**TC ABSTRACT**

**I. Basic Project Data**

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| ▪ Country/Region: | CHILE/CSC - Southern Cone |
| ▪ TC Name: | Promotion for the Development of a Green Hydrogen Market in Chile |
| ▪ TC Number: | CH-T1235 |
| ▪ Team Leader/Members: | Marzolf, Natacha (INE/ENE) Team Leader; Walter, Martin (INE/CCH) Alternate Team Leader; Aoki, Issei; Aiello, Roberto; Carvalho Hallack, Michelle; Correa, Cecilia y Márquez, Fidel (INE/ENE); Alatorre, Claudio y Salas, Cristian (CSD/CCS); Robles, Paola (CSC/CCH). |
| ▪ Taxonomy: | Client Support |
| ▪ Number and name of operation supported by the TC: | N/A |
| ▪ Date of TC Abstract: | 08 May 2020 |
| ▪ Beneficiary: | Ministry of Energy, Chile (MINENERGIA) |
| ▪ Executing Agency: | Inter-American Development Bank |
| ▪ IDB funding requested: | US$500,000.00 |
| ▪ Local counterpart funding: | US$0.00 |
| ▪ Disbursement period: | 36 months |
| ▪ Types of consultants: | Individuals |
| ▪ Prepared by Unit: | INE/ENE - Energy |
| ▪ Unit of Disbursement Responsibility: | INE - Infrastructure and Energy Sector |
| ▪ TC included in Country Strategy (y/n): ▪ TC included in CPD (y/n): | No No |
| ▪ Alignment to the Update to the Institutional Strategy 2010-2020: | Productivity and innovation; Institutional capacity and rule of law; Environmental sustainability |

**II. Objective and Justification**

2.1 The objective of this Technical Cooperation (TC) is to support the development of a green market for hydrogen as a future innovative and competitive energy source which will contribute to decrease greenhouse gas (GHG) emissions and accelerate the decarbonization process.

2.2 Chile has been identified as one among the leading countries with great potential for green hydrogen (GH2) production, estimated at 160,000,000 tons per year. Competitive renewable electricity production costs and over 1.85 GW of identified renewable energy (RE) generation potential are two key factors that could enable a GH2 local and export market in Chile.

2.3 International organizations such as the World Economic Forum (WEF), the International Renewable Energy Agency (IRENA), the International Energy Agency (IEA) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), as well as the governments of Japan (which has declared its intention to consume up to 300,000 tons per year by 2030), Australia and Germany and international automobile companies (Toyota, Mitsubishi, Honda, Daimler, Shell, Total, and BP) have concluded that the use of hydrogen as an energy carrier is key to the rapid, sustained and cost‑effective reduction of GHG emissions.

2.4 Chile is projected as one of the most competitive global producers given its enormous potential for renewable generation and its prioritization to craft a friendly regulatory and investment framework. Even considering storage and transport costs, GH2 produced in Chile could reach competitive prices like those in California (2.7US$/kgH2).

2.5 Potential for scale up is massive, considering the more than 1.85 TW of unexploited cost‑effective RE production potential in Chile and the fact that several energy‑intensive countries such as Belgium, Germany, the Netherlands, Japan and Korea have declared an interest in importing relevant quantities of hydrogen in the long-term such as. Additionally, studies have shown that the cost of GH2 produced in Chile and imported into self-declared importing nations, such as Japan, can be even more competitive than that imported from closer locations due to comparatively lower production costs.

2.6 In the 2018-2022, through the Energy Path policy document, the Chilean government highlighted introducing new technologies to achieve lower GHG emissions, which would accelerate its decarbonization process. Future use of hydrogen (H2) as an energy carrier is also included in Chile’s citizen agenda as an attractive viable alternative for a sustainable energy mix. Given the relatively small future domestic market for H2 in comparison to the untapped demand in industrialized nations, the potential for GH2 export from Chile has become a pathway for facilitating the significant investments needed to make use of a higher fraction of the country’s RE sources. Dedicated large-scale infrastructure will be required to transform H2 into a form or carrier suitable for long-range maritime transportation.

