



Board of Executive Directors
For consideration
On or after 25 November 2015

PR-4342
10 November 2015
Original: Spanish
Public
Simultaneous Disclosure

To: The Executive Directors
From: The Secretary
Subject: Costa Rica. Proposal for a Conditional Credit Line for Investment Projects (CCLIP) for the "Renewable Energy, Transmission and Distribution of Electricity Program" and first individual loan under the line for the "First Renewable Energy, Transmission and Distribution of Electricity Program"

Basic Information: Loan type Conditional Credit Line for Investment Projects (CCLIP)
Borrower *Instituto Costarricense de Electricidad (ICE)*

Line of Credit

Amount up to US\$500,000,000
Source Ordinary Capital

Individual Loan

Amount up to US\$200,000,000
Source Ordinary Capital

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Remarks: Under the provisions set forth in document AB-2990, "Enhancing Macroeconomic Safeguards at the Inter-American Development Bank" (paragraph 2.4), the disbursement of Bank financing will be subject to the restrictions indicated in this loan proposal.

This operation is included in Annex III of document GN-2805, "2015 Operational Program Report", approved by the Board of Executive Directors on 15 April 2015. However, the loan amount exceeds the ceiling established for Group C countries. Therefore, the operation does not qualify for approval by Simplified Procedure.

Reference: AB-2990(5/14), AG-9/14, GN-1838-1(7/94), DR-398-17(1/15), GN-2805(3/15), GN-2246-1(7/03), DE-58/03, GN-2246-4(12/06), DE-10/07, GN-2246-7(11/07), DE-164/07, GN-2564-3(12/11), DE-225/11, GN-2805(3/15), PR-3191(10/07), DE-109/07, DE-107/07, PR-3880(6/12), DE-73/12, PR-3209(11/07), DE-142/07

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

COSTA RICA

COOPERATION FRAMEWORK FOR THE FINANCING OF INVESTMENT PROJECTS UNDER A CONDITIONAL CREDIT LINE FOR INVESTMENT PROJECTS (CCLIP)

RENEWABLE ENERGY, TRANSMISSION AND DISTRIBUTION OF ELECTRICITY PROGRAM (CR-X1014)

AND

FIRST RENEWABLE ENERGY, TRANSMISSION AND DISTRIBUTION OF ELECTRICITY PROGRAM (CR-L1070)

LOAN PROPOSAL

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ABBREVIATIONS

ARESEP	Autoridad Reguladora de los Servicios Públicos [Public Utilities Regulatory Authority]
CCLIP	Conditional credit line for investment projects
EIA	Environmental impact assessment
EIB	European Investment Bank
EIRR	Economic internal rate of return
ESAP	Environmental and social action plan
ESMR	Environmental and social management report
GCI-9	Ninth General Increase in the Resources of the IDB
GWh	Gigawatt-hours
ICE	Instituto Costarricense de Electricidad [Costa Rican Power Authority]
JICA	Japan International Cooperation Agency
kWh	Kilowatt-hour
kV	Kilovolt
LIBOR	London Interbank Offered Rate
MER	Mercado Eléctrico Regional [Regional Electricity Market]
MW	Megawatt
O&M	Operation and maintenance
OEL	Optional electronic link
PEG	New Power Generation Expansion Plan
REL	Required electronic link
SIEPAC	Central American Electrical Interconnection System
SIN	Sistema Interconectado Nacional [National Interconnected System]
tCO ₂ /year	Tons of carbon dioxide per year

I. DESCRIPTION AND RESULTS MONITORING

A. Background, problems, and rationale

- 1.1 **Macroeconomic context.** In recent decades, Costa Rica has experienced sustained economic growth averaging about 4%. This has been reflected during the same period in increased demand for electricity in the country. In 2014, gross domestic product (GDP) grew at a year-on-year rate below the average in recent years, and growth in 2015 is expected to be lower than in 2014. However, GDP is expected to return to the path of sustained growth in upcoming years.¹
- 1.2 **The electricity sector in Costa Rica.** The sector has three main players: the Ministry of the Environment and Energy, which sets policy through its Energy Sector Division; the Autoridad Reguladora de los Servicios Públicos [Public Utilities Regulatory Authority] (ARESEP), the regulatory authority responsible for setting electricity rates and ensuring service quality; and the Instituto Costarricense de Electricidad [Costa Rican Power Authority] (ICE), a state-owned company responsible for safety in the supply of electricity. To fulfill its function, the ICE harnesses hydropower and geothermal resources and other renewable sources; plans for the expansion of generation; operates the Sistema Interconectado Nacional [National Interconnected System] (SIN); develops, operates, and maintains the transmission grid; and expands and maintains the electricity distribution system in most of the country. The ICE and its subsidiaries control 78% of generating capacity, the entire transmission grid, and 77% of national distribution.
- 1.3 Costa Rica maintains a high share of renewable energy in its electricity mix. In 2014,² the generation system had 2,885 megawatts (MW) of installed capacity and generated 10,118 gigawatt-hours (GWh). Hydroelectric plants contributed 66.4% of the energy generated, geothermal facilities accounted for 15.2%, other renewable sources (wind and biomass) accounted for 8.1%, and the remaining 10.3% was generated using imported fossil fuels.
- 1.4 **Central American Electrical Interconnection System (SIEPAC).** Costa Rica is part of SIEPAC and an active member of the Mercado Eléctrico Regional [Regional Electricity Market] (MER).³ In 2014, MER transactions amounted to 1,450 GWh, a 100% increase over 2013. In 2014, Costa Rica's electricity market represented 21.6% of the MER and 21.1% of the region's installed capacity. The importance of the MER's support for Costa Rica's electrical system is clear from the growth of imports, which amounted to 7% of the available power in 2014.
- 1.5 **Challenges of the sector.** Projected growth in Costa Rica over the coming years would produce an estimated average annual increase in energy demand of 3.8%, equivalent in 2035 to more than 2.2 times the 2014 values. To meet this demand, the system will need an additional net power generation capacity of

¹ Central Bank of Costa Rica (BCCR) 2015.

² 2014 Annual Report. Centro Nacional de Control de Energía [National Energy Control Center]. ICE.

³ The SIEPAC line is a shared regional electrical transmission grid built to reduce costs and increase the reliability of the power supply.

2,648 MW over the period 2015-2035, 95% of which is planned to come from renewable energy.⁴

- 1.6 Costa Rica's dependence on hydroelectric generation makes its electrical mix vulnerable to climate change's impact on the varying availability of hydro resources. Since 2010, limited water flows have made it necessary to increase the share of thermal generation, significantly increasing electricity prices, which affected the productive sector in particular.⁵ This situation and some lagging investments led to a reduction in the system's reserve margin. Despite this, in 2014 the share of geothermal power and the introduction of wind power reduced the share of thermal generation to 10.3%, compared to 11.8% in 2013. It is essential to promote the incorporation of new generating capacity based on renewable sources that provide steady energy such as geothermal power, and sources with seasonal availability that would complement hydro power, as in the case of solar and wind power.
- 1.7 In meeting the growing demand with the required quality, lower socioenvironmental impacts, and competitive prices, the sector and the ICE in particular face significant challenges: (i) gradual deterioration of the ability to contribute to the generation infrastructure system due to obsolescence; (ii) exhaustion of transportation and voltage regulation capacity given increased demand for electrical transmission in various parts of the country and for regional transfers; (iii) insufficient equipment and management and control systems for massive incorporation of variable renewable sources (wind and solar); (iv) restrictions on the ability to meet demand due to problems relating to voltage regulation and transportation capacity in the existing distribution grid, affecting the frequency and duration of outages; and (v) voluntary implementation of technical standards on energy efficiency, making it difficult to undertake programs on efficient use of energy and thus be able to adequately regulate and manage the growing demand for electricity.
- 1.8 To meet the indicated challenges, the ICE has been working to develop a New Power Generation Expansion Plan (PEG) for 2015-2035 and the related transmission expansion plan as well as an investment program for distribution and marketing. The PEG 2015-2035 establishes the need to mobilize investments during this period, with a present value of US\$5,464.4 million through 2035, to be provided by the ICE and other public entities, private developers, and power distribution companies. The principal generation projects included in the PEG 2015-2035 are: the Reventazón Hydroelectric Power Plant, 305.5 MW (2016); the Las Pailas II, Borinquen I, and Borinquen II geothermal projects, 165 MW (2019 and 2026), allowing the use a renewable resource not exposed to climate variability; two thermal power plants, 160 MW (2024); and the El Diquís Hydroelectric Power Plant, 650 MW (2025).

⁴ Nuevo Plan de Expansión de la Generación Eléctrica [New Power Generation Expansion Plan] (PEG) 2015-2035. ICE-2015 (being published).

⁵ The average price for this sector practically doubled over the last six years, from 39¢/kWh in 2008 to 67.7¢/kWh in 2013. Average prices in the residential and commercial sectors grew by 52% and 60%, respectively, during the same period (Ministry of the Environment and Energy data). As of April 2015, due to falling oil prices, ARESEP authorized a significant decrease in the rates for all users.

