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DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

ECUADOR

SUPPORT FOR THE ADVANCEMENT OF THE ENERGY MATRIX TRANSITION IN ECUADOR

(EC-L1223)

LOAN PROPOSAL

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CONTENTS

ANNEXES	
Annex I	Summary Development Effectiveness Matrix (DEM)
Annex II	Results Matrix
Annex III	Fiduciary Agreements and Requirements

ELECTRONIC LINKS

REQUIRED

1. Multiyear execution plan and annual work plan
2. Monitoring and evaluation plan
3. Environmental and social management report
4. Procurement plan

OPTIONAL

1. Economic analysis of the project
2. Program rationale with the Public Utilities Policy (document GN-2716-6)
3. Technical annex on regional integration (document GN-2565-4)
4. Gender annex
5. Technical feasibility report
6. Preliminary operating manual
7. Environmental and social documentation for projects in the sample
8. Safeguard policy filter and safeguard screening form

ABBREVIATIONS

CHC	China Cofinancing Fund for Latin America and the Caribbean
CO_2	Carbon dioxide
CORE	Cofinancing for Renewable Energy and Energy Efficiency
EIRR	Economic internal rate of return
ENPV	Economic net present value
FERUM	Fondo de Electrificación Rural y Urbano-Marginal [Fund for Rural and Marginal Urban Electrification]
GWh	Gigawatt-hours
ha	Hectare
JICA	Japan International Cooperation Agency
km	Kilometer
kV	Kilovolt
kVA	Kilovolt-ampere
kWh	Kilowatt-hour
LIBOR	London interbank offered rate
MEER	Ministry of Electricity and Renewable Energy
MEF	Ministry of Economy and Finance
MVA	Megavolt-ampere
MW	Megawatt
PLANEE	Plan Nacional de Eficiencia Energética [National Energy Efficiency Plan]
PMU	Project management unit
SINEA	Sistema de Interconexión Eléctrica Andina [Andean Electrical Interconnection System]
WAL	Weighted average life

PROJECT SUMMARY

ECUADOR
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<table>
<tr><th colspan="5">Financial Terms and Conditions</th></tr>
<tr><td colspan="3" rowspan="2">Borrower: Republic of Ecuador</td><td colspan="2">Flexible Financing Facility[a]</td></tr>
<tr><td>Amortization period:</td><td>25 years</td></tr>
<tr><td colspan="3" rowspan="2">Executing agency: Ministry of Electricity and Renewable Energy (MEER)</td><td>Original WAL:</td><td>15.25 years[b]</td></tr>
<tr><td>Disbursement period:</td><td>5 years</td></tr>
<tr><td>Source</td><td>Amount (US$ million)</td><td>%</td><td>Grace period:</td><td>7.5 years[c]</td></tr>
<tr><td>IDB (Ordinary Capital)</td><td>150.0</td><td>48.5</td><td>Inspection and supervision fee:</td><td>[d]</td></tr>
<tr><td rowspan="2">Japan International Cooperation Agency (JICA) (parallel financing):[e]</td><td rowspan="2">70.0</td><td rowspan="2">22.7</td><td>Interest rate:</td><td>LIBOR-based</td></tr>
<tr><td>Credit fee:</td><td>[d]</td></tr>
<tr><td>Local</td><td>89.1</td><td>28.8</td><td rowspan="2">Currency:</td><td rowspan="2">U.S. dollars from the Ordinary Capital</td></tr>
<tr><td>Total</td><td>309.1</td><td>100.0</td></tr>
<tr><th colspan="5">Project at a Glance</th></tr>
<tr><td colspan="5">Project objective/description: to support advancement of the Investment Plan for the Energy Matrix Transition, by expanding, strengthening, and improving the operational efficiency of the electrical system, as provided for in the Electricity Master Plan and the National Energy Efficiency Plan.</td></tr>
<tr><td colspan="5">Special contractual conditions precedent to the first disbursement of the loan: (i) signature and entry into force of a subsidiary agreement between the Ministry of Economy and Finance (MEF) and the executing agency, indicating that loan proceeds will be transferred and recorded in a timely manner in the corresponding area for the program and used as per the agreed conditions and purposes; (ii) approval by the MEF of the guarantees for the contracts for Components I and II; and (iii) approval by the executing agency of the program operating manual, under the terms agreed on with the Bank, including financial management, interagency governance arrangements, and the specific terms and conditions set by JICA in the framework agreement and its disbursement guide (paragraph 3.2).
Special contractual conditions for execution: prior to the use of Component III resources for the Energy Efficiency Program in Agroindustry, the executing agency will present for the Bank's no objection the investment plan and execution schedule identifying the activities to be conducted. See also the special environmental and social contractual conditions in Annex B of the Environmental and Social Management Report (ESMR) (paragraph 3.3).</td></tr>
<tr><td colspan="5">Exceptions to Bank policies: None.</td></tr>
<tr><th colspan="5">Strategic Alignment</th></tr>
<tr><td>Challenges:[f]</td><td colspan="4">SI ☑ PI ☑ EI ☑</td></tr>
<tr><td>Crosscutting themes:[g]</td><td colspan="4">GD ☑ CC ☑ IC ☐</td></tr>
</table>

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

[b] The original weighted average life of the loan could be shorter, depending on the actual signature date of the loan contract.

[c] Under the Flexible Financing Facility's flexible repayment options, changes in the grace period are possible, provided the original weighted average life of the loan and the last payment date, documented in the loan contract, are not exceeded.

[d] 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.

[e] On 12 September 2017, the Bank received the Conditional Acceptance Letter from JICA. JICA's board is scheduled to approve the cofinancing by the fourth quarter of 2017. The JICA resources are needed to enable the program to achieve the proposed objectives.

[f] SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

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

I. DESCRIPTION AND RESULTS MONITORING

A. Background, problem to be addressed, and rationale

1.1 Twenty years ago, Ecuador experienced recurring energy crises that were most marked in the late 1990s and extended through the first decade of the 2000s due to electricity shortages and the poor quality of electricity infrastructure. The electricity sector had systematic weakness, with prevailing high levels of power losses and low coverage and service quality rates. In 2007, the power generation matrix had little diversification[1] and required constant electricity imports.[2]

1.2 In light of sector problems, the Government of Ecuador moved forward with an ambitious transformation, strengthening the institutional framework by establishing the Ministry of Electricity and Renewable Energy (MEER) in 2007 as the lead agency for the electricity sector. It administers:[3] (i) The Electrical Corporation of Ecuador, comprised of 12 business units responsible for generation, together with Transelectric, which heads up transmission; and (ii) 10 electricity distribution companies.[4] In 2013, the Government of Ecuador developed the Energy Matrix Transition strategy, which seeks to boost social welfare and economic development by improving the supply and quality of electricity service and proactively participating in the regional electricity market.

