

THE NEW 'ENERGY EL DORADO'? The World Bank's Role in Promoting Green Hydrogen in Chile

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CONTENTS

Executive Summary	4
I. Introduction	6
II. Role of the World Bank in promoting green hydrogen	7
World Bank initiative to boost green hydrogen in the Global South	7
Chile's green hydrogen strategy	7
III. World Bank support for Chile's Green Hydrogen Industry	10
Description of the WB Project	10
Risk categorisation	13
Environmental and Social Management of the Project	13
IV. Social and environmental risks and impacts	16
GH Valleys: Affected territories and communities	16
Weaknesses in the regulatory framework and socio-environmental institutions	18
Insufficient Institutional Capacity	20
Lack of community participation	20
Socio-environmental impacts	21
V. Conclusions	25
Recommendations to the World Bank	27
References	29
Glossary of Terms	32
Endnotes	33

EXECUTIVE SUMMARY

While green hydrogen (GH) can be considered a renewable energy fuel, several concerns remain about how it can be produced without diverting renewable energy capacity that could otherwise be used to provide power to communities, or without utilising large tracts of lands to construct the multiple wind turbines necessary to produce green hydrogen fuel. Green hydrogen production also has potential impacts on water supply, especially in areas with scarce water reserves for local needs.

This research aims to analyse the World Bank's investment in the GH industry in Chile and its implications for a just energy transition. Further, this study seeks to determine whether the WB's GH investments in Chile meet the objectives of the Paris Agreement while respecting the rights of the most vulnerable communities and groups in the transition to a greener economy. Key concerns emerging from this analysis:

- ▶ The World Bank's GH investment in Chile is flagged as having 'considerable or substantial environmental and social risk' due to the 'wide range of potential environmental, health and safety impacts.'
 - The GH industry is not sustainable in the Magallanes region. Scientists warn of serious impacts on biodiversity as more GH megaprojects are developed in the region.
 - The accelerated development of GH industry in 'sacrificial zones' in Magallanes and Antofagasta regions is adding more potential impacts on communities and the environment without taking into account historical damages.
 - The GH industry is renewable energy intensive – energy that could otherwise be used by underserved communities without access to clean electricity.
 - Considering the critical water scarcity in the country, further stress on demand is expected due to the additionality of water needs by the GH generation technology, affecting the access of local populations to water resources.
- ▶ Policies to regulate the GH production value chain are lagging behind project development.
 - For instance, regulations for the safe management of GH, storage, transport and use remain in the drafting process and are only expected to be enacted by 2025, despite GH production already taking place as early as 2017.
 - The Chilean government does not have a typology for assessing GH projects, as it does for other sectors and industries.
 - The lack of transparency in the process of handing out concessions in the production of Green Hydrogen
 - The development of capacity to effectively supervise GH subprojects consistent with the WB's sustainability policy and environmental and social safeguards will take time and is unlikely to occur in the short term.
- ▶ Corfo, the implementing agency of the WB project, lacks the experience and capacity to manage the environmental and social risks associated with the GH investments.
 - Corfo does not have the legal function to effectively supervise the environmental and social management of the projects it finances as an intermediary.

- Despite submitting a stakeholder engagement plan, Corfo's consultation process places no emphasis on the participation at the local level of Indigenous Peoples and potentially affected communities, nor with civil society.
- Corfo's concept of a grievance redress mechanism is in the form of its customer service, complaints and claims service, which functions merely as a mailbox for receiving requests and observations.
- There is no existing mechanism to protect human rights defenders against the risk of reprisals, nor are there mechanisms for reparation for any possible damage that the subprojects may cause in the territories.

Recommendations:



1. Ensure environmental impact assessment processes meet highest standards by:
 - a. requiring comprehensive environmental impact assessments for all subprojects instead of the simpler environmental impact 'statements'.
 - b. preventing the 'splitting' of projects to circumvent impact assessment regulations.



2. Establish measures to increase transparency and accountability of financial intermediary operations. Examples include:
 - a. ensuring early access for relevant sub-project information to all project-affected peoples, especially women, Indigenous Peoples and other vulnerable groups.
 - b. disclosing in an early and culturally appropriate manner information on subprojects at different stages of their life cycle.



3. Guarantee meaningful stakeholder consultations by:
 - a. requiring funding stakeholders to conduct in-depth, extensive and inclusive binding consultation processes with communities and civil society.
 - b. strengthening the processes and procedures for consultation and citizen participation, ensuring the right of access to information.
 - c. ensuring the consultation with Indigenous Peoples whenever appropriate.



4. Provide access to functioning grievance redress mechanisms by:
 - a. installing an independent complaints mechanism for the reception and investigation of community complaints.
 - b. implementing measures to protect against reprisals.
 - c. establishing fair compensation and reparation measures.



5. Strengthen environmental and social management efforts by:
 - a. ensuring that ESMS plans, mitigation and compensation measures, and other commitments are established to comply with the WB's ESF.
 - b. mandating periodic reports on compliance with ESMS obligations of subprojects contracted with Corfo.

I. INTRODUCTION

In 2022, the Chilean government signed a \$350m agreement with the World Bank (WB) to help develop the green hydrogen (GH) industry in the country.¹ This agreement is part of the WB's "Hydrogen for Development Partnership" (H4D), meant to allow developing countries to "gain further access to concessional financing and technical assistance to scale up hydrogen projects."² Efforts to promote GH production is also reflected in Chile's National Green Hydrogen Strategy which primarily focuses on creating a GH export-oriented value chain. This is despite the fact that the country's energy mix remains heavily dependent on oil, coal and fossil gas and that energy access remains an issue even for communities close to wind and solar power facilities. These contradictions in turn raise the question of energy colonialism as vast territories belonging to Chileans and Indigenous Peoples are occupied while imposing foreign interests without considering the rights and welfare of the communities that inhabit these territories.

This research aims to analyse the WB's investment in the GH industry in Chile (the "Project") and its implications for a just energy transition. Further, this study seeks to determine whether the WB's GH investments in Chile meet the objectives of the Paris Agreement while respecting the rights of the most vulnerable communities and groups in the transition to a greener economy.

It should be noted that the World Bank categorised the Chile Green Hydrogen Facility Project as having substantial environmental and social risk.³ While green hydrogen can be considered a renewable energy type, several concerns remain about how it can be produced without diverting renewable energy capacity that could otherwise be used to provide power to communities, or without utilising large tracts of lands to construct the multiple wind turbines necessary to produce green hydrogen fuel. Green hydrogen production also has potential impacts on water supply, especially in areas with scarce water reserves for local needs.

But what is green hydrogen? Why is it being promoted by the Bank and what role will Chile play in its production? This study aims to answer these questions in the first section, while providing relevant contextual background. In the second section, the research will review the objectives and characteristics of the WB-supported GH project in Chile, as well as its alignment with climate objectives and Chile's National Green Hydrogen Strategy. The third chapter will analyse the relevance and effectiveness of the measures adopted by the Bank to mitigate the socio-environmental risks associated with the emerging industry and the GH subprojects it will finance. Finally, the last section outlines conclusions and our recommendations on how to improve compliance with the Bank's Environmental and Social Framework (ESF), so that the Project can adequately respond to just transition demands in Chile.

II. ROLE OF THE WORLD BANK IN PROMOTING GREEN HYDROGEN

Green hydrogen is a gaseous element obtained from water through an electricity-intensive chemical process called electrolysis, which separates the oxygen and hydrogen contained in H₂O (water) molecules. In order for it to be classified as 'green hydrogen', the energy source must come from renewables, often in the form of wind power. Thus, current processes to produce green hydrogen consume a great amount of renewable energy relative to the power it can generate. Green hydrogen can be used as a fuel source and is often touted as the 'cleaner alternative' to fossil gas or as a cleaner replacement for grey hydrogen, which is made from fossil gas.