- 1.9 Studies done by the ICE to identify projects that would help to recover the efficiency of geothermal plants now in operation indicate continued growth in non-condensable gas content at the Miravalles III plant, gradually diminishing its production capacity. During 2013, the plant lost 2.6 MW of power for this reason. According to ICE projections, the content of these gases will increase each year until reaching 2.6% in 2030. If the required investments are not made, the plant's nominal capacity (29.45 MW) would be reduced to 14.51 MW of power as of 2030.
- 1.10 The technical studies done by the ICE on the minimum cost transmission grid identified the following priority challenges: (i) exhaustion of transmission and voltage regulation capacity on the Cañas-Filadelfia-Guayabal 138 kilovolt (kV) transmission line, due to the projected increase in demand in the transmission line's service area;⁶ and (ii) inadequacy of the transmission grid associated with the 230 kV Miravalles Ring (North Ring) for meeting future needs for connecting the renewable generation projects planned in the area, basically wind and geothermal projects. In the latter case, when the Las Pailas II and later the Borinquen I and II projects come on line, the studies detected problems with overloads on the North Ring starting in 2016 (with regional transfers) and 2019 (without regional exchanges).
- 1.11 The ICE is responsible for ensuring coverage of the country's demand for electricity, installing new generating capacity based on renewable resources, and for recovering and maintaining the capacity of renewable power plants. It administers 22,719 km of the distribution grid to serve more than 725,705 clients. According to ICE estimates, the distribution infrastructure faces capacity problems for meeting the expected demand, due to both voltage regulation restrictions and transportation limitations. Increasing the reliability, efficiency, and quality of the system requires rebuilding existing circuits, expanding the capacity of single phase circuits and converting to three phase circuits, constructing new feeders that will operate at 34.5 kV, and rehabilitating existing circuits. To expand service coverage to new users in isolated areas, particularly in indigenous communities, optimize the marketing process and improve client services, the ICE considers it necessary to continue with the projects to install photovoltaic systems in remote rural areas⁷ and smart meter projects being executed with IDB financing (loans 1908/OC-CR and 2747/OC-CR).
- 1.12 **Costa Rican government strategy in the energy sector.** The [National Development Plan 2015-2018](#) establishes the strategic lines of activity, priorities, and objectives that should direct the work of the Government of Costa Rica. The plan considers the need to satisfy the demand for energy through a mix that ensures an optimal, continuous supply of electricity and fuels, giving priority to lower cost renewable sources and diversifying the energy mix. Energy policy is embodied in the [VII National Energy Plan 2015-2030](#), the main thrusts of which

⁶ The reliability of a transmission system plays a decisive role in investment decisions, above and beyond the standard economic criteria [OEL 9](#).

⁷ The document "The Welfare Impact of Rural Electrification: A Reassessment of the Costs and Benefits" World Bank (2008) analyzes the principal impacts of rural electrification projects using renewable energy. The study concludes that these projects generate sufficient benefits to justify the investments in economic terms.

- are based on two objectives: (i) promoting actions to address global climate change, through citizen participation, technological change, innovation, research, and knowledge; and (ii) meeting energy demand by means of an energy mix that ensures an optimal and continuous supply of electricity and fuel, promoting the efficient use of energy to maintain and improve the country's competitiveness.
- 1.13 **Recent IDB involvement.** Since 2007, the Bank's support for Costa Rica's electricity sector has focused on financing the ICE's investment program and on strengthening and modernizing the institution to make it an agency with independent corporate governance, run like a business. In October 2007, the IDB granted the ICE a CCLIP (CR-X1005) intended to finance its investments over the period 2008-2014, allowing it to reduce the infrastructure lag; the first loan (1908/OC-CR) was approved for US\$250 million under the CCLIP, aimed at financing the 2008-2011 Electric Power Development Program. In 2007, a non-sovereign guaranteed loan was approved (1931/OC-CR) for US\$381 million to improve the ICE's debt profile by refinancing debt balances.
- 1.14 In October 2012, the second loan (2747/OC-CR) was approved under the CCLIP for US\$250 million for investment projects to be executed during the period 2012-2016, including works and procurement for the Reventazón Hydroelectric Project⁸ and other renewal energy generation and plant modernization projects; investments to adapt and strengthen the transmission and electricity control infrastructure; and projects to expand the coverage of electrical service and strengthen the distribution system.
- 1.15 With resources from the CCLIP in execution, and in conjunction with the Japan International Cooperation Agency (JICA), the IDB supported the ICE with feasibility studies on the projects in its Geothermal Development Program in the area of Guanacaste, which provides for expanding the Las Pailas geothermal field (Las Pailas II) and developing the Borinquen (I and II) field, with combined installed capacity of 165 MW. These studies confirmed the benefit of adding geothermal capacity to the country's energy balance in order to reduce energy costs and supplement renewable sources.
- 1.16 The IDB has been supporting both Costa Rica's participation in the SIEPAC through projects 1368/OC-CR, 3/SQ-CR, and 1908/OC-CR and the related technical cooperation operations,⁹ and the inclusion of variable renewable energy in the SIN, particularly wind and photovoltaic solar power, through technical cooperation operation ATN/OC-14497-CR.
- 1.17 **Program strategy.** The plan is to implement a new CCLIP with up to three operations, lending continuity to the ICE's efforts to address the challenges involved in developing the electricity sector over the medium term: eliminating lags in investments in generation capacity and promoting diversification of the mix to include renewable generation sources that provide solid energy to the system, reducing vulnerability to climate variations; and strengthening

⁸ In addition, the IDB supports the construction of the Reventazón Hydroelectric Project with nonsovereign guaranteed financing (2806A/OC-CR; 2806B/OC-CR; 2804/OC-CR) for US\$335 million and the development of the project's environmental and social aspects through technical cooperation operation ATN/OC-13556-CR.

⁹ Consolidation of the MER, Phase I (ATN/SF-11103) and Phase II (ATN/OC-12388-RG).

transmission and distribution capacity to facilitate the inclusion of variable renewable generation and regional exchanges, ensuring the provision of electrical service with the required quality and reliability levels. The CCLIP is the right Bank instrument to support the ICE in overcoming the aforementioned challenges, given that institution's successful track record in the execution of previous projects and considering the additional benefits that could be obtained from the CCLIP (as described in the conditions of that financial instrument), such as: (i) providing the ICE with timely resources to ensure the continuity of its investment program; (ii) enabling the Bank to effectively support and maintain a continuing presence in the Costa Rican energy sector, where Bank interventions have been accomplishing the stated development objectives; (iii) promoting the retention of skilled personnel who have worked in the ICE on Bank-funded projects; and (iv) continuing Bank monitoring and support to the ICE in its institutional strengthening and reorganization process. The design takes into account the [lessons learned from the experiences](#) of the Bank and other agencies in projects of this kind.

- 1.18 **Bank country strategy.** The IDB Country Strategy with Costa Rica 2015-2018 (document GN-2829-1), under its strategic objective of "improving productive infrastructure quality, efficiency, and sustainability," proposes to continue working with the country to develop a cleaner energy mix, supporting the development of generation from conventional and nonconventional renewable sources. It also proposes to support the institutional modernization of the energy sector to promote the incorporation of new energy sources and the renewal of infrastructure. The program contributes to these country strategy objectives, focusing on expanding electrical generation capacity by developing new renewable capacity; safeguarding availability and recovering the efficiency level of operating renewable power plants; strengthening the national transmission system to accompany growth in demand for electricity in specific areas and helping to resolve voltage stability problems in Costa Rica's exchanges on the MER; and improving the reliability, coverage, and quality of service by modernizing the distribution system.
- 1.19 **Strategic alignment.** The program will contribute to the lending priorities of the Ninth General Increase in the Resources of the Bank (document AB-2764) (GCI-9) of lending: (i) to small and vulnerable countries; (ii) to support climate change, renewable energy, and environmental sustainability initiatives, by financing ICE projects helping to reduce greenhouse gas emissions and expand the electrical system in an environmentally sustainable way; and (iii) to support regional cooperation and integration, in that it involves a national infrastructure project with multinational targeting that helps to strengthen the Costa Rican electrical system, allowing for increased participation in the MER, as analyzed in [OEL 4](#). The program will contribute to the regional targets of: (i) km of transmission lines installed; and (ii) percentage of power generation from low carbon emission sources over total generation; and to the outputs: (i) km of new transmission lines installed or upgraded; and (ii) MW of new geothermal generation capacity installed, as defined in the Results Matrix. The program is aligned with the sector priority of infrastructure for competitiveness and social welfare. Within the framework of the Bank's Sector Strategy to Support

Competitive Global and Regional Integration (document GN-2565-4) and in accordance with the guidelines for classification and validation of operations.

- 1.20 **Consistency with Bank policies.** The project is consistent with the objectives established in the Public Utilities Policy (document GN-2716-6) as described in the analysis of compliance with that policy ([OEL 5](#)). The project meets the financial sustainability and economic evaluation conditions, as reflected in the economic analysis of the investment made (paragraph 2.6), primarily because investment and operation and maintenance (O&M) costs will be recovered with the sale of the power to be generated and because of the benefits of avoiding thermal generation.
- 1.21 The program is aligned with the priority areas of the Sustainable Infrastructure Strategy for Competitiveness and Inclusive Growth (document GN-2710-5) in its support for the construction and maintenance of a socially and environmentally sustainable infrastructure that helps to improve quality of life. The program is aligned with the Operational Policy on Gender Equality in Development (OP-071) in that it includes activities that will empower women economically, promoting their hiring in works associated with the project [OEL 10](#); and with the Indigenous Peoples Policy and Strategy for Indigenous Development (OP-765) in that it improves economic development opportunities by improving access to electrical power services for indigenous communities.

