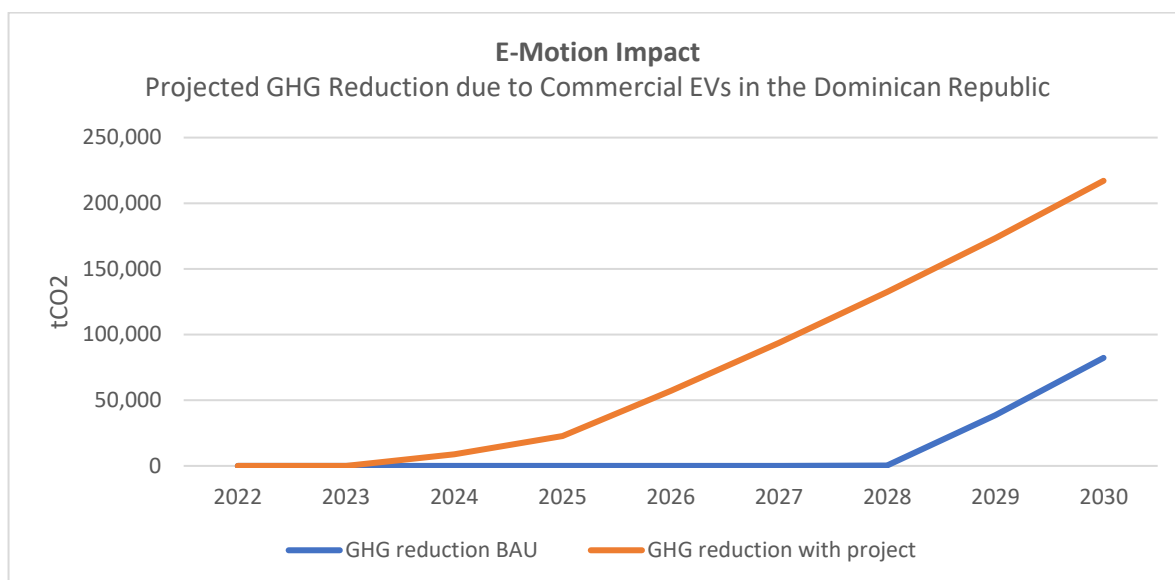


## E-Motion Summary Dominican Republic



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## Overview

1. Dominican Republic has an area of 48,442 km<sup>2</sup> and 10.7 million inhabitants. In 2019, the GDP per capita was 8,300 USD.

## Climate and Energy Policies

2. Dominican Republic's Greenhouse Gas (GHG) emissions for 2015 are estimated at 35 MtCO<sub>2e</sub> with the transport sector contributing 35%. According to the updated version of the Nationally Determined Contribution NDC-RD 2020 (Gobierno de la República Dominicana, 2020) the Dominican Republic has as target a 27% reduction of GHG emissions in relation to a Business as Usual (BAU) scenario by 2030. In terms of electric mobility, the NDC-RD proposes the (i) Electrification of the fleet of diesel buses; (ii) Renewal of public transportation vehicles, such as cabs and "conchos" with electric and hybrid vehicles; and (iii) Introduction of electric buses for school transportation service.

3. Specific plans on sustainable urban mobility have been developed, such as the Strategic Plan for Sustainable Urban Mobility of Greater Santo Domingo and the National Strategic Plan for Electric Mobility in the Dominican Republic, both developed by INTRANT in collaboration with other ministries and international entities. The National Strategic Plan for Electric Mobility aims at all modes of road transportation and has as target that 30% of official vehicles and public buses shall be electric by 2030, whilst the target for the private sector is 10%. 14,000 public charges shall be operational by 2030. By 2050 the respective goals are 100% EVs for official vehicles and public buses and 70% of all private vehicles shall be electric. For the freight sector the target for 2050 is 50% of all units to be electric.

4. In 2020 the share of renewables in total electricity generated was around 15%. The carbon grid factor of Dominican Republic is 0.643 kgCO<sub>2</sub>/kWh.

## Transport Sector

5. 2018 around 4 million vehicles were operating in the country. Road transport GHG emissions of Dominican Republic in 2018 are estimated at 7 million tCO<sub>2e</sub><sup>1</sup>. Commercial vehicles including taxis, buses and LCVs are responsible for around 30% of emissions. GHG emission from the road transport sector are expected to grow under a BAU scenario by more than 70% reaching 12 million tCO<sub>2</sub> by 2030.

