

ELECTRIC MOBILITY PILOT FOR PUBLIC TRANSPORTATION FROM NON-CONVENTIONAL ENERGY SOURCES AT SAN ANDRES, PROVIDENCE AND SANTA CATALINA ARCHIPELAGO, COLOMBIA.

IDB-KIAT Collaboration Project Proposal

Project Overview

Project Title	ELECTRIC MOBILITY PILOT FOR PUBLIC TRANSPORTATION FROM NON-CONVENTIONAL ENERGY SOURCES AT SAN ANDRES, PROVIDENCE AND SANTA CATALINA ARCHIPELAGO, COLOMBIA.		
Sector (sub-topics)	Energy Storage System (ESS) Micro-grid (MG) Electric Mobility Advanced Metering Infrastructure (AMI) Small scale hybrid power plant (eg. Solar + gas as backup + ESS)		
Country	Colombia	Location	San Andres, Providence and Santa Catalina
Project Duration	24 months	Budget	USD 10.000.000
Association with Other Projects	Currently the project “Research for Strengthening of Capacities in Energy Provision Services in San Andres - THINK GREEN” is taking place in the island. It consists in the installation of charging stations with storage for electric vehicles across the island, and also, it wants to train and familiarize the community with information regarding electric mobility and its benefits. The recharge points could operate as extensions to the project presented to KIAT and expand the service coverage. THINK GREEN has a duration of 36 months and the current budget is approximately USD 2.000.000.		

Table 1. Project overview.

Submitter's Information

IDB (country office)	
Name	
Position	(details to be provided when selected)
E-mail	
Telephone	

Table 2. Submitter's information.

Partner Country's Implementing Organization(s)

Partner Country Contact 1 (<i>ministerial level</i>)	
Name	
Position	(details to be provided when selected)
Organization	Ministry of Mines and Energy of Colombia
E-mail	
Partner Country Contact 2	
Name	
Position	(details to be provided when selected)
Organization	EEDAS S.A. E.S.P.
E-mail	

Table 3. Partner Country's Implementing Organization(s)

1. Project Background

Current Situation

Currently, the department of San Andres, Providence and Santa Catalina Archipelago, Colombia, produces the majority of its electric energy by burning marine diesel (fossil fuel) in two generation centers located at San Andres and Providence. This generation system sends out approximately 139.000 CO2 Ton per year, in addition with the greenhouse gasses generated by the existing 25.716 vehicle fleet, meaning a negative impact that is not aimed at the environmental conservation and protection of the region, which was declared as biosphere reserve "SEA FLOWER" by UNESCO IN 2.000.

Regarding energy production, it is important to highlight that the Archipelago is part of an ASE model (Exclusive Service Area), where electric generation, distribution and commercialization are exclusively made through a license that expires in 2030, which prevent the implementation of non conventional energy large-scale projects to supply additional electric energy to the conventional chain. In context with the previous limitation and in order to reduce environmental and health damage, two alternatives are identified in order to give a solution: to implement URE (rational and efficient use of energy), and, to replace the main fuel source for transportation.

To this effect, and as an innovative component, it is intended to address the second alternative since it does not have precedents at the region, and additionally, it can contribute to technological, economical, environmental and social development.

The current proposal is an initiative led by EEDAS S.A. E.S.P (Empresa de Energía de San Andrés, Providencia y Santa Catalina) which wants to favor the environmental component of the region through the replacement of vehicles with a public transportation pilot energized by non-conventional renewable energies.

Relevant National Development Plans, Policies, and Strategies

Among the aspects that support this kind of projects and strengthen sustainability over time, there are laws, decrees, development plans and public policies. In Colombia, these initiatives are being held by the government.

Law 1964 of 11 June 2019 promotes the use of electric vehicles in Colombia and dictates discounts for taxes, mandatory periodic techno-mechanical revisions and mandatory transit accidents insurance. Additionally, benefits are projected as exemption from restriction measures regarding circulation (with exceptions for security reasons), preferential parking spaces, among others. Article 8 proposes that certain cities have to implement public policies and actions that tend to ensure operation of electric vehicles in their massive public transportation systems. Likewise, this law has a timeline specifying a gradual transition to electric public vehicle fleets by 2035.

The Regional Development Plan 2020-2023 seeks to achieve multi-disciplinary and sustainable growth in San Andres, Providence and Santa Catalina Archipelago based on the Sustainable Development Goals for 2030. Policy 3 “Physical Infrastructure that dynamizes Economic Growth” seeks a responsible use of the ecosystems through strategies aiming energetic transformation with renewable energies, stating specifically the need of a pilot project that evaluates potential changes in the energetic source for public transportation. Policy 7 “Mobility, Transit, and Safe and Responsible Transportation” promotes alternative mobility through the inclusion of electric bicycles for touristic and community purposes, all this in order to disincentivize the massive use of motorbikes and favoring intermodal transportation.

The statements above show that Colombia and the Archipelago are in a transition to electric mobility.

Association with Other Projects/Programs

Currently the project “Research for Strengthening of Capacities in Energy Provision Services in San Andres - THINK GREEN” is taking place in the island. It consists in the installation of charging stations with storage for electric vehicles across the island, and also, it wants to train and familiarize the community with information regarding electric mobility and its benefits. The recharge points could operate as extensions to the project presented to KIAT and expand the service coverage. THINK GREEN has a duration of 36 months and the current budget is approximately USD 2.000.000.

