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DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

NICARAGUA

GEOTHERMAL EXPLORATION AND TRANSMISSION IMPROVEMENT PROGRAM UNDER THE NICARAGUA INVESTMENT PLAN (PINIC)

(NI-L1094 AND NI-G1006, NI-G1007, NI-G1008)

LOAN PROPOSAL

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REQUIRED

1. Multiyear Execution Plan (MEP)
2. Monitoring and Evaluation Plan
3. Procurement Plan
4. Environmental and Social Management Report (ISMR)

OPTIONAL

1. Economic Analysis of Component 1 – Geothermal Energy
2. Economic Analysis of Component 2 – Transmission
3. Technical Report on Component 1 – Geothermal Energy
4. Technical Report on Component 2 – Transmission
5. Financial Viability of ENATREL
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ABBREVIATIONS

CBA	Cost-Benefit Analysis
CIF	Climate Investment Fund
CTF	Clean Technology Funds
EIRR	Economic Internal Rate of Return
ENATREL	Empresa Nacional de Transmisión Eléctrica [National Electricity Transmission Company]
ENEL	Empresa Nicaragüense de Electricidad [Nicaraguan Electricity Company]
ENPV	Economic Net Present Value
ESAP	Environmental and Social Action Plan
ESMR	Environmental and Social Management Report
FIRR	Financial Internal Rate of Return
FNPV	Financial Net Present Value
FSO	Fund for Special Operations
GLM	Grant Leverage Mechanism
KIF	Korea Infrastructure Development Co-financing Facility for Latin America and the Caribbean
MEM	Ministry of Energy and Mines
MHCP	Ministry of Finance
MWh	Megawatt-hour
PEU	Program Execution Unit
PEP	Program Execution Plan
PINIC	Plan de Inversión – Nicaragua [Nicaragua Investment Plan]
PNESER	Programa Nacional de Electrificación Sostenible y Energía Renovable [National Sustainable Electrification and Renewable Energy Program]
SIEPAC	Sistema de Interconexión Eléctrica de los Países de América Central [Central American Electric Interconnection System]
SIN	Sistema Interconectado Nacional [National Interconnected System]
SREP	Scaling Up Renewable Energy Program
T/L	Transmission Line

PROJECT SUMMARY

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GEOTHERMAL EXPLORATION AND TRANSMISSION IMPROVEMENT PROGRAM UNDER THE NICARAGUA INVESTMENT PLAN (PINIC)
(NI-L1094 and NI-G1006, NI-G1007, NI-G1008)

<table>
<tr><th colspan="8">Financial Terms and Conditions</th></tr>
<tr><td colspan="4" rowspan="2">Borrower/Beneficiary: Republic of Nicaragua</td><td rowspan="2"></td><td colspan="2">IDB BLEND</td><td rowspan="2">IDB GLM OC</td><td rowspan="2">IDB KIF</td></tr>
<tr><td>OC</td><td>FSO</td></tr>
<tr><td colspan="4" rowspan="2">Executing agency: Ministry of Energy and Mines (MEM), with support from the Empresa Nicaragüense de Electricidad [Nicaraguan Electricity Company] (ENEL); and the Empresa Nacional de Transmisión Eléctrica [National Electricity Transmission Company] (ENATREL)</td><td>Amortization period:</td><td>30 years</td><td>40 years</td><td>30 years</td><td>30 years</td></tr>
<tr><td>Disbursement period:</td><td>5 years</td><td>5 years</td><td>5 years</td><td>5 years</td></tr>
<tr><td>Fuente</td><td>%[b]</td><td>Monto (US$)</td><td>%[c]</td><td>Grace period:</td><td>6 years</td><td>40 years</td><td>6 years</td><td>10 years</td></tr>
<tr><td>IDB (OC)</td><td>60.0</td><td>17,220,000</td><td>16.7</td><td rowspan="2">Inspection and supervision fee:</td><td rowspan="2">[f]</td><td rowspan="2">N/A</td><td rowspan="2">[f]</td><td rowspan="2">N/A</td></tr>
<tr><td>IDB (FSO)</td><td>40.0</td><td>11,480,000</td><td>11.1</td></tr>
<tr><td>SUBTOTAL BLEND</td><td>100.0</td><td>28,700,000</td><td>27.8</td><td rowspan="2">Charges on loan facility</td><td rowspan="2">N/A</td><td rowspan="2">N/A</td><td rowspan="2">N/A</td><td rowspan="2">0.1%[g]</td></tr>
<tr><td>IDB-GLM (OC)</td><td>57.1</td><td>22,670,000</td><td>21.9</td></tr>
<tr><td>Grant-GLM (SREP/CTF), NI-G1006, NI-G1007, NI-G1008</td><td>42.9</td><td>17,024,000</td><td>16.4</td><td rowspan="3">Interest rate:</td><td rowspan="3">Fixed Single Currency Facility [h]</td><td rowspan="3">0.25%</td><td rowspan="3">Fixed Single Currency Facility [h]</td><td rowspan="3">1.0%</td></tr>
<tr><td>SUBTOTAL GLM[d]</td><td>100.0</td><td>39,694,000</td><td>38.3</td></tr>
<tr><td>IDB (KIF)[e]</td><td>-</td><td>25,000,000</td><td>24.2</td></tr>
<tr><td>Local contribution</td><td>-</td><td>10,009,000</td><td>9.7</td><td>Credit fee:</td><td>[f]</td><td>N/A</td><td>[f]</td><td>N/A</td></tr>
<tr><td>TOTAL</td><td></td><td>103,403,000</td><td>100.0</td><td>Approval currency:</td><td colspan="4">United States dollar</td></tr>
<tr><th colspan="8">Project at a Glance</th></tr>
<tr><td colspan="8">Objective: to contribute to the sustainability of Nicaragua’s electricity sector. The specific objectives are to: (i) develop exploration of geothermal potential to diversify the energy matrix; and (ii) increase the accessibility and reliability of electricity service by increasing national and regional transmission capacity by strengthening the grid.</td></tr>
<tr><td colspan="8">Special contractual conditions precedent to the first disbursement: (a) the program Operating Manual has been approved and has entered into force according to terms previously agreed upon with the Bank (paragraph 3.3); (b) an execution agreement has been signed between the Ministry of Finance (MHCP) and the Ministry or Energy and Mines (MEM), and a resource transfer agreement has been signed between the MHCP and ENATREL in accordance with the terms of paragraph 3.1; (c) the Coordination and Monitoring Committee for the program and the Management Committee for Component 1 have been established (paragraph 3.1); (d) Program Execution Units’ staff identified in paragraph 3.2 have been appointed or selected; and (e) the final Environmental and Social Action Plan (ESAP) and the management plans identified in the Environmental and Social Management Report (ESMR) have been submitted (paragraph 2.6);

Special contractual conditions precedent to the disbursement of Component 1 resources: (a) a groundwater study is submitted for phases 2 and 3 of the geothermal project planned under Component 1 of the program; (b) an evaluation framework and natural disaster management plan are submitted; and (c) a procurement and compensation plan is submitted (paragraph 2.6);

Special contractual conditions precedent to the disbursement of Component 2 resources: (a) an evaluation framework and natural disaster management plan are submitted; and (b) a procurement and compensation plan is submitted (paragraph 2.6);

Special contractual conditions for execution: (a) the MEM and ENATREL comply with the environmental and social requirements detailed in the ESMR (paragraph 2.8); (b) ENATREL maintains the financial indicators shown in paragraph 2.15; (c) prior to awarding each works contract, the executing agency demonstrates that it has legal possession, easements, or other rights necessary to start the work (paragraph 2.12); and (d) the MEM agrees to solicit bids for awarding the operating concession to a private investor once the feasibility of geothermal resources is demonstrated and to include the private entity’s obligation to repay an amount of no less than what the State has invested in exploration (paragraph 2.2).</td></tr>
</table>

Exceptions to Bank policies: None			
Strategic Alignment			
Challenges[(i)]:	**SI** ☐	**PI** ☑	**EI** ☑
Cross-cutting issues[(j)]:	**GD** ☐	**CC** ☑	**IC** ☐

(a) Plan de Inversiones de Nicaragua [Nicaragua Investment Plan] (PINIC) under the Program for the Promotion of Renewable Energy in Low-income Countries (Scaling up Renewable Energy Program - SREP) of the Climate Investment Fund (CIF), Nicaragua, 15 April 2015. IDBDOCS-#40266845.

(b) % by source of loan and grant funds.

(c) % of the amount from each of the sources for the total operation.

(d) Grant Leverage Mechanism (GLM). This amount will be financed from Ordinary Capital funds under the Bank's regular lending program, in accordance with the provisions of document AB-2946 (Grant Leverage Mechanism: A Proposal) and will be combined with nonreimbursable resources from the Climate Change funds (SREP; US$7.5 million) and the Clean Technology Fund (CTF; US$9.524 million). See paragraph 2.2 and Table 2. These funds will be administered by the Bank in accordance with the financial procedures agreements signed between the Bank and the World Bank as the administrator of both funds (paragraph 2.1). In total they represent 42.9% of the counterpart of the OC and 40% will be disbursed simultaneously (pari passu).

(e) Funds administered by the Bank under the Korea Infrastructure Development Co-financing Facility for Latin America and the Caribbean (KIF) (documents GN-2804, DE-12/15).

(f) 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 relevant policies.

(g) The KIF fee of 0.1% is an initial fee on the approved loan amount and is payable only once within 60 days following the effective date of the contract.

(h) The borrower will pay interest on the outstanding balance of the loan portion charged to OC at a LIBOR-based rate. When the outstanding balance reaches 25% of the approved amount or US$3 million, whichever is greater, the base rate will be established based on that balance. In no case will the OC portion have more than four base interest rates.

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

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

I. PROJECT DESCRIPTION AND RESULTS MONITORING

A. Background, problems, and rationale

1.1 **Energy sector**. Nicaragua consumes 56,000 barrels of oil equivalent in primary energy each day. A high percentage comes from renewable energies: geothermal energy (22%), hydroelectric and solar energy (3%), biofuels (52%); and hydrocarbons (23%). In electricity generation, renewable energies in the National Interconnected System (SIN) amounted to 50.6% in 2015, while thermal energy accounted for 49.4%. Demand reached 665.4 MW, representing growth of 4.6% compared to growth of 2.6% growth in 2014 and 1.7% in 2013. In 2026, demand is projected to reach between 896 MW and 1,038 MW. Electricity coverage increased from 73.7% in 2012 to 80.4% in 2014, and is expected to reach 90% in 2020.

