TC Document

I. Basic Information for TC

▪ Country/Region:	ARGENTINA
▪ TC Name:	Enhancing the contribution of the energy sector to the green and resilient economic recovery
▪ TC Number:	AR-T1267
▪ Team Leader/Members:	Snyder, Virginia Maria (INE/ENE) Team Leader; Almeida, Juliana Salles (CSD/CCS) Alternate Team Leader; Malagon Orjuela, Edwin Antonio (INE/ENE) Alternate Team Leader; Beaujon Marin, Amanda (INE/ENE); Casalino Franciskovic, Juan Manuel (LEG/SGO); Jorge Luis Malpartida Ampudia (INE/ENE); Loana Vega (INE/ENE); Marianela Cataldi (CSC/CAR); Mejia Reyes, Edwin Orlando (INE/ENE); Suber, Stephanie Anne (INE/ENE) Virginia Snyder (INE/ENE) Team Leader; Almeida, Juliana Salles (CSD/CCS) Alternate Team Leader; Malpartida Ampudia, Jorge Luis (INE/ENE); Mejia Reyes, Edwin Orlando (INE/ENE); Suber, Stephanie Anne (INE/ENE); Casalino Franciskovic, Juan Manuel (LEG/SGO)
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	N/A
▪ Date of TC Abstract authorization:	March 10, 2022
▪ Beneficiary:	The Republic of Argentina through the Secretariat of Energy of the Ministry of Economy
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	Strategic Climate Fund(SCX) Climate Investment Funds (CIF)
▪ IDB Funding Requested:	US$175,000.00
▪ Local counterpart funding, if any:	US$0
▪ Disbursement period (which includes Execution period):	24 months
▪ Required start date:	July 15, 2022
▪ Types of consultants:	Individuals, Firms
▪ Prepared by Unit:	INE/ENE-Energy
▪ Unit of Disbursement Responsibility:	CSC/CAR-Country Office Argentina
▪ TC included in Country Strategy (y/n):	Yes
▪ TC included in CPD (y/n):	Yes
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Productivity and innovation; Environmental sustainability

II. Objectives and Justification of the TC

2.1 The objective of this technical cooperation (TC) is to provide technical assistance to Argentina's planning, operation, and investments in the power sector, support short-term economic recovery and enable energy resilience.

2.2 In 2017, the Government of Argentina (GoA) declared a national interest the Distributed Generation (DG) from renewable energy sources intended for self-consumption and the injection of possible surpluses of electricity into the grid. DG is considered essential for the country since it contributes to improving energy efficiency

by reducing losses in the transmission and distribution systems, and climate change mitigation, as it reduces greenhouse gases emission (GHG). As such, the GoA approved the Law 27.424[1] "Regime for the Promotion of Distributed Generation of Renewable Energy integrated into the Public Electricity Grid". This law establishes the regulatory framework so that all users (residential, commercial, industrial and government) connected to the grid can generate electricity for their own consumption.. Distributed Energy Resources (DERs)[2] can help shield against the impacts of extreme weather events.

2.3 In December 2020, through the second update of its NDC, Argentina committed to an emissions cap of 359 $MtCO_2e$ per year by 2030 (around 397 $MtCO_2e$ in 2018), a target that is 26% more ambitious than the previous one[3]. To achieve this goal, the country proposed to focus its actions on the promotion of energy efficiency, renewable energy, and DG, among others. The country established specific plans to achieve a resilient power system to adapt to the effects of climate change and established energy security as one of the guiding principles to guarantee the reliability of the power system and the energy availability required to boost productive sectors and for the wellbeing of citizens.

2.4 In 2021, the Secretariat of Energy of the Ministry of Economy of the Nation, approved the Guidelines for an Energy Transition Plan to 2030[4]. These dispositions established a set of guidelines towards the decarbonization of the energy matrix, based on a productive structure that is inclusive, dynamic, stable, federal, sovereign, and sustainable.

