## BASIC INFORMATION

### A. Basic Project Data

<table>
<thead>
<tr>
<th>Project ID</th>
<th>Parent Project ID (if any)</th>
<th>Environmental and Social Risk Classification</th>
<th>Project Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>P169272</td>
<td></td>
<td>Low</td>
<td>Transition to Electromobility in Brazilian Cities</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>Country</th>
<th>Date PID Preparted</th>
<th>Estimated Date of Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>LATIN AMERICA AND CARIBBEAN</td>
<td>Brazil</td>
<td>04-Feb-2019</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Financing Instrument</th>
<th>Borrower(s)</th>
<th>Implementing Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment Project Financing</td>
<td>Ministério das Cidades - MCidades</td>
<td>Ministério de Minas e Energia - MME</td>
</tr>
</tbody>
</table>

## PROJECT FINANCING DATA (US$, Millions)

### SUMMARY

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Project Cost</td>
<td>1.11</td>
</tr>
<tr>
<td>Total Financing</td>
<td>0.99</td>
</tr>
<tr>
<td>Financing Gap</td>
<td>0.13</td>
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</table>

### DETAILS

<table>
<thead>
<tr>
<th>Non-World Bank Group Financing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust Funds</td>
<td>0.99</td>
</tr>
<tr>
<td>Clean Technology Fund</td>
<td>0.99</td>
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</tbody>
</table>

## B. Introduction and Context

### Country Context

Brazil is the largest country in LAC and hosting 208 million population. São Paulo, the most populous city in Brazil with the 11th largest GDP in the world, is home to more than 12 million people. Brazil, as the fifth largest GHG emitter in the world in 2012, accounting for nearly 6 percent of global emissions, has a big role to play even considering the important results recently achieved with reduced deforestation.

Brazil is the regional leader of automotive manufacturing industry, regulated by the Associação Nacional dos Fabricantes de Veículos Automotores (Anfavea) since 1956. Most of the world’s large automakers are
present in Brazil, such as BYD, Fiat, Volkswagen Group, Ford, General Motors, Nissan Motors, Toyota, MAN
SE, Mitsubishi, Mercedes-Benz, Renault, Honda, Hyundai etc., accompanied with some emerging domestic
companies.

Sectoral and Institutional Context
The vehicle fleet in São Paulo jumped from 4.7 million in 1998 to 8.6 million in 2008[1], a growth of 82
percent, despite the city having, since 1996, a vehicle rotation scheme, whereby depending on the day of the
week, vehicles with specified license plates are prohibited from being used, in order to reduce pollution. In
terms of public transportation, approximately 21 percent of total trips were made by bus in 2012 (Pesquisa
Origem e Destino na RMSP) where almost every bus line is operated by private companies, under the
management of São Paulo Transporte S.A. – SPTrans. SPTrans is responsible for the operation of around 15
thousand vehicles in more than 1,300 lines. The bus fleet in São Paulo is relatively new, with about 65
percent of buses ageing 5 to 10 years while 30 percent is under 5 years and only around 5 percent of them
are more than 15 years (ICCT 2017).

According to the accelerated rate of motorization occurring since 2003 and the limited capacity of public
transport, the city of São Paulo experiences severe congestion every day. Traffic congestion increases vehicle
emissions and degrades ambient air quality causing health problems to the population. Shifting travel
patterns away from Internal Combustion Engine (ICE) cars to electric mobility (Electric Vehicles – EVs - and
electric public transportation) can provide major health and climate benefits in São Paulo. Electric
transportation plays a key role in confronting these environmental challenges as well as improving life quality
and enhancing a more attractive system for the Brazilian population. Furthermore, experience in Europe (in
cities such as Essen and Ljubljana) shows that not only does a higher quality of life attract workers and
employers, the cleantech economy is a fast growing subsector, with electric mobility as a core component

While there are some preliminary studies which analyze the barriers for a significant EV penetration into the
Brazilian market (e.g. in Feb 2018, FGV partnered with Accenture), little attention has been given to the
effects of electric mobility on the Brazilian national grid, including the regulatory, operational and
infrastructure barriers necessary to operate this disruptive technology.

When looking at the overall picture, one can look at three aspects: (i) the overall operational infrastructure
(by generation and distribution companies) and regulation to accommodate overall electric mobility; (ii)
regulation and infrastructure to accommodate privately owned electric vehicles; and (iii) regulation and
infrastructure for public transportation (in this case, electric buses).

Global experience demonstrates that most charging of EVs occurs at home and at the office. Thus, some
questions related to the distribution companies are related to their readiness, for example: what upgrades
are needed for the network to enable a scale up in EVs (e.g. transformers)? With most residents living in
condos, how is the grid set up to cover costs of individuals? Further global experience shows that while home
and office charging does not add much load to the system, but two areas require attention: (i) managing evening peak load (when people return home to charge cars); and (ii) fast charging (which enables charges almost equivalent to a internal combustion vehicle) which affects the local grid due to the significant peak charges. For the former, incentives need to be placed to dislodge the peak load (better use of ToU), and for the latter, in order to enable EV taxis or other shared electric vehicles (SAEVs), like Lyft or Uber, to operate, what are the urban plans to enable the necessary charging stations for them to operate?