1.2 In 2015 the transmission system consisted of 2,287 km of national lines and 305.6 km of the Central American Electric Interconnection System (SIEPAC). The last section of the SIEPAC, totaling 1,790 km, began operations in October 2014; it was designed to exchange up to 300 MW among countries and to increase the efficiency and reliability of the system.

1.3 The electricity sector has institutions and companies with fully identified functions: the Ministry of Energy and Mines (MEM) designs policies; the Nicaraguan Energy Institute (INE) has regulatory responsibility; the Nicaraguan Electricity Company (ENEL) is responsible for generation; and the National Electricity Transmission Company (ENATREL) is responsible for transmission. Generation and distribution rely on significant private participation.

1.4 **Energy sustainability**. Sustainable energy seeks to balance three dimensions so as to develop stable, accessible, and environmentally-friendly energy. Nicaragua faces a major challenge due to the increase in energy demand resulting from economic growth and the expansion of electricity coverage (paragraph 1.1), placing pressure on generation as a source of supply and energy security, and on transmission as the backbone of the electricity system that ensures universal access.

1.5 The country is highly dependent on firewood and fossil fuels. Imports of petroleum derivatives represented more than 10% of GDP in 2013 and 25.9% of the total primary energy supply. Primary energy consumption grew by 3.5%, and 49.5% of primary energy comes from firewood and other biomass. The residential sector consumed 46.3% of the energy in this sector; firewood represents 87.1%, electricity 8.5%, liquefied petroleum gas 3.8%, and charcoal 0.4%. The industrial sector, with 12.8% of consumption, uses fossil fuels (46%) and firewood (19%).

1.6 The Global Climate Risk Index ranked Nicaragua in fourth place among the countries facng the greatest risk from extreme adverse weather events, and it has been estimated that electricity generation and heat production contribute about 35% of the carbon dioxide equivalent emissions. One of every five people has no electricity to light their home or provide power at their work and nearly 60% of the rural population and 20% of the urban population still use firewood or charcoal to cook. Technical and nontechnical losses and dependence on fossil fuels have kept prices for electrical energy among the highest in the region.

1.7 **Causal factors or main determinants of the problem.** Determining factors in the problem of sustainable energy include: (i) existing limitations on covering the electrical generation requirement by utilizing geothermal energy, which is identified as having the greatest potential in the country; and (ii) the physical limitations of the transmission system.

1.8 **Constraints on geothermal development**. Nicaragua has 12 sites with estimated geothermal potential of 1,500 MW. However, Nicaragua has developed only 10% of this potential, despite having a legal framework for geothermal energy[1] and despite the benefits of geothermal energy for reducing generation costs and emissions (optional electronic link 1). This is due to uncertainty regarding the availability of geothermal resources, their long-term sustainability, and the cost to develop them for purposes of generation, limiting private investment, particularly in the exploration stage.

1.9 **Constraints of the transmission system**. Increases in the demand for and coverage of service, diversification of the energy matrix, and the need to continue to deepen the country's commitment to regional integration have led to pressures on sections of the transmission system, affecting their reliability,[2] limiting their capacity, and impeding the connection of new users to the grid. There are points on the grid with overloaded transformers whose physical parameters are degrading rapidly. Transmission lines (T/Ls) that are not up to standards cause major interruptions in terms of both quantity and magnitude.

1.10 **El Sauce – Villanueva Transmission Line.** This is a 69 kV T/L constructed with wooden structures and conductors already beyond their useful life, causing untimely line outputs and service interruptions. The capacity of the line is insufficient for the current and future load.

1.11 **Lack of backup for transmission circuits.** The Sébaco substation has a single bus system, began to operate more than 50 years ago, and is the point where six 138 kV lines converge. Dependence on a single bus makes service disruptions more likely due to failure of the bus or of a breaker. These episodes leave 10 substations connected to this node, with a load of about 45 MW, without power and prevent the Centroamérica, Larreynaga, and Pantasma hydroelectric plants from delivering 80 MW to the system.

1.12 **Expanding the capacity of six substations.** In SIN substations, 23 transformers operate under hazardous conditions due to their many years of use. In many cases, the models have been discontinued by the manufacturers, making the availability and procurement of spare parts problematic. The project has identified the substations as: Acahualinca, Diriamba, San Benito, Catarina, Ticuantepe I, and Ticuantepe II with obsolete, overloaded, and unstable transformers.

1.13 **Restrictions on the SIEPAC's transmission capacity.** The SIEPAC line, designed to transport 300 MW between countries, became fully operational in October 2014. The line still does not meet the conditions for maximum operating capacity because deficiencies in the national networks—403 km in the case of Nicaragua—occupy part of the transfer capacity of the regional line. This necessitates the construction of additional infrastructure along certain sections of

[1] Law 443, on the Exploration and Exploitation of Geothermal Resources.

[2] In 2014, undelivered energy due to outages reached 8,000 MWh in Nicaragua and 4,000 MWh in the rest of Central America. Source: Central America: statistics for the electricity subsector, 2014. ECLAC.

the national lines. In 2016 the transport capacity of the SIEPAC between Honduras and Nicaragua is 120 MW, while the transmission capacity between Nicaragua and Costa Rica is 100 MW. This limitation has considerable economic consequences because it limits the volume of energy on the Regional Electricity Market. Specifically, the existing conductor between the León-Honduras Border and Amayo-Liberia connection points does not meet the required transmission capacity.

1.14 **Proposed solutions**. To address the limitations on the development of geothermal potential, the program explores the country's potential as well as mechanisms to promote private investment in its development. The program also proposes investments to remedy the limitations of the transmission system in terms of providing quality electrical service to serve growing demand and new generation connection and allow adaptation of the national transmission system so that the SIEPAC will reach its design transfer level of 300 MW. With these investments, it will be possible to increase the welfare of the population in 16 of the country's municipios, 15 of which are located in the north of the Central region and one of which is in the north of the Caribbean Coast region. Several of these municipios report extreme poverty levels exceeding 50% of the population.

1.15 **Sector knowledge**. The IDB has been supporting Nicaragua since 1973. It has supported investments in electrical infrastructure, bolstering reform processes to promote the institutional strengthening of the sector. In 1998, through loan 1017/SF-NI, the Bank participated in reforms of the Electricity Law that transformed the sector and promoted private investment. The Electricity Sector Support Program (loan 1933/BL-NI and Amendments) supported the generation of renewable energies, transmission, and a pilot service normalization program. The National Transmission Investments for Integration with the SIEPAC Project (loan 1877/BL-NI) financed works to strengthen Nicaragua's electrical transmission network and allow its integration with the regional network. The expansion of electricity coverage, reduction of losses in informal settlements, implementation of energy efficiency projects, service for isolated areas, and transmission strengthening have been covered with the Bank's active participation through the National Sustainable Electrification and Renewable Energy Program (PNESER) (2342/BL-NI and Amendments), which includes prefeasibility studies for a geothermal field.[3] The Bank is supporting policy actions in the areas of financial sustainability, transparency of management results, the sustainable energy matrix, promotion of renewable energy, private investment, energy efficiency, and promoting regional integration of the electricity sector, through a programmatic series of policy-based loans (3068/BL-NI and 3493/BL-NI).

1.16 Notable lessons learned[4] include: (i) the benefit of environmental and social assessments that provide advance technical information and precise management plans to facilitate the project's compliance with safeguard policies, particularly on issues related to the availability and source of water, disaster management, management of critical natural habitat areas, and treatment of solid, liquid, and gas wastes; (ii) the need to define project profiles in advance; (iii) the need to classify project areas according to land ownership characteristics, to define appropriate strategies in right-of-way remediation; (iv) establishment of a Project Execution Unit

[3] Through private sector windows, the Bank supported the development of the San Jacinto Tizate geothermal field, which is currently in operation.

[4] Previous experiences in geothermal development: (i) in Nicaragua under the PNESER (a total of three operations); and (ii) in the region with operations in Costa Rica and México.

(PEU) to maintain a clear link with the executing agency's management and decision-making area; and (v) expert support in geothermal exploration to advise the PEU and supervise execution. This program has incorporated the lessons learned through: early coordination with the MEM, ENATREL, and ENEL to ensure that the chain of technical and environmental studies has been completed, defining the area of intervention, establishing a project Operating Manual defining a PEU supported by the management-operational structure of ENATREL and the MEM with support from ENEL, and planning for the contracting of expert support in geothermal exploration.

1.17 The PNESER, which began in 2011 and was promoted by the IDB and seven multilateral organizations, is in the final phase of execution and will allow the Nicaragua Investment Plan (PINIC) to proceed with the development of geothermal potential and improvement of the transmission system. In this latter area, this program and operation NI-L1091, approved in 2015, are complementary in that they include actions strengthening transmission to meet the demand and new generation as well as strengthening adaptation to the regional system.

1.18 **Government strategy**. As part of actions taken by the government to address generation needs based on renewable sources, the PINIC was established in 2015 under the Program for Promotion of Renewable Energy in Low-income Countries (Scaling up Renewable Energy Program - SREP) from the Strategic Climate Fund (Climate Investment Funds - CIF). The PINIC includes the development of geothermal energy and access to energy based on renewable energy and improvements in transmission[5] as its main components.[6]

1.19 **Strategic alignment**. The program is consistent with the IDB Country Strategy with Nicaragua (2012-2017) (document GN-2683), which establishes that the Bank will consider investments aiming to: (i) improve the financial and operational management of the system, and reduce energy losses; (ii) expand electricity service coverage, particularly in rural areas; (iii) improve the service's reliability; and (iv) transform the energy matrix to increase the share of renewable energies to reduce energy costs and overcome an active constraint on the country's growth. The operation is included in the Bank's Country Program Document 2016 (document GN-2849).

1.20 The program is consistent with the Update to the Institutional Strategy 2010-2020 (document AB-3008) and aligned with the development challenges of: (i) productivity and innovation under the criterion of provision of infrastructure and reliable and accessible public services, increasing the efficiency of the transmission system by reducing losses; and (ii) economic integration under the criterion of regional additionality, with the development of a multinational electricity transmission system like the SIEPAC. The program is also aligned with the crosscutting issue of climate change and environmental sustainability, by financing activities aimed at reducing or preventing greenhouse gas emissions through the development of geothermal energy, improving the connection of renewable energy projects, reducing the use of

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5 Map of transmission improvements: NI-L1094 Component 2 Geographic representation of improvements in transmission.

