

SUMMARY OF THE PROJECT IN DESIGN * (*)

Deploying Solar Canoe Circular Business Models for the Amazon Region

PITCH ELIGIBILITY DATE		COUNTRY(IES)
06/28/2024		Ecuador
ALIGNED WITH COUNTRY STRATEGY?		
Yes		
PARTNER(S)		
Kara Solar		
PRELIMINARY CLASSIFICATION ENVIRONMENTAL AND SOCIAL IMPACT		
B (**)		
TOTAL BUDGET	IDB Lab	LOCAL COUNTERPART AND COFINANCING
US 2,250,000	US 1,000,000	US 1,250,000
DESCRIPTION		

The problem Kara Solar is addressing the problem of expensive, polluting, and inconvenient imported gasoline for transportation and electricity in remote indigenous territories of the Ecuadorian Amazon rainforest, which 1) makes river transportation and electricity prohibitively expensive, 2) contaminates delicate and vital ecosystems, and 3) increases the likelihood of continued road construction, which in turn drives deforestation and biodiversity loss, cultural degradation, and climate change.

Cumbersome supply chains create high fuel costs; across the Amazon gasoline is distributed in small planes or via long road and river routes. In Achuar territory, encompassing areas in Pastaza and Morona Santiago, and other isolated regions of the Ecuadorian Amazon, gasoline costs far more than exceed those in the rest of the country; the cost of gasoline in Sharamentsa, Pastaza, for example, is \$6 per gallon, which means that a typical 8 km shuttle boat trip costs \$6. Similarly, gasoline powered electric generation costs about \$1 per kWh.

The 2022 Ecuadorian Census reports that in Pastaza and Morona Santiago, 13% and 18% of households, respectively, do not have access to the public energy grid, the highest levels of dysconnectivity in the country. Of those disconnected households, less than one in five have access to solar energy from either government or private sources.

These same regions are also increasingly affected by water pollution. A recent study by researchers from the University of Las Américas (UDLA), in collaboration with WWF Ecuador, the National Institute of Biodiversity (INABIO) and the Royal Ontario Museum, “reveals patterns of accumulation of heavy metals in fish from the Napo and Pastaza River basins in Ecuador, including the Aguarico, Cuyabeno and Bobonaza rivers, suggesting a relationship with industrial and artisanal extraction of natural resources. The research addresses how pollution and the accumulation of heavy metals, from mining, agriculture and industry, are affecting these river basins”. Rather than exacerbating the river pollution, electric transport helps to keep waterways clean, and perhaps more significantly, provides an alternative to road creep. In response to transportation and energy challenges, many communities express support for the arrival of roads, which inevitably bring deforestation; in the Amazon, 94% of all forest loss occurs within 5km of roads.[3] Ecuador has the highest annual deforestation rate of any country in the Western Hemisphere relative to its size, and much of this is happening in the Amazon region.

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**The IDB categorizes all projects into one of six E/S impact categories. Category A projects are those with the most significant and mostly permanent E/S impacts, category B those that cause mostly local and short-term impacts, and category C those with minimal or no negative impacts. A fourth category, FI-1 (high risk) Financial Intermediary (FI)’s portfolio includes exposure to business activities with potential significant adverse environmental or social risks or impacts that are diverse, mostly irreversible or unprecedented, FI-2 (medium risk) FI’s portfolio consists of business activities that have potential limited adverse environmental or social risks or impacts, FI-3 (low risk) FI’s portfolio consists of financial exposure to business activities that predominantly have minimal or no adverse environmental and social impacts.

The solution Kara Solar is accelerating the deployment of solar powered river transportation in the Ecuadorian Amazon by developing new business models to drive commercialization, local assembly and manufacturing capacity to bring to market equipment built for Amazon conditions, and local technical services teams capable to install, maintain and guarantee the infrastructure. These actions are designed to remove the principal impediments to the infrastructure's deployment, including high upfront costs, lack of equipment built for Amazonian conditions, insufficient qualified local labor, and incomplete data on ecosystem, climate, and social benefits.

The components of our plan for the scaling the solar powered river transportation across the Ecuadorian Amazon are:

1. **Component I: Strengthening Kara Solar:** In order to continue to lead the deployment of solar powered river transportation in the Ecuadorian Amazon, Kara Solar is creating equipment and service enterprise models, designing new business models, advancing training methodologies, creating technological innovations, engaging private and public stakeholders, monitoring economic, environmental, and social impacts, organizing technical exchanges and summits, and publishing technical data on an open source digital platform.
2. **Component II: Technical services enterprise:** The second component is a self-sustaining, revenue generating service business in indigenous territories with a local ownership model and a path to scale and replicate across the Amazon and in other tropical rainforests.
3. **Component III: Equipment assembly and manufacturing spin-off:** Lastly, Kara Solar is creating a product-focused enterprise to design, build, and commercialize solar river transport equipment: electric motors, batteries, and PV systems for the Amazonian conditions. This business is designing and prototyping its first line of products.

The beneficiaries 270 households and 32 technicians will be trained. Small businesses, government institutions, or other organizations who utilize river transportation in isolated regions of the Ecuadorian Amazon will also benefit. This project can directly benefit at least 1,950 boat users, and 7,800 community energy users, collectively saving them roughly 1,170 gallons of gasoline (or \$7,020) per day, generating annual savings of 2.56m USD. In this scenario, the team of technicians employed in the manufacturing, installation and maintenance of the solar systems would number about 32. About 10% of technicians trained by Kara Solar to date have been women, and we aim to increase that over the next two years to reach at least 30% female representation.

The partner Fundación Kara Solar, an Ecuadorian intercultural non-profit organization founded in 2018.

The IDB Lab's contribution will be a combination of \$400,000 as Non-Reimbursable Technical Cooperation from IDB Lab's funding and a \$600,000 of Contingent Recovery Investment Grant from the Green Hub initiative with the main objective to support startups, industry, MSMEs and households to adopt or promote the use of renewable energy/ energy efficiency and circular economy. The project will leverage previous lessons learned by IDB Lab in electromobility in the region, including Go Boost in Dominican Republic. It will also explore collaborations with energy sector operations in the Amazon by IDB Group.

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