2.5 **Renewable Energy in Argentina.** Argentina has good renewable energy resources, especially wind and solar resources[5], as well as high hydroelectric and geothermal potential. In recent years, the country has been promoting a greater penetration of renewable in the energy sector. In 2015, the Law No. 27.191 was enacted, which establishes the goal of reaching a 20% share of non-conventional renewable energy (NCRE) by 2025. Additionally, instruments such as the RenovAr auction program and the Forward Market for Electric Power from Renewable Sources (MATER, in Spanish) were implemented to allow final uses to purchase energy through free negotiation with generating companies. Under the RenovAr program, 5,044.6 MW were awarded, and under the MATER, 892.9 MW to date. Since 2018 there has been significant growth in renewable energy, reaching 9.5% of the total installed capacity in 2020 (35.4% when large hydroelectric plants are included).

2.6 **Increasing the reliability and resilience of the electrical system.** Argentina was ranked 113th in the world in terms of electricity quality infrastructure[6], while Brazil, Colombia, Mexico, and Peru were placed between the 60th and 80th positions. In 2019, Argentina suffered a severe national blackout and the whole National Power System went out for nearly 13 hours, after a localized fault occurred in a 500kV power

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[1] Régimen de fomento a la Generación Distribuida de Energía Renovable.

[2] DERs refer to small, modular, energy generation and storage technologies that provide electric capacity or energy where you need it. DER systems may be either connected to the local electric power grid or isolated from the grid in stand-alone applications. DER technologies mainly include wind turbines, solar photovoltaics (PV), fuel cells, microturbines and energy storage systems.

[3] The previous NDC of 2016 was a 483$MtCO_2$ emissions cap by 2030.

[4] (Secretariat of Energy, 2021).

[5] Average solar irradiation of 3.5 kWh/m^2 and winds of more than 6 m/s in 70% of the territory (PwC, 2017).

[6] (Schwab and Sala I Martin, 2018).

transmission line. At the provincial level, investments in expanding and strengthening the electricity transmission and distribution systems have been insufficient to keep up with the growth in demand, reducing the reliability of supply and affecting the population and the productive sector[7]. As a result, to maintain the quality of service and avoid interruptions, diesel generators are used in remote areas, with high cost of generation, low energy efficiency in the energy transformation process and subsequently high level of carbon dioxide (CO_2) emissions.

2.7 The economic recovery post-COVID-19 will need a robust, reliable and resilient power system to supply the electricity needed for the population and productive sectors. Even though electricity demand has stagnated in the last few years due to the country's general economic crisis, currently, the power system presents serious limitations, especially in the transmission and distribution segments, to offer a proper service. A more resilient and reliable power systems is critical for the economic recovery.

2.8 Power sector resilience can be defined as the ability of the power system and its stakeholders to anticipate, prepare, and adapt to rapid changing conditions, as well as to withstand, respond to, and recover rapidly from disruptions[8]. It entails holistic planning, robust policy development, and the deployment of technical and institutional solutions at multiple levels with the support of many stakeholders (such as planners, operators, regulators, load-serving entities, and generators, among others)[9]. A more resilient and reliable power systems is critical for the economic recovery.

2.9 A reliable power system is one that performs its functions within acceptable standards. New technologies such DERs can contribute to increase the reliability of the grids through cost competitive investments. DERs can provide back-up power during outages, serve critical customers and services, and speed up restoration efforts as well as provide ancillary services to the network. These solutions complement those based on power network strengthening, such as upgrading power lines and power stations, required to provide enough permanent reliability and efficiency. Furthermore, DERs can contribute with redundancy to the system and to defer investments and alleviate load of transmissions and distribution lines, as well by replacing diesel generators that are working as cold or spinning reserve and, therefore, support the decarbonization of the system. Although DERs have been tested and used —and their benefits harnessed— in more developed energy markets, they have not yet taken off in Argentina.