B. Objectives of the CCLIP and the first loan

- 1.22 The general objective of the CCLIP is to contribute to the mitigation of climate change effects, to sustainable economic growth, and to the promotion of regional integration through the MER. The specific objective of the first loan is to increase the supply of electricity based on renewable energy through construction of the Las Pailas II and Borinquen I geothermal power plants and other additional electrical infrastructure.
- 1.23 The ICE meets the requirements established in the CCLIP modification proposal (document GN-2246-7) for obtaining that line. Thus, (i) it has executed similar projects with the Bank, such as the Electric Power Development Programs II and III, the latter of which completed execution in 2006, and it has also completed projects in the preceding five years with other financial institutions, such as a project for US\$172 million (loan 1599) completed in 2011 with the Central American Bank for Economic Integration, having confirmed the financial and institutional soundness of the ICE; (ii) executed projects and active loans satisfy the following: (a) the general execution performance and progress in achieving the expected outcomes have been satisfactory; (b) the ICE has met the loan contract conditions and the Bank's policies on disbursement and procurement of goods and services; (c) financial and operational reports, including audited financial statements, account reports, budgetary execution and operational management reports are prepared and presented on a timely basis and have an acceptable level of quality in terms of financial administration and operational control of the projects; and (d) the operation and maintenance of the investments made and completed with the financing from the aforementioned projects are adequate; (iii) the ICE has a solid track record with satisfactory performance in the execution of the above-mentioned projects; and (iv) the areas that will be financed under the CCLIP and in the first individual operation are among the

priorities set in the Bank’s strategy and country program. In addition, the requirements established for financing an operation under the CCLIP are met, given that the first individual loan operation falls under the CCLIP sectors and components, and is included in the country program.

- 1.24 **CCLIP structure.** Table I-1 presents the CCLIP budget and financing scheme. The total cost of the investment program is estimated to be US\$1,329.4 million, US\$500 million of which will be financed by the Bank. The first program has a total estimated cost of US\$782.7 million and IDB financing of US\$200 million.¹⁰ The remaining amount of the CCLIP (US\$300 million) would finance the ICE’s investment plan for the period 2022-2026.

Table I-1
Total CCLIP cost and financing (US\$ millions)

CR-L1070 – First individual loan	IDB	EIB	JICA	Local	Total
Subprogram I. Las Pailas II / Borinquen I Geothermal Projects	97.1	70.0	421.3	66	654.4
Subprogram II. Other Renewable Energies, Transmission, and Distribution	102.9	-	-	25.3	128.2
TOTAL Loan I (2017-2022)	200.0	70.0	421.3	91.3	782.6
Second / Third individual loan					
Subprogram I. Borinquen II Geothermal Project	72.5	-	225.5	13.5	311.5
Subprogram II. Other Renewable Energies, Transmission, and Distribution	227.5	-	-	7.7	235.3
TOTAL Loan II/III (2022-2026)	300.0	-	225.5	21.2	546.8
CR-X1014 - IDB CCLIP					
Subprogram I. Geothermal Projects	169.6	70.0	646.9	79.4	965.9
Subprogram II. Other Renewable Energies, Transmission, and Distribution	330.4	-	-	33.1	363.5
CCLIP Total (2017-2026)	500.0	70.0*	646.8**	112.5	1,329.4

* The EIB signed a loan contract with the ICE for US\$70 million for Las Pailas II.

** In 2013, JICA signed a credit line with the ICE for US\$646.9 million to support the Guanacaste Geothermal Development Program for 56,086,000,000 Japanese yen (¥). Its US\$ equivalent has been set at the January 2013 exchange rate of ¥86.7/US\$.

- 1.25 The first loan is divided into the following subprograms:

- 1.26 **Subprogram I. Las Pailas II and Borinquen I geothermal projects.** Financing will be provided for the construction of the Las Pailas II and Borinquen I geothermal power plants with capacity of 55 MW each. Las Pailas II is located 17 km northeast of the city of Liberia, in Liberia Canton of the Province of Guanacaste. Borinquen I is located 10 km northeast of Las Pailas, north of Liberia. According to its design, the Las Pailas II project provides for the construction of 15 production wells and nine reinjection wells distributed on six platforms; the machine room including mechanical equipment and the main electrical systems; auxiliary systems (for discharging water from the plant, steam separation, compressed air, and extraction of gases from the condenser, and

¹⁰ [OEL 11](#) shows the itemized budget.

others); two cooling towers, booster electrical substation to evacuate the electrical power produced in the plant; geothermal fluid pipelines; separation station, complementary buildings and access roads and a 230 kV transmission line 2 km long that will connect with the existing Las Pailas I substation. According to its design, the Borinquen I project includes the construction of 20 wells; the machine room with two separate steam units consisting of a turbine, speed regulator, hydraulic oil system, valve system, protections system, instruments, and condenser; auxiliary systems; two cooling towers; booster substation; 12 km of pipes for conveying geothermal fluid; three (water-steam) separator stations; renovation of access roads; and connection to the existing transmission line of the 230 kV Orosí wind project, which connects to the SIN.

- 1.27 **Subprogram II. Other renewable energies, transmission, and distribution. Component 1. Generation.** Financing will be provided for: (i) construction of a parallel tunnel approximately 1,600 meters long at the Río Macho Hydroelectric Power Plant, a distribution well and new water intake, de-sander and tunnel window; (ii) expansion of the capacity of the system for extracting non-condensable gases from the Miravalles III Geothermal Plant, using a hybrid extraction system (ejector and vacuum pump) to recover the nominal power production capacity of the Miravalles III unit (29.45 MW) and delivery of constant quality power (paragraph 1.9); (iii) preinvestment studies on hydroelectric generation projects and training activities on electricity markets, operation and maintenance of generation plants, socioenvironmental aspects, and other subjects; and (iv) updating of the hydro-meteorological network to improve forecasts of the availability and quality of renewable resources (hydro, wind, and solar) and optimize the delivery of power.
- 1.28 **Component 2. Transmission.** Financing will be provided for: (i) strengthening the Cañas-Filadelfia-Guayabal 138 kV transmission line to increase transmission capacity in the project's service area; and (ii) constructing the Mogote-SIEPAC double circuit transmission line branching the Cañas-Ticuantepé (SIEPAC) transmission line in Mogote, to overcome constraints in the North Ring's transmission capacity, promote the injection of renewable energy into the system, avoid voltage problems, and achieve voltage stability in contingencies, promoting greater transfer capacity for regional exchanges on the MER (paragraph 1.10).
- 1.29 **Component 3. Distribution and marketing.** Financing will be provided for: (i) procurement of materials for the expansion works and strengthening of the distribution grid, protective equipment (automatic circuit reclosers); terminal units for supervision and remote control of protective equipment on the distribution grid and mobile units for georeferencing the grid and its attributes; (ii) expansion of rural electrification coverage with the installation of at least 500 photovoltaic systems with 250 watt peak (Wp) panels with a useful life of 20 years, to be installed in remote communities, most of them in indigenous territories, whose beneficiaries¹¹ will be selected based on the criteria established by the ICE,

¹¹ Once eligibility for a remote solution is confirmed, the application will be prioritized according to the following criteria: Residential medical cases (users with serious illness requiring medically prescribed electrical equipment); health centers; schools, satellite antennae for Internet and public telephones; public security stations; park ranger stations; community centers; and residences.

included in the program operating manual; (iii) investments in energy efficiency in public lighting by replacing at least 21,200 120-watt LED (light-emitting diode) lights with more efficient lighting; and (iv) expansion of the program to install smart meters to optimize the process of reading, connecting, and disconnecting users, by replacing at least 70,000 electromechanical or solid state meters in urban areas covered by the ICE.

C. Cost and financing of the first loan

- 1.30 The total estimated cost of the investments is US\$782.7 million, of which US\$200 million will be financed by the IDB from Ordinary Capital resources; US\$421.4 million by JICA; US\$70 million by the EIB; and US\$91.3 million as counterpart funds. The JICA and EIB cofinancing will be parallel, with each institution administering its own funds. Table I-2 provides a breakdown of costs and financing.

