

# Zero-emission vehicle deployment: Latin America

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## OVERVIEW

Latin American countries contributed 7% to global new vehicle sales in 2020. The motorization growth rate in this region is among the highest in the world.<sup>1</sup> As depicted in Figure 1, with no further ZEV policies beyond 2020 (Baseline scenario), well-to-wheel CO<sub>2</sub> emissions are projected to reach 993 million tonnes by 2050, which is a 30% increase over 2020 levels. An accelerated transition to zero-emission vehicles (ZEVs<sup>2</sup>) would offer the opportunity to curb CO<sub>2</sub> emissions by 71% below 2020 levels in 2050 (Ambitious scenario). Currently, approximately 60%<sup>3</sup> of installed power capacity in the region is derived from renewable sources. With zero tailpipe emissions, the ZEV transition can play an important role in reducing traffic-related localized air pollution and related health effects, with additional benefits if the region also decarbonizes its electricity grids.



**Figure 1.** Estimated well-to-wheel CO<sub>2</sub> emissions from cars, vans, buses, and trucks in Latin America countries (million tonnes CO<sub>2</sub> per year)

- 1 María Eugenia Rivas, Ancor Suárez-Alemán, & Tomas Serebrisky, *Stylized Urban Transportation Facts in Latin America and the Caribbean* (IADB: Washington, 2019), retrieved from the Inter-American Development Bank, [https://publications.iadb.org/publications/english/document/Stylized\\_Urban\\_Transportation\\_Facts\\_in\\_Latin\\_America\\_and\\_the\\_Caribbean\\_en\\_en.pdf](https://publications.iadb.org/publications/english/document/Stylized_Urban_Transportation_Facts_in_Latin_America_and_the_Caribbean_en_en.pdf).
- 2 Zero-emission vehicle (ZEV) technology includes battery electric vehicles and fuel cell electric vehicles.
- 3 Guy Edwards, Lisa Viscidi, & Carlos Mojica, *Charging Ahead: The Growth of Electric Car and Bus Markets in Latin American Cities*, retrieved from The Dialogue, <https://www.thedialogue.org/wp-content/uploads/2018/09/Charging-Ahead-web.pdf>.

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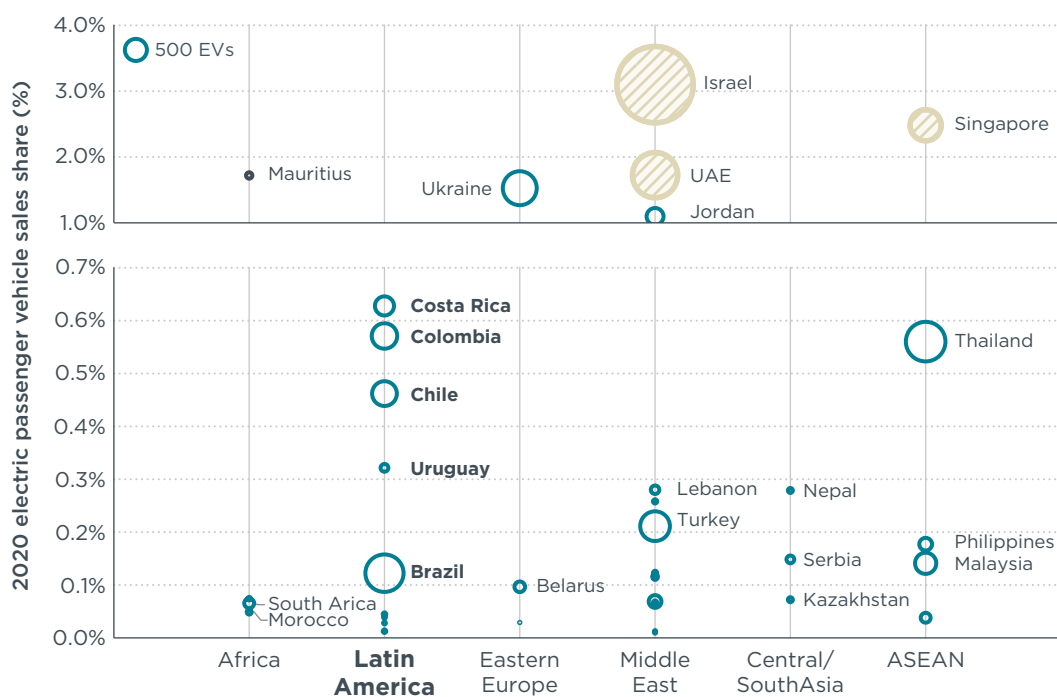
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This briefing gives an overview of the status of ZEV development in Latin American economies. A full version of the work and a complete list of references are available in the ICCT white paper “A critical review of ZEV deployment in emerging markets.” Sister briefings focused on the emerging markets of Africa, Eurasia, and ASEAN member countries can be found at [theicct.org](http://theicct.org).

