TC Document

I. Basic Information for TC

▪ Country/Region:	REGIONAL
▪ TC Name:	Resiliency of Power Infrastructure and Response Preparedness for Energy Service Restoration
▪ TC Number:	RG-T4623
▪ Team Leader/Members:	Aiello, Roberto Gabriel (INE/ENE) Team Leader; Alleng, Gerard P. (CSD/CCS) Alternate Team Leader; Ruddock, Sheries Alethea (CCB/CCB); Johnson, Monique Therese Marie (CSD/RND); Juan Tulande Lopez (INE/ENE); Bonilla Merino Arturo Francisco (LEG/SGO); Masson, Malaika Ebony Anietia (INE/ENE); Brown, Kamala (CCB/CJA); Mayorga Acosta Nayeli (INE/ENE); Pineros Cely Ana Maria (INE/ENE); Sologuren Blanco, Jaime (INE/ENE); Bonzi Teixeira, Augusto Cesar (INE/ENE); Lewis, Gilroy Francis (INE/WSA); Duncan Anya Francene (CCB/CJA); Echeverria, Carlos Bladimir (INE/ENE); Ballon Lopez, Sergio Enrique (INE/ENE).
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	N/A
▪ Date of TC Abstract authorization:	27 Sep 2024.
▪ Beneficiary:	The Bahamas, Barbados, Guyana, Jamaica, Suriname, Trinidad and Tobago, and Belize.
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	United Kingdom Sustainable Infrastructure Program - Technical Assistance Window(STA)
▪ IDB Funding Requested:	US$875,000.00
▪ Local counterpart funding, if any:	US$0
▪ Disbursement period (which includes execution period)	36 months
▪ Required start date:	December 2024
▪ Types of consultants:	Firms and Individual Consultants
▪ Prepared by Unit:	INE/ENE-Energy
▪ Unit of Disbursement Responsibility:	CCB/CJA-Country Office Jamaica
▪ TC included in Country Strategy (y/n):	N
▪ TC included in CPD (y/n):	N
▪ Alignment to the Institutional Strategy 2024-2030:	Institutional capacity and rule of law; Productive development and innovation through the private sector; Regional integration; Sustainable, resilient, and inclusive infrastructure, Economic integration; Environmental sustainability

II. Objectives and Justification of the TC

2.1 The objective of this Technical Cooperation (TC) is to support The Bahamas, Barbados, Guyana, Jamaica, Suriname, Trinidad and Tobago, and Belize to adopt climate resiliency measures in the energy sector. Specifically, the TC aims to: (i) ensure that climate resiliency is addressed in planning and design of new power infrastructure, (ii) strengthen energy sector response strategies and action plans in the aftermath of natural disaster, and (iii) promote the development and adoption of harmonized energy standards.

2.2 The beneficiary countries face the characteristics of Small Island Development States (SIDS) including small individual markets, distance to global markets, constrained natural resources, a small human resource base, and poor economies of scale. Supply prices are high due to market inefficiencies, local monopolies, and weak bargaining power. COVID-19 made evident the urgency to address vulnerabilities to external shocks by economic diversification and planning for resilience towards building forward better.

2.3 Climate change is projected to exacerbate extreme weather events. Temperature indices for the Caribbean are all increasing, it's getting hotter with approx. 23 more 'hot' days and nights i.e. earlier and longer summers, and rain is more variable. There were two major region wide droughts in the last decade (2009-10, 2013-16) and there's a rise in the number of the most intense hurricanes. Energy sector assets will become exposed to operating conditions beyond their design specifications, increasing the risk of structural damage, collapse, malfunctioning, and reduced performance. Electric grid reliability and efficiency are threatened, with consequential impacts on other sectors including health, water supply, land transport and port operations. Notably under post-disaster conditions, the disruption of critical sectors may translate into severe losses in terms of ecosystems, infrastructure assets, and economic output.

