

## TC Document

### I. Basic Information for TC

▪ Country/Region:	BARBADOS
▪ TC Name:	Accelerating the transition to electromobility in Barbados
▪ TC Number:	BA-T1089
▪ Team Leader/Members:	Echeverria, Carlos Bladimir (INE/ENE) Team Leader; Doherty Bigara Rodriguez, Jennifer (CSD/CCS) Alternate Team Leader; Blenman, Shamar (CCB/CBA); Hoffman, Nathalie Alexandra (SEC/TRD); Irati Jimenez Dorronsoro (INE/ENE); Jainauth-Umrao, Naveen (VPC/FMP); Jimenez Mosquera, Javier I. (LEG/SGO); Jorge Luis Malpartida (INE/ENE); Juan Tulande Lopez (INE/ENE); Kim, Jongwoo (INE/ENE); Loana Vega (INE/ENE); Pelaez Restrepo, Johanna (VPC/FMP); Persaud, Christopher (INE/TSP)
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	
▪ Date of TC Abstract authorization:	15 Jul 2022.
▪ Beneficiary:	Government of Barbados
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	Knowledge Partnership Korea Fund for Technology and Innovation(KPK)
▪ IDB Funding Requested:	US\$450,000.00
▪ Local counterpart funding, if any:	US\$0
▪ Disbursement period (which includes Execution period):	24 months
▪ Required start date:	January 2023
▪ Types of consultants:	Firm and Individual Consultants
▪ Prepared by Unit:	INE/ENE-Energy
▪ Unit of Disbursement Responsibility:	CCB/CBA-Country Office Barbados
▪ TC included in Country Strategy (y/n):	yes
▪ TC included in CPD (y/n):	no
▪ Alignment to the Update to the Institutional Strategy 2020-2023:	Environmental sustainability; Institutional capacity and rule of law; Productivity and innovation

### II. Objectives and Justification of the TC

- 2.1 **Objectives.** The general objective of this Technical Cooperation (TC) is to support the Government of Barbados (GOB) in advancing the transition to electromobility by creating an enabling environment for the accelerated penetration of Electric Vehicles (EV). The specific objectives are to: (i) support the preparation of the legal and regulatory framework for electromobility, including the necessary regulation to carry out the policy directives included in the Barbados National Energy Policy 2019-2030 (BNEP) and the Updated Nationally Determined Contribution (NDC); (ii) support the implementation of a national electromobility program by developing studies and preparing investment analyses required to enable the deployment of electromobility projects; (iii) support the development of programs to increase the penetration of electromobility in Barbados; and (iv) promote capacity building and institutional strengthening activities on electromobility by focusing on knowledge sharing activities and training between Barbados and South Korea government authorities.