Table I-2
Cost and financing of the first loan (US\$ millions)

Investment category		IDB	EIB	JICA	Local	Total
Subprogram I. Las Pailas II / Borinquen I geothermal projects		97.1	70.0	421.3	66	654.4
1.1	Engineering, supervision, and administration	4.0	4.3	3.3	9.4	21.0
1.2	Direct costs	82.9	52.7	316.4	39.7	491.7
1.3	Contingencies	6.8	13.0	92.3	14.7	126.8
1.4	Financial expenses	3.4	-	9.3	2.2	14.9
Subprogram II. Other renewable energies, transmission, and distribution		102.9	-	-	25.4	128.3
2.1	Engineering, supervision, and administration	-	-	-	7.0	7.0
2.2	Direct costs	93.4	-	-	18.1	111.5
2.3	Contingencies	7.1	-	-	-	7.1
2.4	Financial expenses	2.4	-	-	0.2	2.6
TOTAL Loan I (2017-2022)		200.0	70.0	421.3	91.3	782.6

D. Key outcome indicators

- 1.31 The Results Matrix shows impact and outcome indicators related to the CCLIP's objectives. The impacts identified include: (i) contribution to the country's economic growth, ensuring the supply of electricity necessary to meet growth in demand; and (ii) contribution to climate change mitigation. The indicators defined for measuring these impacts are: (i) power supplied by the ICE (GWh); and (ii) CO₂ emissions avoided annually (tCO₂/year).
- 1.32 The expected outcomes from the first loan operation involve ensuring the supply of electricity with adequate levels of quality and reliability, promoting environmental sustainability, greater participation by women in the electricity sector, and improving social conditions in indigenous territories. The following indicators were defined: (i) installed energy capacity with renewable sources; (ii) time without power due to transmission failures; (iii) percentage availability of the grid; (iv) average maximum regional transfer capacity; (v) average duration of interruptions in distribution; (vi) average frequency of interruptions in distribution; (vii) installed capacity of photovoltaic panels in remote areas; (viii) women hired

during works construction; and (ix) photovoltaic systems installed in indigenous territories.

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

- 2.1 Implementation of the CCLIP makes it possible to adapt the loans to the sequence and size of the investments planned, making the process of preparing and approving operations effective and swift. The first loan under the CCLIP is structured as an investment loan for up to US\$200 million, to be executed over a period of 60 months between 2017 and 2022, estimated based on experience gained in executing operations of the same kind, according to the schedule in Table II-1.
- 2.2 As established in “Enhancing Macroeconomic Safeguards at the Inter-American Development Bank” (document AB-2990), the Bank’s disbursements of loan funds will be subject to maximum limits of: (i) up to 15% in the first 12 months; (ii) up to 30% in the first 24 months; and (iii) up to 50% in the first 36 months, starting on the date the Board of Executive Directors approves the loan operation. These limits might not be applicable to the extent that the requirements set by Bank policy regarding those limits have been met, providing the borrower has been notified in writing.

Table II-1
Disbursements schedule (US\$ millions)

Source	2017	2018	2019	2020	2021	2022	Total
IDB	19.3	34.4	46.8	49.2	37.2	13.0	200.0
EIB	49.3	20.0	0.7	0.0	0.0	0.0	70.0
JICA	122.7	71.2	44.4	50.1	98.3	34.7	421.4
Local	24.4	14.4	13.8	13.6	17.7	7.3	91.3
TOTAL	215.8	140.0	105.6	112.9	153.3	55.0	782.7
% of IDB disbursement	10	17	23	25	19	7	100

*/ Amounts in 2017 include disbursements made by the EIB, JICA, and ICE in prior years.

B. Viability and sustainability

- 2.3 **Technical viability.** The ICE has 67 years of experience in electricity generation, transmission, distribution, and marketing activities in Costa Rica and has been responsible for the design, construction, and supervision of works similar to those planned, with a long track record of financing from the Bank. The geothermal projects, complementary works, and transmission strengthening efforts considered for financing have been conceived and designed by the ICE. Investment costs were calculated by the ICE based on experience in works of a similar scope.
- 2.4 The program was determined to be technically viable given that: (i) the investments have been planned based on the preliminary analysis done by JICA and the ICE; (ii) the works will be constructed using good design and build practices, following international technical and environmental quality standards;

- (iii) the ICE has a lot of experience in the sector and in constructing similar works; (iv) the equipment to be provided is standard and available on the market; (v) budgeted costs are consistent with market costs; (vi) an estimated contingencies item has been involved based on deviations seen in other projects executed by the Bank in the country, including provisions to cover exchange risk; (vii) the proposed schedule is compatible with the volume of works; and (viii) the ICE has trained personnel for the design, planning, and implementation of the various components of the program and technical and financial management capacity for the O&M of the investments and for sustainable management of generation resources.
- 2.5 **Sustainability.** The program cost estimate considers the annual amount required for O&M of the new investments. A special condition for execution will be that the investments in works and equipment included in the program must be adequately maintained during the execution period, in accordance with generally accepted technical standards.
- 2.6 **Economic viability.** A cost-benefit analysis was performed on the program's main investments ([OEL 1](#)) using a social discount rate of 12%. Assuming that investment and O&M costs will be recovered through the sale of the power to be generated, the proposed investments were shown to meet economic viability requirements. An analysis was done on the sensitivity of the results to shifts in critical parameters (level of investment, operating costs, fuel cost, cost of failures, rates and incremental long-term cost of energy), and it showed the conclusions from evaluation of the analysis to be sound.
- 2.7 The Las Pailas II and Borinquen I geothermal projects were evaluated in Subprogram I. The present value of the difference between the flow of geothermal development costs and that of the alternative using fossil fuel was identified as a benefit. The base scenario for these investments yields an economic internal rate of return (EIRR) of 22.9% and 19.7%, respectively.
- 2.8 For Subprogram II, under generation, the value of the investments for construction of the parallel tunnel at the Río Macho Hydroelectric Power Plant was established, considering benefits from the generation of incremental renewable energy and/or thermal generation avoided (EIRR 84%). Under transmission, this was done for the strengthening of the Cañas-Filadelfia-Guayabal transmission line and investments in the North Ring – Miravalles. The increase in available energy, reduction in operating costs due to failures and losses as a result of strengthening the grid and cost savings from reduced thermal delivery were identified as economic benefits (EIRR 18% and 34%, respectively). Under distribution and marketing, the following were evaluated: (i) improvement and reconstruction of the distribution grid in which the economic benefits identified are related to the quantity of energy that can be supplied and the reduction in costs due to failures and losses (EIRR 386%); (ii) installation of photovoltaic systems in remote rural communities, determining the value of the benefits from the increase in energy consumed and the release of resources due to replacement of sources (EIRR 24%); (iii) installation of LED lights in public lighting, assessing the savings in terms of energy consumed, greater availability of light, and reduced O&M (EIRR 24%); and (iv) expansion of the program to install smart meters, leading to improved quality in the reading of consumption,

reduced failures and losses, and increased coverage, producing significant management savings as quantifiable benefits (EIRR 18%).

- 2.9 **Financial viability.** The analyses done ([OEL 11](#)), considering the financial results obtained by the ICE between 2012 and 2014 and the updated financial projections for the period 2015-2025, confirm that the ICE continues to show reasonable and sustainable financial ratios for a company operating in a context of cost-of-service regulated rates for the electricity sector. The 2014 financial statements show a substantial recovery process, doubling the operating surplus. Although the effects of a major devaluation of the colón affected final net income, the ICE met all financial commitments undertaken with the IDB, in both sovereign guaranteed and non-sovereign guaranteed operations in execution.
- 2.10 The ICE's financial viability for executing the program was analyzed based on its financial projections for 2015-2025, considering a base case according to the assumptions presented by the ICE, a second base case using assumptions requested by the IDB, with the real income obtained from rate recognition reflecting historical behavior; and a sensitivity scenario that seeks to reflect the impact of lower revenues on electricity. The results indicate that the ICE will continue to be financially viable and that it meets the sustainability criteria indicated in the Public Utilities Policy (paragraph 1.20). The result of the projections indicate that the ICE would substantially achieve the [agreed financial indicators](#) in the operations in execution, with minor deviations that it could handle on an ad hoc basis should situations arise requiring it to do so. Thus, it is recommended that the indicators agreed upon for loans 1908/OC-CR and 2747/OC-CR be retained for this operation. A special condition for execution will be that the agreed financial indicators are maintained.
- 2.11 **Institutional viability.** The ICE's institutional development efforts are apparent in the results from the diagnosis performed by the consulting firm financed by the Bank ([OEL 3](#)). The conclusions of the diagnosis point to the advances made by the ICE through self-regulation, both with respect to the adoption and implementation of the recommendations from the Plan of Action proposed in 2008 in the context of preparing the CCLIP currently being executed, and the ICE's conceptualization as a corporate group wherein it acts as the parent company of its shareholding companies. Emphasis should be placed on the change in focus adopted by the ICE in the last three years, moving from a perspective of formal compliance with its obligations to one of commitment to corporate governance and its use as a strategic tool for the sustainability of the institution.

C. Environmental and social risks

- 2.12 According to the Environment and Safeguards Compliance Policy (OP-703), this is classified as a category "A" operation. It has an Environmental and Social Management Report (ESMR) ([REL 4](#)) presenting the environmental and social impact and risks associated with the program as well as an Environmental and Social Action Plan (ESAP). In accordance with Operational Policy OP-703, the Las Pailas II and Borinquen I and II geothermal projects were classified as category "A" operations. The program's additional projects show more limited adverse socioenvironmental impacts and were classified as category "B" operations.

