

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

DOMINICAN REPUBLIC

**PROGRAM TO EXPAND ELECTRICITY NETWORKS AND
REDUCE TECHNICAL LOSSES IN DISTRIBUTION SYSTEMS**

(DR-L1128)

LOAN PROPOSAL

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REQUIRED

1. [Multiyear execution plan](#) and [annual work plan](#)
2. [Monitoring and evaluation plan](#)
3. [Environmental and social management report](#)
4. [Procurement plan](#)

OPTIONAL

1. [Program economic evaluation](#)
2. [Program alignment with the Public Utilities Policy](#)
3. [Gender analysis and support proposal](#)
4. [Study for the development of a master plan on the expansion of the distribution system and study of losses at the three State-owned distribution companies](#)
5. [Program Operating Manual](#)
6. [Safeguard policy filter](#) and [safeguard screening form](#)

ABBREVIATIONS

CDEEE	Corporación Dominicana de Empresas Eléctricas Estatales [Dominican Corporation of State-owned Electricity Companies]
ECLAC	Economic Commission for Latin America and the Caribbean
EDEESTE	Empresa Distribuidora de Electricidad del Este S.A.
EDENORTE	Empresa Distribuidora de Electricidad del Norte S.A.
EDESUR	Empresa Distribuidora de Electricidad del Sur S.A.
EGE Haina	Empresa Generadora de Electricidad Haina
EGEHID	Empresa de Generación Hidroeléctrica Dominicana [State-owned hydroelectric generation company].
EIRR	Economic internal rate of return
ENPV	Economic net present value
ESMF	Environmental and social management framework
ETED	Empresa de Transmisión Eléctrica Dominicana [State-owned electric power distribution company]
FIRR	Financial internal rate of return
FNPV	Financial net present value
GWh	Gigawatt-hour
ICB	International competitive bidding
IPPs	Independent power producers
LIBOR	London interbank offered rate
NCB	National competitive bidding
PCBs	Polychlorinated biphenyls
PEU	Project execution unit
PMESD	Master plan for expanding the distribution system
QCBS	Quality- and cost-based selection
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index

PROGRAM SUMMARY

DOMINICAN REPUBLIC PROGRAM TO EXPAND ELECTRICITY NETWORKS AND REDUCE TECHNICAL LOSSES IN DISTRIBUTION SYSTEMS (DR-L1128)

Financial Terms and Conditions						
Borrower: Dominican Republic			Flexible Financing Facility ^(a)			
			Amortization period:	25 years		
Executing agency: Corporación Dominicana de Empresas Eléctricas Estatales [Dominican Corporation of State-owned Electricity Companies] (CDEEE)			Disbursement period:	4 years		
			Grace period:	5.5 years ^(b)		
Source	Amount (US\$)	%	Interest rate:	LIBOR-based		
IDB (Ordinary Capital):	155 million	100	Credit fee:	^(c)		
			Inspection and supervision fee:	^(c)		
			Weighted average life:	15.24 years ^(d)		
Total:	155 million	100	Approval currency:	United States dollar		
Program at a Glance						
Program objective/description: The general objective of the program is to enhance operating efficiency (i.e. reduce technical losses and improve the continuity and quality of the power supply) and improve the capacity of Empresa Distribuidora de Electricidad del Sur S.A. (EDESUR) to satisfy growing demand for electrical distribution system services, by upgrading and adding infrastructure under environmentally and financially sustainable conditions. The specific objective is to support implementation of the first stage of EDESUR's master plan for expanding the distribution system (PMESD).						
Special contractual conditions precedent to the first disbursement of the financing: The following will be special contractual conditions precedent to the first disbursement: (i) the CDEEE's project execution unit will have been strengthened by hiring a substation technical expert and an environmental and social specialist, as described in the environmental and social management report , all of whom will work on the program's activities; and (ii) the program Operating Manual will have been approved and entered into effect, in accordance with the terms previously agreed upon with the Bank (paragraph 3.4). See other conditions in Annex III, Fiduciary Agreements and Requirements.						
Special contractual conditions for execution: See the special environmental and social contractual conditions in the socioeconomic conditions in Annex B of the environmental and social management report .						
Exceptions to Bank policies: None.						
Strategic Alignment						
Challenges: ^(e)	SI	<input type="checkbox"/>	PI	<input checked="" type="checkbox"/>	EI	<input type="checkbox"/>
Crosscutting themes: ^(f)	GD	<input checked="" type="checkbox"/>	CC	<input checked="" type="checkbox"/>	IC	<input type="checkbox"/>

^(a) Under the terms of the Flexible Financing Facility (document FN-655-1), the borrower has the option of requesting changes to the amortization schedule as well as currency and interest rate conversions. The Bank will take operational and risk management considerations into account when reviewing such requests.

^(b) Under the flexible repayment options of the Flexible Financing Facility, changes to the grace period are permitted provided that they do not entail any extension of the original weighted average life of the loan or the last payment date as documented in the loan contract.

^(c) The credit fee and the inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the relevant policies.

^(d) The weighted average life could be less, depending on the actual signature date of the loan contract.

^(e) SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

^(f) GD (Gender Equality and Diversity); CC (Climate Change and Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

I. DESCRIPTION AND RESULTS MONITORING

A. Background, problem addressed, and rationale

- 1.1 **Macroeconomic and fiscal situation.** The Dominican Republic has a small economy that is highly vulnerable to external shocks and natural disasters.¹ Over the past decade,² the country posted real economic growth of 4.9%, which is above the 2.1% average for Latin America and Caribbean. As of year-end 2017, cumulative growth stood at 4.6%, below the official forecast of 5.5%. The was primarily due to a decrease in investment flows and a significant slowdown in public capital expenditure. Growth has recovered in 2018, boosted by steps taken to ease monetary policy in 2017, improved fiscal performance, and increased foreign demand owing to the economic recovery in the United States, the country's main trade partner. According to government forecasts, the Dominican economy will sustain real GDP growth of 5.5% in 2018, and go on to average 5% between 2019 and 2022.³
- 1.2 However, the fiscal consolidation process initiated in 2012 is currently stalled. The consolidated public sector deficit was 4.4% of GDP in 2017 (compared with 4.2% in 2016), which brought consolidated public debt to 48.9% of GDP at year's end. One of the largest sources of fiscal pressure is the electricity sector. From 2000 to 2017, the electricity sector ran an average deficit of 1.1% of GDP. The drop in international oil prices led to a decrease in current transfers of up to 0.5% of GDP in 2017. However, the increase in oil prices seen during the first half of 2018 will reverse this effect, generating increased pressure on the fiscal accounts.
- 1.3 **The electricity sector.** As of December 2017, the main characteristics of the Dominican electricity sector were as follows: (i) installed generating capacity of 3,703 megawatts; (ii) annual maximum demand of 2,219 megawatts; (iii) energy matrix comprised of 40% liquid fuels,⁴ 30.1% natural gas, 13.3% hydropower, 13.2% coal, and 3.3% nonconventional renewable sources (wind and solar); (iv) the electricity grid met 85.4% of demand, with an average service availability rate of 87.81%; (v) the rate structure has not adequately reflected the costs of service delivery, especially during the 2008-2014 period;⁵ (vi) widespread subsidies benefiting 90% of residential customers and 50% of commercial customers; and (vii) operating deficits attributable to significant total power losses, averaging more than 30% annually over the past decade,⁶ which are largely the result of business management issues (including poor collections management), the high operating costs of power distribution companies (US\$352.4 million), and the informal connections of an estimated 22% of the user base.⁷ Although the

¹ Irma and María, two category 5 hurricanes, grazed the country in September 2017, causing economic damage in productive regions.

² The 2008-2017 period, based on *World Economic Outlook* data (April 2018).

³ Ministry of Economy, Planning, and Development, *Marco Macroeconómico 2018-2020* (June 2018).

⁴ This percentage would be lower were it not for the significant drop in oil prices beginning in 2014, delaying the decommissioning of less efficient, oil-fired installed capacity, which is sold on the wholesale electricity market.

⁵ Given the high price of imported fuels used for roughly 85% of installed generating capacity.

⁶ Each percentage point of power loss is equivalent to US\$22 million.

⁷ [Are Blackout Days Free of Charge? Valuation of Individual Preferences for Improved Electricity Services.](#) IDB-WP-822. Jiménez (2017).