## ZEV TRANSITION STATUS

Uptake of electric vehicles (EVs<sup>4</sup>) is underway in some Latin American markets for the passenger vehicle segment (Figure 2). The 2020 EV sales shares for passenger vehicles are scaling up in Costa Rica and Colombia at 0.6% each, and in Chile at 0.5%. Mexico and Brazil have higher EV sales but lower market shares due to their bigger market sizes. Mexico is the only ZEVTC member country among Latin American nations but is included in the Figure for a complete review of the region. Similar to developing countries in other regions, electric passenger car uptake is still at a very early stage in the Latin America.



**Figure 2.** EV sales share (%) for passenger vehicles of non-ZEV Transition Council (ZEVTC5) countries of key regions for 2020. Mexico is a ZEVTC country but is included for a complete review of Latin America.

Data Source: EV Volumes<sup>6</sup>; OICA<sup>7</sup>; ICCT roadmap model

With regard to vehicle segments, Chile and Colombia are home to the largest fleet of electric buses after China. By the end of 2020, Chile’s electric bus stock stood at more than 800<sup>8</sup> and Colombia had around 500 electric buses, with more on order. Argentina,

4 Electric vehicles (EVs) include battery electric vehicles, plug-in hybrid vehicles, and fuel cell electric vehicles.  
5 ZEVTC, the Zero Emission Vehicle Transition Council, is made up of Ministers and representatives from some of the world’s largest and most progressive car markets, and ZEV leading countries.  
6 EV VOLUMES.COM The Electric Vehicle World Sales Database (2020), <https://www.evvolumes.com/>.  
7 OICA, (2020), <https://www.oica.net/production-statistics/>.  
8 International Energy Agency, (2021), *Global EV Outlook 2021*, <https://iea.blob.core.windows.net/assets/ed5f4484-f556-4110-8c5c-4ede8bcba637/GlobalEVOutlook2021.pdf>.

Brazil, Ecuador, Uruguay, and Mexico have also put 20–70 electric buses into operation. Costa Rica, Panama, Paraguay, and Peru have several electric buses in pilot trials.

The Latin American region is the second largest two-wheeler market after Southeast Asia, but the electrification of two-wheelers is in the earliest stages.

## ZEV POLICY STATUS

Several countries in the Latin American region have set non-legally binding targets for ZEV sales or stock or internal combustion engine (ICE) phase-out:

- » **Colombia:** 10% of urban bus sales are to be zero-emission by 2025 and 100% by 2035.
- » **Costa Rica:** 100% of new light vehicle sales and 100% of buses and taxis are to be ZEVs by 2050.
- » **Chile:** 100% of new sales of light-duty vehicles, urban buses, and taxis to be EVs by 2035; 100% of new sales of vehicles for freight transportation, and of intercity buses, to be EVs by 2045.
- » **Ecuador:** All public transport vehicles must be electric from 2025.
- » **Mexico:** 5% of new vehicle sales to be EVs by 2030; 50% by 2040; 100% by 2050.
- » **Panama:** 25%-40% of private vehicle sales, 10%-20% of private vehicle fleet, 15%-35% of buses, and 25%-50% of public fleets to be EVs by 2030.

Table 1 categorizes existing EV policies and actions in Latin American countries active in supporting transport electrification. The five broad policy categories, including regulation, incentives, infrastructure, ZEV access, and fleet deployment, are consistent with ZEV policies identified as effective in leading ZEV countries worldwide. The “Others” category summarizes actions that could be particularly beneficial for ZEV emerging countries.