2.4 Electric utilities face the challenge to respond quickly and adequately to restore electricity service and minimize losses in post-disaster circumstances. Similarly with the supply of fuels to ensure energy security. The cost of rebuilding is more expensive than investing in resilience before the next storm. Existing disaster response mechanisms in the Caribbean include: (i) CARICOM's Emergency Response Strategy and Action Plan (ERSAP); (ii) CARILEC Disaster Assistance Program (CDAP), a pooling of human resources for member utilities; (iii) Caribbean Catastrophe Risk Insurance Facility (CCRIF SPC), which offers parametric insurance policies; and (iv) Caribbean Disaster Emergency Management Agency (CDEMA), the regional inter-governmental agency responsible for comprehensive disaster management (CDM).

2.5 The ERSAP Action Plan (2023) found that disaster risk management (DRM), climate change adaptation (CCA) capacity, and pre-disaster recovery planning (PDRP) can be strengthened to meet the upcoming challenges; also, funding for response and resilience building is insufficient. The energy sector's planning for more resilient infrastructure and the response capacity is hampered by: (i) the diversity of technical standards in use; (ii) lack of regional stocks of equipment and supplies enabling fast grid repair and service recovery; (iii) lack of expedited procurement, logistics and customs clearance post-disaster; (iv) inadequate funding for system recovery and resilience building due to constrained government budgets and poor appetite of private agents to invest.

2.6 Shared emergency management strategies and swift, technically and financially robust response mechanisms are key for effective post-disaster recovery of the electric service. Given their small size, mutual support among country power utilities is critical to ensure a quick recovery and repair of national electricity systems after natural disaster events. Harmonized approaches, procedures, and technical standards are enabling factors for regional integration of the Caribbean to shape economies of scale, leverage investment capital, and attract the interest of competitive technology suppliers and system integrators. Under the baseline, progress towards the objectives lacks momentum and coordination.

2.7 Energy conservation and energy efficiency (EE) are a second pillar towards sector sustainability and resilience as they decrease the need for more generation with cost savings to the consumers. In 2019, the CARICOM Regional Energy Efficiency Building Code (CREEBC) covering residential and commercial constructions, was developed by CROSQ, CARICOM Energy Unit and ASHRAE. Regional EE standards and Minimum Energy Performance Standards (MEPS) also exist for refrigerators, lighting, and air conditioners. Yet, additional efforts are needed to promote and adopt these standards across the Caribbean.

2.8 The weak resource base and small market size of the individual countries, and the similarities in vulnerabilities and threats from global climate change and economic shocks, are the key drivers behind a regional approach to energy sector resilience. This TC is supportive to CARICOM member state policies towards a stronger internal market and assists electric utilities and governments to improve power system resiliency by making more effective use of assets and human resources and becoming more efficient.

2.9 **Institutional aspects.** This TC will be implemented by IDB's Energy Division (ENE) in coordination with its partners, primarily: the utilities and energy ministries in the beneficiary countries, and the supporting regional organizations including CARILEC, the CARICOM Secretariat Energy Division, CCREEE, and CROSQ:

2.9.1 **Ministry of Energy and Transport (MET)** from The Bahamas oversees the energy sector. Purview on tariffs and competition are under the Utilities Regulation and Competition Authority (URCA). The Bahamas Power and Light (BPL) is the public utility ascribed to MET.

2.9.2 **Barbados Ministry of Energy and Business (MEB)** is responsible for monitoring and policy development as concerning the electricity and oil and gas sector. **Barbados Light & Power Company (BLPC)** is the private-owned electric utility.

2.9.3 **Ministry of Public Utilities, Energy, Logistics and E-Governance (MPUELE)** in Belize. The Belize Energy Unit, established in 2012, plans, promotes, and manages the production, delivery, and use of energy through interventions in energy efficiency, renewable energy, and cleaner production. **Belize Electricity Limited (BEL)** is a mixed-capital company licensed to generate, transmit and distribute electric energy in Belize.