- generating capacity of the Dominican electricity system exceeds demand, due to operational and financial reasons, in circuits with high losses, planned service outages average 8 to 12 hours per day. For microenterprises and small businesses, the quality and cost of the power supply affect the country's competitiveness.⁸
- 1.4 As of 2017, modest progress has been made in reducing total energy losses, primarily due to limited financing to carry out planned investments (reduction in technical losses) and poor management of power distribution companies.⁹ The Bank, along with support from other cooperating institutions,¹⁰ has supported the government with the Support in for the Power Distribution Network Modernization and Loss Reduction Program. The first phase of that plan (loan 3182/OC-DR) began implementation in 2010, with a budget allocation that enabled intervention in 10% of the system's circuits. In coordination with other multilateral institutions, the Bank, through this operation, intends to support the government with the implementation of a second phase, fundamentally to complete: (i) rehabilitation of low-voltage networks, to improve the efficiency of electricity distribution in the country; and (ii) household and master metering, to optimize the business operations of the power distribution companies. The program's target is to reduce total losses to 15% or less.^{11,12}
- 1.5 **The sector's regulatory and institutional framework.** The electricity sector's legal, regulatory, and institutional framework is defined by the [Electricity Act 125-01](#) of 2001, which eliminated vertical integration and boosted capacity for attracting private investment to facilitate new investments in generation, transmission, and distribution.
- 1.6 The sector's main actors are: (i) the Ministry of Energy and Mines, established in 2013 through Law 100-13 as the agency responsible for developing and administering energy and mining policy; (ii) the Office of the Superintendent of Electricity, an independent agency that promotes, regulates, and oversees the electricity sector; (iii) the National Energy Commission, which prepares, coordinates, and enforces legal and regulatory plans for the proper operation and development of the energy sector; (iv) the Corporación Dominicana de Empresas Eléctricas Estatales [State-owned electricity utility] (CDEEE), in charge of developing plans and policies pertaining to the State-owned electricity companies; and (v) the National Interconnected Electricity System Coordination Agency, a private nonprofit organization that coordinates the operation of the Interconnected National Electricity System (see Figure 1).

⁸ According to the Doing Business project (2017), obtaining electricity is the second most significant obstacle to doing business in the country.

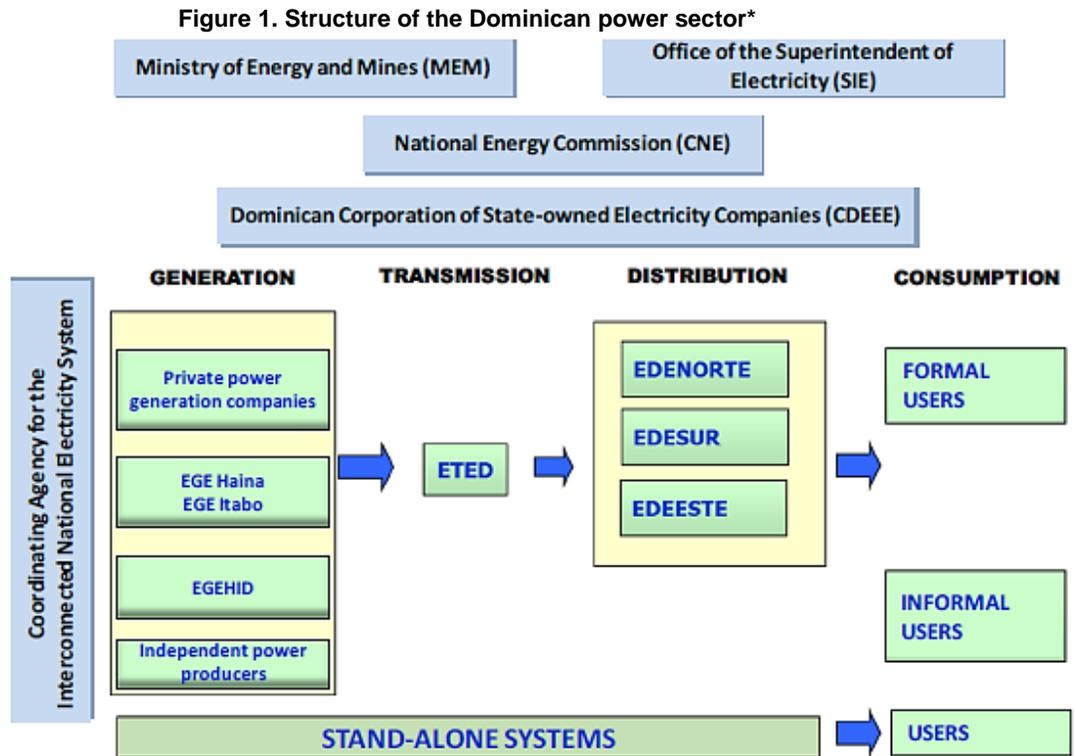
⁹ In countries of the region that have implemented loss reduction plans, their annual losses have declined by roughly 5% in the first few years following implementation.

¹⁰ World Bank, OPEC Fund for International Development, Central American Bank for Economic Integration, and the Andean Development Corporation.

¹¹ The overall indicator of distribution system losses has improved modestly, from 35.5% in 2012 to 29.9% at year-end 2017 (EDENORTE 25.5%; EDESUR 26.5%; and EDEESTE 37.3%). Performance report, CDEEE.

¹² In 2014, average total electricity losses in the Latin American region were 16.5%.

- 1.7 Private companies,¹³ combined public-private capital enterprises,¹⁴ a public enterprise,¹⁵ and independent power producers¹⁶ are responsible for generating electricity. The public sector is responsible for transmitting electricity, through the Empresa de Transmisión Eléctrica Dominicana [Dominican Electricity Transmission Company] (ETED). Three State-owned companies are responsible for distribution: (i) Empresa Distribuidora de Electricidad del Norte S.A.; (ii) Empresa Distribuidora de Electricidad del Sur S.A.; and (iii) Empresa Distribuidora de Electricidad del Este S.A.¹⁷



*Prepared by the authors based on Laws 125-01, 143-13, and 100-13.

- ¹³ The most important include: AES Dominicana; San Felipe; Compañía de Electricidad de San Pedro de Macorís; Compañía de Electricidad de Puerto Plata; Generadora Palamara - La Vega; Consorcio Laesa Limited LTD; Complejo Metalúrgico Dominicano; SeaBoard; Pueblo Viejo Dominicana Corp.; and Falcondo.
- ¹⁴ Empresa Generadora de Electricidad Haina (EGE Haina) and Empresa Generadora de Electricidad ITABO, S.A., in which the government participates through the Endowment Fund of the Reorganized Companies, and organization responsible for overseeing, protecting, and administering State shares in companies that emerged from the reform process.
- ¹⁵ Empresa de Generación Hidroeléctrica Dominicana [State-owned Hydroelectric Generation Company] (EGEHID).
- ¹⁶ Currently, 86% of power generation capacity is privately owned and/or operated (except for self-generated power) and 14% is publicly owned. The system includes 15 generating companies, two of which are independent power producers. Of those 15, three generating companies—AES Dominicana, EGE Haina, and EGEHID—provide more than 69% of total power generated.
- ¹⁷ These three companies serve 98% of the domestic electricity market and provide service based on geographical location, with a total of 2,181,722 billed customers.

- 1.8 **Power distribution.** Although progress has been made on implementing the Loss Reduction Plan (for nontechnical losses), the government of the Dominican Republic must still make the necessary investments to ensure that the rehabilitated network is maintained and that the growing demand for power is met¹⁸ with a suitable level of quality. Due to the lag in the investments to expand the distribution system, the power distribution companies' power distribution systems are currently vulnerable, with overloaded substations and networks and equipment that will need to be replaced in the very short term, all of which leads to poor power supply services in the concession areas (growing technical losses and shortcomings in service quality). Consequently, service interruptions at power distribution companies average 1,109.33 per user per year, while power outage hours average 3,273.28 per user per year, impacting the quality and continuity of the power service for more than 2.6 million national users. The Enterprise Service survey shows that, for the business and industrial sector, the number of electrical outages experienced by Dominican companies is three times the average of companies in Latin America and the Caribbean. Consequently, roughly 50% of Dominican companies have their own backup generators, whereas the corresponding figure for companies in Latin America and the Caribbean is 27.3%.¹⁹
- 1.9 Power generation companies lack the network and substation infrastructure required to properly supply their markets. They also lack backup connectivity systems that would enable them to satisfy demand in the event contingencies, e.g. the need to effect load transfers due to failures at overloaded substations. Based on the technical exercise, if the necessary investments are not made, the grid could experience widespread blackouts in 2025.
- 1.10 With the aim of developing a work plan to overcome these problems, the IDB has supported the power distribution companies' efforts to prepare a Master Plan for Expanding the Distribution System (PMESD),²⁰ with a timeline of up to 2030. The PMESD includes the short-, medium-, and long-term activities and investments (2021, 2025, and 2030, respectively), to guarantee the power supply with high-quality electricity service.²¹
- 1.11 Considering the technical and financial effort entailed in implementing the PMESD and the roughly US\$1.3 billion budget for the three power distribution companies through 2025, it must be implemented in stages, in keeping with the pace of growth in demand, and in coordination with various cooperation agencies, as in the prior network modernization program (operation 3182/OC-DR). The first stage of the PMESD, comprising the investments to be made in the three power distribution companies during the first four years, will cost US\$600 million.

¹⁸ Recent estimates place annual growth in the demand for electricity between 2.5% and 3.5%.

¹⁹ [Enterprise Surveys. Dominican Republic \(2016\)](#). World Bank Group.

²⁰ [Estudio para Elaboración de un PMESD y Estudio de Pérdidas de las Tres Distribuidoras Estatales Dominicanas](#). PMESD study put together by AF-Mercados EMI for the CDEEE (January 2018).

