

REQUEST FOR EXPRESSIONS OF INTEREST **CONSULTING SERVICES**

Selection #: CH-T1235-P001

Selection Method: Full Competitive

Country: Chile

Sector: Energy

Funding – TC #: ATN/JF-18347-CH

Project #: CH-T1235

TC name: Promotion for the Development of a Green Hydrogen Market in Chile.

Description of Services: Prefeasibility study for a hydrogen export project.

<https://www.iadb.org/es/project/CH-T1235>

The Inter-American Development Bank (IDB) is executing the above mentioned operation. For this operation, the IDB intends to contract consulting services described in this Request for Expressions of Interest. Expressions of interest must be delivered using the IDB Portal for Bank Executed Operations (<http://beo-procurement.iadb.org/home>) by: January 15th, 2021, 5:00 P.M. (Washington D.C. Time).

The consulting services (“the Services”) include to study the prefeasibility for a hydrogen export project (first quarter of 2021).

Eligible consulting firms will be selected in accordance with the procedures set out in the Inter-American Development Bank: [Policy for the Selection and Contracting of Consulting firms for Bank-executed Operational Work](#) - GN-2765-1. All eligible consulting firms, as defined in the Policy may express an interest. If the Consulting Firm is presented in a Consortium, it will designate one of them as a representative, and the latter will be responsible for the communications, the registration in the portal and for submitting the corresponding documents.

The IDB now invites eligible consulting firms to indicate their interest in providing the services described below in the draft summary of the intended Terms of Reference for the assignment. Interested consulting firms must provide information establishing that they are qualified to perform the Services (brochures, description of similar assignments, experience in similar conditions, availability of appropriate skills among staff, etc.). Eligible consulting firms may associate in a form of a Joint Venture or a sub-consultancy agreement to enhance their qualifications. Such association or Joint Venture shall appoint one of the firms as the representative.

Interested eligible consulting firms may obtain further information during office hours, 09:00 AM to 05:00 PM, (Washington D.C. Time) by sending an email to: paolar@iadb.org

Inter-American Development Bank

Division: **Energy**

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Draft Synopsis Terms of Reference for EOI

1. Background and Justification

- 1.1. Internationally recognized organizations, governments, NGOs, researchers, and companies have concluded that the use of low-carbon hydrogen (H₂) as an energy carrier is key to a rapid, sustained, and cost-effective reduction of emissions of greenhouse gases throughout the economy and, in particular, in hard-to-abate sectors such as heavy transport or high-grade heat. This is required for an effective mitigation of the effects of man-induced climate change and provides a solution for jurisdictions to achieve their emissions reduction commitments in a timely and cost-effective manner. However, the production and use of H₂ and, especially, green H₂ –that which is produced through the renewable-electricity-powered electrolysis of water– as an energy carrier is a novel trend, so costs are relatively high when compared to existing fossil technologies and thus there is uncertainty regarding various techno-economic and operational aspects. In addition, there are no established markets -yet- for trading this clean fuel. However, some countries and states are strongly promoting these technologies in an effort to develop these markets and commercialize such technologies.
- 1.2. Chile is a country with a significant potential for competitive production of green H₂ –due to its extensive, high-quality renewable resources and its suitable ecosystem for clean energy investments–, as well as a country with significant emissions reduction commitments. Regarding the former, a potential for green H₂ production of over 160 million tons per year has been recognized in Chile¹, which correlates with over 1.75 TW of untapped renewable electricity generation potential mapped in the country². Regarding the latter, a Climate Change Draft Bill of Law is currently in Congress, which states that Chile will become a carbon-neutral country by 2050³. The National Determined Contribution (NDC) for Chile for 2030 has been recently updated with a more ambitious goal of reaching a peak of national Greenhouse Gas emissions by 2025 and a target of 95 MtonCO_{2eq} by 2030 –a reduction of approximately 30% in per GDP terms from 2016 emissions–⁴.
- 1.3. Not only could Chile produce significant amounts of green H₂ for domestic use, but its potential to become a competitive green H₂ exporter has been recognized by self-declared future importers of H₂, such as Germany or Belgium, and has been analyzed in studies^{5,6,7}. In addition, the Government of Chile (GoCh) is currently engaged in discussions with other governments to explore potential international supply chains. However, the physical nature of the gaseous product, green H₂, poses challenges to the process of overseas exportation. Dedicated large-scale infrastructure will be required to transform H₂ into a form or carrier suitable for long-range maritime transportation, such as liquefied hydrogen (LH₂) at cryogenic temperatures, ammonia (NH₃), methanol (CH₃OH), or Liquid Organic Hydrogen Carriers (LOHC), among others.
- 1.4. The study proposed here thus aims to produce key information and recommendations for public and private stakeholders, including government authorities, on the optimal technologies, infrastructure, timings,

