

TC Document

I. Basic Information for TC

▪ Country/Region:	REGIONAL
▪ TC Name:	Digital Transformation in the Energy Sector and Grid of the Future
▪ TC Number:	RG-T4513
▪ Team Leader/Members:	Irigoyen, Jose Luis (INE/ENE) Team Leader; Alarcon, Arturo (INE/ENE) Alternate Team Leader; Planas Marti, Maria Alexandra (INE/ENE); Peri Erez (INE/WSA); Juan Tulande Lopez (INE/ENE); Nayeli Mayorga (INE/ENE); Masson, Malaika Ebony Anietia (INE/ENE); Pineros Cely Ana Maria (INE/ENE); Bonzi Teixeira, Augusto Cesar (INE/ENE); Urquijo, Lee (ITE/IPS); Diaz Gill Virginia Maria (LEG/SGO); Vila Saint Etienne, Sara (LEG/SGO); Correa Poseiro, Cecilia (INE/ENE); Echeverria, Carlos Bladimir (INE/ENE); Ballon Lopez, Sergio Enrique (INE/ENE); Aiello, Roberto Gabriel (INE/ENE); Paz Gonzalez, Santiago (IFD/ICS); Paz Gonzalez, Santiago (IFD/ICS).
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	N/A
▪ Date of TC Abstract authorization:	March 19, 2024
▪ Beneficiaries:	The Bahamas, Barbados, Guyana, Jamaica, Suriname, Trinidad & Tobago, Uruguay
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	OC SDP Window 2 - Infrastructure(W2B)
▪ IDB Funding Requested:	US\$500,000.00
▪ Local counterpart funding, if any:	US\$0
▪ Disbursement period (which includes Execution period):	24 months
▪ Required start date:	August 2024
▪ Types of consultants:	Firms and individual consultants
▪ Prepared by Unit:	INE/ENE-Energy
▪ Unit of Disbursement Responsibility:	INE/ENE-Energy
▪ TC included in Country Strategy (y/n):	No
▪ TC included in CPD (y/n):	No
▪ Alignment to the IDB Group Institutional Strategy: Transforming for Scale and Impact (CA-631).	Environmental sustainability Climate Change, Regional Sustainable Growth

II. Objectives and Justification of the TC

- 2.1 The general objective of the TC is to contribute to the modernization and decarbonization of Latin America and the Caribbean's energy sector. The specific objectives are (i) to help accelerate the digital transformation of the energy sectors in LAC countries; and (ii) to study the potential of renewable energy technologies and the requirements for transmission development to contribute the decarbonization of the power sector in the context of the 2050 net-zero emission scenario under the Paris Agreement.
- 2.2 The digital transformation of the energy sector goes beyond the integration of new technologies. It involves a comprehensive shift that includes the modernization of assets, business models, tools, systems, change in organizational culture and social dynamics in the sector's enterprises. This transformation is driven by four basic pillars:

- (i) an increase in the participation of users in energy systems; (ii) a more sustainable and flexible energy generation and transmission systems; (iii) need for resilient energy systems; and (iv) a solid value chain.¹
- 2.3 However, the pace and scale of digital transformation varies considerably among different countries, particularly in the energy sector. There are significant barriers, including the need for a standard definition, inadequate regulatory frameworks, resistance to innovation, unequal distribution of costs and benefits, the absence of standardized indicators and the shortage of digital skills in the energy sector.
- 2.4 The region faces a significant challenge in their goal of providing high-quality electricity to 100% of the population and at the same time eradicating energy poverty with a sustainable supply. In this context, digital transformation emerges as a powerful tool. It is essential to highlight that digital transformation consists of implementing emerging technologies and empowering all interested parties, this involves investing in a highly skilled workforce and promoting consumer engagement through new business models and services. Adequate regulatory frameworks are crucial to guarantee a sustainable digital development.
- 2.5 While cybersecurity is a nascent topic in the region's energy sector and there is not a lot of information readily available, it is a growing concern because the service is considered critical infrastructure and there is a trend towards connecting systems to the Internet and the use of digital technologies. Cyberattacks can have serious consequences on the security and reliability of the energy supply, including service interruption and loss of critical data. Energy cybersecurity focuses on the protection of industrial process control systems, automation systems, and interconnected devices. To address this threat, appropriate cybersecurity measures must be implemented, including the identification and mitigation of vulnerabilities, continuous monitoring of systems, and strengthening the security culture in the organization.
- 2.6 To contribute to strengthening cybersecurity in the energy sector, the IDB has prepared a menu of tools: (i) Cybersecurity self-assessment tool. The tool was designed in collaboration with IFD/ICS-Cybersecurity. It is a multiple-choice questionnaire that dynamically generates a compliance score for each function and a set of specific recommendations. It serves as a basis for institutions to see how they are doing on the subject and as a basis for putting together an action plan and a budget that the IDB can then support with a TC or a loan; (ii) Cybersecurity audits. These are conducted by a company that is an expert in cybersecurity risks to evaluate the organization's cybersecurity situation and measure the existing gap with the best practices in the industry. International best practice is to perform this audit every two years; and (iii) Cybersecurity training courses. The trainings provide fundamental knowledge to implement defense strategies against possible cyberattacks against current and future threat. There are different courses for two target audiences: a 10-hour course for managers and a 40-hour course for technicians (with theoretical and practical components).
- 2.7 In 2017, the IDB prepared and published a study that identified, measured, and demonstrated the net benefits of a low-carbon interconnected electricity grid in LAC. The study determined cost-effective and technically feasible investment 2030 paths for LAC in generation and transmission. The study determined that a large share (up