²¹ Interventions similar to the one proposed herein were carried out in Peru and Ecuador, leading to significant reductions. For Peru, see: *Las Reformas Estructurales del Sector Eléctrico Peruano y las Características de la Inversión 1992-2000*. Humberto Campodónico Sánchez. For Ecuador, see: [Incrementando la eficiencia del sector eléctrico: Lecciones sobre la reducción de pérdidas eléctricas en Ecuador](#). Tejada, Durán, Jiménez, and Doyle. IDB, 2017.

- 1.12 This first stage will begin with the financing of the investments planned for EDESUR Dominicana,²² since it is regularizing users twice as fast as the other two power distribution companies combined.²³ Furthermore, EDESUR sells almost 40% of the energy supplied on the interconnected system. Nevertheless, EDESUR's concession area includes the poorest regions of the country,²⁴ including Enriquillo and Valdesia,²⁵ which have the country's highest overall poverty rates, 55.6% and 38.4%, respectively. Subsequently, this first stage will finance the planned investments for the other two power distribution companies.
- 1.13 **Rationale for the proposed intervention.** EDESUR has 44 distribution substations. Of these, 60% have load levels that exceed what is technically recommended for their proper operation, and in some cases, there are overloads of up to 123%. The overloaded substations feed networks that provide services to 334,581 residential, governmental, business, and industrial customers. As a result, EDESUR has, on average, 371.6 service interruptions²⁶ annually, leading to approximately 984.2 hours of outages²⁷ per year per customer and impacting the quality and continuity of service for all the company's 751,385 customers. In addition, 35% of the 7,250-kilometer medium-voltage network has saturation levels above the established technical limit. The unregulated growth of these networks has left them crisscrossed and without backup for contingencies, meaning there is a latent risk that part of the market will not be served.²⁸
- 1.14 These conditions in the substations and networks result in technical losses due to which some circuits have total energy losses of up to 60%. These losses limit the company's capacity to efficiently and reliably supply the current and future electricity market, which will be affected if the PMESD is not implemented. The substations' lack of transformer capacity and the weaknesses in the main circuit feeders that supply power to end users thwart the government's objectives and the population's expectations of dependable, efficient, and environmentally sustainable energy, as set out in the [National Development Strategy 2030](#).
- 1.15 The power distribution companies' current financial situation makes it impossible for them to use their own funds for making the investments established in the PMESD, which for EDESUR amount to approximately US\$507 million by 2025. Accordingly, the government's strategy is to seek finance from multilateral banks for the investments required by the distribution sector, and it has requested financing from the Bank to implement the expansion plan.

²² EDESUR serves 28.7% (2017) of billed customers.

²³ According to CDEEE data, EDESUR has been responsible for 62% of the total number of users regularized in the system in 2018, EDENORTE for 27.73%, and EDEESTE with 10.27%.

²⁴ Source: CDEEE, based on the country's bulletin of income poverty statistics.

²⁵ Activities on the productive use of energy will be held in Enriquillo (where Barahona is located) and Valdesia (where Azua is located) (Component III).

²⁶ The System Average Interruption Frequency Index (SAIFI) is 373.4 interruptions per user.

²⁷ The System Average Interruption Duration Index (SAIDI) is 58,956.1 minutes per user.

²⁸ In Paraguay, for example, increased demand and seasonal and peak-hour overloads have exacerbated existing flaws in the transmission system. [Power Lost. Sizing Electricity Losses in Transmission and Distribution Systems in Latin America and the Caribbean](#). Jiménez, Serebrisky, and Mercado. IDB, 2014.

- 1.16 To address the problems described above, progress must be made on implementing the comprehensive actions found in the PMESD, including: (i) network expansion; (ii) strengthening technical capacities for control and operation; (iii) upgrading existing networks; (iv) improving service quality; and (v) increasing the number of customers brought into compliance. This program will support these actions.
- 1.17 Currently in preparation, technical-cooperation operation DR-T1170, a program to expand networks and reduce electricity losses in distribution systems, will define the technical requirements necessary for this program, namely: (i) detailed engineering of the substations and networks to be financed, described in Components 1 and 2; (ii) bidding documents necessary for procuring the required goods and services; and (iii) methodology for monitoring the indicators established in the results matrix.
- 1.18 Given the significance of the comprehensive improvements needed in the sector, it is also important to strengthen EDESUR's human resources and its relationship with the public (including the company's social responsibility in the country). With regard to human resources, it is vital to address the issue of gender and to ensure that human resources policy and planning take gender issues more into account.
- 1.19 **Gender perspective at EDESUR.** In May 2018, EDESUR's workforce was 63% male and 37% female, with the women principally holding administrative positions. The largest gender gap occurs in management positions, only 15% of which are held by women, followed by middle management positions (25% held by women). According to EDESUR's human resources department, this ratio is typical throughout the country's energy sector and is due to, *inter alia*, the fact that the sector has traditionally been dominated by men and, consequently, not enough women seek university engineering degrees. In Latin America and the Caribbean, women's participation in the workforce varies by country and subregion. Although in some countries it has been increasing, in the Caribbean only 53.3% of women participate in the workforce, and in the Dominican Republic the corresponding figure is only 50.8%, compared to 78.8% for men²⁹. Furthermore, far fewer women work in the construction, mining, transportation, electricity, gas, and water sectors, according to the Economic Commission for Latin America and the Caribbean (ECLAC). Only 3% of working women are employed in the energy, gas, and water sector of Latin America and the Caribbean (most of whom hold administrative positions), compared to 9% of working men.³⁰ In general, women working in this sector are paid less and receive fewer benefits than men, and may even work without service contracts. Accordingly, and based on international experience that demonstrates the benefits of female employment in the energy sector,^{31,32}

²⁹ Decent work and gender equality, Regional report, 2013. ECLAC.

³⁰ Women are more concentrated in the service (42.3%) and business (25.6%) sectors. Decent work and gender equality, Regional report, 2013. ECLAC.

³¹ Tata Power in New Delhi, India, hired more than 800 local women from 223 marginal neighborhoods as liaisons for the public utility to encourage customers to pay their bills. The result was a 183% increase in revenue over five years from these neighborhoods, with minimal cost to the company. [The Army of Women Battling India's \\$10 Billion Power Problem. Bloomberg.](#)

- increasing women's share of higher paid and higher level technical positions is seen as an opportunity for companies and women alike.
- 1.20 In 2018, EDESUR created a corporate social responsibility unit. One of the objectives for the unit was to improve the company's relationship with the public and to simultaneously help reduce the company's nontechnical losses. In terms of corporate social responsibility, EDESUR has the opportunity to include gender equality and inclusion activities under an existing social responsibility program that needs to be strengthened and implemented. The operation described herein will support implementation of the gender equality initiatives set out in EDESUR's institutional strategic plan. Specifically, it will promote equality among men and women at the institutional and community levels by implementing a gender policy and action plan at the institutional level; productive energy use pilot projects in underserved areas of the country; and technical training and job placement for women and young people in those areas (paragraph 1.34).
- 1.21 **Innovation and digitization.** The electricity sector is undergoing a digital revolution and transformation, making it possible for distribution systems to become more intelligent, efficient, reliable, and sustainable. Accordingly, this program will promote greater use of digital technologies through the procurement and implementation of remotely controlled reclosers that facilitate more efficient real-time monitoring, to rapidly identify irregular connections and overload situations. This represents an opportunity to reduce losses and improve service quality and efficiency³³ (paragraph 1.33).
- 1.22 **Country strategy with the sector.** The National Development Strategy 2030 governs sector policy, which sets forth the main economic, social, institutional, and environmental objectives that will guide the policy through 2030. This strategy includes, as a specific objective, "ensuring a dependable supply of electricity, at competitive prices and in financially and environmentally sustainable conditions." The Comprehensive Strategic Plan of the CDEEE and Government of the Dominican Republic 2017-2020 is also aligned with this strategy. Accordingly, it includes as an objective improving service quality for customers by decreasing losses and expanding distribution and transmission systems. Through its line of action 2.2, the plan seeks operational solutions such as building new substations and upgrading or expanding existing ones, thereby contributing to the development of the target areas and having a direct positive impact on the population's quality of life.
- 1.23 **Sector knowledge.** The Bank has accumulated extensive knowledge of the sector by providing steady support, especially since 2009, through technical-cooperation operations and technical dialogue, as well as financing of investment and reform initiatives, such as the "Electricity Distribution Network Rehabilitation Project"

³² According to a study of nearly 22,000 listed companies in 91 countries, there is a correlation between having women in leadership positions and increased profitability of power companies. (Peterson Institute). Furthermore, companies with gender diverse boards of directors do better than companies that do not have women on the board in terms of stock price performance during times of crisis or volatility. (Suisse Research Institute).

³³ The modernization and automation of power systems are fundamental to effectively improve system reliability and do so at a low cost. See [A Study on Power System Automation](#). Pai and Kopte (2015). Mumbai, India.

(operation 1281/OP-DR, 2042/OC-DR)³⁴ and “Support for the Power Distribution Network Modernization and Loss Reduction Program” (operation 3182/OC-DR).³⁵ The latter operation, which began implementation in 2014, includes a commercial component that is beginning to have an impact in terms of reducing the three electric power distribution companies’ commercial losses, from 32.1% in 2014 down to 29.9% in 2017. The lessons learned include the importance of an oversight process to supervise project implementation and the construction of the works to be financed, for which specialized professionals are typically subcontracted, as reflected in the present operation’s [procurement plan](#).