Relationship to CPF
The Ministry of Environment of Brazil submitted the country's NDCs (Nationally Determined Contributions) and in coordination of Ministry of Cities and of Transport, produced a sectoral plan for mitigation and adaptation to climate change including regional transport and mobility in cities. The plan explicitly includes the need for public policies for bus fleet substitution, but does not offer specific advice on how to construct this agenda.

The Ministry of Cities of Brazil has developed a fleet financing program (REFROTA) which offers credit lines for vehicle purchase. The program is only directed to companies that hold a concession or a permission contract of urban transport services. The program was launched at the beginning of 2017 and has a budget of R$3 billion. Another recently launched urban mobility program (Avançar Cidades) aims to improve the circulation of people in urban environments through the financing of actions regarding urban mobility. Road qualification, collective public transport, non-motorized transport (active transportation) and elaboration of urban mobility plans and executive projects will be considered. The program is divided into two groups, according to the population size of the municipality. Group one is composed of all municipalities with a population equal to or less than 250 thousand inhabitants. Group two includes municipalities with a population of more than 250 thousand inhabitants.

The Ministry of Cities is also working in partnership with Inter-American Development Bank and IEMA - Institute for Energy and the Environment in the "Urban Low Carbon Mobility in Brazilian Large Cities". This program aims to develop technical tools and knowledge for planning and implementing urban mobility systems that contributes to GHGs reduction. The program aims to achieve a voluntary commitment to reduce GHGs emissions by 36.1% and 38.9%, considering the levels projected for the year 2020.

The World Bank is engaged in developing new bus concession programs and with the introduction of clean bus fleets in major metropolitan areas in Brazil. For instance, is currently working in collaboration with the metropolitan areas of São Paulo and Belo Horizonte with funding from the NDC and SFLAC (Fondo Español para América Latina y el Caribe) respectively.

The World Bank has actively engaged with the Ministry of Mines and Energy to discuss the power reform in Brazil and its impacts in the planning, tariff and financing. The implementation of EV is a technology
disruption that significantly affect the utilities business models, power system planning and operations for cities and financing approach.

Current financing mechanisms at the national level do not specify emission standards for buses, and São Paulo has been actively discussing a way to introduce emission reduction targets into the concession contracts with bus operators. Even with the current adoption of specific requirements of GHG emissions in bidding processes, there is still big uncertainty on how to put them into practice.

C. Project Development Objective(s)

Proposed Development Objective(s)
The Development Objectives are to 1) enhance the technical, financial and institutional readiness of federal government agencies and 2) support the preparation of electric bus pilot projects in selected Brazilian cities.

Key Results
The requested CTF PPG grant is planned to build on existing efforts in Brazil on clean bus implementation and provide preparation support for a strong pipeline of electric bus pilots in selected cities.

- First, the new activities under the CTF grant would share the knowledge and lessons learned from the Clean Bus Implementation TA in five LAC cities funded by the NDC Partnership Support Facility (P164403), so that it could bring the government counterparts up to speed on the enabling factors and roles of stakeholders in the electromobility agenda.
- Second, the CTF grant would be used to design a comprehensive assessment framework to understand the gaps and readiness in cities and with the framework to identify candidate cities for pilot projects. The framework should include legal, institutional, industry, contractual, financial and technical aspects in transport, energy and environment sectors that would fundamentally facilitate the transition to bus electrification.
- Third, the CTF grant would be used to establish a national implementation facility comprising of relevant federal government agencies. The facility is planned to consolidate technical capacity, unlock financial resources, harmonize policies and operational procedures, and coordinate multiple stakeholders in the run up to electromobility.
- Lastly, the grant would be used to design the roadmap of actions for the selected cities and conduct feasibility studies in preparation for the pilot project, including corridor selection, technology compatibility, infrastructure construction, grid impact analysis, electricity pricing, fare management, data collection and monitoring etc.

D. Preliminary Description
Activities/Components

Activity 1: Knowledge sharing on the topic of electromobility for federal government, cities and professional associations

- Organize workshop to disseminate the findings and recommendations on clean bus in the overall LAC region based on the NDC project

Activity 2: Design the assessment framework of enabling factors for electric bus introduction and scale-up with federal government entities

- Public Transport: Characteristics and stakeholders, route compatibility, operational costs, tendering and concessions, existing contracts, willingness to pay potentially higher fares, maintenance, stocktaking of data and experience in e-bus pilots
- Energy and Infrastructure: Available energy sources, standardization and deployment of charging facilities, energy subsidies, utilities demand management and pricing, impacts on electricity network, operational requirements and barriers in power generation and distribution, potential synergies with renewable energy
- Environment: Climate change commitments, GHG mitigation implications, bus emission standards, pollution monitoring and environmental regulations
- Funding and Financing: Funding sources, government subsidies, financing instruments and business models
- Governance and Markets: Institutions, regulations, procurement, supply of technologies and total costs of ownership