## Barriers and Enabling Factors

### 6. Enabling Factors and Barriers to Commercial EVs in Dominican Republic

<b>Enabling factors</b>	<ul style="list-style-type: none"> <li>Enabling regulatory framework through the national policy on EVs, the tax incentive law, or the law to support renewable energies.</li> <li>Political interest in electric mobility expressed through the Strategic Plan for Electric Mobility.</li> </ul>
<b>Barriers</b>	<ul style="list-style-type: none"> <li>The lack of a regulations e.g. for charging infrastructure or pricing.</li> <li>A high cost of EVs.</li> <li>No specialized providers of maintenance of EVs.</li> </ul>

<sup>1</sup> Tank-to-wheel approach; well-to-wheel approach including Black Carbon: 9 MtCO<sub>2e</sub>

## Market Analysis

7. The investment in **Battery Electric Buses (BEBs)** with the current financial conditions and business models is not profitable, entails a high risk, and requires a significant increase in owners capital. BEBs will require a different financial structuring and financial incentives to be a viable business proposal in Dominican Republic. Concessional loans together with an upfront grant only resolve partially the problems of profitability, liquidity and payback time. Current electricity prices in the country are relatively high and diesel buses are used for a very long period resulting in a limited advantage of e-buses versus diesel units.

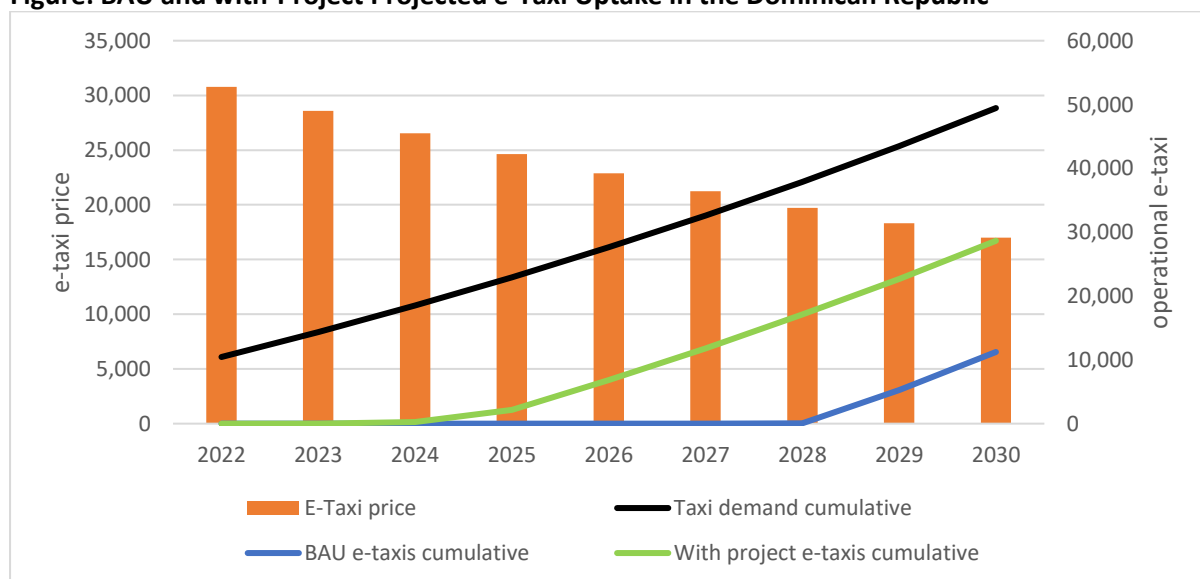
8. Under a BAU scenario BEBs in Dominican Republic will not get commercially viable prior 2030. The E-Motion program helps to get an urban bus fleet on the ground. However, as long as no significant changes of energy prices occur this will not result in a commercial uptake of electric buses.