6 Since 2014 there has been coordination with JICA and the World Bank within the PINIC framework. JICA is handling nonreimbursable parallel financing of US$7 million, under its administration, for exploitation of the Mombacho field, and the World Bank is working on an initiative to support the development of the Casita-San Cristóbal geothermal field.

conventional energy sources based on fossil fuels, and increasing efficiency by reducing energy losses in the transmission system. In addition, the program is aligned with the IDB Infrastructure Strategy, Sustainable Infrastructure for Competitiveness and Inclusive Growth (document GN-2710-5), under its two strategic principles, by promoting access to infrastructure services, supporting infrastructure for regional integration, and supporting the construction and maintenance of a socially and environmentally sustainable infrastructure that helps improve the quality of life. The program is consistent with the Energy Sector Framework Document (document GN-2830) in that it: (i) supports sustainable energy through the development of renewable energy; and (ii) promotes energy security by financing energy infrastructure and regional energy integration.

1.21 **Consistency with the Bank's policies**. The program is consistent with Public Utilities Policy, Operational Policy OP-708 (document GN-2716-6) (optional electronic link 7) with reference to the electricity subsector, complying with the conditions of: (i) financial sustainability by seeking to improve ENATREL's financial indicators, given that operating and maintenance costs are recovered through rates (paragraph 2.15); and (ii) economic evaluation, by including projects capable of generating economic and financial returns according to the results of the financial viability analyses and the cost-benefit analysis (CBA) (paragraphs 2.13 and 2.16). In addition, the program complies with the principles of: (i) technical and operational sustainability by supporting policy actions that help to develop geothermal generation and promote improvements in transmission; (ii) promotion of access and social sustainability by strengthening grids to allow the incorporation of new users; (iii) promotion of competition and private sector participation as well as environmental sustainability, by developing geothermal exploration to reduce the risk of investing in renewables; and (iv) improved efficiency by reducing technical losses on T/Ls and substations and contributing to the adequate supply of electricity, to meet the growing demand and increase service quality.

B. Objectives, components, and cost

1.22 **General and specific objectives.** The general objective of the program is to contribute to the sustainability of Nicaragua's electricity sector. The specific objectives are to: (i) develop exploration of geothermal potential to diversify the energy matrix; and (ii) increase the accessibility and reliability of electricity service by increasing national and regional transmission capacity by strengthening the grid.

1.23 **Component 1. Geothermal development (Total: US$46.1 million; IDB: US$39.7 million[7]).** This component will finance the following activities:

a. **Feasibility level exploration of the Cosigüina field with geothermal potential.** Surface level research has already been done in the Cosigüina Volcano area.[8] This activity seeks to determine the technical feasibility of exploiting the geothermal potential of the Cosigüina field, through exploration activities in two phases. Phase 1 includes the drilling of three commercial diameter exploration wells with an average depth of 2,000 meters, to verify the potential of the field, obtaining information to confirm or modify the preliminary conceptual model of the geothermal system developed on the basis of earlier

[7] Includes SREP and CTF funds.

[8] Surface research includes geological, geochemical, and geophysical studies of the site, without including drilling.

prefeasibility studies that included smaller diameter “slim holes” up to 1,000 meters deep. The activities for Phase 1 consist of: preparatory civil engineering work for expanding the three platforms used in the prefeasibility phase; improvements on four kilometers of the existing 3.5 meter wide road and two kilometers of the new 3.5 meter wide trail, which were restored during the prefeasibility phase, with safety bays, extraction and transport of selected material from quarries; installation of 6.25 kilometers of water pipe; and construction of a water pumping station in a 400 square meter area. If the resource is confirmed in Phase 1, Phase 2 includes the drilling of two new commercial diameter wells. Depending on the results achieved, the five wells could be converted to production or reinjection wells in the exploitation phase. Phase 2 also includes construction of new access roads and extending the water supply pipeline, considering the location of the new wells. Based on the results from Phases 1 and 2, a Final Feasibility Report will be prepared that will allow the private sector concession phase to proceed (paragraph b). The private investor would be responsible for investing in additional commercial diameter wells, for defining the battery of production and reinjection wells for exploitation and generation of energy; for the construction of a geothermal plant and T/Ls connecting the project to the substation determined by the national transmission system’s connection studies.

b. **Development of a mechanism to attract private investment for the implementation of geothermal projects.** This activity will help the MEM structure a competitive bidding process for awarding the exploitation concession to a private investor once the feasibility of the geothermal resource is demonstrated. The documents and agreements for the concession will be developed, including the obligations established under Law 443 on recovering the resources invested (Article 5), the concessionaire’s obligation to establish a company in which ENEL will have a 10% interest as established under Law 882 as well as one member on the Board of Directors. This activity will also help the MEM design and implement a mechanism to support geothermal research based on the resources recovered, allowing research in other fields, and mitigating risks so as to attract private investments. This mechanism will include the development of a training plan and dissemination of the results obtained from Phases 1 and 2 contained in the feasibility report, which will be aimed at potential investors, the MHCP, and PRONicaragua. This component will generate additionality by integrating a gender perspective with activities promoting the job creation and training for women. In addition, incentives will be created for giving women access to technical careers or technical studies leading to career opportunities in the geothermal sector and/or creating partnerships with technical schools and universities to promote internship programs in companies for female students. There will also be efforts to strengthen the institutions responsible for coordinating the component, so as to include this gender perspective.

1.24 **Component 2. Improvements in electricity transmission infrastructure (Total: US$57.3 million; IDB: US$53.7 million[9]).** This component will finance increased capacity of T/Ls and transformation of 138 kV and 230 kV substations to reliably meet both current demand and long-term growth in demand so as to:

[9] Includes Korean Facility funds.

a. **Address growing demand and new generation connection:** (i) El Sauce – Villanueva 38 km, 138 kV T/L between the Villanueva Substation and the El Sauce Substation: construction of the new Villanueva Substation and expansion of the El Sauce Substation. The project will make it possible to reduce undelivered energy for current and future users in 10 municipios of the Department of Chinandega supplied by the Villanueva Substation, to improve service for more than 25,000 existing users, and connect 1,440 new users; (ii) Sébaco Substation, this project includes the addition of a new bay/bus at the Sébaco Substation to reduce service interruptions, for six 138 kV T/Ls that connect to that substation and 10 substations connected to this node, with demand of 45 MW and installed hydroelectric power of 80 MW, affecting the supply to 213,000 customers in seven departments; (iii) expanding capacity in five substations to benefit more than 83,000 customers, replacing five transformers at the Acahualinca, Diriamba, San Benito, Ticuantepe II, and Catarina substations. The existing transformers have outlived their useful live and some are overloaded; (iv) modernization of the Ticuantepe I Substation, by constructing a new 138 kV substation to replace the current 69 kV Ticuantepe I Substation; the project includes a 138 kV, two km T/L and will benefit more than 12,000 customers; and (v) purchase of a 40 megavolt ampere (MVA) mobile transformer with a 138/24.9/13.8 kV voltage ratio (paragraph 1.9).

b. **Allow adaptation of the national transmission system so that the SIEPAC can reach its design transfer level of 300 MW,**[10] by increasing the capacity of the existing 230 kV lines on the León-Honduras Border and Amayo-Costa Rica Border sections, replacing 97 km of conductor with a higher capacity conductor and improving transmission capacity over 213 km through complementary works (paragraph 1.13).

1.25 **Cost and financing**. The total cost of the program is US$103,403,000. Of this amount, US$28,700,000 corresponds to blended financing (US$17,220,000 or 60% from OC funds, and US$11,480,000 or 40% from the FSO); US$39,694,000 as part of the Grant Leverage Mechanism (GLM) of the IDB (US$22,670,000 from the OC under the GLM and US$17,024,000 in nonreimbursable funds, including US$750,000 from the SREP in nonreimbursable investment funds, as well as US$6,750,000 from the SREP and US$9,524,000 from the CTF in nonreimbursable contingent grant funds as indicated in paragraph 2.2. In addition, US$25,000,000 in a concessional loan under the Korea Facility for infrastructure projects (KIF), administered by the Bank, and US$10,009,000 will be financed with local funds from the MEM, ENEL, and ENATREL and will basically be used to cover administrative, financial expenses, and contingencies. The consolidated budget by component is shown in Table 1 – Program Cost, and the itemized budget (optional electronic link 10). The expenditure categories that will be covered by the program include procurement of goods, works, services, consulting assignments, program financing costs, and administration expenses for the PEUs.

C. Key results indicators

1.26 The following are established as program outcomes: (i) development of Nicaragua's geothermal potential on an environmentally and financially sustainable basis;

[10] Nicaragua with executive six adaptation projects, five with support from the IDB and one with financing from the European Investment Bank.

(ii) ensuring the supply of continuous, reliable, accessible, and cost-effective electricity in areas benefitting from the program's expansion of electricity infrastructure; and (iii) optimization of the SIEPAC's transmission capacity in the sections located in Nicaragua (Annex II). The indicators established for measuring these outcomes are: (i) geothermal potential for electricity generation in addition to the existing potential, explored in terms of feasibility; (ii) concessions awarded for geothermal exploitation; (iii) undelivered energy in the program's areas of influence; and (iv) maximum regional transfer capacity increased in the Nicaragua-Honduras N-S and Nicaragua-Costa Rica S-N sections.

