

**CO-T1349**  
**SUPPORT TO THE PREPARATION OF GEF PROJECT CO-G1006**  
**DEMONSTRATION AND ASSESSMENT OF BATTERY-ELECTRIC BUSES**  
**FOR MASS TRANSIT IN COLOMBIA**

**Project Preparation Grant (PPG)**

**TERMS OF REFERENCE**

**1. BACKGROUND AND JUSTIFICATION**

- 1.1. The transport sector is one of the fastest growing sources of greenhouse gases (GHG) emissions in Latin-America and the Caribbean (LAC). In Colombia, in 2004, the transport sector contributed with 12% of the total GHG emissions of the country, and with 33% of the emissions from energy conversion. Measures aimed at reducing transport-related emissions could have a key impact in the overall emissions.
- 1.2. The National Urban Transport Policy (NUTP), adopted in 2002, aims at providing competitive, efficient, affordable, safe, and environmentally sound mobility options for the urban population in Colombia. NUTP calls for the implementation of BRTs and Integrated Mass Transit Systems (“Sistemas Integrados de Transporte Masivo”, (SITM)) in large cities with more than 600,000 inhabitants. SITMs, comprising BRT systems, are in operation or in construction in Seven eight large cities in Colombia: Bogotá, Soacha, Barranquilla, Bucaramanga, Cali, Cartagena, Medellín and Pereira, making Colombia a world leader in the innovation and development of sustainable, high-quality and affordable urban mobility measures.
- 1.3. The impact of SITMs and BRTs on climate change mitigation is significant, as they improve the quality of mass transit, foster a modal-shift from private to public transport, reduce congestion and travel times, and require the rationalization and renovation of urban bus fleets. According to Colombia’s Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), SITMs and BRTs in Colombian cities contribute to the reduction of 0.8 million tons of carbon dioxide equivalent (t CO<sub>2</sub>-eq) per year. Linking NUTP strategies to advanced, low-carbon vehicle technologies would amplify the policy’s effects on GHG emissions, putting mass transit in Colombia on a path to low-carbon sustainable development.
- 1.4. The power system in Colombia is dominated by hydropower generation. In 2011, hydropower contributed with 64% of the installed capacity and with 78% of total power generation. The GoC is committed to further promoting the role of renewable energy - including wind, solar and geothermal power- to maintain a comparatively low-carbon footprint of the country’s power sector.
- 1.5. The National Development Plan also sets a goal for the adoption of 5,000 clean, advanced-technology vehicles (incl. electric, hybrid and EURO V compliant vehicles). The GoC has established fiscal incentives to promote the adoption of these technologies including the reduction of import duties and the deduction of value-added-tax, the latter pending implementation by the authorities
- 1.6. The project *Demonstration and Assessment of Battery-Electric Buses for Mass Transit in Colombia* (GEF ID 5199) will help to address the technology, regulatory, financial and

awareness barriers that prevent development and widespread adoption of battery -electric buses in urban transit solutions. The proposed project will support the development and test of articulated, battery-electric buses in accordance with the requirements of Bogota´s BRT System which is, by all means, a measure that many other BRT systems or integrated transit systems follow not only within Colombia, but also around the world.