2.9.4 The **Office of the Prime Minister (OPM)** in Guyana has the policy-making and regulatory responsibility for the electricity sector, including granting public utility licenses, approval of expansion plans and performance targets**. Guyana Power and Light (GPL)** is the state-owned vertically integrated electric utility.

2.9.5 **Ministry of Science, Energy & Technology (MSET)** in Jamaica. MSET's Energy Division has the role of providing advice on policy, legislative and regulatory initiatives. **Jamaica Public Services Co. (JPSCo)** is the private-owned electric utility responsible for energy distribution and supply.

2.9.6 **The Ministry of Energy and Energy Industries (MEEI)** is responsible for the overall management of the oil, gas and minerals sectors in the Republic of Trinidad and Tobago. The **Trinidad and Tobago Electricity Commission (T&TEC)** is responsible for the supply of power and electricity to the country.

2.9.7 **Energy Authority Suriname (EAS)** is an autonomous institution, established by the Act of March 10, 2016 (State decree 2016 no. 41). The EAS performs

supervisory and steering tasks and duties aimed at establishing and promoting optimal availability, affordability and sustainability in the energy sector of Suriname.

2.9.8 **Caribbean Electric Utility Services Corporation (CARILEC)** is the association of electricity industry companies in the Caribbean, established in 1989. CARILEC's mission is to facilitate networking across its members; training and knowledge sharing; implementing mutual utility assistance programs; and accelerating the energy sector transition through innovation and advocacy. The CARILEC Secretariat is based in Castries, Saint Lucia.

2.9.9 **Caribbean Community (CARICOM)** counts fifteen Member States and five Associate Members. CARICOM Secretariat is based in Georgetown, Guyana. CARICOM was established on 4 July 1973 with the signing of the Treaty of Chaguaramas. Several CARICOM entities are relevant to this TC including CARICOM Secretariat Energy Division, CARICOM Regional Organization for Standards and Quality (CROSQ), and Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE).

2.10 **Gender dimensions.** Women are under-represented in the Caribbean electricity sector with functions showing a strong gender segregation. Energy services and post-disaster recovery efforts tend to be gender-blind, which affects the position of women (and low-income people) who are typically most heavily struck by natural disaster. The TC takes a gender-responsive approach by ensuring that women are duly presented in mapping and data collection exercises, training, and implementation of project activities.

2.11 **Strategic Alignment.** This TC is aligned with the current IDB Group Institutional Strategy: Transforming for Scale and Impact (CA-631) and the objectives: (ii) address climate change (CC); and (iii) bolster sustainable regional growth with the development of a low carbon, resilient electricity sector. It is aligned with the operational focus areas: (i) biodiversity, natural capital and climate action; (iii) institutional capacity, rule of law, and citizen security; (vi) sustainable, resilient, and inclusive infrastructure; and (vii) regional integration. It is aligned with the ONE Caribbean-Partnering for Caribbean Development Framework 2024-2027 (GN-3201-5), as it directly contributes to the climate adaptation and disaster risk management priority area and the cross-cutting area of strengthening institutions.

2.12 The TC is aligned with the Energy Sector Framework (GN-2830-8) by incorporating discussion and assessments on access to energy, sustainability, and energy security. It is also aligned with the Integration and Trade Sector Framework Document (GN-2715-11) regarding the lessons learned from the synergy between CC and trade agendas. This TC is aligned with the Gender and Diversity Sector Framework Document (GN-2800-13), as it will support a fair energy transition with equal opportunities for women and men.

2.13 The TC is strategically aligned with the United Kingdom Sustainable Infrastructure Programme (UKSIP), a British fund that provides technical assistance in LAC, its components aim to support resilience in the power sector in the Caribbean both priorities for UKSIP. The TC will include targeting policies and regulations as well as specific projects that will adopt/implement those new, more sustainable practices. to enhance regulatory frameworks and low carbon policies in key infrastructure sectors, such as the energy, to enable the market conditions for the private sector.