2. Objective of the Project (Short and Long Term)

Replacing part of the existing vehicle fleet for electric buses and taxis, it is intended to reduce approximately 2.850 CO₂ Ton and 262.700 fossil fuel gallons per year generated by public transportation greenhouse emissions in the Archipelago. Also, with the inclusion of the electric bicycles, it is intended to propose an innovative and alternative transportation component to the community and tourists, in addition to the creation of employment opportunities for maintenance and operation that will benefit the community. This would be possible as long as the generation system that will provide energy to these new vehicles come from renewable energies, thus, recharging would be through a decentralized photovoltaic solar system with storage and grid backup divided into substations in order to expand the use at daytime and nighttime. The impact of this project will spread on economical, social and environmental development, and also, it will motivate and influence the community regarding new technologies related to electric mobility.

3. Project components

Component 1 - Acquisition and adaptation of electric vehicles - taxis, buses and bicycles.

- Identification and selection of public transport service providers that will be benefited with the vehicle replacement system. Also, the staff selection for the bicycle system operation and tracking and monitoring of the charging stations. This staff will be fundamental in order to sustain the project over time and to ensure a positive experience to new vehicle holders.
- Define which vehicles are required according to the needs of the region.
- Perform vehicle replacement for future holders.

Description	Quantity
Electric bus	6
Electric car	10
Electric bicycles	100
Charging stations	11

Table 4. Electric vehicles and charging stations.

Component 2 - Autonomous charging stations with solar photovoltaic systems.

- Identification of the requirements and the most suitable areas for the installation of charging stations.
- Decentralized photovoltaic solar system with storage and grid backup divided into 11 substations distributed across the islands (airports, towns and south). Approximately 570 Watts peak [kWp].

Description	Quantity/Capacity
Photovoltaic installed power. the number of modules may vary according to the nominal power found on the market	570 kWp
Inverter	11
Charge controller	11
Batteries pack	11
Energy Meter	11
Metallic elevated structure	11

Table 5. Components required for the charging stations.

Component 3 - Training, operation and maintenance.

- Formulation of an easy to understand maintenance and use guide for new holders and users.
- The electric bicycle component of the project will be given to a vulnerable community-based company (after being trained) of the region in order to create new jobs and opportunities. The buses and taxis component of the project will be given to the current transport operator.
- Training and handling programs will be developed in order to teach users and operators how to maintain and use the new system.
- From the total budget, the project will be sustained during 24 months and, after this period, the selected benefited people will be in charge of its sustainability overtime. EEDAS S.A. E.S.P. will be in charge of maintenance of the electric vehicles and the entire bicycle system (included in the budget) as a tracking and monitoring entity in order to guarantee its integrity.
- All these aims to the community appropriation of the information and usage of these new technologies in an effort to have a transition to electric transportation.

4. Project Duration, Location and Estimated Cost

- **Duration:** The project will last 24 months (2 years).
- **Location:** Department of San Andres, Providence and Santa Catalina Archipelago, Colombia. Specifically, the project would be located at San Andres and Providence islands.



Image 1. Department of San Andres, Providence and Santa Catalina Archipelago.

- **Estimated Cost:** 10.000.000 (USD)

Component	Amount (USD)
Purchase of electric vehicles (buses, taxis and bicycles) including spare parts, washing processes, insurance, taxes, among others	2.467.175,03
Autonomous charging stations with solar photovoltaic systems	4.648.702,13
Training, operation and system maintenance.	2.884.122,83
10.000.000	

Table 6. Project estimated cost.

5. Anticipated Outcome

Social dimensions

- **Employment:** Approximately 40 jobs will be created in order to carry out infrastructural adaptations, management of resources and pedagogy. Approximately 20 jobs will be created for the operation of the bicycles and maintenance of buses and cars. Buses and taxis operation jobs would be maintained and supervision will be added to ensure integrity of the fleet.
- **Mobility:** The public service would improve and benefit the community.
- **Health:** Because electric vehicles do not emit particle matter to the environment, it is expected to have a health benefit for the community.

Economical dimensions

- The Nation would save economical resources because it would not be necessary to subsidize half of the fossil fuels for transportation on electric public transport vehicles.
- The operational cost would decrease because of the shorter maintenance that electric vehicles need in comparison to the conventional. This savings could be addressed to the support and growth of a complete public vehicle fleet.

Environmental dimensions

- The project directly contributes to the actions of climate change mitigation and goes along with the Regional Development Plan 2020-2023.
- Mitigation of greenhouse gasses.
- The new vehicle fleet would not need engine lubrication oils.
- Reduction 285.000 CO₂ Ton in 10 years.

6. Project Implementing Organization

EEDAS S.A. E.S.P (Empresa de Energía de San Andrés, Providencia y Santa Catalina)

7. Required Coordination at National/Regional Level

At National level coordination with the head of the Energy sector of Colombia will be needed, therefore as result this proposal have been built jointly with the technical team of the Ministry of Minas and Energy of Colombia to work together in the future stages of this proposal. At regional level the energy company of the island will be the focal point to coordinate local actions to be develop in the frame of this proposal.