Some industry actors, including the WB, are projecting significant future growth for hydrogen demand, but the scale of the market is yet to be proven either technically or economically speaking. While GH can potentially enable the decarbonisation of some heavy industries (often called 'hard-to-decarbonise' sectors), its application remains limited, which raises concerns about the viability of using such a renewable energy-intensive fuel source.

World Bank initiative to boost green hydrogen in the Global South

On Energy Day at COP27 on 15 November 2022, the WB announced the creation of the Hydrogen for Development Partnership (H4D), which aims to accelerate the development of knowledge and capacity, policy, regulatory solutions, technological innovation, and public and private investment to catalyse the deployment of the GH industry in developing countries. Among the advantages that the Bank cites for promoting the development of a green hydrogen industry in low- and middle-income countries are the potential to create a value-added export sector, jobs for skilled labour, energy capacity to meet local needs, including decarbonisation of domestic industry, and to provide energy access to populations in remote areas and contribute to food security (World Bank, 2022).

It is interesting to note, however, that Chile's national energy mix still relies heavily on fossil fuels, with 75% of power generation coming from oil, coal and fossil gas.⁴ This therefore raises the question of whether the GH strategy should focus on the export sector when its energy needs remain fossil fuel-based.

In Latin America and the Caribbean, particularly in countries such as Chile, Colombia, Costa Rica, Panama and Brazil, the WB promotes the use of GH as a fuel source, designs GH financing facilities, develops GH certification mechanisms in the value chain, and establishes carbon pricing mechanisms through the Partnership for Market Readiness initiative (Kobina & Gil, 2022).

Chile's green hydrogen strategy

The Republic of Chile decided to study the feasibility of developing an GH industry in July 2019, as a possibility to "package the sun from the north and the wind from the south for export to the world", assuming Latin American leadership in the field. In 2020, the World Energy Council called Chile the "hidden champion" in the race to build a green hydrogen economy (Ministry of Energy, 2022).

In November 2022, Chile launched its National Green Hydrogen Strategy (Ministry of Energy, 2020a) with the goals of entering the export market, producing the 'cheapest GH on the planet' by 2030, and becoming one of the top three GH exporters by 2040. The first goal, by 2025, is to generate 5GW of capacity and to introduce the use of the fuel to relevant sectors of the national economy. The abundance of solar and wind resources in Chile is a favourable factor for meeting the goal of producing the cheapest GH in the world by 2030 and positioning Chile, along with Morocco and Brazil, among the three main exporters by 2040 (Puliti, 2022). Indeed, in 2020 Chile led the world ranking of the most attractive countries for investment in renewable energy, according to Climatescope 2020 (Ministry of Energy, 2020b). The country could build renewable power plants with a capacity 80 times greater than that of the national electricity system by 2022 (Ministry of Energy, 2022).

The state promotes the development of the industry by attracting investments under public-private partnerships (PPPs), providing incentives of all kinds, including subsidies and preferential access to credit. In 2021, it launched the National Plan for the Promotion of Green Hydrogen Production, also known as the "Window to the Future" plan, for the direct allocation of land to private individuals through concessions with terms of use lasting up to 40 years. The Latin American Observatory of Environmental Conflicts, OLCA, (2023) denounced the lack of transparency in the process of handing out the concessions, the results of which have been kept confidential.

Since taking office in March 2022, Gabriel Boric's⁵ "green government" has not only endorsed the national GH strategy, but also actively promoted it as a central pillar for the country's economic growth. In April 2022, it created the Committee for the Development of the GH Industry in Chile, led by the Ministry of Energy and composed of 11 other ministries, to coordinate sectoral policies and accelerate the development of the industry, under the technical secretariat of the Chilean Economic Development Agency, Corfo.⁶

At the end of 2022, the Ministry of Energy initiated the elaboration of the Green Hydrogen Action Plan 2023–2030, which will define the roadmap for the deployment of the industry and will be published in the second half of 2023. The plan considers three lines of action: investments and institutional framework; sustainability and local value; and, infrastructure and territorial organisation.

On the regulatory front, the Ministry of Energy is currently drafting regulations for the safe management of GH production, storage, transport and use, which will be enacted within the next two years (World Bank, 2023).

Chile's strategy is primarily focused on building a GH export market (Franco et al, 2021), hoping to generate returns of more than \$30bn annually by 2050, transforming the industry into a new driver of the national economy comparable only to copper mining (Reyes-Bozo, 2021). As of August 2021, the Chile Hydrogen Council (H2 Chile) had 60 projects in the pipeline and estimated that the country was on track to meet its strategic goals by 2025. Currently, these projects are in varying stages of development. Out of the 60 projects, only three plants are currently operational, the first of which started in 2017, and another one was inaugurated in August 2021 (Gubinelli, 2021). More recently, the third GH production facility was inaugurated in Santiago. It aims to power Walmart Chile's Quilicura Distribution Center, replacing lead-acid batteries of forklifts with hydrogen-compatible cells.⁷

According to Franco et al. (2021), in a first stage, domestic demand will drive the GH value chain in Chile. Altmann et al. (2022) estimate that local demand for GH will be concentrated in the Antofagasta Region, where the mining, explosives and fertiliser sectors are located. In Magallanes, meanwhile, domestic demand is low, so it will be positioned from the outset as an export hub for GH and its derivatives, which, together with the Antofagasta Region, will be able to supply large quantities of GH to export markets in Asia, North America and Europe.⁸

Transporting GH for export is currently technically challenging and expensive, as it requires a liquefaction process to turn it into liquid form and it needs to be stored in super-insulated, cryogenic containers. To address these challenges, the Chilean government signed an agreement with the Port of Rotterdam, which currently provides 13% of energy transport needs across Europe.⁹ In addition, the Chilean Ministry of Energy also signed agreements with the ports of Hamburg in Germany and Antwerp in Belgium to facilitate the entry of synthetic GH fuels into Europe from Chile.

III. WORLD BANK SUPPORT FOR CHILE'S GREEN HYDROGEN INDUSTRY

Since at least 2020, the WB has been a key partner of the Chilean government in the development of its GH industry. The WB has promoted the implementation of several components of Chile's Green Hydrogen Strategy. Together with other multilateral banks, it supports the government with loans, to offer private investors financing instruments to mitigate risks, and to develop policies and regulations that facilitate the business environment.

Description of the WB Project

The \$350m financing for the Chilean GH industry announced by the WB in November 2022 includes a first loan of \$150m for 2023, and an additional loan of \$200m for a later stage. As Chile's finance minister, Mario Marcel, pointed out, the alliance had been prepared well in advance and the resources will allow the implementation of the GH strategy, in addition to contributing the Bank's knowledge and experience, "so that, in the future, private participation in the industry can also count on the support of these international organisations" (Ministry of Finance, 2022).

In this analysis, we will focus on the World Bank's \$150m credit operation, identified as P177533 - Chile Green Hydrogen Facility to Support a Green, Resilient and Inclusive Economic Development. As of 28 June 2023, the project has been approved by the Board (see Fig. 1).

Figure 1. WB Project Summary Sheet, as of August 2023

Project Details			
Project ID P177533	Status Active	Team Leader Janina Andrea Franco Salazar	Borrower 2 Republic of Chile
Country Chile	Approval Date (as of board presentation) June 28, 2023	Total Project Cost 1 US\$ 431.00 million	Implementing Agency Corporación de Fomento de la Producción - CORFO
Region Latin America and Caribbean	Fiscal Year 3 2023	Commitment Amount US\$ 150.00 million	Environmental and Social Risk Substantial
Last Update Date July 11, 2023	Closing Date June 30, 2028	Consultant Services required TBD	Last Stage Reached Bank Approved
Notes ▾			

Source: World Bank (15 August 2023). Retrieved from: <https://projects.worldbank.org/en/projects-operations/project-detail/P177533>

Sustentarse became aware of the Project in August 2022, three months before its official announcement, through the Early Warning System, a digital platform managed by a global network of civil society organisations that monitors sixteen Multilateral Development Banks (MDBs).¹⁰ Through this tool, 4 other projects related to the development of GH in Chile from the Inter-American Development Bank (IDB) were identified: two technical cooperations and two loans.¹¹

In November 2022, the IDB followed the WB's announcement in Egypt by announcing an additional loan for GH development in Chile of \$400m, bringing the two banks' total commitment to \$750m.