9. The investment in **e-taxis** with current financial conditions and business models is a loss business with a considerable risk and a high demand of owner's capital. One of the major risks is that revenues will be lower with an e-taxi than with a fossil unit. Taxis are often driven with 2 shifts especially during weekends (Friday to Sunday) or on special days as this is the most profitable period. During such days the driving range of the e-taxi will be insufficient without re-charging. Home-charging takes 6-8 hours and is too slow. Also public chargers available are in general too slow. A fast-charging urban network of 100-150kW chargers is a necessity to ensure that e-taxi owners do not lose a significant part of their revenues. Therefore currently e-taxis cannot be considered a financially viable investment except for special cases such as luxury taxis or low-mileage units with very regular schedules.

10. The main impact of a concessional loan for taxis is that the payback time is reduced and that the Cash Flow would be positive. Whilst this is interesting from a liquidity perspective the core issue will remain to realize a fast-charging network.

11. Under a BAU scenario electric taxis start to get commercially viable around 2029. This can be significantly accelerated by deploying an initial fleet and especially by establishing a fast-charging infrastructure targeted to taxis (see figure below). This acceleration scenario results in additional 1.3 MtCO<sub>2e</sub> reduced, and 15 tons of PM<sub>2.5</sub> as well as 820 tons of NO<sub>x</sub> avoided. The program has a decisive impact on accelerating e-taxi deployment in Dominican Republic.

**Figure: BAU and with-Project Projected e-Taxi Uptake in the Dominican Republic**



12. The investment in **e-LCVs** with current financial conditions and business models is not profitable, has a high risk and a very long payback time. The impact of the concessional loan is very limited. Even a 20% upfront grant will not make the investment commercially attractive. At least for this vehicle segment the commercial viability is still a few years off and it is therefore recommended that the Program does not enter this market in Dominican Republic.

### Investment Projects

#### 13. Proposed Investment Projects

ID	Project	Delivery model	Expected year	CAPEX
1	112 12m BEBs for the capital city	Metropolitan Bus Service Company	2024	62 MUSD
2	150 e-taxis + urban fast-charging	Charging network through electric utility; taxis privately owned & managed; Investment of the fund only in charging network as the loan amount for taxis is too small	2024	6 MUSD
3	80 e-taxis and fast-charging network		2024	4 MUSD <sup>2</sup>

### Financial Assistance (FA)

14. FA includes concessional loans for electric buses and taxis. In the case of buses the project includes buses, charging infrastructure, grid connection and required bus depot upgrades. GCF participation in concessional loans is 30% for buses with an estimated interest rate of 0.75%. Investment grant support worth 20% of the total e-bus investment and 50% of the charging infrastructure is provided with GCF funds. In absence of such support investments will not take place.

### Technical Assistance (TA)

15. TA includes for e-buses (i) Support in the structuring of operation contracts that allow the inclusion of third parties in public transport systems; (ii) technical advisory services for e-bus options for bus-only routes. TA for e-taxis includes advice on optimal e-taxi technology and design of a fast-charging infrastructure, and a roadmap for e-taxi deployment. TA is also realized in the areas of battery policies including battery re-usage, recycling and disposal. The forementioned TA is executed by GIZ. TA is also given for project preparation (full feasibility, due diligence) of individual investment projects. Latter TA is executed by AFD.

### GCF Intervention at a Glance

#### 16. Financial Parameters

Parameter	Value
Total CAPEX excluding TA	72 MUSD
GCF Loan	19 MUSD
GCF Grant FA	13 MUSD
GCF Grant TA	2 MUSD
<b>Total GCF</b>	<b>34 MUSD</b>
<b>Co-finance ratio</b>	<b>54%</b>

<sup>2</sup> Only charging infrastructure is 1 MUSD per site

## 17. Impact Parameters

Parameter	Direct Impact	Indirect Impact	Total Impact
GHG in tons lifetime asset	140,000	1,260,000	1,400,000
PM <sub>2.5</sub> in tons lifetime asset	3	15	18
NO <sub>x</sub> in tons lifetime asset	410	810	1,220
Energy saving in TJ lifetime asset	1,820	24,000	26,000
<b>GCF cost per tCO<sub>2e</sub> avoided</b>	<b>243</b>		<b>24</b>
<b>Total cost per tCO<sub>2e</sub> avoided</b>	<b>527</b>		<b>53</b>

*Direct impact: due to investment projects*

*Indirect impact: Due to acceleration of EV deployment caused directly by the FA and the TA*