Table 1. Program Cost (in US$ thousands)

	IDB (GLM)	IDB (BL)	IDB (KIF)	SREP (Ctg)	SREP (Non-reimb.)	CTF (Ctg)	Local Contr.	TOTAL
1. Engineering, supervision, and administration	1,670	-	-	529	59	747	500	3,505
2. Direct costs	19,031	-	-	6,034	671	8,514	-	34,250
2.1 Feasibility exploration	18,753	-	-	5,946	661	8,390	-	33,750
2.2 Geothermal projects implementation strategy	278	-	-	88	10	124	-	500
3. Contingencies	585	-	-	186	20	263	5,796	6,850
4. Financial expenses	1,384	-	-	-	-	-	91	1,475
Subtotal C1-GEOTHERMAL	22,670	-	-	6,749	750	9,524	6,387	46,080
1. Engineering, supervision, and administration	-	800	731	-	-	-	600	2,131
2. Direct costs	-	25,824	23,582	-	-	-	-	49,406
2.1 Transmission to support national strengthening	-	19,774	18,057	-	-	-	-	37,831
2.2 Transmission to support regional system capacity	-	6,050	5,525	-	-	-	-	11,575
3. Contingencies	-	771	-	-	-	-	2,889	3,660
4. Financial expenses	-	1,305	687	-	-	-	133	2,125
Subtotal C2-TRANSMISSION	-	28,700	25,000	-	-	-	3,622	57,322
TOTAL	22,670	28,700	25,000	6,749	750	9,524	10,009	103,402

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

2.1 The program is a specific investment loan. It will be cofinanced with loan proceeds from the Bank and from the Korean Facility for infrastructure projects, as well as CTF and SREP contributions as part of the PINIC. Bank resources will be charged to the following sources of financing: (i) the biennial allocation for Nicaragua (document GN-2442-46) from parallel OC and FSO loans, under the Debt Sustainability Framework (DSF)/Enhanced Performance-based Allocaton (EPBA) system (document GN-2442); and (ii) the allocation of OC resources under the Bank's regular lending program (OC loan) as established under the GLM (document AB-2946) (optional electronic link 14). In accordance with the GLM, the Bank may finance investment loan operations with resources from the regular program of OC funding and grant resources provided by bilateral and multilateral donors. Of the US$17,024,000 in SREP/CTF resources, up to US$15,113,333 will be used as a counterpart to the OC loan under the GLM for a grant (40%) and OC loan (60%) blend that would be approved and disbursed simultaneously (pari passu) to meet the concessionality requirements. The funds contributed by the CTF and SREP will be administered by the Bank in accordance with the financial procedures agreement signed between the Bank and the World Bank as the administrator of these resources. The Bank may not disburse OC resources until the CTF/SREP resources are available for purposes of the program.

2.2 As indicated in paragraph 2.1, each sum to be disbursed and charged to the OC loan, within the GLM framework, will have a counterpart contribution in an equal amount (pari passu) from CTF and SREP resources. The resources from SREP and CTF are transferred to the country on a nonreimbursable basis to help mitigate the financial risks associated with the exploration of the geothermal field. At no time will the contingent-recovery resources (paragraph 1.25) give rise to a repayment obligation for the State, but rather a positive covenant whereby the State, through the MEM, is required to solicit bids for awarding the concession to a private investor once the feasibility of the geothermal resource is demonstrated, and the concession granted to a private entity will include the obligation to repay an amount that is no less than what the State has invested in exploration. With the resources received from the private investor, the MEM will implement a mechanism to support geothermal research (Mitigation Fund), so that the resources can continue to be used for research in other fields, mitigating the risks for attracting private investment. The resources from these contributions will continue to be used by the Mitigation Fund and repeatedly recovered from the private investors. After 30 years following the signing of the agreements, the Mitigation Fund will establish as a requirement for the private investor who wins the final bid that the resources corresponding to contingent recovery be returned directly to the Bank, in the account designated by the Bank, to be transferred to the CTF/SREP.

2.3 Regardless of their source, resources will be disbursed over a period of five years starting on the effective date of the loan contract, as shown in Table 2:

Table 2. Disbursement Schedule (US$ thousands)

SOURCE	2017	2018	2019	2020	2021	Total
IDB (GLM)	196	425	4,695	12,411	4,943	22,670
SREP (nonreimbursable grant)	7	14	161	421	147	750
SREP (contingent grant)	61	130	1,451	3,791	1,317	6,750
CTF (contingent grant)	86	183	2,048	5,348	1,859	9,524
Local contribution (MEM-ENEL)	76	151	148	3,035	2,977	6,387
Subtotal C1 - GEOTHERMAL	426	903	8,503	25,006	11,243	46,081
IDB (blend)	846	3,604	6,189	11,722	6,339	28,700
IDB (Korean Facility)	769	3,266	5,580	10,194	5,191	25,000
Local contribution (ENATREL)	179	151	145	1,579	1,568	3,622
Subtotal C2 - TRANSMISSION	1,794	7,021	11,914	23,495	13,098	57,322
TOTAL	2,220	7,924	20,417	48,501	24,341	103,403

B. Environmental and social risks

2.4 **Environmental risks**. The Environmental and Social Management Report (ESMR) presents the environmental and social risks associated with the program.

2.5 The program was classified as a category “A” operation in accordance with Operational Policy OP-703. If not mitigated, the adverse environmental and social impacts would be significant. They are: (i) habitat fragmentation and cumulative effects on the forest cover caused by habitat conversion within the Cosigüina Volcano Natural Reserve; (ii) the risk of cumulative effects on water availability caused by extraction and consumption of water for Component 1, which could affect the viability of both Component 1 and the health of surrounding communities; (iii) a high risk of natural disasters that could affect the viability of the projects under Components 1 and 2, and the health and safety of surrounding communities, such as seismic activity, drought, extreme precipitation and storms, landslides, and volcanic activity; (iv) impacts associated with the construction phase of projects under Components 1 and 2, such as contamination of surface water and groundwater and soil by sludge from drilling, air pollution, generation of noise and vibrations, visual impacts, potential pollution caused by poor waste management, and impacts associated with access and the obtaining of easements; and (v) negative impacts on the economic potential of both neighboring owners and the affected communities.

2.6 The mitigation measures that the borrower should take include: (i) as a special condition precedent to the first disbursement of resources under Component 1, the submission of a groundwater study to determine the availability of water and identify appropriate management measures for the Cosigüina geothermal project; (ii) execution, during the project disbursement period, of a biodiversity action plan to restore the Cosigüina Volcano Natural Reserve; (iii) as special conditions precent to the first disbursement of resoruces under Components 1 and 2, the presentation of a natural disaster evaluation framework and management plan as well as a procurement and compensation plan; (iv) development of an environmental and social management framework for the geothermal production stage. Likewise, **the final Environmental and Social Action Plan (ESAP) and the other management plans identified in the ESMR will be a condition precedent to the first disbursement**, ensuring that all environmental and social risks are properly mitigated.

2.7 A description of all measures the borrower will implement to mitigate the most relevant impacts and risks so that the program complies with Operational Policy OP-703 during the contract's effective period is presented in the ESMR.

2.8 The ESMR identifies the program's special contractual conditions and the appropriate monitoring and supervision arrangements. After project approval, the IDB will actively supervise performance of the implementation of mitigation measures and environmental and social compensation.

C. Fiduciary considerations

2.9 **Risks**. During preparation, the institutional capacity assessment of each executing agency was updated, making it possible to identify the financial management risk that an internal control environment acceptable to the Bank would not be reestablished. In general, for fiduciary management, risk mitigation measures are expected to be developed around specific training sessions, close monitoring at the start, and hiring of ad hoc staff with the skills needed to execute Bank-financed operations. A medium risk of procurement delays was also identified, because selected staff members are not up-to-date on IDB policies. To mitigate this risk, the suggestion is to conduct a training workshop and clinics scheduled by the IDB for technical and fiduciary staff involved in the program. The procurement of goods, works, nonconsulting services, and consulting services will be carried out in accordance with the policies set forth in documents GN-2349-9 and GN-2350-9.

D. Other key considerations and risks

2.10 **Public management, governance, and development.** The following medium risks were identified with regard to public management and governance: (i) delays in National Assembly ratification leading to delay in starting the program; and (ii) delays in fulfilling conditions precedent to the first disbursement leading to delays in starting the program, particularly the formation of the PEU with key staff. The respective mitigation measures proposed are as follows: (i) negotiate with the National Assembly's Energy Committee to consider streamlining approval of the loan contract by the National Assembly; and (ii) negotiate with government agencies on issuing over the short term (a) the legal opinion of the Attorney General's Office to establish the effective date of the program; and (b) Transfer Agreements between ENATREL and the MHCP and the Execution Agreement between the MEM and MHCP; and (c) staffing the PEU (paragraph 3.2).

2.11 The following medium development risks were considered: (i) potential delays in execution of the program due to participation of various government entities; (ii) delays in obtaining environmental permits producing delays in starting program works; (iii) limited capacity in the area of geothermal energy delaying the preparation of technical specifications for exploratory drilling; (iv) increased costs limiting the scope of Component 1; (v) delay in obtaining results from topographical surveys and geological studies; (vi) delay in easement negotiations; and (vii) limited private sector demand for investing in the development of geothermal fields.

2.12 The mitigation measures proposed for development risks are to: (i) establish a Program Coordination and Monitoring Committee[11] for monitoring and making important decisions, implementing strengthening measures according to the action plan resulting from the institutional capacity assessment; (ii) negotiate with the

[11] Section 2.2.1. of the program Operating Manual defines the composition and operation of the Program Coordination and Monitoring Committee.

appropriate authorities to ensure approvals in the anticipated timeframe; (iii) hire a specialist in geothermal exploration to support the PEU-MEM in preparing technical specifications and the timely contracting of a technical-environmental supervision firm; (iv) conduct advance market study for similar bidding processes; (v) ensure a contingencies amount from the start of program design and arrange for additional resources from the MHCP; (vi) use own resources to contract studies that the Bank may finance retroactively; and (vii) ensure ongoing coordination between executing agencies with local leaders, mayors' offices, and political secretaries in the affected regions. As a special contractual condition for execution, prior to the award of each works contract, the respective executing agency will demonstrate that it has legal possession, easements, or other rights necessary to begin the work; and (viii) as part of the mechanism for attracting private investment to implement the geothermal projects to be prepared, a plan will be developed to disseminate the results obtained from Phases 1 and 2 contained in the feasibility report, targeting potential investors.