- 2.2 **Background.** In 2019, the GOB prepared the BNEP, which set an ambitious objective of transitioning the country to 100% Renewable Energy (RE) and carbon neutral state by 2030. The policy includes an interim goal of 49% reduction in fossil fuel consumption by 2023, as well as an annual decrease in fuel imports between US\$200 million and US\$400 million by 2030. As the transportation sector is responsible for approximately 33% of the energy consumption in the country, BNEP has outlined a mandate for the decarbonization of the transport sector in the country, seeking to provide measures to address the following issues: (i) energy consumption and efficiency; (ii) conversion from fossil fuel use to electricity; (iii) transportation management; (iv) fuel switching; and (v) clean energy use and emissions control.
- 2.3 BNEP states that the expansion of the local fleet of EV will be key to achieve its targets, alongside the development of alternative fuels, the use of variable RE, the stability of the electricity grid and improvements in efficiency and decarbonization. As the transport sector in Barbados heavily relies on fossil fuels, the government has explicitly mentioned the electrification of transportation in 9 out of 16 sector objectives in the BNEP, and has recently completed the assessment of EV penetration scenarios in the country, showing a clear commitment on making the sector more sustainable.
- 2.4 Aligned with BNEP objectives, the country submitted its NDC to the UNFCCC in 2021, committing to put policies in place to seek to be, by 2030, the first 100% green and fossil-fuel free island-state in the world. The NDC underlined the importance of the BNEP, and its transportation sector vision, by including a target to achieve a 100% electric or alternatively fueled vehicles in the passenger fleet<sup>1</sup>.
- 2.5 Recently, the GOB has advanced with the development of policies and studies to boost electromobility. This include the Physical Development Plan, the Sustainable Urban Mobility Plan for the Greater Bridgetown Area, and the Urban Corridor, which have been key strategies to foster further electromobility investments. Since 2012, the Ministry of Energy and Business (MEB) has been executing activities, financed through the Public Sector Smart Energy Programme (PSSEP, [BA-L1025/BA-X1003](#)) and the Sustainable Energy Investment Program (Smart Fund II, [BA-L1043/BA-G1002](#)), in which public vehicles, charging infrastructure deployment and policy development has started to set favorable conditions for electromobility in the country.
- 2.6 The Transport Authority regulates the public transport system in Barbados, based on the provisions of the Transport Authority Act 2007-28 which includes the regulation of private transport providers by stipulating the number of vehicles through licenses and approved routes, as well as monitor the public transport system, among others. Currently, the privately-owned Public Service Vehicles (PSV) consists of roughly six hundred minibuses and route taxis providing daily service to approximately 70% of commuters using public transportation.
- 2.7 Public transportation service in Barbados is provided by: (i) the Barbados Transport Board (BTB), government entity which operates 49 state-owned electric buses (about 27% of its total fleet) mobilizing approximately 24 million passengers annually. The BTB is expected to acquire 10 additional electric buses by late 2022<sup>2</sup>, which will increase the share of electric vehicles in public transportation to about 85% of the fleet

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<sup>1</sup> [Barbados 2021 Update of the First Nationally Determined Contribution.](#)

<sup>2</sup> Financed under BA-L1043 Sustainable Energy Investment Program (Smart Fund II, cofinanced with European Union grant resources).

in service. The insertion of electric buses in the national fleet started in 2020 when the GOB had made investments totaling US\$22.5 million for the acquisition of 49 electric buses, two of which were co-financed by the IDB and the European Union through the PSSEP. These investments have increased the reliability of bus service to the Barbadians while reduced the maintenance and operational costs significantly. According to a recent report from BTB, the maintenance cost of the fleet fell from US\$7.5 million in 2019 to US\$3 million in 2021 and fuels bill dropped from US\$4.1 million in 2020 to US\$2.8 million in 2021, when considering diesel and electricity costs; and (ii) privately-owned PSV, represented by the Alliance Owners of Public Transport (AOPT) and Association of Public Transport Operators (APTO) which operates fix-route taxis, regular-sized buses, and minibuses.