1.3 The MEER periodically devises the Electricity Master Plan,[5] which identifies the objectives, policies, strategies, and expansion plans for the generation, transmission, and distribution segments. The Government of Ecuador sought to diversify the power generation matrix by constructing nine flagship projects to emphasize renewable energy. Of these, the 16.5 megawatt (MW) Villonaco wind park began operating in 2013, while the 1,500 MW Coca-Codo Sinclair, 487 MW Sopladora, and 65 MW Manduriacu hydropower plants began operating in 2015 and 2016. These projects have doubled power capacity in hydroelectric plants from 2,057 MW in 2007 to 4,446 MW in 2016, bringing hydroelectric production from 49.6% to 66.2%. With the Minas San Francisco 275 MW, Toachi Pilatón 254 MW, Delsitanisagua 180 MW, Quijos 50 MW, and Mazar-Dudas 21 MW hydroelectric plants coming on line in 2017 and 2018, installed capacity will reach 5,226 MW, which would cover 90% of demand with renewable energy by 2019.[6]

1.4 Investments in the National Transmission System and the National Distribution System focused on improving the system's topology, in order to have robust, reliable grids. Accordingly, the following works were implemented: (i) 3,114 additional km of transmission lines, including the first 500-kilovolt (kV) transmission system; (ii) a

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1 Its generation capacity came from the following: 52% from thermal generation, 2% from biomass, and 46% from hydroelectric resources, over 50% of which were concentrated in a single watershed.

2 From 2002 to 2007, Ecuador imported over 7,000 GWh from Colombia, for the equivalent of more than US$820 million. Electricity Master Plan 2016 – 2025, MEER.

3 The following institutions also report to the MEER: (i) the National Electricity Operator; (ii) the Electricity Regulation and Control Agency; and (iii) the National Energy Efficiency and Renewable Energy Institute.

4 The National Electricity Corporation, one of the 10 electricity distribution companies, has 11 business units and serves 49% of clients nationwide, invoicing 62% of total energy.

5 The latest version of the Electricity Master Plan, issued in May 2017, covers the period 2016–2025.

6 Unlike in the past, the new hydroelectric plants are located in different watersheds and basins, diversifying the risk of drought-related shortages.

44% increase in transformer installed capacity in substations, from 7,273 megavolt-amperes (MVA) to 11,495 MVA in the National Transmission System, and from 5,035 MVA to 7,270 MVA in the National Distribution System; (iii) construction of 678 km of subtransmission lines and nearly 20,000 km of distribution lines; and (iv) Fund for Rural and Marginal Urban Electrification (FERUM) projects[7] benefiting over 900,000 additional families.

1.5 The Government of Ecuador's investments, which totaled over US$11 billion in the last decade, have raised operating and service delivery standards, strengthening management of the MEER's business units. This substantially improved the following indices from 2007 to 2016: (i) total electric power losses reduced from 21.42% to 12.21%; (ii) electricity coverage increased from 93.35% to 97.24%; and (iii) service quality, measured as average interruption frequency per kVA installed, improved from 15.2 outages/year in 2012 to 5.59 outages/year in 2016 and total interruption time per kVA installed fell from 16.69 hours/year to 6.41 hours/year in the same period.

1.6 Using its new generation capacity, Ecuador made headway on strengthening infrastructure and the policy-setting framework for increased regional energy exchanges, including notably: (i) completion of the feasibility study and design for the 500 kV Ecuador-Peru interconnection, and preparation of the environmental studies; and (ii) adoption of Decision 816 by the Andean Community Commission, authorizing the trading of electricity between Colombia, Ecuador, and Peru as the first phase of integration under the Andean Electrical Interconnection System (SINEA).[8] In addition, in 2016 Ecuador exported 378.27 GWh to Colombia and 23.28 GWh to Peru through existing binational interconnections.[9]

1.7 **Electricity sector investment needs.** Despite the sector's progress, electricity infrastructure needs to continue to be expanded and strengthened, so as to: (i) meet the expected increase in demand over the next decade, estimated at average annual growth of 5.41% in power and 5.45% in energy;[10] and (ii) replace existing infrastructure where the design capacities have been exceeded or will be shortly, due to the new generating capacity coming on line[11] and potential needs from consolidation of the SINEA.

1.8 In this regard, for the period 2016-2025, the Electricity Master Plan identifies the following investments: (i) in the National Transmission System: 284 km of 500 kV transmission line, 860 km of 230 kV transmission line, 534 km of 138 kV

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7 Electrification Program for Rural and Marginal Urban Areas of Ecuador, by extending isolated grids and systems.

8 "General Framework for Subregional Interconnection of Electricity Systems and Intra-community Trading of Electricity," which provides for establishment of the Andean Regional Electricity Market aimed at enhancing the security of the electricity supply and the sale of surplus electricity among the countries in the region.

9 The following international electricity interconnection infrastructure is already in place: (i) Ecuador – Colombia: two 230 kV lines, with a combined capacity of 540 MW; and (ii) Ecuador – Peru: one 230 kV line with maximum transfer capacity of 110 MW.

10 Electricity Master Plan 2016 – 2025, MEER.

11 Projects for 413 MW are under construction, and another 934 MW is planned, including the 596 MW Cardenillo Hydroelectric Project, to be developed as a public-private partnership. Electricity Master Plan 2016 – 2025, MEER.

transmission line, and 8,363 MVA of transformer capacity in 23 substations, at an estimated cost of US$1.113 billion; (ii) in the National Distribution System: addition of 3.6 million electricity meters, 40,649 km of low-voltage grids, 56,542 distribution transformers, 17,480 km of medium-voltage grids, 148 transformers for the subtransmission system and over 3,212 km of subtransmission grid, at a total estimated cost of US$3.567 billion; and (iii) for the Program for Agroindustry: 21 substations, 224 km of subtransmission grids and 1,260 km of medium-voltage grids, for an approximate total cost of US$199 million.

1.9 These works will make it possible to hit key targets for the sector, such as: (i) increase from 451 MW to 591 MW in the availability of power for the regional exchange with Peru and Colombia; (ii) reduction in electricity losses from 12.21% in 2016 to 8.79% in 2025; (iii) the expectation to provide access to electricity to 1,900 shrimp farms; and (iv) increase in electricity coverage from 97.24% in 2016 to 97.81% in 2025.

1.10 **Problem to be addressed.** In addition to strengthening and expanding infrastructure to cover demand, facilities that have fulfilled or are about to fulfill their useful life or whose load capacity levels have been exceeded or will be soon need to be renovated. For example, some National Transmission System equipment is in suboptimal conditions, which reduces service quality.[12] Moreover, the limited capacity in border substations does not make it possible to increase the current energy exchanges and meet the expected increases stemming from signature of Decision 816 (paragraph 1.6). Accordingly, headway needs to be made in preparing and strengthening national infrastructure to improve operating conditions to, initially, cover the energy exchanges with existing infrastructure.

1.11 With demand growing on average by 4.91% over the last 10 years, the National Distribution System has experienced problems, such as the increase in the load capacity of some lines, feeders, and transformers,[13] which affects service quality and levels of electricity losses.[14] These factors reduce the system's safety and reliability, which has repercussions all along the supply chain, from transmission through to distribution to the end user, and in 2016 translated into 369.2 MWh/year of energy not supplied.[15]

1.12 Ecuador's shrimp agroindustry, which consists of over 2,800 farms covering approximately 147,000 hectares (ha) of ponds, has high consumption of diesel for generating power, pumping water, and aerating the ponds.[16] An estimated 61% of shrimp farms do not have access to the power grid, and only 13% have the three

[12] The transformer at the Posorja substation reached 102.3% of its load capacity in January 2016 and the 230 kV barrier voltage level of the Machala substation fell to 90% in December of that year.