- 2.13 In the environmental impact assessments (EIA) for the geothermal projects prepared by the ICE and approved by the authorities, the Bank found gaps in terms of compliance with its guidelines and the adoption of international best practices. The Bank contracted independent environmental consulting firms to conduct studies to complement these EIAs, in order to ensure environmental and social sustainability and compliance with the environmental and social safeguard policies under the program. These studies and the earlier EIAs were [published](#) in accordance with the Bank's Access to Information Policy.
- 2.14 The most relevant adverse impacts identified in connection with the Las Pailas II and Borinquen I and II geothermal projects are: (i) fragmentation of forest connectivity and edge effects caused by habitat conversion around the Guanacaste Conservation Area; (ii) during the construction phase, air pollution, noise generation, visual impacts, and impacts on water quality; (iii) micro-seismicity and land subsidence caused by the projects; and (iv) negative impacts on the economic potential of neighboring landowners and affected communities (ecotourism). If not mitigated, the adverse environmental and social impacts would be significant.
- 2.15 The following were identified as possible risks of the geothermal projects: (i) the potential impact on species of flora and fauna, including the jaguar, as a result of fragmentation of forest connectivity; and (ii) natural disasters that could affect the viability of the projects and the health and safety of neighboring communities, such as the area's intrinsic seismic and volcanic activity. The risks are considered limited, and their mitigation measures are described in the ESMR and developed in the ESAP. The Bank's environmental and social due diligence determined that the Las Pailas II and Borinquen I and II geothermal projects are in compliance with the safeguard policies and are expected to comply specifically with the Directive on Natural Habitats and Cultural Sites (operational policy OP-703, Directive B.9), and the Disaster Risk Management Policy (operational policy OP-704), through the appropriate implementation of the identified mitigation measures.
- 2.16 Operation of the geothermal projects would have a positive impact on reducing greenhouse gas emissions. Operation of the Las Pailas II project could help to avoid 312,230 tCO₂/year, and the operation of Borinquen I and II could help to avoid 652,752 tCO₂/year.¹²
- 2.17 **A condition for the first disbursement of loan proceeds for the Las Pailas II and Borinquen I projects will be that the ICE has submitted the management plans identified and prepared in accordance with the ESMR and that, pursuant to the ESAP, correspond to the first disbursement.** A special condition for execution establishes that the ICE must comply with the environmental and social obligations included in the ESMR, and implement the actions provided in the ESAP within the established timeframes. The ICE has submitted the final ESAP. The Bank will verify compliance with the environmental and social obligations established in the ESMR in the manner and timeframe described therein.

¹² Technical viability reports prepared by the ICE.

D. Fiduciary risks

- 2.18 It can be concluded from the project's risk management analysis that the program's overall level of risk is medium. In terms of financial management, the risk is medium. The ICE has extensive experience with Bank-financed operations since 1962, with about 19 sovereign guaranteed and non-sovereign guaranteed operations. According to an analysis performed in 2014 by one of the large international rating agencies the ICE Group "has a diversified portfolio of assets, adequate financial profile, and aggressive capital expenditure program oriented toward increasing renewable generation capacity and maintaining a strong market share position in the telecommunications business." However, the ICE is highly exposed to the risk of regulatory interference due to the rate schedules for electricity and telecommunications. The ICE's lack of knowledge of the Bank's procurement management policies is identified as a low risk in procurement management. Mitigation measures include: (i) holding periodic training sessions on the Bank's procurement policies and their impact on the ICE's procurement legislation; and (ii) quarterly preparation by the ICE of electricity rate schedules to be submitted to the regulator (ARESEP) and reflecting cost variations.

E. Other key topics and risks

- 2.19 Delay or postponement of legislative approval of the CCLIP was identified as a public management and governance risk should there be little or no agreement between the executive and legislative branches. Mitigation measures for this risk provide for: (i) coordination between the ICE and the Ministry of Finance in drafting the proposed legislation; (ii) informative and explanatory meetings between the ICE, legislators, and the Financial Affairs Committee; and (iii) meetings between the ICE and the Presidential Palace to report on the context and status of the approval process. Possible delays in construction processes due to geological uncertainty in areas where the projects are located were determined to be a medium risk. Mitigation measures established for this risk include the support of consulting firms and international technical experts, when warranted, with technical knowledge and experience that makes it possible to reduce uncertainty, and the guidance of IDB specialists with respect to the application of the Bank's policies and procedures.

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Execution mechanism

- 3.1 The borrower and executing agency will be the ICE, which will be responsible for the counterpart contributions necessary to ensure the objectives established for each of the IDB loans are met. The Republic of Costa Rica will be the guarantor of the loan obligations, including interest and fees. A cooperation agreement will be signed within the framework of the CCLIP instrument among the Republic of Costa Rica, the ICE, and the Bank, whereby the Republic will guarantee the obligations of the loan contracts the Bank signs with the ICE for each operation, with the acceptance of the guarantor. The guarantor will provide extensive cooperation to ensure the program's objectives are met.
- 3.2 The [execution scheme](#) to be implemented by the executing agency provides for the participation of two representatives to the Bank: (i) a project coordinator with

- responsibility for technical and construction compliance, representing the engineering and construction division of the Electricity Management Department; and (ii) a representative of the corporate finance division of the Corporate Administration and Finance Management Department, with responsibility for compliance with disbursement requests and other activities associated with the financial management of the program, who will also serve as the official interlocutor with the Bank. Both will address considerations inherent to each sphere of action and overall accountability to the Bank.
- 3.3 **Program operating manual.** Program execution will be governed by the program operating manual, which details the responsibilities, rules, procedures, and criteria that will govern execution, such as: (i) execution scheme; (ii) procurement and contracting; (iii) management and execution scheme and tools; (iv) process flow charts; and (v) financial/accounting information and physical monitoring responsibilities and requirements. The manual agreed to between the ICE and the IDB will be applicable to loans in execution, so that lessons learned and opportunities for improvement identified in its application to those operations will be incorporated in the revision of the manual prepared prior to the first disbursement of the loan. **As a special condition precedent to the first disbursement, the ICE will submit evidence of the approval and implementation of the program operating manual previously agreed upon with the Bank.**
- 3.4 **As a condition for the first disbursement of loan proceeds intended for the Mogote-SIEPAC transmission line construction project, the ICE will submit evidence that authorization has been obtained from the Comisión Regional de Interconexión Eléctrica [Regional Electrical Interconnection Commission] (CRIE) to open the SIEPAC line.**
- 3.5 **As a condition for the first disbursement of loan proceeds intended for investments related to the Borinquen I project, the ICE will submit evidence that it has the financing required for the entirety of this geothermal project, provided by JICA and other sources of financing.**
- 3.6 **Exception to Bank policies.** A partial waiver to the Policy on Guarantees Required from the Borrower (OP-303) is sought with respect to the local contribution and the proper execution of the program, as the guarantee provided to the ICE by the Republic of Costa Rica for individual loan operations implemented under the CCLIP (CR-X1014) will only guarantee financial obligations for payment of the loan, including interest and fees. This waiver is justified within the context of the program's strategy, lending continuity to support to the ICE for its transformation to a company with independent corporate governance, administered as a business, reducing its dependence on sovereign guaranteed financing.
- 3.7 **Procurement management.** The contracting of works and the procurement of goods and consulting services financed with Bank funds will be handled 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 ex ante and ex post supervision methods will be applied according to the type of process, as shown in Annex III. Country systems will be used in the cases permitted pursuant to the [Agreement on the Partial Use of the Costa Rican](#)

[Administrative Procurement System](#) in Bank-financed Projects, signed in July 2015.

- 3.8 The program provides for execution of the Río Macho Parallel Tunnel project by the ICE using the force account method, including the financing of items such as hiring the workforce, purchasing materials, and leasing machinery and minor equipment. This project may be financed using the force account method within the framework of the IDB's procurement policies (document GN-2349-9, paragraphs 3.8 (c) and (d)). This is justified because it involves infrastructure that must be executed parallel to and in an area near the current tunnel now in operation. There is a high risk that the works may affect the operations of the Río Macho Hydroelectric Power Plant and the supply of potable water to San José. In this regard, the ICE is better positioned than a contractor to perform this work since, as the entity responsible for managing and maintaining the El Llano dam, it has amassed extensive experience in the performance of its functions and knowledge of the work, allowing it to carry out the construction and start-up works on the parallel tunnel without interfering with its operation. In addition, the ICE, given its status as a public entity and its extensive experience in building tunnels in hydroelectric plants, is better positioned than a contractor to manage the risks associated with an interruption in the works and to handle the costs that would have to be assumed in such a situation.
- 3.9 **Recognition of expenditures.** The Bank may recognize against the local contribution eligible expenditures made by the ICE prior to the date the loan is approved by the Board of Executive Directors, in the Las Pailas II geothermal project and in the construction of the parallel tunnel at the Río Macho Hydroelectric Power Plant, up to US\$10 million (11% of the local contribution), provided that requirements substantially similar to those provided in the loan contract have been met. Such expenditures must have been made as from 19 December 2014, the project profile approval date, but in no case may they include expenditures made more than 18 months prior to the loan approval date.
- 3.10 **Financial management.** The ICE will be responsible for financial management and will submit the audited financial statements on the IDB loan, the national counterpart, and the cofinancing within 120 days following the close of each fiscal year. The last such report will be submitted within 120 days following the date of the last disbursement. The ICE will use its own funds to contract external auditing services based on terms of reference previously approved by the Bank. Disbursements will be made according to the financial plan, as established in the Guide to Financial Management for Projects Financed by the IDB (OP-273-6) and its updates. The documentation of eligible expenditures related to the advance must be submitted when at least 70% of the amount advanced has been used.¹³

B. Summary of monitoring and evaluation arrangements

- 3.11 The project has a monitoring and evaluation plan ([REL 3](#)) that includes economic, social, and environmental performance indicators. The monitoring of outputs and activities will focus on the physical and financial status of the contracts and on obtaining the outputs indicated in the Results Matrix.

