



WORLD BANK GROUP
Transport

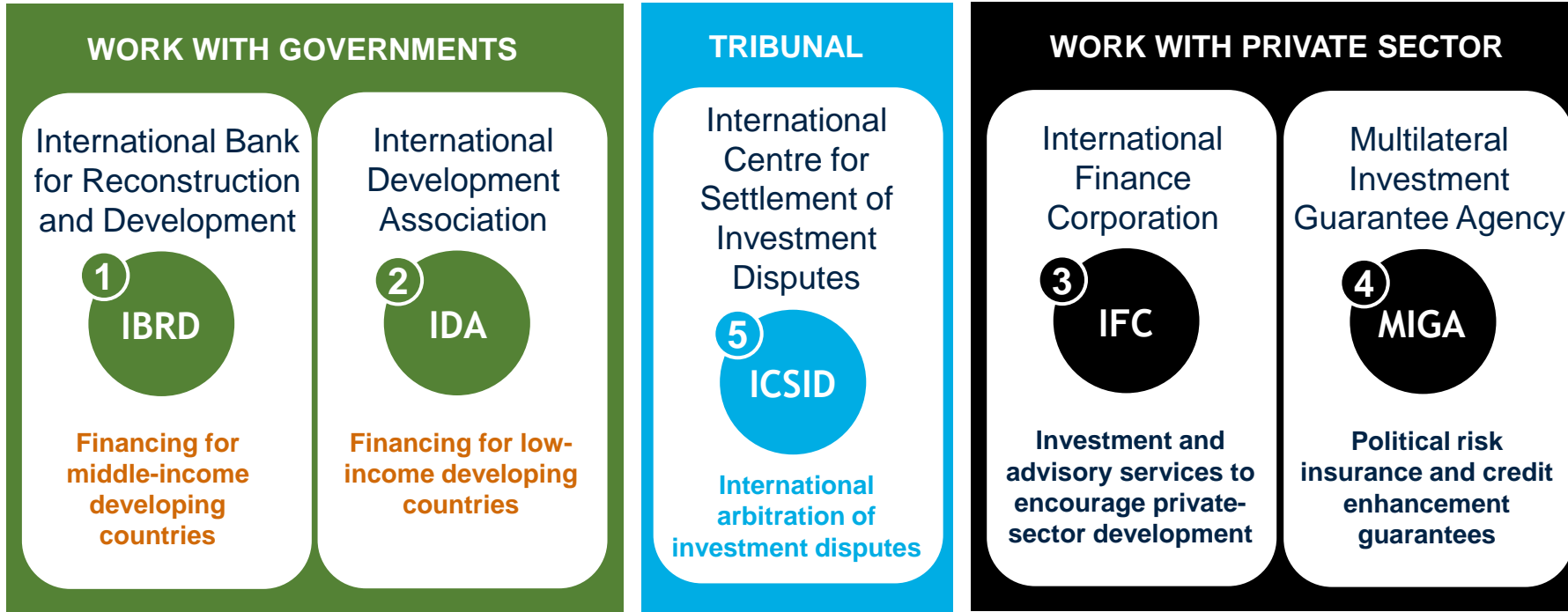
World Bank Presentation to UITP “Clean Bus Europe Platform”

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- Comprises 5 institutions, collectively known as the “*World Bank Group*”
- Mission: to end extreme poverty, promote shared prosperity and global public goods



Private sector options for financing, direct investment and guarantees are provided by MIGA and IFC.

Guarantees can also be provided through the World Bank for public-private partnerships to cover government-related risks, such as:

- Contractual risk (payment risk, performance risk, etc.)
- Regulatory risk (change in law, negotiation or cancellation of license, tariff adjustments, etc.)
- Currency risk (convertibility, transferability, etc.)
- Political risk (expropriation, war and civil disturbance, etc.)

World Bank (IBRD/IDA) Instruments for Public Sector Clients:

Investment Project Financing (IPF) provides financing to governments for activities that create the physical/social infrastructure necessary to reduce poverty and create sustainable development.