[13] In 2016, at least one transformer associated with the Terminal Terrestre 1 (Los Ríos province) and Portovelo (El Oro province) substations experienced a load capacity level of over 80%.

[14] Between 2015 and 2016, electricity losses rose from 12.11% to 12.21%.

[15] Due to outages and unscheduled maintenance in the National Transmission System.

[16] In 2014, shrimp agroindustry consumed an estimated 208 million gallons of diesel.

phase service suitable[17] for efficient, reliable electrification of the farms. The productivity of this agroindustry essentially depends on its level of modernization. To cost-effectively boost productivity,[18] there needs to be an efficient, reliable energy supply system. According to one study[19] by the Government of Ecuador, adding technologies such as electricity-powered continuous aeration can boost shrimp farm production from 3,500 lb/ha to 4,200 lb/ha per year (20%), and increase the size of the shrimp from 15 gr to 25 gr (66%), driving up income per hectare from US$12,600 to US$21,420 (70%).

1.13 In terms of electricity service coverage, approximately 180,000 homes still do not have access to power, and nearly 90.50% of these are in rural and marginal urban areas. To close this gap in access, the Government of Ecuador is promoting and financing FERUM projects aimed at providing access in low-income areas. To that end, the MEER selects the portfolio of projects in less developed sectors of the country to be included in FERUM's investment plan.

1.14 The MEER, with technical assistance from the IDB,[20] designed the National Energy Efficiency Plan 2016 – 2035 (PLANEE), compiling all actions for optimizing the use of energy resources, while also promoting the gradual replacement of use of fossil fuels. PLANEE aims to promote actions that: (i) provide for a sound institutional framework for energy efficiency to ensure that it is mainstreamed; (ii) ensure implementation of energy efficiency with adequate planning; (iii) underpin energy efficiency with a solid regulatory framework; and (iv) promote the creation of market mechanisms and financing arrangements for energy efficiency.

1.15 **Gender considerations.** Ecuador has significant gender gaps as regards women's economic opportunities and contributions.[21] Studies show that women work primarily in sectors of the economy with low productivity, such as commerce, services, and agriculture and are virtually absent from high-productivity sectors like electricity, gas, and mining.[22] In Ecuador, women are still a minority in the "electricity, gas, and mining" sector,[23] at 28% of total employees. Women represent 29% of public electricity sector personnel (see Gender Annex).[24] In Latin America and the

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17 The report, Proyecto Regional para el "Mejoramiento de la Productividad y Competitividad de las Cadenas de Valor de la Pesca en la Región de América Latina y el Caribe," [Regional Project for "Improving the Productivity and Competitiveness of Fishery Value Chains in Latin America and the Caribbean"] by the United Nations Industrial Development Organization (2014), evaluated the change from diesel to electric motors, and proposed using electric-powered automatic feeders, for the following benefits: (i) 61,900 kWh reduction in energy consumption; and (ii) 567 gal/year reduction in fuel use, equivalent to 5.7 tons CO_2/year and a 16,393 m^3 reduction in water use.

18 Tank aeration is more cost-effective, and it improves the availability of shrimp feeds compared to replacing the water in the tank. Improving the cost effectiveness of shrimp feeds. Davis, D. A. et al. Auburn University, 2008.

19 Estudio de Prefactibilidad para Conectar Camaroneras del Litoral Ecuatoriano a las Redes Eléctricas de Distribución [Prefeasibility Study for Connecting Shrimp Farms on the Ecuadorian Coast to Electricity Distribution Grids], Ministry of Agriculture and Livestock, 2015.

20 Nonreimbursable technical-cooperation operations: ATN/OC-15142-EC and ATN/FG-15141-EC.

21 Women's economic participation rate is 52%, compared to 82% for men, while women earn 59% of men's wages and only fill 31% of senior management positions. World Economic Forum, 2016.

22 CEPALSTAT, 2014.

23 The IDB Labor Markets and Social Security Information System (2014).

24 Data from the MEER for the Ministry and electricity distribution companies in 2016.

Caribbean, the roles and responsibilities of women and men in their relationship with energy is generally not taken into account when designing energy sector projects. Studies[25] show that including a gender perspective in energy projects helps to promote greater gender equality, improve project sustainability, and enhance the performance of sector agencies. Accordingly, the energy sector would benefit from a specific gender strategy prepared with an understanding of the issues of gender and energy.

1.16 **IDB experience in Ecuador's electricity sector.** Bank interventions have contributed to the Government of Ecuador's efforts primarily in: (i) bridging the gap in access to electricity coverage; (ii) increasing energy efficiency; (iii) expanding the electrical system and boosting its reliability; (iv) reducing the use of fossil fuels; and (v) improving the sector's operational efficiency. Since 2010, this work has been financed through eight investment loans and one policy-based loan[26] for a total of US$1,2877 billion, with the Bank serving as the catalyst for the participation of other donors and multilaterals.[27] Thus, the MEER has satisfactorily implemented nearly 2,700 projects and has extensive experience executing Bank loans, the results of which are concentrated in the following operations: (i) Electrification Program for Rural and Marginal Urban Areas I and II, loan 2608/OC-EC (US$40 million, closed in 2014) and loan 3087/OC-EC (US$30 million, 89% works progress and 93% financial execution): adding electricity service to approximately 120,000 homes in rural and marginal urban areas, including training more than 400 persons on the project sustainability methodology; (ii) Support for the Transmission Program, loan 2457/OC-EC (US$64.7 million, closed in 2015): which added seven substations, four new transmission lines, and one mobile substation; (iii) Support for the Electrical Interconnection Program in Ecuador, loan 3167/OC-EC (US$150 million, 40% works progress and 90% financial execution): four transmission systems will be built through approximately 300 km of transmission line and 12 substations; (iv) Program to Strengthen the National Electricity Distribution System of Ecuador I and II, loan 3187/OC-EC (US$170 million from the Ordinary Capital), loan 3188/CH-EC (US$50 million from the China Cofinancing Fund for Latin America and the Caribbean (CHC)) with 95% works progress and 93% financial execution, and loan 3494/OC-EC (US$50 million from the Ordinary Capital and US$30 million from the CHC, 55% works progress and 90% financial execution): which includes 41 subtransmission works and 49 distribution works, together with management tools to make the grid more efficient and reliable; (v) Investment Plan to Support the Transition of the Energy Matrix in Ecuador, loan 3710/OC-EC (US$118 million from the Ordinary Capital) and loan 3711/KI-EC (US$25 million from the Korea Infrastructure Development Cofinancing Facility for Latin America and the Caribbean) with 38% works progress and 67% financial execution: these funds will add seven transmission projects, six subtransmission projects, 47 distribution works,

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[25] See: Hunt, V. *et al.*, 2015, *Diversity Matters*; *Ernst and Young*, 2016, *Women in Power and Utilities;* Noland, M. *et al.*, 2016, *Is Gender Diversity Profitable? Evidence from a Global Survey*; and Dinkelman, T. 2008, *The Effects of Rural Electrification on Employment: New Evidence from South Africa*.

[26] Programmatic policy-based loan 3420/OC-EC for US$500 million.