The WB loan was granted to the Chilean Ministry of Finance. The project will be implemented by Corfo's Green Hydrogen Finance Programme (PFCGH), which will also receive the IDB funds, and two additional loans, equivalent to \$110m each, from the German Development Bank (KfW) and the European Investment Bank (EIB), respectively (see figure 3). These last two loan agreements are granted within the framework of the Team Europe Initiative (TEI) for the Development of Green Hydrogen in Chile, an initiative created by the European Union in the framework of Global Gateway, with the aim of boosting cooperation and creating favourable conditions for the development of the industry in Chile, boosting investment opportunities in the country, and offering European technology (TEI, 2022). Corfo's Financial Programme will use these resources both to provide direct financing to green hydrogen subprojects (concessional financing), as well as to Participating Financial Intermediaries (PFIs), i.e. commercial banks and equity investment funds.

Figure 2. Financing sources for the Corfo Green Hydrogen Finance Programme (PFCGH)



Source: Corfo (2023b:60)

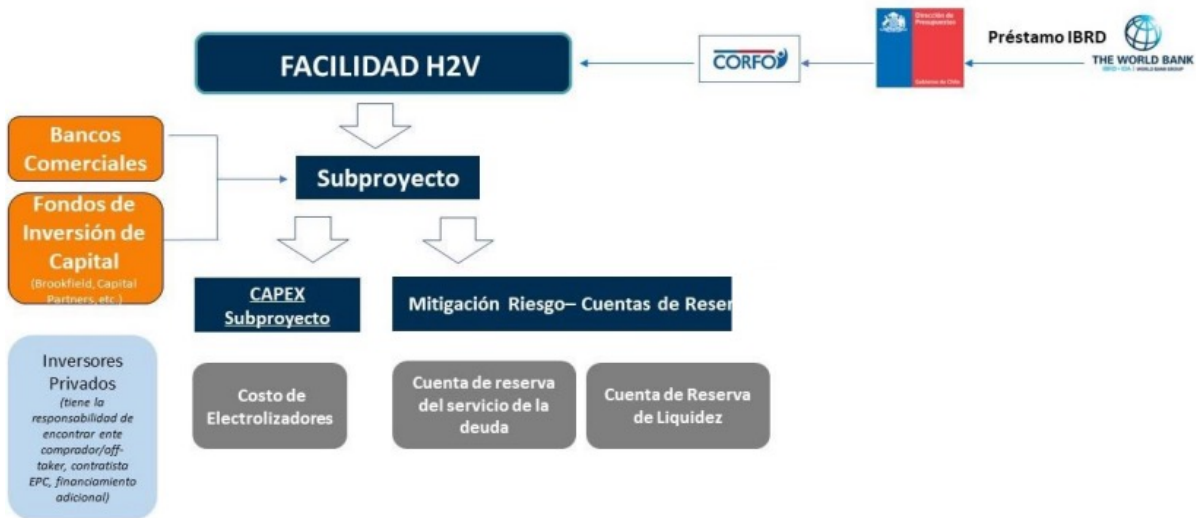
The project's objective is to accelerate the production of green hydrogen (GH), mobilise commercial financing, and contribute to strengthening an enabling environment for local capacity building in green hydrogen in Chile. Corfo will implement the project over a period of 5 years, between 2023 and 2028. It consists of two components: subproject support amounting to \$143m and capacity building and project management for \$7m (see Table 1). The first component of the project entails the granting of credits ("subloans") to GH production projects ("subprojects") aimed at financing electrolysis systems for plants whose capacity is in the range of 10 to 100MW. Although the specific locations of these subprojects are still unknown, project documents suggest that most are expected to be constructed in the Antofagasta and Magallanes regions.

Table 1. Components and subcomponents of the Green Hydrogen Facility Project

Componente	Monto	Descripción
Component 1: Subloans and risk mitigation instruments for GH production	\$143m	Under this component, the Project will provide subloans to partially finance green hydrogen subprojects in Chile, as well as reserve accounts for risk mitigation. The subloans will be deployed through retail financial institutions and eventually directly through Corfo, once Corfo establishes a <u>project finance unit</u> .
▶ Subcomponent 1a. Investment subloans for GH production	\$122m	Provide subloans to subprojects <ul style="list-style-type: none"> ▶ preferential rates ▶ up to 40% of total investment costs (CAPEX) of electrolysis systems
▶ Subcomponent 1b. Risk mitigation instruments	\$21m	It will finance reserve accounts to mitigate operational and subproject non-payment risks. Includes: <ul style="list-style-type: none"> ▶ Debt service reserve account (DSRA) to mitigate risks arising from uncertainty regarding debt repayment for the electrolysis systems; and ▶ Liquidity reserve account (LRA) to cover potential technical deviations in the performance of the GH generation plant in the short term and provide liquidity to the subproject.
Component 2: Capacity building and project management	\$6,625m	It will finance technical assistance and capacity building and project management activities to strengthen the enabling environment for green hydrogen. It would include activities such as: <ol style="list-style-type: none"> i. Financing of independent third-party consultancies for technical, financial, risk, legal, environmental and social assessment of GH subprojects; ii. Training - particularly for women - for the technical, financial, environmental and social assessment of subprojects and their certification; iii. Assessments to inform on ways to foster demand for GH and promote the use of and access to public infrastructure, including ports; iv. Project implementation and management support, including capacity building of Corfo to implement component 1; strengthening its role as a one-stop shop to facilitate subprojects' access to new or existing financial instruments; fiduciary, environmental and social supervision of subprojects; and monitoring and evaluation of the Project as a whole.

The financing scheme of the WB Project is shown in Figure 3.

Figure 3. Project Financing Scheme



Source: Corfo

Risk categorisation

The WB categorised its operation P177533 GH Facility in Chile as a project of considerable or substantial environmental and social risk. This is because the subprojects are expected to have a “wide range of potential environmental, health, and safety impacts,” considering the environmental sensitivity of the specific locations in which they will be located and the occupation of large areas of land. The locations identified in WB documents are home to indigenous communities such as the Changos in the coast and the Licanantay peoples in the interior areas.

The Bank's environmental and social review of the Project established that the main risks and impacts of GH production and its derivatives are related to activities such as renewable energy generation, water supply, construction and operation of electrolysis plants, and construction and operation of other related facilities and infrastructure. These risks and impacts may vary according to location, size and final product, including typical effects of civil works and production processes, the quality and quantity of water to be used, as well as cumulative impacts, considering the complexity and interrelation of the different elements that make up the industrial poles known as “GH valleys” (Franco, 2022).

According to the WB's director for the Andean Region, Marianne Fay (2022), social and environmental aspects, such as sustainable water supply and proper management of natural resources, will be fundamental to ensuring the implementation of green hydrogen projects in the territories. She warned that partnership with communities and the promotion of local productive value chains are fundamental requirements to ensure shared prosperity and a just transition in the industry.

Environmental and Social Management of the Project

In its review of Corfo's current capacity to manage the environmental and social risks and impacts of the Project (Franco, 2023), the WB highlighted the public agency's lack of experience in implementing Bank projects and, therefore, in managing its Environmental and Social Framework. Furthermore, the WB notes that, despite having guidelines for stakeholder consultation and engagement activities, and an area dedicated to citizen participation,

Corfo lacks an environmental and social policy, as well as an environmental and social risk management system.