Development Policy Financing (DPF) provides budget support to governments or a political subdivision for a program of policy and institutional actions to help achieve sustainable, shared growth and poverty reduction.

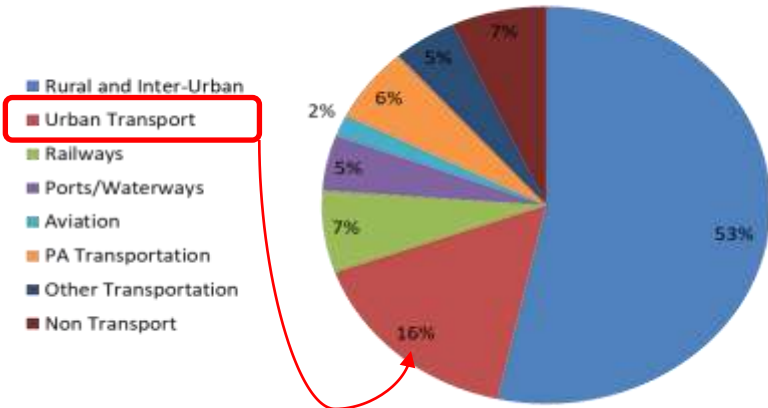
Program-for-Results (PforR) links disbursement of World Bank funds directly to the delivery of defined results, helping countries improve the design and implementation of their own development programs and achieve lasting results by strengthening institutions, enhancing systems, and building capacity.

Advisory Services and Analytics (ASA) are non-lending activities that help external clients or audiences advance a development objective.

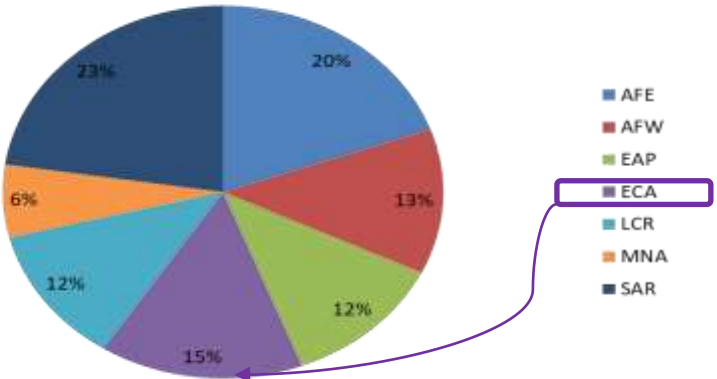
Reimbursable Advisory Services (RAS) are ASA provided in response to a request from, and paid for by, the recipient of the service (client), under a legal agreement.

The WB's active transport portfolio has 180 projects across 86 countries, and comprises USD \$36bn in commitments

Distribution by Sub-Sector



Distribution by WB Region



World Bank Transport Projects in Eastern Europe and Central Asia Region (ECA)



E-Mobility is increasingly relevant for developing countries.

Once understood as a solution only in major global markets, developing countries have more reasons than ever to care about e-mobility.

The Economics of Electric Vehicles for Passenger Transportation

Cecilia Briceno-Garmendia, Wenxin Qiao, and Vivien Foster

MOBILITY AND
TRANSPORT
CONNECTIVITY SERIES



NOVEMBER 2022

- **Why** is electric mobility for passenger transportation relevant to the developing world?
- **When/Where** does it make sense for developing countries to proactively pursue the transition?
- **How** can policymakers accelerate adoption of electric passenger vehicles?



