**TC ABSTRACT**

**I. Basic Project Data**

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| ▪ Country/Region: | PARAGUAY/CSC - Southern Cone |
| ▪ TC Name: | Supporting the Preparation and Implementation of Clean Energy Projects under PR-O0004 and PR-L1156 |
| ▪ TC Number: | PR-T1285 |
| ▪ Team Leader/Members: | Aiello, Roberto (INE/ENE) Team Leader; Alarcón, Arturo (INE/ENE) Alternate Team Leader; Sawada, Emilio; Snyder, Virginia; Correa, Cecilia; Márquez, Fidel; Aoki, Issei y Suber, Stephanie (INE/ENE); Seminario, Cecilia (ITE/ITE) |
| ▪ Taxonomy: | Operational Support |
| ▪ Number and name of operation supported by the TC: | Rehabilitation and Modernization Program for the Acaray Hydropower Plant - PR-L1156 |
| ▪ Date of TC Abstract: | October 15, 2019 |
| ▪ Beneficiary: | National Electricity Administration (ANDE) |
| ▪ Executing Agency: | Inter-American Development Bank (IDB) |
| ▪ IDB funding requested: | US$850,000.00 |
| ▪ Local counterpart funding: | US$0.00 |
| ▪ Disbursement period: | 36 months |
| ▪ Types of consultants: | Individuals |
| ▪ Prepared by Unit: | Energy Division (INE/ENE) |
| ▪ Unit of Disbursement Responsibility: | Country Office Paraguay |
| ▪ TC included in Country Strategy (y/n): ▪ TC included in CPD (y/n): | Yes No |
| ▪ Alignment to the Update to the Institutional Strategy 2010-2020: | Productivity and innovation; Environmental sustainability |

**II. Objective and Justification**

2.1 The objective of the proposed Technical Cooperation (TC) is to support the National Electricity Administration (ANDE) in the preparation and implementation of Clean Energy (CE) projects under the PR-O0004, including its first operation PR-L1173, and the implementation of operation PR-L1156.

2.2 Paraguay has a power generation capacity of 8,814 Megawatts (MW) and a maximum demand of 3,481 MW (February 2019). The National Interconnected System (NIS) has 720 kilometers (km) of transmission lines (TL) in 500 kilovolts (kV) and 4,600 km in 220 kV. The country’s electricity coverage stands at 99.1% (99.6% in urban areas and 96% in rural areas). Annual electricity demand in 2018 was 16,579 Gigawatt hours (GWh) with an average annual growth of 5.2% in the last five years, and an average annual increase in the maximum power demand of 5.6%. Approximately 65% of demand is concentrated in the central and metropolitan area, fed by TL from Itaipú and Yacyretá. Securing the supply, considering such a sustained demand for growth, is a challenge for the country.

2.3 **Potential for Nonconventional Renewable Energy (NCRE) and Energy Efficiency (EE).** Almost 100% of electricity supplied to the NIS is hydroelectric (in 2017 Itaipú generated 73.2%, Yacyretá 20.7% and Acaray 6.1%). Despite Paraguay’s considerable potential for NCRE development, its use has not been extended. The country’s average solar irradiance is 1,725 kWh/m2/year, which could be used mainly for residential generation or in isolated systems. Stable winds would allow for energy generation, especially in the northwestern Chaco region; and the livestock industry has good prospects for biogas projects. Such technologies could deliver electricity to communities with no access to the service and replace some very small isolated diesel generators under operation. These technologies would also contribute to Paraguay’s Nationally Determined Contributions (NDCs) under the Paris Agreement for reducing fossil fuels consumption by 20% and developing a sustainable energy matrix with NCRE. Likewise, there is high potential to implement EE measures both on the demand (EE in buildings based on the age of facilities and equipment) and the supply side (loss reduction). Electrical losses are of 24.5% (as of 2018), with 5.7% corresponding to transmission and 19.9% to distribution.

2.4 **Energy sector programs and requested support.** ANDE is updating its power sector development plan with: (i) an expansion program in high and very high voltage (estimated cost US$ 650 million); (ii) an EE program; and (iii) potential renewable energy solutions in isolated populations. The CCLIP (PR-O0004) and its first investment project (PR-L1173) will support the implementation of projects under this plan. Along this line, ANDE requested comprehensive assistance from the Bank in supporting the: (i) implementation of PR-L1173; (ii) identification and preparation of subsequent investment projects under PR-O0004, including potentially small scale innovative pilot projects; and (iii) implementation of the investment project Rehabilitation and Modernization of the Acaray Hydroelectric Plant (4690/OC-PR).