- 1.24 **The Bank’s country strategy.** The operation is aligned to the Bank’s country strategy with the Dominican Republic (document GN-2908), by prioritizing investments to improve access to and the quality of the power supply, thereby contributing to productive transformation against a backdrop of growing challenges with respect to competitiveness, innovation, and climate change. The strategic objective of the Bank’s participation in the sector is to improve productive infrastructure. This operation contributes to progress on expanding and improving the quality of the power supply for the population, with a direct impact on the country strategy results matrix indicator “improved quality of electric power to businesses.” In this same vein, the Bank approved the second operation of the programmatic policy-based series, “Power Sector Sustainability and Efficiency Program II” (operation 4649/OC-CR), which includes as measures to promote the financial sustainability and operational efficiency of the power sector: (i) the implementation of management-improvement and power loss-reduction plans, of which the PMESD is an integral part, and (ii) the monitoring of the power distribution companies’ compliance with the targets established therein. By complying with the policy conditions established in the programmatic series, the overall expectation is that the country will continue to advance in the implementation of sector reforms. Accordingly, not only are the power distribution companies expected to fulfill their commitment to reducing electricity losses (which will require infrastructure improvements), but the power sector should also benefit from a rate structure that enables the companies to efficiently recover the costs involved in providing service, a more efficient system of subsidies, and a more robust institutional framework for the sector, with enhanced supervision capacity.
- 1.25 **Strategic alignment.** This program is included in the Update to Annex III of the Operational Program Report (document GN-2915-2) and is consistent with the Update to the Institutional Strategy 2010-2020 (document AB-3008), aligning with the development challenges of productivity and innovation through the: (i) strengthening electricity sector infrastructure, which will improve energy security as well as quality, creating conditions for increased productivity and thereby promoting improved economic growth and fostering the business environment; and (ii) automation of meters through the implementation of remotely controlled reclosers, which will allow for more efficient, real-time monitoring. The program also seeks to support the crosscutting objectives of: (i) gender equality and diversity, by: (a) developing an institutional gender policy and action plan; and

³⁴ Approved in 2008 for US\$40 million, with US\$30 million in cofinancing from the Organization of Petroleum Exporting Companies (OPEC).

³⁵ Approved in 2014 for US\$78 million.

- (b) designing and implementing pilot projects on the productive use of energy in underserved areas prioritized by EDESUR, based on a gender-sensitive approach (paragraph 1.34); and (ii) climate change and environmental sustainability, by reducing power losses. The investments in rehabilitating existing networks and substations include climate financing: approximately 55.88% of operation funds will be invested in climate change mitigation activities, pursuant to the [Joint Report on Multilateral Development Banks' Climate Finance](#). These resources contribute to the IDB Group target of increasing financing for climate-related projects to 30% of approvals by the end of 2020.
- 1.26 The program is also aligned with the Corporate Results Framework 2016-2019 (document GN-2727-6), by supporting the attainment of the following country development outcome indicators: (i) government agencies benefited by projects that strengthen technological and management instruments to improve public service delivery, given that the program seeks to improve EDESUR's oversight and operational capacities by increasing network automation through the implementation and monitoring of reclosers; and (ii) women beneficiaries of economic empowerment initiatives, through the implementation of productive enterprise pilot projects that could support women's economic activities (paragraph 1.34).
- 1.27 The program is aligned with the Strategy of Sustainable Infrastructure for Competitiveness and Inclusive Growth (document GN-2710-5), by supporting infrastructure modernization to help satisfy the demand for energy in a sustainable way. It is also consistent with the Energy Sector Framework Document (document GN-2830-5), specifically, with its thematic pillars of: (i) energy access, since it aims to improve quality, reliability, and accessibility by increasing service availability and guaranteeing that new demand is met; (ii) energy sustainability, by decreasing electrical losses and thereby fostering energy efficiency and supporting climate change adaptation; and (iii) energy security, by improving and expanding the infrastructure of the power distribution system to meet growing demand.
- 1.28 **Consistency with the Public Utilities Policy.** The program is consistent with the [Public Utilities Policy](#) (document GN-2716-6) with regard to the electricity subsector, since it complies the objectives of: (i) promoting access to the service, since it seeks to expand infrastructure to ensure that the supply of electricity keeps pace with growing demand; (ii) delivering a reliable, quality service, since the program seeks to reduce service interruptions and thereby improve the quality of service delivered, as evidenced in the cost-benefit analysis; and (iii) delivering service efficiently, since, as a result of infrastructure improvements, EDESUR should be able to reduce its technical losses and become a more efficient and sustainable company. The program also complies with the conditions of financial sustainability: (i) financial sustainability, since power distribution services will generate sufficient revenues to cover financial commitments, as well as the operating and maintenance costs of the new infrastructure; (ii) environmental sustainability, by improving energy efficiency and reducing losses, resulting in fewer greenhouse gas emissions; and (iii) social sustainability, by financing productive energy-use projects to be implemented in vulnerable and/or underserved areas of the country. Lastly, the program complies with the policy's principles and conditions. Specifically, from the financial standpoint, EDESUR has the resources necessary to maintain the works. However, in the event the

distribution companies' resources were insufficient for such maintenance, the State would provide them with transfers to cover, *inter alia*, operating and expansion-related costs. With regard to economic sustainability, the sensitivity analysis performed in connection with the cost-benefit evaluation demonstrated the economic returns and robustness of the results.

B. Objectives, components, and cost

- 1.29 **Objectives.** The general objective of the program is to enhance operating efficiency (i.e. reduce technical losses and improve the continuity and quality of the power supply) and improve EDESUR's capacity to satisfy growing demand for electrical distribution system services, by upgrading and adding infrastructure under environmentally and financially sustainable conditions. The specific objective is to support implementation of the first stage of EDESUR's master plan for expanding the distribution system (PMESD).
- 1.30 The expected outcomes are: (i) reduced technical losses; (ii) increased average service availability; (iii) improved compliance with demand in the target areas; and (iv) improved economic empowerment of women through productive activity initiatives. The program components are described below.
- 1.31 **Component I. Construction and equipping of new distribution substations and associated networks (US\$63.45 million).** This component will finance the construction of new substations, to include new transformers; the construction of low- and medium-voltage networks; the procurement and installation of distribution transformers; and the acquisition of land for the aforementioned substations. The specific details of electricity infrastructure and land requirements will be identified during the stage in which the program's detailed engineering studies are being prepared, and will be included in the program Operating Manual. The works will be selected in accordance with the criteria established in paragraph 2.4 hereof.
- 1.32 The acquisition of land will be necessary to achieve the program's objective of building new substations, with the aim of keeping up with growing demand. These costs are included in the program's total cost and will be budgeted by the Ministry of Finance to ensure that these resources are available to EDESUR. The purchase of the land required to build the substations will be financed for substation construction provided that the requirements of the Policy on Eligible Expenditures in Investment Loans are met, namely: (i) the lands are part of the program and are necessary for the construction of the new substations proposed; (ii) their use is productive and optimal in terms of meeting the technical requirements of EDESUR's distribution system; and; (iii) their value can be established at market prices that are reasonable and satisfactory to the Bank.³⁶
- 1.33 **Component II. Rehabilitation and adaptation of existing substations and networks (US\$86.61 million).** To ensure that the existing infrastructure can continue to function optimally for a longer period of time, this component of the program will finance: the upgrading of substations with load capacity above the technically recommended level; the procurement and installment of power transformers for the existing substations; the rehabilitation of low- and

³⁶ Modernization of Policies and Practices that Restrict the Use of Resources in Investment Loans (document GN-2331-5) and its operating guidelines (document CC-6004-2).

medium-voltage networks; the purchase and installation of distribution transformers; and the procurement, implementation, and monitoring of reclosers and medium-voltage master metering. The specific details of electricity infrastructure and land requirements will be identified during the stage in which the program's detailed engineering studies are being prepared, and will be included in the program Operating Manual. The works will be selected in accordance with the criteria established in paragraph 2.4 hereof.

- 1.34 **Component III. Institutional strengthening and program management and monitoring (US\$4.94 million).** At the institutional level, this component will support:³⁷ (i) a gender policy³⁸ and action plan that fosters, *inter alia*, more participation of women in EDESUR leadership positions, and promotes activities such as mentoring for women, training plans, and professional development plans;³⁹ (ii) implementation of a corporate social responsibility program that will include pilot projects on the productive use of energy in underserved areas prioritized by EDESUR (Barahona and Azua), as well as financing plans for microenterprises to support women's economic activities and thereby help reduce poverty and electrical losses, while improving the company's relationship with the community. The program will enhance the work being done with respect to gender and guarantee the long-term sustainability of the actions promoting access to resources; and (iii) a training program for young people and women to include technical instruction on energy and job placement for these groups⁴⁰ as well as economic empowerment and skills training for entrepreneurs.⁴¹ At the program level, this component will finance support services for: (i) program execution; (ii) midterm evaluation; (iii) final evaluation; (iv) financial audit; and (v) technical monitoring of the works.⁴²

C. Key results indicators

- 1.35 This program supports execution of the PMESD and will help achieve a number of government objectives, such as fostering the development of distribution infrastructure to ensure that it will operate in accordance with quality and reliability standards.⁴³ The program's main expected impact is the increased operational

³⁷ See the gender annex more information on support at the institutional level.