2.14 This TC seeks to increase energy sector resiliency and emergency response strategies. It will conduct vulnerability assessments to identify priority investments in resiliency, contribute to the adoption of regional energy standards and strengthen sector emergency recovery mechanisms and coordination. The proposed activities include technical assessments, delivery of enhanced procedures and instruments as part of recovery mechanisms, capacity building, and knowledge sharing to inform dialogues between relevant stakeholders at various levels of engagement. Special consideration will be given to dimensions such as regional energy security, planning, energy sector decarbonization, energy sector resiliency and disaster risk management, private sector participation, digitalization and innovation, gender equality and social inclusion, and opportunities for tourism development and economic integration.

2.15 This TC will be complemented by activities financed by the TC Energy Resilience for Sustainable Development in the Caribbean (RG-T4613), which is aligned with Window 1 A (Regional Public Goods) from the Ordinary Capital Strategic Development Program (OC SDP - W1A) (GN-2819-14), as it promotes cooperation and collective actions among the beneficiary countries to adopt resiliency measures in the energy sector.

III. Description of Components and Budget

3.1 **Component I. Resilient power sector architecture (US$525,000 financed by the STA-United Kingdom Sustainable Infrastructure Program - Technical Assistance Window).** This component will improve electricity sector resiliency in the beneficiary Caribbean countries through the following outputs: (i) Resilient power sector architecture strengthened by means of vulnerability mapping and investment pipeline development; and (ii) Sector resiliency and disaster response preparedness strengthened both at the national and regional level.

3.2 It will develop a pipeline of investments to upgrade energy sector infrastructure and increase sector resilience, thereby reducing the likelihood of service outages in case of natural disaster. It will conduct vulnerability assessments of critical system assets (“hot spots”) and implement technical studies of system upgrades as a basis for defining priority investments. The TC will increase awareness of resilient electricity sector technologies in the beneficiary countries. It will assess current infrastructure designs and propose upgrades to grid systems and equipment to keep up with the effects of global warming trends, including more frequent extreme events. It will provide training on resilient technology and design approaches to utility staff and other stakeholders in the beneficiary countries.

3.3 This component will further facilitate stakeholder engagement for kick-starting the regional process towards harmonization of energy sector standard, as the latter contribute to sector resiliency through reduced peak demand and system losses, while offering opportunities for economies of scale in the supply market. They further improve energy efficiency and energy conservation (EEC) thereby contributing to energy security and sector decarbonization.

3.4 **Component II. Response preparedness (US$300,000 financed by the STA-United Kingdom Sustainable Infrastructure Program - Technical Assistance Window).** This component will enable electric utilities to reduce service recovery times in the aftermath of disaster by (i) assessment of current preparedness gaps, and (ii) strengthening of recovery mechanisms and financing instruments.

3.5 It will map institutional vulnerabilities of energy sector entities that affect the integrity and effectiveness of disaster response mechanisms and identifies and prioritizes actions to address them. The TC will promote harmonized approaches for Disaster Response Management (DRM) planning and liaise with stakeholders to streamline communication protocols. It will assist electric utilities in the beneficiary countries by providing training on response strategies and updating their Disaster Response Plans (DRPs).

3.6 It will further assess mechanisms and financing instruments for service recovery, and issue recommendations for their enhancement. Identified opportunities include support for enhanced mutual assistance mechanisms including the CARILEC Disaster Assistance Program (CDAP) and parametric insurance schemes such as the Caribbean Catastrophe Risk Insurance Facility (CCRIF).

3.7 **Component III. Project Coordination (US$50,000 financed by the STA-United Kingdom Sustainable Infrastructure Program - Technical Assistance Window).** This component will facilitate coordination, provide execution support to beneficiaries, and enhance communication and visibility efforts to disseminate the TC's outcomes, thereby mitigating implementation risks. This component allocates funds for hiring coordination support, travel expenses, and event and communications budgets.

IV. Indicative Budget.

4.1 The following table provides the total amount of funding need to achieve the expected outputs by main component. The total cost of this TC will be US$875,000 which will be financed by the STA-United Kingdom Sustainable Infrastructure Program - Technical Assistance Window (UKSIP).