2.10 **Community Distributed Generation.** One form of DER is Community Distributed Generation (CDG), also known as shared solar. CDG is a distributed solar energy deployment model that allows residential and non-residential customers to buy or lease part of a larger, off-site shared solar photovoltaic (PV) system[10]. CDG allows an electricity generation facility, like a solar farm, to share the benefits of clean energy production with participants. Through a subscription, residential and business customers can join to receive monthly credits from the electricity generated at the facility without the need to install or maintain equipment on their property.

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[7] In 2017, 65.1% (59.2%, in the average in LAC) of companies in Argentina suffered power outages lasting an average of 5.2 hours (2.9 hours LAC average) affecting their productivity (World Bank, 2021).

[8] (Stout et al., 2019).

[9] (NREL & USAID, 2021).

[10] NREL Community Solar.

2.11 CDG allows customers to enjoy the advantages of renewable solar energy without having to install their own solar energy system. CDG provides an alternative to rooftop PV systems for customers who: (i) do not have the roof conditions (either structure, roof size, shading issues, or other factors) for a rooftop PV system, (ii) do not own their homes or buildings, (iii) are unable or unwilling to install an on-site solar PV system for financial or other reasons. CDG projects can benefit customers, utilities, and third-party entities, by providing: (i) greater electricity rate stability and potential bill savings for program participants; (ii) wider solar accessibility for different electricity customer classes, especially if portions of projects are set aside for low-income customers; (iii) grid benefits by siting projects in specific locations, among others.

2.12 In 2021, the GoA carried out a study to determine the feasibility of incorporating CDG in the national DG regulation established by Law 27.424. The study made an exhaustive analysis of the existing CDG regulations at a national and international level. To move forward and advance on the implementation of CDG, further studies are required. The energy sector requires support to develop a drafting of the regulation for the inclusion of the CDG model in the current national DG regulation. This should include a clear definition of CDG that facilitates market tracking and cost benchmarking.

2.13 **Energy Storage.** A relevant aspect that is required to be studied is electricity storage, particularly when combined with wind and solar power generating capacity on a large scale. Energy storage increases the technical reliability of the power supply, stabilizes the cost of electricity, and helps to reduce CO_2 emissions. Large-scale energy storage is already applied in many countries worldwide but is hasn't taken off in Argentina. Given the advances in storage technologies and the reductions in the cost of batteries, the GoA intends to analyze and evaluate different project proposals with a consultancy to assess the impact of the inclusion of batteries in large scale projects.

2.14 **Gender.** According to estimates by the International Labour Organization (ILO), in 2019, women represented 3.4% of all employees in the construction sector and 19.6% in the mining and electricity storage, water and gas sectors in Argentina[11]. This TC will provide an opportunity to advance in the inclusion of more women in the energy sector, specifically in technical and operational areas.

2.15 **Lessons learned.** The IDB has supported the expansion of the electricity system in the country by financing 2,400 kilometers of transmission lines and 18 electrical substations in thirteen provinces, with the programs for the "Electric Transmission Program in the Norte Grande" (1764/OC-AR and 1764/OC-AR-1) and the "Program to Supply Electricity to the Country's Various Regions under the Federal Electricity Transmission Plan" (2514/OC-AR). Likewise, the Bank financed the elaboration of the Transmission Expansion Plan 2019-2030. In generation, it currently finances the Modernization of the Salto Grande Hydroelectric Complex (4694/OC-RG, 4695/OC-RG), and previously, the strategic plan for the renovation of the plant was prepared through a TC, defining three execution stages. On the other hand, IDB Invest finances various NCRE projects of the RENOVAR Program. This TC will contribute to address some lessons learned of these projects, such as: (i) permanent coordination with national authorities; and (ii) reduce risks and uncertainties during execution.

[11] ILO and own calculations. (2019). Employment by sex and economic activity – ILO modeled estimates, Nov. 2019 (thousands) – annual.