Emissions are rising

Emissions from transport are increasing – and faster in developing countries than anywhere else

Improve local air quality

In developing country megacities, EVs can help reduce local air pollution

Last mile connectivity

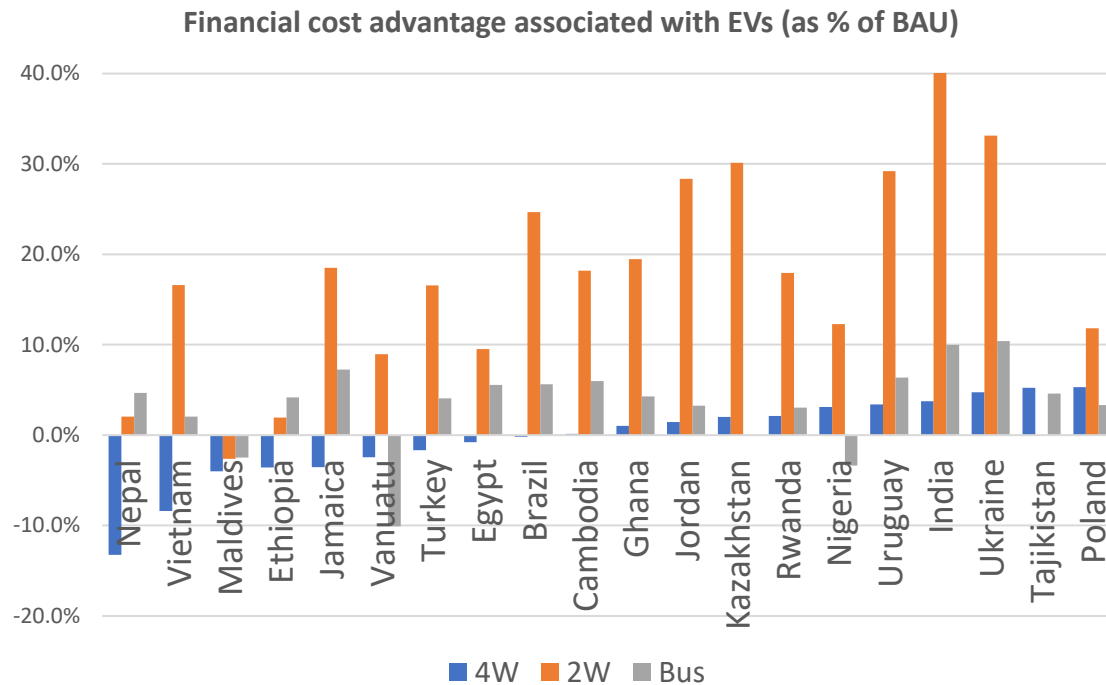
In places where public transport can't yet reach, EVs can be a nimble and affordable option

Supply chain opportunities

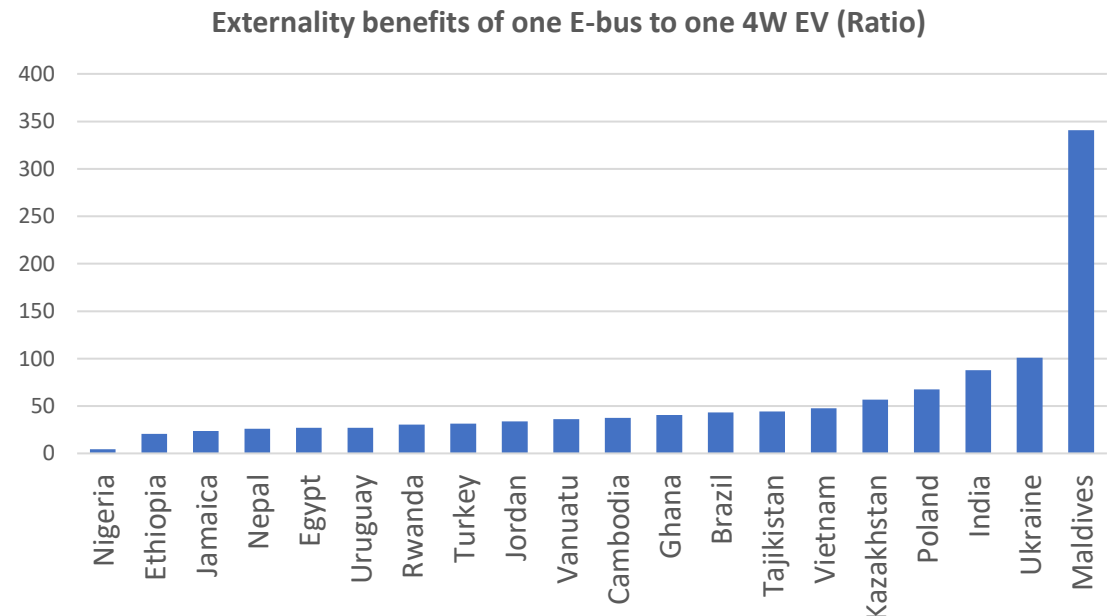
EV production offers new business opportunities and jobs

Question: Should countries prioritize electrification of certain vehicle categories, and if so, which?

