.A.; Imelsa Energía SpA.; Linde GmbH; Hydrogène de France S.A.; y Sociedad de Inversiones Albatros Ltda. The process is currently in the technical evaluation stage.
- The Ministry of Energy awarded €300,000 for co-funding prefeasibility studies and accelerate the implementation of green hydrogen production, storage, transport and use projects in the country with the collaboration of the Agencia Chilena de Cooperación Internacional para el Desarrollo (Chilean Agency for International Cooperation for Development) (AGCID) and CORFO. The funds were assigned to 8 projects including companies RWE, Cerro Dominador, CVE, Statkraft, MOWI, Free Power, Antuko and Sociedad de Inversiones Albatros.
- The Ministry of Energy recently closed the calls for a Green Hydrogen Accelerator with the Chilean Agency for Energy Sustainability, to deliver 300 M CLP for aiding in the implementation of demand side projects. The call received 28 applications, out of which 10 were selected for funding, including companies Melón, Free Power, AxxaChemicals, Farías y Farías, FCAB, COPEC, CNP, Abastible, Puerto Ventanas and Terminal Pacífico Sur.

New

- The Ministry of Energy recently submitted two applications to channel funds (~$CLP400M) from the Agencia Nacional de Investigación y Desarrollo (National Agency for Research and Development) (ANID) to the development of technological solutions for the retrofitting of fossil-fuel-based railway and maritime transport towards green hydrogen, and the DC-DC coupling of renewable generation and electrolysis facilities.
- La Dirección de Presupuestos (the Budget Office) (DIPRES) approved funding to implement a public programme to provide public funds to demand-side projects for $CLP1,000M.
- The Ministry of Energy is working with several multilateral organizations (such as Inter-America Development Bank, World Bank, European Union, KfW, among others) to deploy further funding vehicles to accelerate the development of the green hydrogen economy.

6. Regulations, Codes & Standards, and Safety Update

- The Ministry of Energy is developing the General regulation of hydrogen installations for production, conditioning, storage and consumption systems. The development of this regulation began in September 2020 and is mainly based on NFPA 2. In the future, the regulation will most likely be updated to include liquefied hydrogen.
- For the short-term, we aim to develop the following regulations:
    - H2 Fuelling stations Regulation
    - The modification of the existing Gas fitters Regulation
- Sernageomin launched the “Guide for the Piloting of Green Hydrogen in Mining” https://www.sernageomin.cl/wp-content/uploads/2021/10/Gui%CC%81a-de-Hidro%CC%81geno_web.pdf

Summary Country Update November 2021: Chile

H_2 Production	Target[1]	Current Status	Partnerships, Strategic Approach	Support Mechanism
Water Electrolysis[2] (PEM, Alkaline, SOEC)	200kt by 2025	First tons	Part of the Green Hydrogen National Strategy	Enabling environment with regards to regulation, standards and incentives
Energy Storage from Renewables	**Target[3]**	**Current Status**	**Partnership, Strategic Approach**	**Support Mechanism**
Installed Electrolyser Capacity	5 GW by 2025	First MWs	Part of the Green Hydrogen National Strategy	Enabling environment with regards to regulation, standards and incentives
Installed Electrolyser Capacity	25 GW by 2030	First MWs	Part of the Green Hydrogen National Strategy	Enabling environment with regards to regulation, standards and incentives

[1] Target can be by quantity (Nm^3, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target
[2] Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)
[3] Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity