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COSTA RICA

THE ROAD TO DECARBONIZATION: PROMOTING THE HYDROGEN ECONOMY IN COSTA RICA

(CR-T1194)

DONORS MEMORANDUM

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PROJECT SUMMARY

THE ROAD TO DECARBONIZATION: PROMOTING THE HYDROGEN ECONOMY IN COSTA RICA (CR-T1194)

Costa Rica derives up to 98% of its electricity from renewable sources, such as hydro- and geothermal power. However, electricity accounts for barely 20% of the total energy it consumes. Biomass accounts for 15%, while the remaining 65% is petroleum-based. The principal challenge for decarbonization is posed by the transportation sector, which is responsible for 69% of greenhouse gas emissions. Hydrogen, the most abundant element on the planet, could play a transformative role in the decarbonization of the transportation sector and in the exploitation of renewable energies.

Some of the obstacles that Costa Rica faces in developing the hydrogen ecosystem are: the lack of local data to determine the return and efficiency of hydrogen in the transportation sector; the absence of a regulatory framework promoting hydrogen as a fuel; and inefficient coordination among ecosystem stakeholders.

To address these problems, the project proposes facilitating development of the hydrogen ecosystem in Costa Rica through coordinated actions by the various public and private actors involved, guided by a roadmap for the ecosystem, piloting proof of concept, and human capital training. Systemically, the project seeks to contribute to the decarbonization of the energy matrix in Costa Rica.

This project will support one of the world's pioneer ecosystems, whereby five enterprises will adopt hydrogen solutions as a sustainable technology; at least 220 individuals will be trained in maintenance and safety aspects of the equipment used to produce, store, and dispense hydrogen and/or Fuel Cell Electric Vehicles (FCEVs); and, of them, at least 25 are expected to be employed by the ecosystem in green jobs.

This project is expected to shed light on the potential of clean hydrogen as a mechanism for mitigating the impact of climate change by decarbonizing the economy. The project is expected to be able to be replicated in other countries in the region.

These resources contribute to the IDB Group target of increasing the volume of climate-related financing to 30% of total operational approvals by the end of 2020.

ANNEXES

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Annex II	Summary Budget

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Proposed resolution

INFORMATION AVAILABLE IN THE TECHNICAL DOCUMENTS SECTION OF THE MIF PROJECT INFORMATION SYSTEM

Annex III	Itemized Budget
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ABBREVIATIONS

AARC	Ad Astra Rocket Company
ARESEP	Autoridad Reguladora de Servicios Públicos [Public Utilities Regulatory Authority]
COP 21	2015 United Nations Climate Change Conference
CRUSA	Costa Rica United States Foundation for Cooperation
FCEV	Fuel Cell Electric Vehicle
GHG	Greenhouse gases
GIZ	German Agency for International Cooperation
ICE	Costa Rican Electricity Institute
INA	National Institute of Learning
MINAE	Ministry of Environment and Energy
MOPT	Ministry of Public Works and Transportation
PCR	Project Completion Report
PROCOMER	Foreign Trade Promotion Board
PSR	Project Status Report
RECOPE	Refinadora Costarricense de Petróleo [Costa Rican Oil Refinery]

EXECUTIVE SUMMARY

THE ROAD TO DECARBONIZATION: PROMOTING THE HYDROGEN ECONOMY IN COSTA RICA (CR-T1194)

Country and geographic location:	Costa Rica, nationwide		
Executing agency:	Costa Rica United States Foundation for Cooperation (CRUSA)		
Focus area:	Inclusive Cities		
Coordination with other donors/Bank operations:	German Agency for International Cooperation (GIZ), United Nations Environment Programme (UNEP) / Accelerating NDC Implementation. Unlocking Clean Buses in Latin America and the Caribbean (RG-T3078).		
Project beneficiaries:	1 emerging renewable energies ecosystem; 25 green jobs created by the ecosystem; 5 enterprises adopting sustainable production practices; and the environment		
Financing:	Technical cooperation funding:	US$ 820,000	21%
	Investment:	-	
	Loan:	-	
	Other:	-	
	Total MIF funding:	US$ 820,000	
	Counterpart:	US$3,100,000	79%
	Cofinancing	-	
	Total project budget:	US$3,920,000	100%
Execution and disbursement periods:	36 months for execution and 42 months for disbursement.		
Special contractual conditions:	Conditions precedent to first disbursement will be: appointment of a Project Coordinator and legal establishment of the H_2 Alliance.		
Environmental and social impact review:	This operation was screened and classified pursuant to the IDB's Environment and Safeguards Compliance Policy (Operational Policy OP-703) on 31 August 2018. Given the limited impacts and risks, the project is proposed as a category C operation.		
Unit responsible for disbursements:	IDB Country Office in Costa Rica (COF/CCR)		

I. THE PROBLEM

A. Description of the problem

1.1 Costa Rica, a country of 5 million, has been on the cutting edge of innovation with regard to climate change and low-emission development. It has set ambitious targets for reducing greenhouse gas (GHG) emissions as part of its commitment under the COP 21 Paris Agreements (2016).[1]

1.2 Costa Rica derives up to 98% of its electricity from renewable sources, such as hydro- and geothermal power. However, electricity accounts for barely 20% of the total energy it consumes. Biomass accounts for 15%, while the remaining 65% is petroleum-based (fossil fuels).[2] Consumption of hydrocarbons has grown due to the increased number of vehicles. Thus, the principal challenge Costa Rica faces stems from the transportation sector, which accounts for 69% of the country's GHG emissions.[3] For Costa Rica, transitioning to electric transportation based on clean electricity generation offers enormous potential for transforming the country.

1.3 On its first day in office, the current administration prioritized research into the use, production, and marketing of hydrogen as a fuel. Its Decarbonization Plan identifies the key steps needed to consolidate the process of decarbonizing the Costa Rican economy, one of which accords hydrogen a central role in that plan.

1.4 Hydrogen, the most abundant element on the planet, can play a transformative part in decarbonizing the transportation sector and in making the most of renewable energies. However, to facilitate the adoption of that technology, a major effort will be needed to mobilize industry stakeholders, investors, and public policy makers. Hydrogen makes it possible to store more energy in less weight,[4] compared to conventional lithium batteries, which means that it is more advantageous as a fuel for long-haul, high mileage, and heavy cargo vehicles, such as buses, trains and trucks.[5] Light-duty (passenger transportation) and heavy-duty (freight transport) vehicles together account for 43% of GHG emission in Costa Rica.

1.5 Fuel Cell Electric Vehicles (FCEVs)[6] take oxygen from the air and pressurized hydrogen from tanks to generate electricity to power the motor. Most vehicles with hydrogen fuel cells are classified as zero emission vehicles[7] since they only emit

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1 "Contribución prevista y determinada a nivel nacional de Costa Rica" (Costa Rica's planned, nationally determined contribution), document produced by the Government of the Republic of Costa Rica and the Ministry of Environment and Energy (MINAE). San José, September 2015.

2 Herrera, J., "Informe Estado de la Nación en Desarrollo Humano Sostenible 2017 - Uso y Estado de los Recursos: Energía" [State of the Nation Report on Sustainable Human Development 2017 – Use and State of Resources: Energy], State of the Nation Program, San José, 2017.

3 Chacón, A., Jiménez, G., Montenegro, J., Sasa, J., and Blanco, K.: "Inventario nacional de gases de efecto invernadero y absorción de carbon, 2012" [National inventory of greenhouse gases and carbon absorption, 2012], IMN, MINAE. San José, 2015.

4 Thomas, C.E., "Fuel cell and battery electric vehicles compared," International Journal of Hydrogen Energy, 34 (2009), 6005-6020.

5 Hydrogen Council, "Hydrogen Scaling Up: A sustainable pathway for the global energy transition," 2017.

6 Agora Verkehrswende, "Transforming Transport to Ensure Tomorrow's Mobility," Berlin, 2017.

7 Furthermore, the hydrogen to be produced in Costa Rica is expected to be clean, given the characteristics of the country's energy matrix.

water and heat. Today cars are being sold that use hydrogen as their source of energy in countries such as Japan, Germany, and the United States (California).

1.6 Costa Rica faces a series of obstacles to developing a hydrogen ecosystem.

1.7 **Business model and commercial viability.** Hydrogen technology based on renewable energy and water needs to be proven technically and commercially viable in the country. A business model needs to be developed that allows for the production of hydrogen and mechanisms for using it need to be implemented at a cost that can compete with other fuels. Markets also need to be found for both the hydrogen and oxygen (a byproduct of the process).

1.8 **Information gaps.** Hydrogen and FCEVs are new technologies in Costa Rica and no research has yet been carried out to determine the return and efficiency of hydrogen in the transportation sector, especially compared to other transportation options, such as diesel and electric battery vehicles. Without specific research into the potential for hydrogen and FCEVs in Costa Rica, more widespread adoption of them will be difficult to promote. Likewise, evidence-based information will facilitate the establishment of a regulatory framework to act as a catalyst for investment and promote their adoption.

1.9 **Coordination among stakeholders.** The development of a hydrogen ecosystem requires coordinated actions and investment by the various stakeholders in Costa Rica in order to address the production, storage, and deployment of vehicles and supply stations. With today's still incipient development of the ecosystem, no stakeholder has an incentive to be the first to act and incur start-up costs and risks. There is a clear need for "synchronization" and coordinated actions by the stakeholders in the supply chain. There is also a need to design a communication strategy to advance dialogue about hydrogen with the government and other stakeholders (enterprises, universities, public institutions, etc.).

1.10 Ad Astra Rocket Company (AARC),[8] a company founded by Costa Rican astronaut Franklin Chang, has been developing hydrogen energy solutions. Since 2015, Ad Astra has been working with a consortium of partners[9] interested in promoting hydrogen-based transportation in Costa Rica. The consortium developed a demonstration plant and a hydrogen supply station close to the town of Liberia (57,000 inhabitants), which enabled it to operate a hydrogen-powered bus on demonstration routes in the province of Guanacaste. That supply station is the only one of its kind in Central America, demonstrating the technical feasibility of using Costa Rica's water resources for clean production and storage of hydrogen.

1.11 Based on the success of the initial phase and the political will of the government and other actors, the consortium's objective is to expand hydrogen output and create an ecosystem for transportation based on hydrogen as an economically viable fuel for Costa Rica. That new hydrogen ecosystem will pave the way for the eventually more widespread adoption of FCEVs in Costa Rica, and larger

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[8] Ad Astra Rocket is a wholly-owned Costa Rican subsidiary of Ad Astra Rocket Company in the United States, focused on high-tech applications in renewable energy, electric transportation, and hydrogen technology.

[9] Cummins, Air Liquide, Purdy Motor, Relaxury, RECOPE, SBD, and others.

investments in infrastructure for the production, storage, transfer, and dispensing of hydrogen gas.

II. THE INNOVATION PROPOSAL

A. Project description

2.1 The objective of the project is to facilitate development of the hydrogen ecosystem in Costa Rica through coordinated actions by the various public and private stakeholders; and to pilot green hydrogen-powered transportation solutions. To that end, efforts will be made to strengthen coordination mechanisms among the public institutions and business organizations in the hydrogen ecosystem.

2.2 The proposal entails working with the different actors of the hydrogen ecosystem to create a platform capable of galvanizing collective action and generating trust among stakeholders. Public and private institutions will be harnessed to make new business opportunities viable using innovative processes. The solution includes: (i) developing a roadmap or strategic plan for the hydrogen ecosystem; (ii) piloting a proof of concept for the use of hydrogen as a sustainable transportation solution; and (iii) training specialized human capital for the hydrogen industry.

2.3 Innovation. The project seeks to have a systemic impact on Costa Rica's energy matrix. While the countries currently producing hydrogen on a large scale use natural gas to do so and thereby emit GHGs, in the case of Costa Rica, hydrogen will be produced using water[10] and renewable energies, making Costa Rica a global pioneer. The innovation lies in coordinating the various actors in the hydrogen economy as a way to contribute to the decarbonization of the economy. The aim is to build the business case for taking advantage of this energy vector using renewable sources, storing it in the form of hydrogen, and electrifying transportation. This energy solution will be immune to the fluctuations in fossil fuel prices on the international market and will make it possible to invest the foreign exchange currently spent on importing hydrocarbons in the domestic market.

2.4 **Component I: Roadmap of the ecosystem**. The objective of this component is to plan the roadmap for the development of the hydrogen ecosystem in Costa Rica. High-level technical assistance will be provided to design, monitor, and steer the development and implementation of the ecosystem's strategic plan, while identifying commercial opportunities and forging public-private partnerships. Knowledge gaps will be narrowed by creating a shared database specifically for Costa Rica, to be used to advance and develop the hydrogen ecosystem. In addition, awareness will be raised among key audiences and decision-makers regarding the opportunities afforded by hydrogen, so as to consolidate and expand rgw ecosystem's experience.

2.5 The Partnership for Hydrogen (H_2) will be formed as a nonprofit to coordinate the ecosystem, with a view to positioning hydrogen as the facilitator of the energy transition and promoting the adoption of public policies and mechanisms to support the sector. High-level technical assistance will be provided to quantify the impacts and benefits of hydrogen in the country and to draw up regulatory framework

[10] The clean hydrogen produced by the division of water molecules, when used as a fuel, generates water as a residue, thereby closing the production cycle.

proposals for developing the hydrogen market. Cooperation will also be fostered with the innovation ecosystem to help cultivate innovative business models and financial instruments to mitigate the risks associated with the transportation and distribution of hydrogen and/or oxygen and with the development of the necessary infrastructure.

2.6 In order to promote informed discussion of sustainable mobility options in Costa Rica, this component will finance comparative studies of the different technologies and fuels and quantify their environmental and economic benefits. The financial feasibility of electric vehicles using different fuels will be analyzed, comparing them with traditional combustion engine options (in a Total Cost of Ownership study). As regards environmental benefits, a life-cycle study will also be conducted for the various types of fuels, to reveal impacts on CO_2 emissions, air quality, and water consumption for different vehicle options. The studies will be shared with the Costa Rican academic sector to help generate local knowledge on the subject.

2.7 To develop policies and institutional structures, it will be vital for governments to be able to count on integrated and early planning with the relevant sectors, given that the success and efficiency of efforts to implement sustainable mobility programs, whether with hydrogen or other options, will largely depend on the coordination of energy policies, planning of the electricity grid, and the design of ecosystem regulations and business models. This component will finance a study of the macroeconomic impacts of a hydrogen supply chain in Costa Rica, as an input for decision-making on policies for providing incentives for the technology. Supplementing this analysis, an institutional roadmap will be developed for the implementation of hydrogen infrastructure in Costa Rica.

2.8 The outputs of this component will be: (1) the strategic plan of the Partnership for Hydrogen; (2) comparative studies of electric transportation; (3) a macroeconomic study of the hydrogen supply chain; (4) a roadmap for implementing public policies, tailored to address the challenges of the hydrogen economy; and (5) a communication strategy for the Partnership for Hydrogen.

2.9 **Component II: Proof of the sustainable transportation concept.** The objective of this component is to pilot hydrogen-powered transportation solutions so as to validate their eventual use. Part of this component will be devoted to expanding the capacity of the current hydrogen production plant by a factor of 20, which would make it possible to supply a fleet of four tourist transportation vehicles and one bus operating on a commercial route. Transportation services will be provided, using FCEVs, and market studies will be carried out with a view to selling the oxygen produced.

2.10 Thus far, hydrogen-powered transportation applications in Costa Rica have served demonstrative purposes. The idea of this proof of concept is to generate the data and experience required to determine future uses of the FCEVs in the Costa Rican transportation context. Mobility applications will be explored for public transportation, tourism, freight transportation, logistics services, and other complementary services. In addition, with the help of gas marketers, commercial uses will be sought for the oxygen produced as the principal by-product from the production of hydrogen, as selling oxygen on the market is key for offsetting the price of hydrogen.

2.11 For the tourist transportation services pilot, a partnership will be established with Purdy Motor, the local Toyota dealer in Costa Rica, which has undertaken to import and operate four Mirai model units.[11] Public transportation services will be provided by private operators in Guanacaste province. Part of this component will entail sharing data with the consortium for electrification of public transportation, with a view to generating knowledge of the various technologies available.

2.12 The outputs of this component will be: (1) expansion of the hydrogen production plant; (2) protocols and procedures for operating and maintaining the plant; (3) mobility pilot projects; and (4) a market study for oxygen.

2.13 **Component III: Human capital**. The objective of this component is to develop capacities in technical training institutes to enable them to meet the new demand for skills arising from the hydrogen economy. Forward-looking analysis will analyze the gaps between the skills and competencies required for the hydrogen economy with respect to the training currently available. Efforts will be made to promote the curricular changes needed to meet the demand created by development in the sector. The project will work with the National Institute of Learning (INA) and other training centers.

2.14 Given that technological developments for producing, storing, and dispensing hydrogen involved latest generation equipment, Costa Rica lacks the technical human resources needed to install and maintain that equipment. For that reason, the project aims to foster the training of technical staff and to endow them with the know-how they need to implement and maintain facilities for the production, storage, and dispensing of clean hydrogen. Firefighters and regulatory officials will also be trained to address needs posed by hydrogen vehicles.

2.15 The outputs of this component will be: (1) the design of curricula for specialized courses relating to the hydrogen ecosystem; (2) first responder training; (3) training for regulatory agency staff; and (4) persons trained in hydrogen and oxygen production and maintenance systems.

B. Project results, measurement, and monitoring

2.16 The project is expected to achieve the following outcomes: an ecosystem develops with MIF support; five enterprises adopt hydrogen as a sustainable technology; one enterprise is selling to international markets; and 25 green jobs have been created by the ecosystem.

2.17 **Monitoring and evaluation.** A technological platform will be developed using the Internet of Things to monitor trips made in the mobility pilot projects in real time. This platform will permit ongoing monitoring of the number of trips, the kilometers covered, an estimate of the reduction in GHGs, etc. For the human capital component, a monitoring system will be set up with the educational and training institutes to keep track of human capital skills development and its connection to the hydrogen economy. An effort will be made to identify the hardest vacancies to fill. In addition, CRUSA will report to the Bank every six months in a Project Status Report (PSR) and on the end results of the project in a Project Completion Report (PCR). The main results will be shared with the Ministry of Environment and

[11] Toyota is the pioneer in developing FCEVs and started marketing the Mirai model in 2016. Currently, that model is marketed in Japan, the state of California, Germany, Denmark, Belgium, and the United Kingdom.

Energy (MINAE), the Costa Rican Oil Refinery (RECOPE), the Costa Rican Electricity Institute (ICE), and the INA, as well as other actors.

III. Alignment with the IDB Group, Scalability, and Project Risks

A. Alignment with the IDB Group

3.1 The IDB public sector window, through the Energy Division, has been supporting the Government of Costa Rica and its National Electric Vehicles Strategy by providing inputs from studies carried out by consultants and strategy validation workshops. It provided specific support with updating the Electric Transportation Incentives Act (Legislative Decree 9518 of January 2018) and financed the replacement of the Costa Rican Electricity Institute's fleet of internal combustion vehicles with electric vehicles and the associated recharging infrastructure.

3.2 Virtually 100% of IDB resources for this operation are being invested in climate change mitigation activities, according to the Multilateral Development Banks' joint methodology for estimating climate finance. These resources contribute to the IDB Group target of increasing the volume of climate-change-related financing to 30% of all operational approvals by the end of 2020.

B. Scalability

3.3 This project promotes a new technology being implemented on a small scale in Costa Rica, particularly in the province of Guanacaste. The project's path to scalability and expansion is based on the following: (i) ownership of the technology by the transportation sector thanks to a demonstration effect; (ii) adoption thanks to a reduction of costs and risks; (iii) replication of the model in other cities in the country; (iv) the start-up of operations in other countries in the region; and (v) the marketing of hydrogen and oxygen.

3.4 The scalability route is via public-private cooperation. The idea is to learn about the commercial potential for hydrogen and oxygen, as well as the technological viability of developing the clean hydrogen ecosystem. The outcomes and lessons learned from the activities and outputs of the project will be shared with strategic audiences (MINAE, RECOPE, ICE, MOPT, ARESEP, PROCOMER, INA, training institutes, private sector investors, etc.), at events and relevant forums.

C. Project and institutional risks

3.5 Technical risks include: (1) the impossibility of amending the regulatory frameworks of the government institutions called upon to lead the energy transition, hindering the investments needed to develop the ecosystem; (2) lack of experience with the technologies for producing and exploiting hydrogen, causing development delays; (3) constraints on the supply of FCEVs, blocking the entry of new users; (4) logistical obstacles raising the costs of collecting and distributing hydrogen and oxygen, making it hard for those products to compete on international markets; and lastly, (5) the risk that the proposed solution is not widely adopted outside Costa Rica, which could significantly impact costs given the small size of the market.

3.6 To mitigate the first of these risks, close coordination will be established with the public institutions that have shown interest given the new government's political

support. To mitigate the second risk, the technical team will be strengthened with internships in other companies. To mitigate the third risk, the Partnership for Hydrogen will facilitate coordination with suppliers (Cummins, Purdy Motor, Grupo Q, FACO, etc.) so that they can plan procurement of the vehicles needed with their parent companies. To mitigate the fourth risk, work will be done with the world's leading gas companies to develop the logistics mechsnism best tailored to the country's production needs. Lastly, to mitigate the fifth risk, alternatives to hydrogen transportation will be explored.