2.13 **Financial viability**. The program's financial viability assessment for Component 1 was performed using a cash flow financial analysis model. The methodology that uses this analysis is the evaluation of the financial internal rate of return (FIIR) using cash flow with costs and revenues and financial net present value (FNPV). Using a discount rate of 12%, sensitivities analyses were conducted on the factors considered, such as the rate of the power sale agreement, the interest rate on the debt, the term of the debt, investment cost, tax rate, and exemptions. They were compared with the expected rate of return on capital, estimated to be a minimum of 18% in Nicaragua. Cases that have an FIRR > 18% and a positive FNPV are considered favorable. If the explorations confirm the geothermal resource, the project would be financially viable based on an energy price of US$102/MWh, which compares favorably with similar projects.[12]

2.14 Financial viability for Component 2 was analyzed on the basis of historical and projected evolution of financial statements based on ENATREL's financial indicators (optional electronic link 5), the monitoring of which was agreed upon in previous operations (paragraph 2.18). The results in 2015 were lower than expected: the cash operating margin was 28.8% compared to the agreed 30%; the contribution of the internal generation of funds, net of debt service, to investments was -232% compared to 35%, and debt service coverage amounted to 0.27 times compared to 1.5%. The last two indicators were strongly affected by rising values for the payment of principal and interest due to ENATREL's delays in amortizing both principal and interest. ENATREL's financial projections for the period 2016-2025 were prepared considering an investment scenario of US$509 million, normalization of cumulative debt, and an average annual increase of 11% in the transmission toll.

2.15 It is estimated that ENATREL will achieve the indicators defined as follows: (i) contribution of the net internal generation of funds should increase proportionally from that recorded in 2015 until reaching 35% in 2020 and continuing at that level in subsequent years; (ii) the cash operating margin determined as the amount remaining after operating and maintenance costs are covered will be at least 30%; and (iii) the debt service coverage factor should increase proportionally from that recorded in 2015 until reaching 1.5 in 2019 and remain at that level in subsequent years. The monitoring of these indicators will allow for the adoption of actions to ensure that income from ENATREL's operations will be sufficient to cover its normal

[12] The San Jacinto-Tizate geothermal project in Nicaragua receives a price of US$117/MWh.

operating and maintenance costs, debt service, and make a substantial contribution to the investment plan. The application of the targets defined for these indicators will be extended to include other current loan operations involving ENATREL. ENATREL's maintenance of these financial indicators will be a special contractual condition for execution. In the event of deviations in the indicators and a determination that those indicators point to a deterioration in the company's financial position, the borrower and ENATREL will submit an action plan to the Bank clearly identifying the causes for the deviations and the management or financial measures that will be adopted, the responsibilities of the executing agency and the borrower, and the implementation schedule, so that financially sustainable conditions can be restored.

2.16 **Economic viability**. A CBA was done, yielding a cumulative economic net present value (ENPV) for the entire program of US$864,250,173 and a weighted economic internal rate of return (EIRR) of 20%. For Component 1, cash flow was analyzed by comparing cases with and without the project. Sensitivity analyses were conducted on the most important factors considered ("average" social cost per ton of CO_2; IFO380 Bunker fuel price, investment cost, etc.) and compared to the opportunity discount rate (12%). Cases with an EIRR >2% and a positive ENPV are considered favorable. The project has a positive ENPV and an EIRR in the base case of 17% and variations in sensitivity analyses ranging from 13% to 29%. (optional electronic link 1).

2.17 For Component 2, the CBA was conducted for each of the program's projects, examining their direct and indirect effects, including externalities they might generate and using a discount rate of 12%. The analysis classified the projects in two groups, projects strengthening the national system and projects strengthening the regional system. The former generate a positive ENPV and a weighted average EIRR of 34%, In terms of users, these projects provide average economic benefits on the order of US$2,269 per customer and include a total local aggregate economic investment (adjusted for factors) of US$41,904,080, generating an economic benefit of approximately US$696,700,643. This investment benefits more than 410,000 customers (more than 2,000,000 people). In the case of projects strengthening the regional system, the economic investment of US$12,820,629 generates an ENPV of US$94,739,530 and an EIRR of 23%. Component 2 shows a weighted EIRR of 27% and a cumulative ENPV of US$791,440,173. The details are presented in (optional electronic link 2).

2.18 **Technical viability**. The projects' technical viability was analyzed for each component. For Component 1, technical viability is ensured through a detailed process of investment prioritization and a work plan that includes different development stages from surface studies to deep drilling (optional electronic link 3). Consistent with the PINIC (paragraph 1.18), the sustainability of commercial investments will be promoted by reducing the risks of exploration; scalability to new geothermal research studies will be promoted based on resources from private investors recovered for phases 1 and 2. For Component 2, technical viability is ensured through design development and the component's construction approval process. The preparation of project designs in the program follows the technical specifications, regulatory, social, and environmental regulations in effect in the sector. This process helps to mitigate risks associated with social discord in the areas of influence of the projects to be financed. The development of these projects

is an integral part of ENATREL's planning for the expansion of the National Transmission System (optional electronic link 4).

2.19 **Institutional viability.** The MEM, which is responsible for formulating and promoting national policies and strategies applicable to the promotion, development, exploration, and exploitation of the country's geothermal resources, may also conduct preliminary research on geothermal resources according to the principles established in the Law on the Exploration and Exploitation of Geothermal Resources and its regulations (Article 4 of Law 443). It is currently drilling in the Cosiguina project area for the prefeasibility stage financed by the PNESER. It will also have technical support from ENEL, which has extensive experience in geothermal energy. ENATREL, for its part, has extensive experience executing projects to expand and strengthen the country's transmission system, as in the case of the National Transmission Investments for Integration with the SIEPAC Project (1877/BL-NI) and the Electricity Sector Support Program (1933/BL-NI and Amendments). It is also the executing agency responsible for coordinating and implementing the largest program being executed for the electricity sector, the PNESER (2342/BL-NI and Amendments), which comprehensively addresses the sector's needs.[13] ENATREL has proven to be an executing agency with high management capacity, as it completed execution of the first two programs mentioned with satisfactory results in 2012 and 2015, respectively, and is currently executing the PNESER and the NI-L1091 program.

III. Implementation and Management Plan

A. Summary of implementation arrangements[14]

3.1 The borrower will be the Republic of Nicaragua, and the executing agencies will be: the MEM, with technical support from ENEL, for Component 1, and ENATREL for Component 2. A Program Coordination and Monitoring Committee is planned to made up of the MHCP, the MEM, and ENATREL. ENEL's participation in the technical aspects related to feasibility level exploration (preliminary research) for the Cosiguina project will be based on the provisions of Article 2 of Law 882 of 2014 amending Law 443, establishing that the public entity that will conduct preliminary research will include the participation of ENEL, for which a participation agreement will be entered into by means of an interagency agreement among the MEM, ENEL, and the MHCP, establishing the execution terms and obligations and defining the roles and responsibilities of the parties. A Management Committee will be established for Component 1. ENATREL is a public company created by Law 583 and has its own legal status as a decentralized entity of the Executive Branch. ENATREL will execute Component 2 through the PEU-ENATREL, and the MEM will execute Component 1 through the PEU-MEM. The borrower, through the MHCP, will sign a resources transfer agreement with ENATREL establishing the terms of that transfer as well as ENATREL's execution obligations under the terms of the loan contract. **The following will be special contractual conditions precedent to the first disbursement of the Bank's financing: (i) establishment of the Program**

[13] The PNESER has seven components impacting: rural electrification, standardization of networks, expansion of isolated systems, preinvestment studies, energy efficiency, strengthening of the transmission system, and sustainability of isolated systems.

[14] The program Operating Manual (Section 2.2-Mechanism for coordinating execution) describes in detail the roles, functions, and arrangements of the program's stakeholders.

Coordination and Monitoring Committee and the Management Committee for Component 1; and (ii) signing of an execution agreement between the MHCP and the MEM, and a resources transfer agreement between the MHCP and ENATREL, establishing the parties' obligations for the proper implementation of the project.

3.2 **PEUs**. The PEUs will be the units responsible for the administration of each component of the program and will serve as liaisons with the Bank. To perform their functions, the PEUs will have a Component Coordinator and the following key personnel: (i) an administrative-financial specialist; (ii) a procurement specialist; and (iii) a monitoring and evaluation specialist; who will work in coordination with the career technical and administrative staff of the MEM and ENATREL. **The appointment or selection of the following staff for each PEU will be a special contractual condition precedent to the first disbursement: (i) component coordinator; (ii) administrative-financial specialist; (iii) procurement specialist; and (iv) monitoring and evaluation specialist.**

3.3 **Program Operating Manual.** The implementation of the program will be governed by the provisions contained in the program Operating Manual. This manual will incorporate all the procedures to be used during program execution, including a system for monitoring, following up, and evaluating actions and results, and an environmental and social management framework for the potential geothermal production stage, as described in the Environmental and Social Management Plan (ESMP). During execution, the program Operating Manual may be amended with the Bank's written statement of no objection. **Indication that the program Operating Manual been approved and is in effect, with separate chapters for each executing agency, under the terms and conditions previously agreed upon with the Bank, will be a special contractual condition precedent to the first disbursement of the loan proceeds.**

3.4 **Program Execution Plan (PEP).** The development of program activities will follow a program implemented through the PEP and its annual review as contained in the respective annual work plan (AWP). The PEP contains the detail equivalent to the AWP for each year of execution. However, it will be amended each year taking into account actual progress made under the program. The annual reviews of the PEP (AWP) will be submitted to the Bank by each executing agency.

3.5 **Procurement plan.** Agreement has been reached on a procurement plan for the first 12 months of execution. Each executing agency will update the procurement plan each year, coinciding with the annual evaluations and before the end of each calendar year or whenever substantial changes occur. The different types procurement of goods, works, and consulting services will be undertaken in accordance with policies set forth in documents GN-2349-9 and GN-2350-9, respectively.

3.6 **Retroactive financing**. The Bank may use the loan proceed to retroactively finance engineering costs incurred by the borrower prior to the loan approval date for an amount up to US$500,000 corresponding to 0.5% of the total amount of the operation, provided such expenditures have complied with requirements substantially analogous to those established in the loan contract. Such expenditures will have been made as of 1 June 2016, the project profile approval date, but in no case may they have been incurred more than 18 months prior to the loan approval date.

3.7 **Financial audit**. External audit services will be provided by a firm of external auditors acceptable to the Bank, to be hired based on terms of reference to be agreed upon with the executing agencies. External audits of the program and of ENATREL will be contracted using loan proceeds and will be submitted to the Bank within 120 days following the end of each calendar year during the original disbursement period or its extensions and 120 days after the date of the last disbursement.

B. Summary of arrangements for monitoring results

3.8 **Monitoring.** The Bank team will conduct semiannual technical visits to each executing agency to review progress made by the program and make adjustments based on program execution. Fiduciary supervision visits will be made according to the initial fiduciary risk. The number of such visits will be adjusted to the extent that the operation's fiduciary risk changes. External operational audits of the program are planned, to be contracted by the MEM, to validate the use of the loan proceeds and the internal operational processes and controls to be implemented in the executing agencies. The information collected will be analyzed every six months and the monitoring and progress report will be produced once a year (required electronic link 2).