2.16 **Strategic alignment.** This TC is aligned with the 2025 Vision of the IDB Group by promoting Climate Change Action and gender equality. The TC is also consistent with the Second Update of the Institutional Strategy 2020-2023 (AB-3190-2) and is aligned with the development challenges of: (i) Productivity and Innovation, by financing the technical and economic feasibility analysis of the integration of modern and innovative DERs technologies that will potentially improve the reliability and resilience of the electrical grid which impact positively in productive sectors; and (ii) Climate Change and Environmental Sustainability, by financing: (a) the feasibility analysis of the integration of technological solutions that can increase renewable energy participation, which will contribute to reduce GHG emissions and (b) analysis of the impacts, vulnerabilities, and the value of electrical grid climatic resilience. The TC is also aligned with the cross-cutting area of: (i) Gender Equality and Diversity by promoting greater inclusion of women in the energy sector workforce. Likewise, the TC is consistent with the Sectoral Framework for Energy (GN-2830-8) by supporting the sustainability and security of the sector financing that activities that can increase the role of renewable energy and improve the quality of the service delivered. The TC is also aligned with the IDB Group Country Strategy with Argentina 2021-2023 (GN-3051) in response to the strategic objectives of: (i) Reduce Infrastructure Gaps, by supporting activities that seek to improve electricity services and increase the share of renewable energy in the energy matrix; and (ii) Move Toward Environmental Sustainability, by financing activities that seek to reduce GHG emissions. Additionally, it aligns with the country's Guidelines for an Energy Transition Plan to 2030, under the axes: (i) environmental, to achieve the commitment to reduce emissions; (ii) economic, to serve as a tool for economic reactivation and development of the national energy industry; and (iii) inclusive, to achieve a more secure, reliable, and affordable energy supply**.**

III. Description of activities/components and budget

3.1 **Component I: Analysis of preliminary project proposals from call for MDIs (US$60,000).** This component will finance activities to contribute to the analysis of the technical characteristics of the MDI's project proposals, including operational and economic aspects and the contribution to the fulfillment of the proposed objectives of the MDI (¶2.13). The analysis should consider the additional benefits of renewable energy and storage, and other positive externalities (substitution of firm power, reduction of CO_2 emissions, etc.) as well as other environmental and/or social impacts. It should also analyze the replacement of the forced generation depending on the location of the new renewable supply and storage. Additionally, the analysis will try to identify opportunities within the proposals to promote female labor force participation in the sector.

3.2 **Component II: Applicability of large-scale energy storage solutions for the grid (US$65,000).** This component will finance a consultancy to analyze the inclusion of battery storage particularly combined with wind and solar power generating capacity on a large scale. The analysis should take into consideration the main advantages in terms energy security, grid stability, increase used of RE, periods, and the savings that the use of storage can represent to the national government by the displacement of fossil fuel generation, reduction in CO_2 emissions, among other things. The study should take into consideration the experiences of the use of energy storage in international markets, regulations, and market models. The objective of the study will be to analyze the inclusion of batteries, its advantages in terms of self-consumption, energy security and efficiency, repayment periods, national government savings due to the displacement of fossil fuel generation, reduction in CO2 emissions, etc. The

study should take into consideration the experiences of the use of energy storage in international electricity markets.

3.3 **Component III: Institutional arrangements and legal framework (US$40,000).** This component will finance the preparation, design and drafting of the regulation for the inclusion of the CDG in the current national DG regulation. This should include a clear definition of CDG to allow the GoA to have a common understanding of it, and to provide clarity to the sector. A clear and common definition also facilitates market tracking and cost benchmarking. Additionally, this component will finance the preparation of incentives, deployment, and communication plan to promote and incentivize the use of CDG throughout the country. This plan should consider the possible regulatory barriers when valuing the energy injected by these projects. The expected results are: (i) a draft regulation for CDG, including the operational aspects that must be incorporated into the Public Access Digital Platform; and (ii) a CDG national plan to deploy, incentivize and promote CDG.