³⁸ [Women in Power and Utilities. Index 2016.](#)

³⁹ Activities include: a review of how EDESUR staff members are recruited, trained, and promoted.

⁴⁰ The proposed actions are directly related to the Bank's strategic lines for access to resources, leadership, and small businesses.

⁴¹ This program may be supplemented with a job placement plan, which would lower unemployment in the community, raise individuals' awareness of the importance of the service (electricity) being provided, give them a sense of ownership, and provide them with financial resources to pay their electricity bills. The operation will work with CDEEE and EDESUR to design and implement the activities, maximizing the work of local nongovernmental organizations and efforts already under way. The courses could be implemented, for example, in partnership with the International Union for Conservation of Nature, the U.S. Agency for International Development, the International Center for Research on Women, and John Hopkins University, all of which have experience in this type of work in Latin America and the Caribbean.

⁴² Training will follow the Empowered Entrepreneur Training Program model, consisting of a publicly available curriculum based on the Empowered Entrepreneur Training Handbook, which has been used in the energy sector for business, empowerment, and leadership training for more than 600 entrepreneurs and sales agents (mostly women) in nine countries.

⁴³ This objective is included in the National Development Strategy 2030.

efficiency of the distribution system; namely, improved service continuity and quality, to be measured by the increase in power supplied.

- 1.36 More specifically, the program should help reduce technical electrical losses, increase average service availability, meet new demand, and improve women's empowerment through productive activity initiatives in the EDESUR concession areas. The results matrix lists the monitoring and evaluation indicators. The program execution outcome indicators are: (i) energy not supplied due to technical losses; (ii) System Average Interruption Frequency Index (SAIFI) in a given period; (iii) System Average Interruption Duration Index (SAIDI) in a given period; (iv) installed capacity for meeting demand; (v) women benefited through economic empowerment initiatives (in Azua and Barahona); and (vi) women in UDESUR leadership and middle-management positions.
- 1.37 **Economic evaluation.** An [economic evaluation](#) was performed of the expected outcomes and impact of program activities. Although this is a multiple works program (paragraph 2.1), the analysis considered all of the substations to be built and renovated, based on the PMESD study. The analysis of program Components I and II yielded positive financial returns, with a financial net present value (FNPV) of US\$519.8 million and financial internal rate of return (FIRR) of 34.4%, for a total investment of US\$150 million disbursed in the initial 2020-2023 period, with a 30-year evaluation horizon.
- 1.38 The program economic evaluation found a high level (US\$1,882,500,000) of economic net present value (ENPV) and a 77.9% economic internal rate of return (EIRR). A sensitivity analysis found that modifying each variable independently, within a typical range of +/-15%, results in the following changes: average purchase price, change in FNPV of +/- US\$282 million; and average sales price, change in ENPV of +US\$386 million/-US\$422 million.
- 1.39 In addition, modifying the growth rate in energy demand results in a change of +US\$88 million/-US\$97 million in FNPV, and a change of +US\$266 million/-US\$300 million in ENPV. Lastly, the program's most sensitive variable is average purchase price: if it increases by more than 27.6%, the program will become financially unfeasible.
- 1.40 In short, the financial and economic returns of the program are positive and reasonably robust to unexpected changes in its variables. This robustness is primarily due to the marked increase in transformer capacity of new and existing substations, with the resulting benefits for consumers. Program execution is therefore recommended, as it will definitely provide significant benefits to the Dominican people.
- 1.41 **Beneficiaries.** The improvements in operational efficiency (continuity and quality of the power supply) and capacity of the EDESUR power distribution system to meet growing demand will directly benefit all customers (residential, commercial, and industrial) in terms of the increase in power supplied and the reduction in planned and unplanned outages. In addition, improved operating capacity that reduces electrical losses and meets growing demand will translate into improved financial sustainability, thereby benefiting the economy as a whole.

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

- 2.1 The program is structured as a multiple works investment loan, since it will finance works that are physically similar but independent of each other, which meet the eligibility criteria described in paragraph 2.4. The program cost is US\$155 million, to be financed from the Bank's Ordinary Capital. Table 1 presents a breakdown of costs by component.

Table 1. Program costs (US\$ millions)

Components	Bank	%
Component I. Construction and equipping of new distribution substations and associated networks	63.45	41
Component II. Rehabilitation and adaptation of existing substations and networks	86.61	56
Component III. Institutional strengthening and program management and monitoring	4.94	3
Total	155.00	100

- 2.2 The program disbursement period will be four years, due to the project's technical characteristics, the availability of preliminary technical designs for the works, and the experience acquired in similar projects in the country. Table 2 presents the details of annual disbursements under the program.

Table 2. Projected disbursements (US\$ millions)

Component	Year 1	Year 2	Year 3	Year 4	Total
I. Construction and equipping of new distribution substations and associated networks	8,832,574	19,287,954	33,369,543	1,955,214	63,445,286
II. Rehabilitation and adaptation of existing substations and networks	5,710,000	24,460,357	54,121,357	2,322,571	86,614,286
III. Institutional strengthening and program management and monitoring	1,143,107	1,829,107	1,664,107	304,107	4,940,429
Total	15,685,681	45,577,418	89,155,008	4,581,893	155,000,000
Percentage of total	10	29	58	3	100

- 2.3 **Sample and eligibility criteria.** The projects of the sample represent 36% of the works to be financed under the program. The sample is comprised of three new substations (Monoguyabo, Los Alcarizos, and Piedra Blanca) of approximately five to be built under Component I, and two substations (Metropolitana and Embajador) of the nine to be renovated under Component II.
- 2.4 The [preliminary technical designs](#) and respective environmental studies for the substations of the sample to be built or renovated have already been prepared.

Furthermore, EDESUR has the preliminary technical designs for the remaining works that may be included in the program and is working on the environmental studies. The sample works to be financed with program proceeds are described and the procurement methods to be used are identified in the [procurement plan](#). The sample works were selected in accordance with the eligibility criteria. Any other works to be financed under the program must also comply with that criteria; namely: (i) they must be planned by EDESUR (i.e. included in the PMESD); (ii) they must contribute to the construction and/or renovation stage of electrical substations and related networks; (iii) they must help improve electricity service quality; (iv) they must comply with the social and environmental provisions set out in the program's environmental and social management framework (ESMF); (v) their respective preliminary technical designs must already have been prepared; (vi) they cannot be classified as a category "A" operation under the Bank's socioenvironmental classification, under the Bank's Environment and Safeguards Compliance Policy; and (vii) they must comply with the financial and economic analysis criteria established in the [monitoring and evaluation plan](#), and have an EIRR equal to or greater than 12%.

B. Environmental and social risks

- 2.5 Based on the information furnished by the CDEEE on the projects of the representative sample, the adverse social and environmental impacts associated with their implementation should be medium-scale, localized, and reversible, for which there are effective control and mitigation measures. Accordingly, the program has been classified as a category "B" operation, pursuant to Bank's Environment and Safeguards Compliance Policy (Operational Policy OP-703).
- 2.6 The majority of the sample projects (see paragraph 2.3) will be implemented in areas where work has already been done and rights-of-way are in place. No impacts due to physical or economic displacement have been identified. The potential adverse socioenvironmental impacts would primarily occur during the construction phase of the substations and the distribution works and, to a lesser extent, during their operation. Measures will be taken to ensure that any polychlorinated biphenyls (PCBs) associated with the removal of the old transformer equipment are properly handled and disposed of in accordance with the Ministry of the Environment and Natural Resources' environmental regulations governing the use, handling, transport, and disposal of PCBs.
- 2.7 The environmental and social studies and/or environmental and social analyses have already been prepared for the projects of the sample, which also include environmental and social management plans. Moreover, since this is a multiple works program, an ESMF has been prepared so that the works not included in the sample will be also executed in compliance with environmental and social provisions in line with IDB policies. These documents have been published on the IDB web page.
- 2.8 The following public consultations were held for the sample works: one for the Managuayabo substation (13 July 2018); one for the Los Alcarrizos substation (14 July 2018), and one for the Piedra Blanca substation (20 July 2018). The final versions of the public consultation reports, the environmental and social studies, the environmental and social analysis, and the ESMF have been published on the

IDB web page, in compliance with the Bank's Access to Information Policy (Operational Policy OP-102) and Operational Policy OP-703.