[27] Korea Infrastructure Development Cofinancing Facility for Latin America and the Caribbean, China Cofinancing Fund for Latin America and the Caribbean (CHC), Global Environment Facility, Spanish General Cooperation Fund, Korea's Knowledge Sharing Program (*EximBank*), French Development Agency, Development Bank of Latin America, and Japan Bank for International Cooperation.

and 396 FERUM projects and will support implementation of the National Program for Efficient Cooking; and (vi) Program for the Reconstruction of Electricity Infrastructure in Areas Affected by the Earthquake in Ecuador, loan 3906/OC-EC (US$60 million, approved in January 2017 and expected to reach eligibility in the fourth quarter of 2017).[28]

1.17 The Bank has also supported the sector through technical cooperation operations[29] that have contributed to efficient execution of the loans, and to the design of plans and policies for modernizing and expanding the electrical system and strengthening sector businesses and institutions, with a presence in areas such as: (i) regional integration; (ii) modernization of the National Distribution System; (iii) electricity loss reduction; (iv) replacing fossil fuels with renewables; (v) building geothermal capacity; (vi) building the capacity of the electricity distribution companies; (vii) strengthening the institutional and regulatory framework; (viii) sustainability of rural electrification; and (ix) diversification of financing sources for the electricity sector.

1.18 The Bank's extensive experience in the sector has enabled it to support the MEER in preparing and executing operations, by promoting elements such as: (i) implementing project sustainability methodologies; (ii) fostering conditions to strengthen use of project management and information systems; and (iii) consolidating systematized monitoring during execution. The MEER has adopted those practices internally, so the selection and make-up of its project portfolios meet the socioenvironmental, technical, and financial sustainability criteria (including climate change resilience and adaptation), and has centralized, up-to-date technical and economic reports available. This has made the executing units' accountability processes more effective and also shines a light on good practices so they can be replicated in other projects. Moreover, the Bank has strengthened its joint work with the executing agency, facilitating implementation of the aforementioned practices, which has helped much of the project portfolio have the background needed to get an early start on the precontracting phases, thereby facilitating effective execution of the operations.

1.19 In addition to the Bank's successful experience in Ecuador, there is evidence from an impact evaluation that found that access to electricity has a significant effect on a household's likelihood of emerging from poverty.[30] Moreover, Khandker et al.[31] found that electrification can raise household income and expenditures by up to 28% and 23%, respectively. With regard to productive uses, an analysis of electrification in Brazil from 1960 to 2000 estimated that a 10% increase in electricity coverage boosted agricultural productivity, through irrigation, by 9.8%.

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[28] Percentages of construction work and financial execution, as reported by the executing units as of December 2016.

[29] Since 2010, 11 technical cooperation operations have been financed in different areas of the energy sector, for approximately US$4 million.

[30] Tegene G., G. Berhe, D. Teklemariam (2015), *Impact of Rural Electrification on Poverty Reduction. Evidence from Rural Districts of Tigrai, Northern Ethiopia*, *Journal of Business Management & Social Sciences Research*, Volume 4, number 1.

[31] Khandker S., D.F. Barnes, H. Samad (2013), *Welfare Impacts of Rural Electrification: A Panel Data Analysis from Vietnam*, *Economic Development and Cultural Change*, Vol. 61, number 3, pp. 659-692.

1.20 **The Bank's country strategy with Ecuador 2012-2017 (document GN-2680).** The Bank's country strategy includes IDB support for the sector's efforts to promote the sustainable increase and diversification of energy generation, transport, and distribution capacity, system reliability, energy efficiency, and universal access to energy. The project specifically contributes to the objective to "create a long-term energy strategy that promotes a sustainable energy framework, facilitates adequate energy supply, and improves access to electric power" and to achieving the following expected outputs: (i) increased electricity coverage; (ii) increased energy efficiency; and (iii) lower CO_2 emissions. The operation is included in the 2017 Operational Program Report (document GN-2884).

1.21 **Strategic alignment.** The program is consistent with the Update to the Institutional Strategy 2010-2020 (document AB-3008) and aligned with the development challenges of: (i) social inclusion and equality, by providing infrastructure for supplying electricity to low-income rural and marginal urban populations; (ii) productivity and innovation, by financing activities that boost competitiveness and productivity in the agricultural sector; and (iii) economic integration, by facilitating growth in regional energy transactions. It is also aligned with the crosscutting areas of: (i) gender and diversity, by seeking to promote increased participation by women in the sector; and (ii) climate change and environmental sustainability, through energy efficiency projects. The program is aligned with the Corporate Results Framework 2016-2019 (document GN-2727-6) through the country development results indicator "Reduction of emissions with support of IDBG financing (annual million tons CO_2 equivalent)" and the auxiliary indicators: (i) distribution and transmission lines installed or upgraded; and (ii) number of households with new or improved access to electricity. Likewise, the program is aligned with the priority areas of the Strategy for Sustainable Infrastructure for Competitiveness and Inclusive Growth (document GN-2710-5), by financing the expansion and strengthening of electricity transmission and distribution infrastructure to help meet projected demand and improve energy exchanges in the Andean region. The program is consistent with the Energy Sector Framework (document GN-2830-3) in that it: (i) supports universal, sustainable access to electricity in rural and marginal urban areas; (ii) strengthens Ecuador's energy integration with the Andean region; and (iii) promotes energy efficiency and the use of cleaner fuels in agroindustry. The program is consistent with the Climate Change Sector Framework (document GN-2835-5), by promoting policies and technologies for use of renewable energy systems and efficient energy use, both in urban and rural areas and in Ecuador's agroindustry, since approximately 10.16% of the operation's resources are invested in climate change mitigation activities, as per the joint methodology of the MDBs for estimating climate finance. These resources contribute to the IDB Group target of increasing lending for climate change-related projects to 30% of all operation approvals by the end of 2020.

1.22 **Consistency with the Sector Strategy to Support Competitive Global and Regional Integration (document GN-2565-4).** The project, through Subcomponent I.2, "Strengthening the National Transmission System to support regional interconnection," is financing construction of new transmission systems that will help increase energy exchanges with Peru and Colombia and will bring the National Transmission System up to the technical and operating standards of a regional interconnected system, thereby contributing to the SINEA initiative. The

strategy says that regional integration operations will be identified according to four non mutually exclusive indicative criteria. The program is aligned with two of these criteria: (i) cross-country focus – contributing to the alignment of internal policies and future country investments with cross-border impacts (energy exports); and (ii) regional additionality – incorporating international and/or regional cooperation objectives (see Integration Annex).

1.23 **Public Utilities Policy (document GN-2716-6).** The program is consistent with the pillars of the Public Utilities Policy, as it meets the conditions on: (i) financial sustainability, facilitated by eliminating the rate deficit in 2016, based on: (a) a 24.27%[32] reduction in generating costs; (b) the reduction in electricity losses;[33] (c) modernization of operating systems; and (d) implementation of programs for shifting away from subsidized fossil fuels; and (ii) economic evaluation, since selection of the portfolio of projects to be financed stems from a rigorous economic-financial and technical feasibility analysis. The sector is consistent with the principles of supporting basic needs, transparency, financial sustainability, and an adequate institutional framework, by having the following clearly defined criteria on: (i) separation of roles among the MEER as the lead agency, the National Electricity Regulation and Control Agency (ARCONEL) as the regulator, and the generation, transmission, and distribution companies; (ii) opening up generation to private participation; (iii) successful reform of public companies, to improve their management; and (iv) rate adjustment to guarantee system operation and maintenance, and adjusting the government's contributions to guarantee sector expansion (see Public Utilities Policy Annex).