However, the Bank notes that Corfo is in the process of developing its own environmental and social sustainability policy applicable to the institution, which is expected to be operational in 2024. The Environmental and Social Management System (ESMS) will include an environmental and social policy specific to the Green Hydrogen Facility, the requirements of which will apply only to GH subprojects supported through the Project.

In the framework of the Project, Corfo presented an Environmental and Social Commitment Plan (2023c), in which it is obliged to create an Environmental and Social Risk Unit (URAS) under its Investment and Financing Management (GIF), to “support” the environmental and social management of the financial resources provided by the different multilateral banks. This plan forms part of the loan agreement between the WB and the Chilean government.

The WB (2023) established that Corfo, when evaluating the granting of financing to GH subprojects, must comply with the Bank’s safeguards or Environmental and Social Standards (ESS), and the critical aspects identified in the Environmental and Social Review (ESR) of the Project. These include those listed in Table 2.

Table 2. Critical aspects of the Project identified in the Bank's Environmental and Social Review

Environmental and Social Standards (ESS)	Critical aspects to consider
ESS1: Environmental and Social Risk and Impact Assessment and Management	<ul style="list-style-type: none"> ▶ The URAS will be the organisational structure responsible for implementing the ESMS and will be staffed by two senior specialists. ▶ Require each entity interested in receiving funding to designate a person in charge of environmental and social management.
ESS 3: Resource Efficiency and Pollution Prevention and Management	<ul style="list-style-type: none"> ▶ Prepare a water balance assessment for the case of subprojects with relevant impact on communities, water users or the environment, given the expected consumption of this resource.
ESS 5: Land Acquisition, Land Use Restrictions, and Involuntary Resettlement	<ul style="list-style-type: none"> ▶ Exclude subprojects that may require land acquisition resulting in large-scale involuntary economic or physical displacement.
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	<ul style="list-style-type: none"> ▶ Develop guidelines for the proper management of the impacts of civil works on natural habitats or sensitive species.
ESS7: Indigenous Peoples	<ul style="list-style-type: none"> ▶ Prepare guidelines to provide Indigenous Peoples with relevant information about subprojects and consultation in a culturally appropriate manner.
ESS8: Cultural Heritage	<ul style="list-style-type: none"> ▶ Prepare guidelines for the assessment of sites of high tangible and intangible cultural and heritage value that could be affected by subprojects; ▶ Establish a procedure for chance finds applicable to all construction works, and a process for developing a Cultural Heritage Management Plan for civil works that require it.

ESS9: Financial Intermediaries	<ul style="list-style-type: none"> ▶ Develop, maintain and implement an ESMS to identify, assess, manage and monitor the risks and impacts of the Project and GH subprojects. The contents, scope and terms of reference for its preparation are defined in the Environmental and Social Review (ESR) of the Project. ▶ Publish a summary of the most relevant elements of the ESMS on Corfo's website and authorise the WB to do the same on its website.
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Source: World Bank Project Documents

As shown in Table 2, the requirements and criteria defined by the Bank for the environmental and social management of the Project and its subprojects are generic in nature and consist mainly of preparing guidelines and procedures.

Given Corfo's lack of experience and capacity to implement the required actions, it is expected that these measures will be a rather bureaucratic exercise, producing documents and guidelines, the implementation of which will be difficult to supervise, since Corfo has no legal powers to perform this function, considering that public bodies in Chile can only perform those functions for which they are expressly mandated by law. It is also unclear how Corfo will coordinate with the Ministry of Environment, in particular with the Evaluation Services responsible for assessing the environmental and social impacts of projects, and the Superintendence of the Environment responsible for overseeing that investment projects are developed as authorised, and in compliance with the mitigation and compensation plans and measures established in the Environmental Qualification Resolution.

In the Stakeholder Participation Plan (SPP) prepared in the framework of the project, Corfo (2023b) commits to define a Communication, Participation and Consultation Strategy (CPCS) for its PFCGH. However, the guidelines to elaborate this strategy are too general to allow anticipation of its inclusiveness and effectiveness. In particular, there is no emphasis on consultation and participation at the local level, neither with Indigenous Peoples and potentially affected communities, nor with civil society, in particular organisations defending human rights in development and the environment.

Corfo is also committed to establishing a complaints and grievance mechanism for the Project, as required by the Bank. To this end, it will use the structure of the institution's current customer service and complaints and claims service, which functions as a mailbox for receiving all types of requests and observations. The description of the MAQR proposed by Corfo is cursory and does not even meet minimal international standards for an independent and secure mechanism to address community complaints. It does not clearly define the principles or a policy that will guide the mechanism, nor does it clearly define the processing process, procedures, and access facilities for local populations.

Corfo states that it submitted for early stakeholder consultation, in draft form, two key documents prepared for the WB: The ESR and the Stakeholder Engagement Plan (ESPP) for the project. This consultation process was supposed to have taken place on Thursday 30 March 2023, with hybrid face-to-face and virtual participants. However, only 42 external guests participated – by invitation only – in this activity, most of them representatives of companies related to the GH industry and its value chain (Corfo, 2023b:32). Civil society was not included; there was no public information available before or after this activity.

IV. SOCIAL AND ENVIRONMENTAL RISKS AND IMPACTS

A comprehensive assessment of the environmental and social risks and impacts of GH projects requires a careful consideration of the GH industry value chain. For instance, it's important to look at the fact that the development of subprojects will be concentrated into what are called "GH hubs." These GH hubs, defined as "ecosystems" of hydrogen production, distribution, utilisation, innovation and export, are crucial in the production of renewable energy for GH generation in larger areas, which in turn necessitates the creation of larger hydrogen valleys.¹²

The individual components that make up the GH value chain in Chile can be assigned, according to Altmann et al. (2022) into 7 groups: renewable electricity generation, electricity infrastructure – high voltage transmission lines and substations, desalination, hydrogen generation, hydrogen conditioning and derivative synthesis – compression, liquefaction, storage, ammonium synthesis and storage, etc., hydrogen ships and derivatives, and distribution of GH and its derivatives. It excludes investments in port infrastructure.¹³

Figure 5. GH Value Chain Processes



Fuente: SEA (2023)

The SEA (2023) further identified one main subprocess: the supply and pre-treatment of water. Regarding the GH transport process, the SEA differentiated two modes: transport in gaseous form, through pipelines and pressurised containers, in trucks or ships, and transport in liquid form, in ships with thermal containers, and in trucks with special tanks.

The SEA also defined different parts associated with the GH value chain, each with specific impacts, including, among others, the following: solar or wind farms, transmission lines, electrical substations, seawater desalination plants, electrolysis plants, energy transformation systems, pipelines, land or maritime transport infrastructure and port infrastructure.

GH Valleys: Affected territories and communities

Although GH projects in Chile will be located throughout the country, subprojects will be concentrated in two industrial clusters that will be developed in the Antofagasta and Magallanes regions. This concentration of the industry is explained by the fact that, as Kobina & Gil (2022) point out, only a few GH projects have been successfully brought to market to date globally. One formula to make these projects bankable and commercially viable is to locate renewable energy and hydrogen production facilities together so that they can be better integrated, thus the need for such GH hubs.

The regions of Antofagasta and Magallanes have extraordinary conditions to supply the enormous amount of renewable energy required to produce the energy. Both regions have the

most suitable economic and technical conditions to establish GH valleys. The government projects that, by 2050, investments of \$70bn could be made in Antofagasta and \$100bn in Magallanes to establish and develop GH hubs with the projected capacities.¹⁴ Though this will depend on uncertain market development in the coming decades.

The Chilean government has targeted Antofagasta in the northern desert, because it presents exceptional characteristics for solar and wind generation. Together with the Atacama Desert, it has a solar potential of 1400GW. In addition, three potential sites have been identified: Tocopilla, Mejillones and Taltal, all of which have overseas ports, eligible for exports of GH derivatives. Magallanes, the southernmost region of the country in Chilean Patagonia, is conducive to the installation of large wind farms, with an on-shore potential of about 130GW (Altmann et al., 2022). Magallanes alone could meet 13% of global GH demand.¹⁵

Both regions also have availability of large areas of land, owned by the Chilean Treasury, which will be loaned to private parties for activities related to the GH value chain. This is relevant, as an estimated average of 250 hectares is needed for each industrial-scale green hydrogen production project (HIF Global, 2023).

Another relevant factor for the selection of Antofagasta and Magallanes as GH hubs is the strategy of “industry for industry substitution”. The Chilean authorities highlight the synergies of the existing fossil fuel industry in these regions to overlap GH production plants. This is because the thermal power plants “have the permits and the physical part of water collection already resolved” and also “have an associated port to transport the product” (Burgos, 2023). This is congruent with the recommendations of Altmann et al. (2022), who point out that the selection of sites for GH centres or hubs should be based on the existence of infrastructure (e.g. ports), synergies with local industry, proximity to domestic demand, among others, recommending the coastal cities of Tocopilla, Mejillones and Taltal, and the establishment of corridors between these different centres in the north of the country and Cabo Negro Bay in the south.¹⁶

In the Antofagasta Region, the communes of Tocopilla and Mejillones are environmental sacrifice zones, where communities have suffered for decades with very high levels of pollution and disruption to their livelihoods, mainly due to the presence of a large number of thermoelectric power plants and associated infrastructure. Clearly without recognition of this historical debt, local communities have not been informed or consulted regarding the choice of industry development and the location of GH valleys, clusters or hubs. The local population fears that new industrial developments linked to GH could turn Taltal into a new environmental and social sacrifice zone. These circumstances, together with the lack of information, have generated great concern in Indigenous communities such as the Changos peoples, who have initiated resistance through their Antofagasta Regional Council.¹⁷

On the other hand, Patagonia is considered a biodiversity hotspot where sites of highly fragile ecosystems and unparalleled natural landscapes prevail. Some 52% of the territory of the Magallanes region is protected by the National System of State Protected Wildlife Areas. The WB itself (2023) identified in the region the presence of two Biosphere Reserves and one UNESCO World Heritage Site, as well as one Ramsar site as well as five National Parks.

Experts argue that, as the GH industry is conceived, it is not sustainable in Magallanes (Plataforma Costera, 2022). In the latter region, 2,900 wind turbines could be installed, occupying an area of 150,000 hectares in areas of high environmental and landscape value

(Norambuena et al, 2022). In a letter published in the prestigious journal *Science*, a group of scientists warned of the serious impacts on biodiversity that the development of GH megaprojects in the Magallanes Region could have (Norambuena et al, 2022).

Weaknesses in the regulatory framework and socio-environmental institutions

A sensitive aspect related to the environmental and social risks and impacts of GH subprojects to which the Bank paid insufficient attention is the weakness of the environmental regulatory framework applicable to the industry in Chile.

In Chile, projects can be assessed and obtain their environmental licence through two modalities of entry into the Environmental Impact Assessment System (ESIA): an Environmental Impact Assessment (EIA), but also a simple Environmental Impact Statement (EIS), which is less in-depth and demanding, and therefore less costly for the project owner than the former, and the EIS process is significantly shorter.¹⁸ Among others, because an EIS does not necessarily require the opening of a public participation process.

Despite the high environmental and social risk associated with GH projects, the SEA expressly established that they are eligible to enter the ESIA through the EIS modality (SEA 2022, 2023). In 2022, two GH projects located in Tocopilla, Antofagasta Region, obtained their Environmental Qualification Resolution from an EIS: Engie Latam's HyEx Green Hydrogen Production (\$47m) and ENAEX's HyEx Green Ammonia Synthesis (\$90m). In both cases, no public participation activities were carried out,¹⁹ despite being located in a sacrifice zone, declared saturated for respirable particulate matter,²⁰ and whose population has suffered for decades from the effects of pollution.

Also of concern is the increasingly frequent utilisation of a legal loophole known as Request of Relevance ("Consulta de Pertinencia") as an administrative mechanism aiming to circumvent the entry of projects into the ESIA. Thus, in Mejillones, another sacrifice zone in the Antofagasta Region, and after a Request of Relevance, the SEA authorised, in July 2022, without need for a comprehensive environmental assessment, the construction and operation of AES Andes' Adelaida project in a site adjacent to the Angamos thermoelectric power plant, with an investment of \$10m. Adelaida will have the capacity to produce 1,000kg/day of GH, equivalent to 2.5MW of power, and will have two refuelling stations for synthetic fuel for vehicles of mining, port, and other industries.

An additional shortcoming of Chilean environmental law is that it does not have a typology for assessing GH projects, as it does for other sectors and industries. A technical document of the SEA (2023) seeks to fill the legal gap, stating that:

...the GH industry does not necessarily contemplate the development of a single project in stages, but is rather composed of different typologies of projects that jointly describe the processes and sub-processes involved in the production of GH, forming the "GH value chain", it being understood that this industry does not refer to one of the typologies established in article 10 of Law N°19.300".

The SEA provides that, while the description of GH projects entering the ESIA must identify their place in the value chain, the environmental assessment must be limited only to their parts, actions and physical works, and not to other associated processes or sub-processes.

This criterion is controversial, as it contradicts the principle of “no fragmentation of projects” enshrined in Chilean environmental law.²¹ This SEA approach had already been applied to two GH projects in Tocopilla approved in 2022, which were assessed independently and separately, despite being located on the same land. During the environmental assessment, the Regional Ministerial Secretariat of Housing raised objections, noting precisely the “splitting of the project”, considering the obvious relationship between the two adjacent initiatives.²²

SEA's administrative decision to assess GH projects in a piecemeal manner is not only against the law, but also contravenes expert recommendations. An IDB technical note on environmental and social management of GH projects (Signoria & Bartaletti, 2023:12) notes that large-scale initiatives can include several components, sometimes developed by different entities and at different times, such as solar or wind farms, transmission lines, hydrogen plants, ammonia or methanol plants, port facilities and transport infrastructure. They caution that the cumulative and overall impacts of a GH project cannot be determined through the sum of the impacts of each of its components. They argue that the method generally adopted to conduct the environmental and social impact assessment of a large-scale GH project, “especially if applied separately to each individual component”, may be inadequate to prevent potential negative effects, considering in particular that these studies are usually conducted once projects are at a fairly advanced stage of development and the location of the plant has already been decided.

Thus, Signoria & Barlettani put forward two essential considerations for assessing the environmental and social impacts of complex and extensive GH projects: analyse the suitability of the project site, with a holistic approach and in the early stages of development, and, prepare a strategic environmental and social assessment during the planning phase of the project, including the assessment of potential effects on natural and human ecosystems. None of these criteria have been applied so far in the development of the industry and its projects in Chile.

On the one hand, environmental legislation does not consider the assessment of the suitability of project sites. On the other hand, the Strategic Environmental Assessment (SEA) is an environmental management instrument incorporated into the General Environmental Bases Law in the 2010 reform, with the aim of promoting sustainable planning in the country. However, the SEA is optional with respect to public policies and plans. Thus, the definition of the development poles for the GH industry in Chile and the National Green Hydrogen Strategy did not include the application of this instrument.

Although the SEA (2023:21) stipulated that the synergistic effect²³ of a GH project must be assessed, the analysis of its interaction with other projects or activities that share the territory should only refer to those that already have an RCA, and not to other infrastructure or planned works that do not yet have an environmental licence.

Corfo also identified Chilean regulatory gaps for the industry, such as the lack of a safety regulation for GH installations and the absence of regulation for environmental assessment and operation of desalination plants associated with production (Corfo, 2023b). Regarding the latter, Signoria & Barlettani (2023) note that in Chile there is no legislation establishing critical limits for chemical components or physical properties of brines generated by desalination plants, with special attention to habitats and species susceptible to be affected.

Insufficient Institutional Capacity

Considering the considerable environmental and social risks identified by both the WB and the IDB for the industry, the WB's warning that the Chilean state is not prepared to face the environmental and social challenges of GH projects and must strengthen its capacities to exercise its responsibility in these matters is worrying. The WB highlighted the need for complex institutional arrangements to ensure proper environmental management, monitoring, and supervision, considering the newness of the industry in Chile. In particular, it recommended strengthening capacities in the Ministry of Energy, the Environmental Assessment Service (SEA) and the Superintendence of the Environment (SMA) to evaluate, approve and monitor environmental and social instruments (Franco, 2022).

Lack of community participation

Despite the gigantic size of the GH industry in Chile and its accelerated advance, which has been planned for several years behind closed doors by state bodies, citizen consultation and participation in the definition of public policies, strategies and action plans has been scarce and insufficient.

The National Green Hydrogen Strategy was drawn up during the pandemic, without citizen participation and "tailored to the interests of transnational companies", according to civil society complaints (Moya, 2022). It was only at the beginning of 2023 that the Ministry of Energy initiated a rather weak process of citizen participation at the national level, within the framework of the elaboration of the Green Hydrogen Action Plan 2023–2030. Not only was this process initiated late, but the mechanisms chosen, and the timelines considered, do not ensure informed, broad, and meaningful participation. For instance, the consultation only lasted for two months – during the summer holiday period – for interested parties to register on a digital platform created for this purpose (www.planhidrogenoverde.cl). However, insufficient prior dissemination of the process and the digital registration requirement constituted barriers to access, particularly for communities living in isolated areas.

The activities of the "participatory construction" process of the Green Hydrogen Action Plan started in April 2023, with a virtual session and face-to-face briefings in the cities of Antofagasta, Punta Arenas, Concepción, Santiago and Valparaíso. Broadly pitched, with representation from technicians and industry actors, these meetings had little representation from civil society, communities and Indigenous Peoples. The information provided was biased; the benefits of the emerging industry were highlighted, while its main risks and impacts were not described. A second round of workshops was held in June 2023 in face-to-face and virtual format, with "limited spaces." Another "public consultation" was conducted in July and the process closed in August.

An important omission in the elaboration of these public policies has been the absence of information about the enormous socio-environmental impacts of large-scale GH production, particularly on local communities potentially affected by the location of GH projects in their territories. Despite the existence of detailed studies on the potential environmental and social impacts of the GH industry in Chile, the authorities have not been honest about them, and have focused mainly on highlighting the economic benefits of its development. It should be noted that the right of access to information is a key right and a precondition for the exercise of other rights, such as the right to free, prior and informed consultation and the right to participation. Thus, the state of Chile will have to make a major effort to fulfil the rights to Access to Information and Public Participation enshrined in the Escazú Agreement, to which it became a state party on 11 September 2022.

Even more serious is the violation of the right to consultation and consent of Indigenous Peoples, in accordance with ILO Convention 169 and regulated by Supreme Decree No. 66 of the Ministry of Social Development of 2014. The *Guía de Orientaciones Metodológicas Procesos de Consulta Indígena de dicho ministerio* (2018) cites Article 7 of Convention 169, which states that,

The peoples concerned shall have the right to decide their own priorities for the process of development as it affects their lives, beliefs, institutions and spiritual well-being and the lands which they occupy or otherwise use, and to control, to the extent possible, their own economic, social and cultural development. Furthermore, these peoples shall participate in the formulation, implementation and evaluation of national and regional development plans and programmes which may affect them directly. (Note: emphasis by the author)

Such consultation must obey the principle of good faith, be conducted in a manner appropriate to the circumstances and through adequate procedures, with the aim of reaching agreement or consent. The Chilean state did not comply with these obligations when approving the National Green Hydrogen Strategy, nor has it informed how it will comply with this requirement during the process of elaborating the 2023 – 2030 Action Plan.

Thus, in the expectation of making millions in GH business – sanctified by its contribution to the fight against climate change – the debate about the industry's potential unwanted externalities in Chile has been postponed, as has the creation of spaces for real participation by local communities (Seeger, 2023). As CIPER (2023) points out, it seems that the logic of the exploitation of this new 'energy El Dorado' risks following the path of other extractive industries and their undeniable environmental damage, with the total absence of communities in the discussion.

The lack of spaces for participation has led to a growing number of publications, discussions and citizen debates to address the problems of an inorganic development of the GH industry. In May 2022, a group of scientists and environmental advocates sent an Open Letter (Norambuena et al, 2022) to President Gabriel Boric, warning about the dire consequences of the development of the GH industry in the Magallanes Region, including the description of impacts already materialised, such as the massive migration of executives, professionals and technicians to Chilean Patagonia, and speculation for the purchase or lease of land. They called on the government not to repeat past mistakes that created great territorial inequalities and the sacrifice of various areas of Chile in the name of a development model that led the country into a deep multidimensional crisis, and further pressed for "a careful, informed and transparent process, with the highest standards of participation and equity, with special attention to local communities", that puts on the table all possible negative socio-environmental and territorial impacts associated with it.

Socio-environmental impacts

Various studies indicate that the WB's ESR of the project neglected factors that could be significant in assessing the environmental and social risks associated with the operation and subprojects, which could result in insufficient mitigation commitments and weak management.

Corfo (2023a:6), based on a report prepared by the consultancy Social Capital Group for

the IDB²⁴, identified the following significant environmental and social risks and potential impacts for GH projects and their value chain: impact on the territories of Indigenous Peoples' communities, involuntary resettlement, impacts on biodiversity, significant demand for water resources for production, and risks of social conflict.

According to Signoria & Barlettani (2023), the environmental, health and safety, and social aspects of the GH value chain that require special attention are: land use and fragmentation of territory; wastewater and brine management; process and community safety; development of large-scale solar and wind power plants in pristine areas, which could result in changes in the overall ownership structure of vast areas of land, in addition to the corresponding environmental and social impacts. On indigenous issues, they note that Chile reports the highest share of Indigenous Peoples in the total national population (12.4%) and the highest number of Indigenous People (2,175,873) in Latin America.

Based on the different sources consulted for this analysis, in particular Signoria & Barlettani (2023), including observations from community organisations such as the Regional Council of the Chango People of Antofagasta and the Citizen Assembly of Última Esperanza (ACUE) of Puerto Natales, Magallanes Region, shared with Sustentarse, we identify the significant risks and impacts that have not been duly weighted by the World Bank Project, and make some recommendations for their appropriate management. It should be noted that the order of these risks does not define the priority assigned to each of them. It is also relevant to keep in mind that the risks and impacts are interrelated, so presenting them separately is for illustrative purposes only, as it does not account for the synergistic and cumulative effects of the different links in the GH value chain and its components and parts.

High energy consumption

The GH industry is renewable energy intensive. The Ministry of Energy (2023) estimated a demand of 50kWh of electricity to produce one kilo of hydrogen, plus between 2 and 6kWh to produce 1000 litres (1m³) of desalinated water. The generation of renewable energy required by the industry has enormous impacts on land use and territories, as will be seen below. Currently, Chile generates more renewable energy than it can practically consume due to the lack of transmission infrastructure to transport electricity to areas where it is most needed. This is despite the fact that many communities living close to solar and wind farms remain without access to energy.

High water consumption

The GH industry requires large volumes of fresh water to carry out the electrolysis process. The Ministry of Energy (2023) estimates that 11 litres of water are needed to obtain one kilo of hydrogen. Signoria & Barlettani (2023) consider a water demand of 20 litres per kilo of hydrogen, accounting only for consumption by electrolysis and auxiliary units. They infer that industry in Chile will consume around 4,000,000m³ of water by 2025 and almost 60,000,000m³ by 2030, if the country is to reach its GH production targets.

Considering the critical water scarcity affecting the country²⁵, in particular the regions that will become GH production poles, impacts are expected due to the additionality of water demand by the technology, affecting the access to water resources by local populations.

In addition, a large number of desalination plants are expected to be installed on the Chilean coasts, bringing about impacts on coastal and marine ecosystems, the economic displacement of traditional fishing communities, and the impact on the livelihoods of local

populations.

Affecting ecosystems by occupation of large areas of land

GH projects tend to occupy large areas, often involving land-use changes. Industry estimates (HIF global, 2023) indicate an average of 250 hectares for the siting of infrastructure associated with each GH plant, primarily for renewable energy generation farms. Altmann et al. (2022) estimate that the development of a wind farm of 1GW capacity requires at least 155 large wind towers, with wind turbines over 200m high.²⁶ To dimension the size of a solar plant, we take as an example Engie Chile's Capricornio Photovoltaic Park in Antofagasta, inaugurated in early 2023. With a generating capacity of 87.9MW, it has 249,210 photovoltaic panels on a section of public land of approximately 180 hectares.²⁷

Renewable energy plants are commonly located in rural areas. GH projects and their value chain can lead to fragmentation of territory in regions characterised by vast areas with uniform land use, ecosystems and landscape, and consequent effects on social and demographic development. Land acquisition processes may cause involuntary physical and/or economic displacement of local communities. Adverse synergistic effects are also expected on already impacted territories and communities, such as the Tocopilla and Mejillones sacrifice zones, and on sensitive ecosystems or ecosystems of high landscape value.

According to the UN, the female population is, in general, the most affected by land use changes particularly affecting ownership and access.²⁸

Indigenous Peoples

Altmann et al. (2022) recommend paying special attention to the presence of Indigenous Peoples, in particular the Changos in northern Chile, and the Kaweskar and Yagan peoples in the Magallanes region. In the case of the Changos, dedicated to artisanal fishing, a balance must be ensured between the development of port infrastructure and the interests of these groups.²⁹

In addition, they warn about the possible appearance of archaeological sites during construction activities, which should be closely monitored. In the Magallanes region, the draft law proposing to incorporate the Selk'nam people into the list of "main ethnic groups" recognised by the State of Chile in Law No. 19.253 is at an advanced stage.

It is therefore imperative to ensure free, prior and informed consultation, not only on GH subprojects that could be financed by the WB, but also on government strategies and plans to promote the industry.

Impact on the communities

GH production sites will preferably be located in areas connected to existing infrastructure (roads, pipelines, port areas, desalination plants), increasing the impacts on local people. The construction of new renewable energy parks, extensive transmission lines that will cross community territories, ports, pipelines, desalination plants and other infrastructure can have huge impacts on their quality of life, including economic and physical displacement, and violate economic, social, cultural and environmental rights. The absence of information, consultation and participation in decisions that affect them constitutes a violation of essential human rights.

Intangible Cultural Heritage

GH projects present risks with regard to communities' free access to sacred sites and areas of importance for recreation and aesthetic enjoyment, which are relevant in terms of ecosystem services. Risks include the loss of sites of high landscape value and recreational opportunities for residents and tourists. They also threaten the continuity of traditional lifestyles.

Security risks

The production, transport, storage and use of GH pose significant operational safety challenges, as it is a highly volatile and flammable element. It is therefore recommended that land-use and site planning is done prior to the development of GH projects and the establishment of buffer zones separating industrial risk facilities from residential and/or commercial areas.

Pollution prevention

There is particular concern about the discharge of brine – associated with seawater desalination – into marine ecosystems, considering the absence of national regulations to regulate the management of this impact. The risk of wastewater management from ammonium and methanol plants has also been highlighted.

Closure and decommissioning plans

Considering that the GH industry and associated renewable energy generation, such as wind farms or solar plants, is new, there are apprehensions about the closure and decommissioning processes of the infrastructure at the end of its operational lifespan.

V. CONCLUSIONS

The Chilean government has the support of multinational organisations, including the World Bank, for the implementation of the National GH Strategy, including the financing of subprojects driven by the private sector through the state agency Corfo.

Beyond the climate rhetoric, it is easy to see that the most relevant motivation for the development of the GH industry in Chile is the expectation of private actors to make multi-million-dollar export deals for hydrogen and its derivatives to international markets. From the perspective of the Global North, the support given to the Latin American country is functional to the fulfilment of the decarbonisation goals committed to in the Paris Agreement, by shifting the undesired externalities of this energy colonialism to the Southern Hemisphere.

Chile's public policy to promote GH obeys a model of energy colonialism, as defined by Dalmau – Rovira (2023), in which it plans to occupy territories that belong to all Chileans and even to Indigenous Peoples, imposing foreign interests without considering the interests and expectations of the communities that inhabit these territories.

The rapid development of the GH industry without proper consultation with citizens and potentially affected communities, violates their rights to consultation, informed participation and a healthy environment. Therefore, the first consideration is that the WB Project is inserted in a political, legal and institutional context that does not guarantee a just economic and energy transition.

It is important to note that the Bank has categorised its Project as having considerable environmental and social risk. However, in its environmental and social review, the Bank has omitted to comment on the weaknesses of the socio-environmental regulatory framework applicable to the GH industry in Chile, which undermines the legitimacy of environmental licensing processes and therefore has the potential to cause significant socio-environmental conflicts.

The Bank also recognises the insufficient institutional capacity of the public bodies responsible for environmental and social assessment, authorisation and oversight of the subprojects to be financed through the project. However, it intends to remedy these shortcomings by installing capacities in bodies such as the Ministry of Energy, the executing agency Corfo, and the services of the Ministry of the Environment, such as the SEA and the SMA.

In this regard, it can be noted that the installation of sophisticated capacities, such as those required to supervise and oversee GH subprojects, takes time, which is unlikely to occur in the short term, to ensure compliance with the WB's sustainability policy and environmental and social safeguards in the implementation of the project, which will begin in 2023; and, Corfo does not have among the functions assigned to it by law the supervision of the environmental and social management of the projects it finances as an intermediary. Although, in the framework of the negotiation of the loan granted by the WB, Corfo has committed itself to installing certain elements of management, it remains to be seen how it could exercise functions that go far beyond its capacity and legal mandate.

The WB's demands on the Chilean state to enforce its environmental and social policies and safeguards in the execution of the project have basically resulted in the production of a large number of generic documents, which seem insufficient to prevent the violation of human

rights, and the impact on Indigenous Peoples, local communities and the territories by the GH subprojects that will be financed by the credits provided by the multilateral institution. On the other hand, Corfo's intention to prioritise subprojects that can meet energy or development needs at the local level is not evident either. Nor is there any indication of a vocation to lead inclusive processes in the planning and implementation of subprojects. Finally, no suitable accountability and complaint mechanisms are established, nor are there any mechanisms for the protection of human rights defenders against the risk of reprisals, nor are there any mechanisms for reparation for any possible damage that the subprojects may cause in the territories.

As Recourse points out, all renewable energy initiatives, including policy reforms and financial instruments, must be governed by rights-based scientific and social criteria. A cursory assessment of compliance with Environmental and Human Rights integrity criteria allows us to conclude that the World Bank Project does not ensure compliance with many of the critical issues of potential GH subprojects, as indicated in Table 3.