3.9 Environmental and social monitoring will focus on compliance with environmental and social requirements contained in the contract, including those in the ESAP following the schedule described therein.

3.10 **Evaluation.** Program evaluation includes a midterm evaluation and a final evaluation using the loan proceeds. The midterm evaluations will be contracted by each executing agency, within no more than two months after 50% of the respective component's resources have been committed. The final evaluation will include an ex post CBA and will be contracted by each executing agency within no more than two months after 95% of the component's resources have been disbursed. The final evaluations will determine the extent to which the targets established in the Results Matrix have been achieved, i.e., they will analyze the situation before and after implementation of the program. The semiannual and annual reports will be submitted by the executing agencies according to the Monitoring and Evaluation Plan. In addition, a workshop will be conducted on the preparation of the final report and an ex post CBA will be performed to verify the operation's assumptions.

Development Effectiveness Matrix			
Summary			
I. Strategic Alignment			
1. IDB Strategic Development Objectives	**Aligned**		
Development Challenges & Cross-cutting Themes	**-Productivity and Innovation -Economic Integration -Climate Change and Environmental Sustainability**		
Regional Context Indicators			
Country Development Results Indicators	**-Reduction of emissions with support of IDBG financing (annual million tons CO2 e) -Regional, sub-regional and extra-regional integration agreements and cooperation initiatives supported (#)**		
2. Country Strategy Development Objectives	**Aligned**		
Country Strategy Results Matrix	**GN-2683**	**Change the energy matrix by promoting electricity generation from renewable sources and improve service reliability.**	
Country Program Results Matrix	**GN-2849**	**The intervention is included in the 2016 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**
	8.5		**10**
3. Evidence-based Assessment & Solution	**8.4**	**33.33%**	**10**
3.1 Program Diagnosis	**3.0**		
3.2 Proposed Interventions or Solutions	**2.4**		
3.3 Results Matrix Quality	**3.0**		
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	**7.0**	**33.33%**	**10**
5.1 Monitoring Mechanisms	**2.0**		
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, Accounting and Reporting.	
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**	The project will promote job creation and training for women in the field of geotermal energy, as well as incentives for women's access to technical studies and the creation of partnerships with technical schools and universities to promote internship programs for female students. Addtionally, the institutions involved in the implementation of component I will receive training regarding the inclusion of gender perspective.	
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			

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

Nicaragua faces a major challenge to ensure the sustainability of the energy sector. The increase in energy demand, resulting from economic growth and expansion of electricity coverage, has put pressure on the generation systems as a source of supply to ensure the energy security, and to the transmission systems as a driver of universal access to electricity and regional integration. The diagnosis is adequately documented and identifies as key determinants the constraints for the exploitation of resources for power generation, and physical limitations in the transmission system due to the deterioration of its components.

The operation seeks to address this challenge and limitations throgh two components: (i) promote the development of electricity generation using geothermal resources, through exploration works and the development of mechanisms that encourage investment and subsequent operation; and (ii) optimize the electricity transimision system through improvements in physical infrastructure, both national and for integration.

The intervention is consistent with the diagnosis presented and has shown well designed vertical logic. The expected results are: (i) develop the geothermal potential of Nicaragua; (Ii) ensure continuous supply, reliable, accessible and cost-effective power in areas served by the program; and (iii) optimize the energy capacity for SIEPAC in sections located in Nicaragua. The results matrix is well formulated and, while impact or impact indicators were not established, the expected development objective has been identified.

The economic analysis relies on an cost - benefit assessment by component and by intervention. Component I, derives the economic benefits from cost savings due to the replacement of fossil fuel (oil import) and reducing CO2eq emissions due to displacement of electricity generation from thermoelectric plants to geothermal plants. Component II, relies on six individual transimisión projects where the benefits are related to the improved system reliability. Economic indicators are positive and the sensitivity analysis has taken into account the uncertainty variables common to such projects. The evaluation scheme proposes a cost - benefit analysis ex post and a before-and-after measurement of indicators.

The operation's overall risk was determined as medium. Medium risks classified as high impact have a low probability of occurrence and are related to public management and governance, environmental and social sustainability, and development. All risks include mitigation measures.

RESULTS MATRIX

Objective	To contribute to the sustainability of Nicaragua's electricity sector. The specific objectives are to: (i) develop exploration of geothermal potential to diversify the energy matrix; and (ii) increase the accessibility and reliability of electricity service by increasing national and regional transmission capacity by strengthening the grid.

Outcomes	Baseline 2016	Target 2021	Observations/Means of verification
Develop Nicaragua's geothermal potential on an environmentally and financially sustainable basis			
Geothermal potential for electricity generation, explored in terms of feasibility at the Cosigüina field (MW).	0[1]	40	Feasibility study of Cosigüina field approved by the MEM and ENEL.
Geothermal exploitation concessions granted.	0[1]	1	Concession agreement between the MEM and a private or public-private investor signed by both parties.
Ensure the supply of continuous, reliable, accessible, and cost-effective electricity in the areas benefitted by the program's expansion of the electricity infrastructure.			
Undelivered energy[2] (GWh) in the program's areas of influence.[3]	1.178	0.080	The measurements of undelivered energy will be verified through statistical and technical reports from the Centro Nacional de Despacho de Carga [National Load Dispatch Center] (CNDC).
Optimize the power load capacity of the Central American Electric Interconnection System (SIEPAC) in the sections located in Nicaragua			
Maximum Regional Transfer Capacity (MW) on the Nicaragua-Honduras N-S section increased.[4]	120	300	The target assumes that in addition to strengthening included under this program, all strengthening planned for the SIN is built. Report of the Ente Operador Regional [Regional Operating Entity] (EOR). Transfer capacity will be verified through statistical and technical reports from the EOR.
Maximum Regional Transfer Capacity (MW) on the Nicaragua-Costa Rica S-N section increased.[4]	100	300	

[1] Currently there is no feasibility level study for the Cosiguina field that estimates a baseline for geothermal potential, nor are there any exploitation concessions.
[2] Amount of energy that is not delivered to users due to a transmission system event that restricts the availability of the system's assets, preventing power transmission.
[3] Jinotega Department (Municipios: Jinotega, La Concordia, Santa María de Pantasma, San Rafael del Norte, and San Sebastián de Yalí); Madriz Department (Municipio: San Juan de Rio Coco); Matagalpa Department (Municipios: El Cuá, Rancho Grande); Nueva Segovia Department (Municipios: Ciudad Antigua, Jalapa, El Jícaro, Murra, Quilali, San Fernando, Wiwili de Nueva Segovia); Autonomous Region of the North Atlantic (Municipio: Waslala).
[4] The increased areas of control refer to the transmission grid controlled by the CNDC, which also include the substations of neighboring countries reached by regional interconnection lines.

Outputs	Baseline	Year					Target	Means of Verification
		1	2	3	4	5		
Component 1. Development of the geothermal potential of the Cosigüina field								
1. Commercial diameter exploratory wells drilled.[5]	0	0	0	3	2	0	5	Technical report approved by the MEM and ENEL.
2. Feasibility study for exploitation of the Cosigüina field.[6]	0	0	0	0	1	0	1	Final report of study approved by the MEM and ENEL.
3. Geothermal exploration risk mitigation study designed.[7]	0	0	0	0	0	1	1	Study approved by the MEM.
Component 2.a. Improvement of physical transmission infrastructure to guarantee and increase the supply of continuous electrical power to meet the demand for electricity and power generation in the program's areas of intervention								
4. Villa Nueva and El Sauce Substations constructed and in operation (S/E).	0	0	0	0	0	2	2	Records indicating acceptance of works, supply, installation, and startup of equipment, approved by ENATREL including as an annex the technical-environmental supervision reports.
5. 138 kV El Sauce – Villanueva transmission line constructed and in operation[8] (km).	0	0	0	0	0	38	38	
6. Sebaco Substation expanded and in operation.	0	0	0	0	1	0	1	
7. San Benito, Catarina, Diriamba, Acahualinca, and Ticuantepe II Substations constructed and in operation.	0	0	0	0	5	0	5	
8. Ticuantepe I Substation constructed and in operation.	0	0	0	0	0	1	1	
9. Transmission line connected to Ticuantepe I Substation constructed[9] (km).	0	0	0	0	0	2	2	
10. 40 MVA mobile transformer (transformer) acquired.	0	0	0	1	0	0	1	
Component 2.b. Improvement of the physical transmission infrastructure to optimize the load capacity of the regional T/L in the sections located in Nicaragua								
11. 230 kV T/L with transmission capacity increased through replacement of conductors in the Leon – Honduras Border and Amayo – Costa Rica Border areas, in operation (km).	0	0	0	0	97	0	97	Technical report approved by the CNDC.

[5] The drilling process consists of preparatory civil engineering, including the expansion of platforms, improved access to wells, construction of a water pumping station, and the drilling of commercial diameter wells.
[6] Will include a detailed analysis with technical, socioenvironmental, and financial information on the field's geothermal potential.
[7] This study will include: (i) proposals for actions intended to support geothermal research based on recovered resources, allowing for their continued use for research on other fields, mitigating risks in order to attract private investment; (ii) a training plan and dissemination of the results obtained from Phases 1 and 2 directed to potential investors, the MHCP, and PRONicaragua.
[8] Includes the construction and startup of the 138 kV outlet bay line from the La Dalia Substation.
[9] Includes the construction and startup of the 138 kV outlet bay line from the La Dalia Substation.

Outputs	Baseline	Year					Target	Means of Verification
		1	2	3	4	5		
12. 230 kV T/L with transmission capacity increased through a LIDAR survey and retightening of conductor, in operation (km).	0	0	0	0	0	213	213	

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Country:	Nicaragua
Project No.:	NI-L1094
Project Name:	Geothermal Exploration and Transmission Improvement Program under the Nicaragua Investment Plan (PINIC)
Executing Agency:	Empresa Nacional de Transmisión Eléctrica [National Electricity Transmission Company] (ENATREL), Ministry of Energy and Mines (MEM), with support from the Empresa Nicaragüense de Electricidad [Nicaraguan Electricity Company] (ENEL)
Fiduciary Team:	Santiago Castillo and Juan Carlos Lazo; (FMP/CNI)

I. EXECUTIVE SUMMARY

1.1 The executing agencies for this operation will be ENATREL and the MEM. The latter will be supported by ENEL. They will be responsible for the execution and technical and financial supervision of the project.