Urban buses and 2/3 wheelers are much more promising than Cars in most countries



Electrifying one bus brings externality benefits that are 30x higher than electrifying one Car



Sources: World Bank, “The Economics of Electric Vehicles for Passenger Transportation” and “Electric Mobility Scoping Tool” (2022)

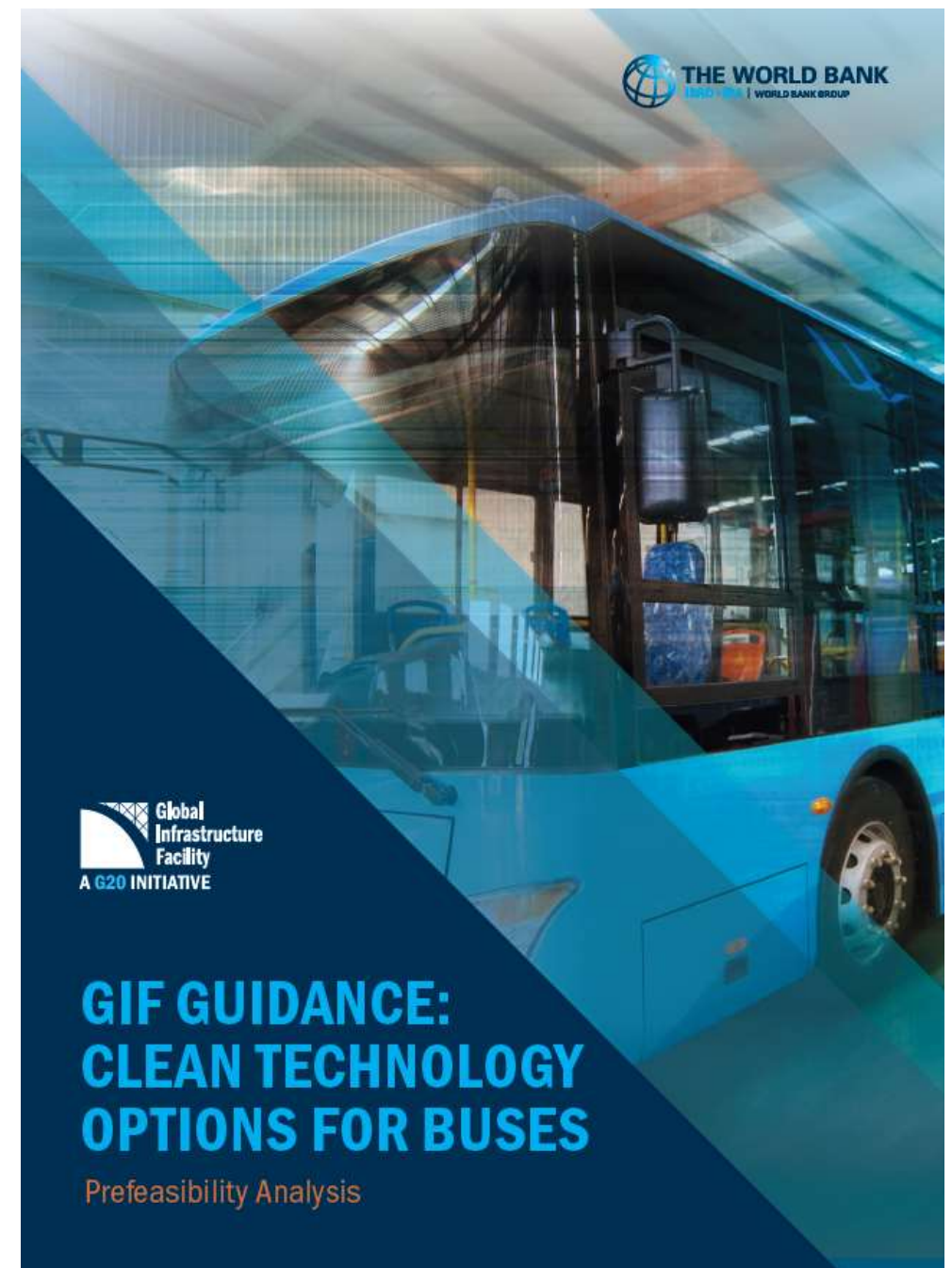
<https://www.worldbank.org/en/topic/transport/publication/the-economics-of-e-mobility-for-passenger-transportation>

