



EXECUTIVE SUMMARY

Accelerating the Transition: A Strategy to Electrify Brazil's Bus Fleet by 2030



ITDP BRASIL

Executive Director

Clarisse Cunha Linke

Program and Communication Team

Aline Leite
Ana Nassar
André Mello
Bernardo Serra
Danielle Hoppe
Giulia Milesi
Iuri Moura
João Miranda
Juan Melo
Laís Silva
Leonardo Veiga
Lorena Freitas
Mariana Brito
Rebecca Bassi

Administrative and Financial Team

Célia Regina Alves de Souza
Livia Guimarães
Paola Lomeu
Roselene Paulino Vieira

Accelerating the Transition: A Strategy to Electrify Brazil's Bus Fleet by 2030

Coordinator

Bernardo Serra
André Mello

Authors

André Mello
Bernardo Serra
Camila Perotto (Scipopulis)
Gustavo Gonçalves (Scipopulis)
Milena Soares (Scipopulis)
Rebecca Bassi
Roberto Speicys (Scipopulis)

Collaborators

Alphonse Tam
Ana Nassar
Clarisse Cunha Linke
Juan Melo
Leonardo Veiga
Mariana Brito

Supported by

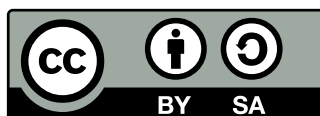


Cover photo

ITDP Brasil

Date

August, 2025



This work is licensed under a Creative Commons Attribution-ShareAlike 3.0 Brazil License. To view a copy of this license, visit: <http://creativecommons.org/licenses/by-sa/3.0/br/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA

EXECUTIVE SUMMARY

Accelerating the Transition: A Strategy to Electrify Brazil's Bus Fleet by 2030 is a study that identifies **the number of electric buses that could be implemented in the 21 most populous metropolitan regions of the country** in the short- and medium-term. It explores solutions with minimal operational impact; without the need to increase the fleet size to complement operations; and using a focused approach according to the technology and age of the vehicles. To this end, the analysis focused on diesel buses currently in operation and their travel patterns. This data was translated into energy consumption patterns that are considered compatible with the autonomy of the electric buses available on the market. Finally, it proposed a technological transition pathway that prioritizes the elimination of the least efficient vehicles,¹ thus enhancing the effects and benefits of the policy in addition to providing predictability for the industry.

The proposed analyses are built on data published by transportation agencies and materials provided by transportation managers. Where data was not publicly available, we requested information on a system's fleet inventory, operating route maps, and vehicle position history. Furthermore, data on a city's topography was also incorporated into the study to consider the influence of physical slopes on buses' operational performance, as this is a critical factor for electric vehicles in Brazil. **Of the 21 metropolitan regions that we analyzed, 18 transportation systems were selected for study, including municipal and intermunicipal systems, according to data quality and availability.**

The study was divided into three stages:



1

Presentation of manufacturers, including types and models of electric buses available on the Brazilian market,² with the aim of establishing a public transport electrification strategy that considers the supply of buses on the market;



2

Analysis of operational data from 18 systems to assess the operation of each vehicle to determine its energy consumption and its potential for replacement by an electric bus; and



3

Estimation of the proposed fleet replacement in terms of emission reductions and associated economic impacts.

The findings show that:

1. The vehicles in the largest supply in the Brazilian electric bus market are of the basic and standard types, totaling 16 different models from 9 manufacturers;
2. Adding up all vehicles in the 18 systems analyzed, the estimated electrification potential includes 14,146 standard buses;
3. São Paulo, Rio de Janeiro, Goiânia, and Belo Horizonte are the cities with the greatest potential for electrification in absolute values;
4. Belo Horizonte (Main City³ and Metropolitan Region), Curitiba (Main City and Metropolitan Region), Florianópolis (Main City), Goiânia (Metropolitan Region), Porto Alegre (Main City) and Rio de Janeiro (Main City and Metropolitan Region) are the regions that may see the largest share of their fleets replaced by electric buses in relative terms;
5. Of all GHG emissions from the public transportation systems that we analyzed, 24.64 percent come from vehicles using Euro III and Euro V technology that are more than 5 years old, with daily consumption lower than a battery's capacity;

¹ These vehicles are generally older and will need to be replaced/upgraded in the short term to comply with standards and contractual clauses.

² As of August 2024.

³ The Main City is the municipality that is generally more populous and concentrates a large share of the trips and opportunities for employment and services within the metropolitan area, thus exercising strong influence over the whole region.

6. According to estimates, replacing a Euro III and Euro V fleet that is more than 5 years old should avoid a total of 437.7 kt of CO₂eq emissions per year, which translates into annual savings ranging from R\$54.4 million to R\$62.1 million, considering only the social cost of carbon;
7. The impact analysis methodology was expanded to other Brazilian cities that do not have available operational data on their fleets in order to estimate the positive impacts of the country's New PAC/REFROTA program. The investments made in the first stage of the program include the introduction of 2,296 electric vehicles, which could reduce CO₂eq emissions in public transportation by 8.8 kton per year (7.9 percent compared to current levels). In socioeconomic terms, this fleet replacement could reduce emissions-associated costs by R\$11.6 million per year.

The findings of this study also support the adoption of measures to enhance transport decarbonization policies. The goal is to maximize the effectiveness of public investment and socioenvironmental gains in the medium-term, in addition to strengthening the transparency and management of collective public transportation systems. To this end, some recommendations aligned with federal policies have been presented, including: :



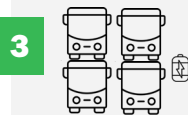
1

Improved management and governance of data and public transportation contracts;



2

Incentives for the adoption of charging strategies aligned with each system's operational demands;



3

Coordination, by the federal government, of any state and municipal procurement of electric buses involving federal funds;



AUGUST 2025