¹ Inter-American Development Bank (2023) "[Roadmap for the digital transformation of the energy sector in Latin America and the Caribbean](#)".

to 80% of renewable energy could be optimally integrated into LAC's energy matrix by 2030, by mitigating their variability with more electricity interconnection links. To install renewable energy needed to meet sustainability targets, interconnections and more transmission lines are critical. Nonetheless, there exist different challenges for the development of transmission in the region, including inadequate planning practices, lack of regulatory incentives, long processes for licensing for environmental and social permits, among others. Understanding the planning and regulatory needs across the region for the development of transmission lines needed for energy transition is a priority for the sector.

- 2.8 **Strategic Alignment.** This TC is consistent with the Institutional Strategy, Transforming for Greater Impact and Scale (CA-631), under the Sustainable, Resilient, and Inclusive Infrastructure with an Emphasis on Regional Integration area of operational focus, the IDB Group has committed to boost digital transformation of the public sector as well as to foster digital infrastructure and innovative technology-based services. The TC is also aligned with the transversal areas of: (i) Climate Change and Environmental Sustainability, by promoting the decarbonization of the sector through digitalization. The TC is aligned with the 2020-2023 Corporate Results Framework (GN-2727-12) by improving the institutional capacity of governments and sectoral entities. The TC is consistent with the Energy Sector Framework (GN-2830-8) by contributing to: (i) the sustainable development of the sector; (ii) diversification of the energy matrix; and (iii) strengthening the capacity to formulate and execute energy policies. The TC is aligned with the Strategic Program for Infrastructure Development (GN-2818-1) by contributing to the generation of knowledge and dissemination of good execution practices in the region and strengthening the capacities of public institutions with responsibility. Additionally, it is aligned with the Strategic Program for the Development of Infrastructure Financed with Ordinary Capital (GN-2819-1) by strengthening the technical capacity of the public sector and promoting knowledge, and with the IDB Infrastructure Strategy: Sustainable Infrastructure for Competitiveness and Inclusive Growth (GN-2710-5) since the TC contributes to closing the digital gaps in the region. Finally, the TC is aligned with the One Caribbean: Partnering for Caribbean Development Framework 2024-2027 (GN-3201-5), as it includes activities to strengthen the countries' response to cybercrime against critical infrastructure.
- 2.9 This TC will complement previous work on digital transformation in the energy sector and complements activities related to CO-L1287, RG-L1167 and SU-L1076. Among other activities, the TC will fund cybersecurity training in CCB countries and the continuation of Salto Grande's digital transformation strategy.

III. Description of Activities/Components and Budget

- 3.1 **Component I. Digital Strategies.** This component will support at least two governments and/or electricity service provider companies to advance and develop their digitalization strategies through the support of consultancy services (firms or individuals) with the aim of improving their efficiencies and improving their performance. One of these will be the continuation of the digital transformation strategy for the binational Hydroelectric Powerplant Salto Grande (Argentina and Uruguay).
- 3.2 **Component II. Cybersecurity.** This component will finance support to develop and enhance cybersecurity capabilities through comprehensive cybersecurity self-assessments; cybersecurity audits; and targeted cybersecurity trainings

prioritizing CCB countries. It will also provide an action plan to close eventual gaps identified in the assessment.

- 3.3 **Component III. Digital AI Tools.** This component will finance the implementation of advanced open-source AI tools developed by IDB, through the support of data scientists, to address energy sector challenges in the region, such as electricity losses and solar energy optimization.
- 3.4 **Component IV. Grid of the Future.** The component will finance a study and workshops on the transmission needs (transmission for energy transition, regulation, planning) in the region.
- 3.5 The total budget for this TC is US\$500,000 from The Ordinary Capital Strategic Development Program (OC SDP), Window 2: Priority Area 2: Sustainable and Resilient Infrastructure (W2B) (GN-2819-14). The breakdown by main component is as indicated below.

