TC ABSTRACT

I. Basic Project Data

▪ Country/Region:	BRAZIL/CSC - Southern Cone
▪ TC Name:	Support for Innovation in the Energy Sector - Rio Grande do Sul, Paraná and Santa Catarina
▪ TC Number:	BR-T1422
▪ Team Leader/Members:	ALARCON, ARTURO (INE/ENE) Team Leader; SNYDER, VIRGINIA MARIA (INE/ENE) Alternate Team Leader; BERGA, PEDRO CORREIA DE SOUZA (CSC/CBR); MALAGON ORJUELA, EDWIN ANTONIO (INE/ENE); AIELLO, ROBERTO GABRIEL (INE/ENE); CORREA POSEIRO, CECILIA (INE/ENE); PEREZ JARAMILLO, DANIEL (INE/TSP); CELESTE MARZO, CRISTINA (LEG/SGO)
▪ Taxonomy:	Client Support
▪ Number and name of operation supported by the TC:	N/A
▪ Date of TC Abstract:	28 Mar 2019
▪ Beneficiary:	CEEE Rio Grande do Sul, CELESC Santa Catarina; COPEL Paraná
▪ Executing Agency:	INTER-AMERICAN DEVELOPMENT BANK
▪ IDB funding requested:	$ 250,000.00
▪ Local counterpart funding:	$ 75,000.00 (In Kind)
▪ Disbursement period:	24 months
▪ Types of consultants:	Individuals; Firms
▪ Prepared by Unit:	Energy
▪ Unit of Disbursement Responsibility:	Country Office Brazil
▪ TC included in Country Strategy (y/n): ▪ TC included in CPD (y/n):	No No
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Productivity and innovation

II. Objective and Justification

2.1 The objective of this technical cooperation is to support innovation in the electricity sector of the Brazilian States of Rio Grande do Sul, Paraná and Santa Catarina. The specific objectives are to: (i) support the development and implementation of innovative solutions to improve quality of power supply and energy efficiency with the three public utilities of these states (CEEE, CELESC and COPEL); (ii) support the evaluation and design of an electric vehicle corridor between the three states and with neighboring countries; (iii) support the coordination and exchange of experiences among the public electricity utilities of these states, and between utilities and innovation experts.

2.2 The southern region of Brazil includes the states of Paraná, Santa Catarina and Rio Grande do Sul. With an area of 576 km2 and 30 million people, it is the smallest geographical region of the country. This region is an economic center, with diverse activities, like industry, tourism, agriculture, agroindustry and services. The region accounts for 28% of the industries of the country; 17% of the GDP and 25% of the country's industrial exports come from these states. Electricity is an essential input for their economy. According to the Confederação Nacional da Indústria, 80% of companies in the South use electricity as the main input for their production process; 95% of these are impacted by power outages, with 10% experiencing them frequently;

and 64% believe such outages are cause moderate to heavy damage. Electricity utilities in these states are aware of the need of maintaining and improving power quality, and they have investment plans that have shown considerable increases of quality in recent years. Nonetheless, recent innovations in the power sector, such as distributed energy resources, and digitalization can provide new cost-efficient tools for the improvement of power quality and increase of energy efficiency. According to the electricity regulation in Brazil, all electricity companies should apply a minimum of 1% percent of their net operating income every year in the Research and Development Program for the Electric Power Sector. From these resources 40% is directly invested by the companies in R&D projects. The regulatory entity, ANEEL, regulates the elaboration and scope of R&D projects, which must be tendered periodically by the power utilities. The three utilities have applied R&D resources, developing projects in energy efficiency, smart grids, distributed generation, electric vehicles, and alternative energy generation. The resources used in the R&D programs have provided a way of support innovation in the sector; however, specific projects are often not coordinated among different utilities, losing an important opportunity to scale up innovation and results, and to exchange lessons learnt at a regional level. The deployment of electric vehicles in Brazil is still incipient, with around 10.000 vehicles in circulation. Nonetheless, the potential for electric and hybrid cars cannot be underestimated. Brazil has over 50 million vehicles, making this the largest market in Latin-American, with more than two million cars added in 2018. Several car producers are established in the country, particularly in the southern region, with a capacity of producing 4,6 million cars/year. Considering that the electricity matrix is mostly renewable (85%), the deployment of electric and hybrid cars could be expected in the medium term. COPEL has already an electric corridor, with 11 charging units, that permits to reach Foz do Iguacu, in the border with Argentina and Paraguay, from the coast. Likewise, there is a corridor that permits to reach Florianopolis from Curitiba, implemented by COPEL and CELESC. Given the geographical location of these three Brazilian states, which have borders with Paraguay, Uruguay and Argentina, there is potential for the implementation of international corridors for electric vehicles. This TC is consistent with the country strategy with Brazil (2016-2018), which aims to promote the dialogue between energy sector actors regarding energy costs in Brazil and their potential impact on productivity.