Table 3. WB project: Compliance with rights-based scientific, environmental and social criteria for a Just Energy Transition, according to Recourse methodology

ENVIRONMENTAL INTEGRITY CRITERIA	
Climate Change Mitigation; alignment with the Paris 1.5°C trajectory	The international scientific community has not reached a consensus on this aspect
Resilience to climate impacts	No track record
Sustainable use of water and marine resources	Not guaranteed
Pollution prevention and control	Partially
Ecosystem protection	Partially
SOCIAL AND HUMAN RIGHTS CRITERIA	
Safeguards compliance	Nominal compliance, with no certainty of implementation capacity
Social dialogue and democratic participation of stakeholders, including communities, trade unions, women, and youth.	Not guaranteed
Respect for the needs and concerns of local communities, putting them at the centre of the development of energy alternatives, prioritising women, vulnerable and marginalised populations and Indigenous Peoples	Not guaranteed
Free, Prior and Informed Consent of Indigenous Peoples	Not ensured
Protects the human rights and land rights of impacted communities	Not secured
Access to effective grievance and redress mechanisms	Not guaranteed

Recommendations to the World Bank

Based on the analysis from this study, we recommend the World Bank to require the Chilean government to:



1. Ensure environmental impact assessment processes meet highest standards by:
 - a. Requiring comprehensive Environmental Impact Assessments (ESIA) for all subprojects instead of simple Environmental Impact Statements (EIS), guaranteeing without exception fair and inclusive processes of citizen participation;
 - b. Preventing the 'splitting' of projects to circumvent impact assessment rules;
 - c. Not allowing the modification of projects linked to GH through simple Request of Relevance. In this way, environmental permits for GH subprojects will enjoy greater social legitimacy and will therefore be less susceptible to legal challenges.



2. Establish measures to increase transparency and accountability of financial intermediary operations by:
 - a. Ensuring early access for relevant subproject information available to all project-affected peoples, especially women, Indigenous Peoples, and other vulnerable groups, in a culturally appropriate and balanced manner, and to disclose their real risks and impacts.
 - b. Disclosing in an early and culturally appropriate manner information on subprojects at different stages of their life cycle, in accordance with the highest standards of transparency and accountability.
 - c. Requiring Corfo to disseminate information on subprojects interested in obtaining financing, as well as those already approved, including the corresponding supporting information, such as project profile, environmental permits, background information on the consultation and participation processes planned and/or carried out, and to maintain updated and publicly accessible databases of this information.



3. Guarantee meaningful stakeholder consultations by:
 - a. Requiring funding stakeholders to conduct in-depth, extensive and inclusive binding consultation processes with communities and civil society to ensure that such initiatives are responsive to the needs, interests and expectations of local populations.
 - b. Strengthening the processes and procedures for consultation and citizen participation, ensuring the right of access to information, in line with the principles of the Escazú Agreement, to which Chile is a signatory. Take into account the gap detected by Corfo: of requiring "instances of consultation and participation of stakeholders higher than those required by the applicable regulations", (Corfo, 2023b), both at the level of the Corfo Financing Programme, as well as at the sub-project level.

- c. Ensuring the consultation with Indigenous Peoples whenever appropriate, under the principles of ILO Convention 169, in a manner appropriate to the circumstances and through adequate procedures, with the aim of reaching agreement or consent.



4. Provide access to functioning grievance redress mechanisms by:

- a. Installing an Independent Complaints Mechanism for the reception and investigation of community complaints, under the protection of a competent body, with the capacity and legitimacy to fulfil this function, easily accessible and at no cost to users, offering an extra-judicial mechanism for the resolution of disputes.
- b. Implementing measures to protect against reprisals against human rights and environmental defenders linked to GH subprojects.
- c. Establishing fair compensation and reparation measures for those cases in which the projects generate unforeseen impacts and damage to the community and the territories.



5. Strengthen environmental and social management efforts by:

- a. Ensuring that the environmental and social management plans, mitigation and compensation measures, and other environmental and social commitments of the subprojects, established in order to comply with the World Bank's ESF, become part of the obligations established in the environmental licence (RCA) and, therefore, can be audited by the Superintendence of the Environment.
- b. Mandating periodic reports on compliance with the environmental and social obligations of the subprojects contracted with Corfo, in compliance with the Bank's requirements, with wide dissemination to stakeholders, to ensure greater transparency and accountability.

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GLOSSARY OF TERMS

IDB	Inter-American Development Bank
UNFCCC	United Nations Framework on Climate Change
Corfo	Corporación de Fomento de la Producción
EIS	Environmental Impact Statement
ESS	Environmental and Social Standard
EIA	Environmental Impact Assessment
ESCP	Environmental and Social Commitment Plan
ESMAP	Energy Sector Management Assistance Program
GIF	Investment and Financing Manager (Corfo)
H2 Chile	Chilean Hydrogen Association
GH	Green Hydrogen
H4D	Hydrogen for Development Association (H4D)
ESF	Environmental and Social Framework (WB)
PFCGH	Corfo Green Hydrogen Financing Program (Corfo)
SEP	Stakeholder Engagement Plan
ESR	Environmental and Social Review (WB)
RCA	Environmental Qualification Resolution
SEA	Environmental Evaluation Service
ESIA	Environmental Social Impact Assessment System
ESMS	Environmental and Social Management System
SMA	Superintendencia del Medio Ambiente
JET	Just Energy Transition
MT	Metric tons
URAS	Environmental and Social Risk Unit (Corfo)
WB	World Bank

ENDNOTES

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- 5 During the presidential campaign, Gabriel Boric promised to be “the first ecological government in Chile, where each State policy will be respectful of the environment.” See, for example, his message on Twitter, at <https://twitter.com/GabrielBoric/status/1460618647676805120>
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- 12 Altmann, M. et al. (14 April 2022). Ibid.
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- 15 Statement by President Gabriel Boric, when he participated in the Driving Growth: Enabling Small and Medium Enterprises panel, within the framework of the IV CEO Summit of the Americas, in the United States last 8 June 2022.
- 16 Altman et al. (2022), Ibid.
- 17 The following organisations (13) are part of the Regional Council: Mujeres Changas del Costero de Tocopilla; Association of Cobija Camanchangos; Changos Land of the Sun Hornitos; Monkeys from the Mejillones Peninsula; Monkeys Cove Lizard; Changos Caleta Chirrí; Monkeys Caleta Abtao; Changos de Playita Taltal Association; Changos El Gaucho Taltal Association; Agrupación Changos Salitre Taltal; Chango Finao Loreto Taltal Association; Pabla Armendares Community Woman of Sea

and Land; and, Changos de Cachinales Community.

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20 Supreme Decree 50 of 2007, of the Ministry of the General Secretariat of the Presidency.

21 The art. 11 bis introduced in Law 19,300 on General Environmental Bases establishes that "proponents may not knowingly divide their projects or activities in order to vary the evaluation instrument...", for example, to avoid presenting an Environment Effect investigation.

22 These are the Engie HyEx and ENAEX HyEx plants, which obtained their RCA in 2022.

23 Article 2 letter h) bis, of Law No. 19,300, defines the synergistic effect as "the one that occurs when the joint effect of the simultaneous presence of several agents supposes an environmental incidence greater than the effect of the sum of the incidents individuals viewed in isolation".

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26 Altmann et al. (2022), Ibid.

27 Download Description of the Project in the environmental evaluation file in the SEIA, in <https://seia.sea.gob.cl/documentos/documento.php?idDocumento=2128425494>

28 See page of the Office of the UN High Commissioner for Human Rights (UN OHCHR), at <https://www.ohchr.org/es/node/3447/women-and-housing-land-and-property>

29 Altmann et al. (2022), Ibid.



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