B. Objectives, components, and cost

1.24 **Objective.** The objective is to support advancement of the Investment Plan for the Energy Matrix Transition, by expanding, strengthening, and improving the electrical system's operational efficiency, as provided for in the Electricity Master Plan and the National Energy Efficiency Plan. The specific objectives are to: (i) continue projects to strengthen and expand the National Transmission System and National Distribution System, to facilitate effective transportation and distribution of energy from the generation projects being developed; (ii) strengthen national transmission infrastructure for increased exchange of energy in the region; (iii) facilitate the priority use of electricity in the agroindustrial sector, by strengthening and expanding the National Distribution System, and promote higher electricity coverage in rural and marginal urban areas; (iv) promote implementation of energy efficiency projects; and (v) implement a strategy for fostering gender equality in the electricity sector. The proposed components are as follows:

1.25 **Component I. Expansion and strengthening of the National Transmission System (US$111.36 million).** The proposed works will help to continue execution of the Transmission Expansion Plan, as well as to provide the necessary reinforcements to improve operating conditions, thereby facilitating the transportation of electricity to different consumption centers in the country and

[32] From 2007 to 2016, the average cost of energy purchased by distribution companies fell from 6.55US¢/kWh to 4.96US¢/kWh.

[33] The roughly 9.2% drop in electricity losses from 2007 to 2016 has represented cumulative savings of US$1.2 billion.

improving national infrastructure for increasing energy exchanges with Peru and Colombia, under the SINEA initiative. The following subcomponents will be financed:

a. **Subcomponent I.1: Expansion and strengthening of National Transmission System infrastructure (US$60.8 million):** (i) expansion of the Posorja 138/69 kV substation, to add 67 MVA of transformation capacity; (ii) new Las Orquídeas transmission system, including construction of a gas-insulated 138/69 kV substation with transformation capacity of 250 MVA, together with construction of a 138 kV transmission line 500 m long, to interconnect the substation, and repowering the 7-km long Pascuales transmission line; and (iii) new Tanicuchí transmission system, including construction of a 230/138 kV substation with 150 MVA capacity, and three transmission lines, one 4 km-long 230 kV line and two 138 kV lines, 10 km and 16 km in length, respectively.

b. **Subcomponent I.2: Strengthening of the National Transmission System to support regional interconnection (US$50.5 million):** (i) new La Avanzada transmission system, including construction of a 230/138 kV substation with 150 MVA in transformation capacity and one 4-km, 230 kV transmission line to interconnect the substation; and (ii) new Cajas transmission system, adding a 138/69 kV substation, with 150 MVA transformation capacity, two 138 kV transmission lines (10 km and 11 km in length) to interconnect the substation, and expansion of the Ibarra and Pimampiro substations.

1.26 **Component II. Expansion, strengthening, and modernization of the National Distribution System (US$104.24 million)**. This will finance priority projects under the Distribution Expansion Plan to improve grid topology, increase National Distribution System reliability rates, and improve access to electricity for agroindustry, while also boosting electricity service coverage in rural and marginal urban areas. The following subcomponents will be financed:

a. **Subcomponent II.1: National Distribution System infrastructure (US$50.3 million):** This includes (i) 18 proposed lines and a 69 kV substation, expanding subtransmission system capacity and improving service quality, by adding systems to automate operation; and (ii) 65 distribution projects that add medium- and low-voltage grids, to allow for expansion, improve operating efficiency, and strengthen distribution infrastructure.

b. **Subcomponent II.2: Rural and marginal urban electrification (US$30.4 million).** This will finance projects to continue bridging the electricity service coverage gap by financing 564 FERUM projects that include extending distribution networks and adding meters in rural and marginal urban segments of the country.

c. **Subcomponent II.3: Electrification of agroindustry (US$23.6 million).** This will provide access to electricity on, at least, 400 agroindustrial farms, by building 49 electricity distribution infrastructure works, including eight projects in the 69 kV subtransmission system and 40 in the medium-voltage system. To determine project priority, the MEER compiled information from the agroindustrial farms to ascertain demand levels and readiness to make own

investments, among other things. Accordingly, projects are designed based on a grouping of farms in accordance with the MEER plan.

1.27 **Component III. Support for implementation of PLANEE and institutional capacity-building (US$3.4 million).** The following projects will be financed: (i) preparation of the PLANEE regulatory and policy-setting framework, and of the labeling standards for promoting energy efficiency in the country;[34] (ii) execution of the program to support energy efficiency in agroindustry, including activities aimed at introducing best practices that promote energy efficiency through training processes and energy audits; (iii) development of the Strategy for Promoting Gender Equality in Ecuador's Electricity Sector, which will include: (a) a nationwide diagnostic assessment identifying the social, educational, and labor conditions to determine the barriers women face to entering and remaining in the various entities in the sector; (b) an analysis of a sample of MEER-financed projects, to determine the gender impacts that make it possible to identify improvements in the design, implementation, and monitoring processes, considering the gender approach; (c) determination of the desired status of the electricity sector in gender terms by 2030; and (d) preparation of a Gender Action Plan setting five-year targets and establishing the resources and actions needed to promote gender equality in the sector; and (iv) development of a Strategy for Universal Access to Electrical Energy in Ecuador, which will include a geo-referenced plan for universal access at the lowest cost, an investment plan that includes the execution schedule, and the institutional and regulatory considerations associated with its implementation, incorporating sustainability criteria and promoting its monitoring and evaluation.

1.28 **Program administration (US$1 million).** In addition, administration expenses related to the Project Management Unit (PMU) will be financed, together with program audits and evaluations.

1.29 **Cost and financing.** The estimated cost of the program is US$309.1 million, of which US$150 million will be financed by the Bank from the Ordinary Capital, US$70 million corresponds to parallel financing from the Japan International Cooperation Agency (JICA) through its Cofinancing for Renewable Energy and Energy Efficiency (CORE) mechanism,[35] and approximately US$89.1 million is from the local counterpart (see Table 1. Program costs).

1.30 The proposed investments in the program, in relation to total investments in the Electricity Master Plan, represent: (i) 9% of requirements under the transmission expansion plan; (ii) 2% of the investments set out in the distribution expansion plan; (iii) 5% of financing needs for rural and marginal urban electrification; (iv) 12% of

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[34] The Japan International Cooperation Agency (JICA) is set to provide additional support through technical cooperation to complement these activities.

[35] CORE is a cofinancing mechanism established in March 2012 and amended in March 2014 and April 2016, through which the IDB and JICA pledge to offer highly concessional loans for a target amount of US$3 billion to Latin America and the Caribbean as cofinancing, to support renewable energy and energy efficiency projects and programs, aimed at expanding quality infrastructure in the region. Under this window, the Bank serves as project administrator in a joint financing structure. On 12 September 2017, the Bank received the Conditional Letter of Acceptance from JICA. JICA's board is scheduled to approve the cofinancing by the fourth quarter of 2017. The JICA resources are needed to enable the program to achieve the proposed objectives.

investments for electrification of agroindustry; and (v) 2% of requirements under PLANEE.