**Table 1:** Existing EV actions for selected Latin American countries

Country	Phase-out target	Regulations		Incentives		Infrastructure	Demand		Industrial development		Others		
		CO <sub>2</sub> standard	ZEV regulation	Subsidy/tax	In-use	Strategy/Support	Special fleet	Shared mobility	Manufacturing	Assembly	R&D and capacity building	Business model	International support
Brazil		●		●	●	●	●	●	●	●		●	●
Colombia	●			●	●	●	●	●				●	●
Chile	●			●	●	●	●	●					
Uruguay				●		●	●	●					●
Costa Rica	●			●	●	●	●	●	●	●			●
Mexico				●	●	●		●	●				

● indicates that a given country has at least some policy actions for the given policy category

ZEV-related interventions by countries listed in Table 1 include developing charging infrastructure, offering financial benefits to enhance EV cost-competitiveness, deploying ZEVs in government fleets, and leveraging international support for ZEV deployment.

## OPPORTUNITIES AND SUCCESS STORIES

- a) **Electrification of bus fleets:** On-road public transportation, which accounts for the majority of ridership in Latin America, represents the potential for economically viable deployment of electric public transport fleets. **Chile's** capital, Santiago, has adopted Euro VI emission standards for diesel vehicles and set a target of fully electrifying its public transportation system. Santiago embedded incentives in bus tenders that favor electric buses. **Colombia** has adopted a law that requires 100% of Mass Transport System purchases to be electric by 2035 and requires that electrification programs be financed through local governments and international banks. **Uruguay** subsidizes the purchase of electric buses. **Costa Rica** has a mandate that will replace at least 5% of the bus fleet with electric buses, biennially.
- b) **Government fleet electrification:** Electrifying government fleets could not only demonstrate the effectiveness of the new automotive technology, but also instill public confidence. **Colombia** incorporated electric motorcycles into the fleet of the Bogotá Police Department for patrolling and traffic enforcement. **Chile** and **Costa Rica** have deployed EVs for use by municipal governments and public agencies. In 2020, **Costa Rica** acquired 330 EVs, which were assigned to 35 institutions. **Brazil's** capital, Rio de Janeiro, has deployed electric trucks for urban waste collection.
- c) **Manufacturing & assembly:** Latin American countries account for around 65% of global lithium reserves.<sup>9</sup> **Bolivia, Chile** and **Argentina** possess the largest stocks, and therefore have the potential to lead battery and ZEV production and export. **Brazil** hosts an EV battery manufacturing plant and an electric bus chassis production plant. A company in **Mexico** has the capacity to assemble up to 3,000 electric delivery trucks.
- d) **Incentives:** Many Latin American countries are providing financial benefits to reduce the cost of EV purchases and operation. In **Paraguay**, EVs are exempt from import duties and VATs. **Ecuador** allows duty-free imports of charging equipment and batteries. Other financial benefits include free parking, waived toll charges, income tax benefits, reduced tariffs for charging, and government-mandated discounts on vehicle insurance.
- e) **Charging infrastructure:** A dense network of easily accessible charging stations enhances consumer confidence in ZEVs. **Costa Rica** has mandated the installation of charging stations every 80 km on national roads and every 120 km on county roads. **El Salvador** exempts EV charging services from income taxes. Integration of renewable energy and charging infrastructure has also been undertaken by countries in the region. **Ecuador** exempts charging equipment from import duties.
- f) **R&D:** In **Brazil**, a five-year research project, operated and financed by a Chinese energy utility, is studying charging behavior, evaluating grid preparedness and installation of charging infrastructure, exploring business models for charging infrastructure, and constructing an electric mobility laboratory.
- g) **Capacity building:** **Chile** developed a project to train, evaluate and certify electric bus drivers. Educational institutions have begun training future professionals for maintenance of electric buses. A training workshop on operation and maintenance of electric buses was held in 2019 in **Peru**; 55 local bus operators participated.

<sup>9</sup> Remco Perotti, & Manlio Coviello, *Governance of Strategic Minerals in Latin America: The Case of Lithium*, (Santiago: ECLAC, 2015), <https://www.cepal.org/en/publications/38961-governance-strategic-minerals-latin-america-case-lithium>.

## TOP BARRIERS AND CHALLENGES

- a) **Insufficient fiscal incentives to reduce the cost of electric passenger cars** for the highly price-sensitive consumer market, especially given the higher differential between low average ICE costs and costs of ZEVs from the dominant global manufacturers
- b) **Inadequate charging infrastructure**, which limits the functionality of ZEVs
- c) **Weak regulatory policies**, which encourage sales of lowest-cost, highly polluting, and inefficient ICE vehicles, further hindering the transition to ZEVs
- d) **Lack of ZEV model availability**, which limits the choices that meet consumers' needs
- e) **Lack of public awareness** of ZEV technologies, incentives, and charging options.