Activity 3: Identify candidate cities and apply the assessment framework to understand barriers and opportunities in local contexts

- Identify candidate cities in Brazil based on city sizes, capacities, counterpart interest and previous Bank engagement
- Apply the assessment framework to analyze gaps and readiness, barriers and opportunities of selected cities
- Develop consensus among key stakeholders, development partners and financiers on defining and preparing pilot interventions

Activity 4: Prepare the establishment of a national implementation facility and develop implementation plan for the e-bus pilots

- Prepare the establishment of a national implementation facility to select, appraise, fund and monitor the implementation of e-bus projects in Brazilian cities. The facility will support governance, technical and fiduciary aspects, which include unlocking financial resources, harmonizing policies and operational procedures, consolidating technical capacity and coordinating multiple stakeholders in implementation and supervision, and identifying scale-up opportunities.
• Develop implementation plan on the pre-identified corridors in terms of appropriate scale, scope and timeframe, and should include options of location and construction design, financing, procurement, concession, operation and maintenance protocols, revenue management, policies and regulations, charging standards, power distribution and storage, and data monitoring and evaluation plans
• Prepare customized training materials for counterparts and stakeholders to improve strategic policy making and improve technical/operational know-how

### Environmental and Social Standards Relevance

#### E. Relevant Standards

<table>
<thead>
<tr>
<th>ESS Standards</th>
<th>Relevance</th>
</tr>
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<tbody>
<tr>
<td>ESS 1</td>
<td>Assessment and Management of Environmental and Social Risks and Impacts</td>
</tr>
<tr>
<td>ESS 10</td>
<td>Stakeholder Engagement and Information Disclosure</td>
</tr>
<tr>
<td>ESS 2</td>
<td>Labor and Working Conditions</td>
</tr>
<tr>
<td>ESS 3</td>
<td>Resource Efficiency and Pollution Prevention and Management</td>
</tr>
<tr>
<td>ESS 4</td>
<td>Community Health and Safety</td>
</tr>
<tr>
<td>ESS 5</td>
<td>Land Acquisition, Restrictions on Land Use and Involuntary Resettlement</td>
</tr>
<tr>
<td>ESS 6</td>
<td>Biodiversity Conservation and Sustainable Management of Living Natural Resources</td>
</tr>
<tr>
<td>ESS 7</td>
<td>Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities</td>
</tr>
<tr>
<td>ESS 8</td>
<td>Cultural Heritage</td>
</tr>
<tr>
<td>ESS 9</td>
<td>Financial Intermediaries</td>
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### Legal Operational Policies

<table>
<thead>
<tr>
<th>Safeguard Policies</th>
<th>Triggered</th>
<th>Explanation (Optional)</th>
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</thead>
<tbody>
<tr>
<td>Projects on International Waterways OP 7.50</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Projects in Disputed Areas OP 7.60</td>
<td>No</td>
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</table>

### Summary of Screening of Environmental and Social Risks and Impacts

The screening of Environmental and Social Risks and Impacts for this TA project was based on the proposed activities and extensive work experience in other urban transport projects developed in some of the largest Brazilian cities. Despite the fact that other transportation projects had a more specific focus on improving urban transport networks and traveling times in some of the largest capitals of Brazilian states, the emphasis
on achieving concomitant gains in GHG emissions and pollutants was also present among the efforts of preparation and supervision of several other operations. This allows for a well-founded comparative evaluation and to discussion of each aspect’s relevance. Besides that, considering the Technical Assistance nature of the project and the scale of its products, risks and impacts are consequently minor, which simplifies the screening efforts. It is also important to note that work related to the project - AT activities - will not have any impact under the ESSs. Potential impacts are expected when TA’s final products (e.g., pilot plans) are implemented, which will happen beyond the project. One of the important outcomes will be to increase the client’s ability to manage potential risks after the TA has been completed, when implementing the plans. For example, the TA itself does not reduce or increase emissions, but implementation of plans after the TA closure will lead to reduced emissions.

CONTACT POINT

World Bank
Contact: Bianca Bianchi Alves
Title: Senior Urban Transport Specia
Telephone No: 1-202-473-32
Email:

Contact: Silvia Martinez Romero
Title: Senior Energy Specialist
Telephone No: 473-0065
Email:

Borrower/Client/Recipient
Borrower: Ministério das Cidades - MCidades
Contact: Alexandre Baldy de Santana Braga
Title: Ministro de Estado
Telephone No: 6121081621
Email: gabinete@cidades.gov.br

Implementing Agencies
Implementing Agency: Ministério de Minas e Energia - MME
Contact: Wellington Moreira Franco
Title: Ministro de Estado
Telephone No: 612032-5041
Email: gabinete@mme.gov.br

FOR MORE INFORMATION CONTACT

The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 473-1000
Web: http://www.worldbank.org/projects