¹³ Annex III provides detailed information on accountability.

Administrative monitoring and control will focus on compliance with administrative, financial, accounting, and legal standards, in accordance with national, IDB, and loan contract guidelines. Environmental and social monitoring will focus on compliance with the requirements contained in the ESMR and ESAP (paragraph 2.17). The plan describes the monitoring reports required from the ICE and the schedule for submission to the Bank during execution.

- 3.12 The monitoring and evaluation plan includes the project evaluation mechanisms, the objective of which is to verify the achievement of the objectives and the targets agreed in the Results Matrix. The ICE will select and contract consulting services to conduct: (i) a midterm evaluation; (ii) a final evaluation; and (iii) an ex post cost-benefit analysis using the ex ante methodology applied.

Development Effectiveness Matrix			
Summary			
I. Strategic Alignment			
1. IDB Strategic Development Objectives		Aligned	
Lending Program		-Lending to small and vulnerable countries -Lending to support climate change initiatives, renewable energy and environmental sustainability -Lending to support regional cooperation and integration	
Regional Development Goals			
Bank Output Contribution (as defined in Results Framework of IDB-9)		-Km of electricity transmission and distribution lines installed or upgraded -Number of cross border and transnational projects supported (infrastructure and customs, etc.)	
2. Country Strategy Development Objectives		Aligned	
Country Strategy Results Matrix	GN-2829-1	Improve the quality, efficiency, and sustainability of the productive infrastructure	
Country Program Results Matrix	GN-2805	The intervention is included in the 2015 Operational Program.	
Relevance of this project to country development challenges (If not aligned to country strategy or country program)			
II. Development Outcomes - Evaluability			
	Evaluable	Weight	Maximum Score
	8.8		10
3. Evidence-based Assessment & Solution			
	8.8	33.33%	10
3.1 Program Diagnosis	3.0		
3.2 Proposed Interventions or Solutions	4.0		
3.3 Results Matrix Quality	1.8		
4. Ex ante Economic Analysis			
	10.0	33.33%	10
4.1 The program has an ERR/NPV, a Cost-Effectiveness Analysis or a General Economic Analysis	4.0		
4.2 Identified and Quantified Benefits	1.5		
4.3 Identified and Quantified Costs	1.5		
4.4 Reasonable Assumptions	1.5		
4.5 Sensitivity Analysis	1.5		
5. Monitoring and Evaluation			
	7.5	33.33%	10
5.1 Monitoring Mechanisms	2.5		
5.2 Evaluation Plan	5.0		
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		A	
IV. IDB's Role - Additionality			
The project relies on the use of country systems			
Fiduciary (VPC/FMP Criteria)	Yes	Financial Management: Budget, Treasury, External control. Procurement: Shopping Method.	
Non-Fiduciary			
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:			
Gender Equality	Yes	In accordance with the Operational Policy on Gender Equality (OP-071), the program will empower women economically by promoting their participation in the works related to the project.	
Labor			
Environment			
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			
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan			

The diagnosis is clear. Costa Rica has an energy matrix where renewables have a high share: nearly two-thirds comes from hydro sources. The variability of water availability means that the electricity matrix is vulnerable to climate change. In addition, since 2010, low water levels have led to an increased reliance on thermal generation. Given the expected growth in future demand (3.8% annually) it will be necessary to add 2,649MW in net generation capacity in 2015-2035, 95% of which is proposed to be from renewable sources. Costa Rica is part of SIEPAC and accounts for 21.6% of the Regional Electricity Market (MER).

The proposed program is part of this plan. The overall objective of the conditional credit line for investment projects (CCLIP) is to contribute to the mitigation of the impacts of climate change, sustainable economic growth and the promotion of regional integration in the Regional Electricity Market. The specific objective of the first loan of the CCLIP is to increase the supply of electricity based on renewable energy, by funding generating geothermal plants Pailas II and Borinquen I and additional electrical infrastructure.

Financing generation and transmission projects and other works (products), will be reflected in increased capacity of electricity generation from renewable energy sources, greater reliability in the transmission and distribution networks, improving access to remote areas and increased participation of women in infrastructure projects (outcomes) which in turn will be reflected in higher growth and climate change impact mitigation (impacts). This vertical logic is sound, but the connection between increased labor participation of women in infrastructure projects and the impact variables should be further explained. A complete cost-benefit analysis is included based on the analysis of the individual projects to be financed. A complete monitoring and evaluation plan is presented including a full ex post CBA based on the methodology established in the ex-ante economic appraisal.

RESULTS MATRIX

Objective	<p>Objective of the CCLIP: To contribute to the mitigation of climate change effects, to sustainable economic growth, and to promotion of regional integration through the Regional Electricity Market.</p> <p>Specific objective of the first loan: To increase the supply of electricity from renewable energies, through the construction of the Las Pailas II and Borinquen I geothermal power generation plants, and other additional electrical infrastructure.</p>				
Indicators*	Unit	Baseline 2014	End of Loan 1 2022	End of CCLIP 2026	Means of verification
Impacts					
Contribution to the country's economic growth, ensuring the supply of electricity necessary to meet growth in demand					
Assumptions: Growth in demand for electricity is correlated with economic growth using a plausible and proven methodology					
Energy supplied by the Costa Rican Power Authority (ICE)	GWh	10,322	13,763	16,414	ICE / Public Utilities Regulatory Authority (ARESEP) reports
Contribution to the mitigation of climate change effects					
Assumptions: The studies and projects included in the program are fully executed **					
CO ₂ emissions avoided annually	tCO ₂ /year	0	638,606	964,982	ICE / ARESEP reports
Outcomes					
Increase in the country's capacity to generate electricity using renewable energy sources					
Installed energy capacity using renewable sources	MW	2,289.11	3,156.51	3,861.51	ICE / ARESEP reports
Reliability of the country's electricity transmission system ensured					
Time of energy not supplied due to transmission failures	Minutes/year	0:50	0:48	0:48	ICE reports
Availability of the grid	%	99.81	99.84	99.86	idem
Maximum average carrying capacity of regional transfers	MW	130	300	600	idem

Indicators*	Unit	Baseline 2014	End of Loan 1 2022	End of CCLIP 2026	Means of verification
Outcomes					
Reliability of electricity distribution system ensured					
Average outage duration in the distribution grid	hours/year	11.59	12.00	10.00	idem
Average outage frequency in the distribution grid	#/year	10.23	10.00	9.00	idem
Improvement in the sustainability of electricity service in remote areas (not connected to the National Interconnected System)					
Installed capacity of photovoltaic panels in remote areas	kW	473.67	705.17	765.17	idem
Increased participation of women in the infrastructure construction sector					
Average number of women operators hired during construction of the Río Macho Parallel Tunnel project	%	1.5%	4%	7%	idem
Improved access to electricity in indigenous communities					
Homes in indigenous territories benefitting from photovoltaic systems	Home	827	1,128	1,128	idem

OUTPUTS CR-L1070 – FIRST LOAN	Unit	2017	2018	2019	2020	2021	2022	Total
Subprogram I. Las Pailas II / Borinquen I geothermal projects								
New geothermal generation capacity installed at Las Pailas II	MW			55				55
New geothermal generation capacity installed at Borinquen I	MW						55	55
Subprogram II. Other renewables, transmission, and distribution								
Component I. Generation								
Río Macho parallel tunnel constructed	Tunnel					1		1
Miravalles non-condensable gases system in operation	System					1		1
Preliminary generation studies completed	Studies			2		3	1	6
Training courses completed on the electricity market and plant operation and maintenance	Courses	1		3		3		7
Hydro-meteorological network stations upgraded	Station	30	60	100				190
Component II. Transmission								
Cañas-Filadelfia-Guayabal 138 kV transmission line reconstructed	km					57.6		57.6
Miravalles Ring (Mogote SIEPAC branch) constructed	km			7				7
Component III. Distribution and marketing								
New lines and strengthening of operational grids	km		57	57	57	57		228
Photovoltaic systems operating in remote communities	System			125	125	125	125	500
Meters operating to automate the reading of consumption	Meter		10,000	15,000	15,000	15,000	15,000	70,000
LED lights in operation	Light		7,420	7,420	3,180	3,180		21,200

* The first and second loans share impact and outcome indicators.