- 2.9 Based on the analysis of the program sample, a social/environmental risk has been identified in connection with the acquisition of land the implications it may have going forward, which may include compensation to the affected parties. Supervision of these processes must therefore be ongoing during the construction phase. Accordingly, a compensation framework is included as part of the ESMF.
- 2.10 Natural disasters, such as floods and hurricanes, were also identified as a high risk. To mitigate this risk, the projects have solid contingency plans in place and include parameters for procuring equipment that can withstand strong winds. In addition, the Government of the Dominican Republic has ex ante coverage for earthquakes and hurricanes, through the Contingent Loan for Natural Disaster Emergencies (operation DR-X1003).
- 2.11 The team also identified the following as potential socioenvironmental risks of the program:
- (i) The awarding of environmental licenses and authorizations may be delayed (medium risk). This risk will be mitigated by involving the relevant entities and handling the authorizations early enough, so that they can be processed and issued by the desired deadlines.
 - (ii) Natural disasters that could harm the new infrastructure may occur (high risk). To mitigate the effects of natural disasters, the technical team is working on a proposal for substations that will be less vulnerable due to their design and locations, which will make it possible to rapidly reestablish service if they are affected.
 - (iii) The beneficiary communities may reject program implementation (medium risk). To mitigate this risk, the EDESUR social management team will hold training and information workshops with the communities on the program's benefits, potential risks, and impacts. These training sessions will continue during and after execution of the works.

C. Other risks

- 2.12 **Public management and governance.** Other potential risks that were analyzed are: (i) the government may change its priorities regarding the financing of energy sector works (medium risk); (ii) there may be difficulties or delays in acquiring land (high risk); and (iii) there may be delays in the process of legalizing ownership of the land on which the new substations are to be built (medium risk). The risk of the government changing its priorities will be mitigated through ongoing dialogue with the authorities to raise awareness of the program's importance. To prevent the second risk from materializing, the team will, as soon as possible, engage with the various actors involved in the procurement process. As mitigation measures for the third risk, property surveys and title searches will be conducted. Notably, both CDEEE and EDESUR have experience in performing these procedures.
- 2.13 Another institutional risk is the lack of capacity for executing the program, specifically with regard to the bidding procedures and the proper, timely preparation of the relevant documents (medium risk). To mitigate this risk, a

consultant specializing in substations will be contracted and, simultaneously, a capacity development plan will be implemented.

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary of implementation arrangements

- 3.1 **Borrower and executing agency.** The borrower will be the Dominican Republic and the executing agency will be the CDEEE, which will act through its project execution unit (PEU). The CDEEE has experience implementing energy projects, having completed the operation "Support for the Power Distribution Network Modernization and Loss Reduction Program" (operation 3182/OC-DR) in two and a half years. EDESUR will provide technical support to the PEU and will prepare an agreement to that end to be signed by the borrower, the CDEEE, and EDESUR.
- 3.2 The CDEEE will fulfill its role through the PEU and its staff. The PEU's key staff will remain in place throughout program execution and are as follows: a general coordinator; a technical coordinator; a procurement specialist; and a financial specialist. The PEU will also contract a substation technical expert and the environmental and social specialist mentioned in the environmental and social management report, all of whom will work on the program's activities. The PEU reports directly to the Office of Executive Vice President of the CDEEE. The PEU will coordinate all program-related activities with the CDEEE and EDESUR, and will serve as the direct contact with the IDB.
- 3.3 The PEU will be responsible for the administrative/managerial, procurement, and financial aspects of the program, using the existing monitoring, procurement, financial, budget, and filing systems, which are acceptable to the IDB. The PEU will also be responsible for preparing the bidding documents and for fully managing the procurement processes, including preparing the installation and supply contracts. It will also be responsible for evaluating the contract proposals and assignment recommendations, with technical support from EDESUR.
- 3.4 **Special contractual conditions precedent to the first disbursement of the financing. The following will be special contractual conditions precedent to the first disbursement of the loan: (i) the CDEEE's PEU will have been strengthened by hiring a substation technical expert (paragraph 3.2) and an environmental and social specialist, as described in the environmental and social management report; and (ii) the [program Operating Manual](#) will have been approved and entered into effect, in accordance with the terms previously agreed upon with the Bank, such that the responsibilities, standards, and procedures that will govern execution have been agreed upon and adopted.**
- 3.5 **Financial management.** The IDB policies and procedures specified in the program Operating Manual will be followed, including: (i) management of funds in United States dollars and local currency; (ii) submission of reports, including the annual procurement plans, works progress reports, bidding documents, and other documentation involved in program execution; (iii) technical and financial audits; and (iv) identification of eligible expenses. A designated account will be opened for local currency funding needs, which should be relatively minor. This account will be managed pursuant to the program Operating Manual.

- 3.6 **Procurement of goods and services.** The procurement of works, goods, and services and the selection and contracting of consulting services will be carried out in accordance with the Policies for the Procurement of Works and Goods Financed by the IDB (document GN-2349-9) and the Policies for the Selection and Contracting of Consultants Financed by the IDB (document GN-2350-9). The procurement plan contains the bidding and procurement processes planned for the program.
- 3.7 **Program Operating Manual.** Program execution and management procedures will be established in the program Operating Manual, to include the responsibilities, standards, and procedures that will govern execution, such as: (i) details on procurement and contracting flows; (ii) management and execution tools and system; (iii) physical monitoring and accounting/financial information requirements and responsibilities; (iv) CDEEE-EDESUR interagency coordination mechanisms; (v) environmental and social management considerations; and (vi) the scope of the components identified in the detailed engineering studies.
- 3.8 **Audits.** The program's external financial auditing services will be provided by an independent auditing firm acceptable to the Bank, contracted as a charge against the loan on the basis of the terms of reference agreed upon with the executing agency.
- 3.9 In addition to the financial auditing firm, technical auditors will be contracted, with program funds, to support the PEU and EDESUR in certifying: (i) that the contractors' works are compliant; (ii) the program performance indicators; and (iii) compliance with the program's environmental and social management framework.
- B. Summary of results monitoring arrangements**
- 3.10 **Monitoring.** The program has a monitoring and evaluation plan. The methodology will consist in periodic monitoring of the output indicators that will render an account of the most important program execution aspects. The administrative monitoring and control of the program will focus on monitoring and documenting compliance with procedural standards in administrative, financial, accounting, and legal matters, in accordance with country and IDB guidelines, as well as those set out in the program Operating Manual and the loan contract. The monitoring and evaluation plan includes indicators of the program's economic, social, and environmental performance. The executing agency will submit progress status reports to the Bank within 60 days after the end of each six-month period. These reports will document the degree of compliance with the output indicators and progress on the outcomes set forth in the results matrix. The problems encountered will be identified and corrective measures will be suggested. No later than 30 November of each year, the executing agency will submit the following to the Bank: annual work plan, procurement plan, and cash flow planning for the following year.
- 3.11 **Evaluation.** The PEU will supervise compliance with the agreed-upon performance indicators. It will also deliver consolidated program progress reports within 60 days after the end of each six-month period, in the format established in the program Operating Manual.

- 3.12 The CDEEE, through the PEU, will contract an independent firm to supervise the works. It will issue supervision reports on the quality of execution and adherence to the timelines for the contracted works. These reports will be approved by the CDEEE prior to issuing payments to the respective contractors against the loan proceeds.

Development Effectiveness Matrix		
Summary		DR-L1128
I. Corporate and Country Priorities		
1. IDB Development Objectives	Yes	
Development Challenges & Cross-cutting Themes	-Productivity and Innovation -Gender Equality and Diversity -Climate Change and Environmental Sustainability	
Country Development Results Indicators	-Electricity transmission and distribution lines installed or upgraded (km)*	
2. Country Development Objectives	Yes	
Country Strategy Results Matrix	GN-2908	Improve the operational and tariff efficiency of the electricity sector
Country Program Results Matrix	GN-2915-2	The intervention is included in the 2018 Operational Program.
Relevance of this project to country development challenges (if not aligned to country strategy or country program)		
II. Development Outcomes - Evaluability		
		Evaluable
3. Evidence-based Assessment & Solution		7.7
3.1 Program Diagnosis		3.0
3.2 Proposed Interventions or Solutions		1.7
3.3 Results Matrix Quality		3.0
4. Ex ante Economic Analysis		9.0
4.1 Program has an ERR/NPV, or key outcomes identified for CEA		3.0
4.2 Identified and Quantified Benefits and Costs		3.0
4.3 Reasonable Assumptions		1.0
4.4 Sensitivity Analysis		2.0
4.5 Consistency with results matrix		0.0
5. Monitoring and Evaluation		6.5
5.1 Monitoring Mechanisms		1.8
5.2 Evaluation Plan		4.7
III. Risks & Mitigation Monitoring Matrix		
Overall risks rate = magnitude of risks*likelihood		Medium
Identified risks have been rated for magnitude and likelihood		Yes
Mitigation measures have been identified for major risks		Yes
Mitigation measures have indicators for tracking their implementation		Yes
Environmental & social risk classification		B
IV. IDB's Role - Additionality		
The project relies on the use of country systems		
Fiduciary (VPC/FMP Criteria)	Yes	Financial Management: Budget, Treasury, Accounting and Reporting. Procurement: Information System, Price Comparison.
Non-Fiduciary		
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:		
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project	Yes	The Bank is in currently preparing the TC "Support for the Evaluation of Projects to Reduce Losses and Strengthen the Governance of the Electricity Sector" (DR-T1179) and "Program for Expansion of Networks and Reduction of Electric Losses in Distribution" (DR -T1170, the latter to support the design of the substations to be implemented in the framework of the operation DR-L1128.

Note: (*) Indicates contribution to the corresponding CRF's Country Development Results Indicator.