¹IEA. (2019). *The Future of Hydrogen: Seizing today's opportunities*. Report prepared by the IEA for the G20, Japan. Available at: www.iea.org/reports/the-future-of-hydrogen

² Ministry of Energy of Chile & GIZ. (2014). *Energías Renovables en Chile – El Potencial eólico, solar e hidroeléctrico de Arica a Chiloé*. Available at: <http://4echile.cl/4echile/wp-content/uploads/2017/03/Energias-Renovables-en-Chile-El-potencial-eolico-solar-e-hidroele%CC%81ctrico-de-Arica-a-Chiloe.pdf>

³ Bulletin 13191-12 of the Senate of Chile. Available at: https://www.senado.cl/appsenado/templatess/tramitacion/index.php?boletin_ini=13191-12

⁴ Ministry of Environment. (2020). First update of the Nationally Determined Contribution of Chile. Available at: <https://mma.gob.cl/primer-proceso-de-actualizacion-de-la-contribucion-determinada-a-nivel-nacional-ndc/>

⁵ APERC. (2018). *Perspectives on Hydrogen in the APEC Region*. Published by IEEJ.

⁶ Gallardo, F., et al. (2020). *A Techno-Economic Analysis of on-grid solar hydrogen production by electrolysis in the north of Chile and the case of exportation from Atacama Desert to Japan*. International Journal of Hydrogen Energy Manuscript Draft, Elsevier.

⁷ Hydrogen Council. (2020). *Path to Hydrogen Competitiveness*. Analysis supported by McKinsey&Company.

sizing, location, and business models that would altogether englobe a new export terminal for hydrogen via maritime transportation in Chile. The findings of this study will be key for policy makers, industry and academia stakeholders and will provide the basis to develop a market in Chile for future exports of clean energy carriers such as H₂. The GofCh will play a key role in promoting the development of export infrastructure that tends to the optimal economic efficiency of markets as a whole and that can enable the export of clean energy produced via H₂ by a wide variety of industrial stakeholders.

2. Objectives

- 2.1. **General objective:** To study the prefeasibility of maritime export infrastructure of hydrogen from Chile.
 - 2.1.1. **Specific objective 1:** To gauge the potential projected international demand for hydrogen imports via maritime transportation in the form of hydrogen and other carriers under diverse future scenarios.
 - 2.1.2. **Specific objective 2:** To review and recommend shipping technologies and hydrogen form or carrier that would enable Chile to access the future international hydrogen market as an exporter, considering cost efficiency, safety, sustainability, and reliability criteria.
 - 2.1.3. **Specific objective 3:** To determine the required and optimal infrastructure and installations -as well as their location along the coast of Chile- necessary to access the aforementioned market considering the recommended technologies and carrier for hydrogen maritime transportation.
 - 2.1.4. **Specific objective 4:** To propose public-private business models for the investment and operation of this export terminal that can maximize economic efficiency, allocate risks to the stakeholders better positioned to hedge against them, allow participation of medium-sized stakeholders, and minimize capital investment required from the public sector.

3. Scope of Services

- 3.1. A consulting firm with experience in strategic, technical, economic, and commercial studies regarding the hydrogen sector is required. It is desirable that the firm also has experience in the oil & gas sector, in particular in the international Liquefied Natural Gas (LNG) market and in development of LNG terminals and contracts⁸. Experience in supporting the development of strategic plans and roadmaps for private and public stakeholders in the hydrogen and oil & gas sectors is also desirable. The firm is required to have experience in projects in Latin America and/or the Caribbean regions.
- 3.2. The team proposed to execute the study by the consulting firm shall be multidisciplinary and have experience per section 3.1 above. The team shall consolidate both quantitative skills, as well as the ability to effectively communicate findings and methodologies.

⁸ Experience in the oil and gas sectors is desirable due to the similarities present between these industries and the emerging hydrogen market, both in terms of technical issues (infrastructure, installations, equipment, capabilities, security concerns, among others) and of economic and commercial issues (capital intensive industries, business models for export of fuels, companies from the oil&gas sector entering the hydrogen business, among others). Additionally, the novel market of hydrogen as an energy carrier is still to mature and acquire experience, so transferring experience from consolidates markets can be an adequate solution to carrying out complex assessments in these early stages.