3.4 **Component IV: Dissemination workshops and knowledge sharing (US$10,000).** This component will finance the dissemination of successful knowledge outputs resulting from this project through relevant resources, including workshops, webinars and technical notes (the participation of women will be highly encouraged in all the activities).

3.5 **Budget.** The total cost of the project is US$175,000, which will be financed with resources from the CIF Technical Assistance Facility (CIF-TAF). Resources of the Bank's Ordinary Capital are not contemplated nor a counterpart by the GoA.

Indicative Budget

Activity/Component	Description	CIF	Counterpart Funding	Total Funding
Component I	Analysis of impacts, vulnerabilities, and the value of power system resilience, with gender perspective	US$ 60,000	US$ 0	US$ 60,000
Component II	Applicability of energy storage solutions for the grid	US$ 65,000	US$ 0	US$ 65,000
Component III	Institutional arrangements and legal framework	US$ 40,000	US$ 0	US$ 40,000
Component IV	Dissemination workshops and knowledge sharing	US$ 10,000	US$ 0	US$ 10,000
		US$ 175,000	**US$ 0**	**US$ 175,000**

3.6 The responsible for the execution of this TC is Virginia Snyder (INE/ENE), senior energy specialist based in Washington, D.C. The team will report progress annually, by March 15th of each year, using the IDB systems standard (Monitoring and Reporting System - M&R system). The progress report will include information about the actual inputs, output delivery, and outcome achievement, among others, as of the last day of the reporting period, which closes on December 31st of the reporting year. The team will also submit to the CIF Coordinator any additional information needed for annual reports to the Donor. The TC final evaluation report will be submitted according to the schedule established in IDB systems and will be financed using funds from the TC.

IV. Executing agency and Execution Structure

4.1 The Bank, through the Energy Division (INE/ENE) will be the Executing Agency (EA) of this TC, considering the Bank's experience in the preparation and development of the technical work required for this type of operation. The beneficiary of this TC is the Republic of Argentina through the Secretariat of Energy. In accordance with the Operational Guideline for Technical Cooperation Products (GN-2629-2), the Bank being the EA of this TC is justified under Appendix 10 of the beforementioned guidelines as the TC responds to a request from the beneficiary and exceptionally – and at the request of the beneficiary– the Bank with the responsibility for the contracting of consultancies. Furthermore, the Bank and the beneficiary agree that contracting by the Bank would enhance independence under the impartiality criteria.

4.2 The IDB will be responsible for the selection and contracting of consulting firms and individual consultants, to be carried out in close coordination with the beneficiary. Activities to be executed are included in the Procurement Plan and will be contracted in accordance with Bank policies as follows: (i) Hiring of individual consultants, as established in the regulations AM-650; (ii) Policy for the Selection and Contracting of Consulting Firms for Bank-executed Operational Work 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. The beneficiary may provide technical inputs to the terms of reference and reports of the consultants, such inputs should be done directly to the Bank. This dynamic will facilitate proper articulation between the various actors within the framework of the technical dialogue of this TC. The TC does not present fiduciary management risks as it will be implemented by the Bank. For the same reason, no financial audit is required.

V. Major issues

5.1 The main risk of this TC is the lack of coordination among key national stakeholders. The Bank will convene technical roundtables with key stakeholders under each of the components, under the leadership of the Secretariat of Energy. Additionally, the Secretariat of Energy will coordinate all the professionals and consulting firms that participate in this technical assistance. Given that it may be difficult or require long times to collect all the information necessary to carry out the studies, to mitigate this risk, work will be done from the beginning of the execution of the TC to identify all the data that will be necessary and prioritize its management. Another important risk will be the possible limitations for the execution of the activities derived from the restrictions by COVID-19. To mitigate this risk, the use of digital tools will be sought to monitor and supervise the activities.

VI. Exceptions to Bank policy

6.1 The TC does not require exceptions to the Bank policy.

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 - AR-T1267

Results Matrix - AR-T1267

Terms of Reference - AR-T1267

Procurement Plan - AR-T1267