The general objective of the program is to increase operational efficiency (reduction of technical losses, greater continuity and quality of supply) and the capacity to meet the growth of demand in the electricity distribution system of Empresa Distribuidora de Electricidad del Sur SA (EDESUR), through the renovation and addition of infrastructure with financial and environmentally sustainable standards.

The documentation is well structured—a good summary of the electricity sector and the regulatory and institutional framework is provided, and the main challenges of the distribution system are highlighted: lag in investments in the system to replace or update substations and distribution networks, which translates into overloads, technical losses, and deficiencies in the quality of the service.

The program is structured as an investment loan for multiple works. The projects in the sample represent 36% of the works to be financed. The proposed solution is clearly linked to the problems identified. The results matrix (RM) reflects the objectives of the program and shows a clear vertical logic for each of the three components. The lower level indicators reflect the design of the three components. The RM includes SMART indicators at the level of products, outcomes, and impacts, with their respective baseline values, targets, and means to collect the information.

A Cost-Benefit Analysis is carried out for Components I and II, and in aggregate form. The main benefit is based on the Consumer Surplus associated with the increase of energy delivered to final consumers. The EA is well developed, however, given the presentation of the data for the variables that define the main benefit, the consistency of the values assumed in the EA cannot be verified with those in the RM. For the combined evaluation, there is an internal rate of return (IRR) of 77.9% and a net present value (NPV) of US \$1,882.5 million. A sensitivity analysis is performed under alternative scenarios modifying the main variables that can affect costs and benefits. The conservative scenario finds an IRR of 63.9% with an NPV of US\$1,581 million.

The monitoring and evaluation plan proposes a Before-and-After evaluation and an ex post cost-benefit EA.

The risks identified in the risk matrix seem reasonable and are classified as Low (3), Medium (5) and High (2) risk. The risks of medium and high classification include mitigation actions and compliance indicators.

RESULTS MATRIX

Program objective:	The general objective of the program is to enhance operating efficiency (i.e. reduce technical losses and improve the continuity and quality of the power supply) and improve the capacity of Empresa Distribuidora de Electricidad del Sur S.A. (EDESUR) to satisfy growing demand for electrical distribution system services, by upgrading and adding infrastructure under environmentally and financially sustainable conditions. The specific objective is to support implementation of the first stage of EDESUR's master plan for expanding the distribution system (PMESD).
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EXPECTED IMPACT

Indicators	Unit of measurement	Baseline	Baseline year	Year 1	Year 2	Year 3	Year 4	Final target	Means of verification	Comments
IMPACT #1: Increase in the energy supplied by EDESUR										
Energy supplied by EDESUR	Gigawatt-hour (GWh)	5,010.4	2017	5,189	5,815	6,301	6,753	6,753	EDESUR Management Control Reports	This indicator is aligned with the strategic objective of the Country Strategy GN-2908 DE Results Matrix, "Improve the operating efficiency and rate structure of the power sector."

EXPECTED OUTCOMES

Indicators	Unit of measurement	Baseline	Baseline year	Year 1	Year 2	Year 3	Year 4	Final target	Means of verification	Comments
OUTCOME #1: Reduction of technical electrical losses										
Energy not supplied due to technical electrical losses	GWh	60.1	2017				26.4	26.4	Official CDEEE report	This indicator measures compliance with the objective of improving the continuity of the power supply.
OUTCOME #2: Average service availability										
SAIFI	# of interruptions per user ¹	373.4	2017	373.40	373.40	339.88	313.92	313.92	EDESUR Management Control Reports	The purpose of these indicators is to help monitor improvement in the quality and continuity of the power supply.
	# of customers affected	717,264	2017	717,264	717,264	550,222	427,028	427,028		
SAIDI	# of minutes per user	58,956.1	2017	58,956.1	58,956.1	49,181.6	41,433.5	41,433.5		
	# of customers affected	717,264	2017	717,264	717,264	550,222	427,028	427,028		
OUTCOME #3: Meeting demand										
Installed capacity for meeting demand	MVA	1,689.3	2017	1,699.3	1,798.3	2,148.3	2,394.3	2,394.3	Official CDEEE report	The purpose of this indicator is to monitor improvement in the capacity to meet new demand.

¹ Excluding circuits brought to 24 hours of service.

Indicators	Unit of measurement	Baseline	Baseline year	Year 1	Year 2	Year 3	Year 4	Final target	Means of verification	Comments
OUTCOME #4: Improved economic empowerment of women through productive activity initiatives										
Women benefited with economic empowerment initiatives (Azua and Barahona)	# of women	0	2017	0	0	25	25	50	Official CDEEE report	This indicator contributes to the expected Country Strategy with the Dominican Republic outcome of "Greater participation of women in the labor market."
Women in leadership and middle management positions at EDESUR	%	25	2017	0	0	15	20	35	Official CDEEE report	This indicator aligns with the gender strategy.

OUTPUTS

Outputs	Unit of measurement	Baseline	Baseline year	Year 1	Year 2	Year 3	Year 4	Final target	Means of verification	Comments
Component I: Construction and equipping of new distribution substations and associated networks										
New distribution substations to be built and equipped	# of substations	0	2019	0	0	2	3	5	PEU-CDEEE	
Equipped distribution network (medium voltage and low voltage) ²	Kilometer	0	2019	0	0	160	237	397		

² This indicator will be measured by the length (kilometers) of the medium-voltage network.

Outputs	Unit of measurement	Baseline	Baseline year	Year 1	Year 2	Year 3	Year 4	Final target	Means of verification	Comments
Component II: Rehabilitation and adaptation of existing substations and networks										
Renovated distribution substations	# of substations	0	2019	0	0	3	6	9	PEU-CDEEE	
Rehabilitated distribution network (medium voltage and low voltage)	Kilometer	0	2019	0	0	450	720	1,170		
Remotely controlled reclosers and medium-voltage master metering installed	# of reclosers	0	2019	0	0	30	40	70		
Component III. Institution-strengthening and program management and monitoring										
Gender strategy developed and approved	# of strategies	0	2018	1	0	0	0	1	EDESUR gender strategy	
Action plan for women implemented	# of plans	0	2018	0	1	0	0	1	Action plan report	
Pilot projects on the productive use of energy, from the Social Responsibility Unit	# of projects	0	2018	0	1	0	1	2	Project reports	
Technical training program for women up and running	# of programs	0	2018	0	0	1	0	1	Training program reports	Estimated target: 20 women per course
Technical training program for young people up and running	# of programs	0	2018	0	0	0	1	1	Technical training program curriculum Agreements with training institutions	Estimated target: 20 young people per course

FIDUCIARY AGREEMENTS AND REQUIREMENT

Country: Dominican Republic
Project number: DR-L1128
Name: Program to Expand Electricity Networks and Reduce Technical Losses in Distribution Systems (DR-L1128)
Executing agency: Dominican Corporation of State-owned Electricity Companies (CDEEE)
Prepared by: Willy Bendix; Romina Kirkagacli; Denise Salabie (FMP/CDR); and Yonaida Encarnación (CID/CDR)

I. EXECUTIVE SUMMARY

- 1.1 The assessment of the fiduciary capacity of the CDEEE, which will be the executing agency for this program, was updated in June 2018. Based on the findings from the assessment and the CDEEE's extensive experience in managing projects with financing from the Bank and other multilateral organizations, the CDEEE has, in general, adequate fiduciary capacity and a low fiduciary risk for executing the operation.
- 1.2 According to the August 2017 evaluation¹ of the Dominican Republic's public finances management system (SGFP) and the 2016 PEFA report² on the Dominican Republic (presented in October 2016), overall, the Dominican government's SGFP is partially aligned with good international practices.
- 1.3 The update to the diagnostic assessment of the Dominican Republic's public procurement system was completed in February 2016, using the OECD/DAC³ methodology. In this assessment, the average result for the four pillars was 2.12 compared to the 1.69 obtained in 2012. This improvement is attributable to the progress made on Pillar II, "Institutional Framework and Management Capacity," and Pillar III, "Procurement Operations and Market Practices." Progress has been less evident on Pillar I, "Legislative and Regulatory Framework," and Pillar IV, "Integrity and Transparency of the Public Procurement System," which reveals the need to modify Law 340-06 on Procurement and Contracting.

II. FIDUCIARY CONTEXT OF THE EXECUTING AGENCY

- 2.1 The CDEEE has extensive technical and fiduciary experience in the implementation of energy projects. At present, the CDEEE's project execution unit (PEU) is successfully executing the Bank-financed loan operation 3182/OC-DR, Support for the Power Distribution Network Modernization and Loss Reduction Program (US\$78 million). The

¹ Evaluation of the Internal Control, Budget, Treasury, Accounting, and Reports Subsystems, through the application of the methodology established in the IDB Guide for Determining the Level of Development and Use of Public Financial Management Systems (GUS).

² Public Expenditure and Financial Accountability.

³ Development Assistance Committee of the Organization for Economic Cooperation and Development.

PEU also has prior experience managing other projects financed by the Bank and other multilateral development organizations. For instance, the CDEEE executed operation 2042/OC-DR, Loss Reduction and Business Improvement Program (PRPMC), in support of the electricity sector and the rehabilitation of the electric power distribution companies (US\$152.1 million). This program was financed through several loans signed by the Dominican government with the World Bank,⁴ the Fund for International Development of the Organization of the Petroleum Exporting Companies,⁵ the IDB,⁶ and the local counterpart. The programs successfully adhered to Bank policies and implemented internal control procedures that made it possible to achieve the objectives.