- 2.8 The overall vehicular fleet in Barbados is characterized by having over 136,400<sup>3</sup> registered private vehicles on the island in 2020, with a total population of 277,821. This is a ratio of approximately one vehicle for every two persons on the island, or about 1.2 vehicles for every employed person in Barbados, aged 18 years and over. In addition, the government's electric transport fleet includes 11 electric cars and vans financed with IDB loans<sup>4</sup>, which represents about 1% of the government vehicular fleet.
- 2.9 In terms of incentives, the GOB has established the following measures: (i) increase in the interest-free loan limit, from US\$25,000 to US\$50,000, for eligible public officers, to increase accessibility of electric and hybrid vehicles; (ii) a reduction of import duties, from 45% to 10%, on used EVs, fuel cell electric and solar powered vehicles; (iii) an excise tax of 20% and a VAT holiday on the purchase of electric vehicles for a period of 24 months commencing April 1, 2022; and (iv) since 2021, public procurement policy prioritizes the purchase of electric or hybrid vehicles, whenever possible.
- 2.10 **Justification.** Barbados has one of the largest EV per-capita index, not only given the government owned EVs fleet, but also considering over 500 private EVs currently in operation. Notwithstanding, the transport sector share in greenhouse gasses emissions remains high. The large stock of private vehicles, combined with the public transportation sector, are still heavily dependent on fossil fuels and consumes about 3,500 barrels of oil per day. However, a greener transport sector in Barbados still faces barriers, such as:
  - 2.11 (i) Regulation, as the sector lacks a regulatory framework and a comprehensive incentive/tariff scheme<sup>5</sup> that allows larger penetration of electric vehicles. The design of strategies, including fiscal, regulatory, and local measures for the expansion and implementation of EV projects, involving both public and private transport operators are crucial to determine sustainable pathways to increase EV deployment in Barbados.
  - 2.12 (ii) Penetration of electromobility, both in PSV and for private use is limited and constitutes an obstacle to reduce emissions and improve efficiency in the transportation system in Barbados. The limited penetration of EVs is partially explained considering that car dealerships in Barbados have restricted availability of EV models for passenger or commercial use, which discourages customer's decision

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<sup>3</sup> Alleyne, A., Drakes, C., Henry, L., Moore, W. (2021). Strategy for Electric Mobility in Barbados.

<sup>4</sup> Include BA-L1025 Public Sector Smart Energy Program (cofinanced with European Union grant resources) and BA-L1012 Deployment of Cleaner Fuels and Renewable Energies in Barbados.

<sup>5</sup> [Budgetary Proposal & Financial Statement 2022](#), Page 46.

of shifting to EVs, which is also a challenge faced by the GOB for the electrification of the public sector fleet. In general, the higher cost of EVs relative to traditional fossil fuel vehicles restricts access to loans and leases to potential buyers.

- 2.13 (iii) Infrastructure access across the country, in terms of charging infrastructure, proper waste disposal options for EV batteries and EV integration technologies are currently limited. Transitioning to a greater use of electric vehicles will need integrated plans to deploy charging infrastructure at the national level, as well as facilities and programs to support the disposal/management of electric vehicle batteries and the use of integration technologies such as Vehicle to X (V2X), which allow an EV to export the energy within its battery for another use, increasing resilience and efficiency into a power grid.
- 2.14 (iv) Capacity building, as Barbados can benefit from strengthening skills and abilities at different levels such as policymakers, government officials in charge of public transportation systems, EV fleet operators and technicians, including fostering a gender-based approach.
- 2.15 To move forward and accelerate the transition to electromobility, an integrated strategy needs to define the institutional, regulatory, technical, and environmental aspects to create an enabling environment for the massive penetration of EV expected in the next decade, not only into the transportation system in Barbados, but also in terms of its integration to the power grid and the management of asset disposition.
- 2.16 In this sense, defining a legal and regulatory framework, as well as incentive schemes and new business models or financial instruments are needed to open the EV market, which in turn, will foster the decarbonization of the transportation sector, with appropriate operation protocols for public transportation, to ensure the safety of EV users.
- 2.17 Moreover, a public vehicle replacement strategy will support the GOB to expand EV usage in government entities, while specific projects to increase the grid resilience and support a learning curve of storage services with V2X projects, will mitigate the risk of disruption of electricity services as it allows the two-ways exchange of power between buildings and utility grids with electric vehicles. These projects will test the needs and benefits of integrated deployment, hardware, software, and grid integration of EV charging infrastructure. During the implementation, customer behavior can be analyzed and the impact on greater adoption of EVs can be evaluated. Moreover, as it is usual with the introduction of new technology, there is a need for capacity building for automotive technicians, public fleet personnel, government authorities and the general population, on which training courses, and national awareness campaigns.
- 2.18 Electrifying the transportation sector is a much-needed step to reduce emissions, while also supporting the achievement of BNEP targets and independence of imported fossil fuels.
- 2.19 This TC will support the GOB to develop an overarching framework needed for electromobility transition. Activities to be financed under the TC will support, among others, to analyze feasible low-carbon and resilient transportation measures as well as regulatory, financial, environmental, infrastructural, and behavioral changes required for a green mobility system in Barbados. The TC is expected to have a direct positive impact on the consideration of fleet renovation directives, payment systems, charging infrastructure deployment, change-out plans, tracking systems, waste and demand management, alternate connectivity and accessibility measures.