Table 1. Program costs (US$)

Program components	Funding			
	IDB (Ordinary Capital)	**JICA (parallel financing)**	**Local counterpart**	**Total**
I. Expansion and strengthening of the National Transmission System	**86,240,373**	**25,123,954**	**71,563,578**	**182,927,905**
Subcomponent I.1: Expansion and strengthening of National Transmission System infrastructure	35,695,972	25,123,954	37,865,912	98,685,838
Subcomponent I.2: Strengthening of the National Transmission System to support regional interconnection	50,544,401	-	33,697,666	84,242,067
II. Expansion, strengthening, and modernization of the National Distribution System	**61,177,214**	**43,058,459**	**16,983,298**	**121,218,971**
Subcomponent II.1: National Distribution System infrastructure	29,494,150	20,758,916	10,043,726	60,296,792
Subcomponent II.2: Rural and marginal urban electrification	17,846,204	12,560,723	4,110,490	34,517,417
Subcomponent II.3: Electrification of agroindustry	13,836,860	9,738,820	2,829,082	26,404,762
III. Support for implementation of PLANEE and institutional capacity-building	**1,995,501**	**1,404,499**	**408,000**	**3,808,000**
Regulatory and policy-setting framework prepared for PLANEE	234,764	165,236	48,000	448,000
Labeling standards prepared	234,764	165,236	48,000	448,000
Program executed to support energy efficiency in agroindustry	1,173,825	826,175	240,000	2,240,000
Gender equality strategy	352,147	247,853	72,000	672,000
Strategy on Universal Access to Energy	234,765	165,235	48,000	448,000
Program management	**586,912**	**413,088**	**120,000**	**1,120,000**
Project Management Unit	387,362	272,638	79,200	739,200
Financial audits	88,037	61,963	18,000	168,000
Midterm and final evaluations	111,513	78,487	22,800	212,800
TOTAL	**150,000,000**	**70,000,000**	**89,074,876**	**309,074,876**

C. Key results indicators

1.31 The program has a Results Matrix listing outputs, outcomes, and impacts associated with the objectives and components. The expected impact corresponds to the annual reduction in CO_2 emissions (Annex II).

1.32 Since the transmission projects are scattered among key points of the National Transmission System, all electricity service clients in Ecuador are program beneficiaries; they will have higher service quality rates and more stable operating

costs due to the revenue generated from increased regional energy exports. In terms of the FERUM projects included in Subcomponent II.2, approximately 16,680 households in low-income segments that do not currently have electricity service will benefit. Moreover, with execution of Subcomponent II.3, access to electricity service will be provided, to encourage the productive use of electricity for approximately 400 shrimp farms.

1.33 **Economic analysis.** An analysis showing the feasibility of the investments was conducted for each individual component and for the program as a whole. The economic evaluation of each component, with a 12% discount rate, resulted in the following amounts for the economic internal rate of return (EIRR) and the economic net present value (ENPV). (i) Component I: EIRR=52.4% and ENPV= US$1.202 billion; (ii) Component II: EIRR=43.0% and ENPV=US$945.6 million; and (iii) Component III: EIRR=55.2%; ENPV=US$22.3 million. The overall analysis of the program yielded an EIRR of 47.7% and an ENPV of US$2.2061 billion.

1.34 A sensitivity analysis was performed, with the study's main parameters varying by +/-15%. The program's Economic Evaluation link presents the evaluation's assumptions, scenarios, and findings.

II. Financing Structure and Main Risks

A. Financing instruments

2.1 This program is structured as a multiple works investment loan, since the projects are physically similar, but independent from one another. The projects in the sample account for 30% of the budget to be financed from the Ordinary Capital and are representative of the works to be financed by the program. The projects in the sample include high- and medium-voltage substations, transmission lines, projects to extend the distribution grid, FERUM projects, and works to provide agroindustry with access to electricity. They meet the following eligibility criteria: (i) are included in the least-cost expansion plans; (ii) contribute to strengthening the National Transmission System and National Distribution System; (iii) contribute to improving electricity service quality; (iv) contribute to increasing electricity service coverage; (v) are profitable according to the economic evaluation and financially sustainable, ensuring that sufficient resources will be received to cover the financial costs of operation and maintenance; and (vi) are not category "A" operations under the environmental and social classification. Of the 701 works included in the operation, over 70% have the necessary designs and background for preparing the bidding documents, so the works are estimated to begin within the first three years of execution (see link Technical Feasibility Report), due to the sequencing of the works and planning for when they will come on line based on demand estimates. Program resources will be disbursed, combining IDB and JICA resources, as follows:

Table 2. Disbursement projection (US$ million)

SOURCE	BUDGET	2018	2019	2020	2021	2022
IDB (Ordinary Capital)	150.0	46.8	36.3	35.7	25.0	6.2
JICA	70.0	17.6	19.5	19.5	11.6	1.8
TOTAL	**220.0**	**64.4**	**55.8**	**55.2**	**36.6**	**8.0**

B. Environmental and social risks

2.2 Based on the project information furnished by the project team for the sample, the adverse social and environmental impacts from implementing the works are expected to be of medium magnitude, localized, and reversible, for which there are effective control and mitigation measures. Accordingly, this is classified as a category "B" operation under the Bank's operational policy OP-703.

2.3 The majority of the projects will be implemented in areas where work has already been done and where the rights-of-way are in place. No involuntary resettlements or displacements of the population are expected, and any adverse socioeconomic effect will be minimal. The potential adverse socioenvironmental impacts would primarily be during the construction phase for the new transmission and distribution lines and, to a lesser extent, during their operation.

2.4 Environmental and social studies have been produced for the eight largest projects in the sample and an environmental and social analysis for the projects in Component II. They include mitigation measures for the impacts and risks identified therein under the environmental and social management plans. Moreover, as this is a multiple works program, an environmental and social management framework was prepared so that any future projects comply with the program's environmental and social provisions and, hence, with the Bank's environmental and social safeguards. The social engagement and public consultation processes for projects in the sample were conducted. The environmental and social studies, the environmental and social analysis, the environmental and social management framework, and the social engagement processes have been posted on the websites of the Bank and the executing agency, as per the Bank's Access to Information Policy (OP-102).

2.5 The environmental risks identified as "medium" are: (i) delays in program execution due to natural and anthropic phenomena; to mitigate this, the executing agency will propose execution of priority works as part of the National Contingency Plan; and (ii) delays in obtaining environmental permits and licenses; to mitigate this, the Bank will support the PMU in moving forward with obtaining the environmental documents.

C. Fiduciary risks

2.6 **Procurement risk.** There is a medium risk of delays in executing the projects, due to the process for the Ministry of Economy and Finance (MEF) to authorize contracting of works. To mitigate this risk, early approval will be sought from the MEF for the program contract guarantees.

2.7 **Implementation risks.** There is medium risk of delays in the MEF transferring program resources to the executing agency. To mitigate this risk, the interagency agreements would include the timely transfer of resources allocated to the executing agency, once the disbursements in the form of funds advances from the Bank had been received.

D. Other project risks

2.8 One medium risk is the program having a smaller reach due to a partial or total reduction in cofinancing from JICA; to mitigate this, the Bank will support the JICA team during preparation of the operation, eligibility, and approval by the Government of Japan.