III. FIDUCIARY RISK EVALUATION AND MITIGATION MEASURES

- 3.1 It follows from Bank experience during execution of the loans and from the findings obtained from the Institutional Capacity Assessment System update to the assessment of the CDEEE PEU's fiduciary capacity that the fiduciary risk of program execution is low.

IV. CONSIDERATIONS FOR SPECIAL PROVISIONS OF CONTRACTS

- 4.1 The following agreements and requirements should be included in the special provisions of the contract:

A. Special contractual conditions precedent to the first disbursement

- a. The borrower, represented by the Ministry of Finance, the CDEEE, and EDESUR will have signed a fund transfer agreement, which will have entered into effect. This agreement will include the terms under which loan proceeds are to be transferred and the other program execution obligations of each party.

B. Special contractual conditions for execution

- a. **Exchange rate agreed upon with the executing agency for accountability.** For the purpose of determining the equivalence of expenses incurred in local currency as charges against the local counterpart or of reimbursements for expenses charged against the loan, the agreed-upon exchange rate will be the one in effect on the date that the borrower, the executing agency, or any other individual or legal entity given the power to incur expenses, makes the respective payments to the contractor, vendor, or beneficiary.
- b. **Audited financial statements and other reports.** During program execution the executing agency will submit:
- (i) annually, the program's audited financial statements, no more than 120 days after the close of each fiscal year;
 - (ii) at the first six months of every year, the respective unaudited financial execution report, within the 60 days after the close of the six-month period.
 - (iii) at program closing, the program's final audited financial statements, no more than 120 days after the date of the last disbursement.

⁴ International Bank for Reconstruction and Development project P089866 in the amount of US\$42 million.

⁵ Loan contract 1281/OP-DR in the amount of US\$30 million (operation administered by the Bank).

⁶ Operation DR-L1026, under loan contract 2042/OC-DR in the amount of US\$40 million.

V. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

- 5.1 **Procurement execution.** The initial procurement plan will be for the first 18 months and the PEU will update it annually or as necessary for the duration of the program.
- 5.2 **Procurement of works, goods, and nonconsulting services (procurement policy GN-2349-9).**⁷ Under this category, procurement processes subject to international competitive bidding (ICB) and limited international bidding (LIB) will be executed using the standard bidding documents issued by the Bank; and procurement processes subject to national competitive bidding (NCB) will be executed using the national bidding documents agreed upon with the Bank (or satisfactory to the Bank). With regard to the Bank, the program's sector specialist is responsible for reviewing/approving the technical specifications, which must be available prior to preparation of the bidding processes.
- 5.3 **Selection and contracting of consultants (procurement policy GN-2350-9).** Regardless of the contract amount, consulting services contracts will be executed using the standard request for proposals issued by the Bank. With regard to the Bank, the program's sector specialist or team leader is responsible for reviewing/approving the terms of reference for contracting services.
- 5.4 **Selection of individual consultants.** Contracting will be based on the comparison of at least three candidates' qualifications for performing the work. When the situation so warrants, notices will be published in the local or international press or at United Nations Development Business in order to obtain background on qualified consultants. With regard to the Bank, the program's sector specialist is responsible for reviewing/approving the terms of reference for contracting services.
- 5.5 **Procurement planning.** The CDEEE will publish the procurement plan in the Procurement Plan Execution System (SEPA) and will update it at least annually or as required to reflect actual program execution needs and progress made.
- 5.6 **Domestic preference.** For the execution of this operation, domestic preference will not be included in procurement procedures.
- 5.7 **Threshold amounts.** The thresholds for international competitive bidding and for the shortlist of international consultants will be made available to the executing agency on the Bank's [procurement page](#). The selection method will be determined in accordance with the complexity and characteristics of the procurement or contract, which will be reflected in the procurement plan approved by the Bank.

Table V-1. Table of thresholds for ICB and international shortlist (US\$)

Works			Goods			Consulting services	
ICB	NCB	Shopping	ICB	NCB	Shopping	International advertising consulting	Shortlist 100% national
≥3,000,000	<3,000,000 ≥250,000	<250,000	≥250,000	<250,000 ≥50,000	<50,000	≥200,000	<200,000

⁷ Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (document GN-2349-9), paragraph 1.1: Nonconsulting services are treated as goods.

- 5.8 **Major procurement processes.** The CDEEE will be responsible for preparing the procurement plan with assistance from the executing agency, which will ensure that procedures are appropriate according to the Bank’s procurement policies. To that end, it will issue an expert opinion for consideration by the sector specialist/project team leader. The main procurement processes planned for this operation are listed below:

Table V-2. Major procurement processes

Activity	Type of process	Estimated amount (US\$000)
Works		
Construction, supply and installation, and civil works for the new substations and the adaptation of existing substations	ICB	57,396
Rehabilitation and expansion of associated networks (new and existing substations); supply and installation of remotely controlled reclosers and master meters	ICB	89,600
Firms		
Supervision of construction and rehabilitation works	QCBS	2,900

*To access the procurement plan for the first 18 months, see [procurement plan](#).

- 5.9 **Procurement supervision.** Contracts subject to Bank ex post review will be specified in the procurement plan, based on the fiduciary risk level identified for the program. Bank ex post review visits will be made at least once every 12 months. Ex post review reports will include at least one physical inspection visit, where applicable.
- 5.10 **Records and files.** The files must be kept at the CDEEE’s offices and under appropriate security conditions.

VI. FINANCIAL MANAGEMENT AGREEMENTS

- 6.1 **Programming and budget.** As an autonomous State-owned entity, the CDEEE receives budget transfers for the sector from the Ministry of Finance to cover its investment plan and subsidies. The program’s required counterpart contributions are allocated from these funds. The Financial Analysis Unit periodically sends financial reports on the program’s budget execution to the Ministry of Finance, which subsequently validates them with the PEU. In this context, the executing agency will be responsible for ensuring that the budget allocations for the program are consistent with the execution plan and the operating plans agreed upon with the Bank. The Bank’s planning instruments (project execution plan, annual work plan, and procurement plan) will be used in program execution.
- 6.2 **Accounting and information systems.** Through the PEU, the executing agency will use the UEPEX/SIGEF accounting/finance and budget control system to process and record accounting transactions, perform budget control, and generate the required financial reports, pursuant to Bank policy and regulations. Cash-basis accounting will be used for the program.
- 6.3 **Disbursements and cash flow.** The principal disbursement modality to be used for the program will be the advance of funds, based on financial planning for up to six months. Subsequent advances may be disbursed once 80% of the cumulative balance pending justification has been submitted to and accepted by the Bank. The disbursements will be

deposited in special bank accounts in the program's name, opened by the borrower at the Central Bank and the National Treasury.

- 6.4 **Internal control and internal auditing.** The Office of the Comptroller General of the Dominican Republic⁸ is in charge of the government's internal auditing function. However, the CDEEE has its own internal auditing division, which conducts ex post control procedures and evaluations of internal control processes and transaction payments in Bank-financed programs.
- 6.5 **External control and reports.** The program will have to contract the services of independent auditing firms for the program's external financial audits. External audits will be conducted pursuant to the terms of reference previously agreed upon with the Bank and in accordance with the requirements of the applicable Bank policies and procedures. Program auditing costs will be financed with the loan proceeds.
- 6.6 **Financial supervision plan.** The staff members responsible for program coordination and financial management at the CDEEE's PEU have solid and proven experience managing Bank-financed operations. In view of this fact, financial supervision will be performed through inspection visits and ex post review, during which the originally established fiduciary risk will be assessed through ongoing dialogue and communication and through the external auditors.
- 6.7 **Execution mechanism.** The program executing agency is the CDEEE. The program will be implemented through the PEU, with technical support from EDESUR, which will coordinate, supervise, and report implementation outcomes. EDESUR is responsible for the design, technical specifications, and supervision of the works.
- 6.8 The PEU reports directly to the Office of the Executive Vice President of the CDEEE. It will coordinate all program-related activities with the CDEEE and EDESUR, and will serve as the direct contact with the IDB. The PEU will manage the administrative, procurement, and financial aspects using the existing monitoring, procurement, financial, budget, and filing systems, which are acceptable to the IDB. The PEU will be responsible for preparing the bidding documents and for fully managing the procurement processes, including preparing the installation and supply contracts. EDESUR and the PEU will also be jointly responsible for evaluating the contract proposals and assignment recommendations.

⁸ See Law 10-07, on the National Internal Control System and its "Implementing Regulations," and Presidential Decree 121-01.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/18

Dominican Republic. Loan ___/OC-DR to the Dominican Republic
Program to Expand Electricity Networks and Reduce
Technical Losses in Distribution Systems

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Dominican Republic, as Borrower, for the purpose of granting it a financing to cooperate in the execution of the Program to Expand Electricity Networks and Reduce Technical Losses in Distribution Systems. Such financing will be for the amount of up to US\$155,000,000 from the resources of the Bank's Ordinary Capital, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

(Adopted on ___ _____ 2018)