- 2.20 **Knowledge sharing.** The Republic of South Korea (RSK) is a high-tech industrialized nation with particular development of battery and cell manufacturing processes, which puts the country in a privileged position in terms of electromobility. The RSK shares interesting similarities with Barbados, specifically in terms of grid and electromobility development in isolated regions such as Jeju Island. As such, in 2012 the government of the RSK launched the Carbon Free Island 2030 project (CFI 2030), a project that aims to transform Jeju Island into a carbon free and 100% renewable energy island by 2030. To put this in practice, Jeju Island was selected to lead the EV industry development, for which in 2020 the island had close to 23,000 electric vehicles (6.4% of the total vehicles on the island) and Jeju's RE generation share was ranked the highest in the country at 16.2% (757MW). Given the above, Jeju Island experience could be used as benchmark for Barbados, as knowledge sharing opportunities by showcasing the planning process and lessons learned during the creation of the enabling environment needed to overcome challenges to achieve carbon neutrality, 100% renewable energy and a fleet formed mainly by EVs.
- 2.21 **Strategic Alignment.** The TC is aligned with the Bank's country strategy of Barbados, which includes IDB support for power sector's efforts to improve efficiency and develop resilient sustainable infrastructure for climate change. Furthermore, it is consistent with the Energy Sector Framework (GN-2830-3) and with the Climate Change Sector Framework (GN-2835-8) with the principle "innovation for climate-resilient and low carbon development". And supports the climate commitments done by the GOB within its updated Nationally Determined Contribution (NDC, 2021).
- 2.22 The TC is also aligned with the Second Update of the Institutional Strategy (UIS) (AB-3190-2), through the development challenge of Productivity and Innovation by modernizing the institutional and regulatory framework as well as promoting competitiveness in the energy sector; and through the cross-cutting issues of: (i) Climate Change and Environmental Sustainability, as the activities of the TC will contribute to achieve an ambitious transition to carbon neutrality by 2030; and (ii) Institutional Capacity and the Rule of Law, as the TC supports the institutional, policy and regulatory transformation of the energy sector. Moreover, this TC will contribute to the IDB Group Corporate Results Framework 2020-2023 (GN-2727-12) with the following output indicators: (i) government effectiveness; (ii) emissions avoided; and (iii) agencies with strengthened transparency and integrity practices. Finally, the TC is aligned with the IDB's Group Climate Change Action Plan 2021-2025 (GN-2848-9) and the Sustainable Infrastructure Strategy for Competitiveness and Inclusive Growth (GN-2710-5). These initiatives intend to set the aspirational goal to achieve a fossil fuel-free economy and to reduce GHG emissions across all sectors to as close to zero as possible.

### III. Description of Activities/Components and Budget

- 3.1 **Component I: Enhance the national electromobility framework (US\$250,000).** The objective of this component is to implement a national EV strategy that will allow to increase the deployment of electric vehicles in Barbados. This component will finance: (i) an analysis of the existing legal and regulatory framework for electromobility, including the necessary regulation, incentives and fiscal measures to carry out the policies to increase the penetration of electromobility; (ii) a charging infrastructure deployment plan, which takes into consideration current market structure, power grid conditions and the existing charging infrastructure and payment mechanism currently in operation; (iii) a strategy to increase private sector investments in electromobility, including mechanisms to diversify EV types offered in the Barbados

market, such as public transportation, trucks and commercial vehicles; (iv) waste management plan, for the proper disposal and treatment of EV batteries; and (v) a public vehicle replacement strategy for government fleets. The outputs of this component are proposals for legal and regulatory framework for electromobility; and key electromobility plans and strategies.