** Costa Rica has based the expansion of its electrical generation on the development of projects based on renewable energies (hydro and geothermal) and more recently on wind energy. So far, this has allowed it to cover a large part of the growth in demand for electricity that would otherwise have been covered by thermoelectric generation with fossil fuels. This is reflected in the cumulative reduction in CO₂ emissions between 2000 and 2009 compared to the period between 1990 and 1999. *Evolución del sector energía, sus patrones de consumo e impacto en la huella de carbono* [Evolution of the energy sector, its consumption patterns and carbon footprint] p. 24. http://www.estadonacion.or.cr/files/biblioteca_virtual/016/freddy_martinez.pdf

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Country:	Costa Rica
Name:	Renewable Energy, Transmission and Distribution of Electricity Program (CR L1070)
Executing agency:	Instituto Costarricense de Electricidad [Costa Rican Power Authority] (ICE)
Fiduciary team:	Andrés Suárez (Financial) and Jorge Luis González (Procurement)

I. EXECUTIVE SUMMARY

- 1.1 The fiduciary evaluation was performed in coordination with ICE staff. The financial management analysis was based on the Guide to Financial Management for Projects Financed by the Inter-American Development Bank (OP-273-6); meetings with the ICE and documentary information on operations in execution (loans 1908/OC-CR and 2747/OC-CR), directives, and legal provisions.
- 1.2 According to the evaluation of the Government Procurement System of Costa Rica (2009) using the OECD methodology, the main characteristic of the government procurement system is that the rules are highly dispersed. Although the system is based on a single law, there are other laws, regulations, and special processes. In addition, an ex ante control system for hearing protests and involving the Contraloría General de la República [Office of the Comptroller General] (CGR) means a significant amount of time passes before awards are final. The government contracting system has solid regulations and controls. In practice, it is inefficient and probably rather expensive. The diagnosis using the OECD methodology (2009) is being updated. The situation is not expected to have changed.
- 1.3 Analysis of the public finance management system in 2010, using the Public Expenditure and Financial Accountability (PEFA) methodology, concluded that management was satisfactory. The report covered legislatively approved budgetary expenditures, which are central government expenditures. As an autonomous public enterprise, the ICE is not part of the central government. The budgets of public enterprises are approved by the CGR. The PEFA report acknowledges that there are no significant governmental operations that are not adequately recorded and reported in the regular fiscal reports maintained both by the Ministry of Finance through the National Accounts and Technical Secretariat of the Budgetary Authority and by the CGR. The financial management of the ICE Group is the responsibility of its Gerencia Corporativa de Administración y Finanzas [Corporate Office for Administration and Finances] (GCAF), which assumes the functions of planning, programming, cash flow, and accounting of the financial process, as well as the functions related to issues of purchasing

(goods and services), logistics (consulting), human resources, and administrative management of projects with external financing.

- 1.4 The ICE has extensive experience with IDB-financed operations. It has supporting systems and technological infrastructure that allow it to operate reasonably using its own data processing procedures to maintain control and efficiency in financial management. Its fiduciary risk level is medium in terms of financial management.

II. THE EXECUTING AGENCY'S FIDUCIARY CONTEXT

- 2.1 The ICE Group consists of the ICE and its subsidiaries, Compañía Nacional de Fuerza y Luz, Radiográfica Costarricense, and Compañía Radiográfica Internacional de Costa Rica. Its regulatory framework consists of the CGR, the General Securities Superintendency, Costa Rica's stock exchange La Bolsa de Valores de Costa Rica S.A., the Securities Market Regulatory Act, the Public Utilities Regulatory Authority (ARESEP), the Superintendency of Telecommunications, and the Superintendency of Pensions.
- 2.2 Program execution will be the responsibility of the project coordinator who is in charge of technical and construction compliance, from the engineering and construction division of the Electricity Management Department; and a representative of the corporate finance division of the Corporate Administration and Finance Management Department, who is in charge of fulfillment of disbursement requests and other activities associated with the financial management of the program, and who will also serve as the official interlocutor with the Bank. Both will address considerations inherent to each sphere of action and overall accountability to the Bank. [The institutional capacity assessment system \(ICAS\)](#) provides a breakdown of the structure and the most important financial management considerations.

III. FIDUCIARY RISK EVALUATION AND MITIGATION ACTIONS

A. Finances

- 3.1 The ICE has extensive experience with Bank-financed operations, dating back to 1962 with loan 54/OC-CR and 19 loan operations since the 1970s, including both sovereign and nonsovereign guaranteed loans.
- 3.2 There is a clear definition and separation of functions to provide effective controls in the financial management process. No problems have been identified with disbursement request processes or with the payment for services or procurement processes carried out in IDB projects.
- 3.3 The ICE Group is considered highly exposed to the risk of regulatory interference due to the electricity and telecommunications rate schedules. Each year, the company submits an electricity rate schedule to the regulatory agency, ARESEP. As of 2013, rates are adjusted quarterly to reflect variations in the cost of fuel. This change has a positive effect on the ICE Group's working capital and reduces its exposure to hydrological risk.

- 3.4 In October 2014, the Fitch rating agency noted that the ICE Group has “a diversified portfolio of assets, adequate financial profile, and aggressive capital expenditure program oriented toward increasing renewable generation capacity and maintaining a strong market share position in the telecommunications business.”
- 3.5 The level of fiduciary risk is medium in terms of financial management. The 2014 consolidated audited report of the ICE Group presents a qualified opinion from the external auditors with various recommendations on internal control. The consolidated statement of income and expenditures shows items related to exchange rate differential, fees, interest, and other undetailed expenses affecting the entity’s operating margin.

B. Procurement

- 3.6 The executing agency has extensive experience with Bank-financed operations and no significant risks to the proper execution of procurement are perceived. It is recommended that the ICE’s knowledge of the Bank’s procurement policies be strengthened with periodic training workshops and that emphasis be placed on the importance of applying IDB policies over the ICE’s procurement law and using the Bank’s standard procurement documents. To expedite some small purchases, it is suggested that the threshold amount for procurement based on the shopping method be increased. Fiduciary risk for procurement is medium.

IV. AGREEMENTS AND REQUIREMENTS FOR FINANCIAL EXECUTION

A. Disbursements

- 4.1 The ICE may use the following disbursement modalities: advances, reimbursements, and direct payments. Once the conditions precedent to the first disbursement have been met, the following may be requested:
- 4.2 **Advances:** accompanied by the financial plan and list of commitments according to the liquidity requirements for the period agreed upon, which may be 180 days. Eligible expenditures relating to the advance must be accounted for when at least 70% of the advanced amount has been used. This percentage is based on lessons learned in executing loan 2747/OC-CR, where it is noted that the invoices to be paid to contractors hired under IDB-financed projects generally involve large amounts so that a delay in paying any one of them has a significant effect on financial planning and the ICE’s submission of accounts to the Bank. For this reason, the executing agency has asked to reduce the percentage for rendering accounts on the advance so as to adhere closely to disbursements projected in the months agreed with the IDB at the start of the year. The executing agency may also make short-term, low-risk investments using the funds from advances it receives so it can produce returns for the project. These investments may not affect the need for project resources and liquidity according to the payment financial plans submitted at least every 180 days. The ICE will be solely responsible for covering any asset or capital loss that these investments may cause.

- 4.3 The last advance request must be submitted no later than 30 days before the date of the last disbursement. Supporting documents for this advance are to be submitted during the closing period.
- 4.4 **Direct payments:** using acceptable supporting documents, invoices, or evidence of receipt of the work, good, or service for payments exceeding US\$30,000.
- 4.5 **Reimbursement:** when the executing agency requests reimbursement for expenditures made and certifies that the supporting documentation for the expenditures is available for review by the Bank, auditors, and consultants.
- 4.6 **Projections:** As established in “Enhancing Macroeconomic Safeguards at the Inter-American Development Bank” (document AB-2990), the Bank’s disbursements of loan funds will be subject to maximum limits of: (i) up to 15% in the first 12 months; (ii) up to 30% in the first 24 months; and (iii) up to 50% in the first 36 months, starting on the date the Board of Executive Directors approves the loan operation. These limits might not be applicable to the extent that the requirements set by Bank policy regarding those limits have been met, providing the borrower has been notified in writing

B. Reports

- 4.7 There is not expected to be any need for periodic financial reports, given medium risk in financial management, the ICE’s experience with the operations in execution, systemic supports for financial management, a clear separation of functions in financial administrative management, and internal controls and payment processes.
- 4.8 Each rendering of accounts to the Bank should be accompanied by a reconciliation of the account that received the funds. Specific reports should be prepared and adequate records kept to manage the resources so that movements of funds are clearly identified. The cumulative investment report should be updated at least monthly.
- 4.9 To receive disbursements (advances), the ICE will continue to keep disbursements in the ICE’s master account, with separate reports on program income and expenditures. The Bank may request a bank reconciliation of advance funds in the receiving account, whenever it deems advisable.
- 4.10 Financial supervision is based on: submission of the financial plan for each advance covered, at least every 180 days; fiduciary visits for ex post review of disbursements; and the external auditors’ review and opinion.
- 4.11 Reports will refer to the investment statement, which should be recorded manually, and should include data on progress and budgetary execution for each of the components of the operation.

C. External audits

- 4.12 Each year during execution and at the end of the project, the ICE will submit an audited project report showing the sources and uses of funds, identifying revenue coming from the Bank, the counterpart, and other sources, expenditures for execution, cash balances for which the ICE is responsible, explanatory notes disclosing the accounting policies adopted, and a report on the bank account reconciliation at the close of each fiscal year.

- 4.13 The report will include the external auditors' opinion on income and expenditures during execution, according to the terms of reference approved by the Bank. These will be submitted within 120 days after each year-end (31 December) and 120 days after the last disbursement. External audits will be financed by the ICE.
- 4.14 It is not recommended that audited financial statements be required of the ICE. In the event that audited financial information is needed from it, the Project Team Leader may request it as an additional technical report, as part of the "other reports" requested at specific times. This removes the executing agency's audited financial statements from the automated process defined in the Guide to Financial Management for Projects Financed by the Inter-American Development Bank, OP-273-6, paragraph 8.6, which establishes that failure to submit audited financial statements by the specified deadlines may culminate with the suspension of program disbursements.