III. Description of Activities and Outputs

3.1 Component I: Innovation to improve quality of power supply and energy efficiency. This component will finance studies to evaluate the feasibility for the implementation of innovative technologies to improve power quality (frequency and duration of interruptions) and increase energy efficiency (including reduction of power losses). The technologies to be analyzed include distributed energy resources (such as distributed storage and distributed generation), smart metering, digitalization, smart grids, and demand side management, while the studies will include analysis of the technical and financial viability of such implementations, as well as considerations for cybersecurity. The studies conducted with this component will be coordinated with the R&D programs of the companies. This component will provide inputs for the companies to implement projects as part of their investment plans. Moreover, results will also provide inputs for the development of regulation at a federal level.

3.2 Component II: Southern electric vehicle corridor. This component will finance studies to evaluate the feasibility of an electric vehicle corridor from Parana to Rio Grande do Sul (crossing Santa Catarina). Studies include the projection of traffic demand (including possible traffic with neighboring countries), the identification of electricity infrastructure reinforcement needs, and the preliminary design of the charging station (location, type, etc). This component will be coordinated with the activities that each power utility already performs regarding electric vehicles in these brazilian states. It

will also be coordinated with other activities performed by the Bank with the technical cooperation RG-T3349 - Support to Electromobility Initiatives in Latin America and the Caribbean, to avoid duplication . Results from this component will strengthen the development of electric vehicle corridors in Brazil, in a coordinated manner within these 3 states.

3.3 Component III: Dissemination of Knowledge. This component will support the implementation of at least three workshops (one in each state) to exchange experiences among the three public utilities, the IDB and industry experts regarding innovative solutions in the electricity sector. The result of this component is to create a more coordinate development of innovative solutions among the three utilities, as well as to exchange lessons learnt by the Bank in other countries.

3.4 **Component I: Innovation to improve quality of power supply and energy efficiency. .** This component will finance studies to evaluate the technical and financial feasibility of implementing innovative solutions to improve quality of supply and energy efficiency. All studies will be coordinated with the activities of the R&D program of each entity.

3.5 **Component II: Southern electric vehicle corridor..** This component will support a feasibility study for the implementation of an electric vehicle corridor among the 3 states and neighboring countries.

3.6 **Component III: Dissemination of Knowledge..** This component will support implementation of at least three workshops (one in each state) to exchange experiences among the three public utilities, the IDB and industry experts regarding innovative solutions in the sector. The result of this component is to create a more coordinate development of innovative solutions among the three utilities, as well as to exchange lessons learnt by the Bank in other countries. The results of each workshops will be disseminated, using the Bank's platforms.

IV. Budget

Indicative Budget

Activity/Component	IDB/Fund Funding	Counterpart Funding	Total Funding
Innovation to improve quality of power supply and energy efficiency.	$ 100,000.00	$ 30,000.00	$ 130,000.00
Southern electric vehicle corridor.	$ 100,000.00	$ 30,000.00	$ 130,000.00
Dissemination of Knowledge.	$ 50,000.00	$ 15,000.00	$ 65,000.00

V. Executing Agency and Execution Structure

5.1 At the request of the beneficiaries, and in line with the Operational Guidelines for Technical Cooperation Products (GN-2629-2), IDB will act as the executing agency for this TC. The technical responsibility will be of the Energy Division (INE/ENE), which will receive support from the IBD’s Country Office in Brazil (CBR). The focal point designated and responsible for executing this TC will be the Energy Specialist, Arturo Alarcón, with support from energy specialists based in Paraguay, Argentina and HQ. Each beneficiary company will design a focal point for the coordination with the IDB regarding the TC execution.

5.2 The IDB role is essential for the coordination and articulation of the activities between the three independent public electricity companies, and therefore for the harmonization of the activities at the states level. At present, there is few coordination among these three utilities regarding their R&D programs. Moreover, the Bank will contribute with

the acceleration of the procurement process of consultancies that will allow the correct execution of this TC in time and manner. Given that innovation is the focus of this TC, the speed of start and execution of the TC should enable to follow new developments.

VI. Project Risks and Issues

6.1 The main risk of this TC is the coordination of all the stakeholders, and to maintain the interest of all parties during the TC execution. Coordination among stakeholders will be strengthened with IDB as an executing agency, and further by designating a focal point in each utility. In terms of the interest of the companies, two of the three beneficiary companies (CEEE and CELESC) are already Bank clients, and have a fluid communication with the Bank.

VII. Environmental and Social Classification

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