1.2 The Sistema Integrado de Gestión Financiera y Auditoría [Integrated Financial Management and Audit System] (SIGFA) has been validated by the Bank for handling aspects related to budget, cash management, and accounting for the operation. Similarly, its projects module, the Sistema Integrado de Gestión Financiera y Administrativa [Integrated Financial and Administrative Management System] (SIGFAPRO) has been validated for aspects related to reports. The national procurement system is being improved; thus, it is important to sustain a continuous effort to promote various actions to make them compatible with international best practices and consistent with Bank policies. ENATREL has experience in the execution of Bank-financed projects such as loans 2342/BL-NI, 1877/BL-NI, and 1933/BL-NI.

1.3 In the area of financial management, ENATREL and the MEM have experience in the administration of external funds. The results of the institutional capacity assessment indicate a medium level of risk for the three executing agencies. Their cumulative and proven experience includes the use of country systems. To mitigate risks, it will be necessary to hire additional staff with experience in Bank operations and to reinforce key concepts among current personnel who will be responsible for the operation. This strengthening may be provided through specific training on the Bank's tools to strengthen the institution's performance or through temporary support seeking sustainable improvement over the short term.

1.4 The current operation is for the amount of US$103,403,000.

II. THE EXECUTING AGENCY'S FIDUCIARY CONTEXT

2.1 ENATREL is a public energy sector company created by Law 583 of 16 November 2006 as a decentralized entity enjoying technical and administrative autonomy, with its own assets and the ability to undertake obligations.

2.2 In the area of procurement, ENATREL, MEM, and ENEL personnel have experience in projects with IDB financing. Procurement operates institutionally with personnel using the Procurement Plan Execution System. There are plans to provide training on procurement processes in accordance with Bank procedures.

2.3 For financial management, ENATREL uses the SIGFA, which includes the following subsystems: budget, cash management, accounting, and reporting, supported by the projects model (SIGFAPRO). The Bank is currently supporting the Nicaraguan government's efforts to modernize the Sistema de Administración Financiera [Financial Administration System] (SIGAF), which will incorporate: (i) the MHCP's own applications for recording and reporting on public resources in the SIGAF; (ii) the functionalities needed for administration according to their own characteristics and administrative autonomies; (iii) budgeting using a results-based management approach; (iv) administrative management of institutions using complete transactional cycles; and (v) international accounting standards and automatic generation of public finance statistics. In the event that the SIGFA is implemented during this operation's execution period, migration of the operation's records to the new system will be evaluated.

III. FIDUCIARY RISK EVALUATION AND MITIGATING ACTIONS

3.1 The executing agencies' technical and fiduciary capacities will be strengthened as follows: (i) a procurement specialist will be hired (contracting should have the Bank's no objection in order to ensure compliance with a job profile suited to program execution). The Bank will approve the proposed staffing structure that will be responsible for the operation's financial management; (ii) the Bank's fiduciary sector will provide training in financial and procurement management to staff responsible for program execution; and (iii) the data processing tool will be updated to facilitate monitoring of procurement and contract administration processes, so that project reports can be obtained.

IV. CONSIDERATIONS FOR THE SPECIAL PROVISIONS OF THE CONTRACT

4.1 To streamline contract negotiation by the project team, primarily the Legal Department, the agreements and requirements to be considered in special provisions are: (i) prior to the first disbursement, each Program Execution Unit will have the following staff, either appointed or selected, for the fiduciary structure responsible for project execution, consistent with the terms of reference agreed upon with the Bank, and with the Bank's no objection: (a) a procurement specialist; and (b) an administrative-financial specialist; (ii) prior to the first disbursement, submission to the Bank's satisfaction of the program's Operating Manual, which will establish inter alia ENATREL's responsibilities in the implementation of the program, approved and in effect, as well as performance manuals, functional organizational charts, flowcharts, plans with indicators and means of verification for both institutions; (iii) exchange rate: to avoid foreign exchange losses, it is recommended that the currency's monetization exchange rate to the cordoba be used; (iv) submission of the program's Audited Financial Statements (AFS), contracted by the MEM, separately identifying resources by

source of financing and component, without this implying the submission of separate reports and independent opinions for each source of financing or component; as well as for ENATREL, within a period of 120 days following the close of each calendar year during the original disbursement period or its extensions; (v) the percentage documentation required to obtain access to a new advance will be 80%, and the period for the use of such funds will be six months; and (vi) the Bank will not make payments to third parties in Nicaraguan territory on behalf of the borrower.

V. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

5.1 The fiduciary agreements and requirements in procurement establish the provisions applicable for executing all procurement planned under the program.

A. Procurement execution

5.2 **Procurement of works, goods, and nonconsulting services**. Contracts for works, goods, and nonconsulting services arising under the program and subject to international competitive bidding (ICB) will be executed using the Standard Bidding Documents (SBDs) issued by the Bank. Tenders subject to national competitive bidding (NCB) will be executed using national bidding documents agreed upon with the Bank. The Project Team Leader is responsible for reviewing the technical specifications for procurement during the preparation of selection processes.

5.3 Information technology systems purchases. Hardware and technology required for the execution of this project will be procured using the SBDs issued by the Bank. Tenders subject to NCB will be executed using national bidding documents agreed upon with the Bank.

5.4 Turnkey procurement (supply and installation). Not applicable.

5.5 Procurement with community participation. Not applicable.

B. Selection and contracting of consultants

5.6 Consulting services contracts arising under the program will be executed using the Standard Request for Proposals issued by or agreed upon with the Bank. The Project Team Leader is responsible for reviewing the terms of reference for contracting consulting services.

5.7 **Selection of individual consultants.** There will be cases in which individual consultants may be contracted based on local or international notices for the purpose of drawing up a shortlist of qualified individuals.

5.8 **Training**. The training services required to execute this project will be procured using the SBDs issued by the Bank, and tenders subject to NCB will be executed using national bidding documents agreed upon with the Bank.

C. Use of the country procurement system:

5.9 The national procurement subsystem approved by the Bank, the SISCAE, will be used to publish notices seeking expressions of interest and/or calls for bids in all procurement processes. Any system or subsystem approved subsequently will be applicable to the operation. The operation's procurement plan and its updates will indicate which contracting procedures will be carried out using approved country systems.

5.10 **Strengthening measures**. Training on procurement will be conducted at ENATREL, MEM, and ENEL. In addition, project funds will be used to contract a procurement specialist to strengthen each executing agency (ENATREL and MEM) and ENEL.

5.11 **Recurrent costs.** Not applicable.

5.12 **Trade practices**. Not applicable.

5.13 **Retroactive financing**. The Bank may retroactively finance, using the loan proceeds, the engineering costs incurred by the borrower prior to the date the is approved by the Bank's Board of Executive Directors, up to the amount of US$500,000, provided they comply with requirements substantially analogous to those established in the loan contract. Such expenses will have been incurred as of 1 June 2016, the project profile approval date, but in no case may they be incurred more than 18 months prior to the loan approval date.

5.14 **National preference**. Not applicable.

5.15 **Other project execution arrangements**. As part of the project's operating expenses, it is anticipated that ENATREL will use IDB funds to update the technical standards. With its own funds, ENATREL agrees to acquire the lands and easements required for the project.

D. Threshold amounts for international competitive bidding and International shortlists (thousands of US$)

Method	ICB works	ICB goods and nonconsulting services	International shortlist in consulting services
Threshold	>1,500	>150	>200

E. Main procurement procedures

Activity	Selection method	Estimated date of call / invitation to bid	Estimated amount (US$)
Goods			
Provision of goods and services related to Villanueva substation; 138 kV El Sauce-Villanueva transmission line and expansion of El Sauce substation	ICB	First half 2018	14,206,000
Provision of goods and services related to expansion of Sébaco substation	ICB	Second half 2016	8,272,000
Provision of goods and services related to increasing transformation capacity at San Benito, Catarina, Diriamba, Acahualinca, and Ticuantepe II substations	ICB	First half 2017	8,480,000
Provision of goods and services related to the new 138 kV Ticuantepe I Substation and 138 kV four-circuit transmission line	ICB	Second half 2017	5,749,000
Provision of goods and related services for repowering of the 230 kV lines	ICB	First half 2018	7,320,000
Firms			
Financial and compliance audit	AF-200	First half 2017	249,900
Technical environmental supervision	QCBS	Second half 2016	23,364,000
Works			
Civil engineering for drilling commercial diameter geothermal wells in the Cosigüina Volcano area. Provision of goods and related services for Santa Clara substation and Ocotal-Santa Clara 138 kV line.	ICB	First half 2018	30,000,000
Drilling and provision of materials for exploratory geothermal wells at Cosigüina Volcano.	ICB	First half 2018	30,000,000

* To access the 18-month procurement plan, click here.

5.16 **Procurement supervision**. The procurement supervision method will be as defined in the procurement plan and will be determined for each selection process. There will be ex post reviews every six months in accordance with the project's supervision plan. Ex post review reports will include at least one physical inspection visit, selected from the procurement processes subject to ex post review. No less than 10% of the contracts reviewed should be physically inspected.

Threshold for ex post review for ENATREL, MEM, and ENEL		
Works	**Goods and nonconsulting services**	**Consulting services**
Up to US$150,000.00	Up to US$25,000.00	US$00,000.00

Note: The threshold amounts established for ex post review are applied based on the executing agency's fiduciary execution capacity and may be amended by the Bank to the extent that such capacity changes.

F. Special provisions

5.17 **Measures for reducing the likelihood of corruption**. Implement an institutional staff code of ethics and conduct covering the procurement division and primarily conflicts of interest.

5.18 **Other special procedures**. Not applicable.

G. Records and files

5.19 The documentation required for fiduciary management (procurement and finance) will be maintained in the program's files and records organized under security level conditions in the office of the executing agency, using the report forms defined for the project in accordance with the procedures that have been agreed upon and described in the program Operating Manual and/or the Operating Regulations.