2.9 Medium- and long-term sustainability of the investments to be financed is feasible because the projects are prioritized in the sector expansion plans and will be part of the respective business units' assets (paragraph 3.1). Operating and maintenance costs will be included in those entities' budgets, and the executing agency will submit the annual maintenance plan to the Bank.

III. Implementation and Management Plan

A. Summary of implementation arrangements

3.1 The executing agency is the MEER, as the sector's lead agency (paragraph 1.2), in keeping with the arrangement in the projects currently under way, where the PMU centrally coordinates execution. That unit will be based in the MEER and will have a general coordinator, a procurement specialist, and a financial specialist, paid for out of loan proceeds. The PMU will receive technical support from the respective electric companies in executing the works. This will be coordinated through the MEER's branches, which will have a work team made up of technical, socioenvironmental, financial, procurement, and legal managers, who will supervise and report to the PMU on implementation of the activities, as follows: (i) Transelectric, for the works in Component I; and (ii) the electricity distribution companies, for the works in Component II. For execution of Component III activities, the PMU will coordinate with the Energy Efficiency and Power Distribution and Sales Branches of the MEER. The proposed arrangement facilitates optimal execution, as evidenced by the progress being made in the portfolio currently in execution (paragraph 1.16).

3.2 Execution of the following activities will be part of the special contractual conditions precedent to the first disbursement of the loan and must have the Bank's no objection: **(i) signature and entry into force of a subsidiary agreement between the Ministry of Economy and Finance (MEF) and the executing agency, indicating that loan proceeds will be transferred and recorded in a timely manner in the corresponding area for the program and used as per the agreed conditions and purposes,** in order to establish the legal nexus between the two institutions for the transfer and appropriate use of loan resources; **(ii) approval by the MEF of the guarantees for the contracts for Components I and II,** to streamline and ensure effective execution of the program within the established timeframe; and **(iii) approval by the executing agency of the program operating manual, under the terms agreed on with the Bank, including financial management, interagency governance arrangements, and the specific terms and conditions set by JICA both in the framework agreement and in its disbursement guide,** so as to establish the guidelines and procedures for the executing agency to follow, for successful program execution.

3.3 **Special contractual conditions for execution.** Prior to use of the resources for Component III, related to the energy efficiency program in agroindustry, the executing agency will present, for the Bank's no objection, the investment plan and

execution schedule, identifying the activities to be conducted, since the MEER has conducted a survey of activities and established a baseline for the projects to be included, which must be prioritized before execution begins.

3.4 **Procurement plan and procurement policies.** A Procurement Plan was agreed on and is to be updated annually, along with the annual evaluations and before the end of each calendar year or when there are substantial changes. The Procurement Plan Execution System (SEPA) will be used for this purpose. Goods, works, and consulting services will be procured in keeping with the Policies for the Procurement of Goods and Works Financed by the IDB (document GN-2349-9) and the Policies for the Selection and Contracting of Consultants Financed by the IDB (document GN-2350-9), respectively.

3.5 **Disbursements and funds advances.** Disbursements will be made through funds advances, in keeping with the program's estimated liquidity needs stemming from the annual work plan and the procurement plan. The programming of cash needs will have a moving 12-month horizon, and the advances will cover liquidity needs for nine months of execution.

3.6 **Retroactive financing and recognition of expenditures.** The Bank may retroactively finance from loan proceeds, for up to US$30 million (20% of the financing from Ordinary Capital resources), and recognize out of the local contribution, for up to US$17.8 million (20% of the local contribution), eligible expenditures made by the executing agency before the loan approval date, for payments made for advance contracting and progress on works for the projects, provided requirements substantially similar to those in the loan contract were met. Such expenditures must have been made on or after 8 June 2017 (the project profile approval date), but in no case will they include expenditures made more than 18 months prior to the loan approval date. Regarding JICA resources, pursuant to the Framework Agreement, and to facilitate the pari passu of JICA cofinancing, JICA can recognize expenditures eligible for Ordinary Capital financing, which can be included in the disbursement request/justification to JICA.

3.7 **Auditing.** External auditing services for the program will be provided by an external auditing firm acceptable to the Bank, hired using loan proceeds, based on the terms of reference agreed on with the executing agency.

B. Summary of results monitoring arrangements

3.8 **Monitoring arrangements.** The Bank will conduct semiannual technical visits to the executing agency, to review progress on the works and make any adjustments stemming from execution. Annual fiduciary supervision visits will be conducted. External accounting and operational audits are planned to validate use of the loan proceeds and the internal operating controls and processes. Semiannual status reports on execution will be sent to the Bank, including the technical and financial status of the program, while the monitoring and progress report will be prepared annually (see Monitoring and Evaluation Plan).

3.9 **Program evaluation arrangements.** Program evaluations include a midterm and final evaluation, financed with loan proceeds. The midterm evaluation will be commissioned by the executing agency a maximum of 30 months after program eligibility. The executing agency is to commission the final evaluation when the last disbursement of loan proceeds is requested. The final evaluation will determine

the level of fulfillment of the targets in the Results Matrix and is to be presented before the financial closing of the operation. The terms of reference for the midterm and final evaluations must have the Bank's no objection. The executing agency will submit the semiannual and annual reports as per the program's Monitoring and Evaluation Plan.

Development Effectiveness Matrix		
Summary		
I. Corporate and Country Priorities		
1. IDB Development Objectives	**Yes**	
Development Challenges & Cross-cutting Themes	**-Social Inclusion and Equality -Productivity and Innovation -Economic Integration -Gender Equality and Diversity -Climate Change and Environmental Sustainability**	
Country Development Results Indicators	**-Reduction of emissions with support of IDBG financing (annual million tons CO2 e)* -Households with new or improved access to electricity supply (#)* -Electricity transmission and distribution lines installed or upgraded (km)* -Farmers with improved access to agricultural services and investments (#)***	
2. Country Development Objectives	**Yes**	
Country Strategy Results Matrix	**GN-2680**	**i) Increase in electricity coverage; ii) Diversified national energy matrix; and iii) Increased energy efficiency.**
Country Program Results Matrix	**GN-2884**	**The intervention is included in the 2017 Operational Program.**
Relevance of this project to country development challenges (If not aligned to country strategy or country program)		
II. Development Outcomes - Evaluability	**Evaluable**	
3. Evidence-based Assessment & Solution	**9.2**	
3.1 Program Diagnosis	**3.0**	
3.2 Proposed Interventions or Solutions	**3.6**	
3.3 Results Matrix Quality	**2.6**	
4. Ex ante Economic Analysis	**10.0**	
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**	
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	**B**	
IV. IDB´s Role - Additionality		
The project relies on the use of country systems		
Fiduciary (VPC/FMP Criteria)	**Yes**	**Financial Management: Budget, Treasury, Accounting and Reporting. Procurement: Information System, National Public Bidding.**
Non-Fiduciary		
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:		
Gender Equality		
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.

The project seeks to support the progress of the Investment Plan for the Change of the Energy Matrix of Ecuador. In particular, the loan proposal proposes to (i) continue the projects to strengthen the National Transformation System; (ii) strengthen the national transmission infrastructure for greater energy exchange in the region; (iii) facilitate the use of electricity in the agroindustry sector, by strengthening the National Distribution System and increasing electricity coverage in rural and marginal urban areas; (iv) promote the implementation of Energy Efficiency projects; and (v) implement a strategy to promote gender equality in the electricity sector.