## POLICY IDEAS FOR COUNTRY COLLABORATION

- a) **Improve ZEV cost-competitiveness through fiscal incentives.** While Latin American governments are generally opposed to direct subsidies for EV buyers, these subsidies, which reduce the upfront cost to consumers, can be framed as investments, because operational savings are returned to the economy through consumer spending in other areas. Many revenue-neutral options can incentivize EVs while reducing fossil fuel consumption and CO<sub>2</sub> emissions through surcharges on conventional fuels and vehicles. Leveraging international financing and temporary exemptions from import duties can also provide support to develop EV market maturity.
- b) **Develop a dense nationwide network of charging infrastructure.** Establish mandates for installing charging stations in major municipalities and along key highways, and encourage public-private partnerships. Offer incentives for installation of home chargers and reform building norms to require installation of public chargers.
- c) **Improve EV access through ZEV manufacturing and imports.** Establish stringent fuel economy standards, designed to encourage ZEVs, and ZEV mandates to drive investment toward zero-emission technologies. Regulate imports of new and used vehicles, facilitate collaborations with international ZEV manufacturers to spur local production of quality ZEVs, batteries, ZEV components, and charging equipment.
- d) **Replicate successful financing and business models for scaling ZEVs in fleets.** Facilitate easy access to low-cost financing for various ZEV models. Encourage business engagement in ZEV technology development, such as electric ride-hailing services, delivery services, electric vehicle leasing, and battery renting and/or swapping.
- e) **Targeted electrification of two-wheelers with battery swapping or renting.** Offer direct incentives or financing benefit to electric two-wheeler production and purchase. Explore low-cost e-mobility options, such as battery swapping and renting solutions. Educate dealers to pitch electric two-wheelers to consumers.
- f) **Public awareness campaigns to spark curiosity and dispel myths.** Run ZEV educational outreach campaigns in collaboration with ZEV manufacturers, dealers, electric utilities and charging station operators. Demonstrate ZEV technology through exhibitions, ZEV experience centers and pilot programs.
- g) **Regional collaboration and coordination.** Implement a regionally coordinated effort to regulate import of new and used ICE vehicles. Collaborate with regional countries to leverage each other's ZEV-related resources, capabilities, and experiences. Develop a region-wide charging network, with uniform standards and payment mechanisms, to facilitate cross-border travel using ZEVs.

## INTERNATIONAL SUPPORT FOR A ZEV TRANSITION

Latin American countries have been recipients of financial and technical support for ZEV transitions from international financial agencies and development organizations including the Global Environment Facility (GEF), United Nations (UN), National Finance Corporation (CFN), Central American Bank for Economic Integration, and European Union (EU). Over the past five years, these organizations supported at least six countries with non-profit funding of \$7.4 million and one country with a loan of \$7.6 million<sup>10</sup> for technical and financial feasibility studies of electric buses, fleet deployment, and policy interventions and demonstration projects. The non-profit funding, on a per-country basis, ranges from \$40,000 to \$2.4 million, depending on the area of intervention.

The current international support is far from the levels needed to facilitate leapfrogging to ZEVs for non-ZEVTC countries in the region. A five-year goal to bring cumulative ZEV sales to 10% of 2020 sales of passenger vehicles, bus, and 2&3 wheelers would require funding at a rate of \$30 per kWh<sup>11</sup> of battery capacity, or about \$1.1 billion. This is a rough estimate but it reveals the gap between existing and needed international support. The funding could be used for various purposes including, but not exclusive to, technical support, policy interventions, R&D, infrastructure, financial incentives, localization of the ZEV value chain, and loan service to support ZEV leapfrogging in Latin America.

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<sup>10</sup> Statistics based on available public information. It is expected that some activities are not captured by this analysis.

<sup>11</sup> Literature shows that the battery pack cost will be \$130-\$160/kWh by 2020-2022 and will decline to \$62/kWh in 2030. The assumed \$30/kWh funding level is a rough estimate that mimics the effort to reduce EV cost as EVs reach cost parity with conventional vehicles. Nic Lutsey and Mike Nicholas, *Update on electric vehicle costs in the United States through 2030*, Working Paper 2019-06, (ICCT: Washington, DC, 2019), [https://theicct.org/sites/default/files/publications/EV\\_cost\\_2020\\_2030\\_20190401.pdf](https://theicct.org/sites/default/files/publications/EV_cost_2020_2030_20190401.pdf).