Table 1. Indicative Budget

Activity/Component	Description	IDB Funding	Total Funding
Component I. Resilient power sector architecture	Support the architecture of a resilient power sector	US$300,000	US$300,000
	Incorporation of resiliency in the planning and designs of all new power infrastructure	US$225,000	US$225,000
Component II. Response preparedness	Support response preparedness for service restoration.	US$300,000	US$300,000
Component III. Project Coordination	Project coordination and execution support.	US$50,000	US$50,000
Total		**US$875,000**	**US$875,000**

4.2 The proposal includes the letters of Non-Objection from the entities that will be part of the project (Annex I). The letters from the countries part of the TC not included as part of the Annex I are currently being processed.

V. Executing Agency and Execution Structure

5.1 To facilitate the development of this TC, as requested by the beneficiary countries, the execution will be carried out by the IDB's Energy Division (INE/ENE). In addition, no regional entities have been identified with the fiduciary capacities to implement the TC under IDB's rules and guidelines (OP-619-4). The TC Unit of Disbursement

Responsibility is based in Jamaica Country Office (CCB/CJA-Country Office Jamaica). Specifically, the IDB's team will have technical responsibility and will supervise the execution of this operation. This dynamic will: (i) facilitate proper articulation between the various actors within the technical dialogue framework of this TC; (ii) improve the dialogue in beneficiary Caribbean countries; and (iii) avoid fiduciary management risks eliminating the need of a financial audit.

5.2 **Steering committee**: It is comprised of representatives from the entities of the beneficiary countries and a senior representative of the FCDO's Caribbean Development Team (based in Barbados). The main functions of a Steering Committee are: (i) to analyze the development of the project's work program, procurement plan, and budget, as well as its financial and progress reports; (ii) review the terms of reference for the hiring processes to be carried out under the project; and (iii) facilitate the development of activities in order to achieve the objectives of the project, including contact and cooperation with relevant institutions in each country, the provision of the necessary information to project consultants to carry out their work, the participation in meetings and workshops organized, and the review of technical inputs and products generated within the framework of the project.

5.3 **Procurement Policies.** The Bank will be responsible for the selection and hire of the consulting services. All activities to be executed under this TC have been included in the Procurement Plan (Annex IV) and will be contracted in accordance with Bank Policy as follows: (a) Hiring of individual consultants, as established in the regulation on Complementary Workforce (AM-650) and (b) Contracting of services provided by consulting firms in accordance with the Corporate Procurement Policy (GN-2303-33) and its Guidelines.

5.4 Prior to the initiation of activities in each of the beneficiary countries, the Bank will seek the corresponding non-objection letter from the liaison country offices. The letters of No Objection from the entities that will be part of the project are included in this proposal in Annex I, those that are not included as part of the Annex I are currently being processed.

5.5 The execution and disbursement period for this TC is estimated to be 36 months.

5.6 Any knowledge products generated within the framework of this technical cooperation will be the property of the Bank and may be made available to the public under a creative commons license. However, upon request of the beneficiary, the intellectual property of said products may also be licensed and/or transferred to the beneficiary through specific agreements.

VI. Project Risks and issues

6.1 There is a moderate risk of coordination delays given the complex stakeholder setting in the region spanning multiple jurisdictions, regional entities and development partners. This risk is mitigated by streamlining the operation into IDB's energy sector portfolio and the track record in engaging with regional and national stakeholders supported by IDB's country-based specialists.

VII. Exceptions to Bank policy

7.1 No exceptions to the Bank's policies are requested.

VIII. Environmental and Social Classification

8.1 This TC will not finance feasibility or pre-feasibility studies of investment projects associated with environmental and social studies, yet it will conduct vulnerability

assessments under component 1 to identify priority investments in resiliency. Therefore, it falls within the scope of the Bank's Environmental and Social Policy Framework (ESPF).

Required Annexes:

Results Matrix_54113.pdf

Procurement Plan_5676.pdf