IV. INSTRUMENT AND BUDGET PROPOSAL

4.1 The project has a total cost of US$4,134,900, of which US$820,000 (21%) will be provided by the MIF and US$3,314,900 (79%) by the counterpart. The instrument to be used is technical cooperation funding given that the ecosystem is still incipient and the high level of risk involved for industry players, as well as the potential for leveraging knowledge relating to the development of renewable energies. CRUSA is a nonprofit organization and the project will not generate income for it.

4.2 Retroactive recognition of counterpart funds. Expenses incurred by CRUSA starting on 1 August 2018 may be recognized as part of the counterpart contribution to the project, up to a maximum of US$20,000, for strategic communication actions with decision-makers

	MIF (US$)	Counterpart (US$)	Total (US$)
Project Components			
Component 1: H_2 ecosystem roadmap	427,000.00	121,900.00	548,900.00
Component 2: Sustainable transportation pilot	225,000.00	2,912,200.00	3,137,200.00
Component 3: Human capital	8,000.00	47,900.00	55,900.00
Project management (execution unit's costs)	144,000.00	18,000.00	162,000.00
Ex post reviews	4,500.00	-	4,500.00
Contingencies	11,500.00	-	11,500.00
Grand Total	820,000.00	3,100,000.00	3,920,000.00
% of financing	**21%**	**79%**	**100%**

V. EXECUTING AGENCY AND IMPLEMENTATION STRUCTURE

A. Executing agency description

5.1 Costa Rica United States Foundation for Cooperation (CRUSA) will be the executing agency for this project and will sign the agreement with the IDB. CRUSA is a nonprofit foundation established in 1996. Its mission is to help improve the quality of life in the country by promoting its progress toward an environmental and social sustainability model. As part of its programmatic strategy for 2018-2022, CRUSA has a sustainable transportation initiative which serves as a laboratory for the electrification of public transportation.

5.2 CRUSA has satisfactorily executed a MIF technical cooperation project, has executed funds from other donors for development projects, and has engaged the specialized services of consultants. As regards its own funds generated by its equity fund, CRUSA is able to elicit the support and coordination of several partners in order to carry out the project.

5.3 CRUSA would contribute part of the counterpart funds; PROCOMER, INA, SBD, and Purdy Motor, and others, will also make counterpart contributions.

B. Implementation structure and mechanism

5.4 CRUSA will establish an execution unit and the necessary structure to execute project activities and manage project resources effectively and efficiently. CRUSA will also be responsible for submitting progress reports on project implementation. Details regarding the structure of the execution unit and progress report requirements can be found in Annex V in the technical files for this operation.

5.5 CRUSA will coordinate with the Board of Directors of the Partnership for Hydrogen and the project coordinator will act as the Partnership executive.

5.6 Because of its technological expertise, AARC heads the hydrogen ecosystem in Costa Rica. For the purposes of this project, AARC will be the principal technical advisor to CRUSA. AARC has a team of technical specialists with experience of designing and implementing clean hydrogen technologies, as well as expertise in public policy design.

VI. Fulfillment of Milestones and Special Fiduciary Arrangements

6.1 **Disbursement by results and fiduciary arrangements**. CRUSA will adhere to the standard MIF arrangements relating to disbursement by results, IDB procurement policies,[12] and financial management for the private sector[13] as specified in Annexes V and VI. CRUSA is a private sector entity with established procedures for the procurement of goods and services and the other administrative instruments. CRUSA procedures will be used.

VII. Access to Information and Intellectual Property

7.1 Access to Information. This document will be made available to the public in accordance with the IDB's Access to Information Policy.

7.2 Intellectual Property: The project is based on the expansion of the hydrogen and oxygen production plant, whose intellectual property pertains to AARC. Accordingly, any adjustments to the system developed under the project will be considered a substantial part of the original model and hence as the intellectual property of AARC. However, the intellectual property of the knowledge products and any results of interest to the Bank for replication as a public good will be property of the IDB.

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[12] Link to the Policies for the Procurement of Works and Goods Financed by the IDB.

[13] Link to the Financial Management Guidelines for IDB-financed Projects.