2.7 Key challenges to the development of an export industry for GH2 include uncertainty in technical and economic aspects of optimal infrastructure for overseas export, coordination between multiple public and private stakeholders, an incipient regulatory framework and a general lack of understanding of this new technology. In this context, the Ministry of Energy of Chile (MINENERGIA) requested support from the Bank in developing a viable path for H2 as the future energy carrier in Chile.

**III. Description of Activities and Outputs**

3.1 **Component I: Development of pre-investment studies for flagship projects.** This component will finance the pre-investment studies for flagship projects associated with the deployment of GH2 production and use. Several studies have shown the large potential production capacity of the North of Chile for GH2 (82.5Mt/year) and the competitive prices that could result (1.6-3.0USD/kgH2). This component consists of: (i) pre-feasibility study for hydrogen export; and (ii) pre-feasibility studies of a green hydrogen project in the Magallanes region.

3.2 **Component II: Support for development of regulatory framework and institutional capacity building.** This component will contribute to establish a regulatory framework for H2 as an energy carrier together with providing capacity building and knowledge transfer to key stakeholders. It will consist of: (i) supporting the development of GH2 regulatory framework through technical, regulatory, and environmental studies; and (ii) capacity building and dissemination to raise awareness and educate about H2 as an energy carrier and viable energy source.

3.3 **Component III: Project Management and Coordination.** This component will provide support for the overall management, execution, and coordination of the project in collaboration with MINENERGIA and IDB and with the objective to ensure timely and budget completion.

**IV. Budget**

**Indicative Budget**

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| --- | --- | --- | --- |
| **Activity/Component** | **IDB/Fund Funding** | **Counterpart Funding** | **Total Funding** |
| Development of pre-investment studies for flagship projects | US$320,000.00 | US$0.00 | US$320,000.00 |
| Support for development of regulatory framework and institutional capacity building | US$130,000.00 | US$0.00 | US$130,000.00 |
| Project Management and Coordination | US$50,000.00 | US$0.00 | US$50,000.00 |
| **Total** | **US$500,000.00** | **US$0.00** | **US$500,000.00** |

**V. Executing Agency and Execution Structure**

5.1 At the request of the beneficiary, and to expedite the implementation of the TC, the Executing Agency will be the IDB through its Energy Division (INE/ENE). Technical responsibility will rest with INE/ENE, who will closely work with the Division of Climate Change (CSD/CCS), the Mining, Geothermal Energy and Hydrocarbons (MGH) Cluster and the Bank's Representation in Chile (CSC/CCH). The Bank’s project team will coordinate with the team of MINENERGIA who will act as the focal point with relevant stakeholders in the project such as CORFO and ENAP.

5.2 The Bank, in collaboration with MINENERGIA, will be responsible for the selection and hiring of consulting firms and individual consultants which will be in accordance with IDB policies and procedures (GN-2350-9). Following the Bank’s Operational Guidelines for Technical Cooperation Products (GN-2629-1), this TC is classified as a product for Client Support.

5.3 MINENERGIA has ample experience in executing policy loans with the Bank, such as the execution of loan 3821/OC-CH "Sustainable Energy Program" approved by the Bank's Board of Directors on November 30, 2016 and disbursed that same year and where MINENERGIA and the National Energy Commission demonstrated high technical and management capacities in implementing and achieving the program's commitments and meeting all the policy conditionalities agreed upon in the Policy Matrix. The professionals who acted as counterparts of the Program have a high level of specialized training in the energy sector and coordination skills to work as a team. Additionally, there is a coordinating Office of International Affairs with who the Project Team will work closely, and which will help to coordinate the TC activities within MINENERGIA.

**VI. Project Risks and Issues**

6.1 The main risk for the implementation of this TC lies with the technical complexity of H2 technology and the coordination with all the stakeholders associated with each component. This risk is mitigated by the creation within MINENERGIA of an Executive Committee which will serve as a quality peer reviewer for the technical aspects of the project. Also, MINENERGIA has put together a strong technical team at both the operational and policy levels and the Bank has assembled a multidisciplinary team for this project as well.

**VII. Environmental and Social Classification**

7.1 The ESG classification for this operation is "undefined".