Pre-Feasibility Analysis of Clean Bus Technologies

- Diesel Euro VI buses;
- Biodiesel Euro VI buses;
- Natural gas Euro VI buses (CNG and LNG);
- Hybrid diesel Euro VI buses;
- Fully electric buses (fast charge and slow charge); and
- Hydrogen fuel cell buses.

World Bank-GIF Guidance (2022) “Clean Technology Options for Buses – Prefeasibility Analysis”

<https://elibrary.worldbank.org/doi/abs/10.1596/38382>



Comparing Total Cost of Ownership (TCO) for Clean Bus Technologies

Figure 2.2: World Bank TCO Mexico City estimates (\$/km)



Figure 2.1: World Bank TCO Buenos Aires estimates (\$/km)

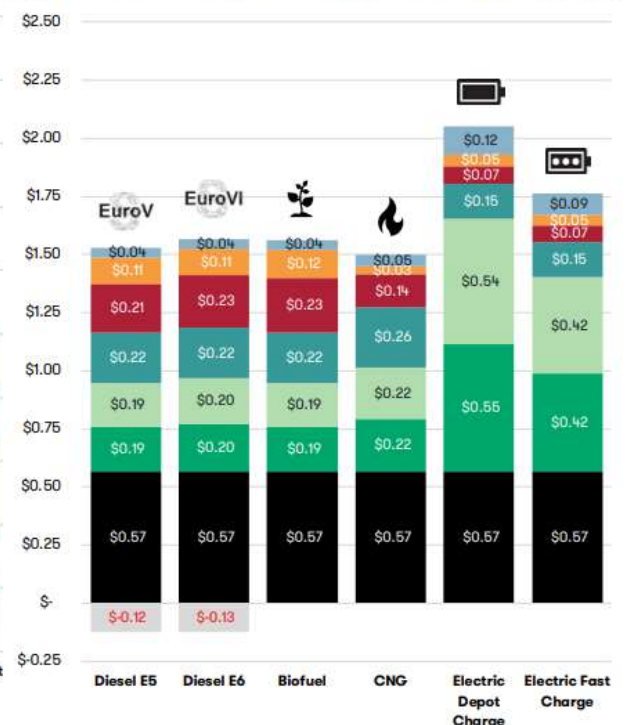
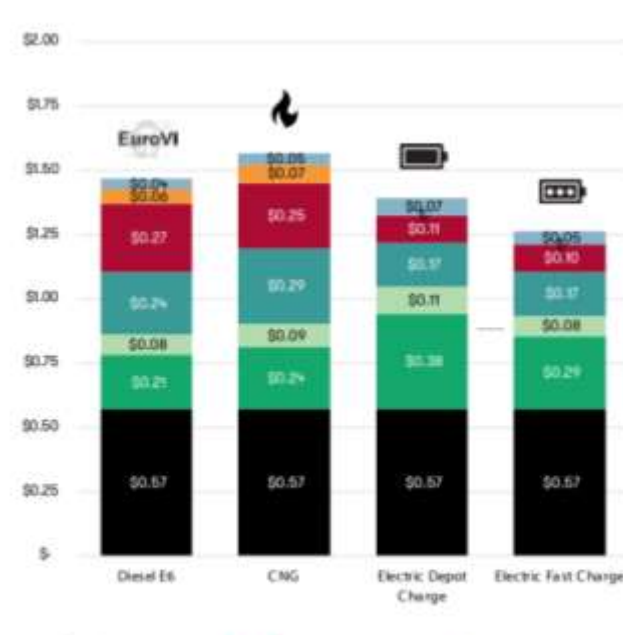