- 1.7. Under the project, BYD Company Limited (BYD), a world leader in battery technologies and battery-electric vehicles, will develop a prototype of articulated battery-electric buses, following the technical specifications set by the Ministry of Transport and TRANSMILENIO S.A.
- 1.8. The GEF project will finance the incremental costs associated to (i) testing the battery-electric bus prototype under operational conditions, (ii) the development of policies, regulations and standards for battery-electric buses adoption, (iii) building the technical capacities of relevant stakeholders and (iv) raising awareness and disseminating information on battery-electric vehicle technologies. The components, and their corresponding objectives and scope are summarized below:
- 1.9. **Component 1: Policy Development (GEF financing: US\$ 0.2M, co-financing: US\$ 0.45M)** to create favorable local and national policies and regulatory environment for the deployment of Battery Electric buses in Colombia. Expected outputs are draft policies, regulations and guidelines, technical and safety standards for vehicles and charging infrastructure, policies and guidelines for battery disposal.
- 1.10. **Component 2 Demonstration and assessment of battery-electric articulated buses Development (GEF financing: US\$ 1.7M, co-financing: US\$ 27.6M)** to determine and disseminate the performance and economics figures for the battery electric buses. Specific outputs associated to this component are, reports on the performance and economic figures obtained from the tests, bus charging infrastructure installed and operational.
- 1.11. **Component 3: Design of financial mechanisms for the deployment of battery-electric buses (GEF financing: US\$ 0.1M, co-financing: US\$ 0.2M)** that promote the purchase and use of battery-electric buses. The outputs considered are business models that simulate revenues, costs and viability of battery-electric buses.
- 1.12. **Component 4: Training Outreach and Communication (GEF financing: US\$ 0.1M, co-financing: US\$ 0.6M)** to improve awareness and knowledge of battery-electric alternatives. Expected outputs are a technology road-map for the adoption of electric vehicles, technical assessment reports and technology reviews, training of bus operation staff, transport authorities and the auto industry.
- 1.13. Fiduciary mechanisms will be put in place to ensure the flow of funds to the targeted vehicles. Implementation will involve a consultation period with active stakeholders such as government officials, bus operators, and bus providers (incl. additional technology). A monitoring program will be in place to ensure that the tests are carried out generating as much information as possible.
- 1.14. Within the GEF project cycle, after the PIF is presented, a Project Preparation Grant is approved for the IDB as GEF to invest in preparation of a Full Size Project Document in order to present it to the GEF CEO for endorsement/approval. This Consultancy will

support the preparation of preliminary activities, studies, surveys and technical documentation of the Project Document of the *Demonstration and Assessment of Battery-Electric Buses for Mass Transit in Colombia* Project, including consultations and validation with relevant stakeholders from both the public and private sectors.

## 2. OBJECTIVES

- 2.1. The objective of this Consultancy is to consolidate and prepare the execution strategy and the Project Document to be submitted for the GEF's CEO Endorsement of the Project titled "Demonstration and Assessment of Battery-Electric Buses for Mass Transit in Colombia" (GEFID 5199). This Project has already obtained preliminary approval by the GEF under the terms expressed in the corresponding Project Identification Form, attached to this request.

## 3. ACTIVITIES AND DELIVERABLES

- 3.1. The **Project Document resulting from this PPG** will include all subjects and documentation required within the GEF project cycle, including four main outcomes. All the outcomes and related activities should be oriented to fulfill the GEF project preparation requirements and documentation.
- 3.2. **Outcome 1. Review and adjustment of the structure of the PIF and preparation of a Work Plan.** This outcome will help adjust the Project's goals and strategy to maximize the project's relevance and impact, after considering the changes that have taken place in the context of "cleaner" powertrain vehicles in Colombia, particularly those related to the policies in Bogotá and also the introduction of credit lines aimed at promoting these kinds of vehicles.
- 3.3. This outcome will carry out a comprehensive literature review and will also review the current mass transit and electric vehicle context in Colombia in order to determine the current baseline for the project and the possible avenues of action on topics such as: (i) policies, plans and incentives both for mass transit, and for the use of electric-powered buses in them; (ii) technologies and standards for recharging electric vehicles, their similarities and differences and possible application to the Colombian context. Based on those avenues of action and the expected impact and relevance of each of them, the consultant will consolidate the work plan for each of the components.
- 3.4. **Outcome 2 Analysis and definition of institutional arrangements, policy development and execution mechanisms.** The proposed activities under this outcome will strengthen the institutional framework within which C40-CCI as the Execution Agency selected for the Project, will carry out its work. The activities in this outcome will include:
  - a. Definition and validation of the institutional arrangements for project implementation.
  - b. Prepare an operational manual for project implementation.
- 3.5. **Outcome 3. Draft Project Proposal.** This outcome includes the preparation of the Project Document, according to the GEF guidelines and templates. This document includes the preparation of a Monitoring and Evaluation Plan as well as the project's work, procurement and financial plan. In addition, the project's potential for green-house gas emissions reduction and socio-economic benefits need to be evaluated. The

consultant will develop the full project proposal according to GEF guidelines (See Appendix for the guidelines). Including, among others:

- a. Preparation of the project procurement plan.
- b. Preparation and validation of the Monitoring and Evaluation Plan.
- c. Prepare of financial plan including project budget and co-financing
- d. Profile of the main experts group required for the project management and implementation, including list of responsibilities for the main project officers.
- e. Assessment of the project's potential for Green-house gas emissions reduction and other environmental benefits.
- f. Assessment of the project socio-economic benefits.

- 3.6. **Outcome 4. Answering GEF's requests or comments on the project during the CEO Endorsement process.** The consultant will be expected to any comment or request from the GEF during the final consideration for CEO Endorsement and will support the preparation of any reply or answer to them.

#### 4. REPORTS

- 4.1 The consultant will prepare and submit two reports:
- a. **Report 1.** The report (max 15 annotated pages) will summarize the results from outcomes one (1) and (2) above. The report should be prepared in English and be submitted within 30 calendar days from the signature of the contract.
  - b. **Report 2.** The report should present the results from outcome 3 (three). The report should specify and elaborate on issues such as technical specifications, stakeholder participation, institutional arrangements and project feasibility in compliance with GEF project preparation templates. The report should be prepared in English and be submitted within 60 calendar days from the signature of the contract.
- 4.2 The consultant is also expected to participate in the preparation of replies to the GEF regarding any issues they may require during their consideration for CEO Endorsement.

#### 5. SCHEDULE OF PAYMENTS

- 5.1. Payments for the consulting services will be specified in the contract and will be made as follows:
- a. 20% upon contract signature;
  - b. 35% upon approval of Report 1
  - c. 35% upon approval of Report 2
  - d. 10% upon conclusión of the GEF's CEO Endorsement process

#### 6. COORDINATION

- 6.1 Team Leader or Coordinator: Roberto Esmeral (rmesmeral@iadb.org)
- 6.2 Department/Division: CCS/CCO

- 6.3 C40-CCI in their capacity as the Execution Agency for the GEF project resulting from this consultancy is expected to collaborate in the analysis, and will be expected to provide feedback on the Outcomes of the consultancy and the way in which they are documented in the Reports.

## 7. CHARACTERISTICS OF THE CONSULTANCY

- **Consultancy Category & Modality:** Consulting firm, local. Lump Sum
- **Contract Duration:** From January to May, 2013
- **Place(s) of work:** Bogotá, Colombia.

## 8. QUALIFICATIONS

- 8.1 The consultant(s) should have experience in formulation of execution of transport or transit projects, being desirable that the firm has prior experience in the formulation of GEF projects. The consultancy or the group of consultancies that carry out this job should demonstrate the following experience:
- a. At least 5 years of demonstrated professional experience in the design, operation and evaluation of transit solutions.
  - b. Experience in the design, preparation or implementation of 4 technical cooperation projects where at least one ought to be with the GEF.
  - c. Experience evaluating at least one low-carbon project in the transportation sector.
- 8.2 Expert(s) that comprise the working team specified below should help the IDB with the following tasks:
- a. A Team Leader with international experience will be head the consulting team and is responsible for the coordination of all activities.
  - b. A transport specialist that will lead the consolidation of current information and contribute to the formulation of the formulate work plan of the GEF project from the technical perspective
  - c. An Environmental Specialist that will support the analysis of all environmental impacts and will lead the preparation of the project document to be submitted for CEO Endorsement.
- 8.3 The consultant may propose additional staff as part of the team if deemed necessary and not exceeding the suggested budget for the consultancy.