D. Supervision plan

- 4.15 **Ex post review of disbursements.** The documentation supporting expenditures will be reviewed following the Bank's disbursement of resources. As the level of financial risk is considered medium, at least one semiannual review is expected. During the fiduciary supervision visit to the ICE and depending on the findings of the ex post evaluation of disbursements, changing the frequency of fiduciary visits may be considered.
- 4.16 The Bank will provide ongoing training to ICE staff participating in program execution on the ex post review method and disbursement processes, recommending they maintain internal controls.

E. Exchange rate

- 4.17 Based on analysis of the executing agency's financial management and implementation of loans 1908/OC-CR and 2747/OC-CR, it is recommended that the exchange rate to establish the equivalent amount of Costa Rican currency as against the United States dollar for an expenditure made in domestic currency should be the exchange rate in effect in Costa Rica on the effective date of payment of the expenditure in domestic currency. It is recommended, for the purposes of the above, that the exchange rate be the sell rate in effect on the day the ICE, or any other individual or legal entity authorized to make expenditures, makes the respective payments to the contractor or supplier.

V. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

- 5.1 The fiduciary agreements and requirements for procurement establish the provisions applicable to the execution of all procurements planned in the project.

A. Procurement execution

1. Use of the country procurement system

- 5.2 Country procurement subsystems approved by the Bank will be used as follows: contracts for goods and nonconsulting services up to the amount established by the Bank for the shopping method for complex goods and services (for reference, US\$50,000).

- 5.3 Any subsequently approved system or subsystem will be applicable to the operation. The procurement plan and its updates will indicate which contracts will be executed using the approved country systems.
- 5.4 All Bank-financed contracting conducted using country subsystems will be subject to the provisions of Section I of the Bank's policies on procurement and consultants.

2. Procurement of works, goods, and nonconsulting services

- 5.5 All procurement of works, goods, nonconsulting services, and consulting services must be included in the procurement plan approved by the IDB through the Procurement Plan Execution System and in accordance with the special conditions of the loan contract.
- 5.6 Contracts for works, goods, and nonconsulting services under the project and subject to international competitive bidding (ICB) will use the standard bidding documents issued by the Bank. Bidding on goods and nonconsulting services not subject to ICB will use the standard bidding documents or documents agreed upon with the Bank.
- 5.7 Procurements financed using local counterpart resources such as the services of technical and administrative staff, operation and maintenance expenses, etc., will be governed in accordance with the procedures applicable to the borrower, provided they are not contrary to the principles established by the Bank. In such cases, the following should be verified: (i) compliance with applicable local legislation; (ii) compliance with the program's objectives and technical requirements; (iii) satisfactory quality compatible with the rest of the project; (iv) timely delivery or completion; (v) prices with no adverse effect on the economic and financial viability of the project; and (vi) adherence to the highest ethical standards.
- 5.8 No contract for the procurement of goods, services or works contracting requires the prequalification of contractors. Processes relating to such procurements are listed in the initial procurement plan. The ICE's UG-IDB sector specialist is responsible for reviewing the technical specifications for procurement of works and goods during the preparation of bids. That specialist will indicate whether external support is advisable to help the CGP during the evaluation of the bids, considering the nature and technical complexity of the procurements being processed.
- 5.9 The program provides for execution of the Río Macho Parallel Tunnel project by the ICE through the force account method, including the financing of items such as hiring labor, purchasing materials, and leasing machinery and small equipment. This project may be financed using the force account method in the framework of the Bank's procurement policies (document GN-2349-9, paragraphs 3.8 (c) and (d)).

3. Selection and contracting of consultants

- 5.10 Consulting service contracts are listed in the procurement plan and will be executed using the standard request for proposals (RFP) issued by the Bank.
- 5.11 Consulting firms will be selected using the RFP issued by the Bank.

- 5.12 The shortlist of consulting firms could consist entirely (100%) of domestic firms for contracts under the threshold amounts established for the country by the Bank.
- 5.13 The selection of individual consultants will take into account consultants' qualifications for performing the work, by comparing the qualifications of at least three candidates.
- 5.14 The project's sector specialist is responsible for reviewing the terms of reference for contracting consulting services. The specialist will also indicate whether it is advisable to have external support to help the ICE during the evaluation of bids, considering the nature and technical complexity of the procurements being processed. There will be cases where individual consultants may be sought through local or international notices for the purpose of forming a shortlist of qualified individuals.

4. Advance procurement/Retroactive financing

- 5.15 The Bank may recognize and charge to the local contribution eligible expenditures made by the ICE prior to the date of loan approval by the Board of Executive Directors, for the Las Pailas II geothermal project and construction of the parallel tunnel for the Río Macho Hydroelectric Power Plant, up to US\$10 million (11% of the local contribution), provided that requirements substantially similar to those provided in the loan contract have been met. Such expenditures must have been made on or after 19 December 2014, the project profile approval date, but in no case will expenditures made more than 18 months prior to the loan approval date be included.

Table 1
Threshold Amounts (US\$ thousands)

Procurement procedures, by threshold amount			
Type of Investment	Threshold amount (US\$ thousands)	Procedure	IDB review method
Works	≥ 3,000	International competitive bidding (ICB)	Ex ante
	Between 250 and 3,000	NCB or Shopping *	Ex post
	< 250	Shopping	
Goods and nonconsulting services	≥ 250	ICB	Ex ante
	Between 50 and 250	NCB or Shopping *	Ex post
	< 50	Use of country systems	Ex post
Consulting services	≥ 200	Shortlist of six firms with broad geographic representation (international and national publicity)	Ex ante
	< 200	Shortlist of six firms that may be national firms (national publicity)	Ex post
Consulting services	≥ 50	Use of country systems, At least three candidates	Ex post
	> 50		Ex post
Direct contracting of goods, works, nonconsulting services, and consulting services.			Ex ante

* Shopping in the cases of works, goods, and common services.

VI. MAJOR PROCUREMENTS

6.1 [Procurement plan](#)

VII. PROCUREMENT SUPERVISION

- 7.1 Table 1 establishes the supervision methods. The review method should be determined for each selection process.¹ Ex post reviews will be conducted every six months according to a project supervision plan. Ex post review reports will include at least one physical inspection visit,² selected from among the procurement processes subject to ex post review. A minimum of 10% of the contracts reviewed must be physically inspected.

¹ Responsibility, support for the review, and the methodology are described in [Ex post guidelines in procurement](#).

² Inspection verifies the existence of procurement, leaving verification of quality and compliance with specifications to the sector specialist.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/15

Costa Rica. CR-X1014. Cooperation Framework for the Financing of Investment Projects under the Lending Instrument Conditional Credit Line for Investment Projects Renewable Energy and Electric Power Transmission and Distribution Program

The Board of Executive Directors

RESOLVES:

1. 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 agreement or agreements as may be necessary with the Republic of Costa Rica and Instituto Costarricense de Electricidad (ICE), to establish a Cooperation Framework for Financing of Investment Projects for the Renewable Energy and Electric Power Transmission and Distribution Program under the lending instrument Conditional Credit Line for Investment Projects and for up to the sum of US\$500,000,000, chargeable to the resources of the Bank's Ordinary Capital.

2. That the establishment and utilization of resources under the Cooperation Framework for the Financing of Investment Projects shall be carried out in accordance with: (a) the objectives and regulations of the Conditional Credit Line for Investment Projects established by Resolution DE-58/03 of July 16, 2003 as amended by Resolution DE-10/07 of January 31, 2007 and DE-164/07 of December 19, 2007; and (b) the specific provisions set forth in document GN-2246-7.

3. That the amounts authorized to finance individual operations chargeable to the Cooperation Framework for the Financing of Investment Project shall be granted as individual operations, guaranteed by the Republic of Costa Rica, subject to the usual financial terms and conditions applicable to financing from the resources of the Bank's Ordinary Capital, in force at the time that each individual operation is approved. Such terms and conditions shall be specified in the executive summary of the corresponding loan proposal.

4. That the effectiveness of the agreement or agreements executed by the Bank with Instituto Costarricense de Electricidad (ICE) to grant financing for each individual operation shall be subject to the effectiveness and validity of the Cooperation Framework for the Financing of Investment Projects and the respective guarantee of the Republic of Costa Rica.

(Adopted on ____ 2015)

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-____/15

Costa Rica. Loan ____/OC-CR to Instituto Costarricense de Electricidad (ICE)
First Renewable Energy and Electric Power Transmission and Distribution
Program, under the Cooperation Framework for the Financing of
Investment Projects approved pursuant to Resolution DE-__/15,
under the lending instrument Conditional Credit Line
for Investment Projects

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 Instituto Costarricense de Electricidad (ICE), as Borrower, and with the Republic of Costa Rica, as Guarantor, for the purpose of granting the Borrower a financing to cooperate in the execution of the First Renewable Energy and Electric Power Transmission and Distribution Program, within the Cooperation Framework for the Financing of Investment Projects approved by Resolution DE-__/15 of _____, 2015, under the lending instrument Conditional Credit Line for Investment Projects. Such financing will be for the amount of up to US\$200,000,000, 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 Executive Summary of the Loan Proposal.

(Adopted on ____ _____ 2015)