Figure 2.4: World Bank TCO São Paulo estimates (\$/km)



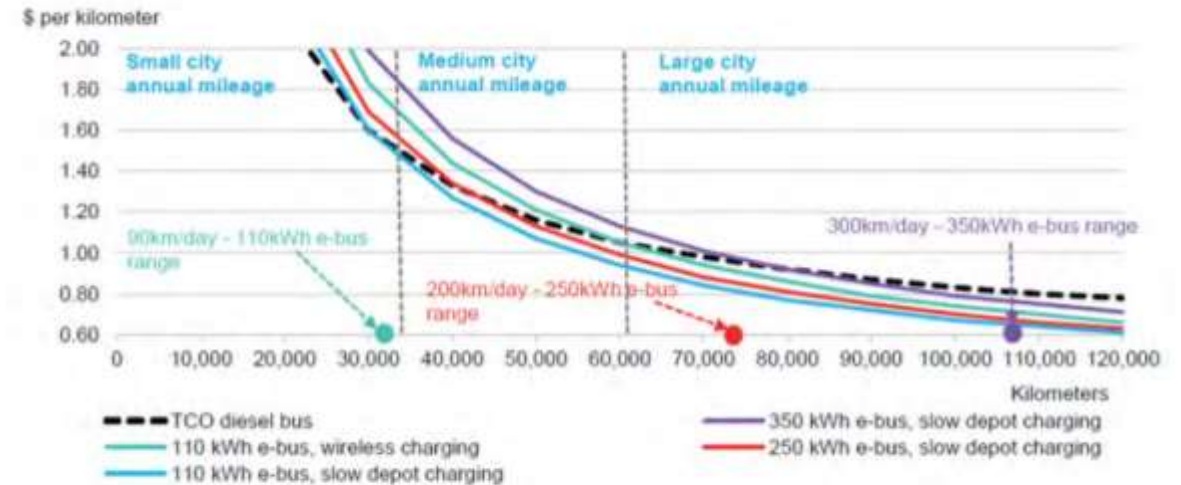
Figure 2.5: World Bank TCO Santiago estimates (\$/km)



Source: World Bank (2019) [“Green Your Bus Ride: Summary Report of Clean Bus Technologies in Latin America”](#)