VI. FINANCIAL MANAGEMENT AGREEMENTS AND REQUIREMENTS

6.1 **Programming and budget**. The public sector uses the provisions of the Law on Financial Administration and the Budgetary Regime and the provisions of the National Public Investment System as the country system, following the approval cycle of the General Budget of the Republic. Both executing agencies will execute the budgetary allocations necessary so as to have sufficient budgetary appropriations to cover each year's execution commitments, and should use the SIGFAPRO as the financial/accounting system acceptable to the Bank. Should there be changes improving the SIGAF's SIGFA/SIGFAPRO project administration module that is now being modernized, it is expected that migration to use the improved system would be immediate.

6.2 **Disbursements and cash flow**. Disbursements will be made to the executing agency by the IDB through the single treasury account with a financial control subaccount. Disbursements will be made using the methods authorized by the Bank: Advance to Borrower, Direct Payment to Suppliers (DPS), or Reimbursement to Borrower. DPS can only be used to pay suppliers outside Nicaragua as direct payment to suppliers is not feasible within the country due to current legal provisions regarding the handling of funds from external debt. Advances to the borrower will be in accordance with the program's real liquidity needs (financial planning). The disbursement request will be submitted to the Bank along with a spending schedule for activities in the annual work plan (AWP) covering a maximum period of six months. At least 80% of the disbursements will be documented in order to proceed with a new advance of funds, supported by a financial plan aligned with the Program Execution Plan (PEP), AWP, and the procurement plan. Cash flows may consider payment of interest during the execution period using funds from the loan consistent with the amount established in the program budget (single annex).

6.3 **Accounting and financial reports**. The program's financial statements will be issued in accordance with International Accounting Standards and the Financial Management Guidelines (document OP-273-6). They will be audited annually by an independent firm considered eligible by the Bank. Financial accounting will be recorded using the SIGFA/SIGFAPRO system, which provides transparency and specific control for budgetary execution.

6.4 **Internal control and internal audit**. The environment and/or activities for control, communication, reporting, and monitoring of the activities of ENATREL and the MEM are governed by country standards (Technical Standards for Internal Control). Both executing agencies have an acceptable internal control

system, with defined manuals and procedures, as well as an internal audit unit. It is expected that to the extent they are able the internal audit units will include in their annual planning a review of the execution of the components under the program. However, in recent operations a deterioration has been noted in quality and compliance with Bank rules, which led to an inappropriate closing of operations NI-L1021, NI-L1040, and the ENATREL component of operation NI-L1022, and a decline in the quality of accounting records in operations NI-L1050 and NI-L1063. The Bank will conduct training/refresher clinics every four months with staff responsible for financial matters in order to ensure compliance with the aforementioned rules and policies.

6.5 **External control and reports**. The project execution units (PEUs) will coordinate the contracting of an independent audit firm considered eligible by the Bank, following the Bank's established procedures. Reports on the external audit of the program will be submitted 120 days following each fiscal year during the disbursement period and 120 calendar days after the original disbursement period or its extensions, taking International Audit Standards into consideration. The annual audited financial statements will be prepared in accordance with the guidelines for financial reports and external auditing for Bank-financed operations.

A. Financial supervision plan

6.6 The Bank will promote the following actions: (i) prior to beginning program execution, a start-up training workshop will be held for personnel responsible for program execution, consistent with the regulatory instruments of fiduciary management; (ii) financial accounting visits to confirm progress made in program execution and compliance in applying internal control measures, with emphasis on surveying financial execution processes, quality and timeliness of accounting records, and suitability of supporting documentation; and (iii) disbursement requests will be reviewed on an ex post basis and verification thereof will be the responsibility of the auditor and Bank staff.

6.7 **Execution arrangements.** Each PEU will handle advances of funds through their respective Institutional Financial Unit (IFU). Payment and commitment processes related to the operation will be generated by each PEU through those IFUs.

NICARAGUA GEOTHERMAL EXPLORATION AND TRANSMISSION IMPROVEMENT PROGRAM UNDER THE PINIC

NI-L1094

CERTIFICATION

The Grants and Co-Financing Management Unit (ORP/GCM) certifies that the operation received the non-objection for financing by the Korea Infrastructure Development Co-financing Facility for Latin America and the Caribbean (KIF) for the amount of up to US$25,000,000 confirmed by Chang Yeon You, on July 12, 2016.

Original Signed	08/09/2016
Sonia M. Rivera Chief Grants and Co-Financing Management Unit ORP/GCM	Date

NICARAGUA GEOTHERMAL EXPLORATION AND TRANSMISSION IMPROVEMENT PROGRAM UNDER THE PINIC

NI-G1006

CERTIFICATION

I hereby certify that this operation was approved for financing under the **Clean Technology Fund (CTF)** through a communication dated August 2, 2016 and signed by Goritza Ninova. Also, I certify that resources from the **contingent recovery grant** are available for the amount up to **US$9,524,000** in order to finance the activities described and budgeted in this document. The commitment and disbursement of these resources shall be made only by the Bank in US dollars. The same currency shall be used to stipulate the remuneration and payments to consultants, except in the case of local consultants working in their own borrowing member country who shall have their remuneration defined and paid in the currency of such country. No resources of the Fund shall be made available to cover amounts greater than the amount certified herein above for the implementation of this operation. Amounts greater than the certified amount may arise from commitments on contracts denominated in a currency other than the Fund currency, resulting in currency exchange rate differences, i.e. represent a risk that will not be absorbed by the Fund.

Original Signed	08/09/2016
Sonia M. Rivera	Date
Chief	
Grants and Co-Financing Management Unit	
ORP/GCM	

NICARAGUA GEOTHERMAL EXPLORATION AND TRANSMISSION IMPROVEMENT PROGRAM UNDER THE PINIC

NI-G1007 – US$6,750,000
NI-G1008 – US$750,000

CERTIFICATION

I hereby certify that this operation was approved for financing under the **Strategic Climate Fund/ Scaling-up Renewable Energy Program in Low Income Countries (SCX/SREP)** through a communication dated August 2, 2016 and signed by Goritza Ninova. Also, I certify that resources resources from the **contingent recovery grant** are available for the amount of up to **US$6,750,000; and grant resources** for the amount up to **US$750,000** in order to finance the activities described and budgeted in this document. The commitment and disbursement of these resources shall be made only by the Bank in US dollars. The same currency shall be used to stipulate the remuneration and payments to consultants, except in the case of local consultants working in their own borrowing member country who shall have their remuneration defined and paid in the currency of such country. No resources of the Fund shall be made available to cover amounts greater than the amount certified herein above for the implementation of this operation. Amounts greater than the certified amount may arise from commitments on contracts denominated in a currency other than the Fund currency, resulting in currency exchange rate differences, i.e. represent a risk that will not be absorbed by the Fund.

Original Signed	08/09/2016
Sonia M. Rivera Chief Grants and Co-Financing Management Unit ORP/GCM	Date

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/16

Nicaragua. Loan ____/BL-NI to the Republic of Nicaragua
Nicaragua Geothermal Exploration and Transmission
Improvement Program under the PINIC

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 Republic of Nicaragua, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a Nicaragua Geothermal Exploration and Transmission Improvement Program under the PINIC. Such financing will be for the amount of up to US$17,220,000 from the resources of the Single Currency Facility of the Bank's Ordinary Capital, corresponds to a parallel loan within the framework of the multilateral debt relief and concessional finance reform of the Bank, 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 __ _____ 2016)

LEG/SGO/CID/IDBDOCS#40403994
NI-L1094

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/16

Nicaragua. Loan ____/BL-NI to the Republic of Nicaragua
Nicaragua Geothermal Exploration and Transmission
Improvement Program under the PINIC

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 Republic of Nicaragua, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a Nicaragua Geothermal Exploration and Transmission Improvement Program under the PINIC. Such financing will be for the amount of up to US$11,480,000 from the resources of the Bank's Fund for Special Operations, corresponds to a parallel loan within the framework of the multilateral debt relief and concessional finance reform of the Bank, 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 __ _____ 2016)

LEG/SGO/CID/IDBDOCS#40403995
NI-L1094

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/16

Nicaragua. Loan ____/OC-NI to the Republic of Nicaragua
Nicaragua Geothermal Exploration and Transmission
Improvement Program under the PINIC

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 Republic of Nicaragua, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a Nicaragua Geothermal Exploration and Transmission Improvement Program under the PINIC. Such financing will be for an amount of up to US$22,670,000 from the resources of the Ordinary Capital of the Bank, corresponds to a parallel loan within the framework of the Grant Leverage Mechanism authorized pursuant to Resolution AG-9/13, 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 __ _____ 2016)

LEG/SGO/CID/IDBDOCS#40414870
NI-L1094

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/16

Nicaragua. Loan ____/KI-NI to the Republic of Nicaragua
Nicaragua Geothermal Exploration and Transmission
Improvement Program under the PINIC

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, acting as Administrator of the Korea Infrastructure Development Co-financing Facility for Latin America and the Caribbean (hereinafter, the "Facility"), to enter into such contract or contracts as may be necessary with the Republic of Nicaragua, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a Nicaragua Geothermal Exploration and Transmission Improvement Program under the PINIC. Such financing will be for an amount of up to US$25,000,000 from the resources of the Facility, 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 __ _____ 2016)

LEG/SGO/CID/IDBDOCS#40414783
NI-L1094

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/16

Nicaragua. Nonreimbursable Investment Financing GRT/__-_____-NI,
GRT/__-_____-NI and GRT/__-_____-NI
Nicaragua Geothermal Exploration and Transmission
Improvement Program under the PINIC

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, in its capacity as Implementing Entity for the Clean Technology Fund and for the Scaling Up Renewable Energy Program in Low Income Countries ("SREP") of the Strategic Climate Fund, to enter into such agreement or agreements as may be necessary with the Republic of Nicaragua, as Beneficiary, and to adopt such other measures as may be pertinent for the execution of the project proposal contained in document PR-____ regarding a nonreimbursable investment financing for the Nicaragua Geothermal Exploration and Transmission Improvement Program under the PINIC.

2. That: (1) up to the amount of US$7,500,000 is authorized for the purposes of this resolution chargeable to the SREP resources, to be provided on a nonreimbursable basis; and (2) up to the amount of US$9,524,000 is authorized for the purposes of this resolution chargeable to the resources of the Clean Technology Fund, to be provided on a nonreimbursable basis.

(Adopted on __ _____ 2016)

LEG/SGO/CID/IDBDOCS#40416461
NI-L1094; NI-G1006; NI-G1007; NI-G1008