2.5 **IDB experience with ANDE.** The IDB has extensive knowledge of the sector and has been a strategic partner of ANDE. In recent years, the Bank financed the Multi-Phase Electric Transmission Program of ANDE-Phase I (1835/OC-PR) for US$69 million, in 2006, and Phase II (2891/OC-PR) – in 2012 – for US$50 million. More recently, a loan has been approved for the Rehabilitation and Modernization of the Acaray Hydroelectric Plant (4690/OC-PR), for US$125 million. In addition, the Bank is executing a non‑reimbursable TC (ATN/OC-15910-PR) which includes technical support for the modernization of infrastructure, EE in public lighting and energy access in isolated areas of the country.

**III. Description of Activities and Outputs**

3.1 **Component I. Support project preparation.** The component will finance: (i) assessments to evaluate technical, economic, and environmental/social feasibility of EE and CE projects; and (ii) preliminary design studies for the implementation of EE and CE projects. The products will be studies and technical designs for innovative technologies to support the structuring of new sustainable infrastructure operations under PR-O0004. Projects will be designed considering the application of the latest technologies.

3.2 **Component II. Support project implementation.** The component will finance activities to support the implementation of PR-L1173 (including investments to promote sustainable energy in Paraguay such as TL and EE on public buildings) and the 4690/OC-PR, including technical assistances, workshops, trainings, and implementation support to ensure the achievement of quality infrastructure.

3.4 **Component III. Support for the design and testing of innovative CE projects.** The component will finance: (i) identification of innovative CE projects, like floating and inland solar photovoltaic, to be tested within ANDE’s Acaray Hydropower Complex premises; (ii) commercial and technical feasibility studies for a CE pilot project; and (iii) the procurement and construction of the project. The product will be a commissioned CE pilot project (to act as a testing platform for further replication and scalation to commercial size) including transfer of knowledge to ANDE staff.

3.5 **Component IV. Component IV: Knowledge dissemination and execution support.** The component will finance: (i) knowledge dissemination events such as trainings on sustainable energy technologies, and workshops to disseminate experiences and findings of the pilot project; and (ii) complementary support for the execution of the TC.

**IV. Budget**

4.1 Total amount of funding needed for the TC will be US$850,000.00. The funding needed for each component is detailed in the table below.

**Indicative Budget**

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| **Activity/Component** | **IDB/Fund Funding** | **Counterpart Funding** | **Total Funding** |
| Component I. Support project preparation. | US$350,000.00 | US$0.00 | US$350,000.00 |
| Component II. Support project implementation | US$300,000.00 | US$0.00 | US$300,000.00 |
| Component III. Support for the design and testing of innovative CE projects | US$170,000.00 | US$0.00 | US$170,000.00 |
| Component IV. Knowledge dissemination and execution support | US$30,000.00 | US$0.00 | US$30,000.00 |
| **Total** | **US$850,000.00** | **US$0.00** | **US$850,000.00** |

**V. Executing Agency and Execution Structure**

5.1 At the request of the beneficiary and in line with the Operational Guidelines for Technical Cooperation Products (GN-2629-2), the Bank will act as the executing agency for the TC. This condition has been established as a special circumstance considering that the benefited entity has limited operational capacity to properly execute, in time and manner, the activities of this TC. The Bank will be responsible for the selection and contracting of both consulting firms and individual consultants; in accordance with the policies for the selection of consultants (GN-2765-1), operational guidelines (OP-1155-4) for the contracting of consulting firms and human resources standards (AM-650) for the hiring of individual consultants. Additionally, the Financial Management Guide OP-273-6 (GN‑2811) will be applied. The initial procurement plan provides information on the foreseen contracts, their applicable monitoring, and contracting methods. In accordance with the Operational Guidelines for Technical Cooperation Products, Revised Version (GN-2629-1), the TC is classified as a Client Support product.

5.2 The technical responsibility will fall upon the Energy Division (INE/ENE), which will receive support from the Bank Country Office in Paraguay (CPR). The focal point designated and responsible for executing the TC will be the Energy Principal Specialist, Roberto Aiello, with support from other ENE’s energy specialists. ANDE has designated a technical focal point for coordination with the Bank regarding TC execution.

**VI. Project Risks and Issues**

6.1 The main risks of this TC are potential delays that could arise due to inadequate coordination with the beneficiary. These risks will be mitigated by involving the counterpart from the beginning of the execution of the TC through the exchange of the required information and discussing the project progress and schedule on a regular basis.

**VII. Environmental and Social Classification**

7.1 The ESG classification for this operation is "undefined".