Key considerations in financing electric buses

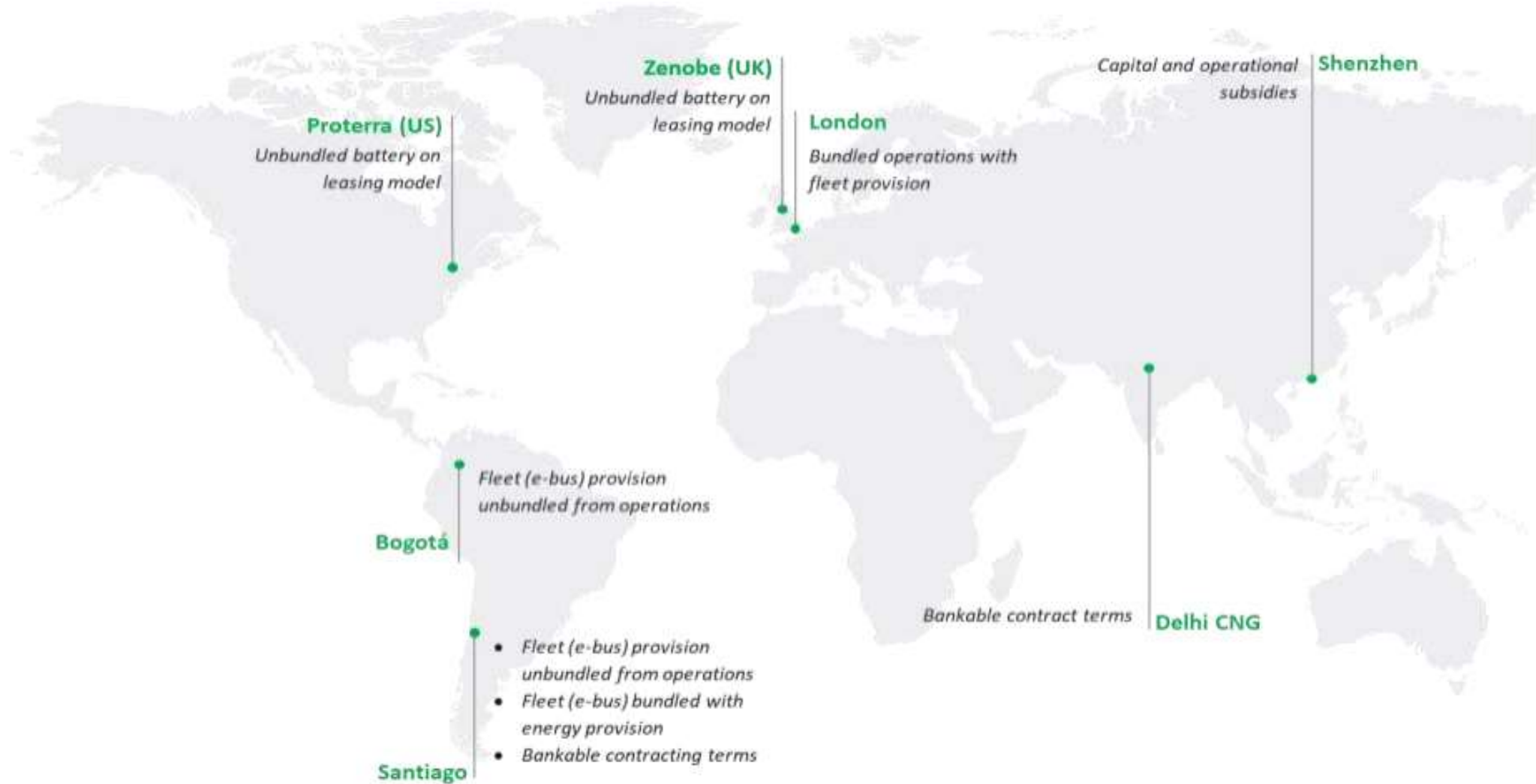
Figure 2.2: Total cost of bus ownership comparison with different annual distance driven.



Source: Bloomberg New Energy Finance, AFLEET, Advanced Clean Transit Notes: Diesel price at \$0.66/litre (\$2.5/gallon). Electricity price at \$0.10 kWh, annual km. traveled - variable. Bus route length will not always correspond.

- 1. Upfront Costs:** Although becoming more competitive, e-bus CAPEX is still greater than conventional buses.
- 2. Operating Costs:** E-buses typically have lower OPEX due to lower fuel and maintenance expenses but depends on operational factors (see figure above). Consider how to finance the long-term savings by transitioning to electric buses.
- 3. Infrastructure:** Electric buses require charging infrastructure, which may not be readily available in some countries, and may need upgrades to the electrical grid.
- 4. Local Manufacturing and Capacity Building:** Can create jobs in new industries but can also impact existing jobs and create a need to re-training bus drivers, mechanics and other staff to ensure the successful adoption of electric buses.
- 5. Regulatory Environment:** Governments can create incentives for e-bus adoption, such as tax credits or subsidies, and establish regulations that require bus fleets to transition to electric over time.
- 6. Financing Mechanisms:** If traditional methods (bank loans or bond issuances) are limited, may want to consider public-private partnerships (PPP), blended public-private finance, and different e-bus provision models.

Case Studies on E-Bus Financing/Provision Models



World Bank (2022) [“IMPROVING BANKABILITY OF E -BUS PROCUREMENT IN INDIA”](#)