Indicative Budget (US\$)

Activity/Component	Description	IDB/Fund Funding	Total Funding
I. Digitalization Strategies	Support at least two agencies in the development of digital strategies.	80,000	80,000
II. Cybersecurity	Trainings (with a gender focus) and support for audits and self-assessments.	110,000	110,000
III. Digital AI Tools	Implementation of digital AI tool.	60,000	60,000
IV. Grid of the Future	Study and workshops on the transmission needs in the region.	250,000	250,000
Total		500,000	500,000

- 3.6 **Expected Results.** The added value of this technical assistance will focus on: (i) preparation of digitalization strategies; (ii) strengthening of cybersecurity capabilities, including development of action plans; (iii) implementation of digital AI tools; and (iv) identification of transmission needs in the region and recommendations to improve planning and regulatory practices. These results are expected to be complementary to other efforts made by the Bank not only in the energy sector, but also in infrastructure and other sectors.
- 3.7 **Reporting, Monitoring and Evaluation.** The progress of this TC will be monitored through its expected results, as defined in the results matrix. The result matrix also defines the indicators and their expected schedule. The team will be responsible for monitoring the evolution of these indicators and reporting their physical and financial progress by product and component. The required information will be recorded in Convergence. The annual reports to be submitted will describe the progress towards completion of each of the TC components over their duration, presenting the degree of achievement of the output indicators and the progress towards the result matrix recorded in the updated Acquisition Plan. It will also provide relevant information to identify areas requiring improvement and lessons learned, which will be shared through blogs and other spaces to increase impact of the TC.

IV. Executing Agency and Execution Structure

- 4.1 In compliance with the Operational Guidelines for Technical Cooperation Products Revised version (GN-2629-1), this TC is classified as Client Support. At the request of the beneficiary countries, the Executing Agency (EA) of the TC will be the Bank, through the Energy Division (INE/ENE). The TC is regional, and the Bank has extensive experience and capacity to convene different actors of the countries involved, which is essential to complete this project successfully, and the cybersecurity training is a multi-country activity for which the Bank has ample experience convening.
- 4.2 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 II) and will be contracted in accordance with Bank policies as follows: (i) AM650 for Individual consultants; (ii) GN-2765-4 and Guidelines OP-1155-4 for Consulting Firms for services of an intellectual nature; and (iii) GN-2303-28 for logistics and other related services. The funding for this operation will be used to hire consultancy services. These activities are scheduled for completion within 24 months of approval of the TC. All products from this TC will be the intellectual property of the Bank. On November 22, 2023, the IDB Corporate Procurement Policy (GN-2303-33) was approved by the Board of Executive Directors. This policy will come into effect on July 1, 2024. This new policy replaces the current policies contained in documents GN-2303-28 and GN2765-4. Therefore, starting July 1, 2024, all contracting of consulting firms and logistical services and other services different from consulting will be conducted following this new Policy GN-2303-33 and its associated guidelines. On November 22, 2023, the IDB Corporate Procurement Policy (GN-2303-33) was approved by the Board of Executive Directors. This policy will come into effect on July 1, 2024. This new policy replaces the current policies contained in documents GN-2303-28 and GN2765-4. Therefore, starting July 1, 2024, all contracting of consulting firms and logistical services and other services different from consulting will be conducted following this new Policy GN-2303-33 and its associated guidelines.
- 4.3 The Procurement Plan (Annex II) includes two Single Source Selecting Processes (SSS). For the first contract of Component I we have identified Hart consulting, which has been selected to support Salto Grande with advancing their digital strategy given their exceptional knowledge of Salto Grande's digital strategy from their previous support to this organization. For the cybersecurity trainings, we have selected Tecnalía. This firm developed and delivers a unique set of training tailored for the energy sector and for two different levels of professionals, key for the TC's objectives.
- 4.4 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.

V. Major Issues

- 5.1 No major risks are anticipated for this TC. A moderate risk identified is the lack of demand for digital strategies and pilots. This risk is mitigated by close dialogue with the beneficiary countries and early identification of demands. Elections in some of the beneficiary countries during the implementation period of this TC could result in delays. This risk is mitigated through a close dialogue with Sectorial Ministries highlighting the technical nature of the TC's activities.

VI. Exceptions to Bank Policy

- 6.1 No exceptions to the Bank's policies are identified.

VII. Environmental and Social Strategy

- 7.1 This TC will not finance feasibility or pre-feasibility studies of investment projects with associated environmental and social studies; therefore, it is excluded from the scope of the Bank's Environmental and Social Policy Framework (ESPF).

Required Annexes:

[Request from the Client_40003.pdf](#)

[Results Matrix_88359.pdf](#)

[Terms of Reference_1501.pdf](#)

[Procurement Plan_31537.pdf](#)