- 3.2 **Component II: Foster electromobility project development (US\$100,000).** The objective of this component is to support activities aimed at fast tracking electromobility projects in Barbados. This component will finance: (i) a V2X scalability program, for the identification of V2X projects suitable for Barbados, considering existing power grid condition and battery storage policy; (ii) the development of financial and technical feasibility studies, including cost-benefit analysis, economic evaluation and tender documents for electromobility projects, including V2X. The outputs are a national scale V2X program and tender-ready project pipeline.
- 3.3 **Component III: Capacity building and knowledge dissemination (US\$80,000).** This component aims to provide assistance to enable effective knowledge sharing activities between Barbados and RSK. Jeju's electromobility project will be a benchmark for the cooperation with the participation of national authorities. This component will finance: (i) capacity building activities, in coordination with the RSK, such as training of adequate management of EV equipment, charging stations operations and maintenance, safety trainings (including on public buses operation), optimal management of EV fleets, and performance monitoring of EV; (ii) institutional strengthening for capacity building of sectoral ministries, and other public sector entities involved in the planning, prioritization, contracting and implementation of EV projects; and (iii) the development of a EV training plan that will identify automotive technicians needs to ensure they receive appropriate trainings and are exposed to different features of the EV technology, such as charging station maintenance, waste disposal, battery upkeep and safety trainings.

#### Indicative Budget

Activity/Component	Description	IDB/KPK	Counterpart Funding	Total Funding
<b>Component I</b>	Enhance the national electromobility framework	US\$250,000	US\$0	US\$250,000
<b>Component II</b>	Foster electromobility project development	US\$100,000	US\$0	US\$100,000
<b>Component III</b>	Capacity building and knowledge dissemination	US\$80,000	US\$0	US\$80,000
<b>Administrative support</b>	Local coordination	US\$20,000	US\$0	US\$20,000
<b>Total</b>		<b>US\$450,000</b>	<b>US\$0</b>	<b>US\$450,000</b>

#### IV. Executing agency and Execution Structure

- 4.1 At the request of the Government of Barbados (GoB), the Bank will act as the Executing Agency through the Energy Division (ENE/CBA), given the importance of addressing technical and environmental issues in a timely manner; and to guarantee

the technical coordination for the development of products. The activities to be executed under this operation have been included in the Procurement Plan and will be carried out in accordance with the Bank's established procurement methods, namely: (i) hiring of individual consultants, as established in the regulations AM-650; (ii) contracting of consulting firms for services of an intellectual nature according to GN-2765-4 and its associated operational guides (OP-1155-4) and (iii) contracting of logistics services and other services other than consulting, according to the policy GN-2303-28. This TC is classified as Operational Support, and the beneficiaries will be the population of Barbados in general, and in particular public and private ground transportation users.

## **V. Major Issues**

- 5.1 The main risk in the TC is the potential delay arising from the coordination with multiple stakeholders. Risks related to capacity within government agencies to coordinate energy, transport and fiscal objectives/incentives with potentially disparate timetables and coordination capacity. These risks may delay the delivery of the TC's products and in their dissemination; therefore, the local coordination under Component III will coordinate frequent meetings to mitigate these risks.

## **VI. Environmental and Social Strategy**

- 6.1 The ESG classification expected for this operation is (C). This TC will not finance prefeasibility or feasibility studies for investment projects with social or environmental associated studies, as such, the TC is excluded from the scope of the Social and Environmental Policy Framework of the Bank.

### **Required Annexes:**

[Request from the Client - BA-T1089](#)

[Results Matrix - BA-T1089](#)

[Terms of Reference - BA-T1089](#)

[Procurement Plan - BA-T1089](#)