The loan proposal presents a solid diagnosis of the problems and their determinants that is consistent with the proposed interventions. The document is supported by empirical data and information on experiences in the sector, as well as evidence on the effectiveness of similar interventions.

The results matrix includes different products with their associated results, which reflects a clear vertical logic for the proposed components based on the main problems and the proposed objectives. The indicators presented are SMART.

The project includes a cost-benefit analysis that quantifies the economic benefits from increased energy sales for both final consumers, shrimp producers and exports, as well as the reduction of system losses. The results show positive current values and internal rates of return higher than 12%. The profitability is maintained in different sensitivity scenarios.

The monitoring plan details the instruments that will be used. The evaluation plan is based on an ex post economic analysis, and includes a data collection methodology, work plan and assigned budget.

RESULTS MATRIX

Project objective:	To support advancement of the Investment Plan for the Energy Matrix Transition, by expanding, strengthening, and improving the operational efficiency of the electrical system, as provided for in the Electricity Master Plan and the National Energy Efficiency Plan.

EXPECTED IMPACT

Indicators	Unit of measure	Baseline		Targets		Means of verification	Observations
		Value	Year	Value	Year		
Climate change mitigation - Annual CO_2 emissions avoided, by replacing fossil fuels in shrimp agroindustry.	Ton CO_2/year	0	2016	38,800	2022	Status report from the energy efficiency program in agroindustry	To be conducted by the Energy Efficiency Branch

EXPECTED OUTCOMES

Expected Outcomes	Unit of measure	Baseline		Intermediate		Targets		Means of verification	Observations
		Value	Year	Value	Year	Value	Year		
Component I – Expansion and strengthening of the National Transmission System									
Megawatts available for regional exchanges from Ecuador	MW	451	2016	451	2019	591	2022	Electrical interconnections operations report. Transelectric.	The calculation methodology is established in the Monitoring and Evaluation Plan.
Component II – Expansion, strengthening, and modernization of the National Distribution System									
AIFk: average interruption frequency per kVA	outages/year	5.59	2016	5.11	2019	4.78	2022	Program status report	See calculation methodology in the Monitoring and Evaluation Plan.
TITk: Total interruption time (hours)	hours/year	6.41	2016	5.98	2019	5.62	2022		
Additional dwellings served by the FERUM program	No. of dwellings	0	2016	1,862	2019	16,680	2022		Includes dwellings with new or improved service.
Shrimp agroindustry using electricity, served by the program.	No. of farms	0	2016	82	2019	400	2022		-

OUTPUTS

Outputs	Estimated cost (US$)	Unit of measure	Baseline 2017	Year					Final target	Means of verification
				2018	2019	2020	2021	2022		
Component I. Expansion and strengthening of the National Transmission System	**182,927,905**									
Subcomponent I.1. Expansion and strengthening of the National Transmission System infrastructure	**98,685,838**									
1.1.1. Expansion of the Posorja 138/69 kV substation	**14,317,893**	**# projects**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	Project status report. Programming transmission expansion.
1.1.1.1. Installation of a 67 MVA autotransformer, expansion of the 138 kV switchyard, and upgrading the automation system.	14,317,893	%*	5	10	50	70	100	0	100	
1.1.2. Las Orquídeas 138kV, 2x125 MVA transmission system	**46,369,755**	**# projects**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	
1.1.2.1. Construction of a 138/69 kV substation and installation of two 125 MVA gas-insulated autotransformers	43,003,272	%*	5	10	50	70	90	100	100	
1.1.2.2. Construction of a transmission line from the National Transmission System switch to the Las Orquídeas 138 kV, dual-circuit substation (length: 0.5 km).	198,147	%*	5	10	50	70	90	100	100	
1.1.2.3. Repowering the Pascuales transmission line - switch connection of the National Transmission System through to the Las Orquídeas 138kV dual-circuit substation (length: 7 km).	3,168,336	%*	5	10	50	70	90	100	100	
1.1.3. Tanicuchí transmission system 230/138 kV, 2x75 MVA	**37,998,190**	**# projects**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	
1.1.3.1. Construction of a 230/138 kV substation and installation of two 75 MVA autotransformers.	28,866,372	%*	5	10	50	70	90	100	100	
1.1.3.2. Construction of a transmission line from the National Transmission System's switch to the Tanicuchí 230 kV, dual-circuit substation (length: 4 km).	1,611,846	%*	5	10	50	70	90	100	100	
1.1.3.3. Construction of a transmission line from the National Transmission System switch to the Tanicuchí 138 kV, dual-circuit substation (length: 10 km).	2,892,297	%*	5	10	50	70	90	100	100	
1.1.3.4. Construction of a transmission line from the National Transmission System switch to the Tanicuchí 138 kV, dual-circuit substation (length: 16 km).	4,627,675	%*	5	10	50	70	90	100	100	

Outputs	Estimated cost (US$)	Unit of measure	Baseline 2017	Year					Final target	Means of verification
				2018	2019	2020	2021	2022		
Subcomponent I.2. Strengthening of the National Transmission System to support regional interconnection	**84,242,067**									
1.2.1. La Avanzada transmission system 230 kV, 2x75 MVA	**44,818,626**	**# projects**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	Project status report. Programming transmission expansion.
1.2.1.1. Construction of the La Avanzada 230/138 kV substation and installation of two 75 MVA autotransformers.	30,851,480	%*	5	10	50	70	90	100	100	
1.2.1.2. Construction of a transmission line from the National Transmission System switch to the La Avanzada 230 kV, multi-circuit substation (length: 4 km).	3,583,843	%*	5	10	50	70	90	100	100	
1.2.1.3. Construction of the La Avanzada 138/69 kV substation.	10,383,303	# projects	0	0	0	0	0	1	1	
1.2.2. Cajas 138 kV transmission system and strengthening of the Pimampiro - Ibarra 138 kV transmission system	**39,423,441**	**# projects**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	
1.2.2.1. Construction of the Cajas 138/69 kV substation and installation of two 75 MVA autotransformers.	26,095,846	%	5	10	50	70	90	100	100	
1.2.2.2. Construction of a transmission line from the National Transmission System 138 kV switch to the Cajas multi-circuit substation (length: 10 km).	3,829,615	%	5	10	50	70	90	100	100	
1.2.2.3. Construction of the Ibarra – Yaguarcocha 138 kV, dual-circuit, transmission line (length: 11 km) and laid from the second circuit of the Yaguarcocha – Pimampiro 138 kV transmission line.	6,612,957	%	5	10	50	70	90	100	100	
1.2.2.4. Expansion of the Ibarra 138 kV substation, primary equipment for a 138 kV line bay.	1,151,410	%	5	10	50	70	90	100	100	
1.2.2.5. Expansion of the Pimampiro 138kV substation, primary equipment for a 138 kV line bay.	1,733,613	%	5	10	50	70	90	100	100	

Outputs	Estimated cost (US$)	Unit of measure	Baseline 2017	Year					Final target	Means of verification
				2018	2019	2020	2021	2022		
Component II. Expansion, strengthening, and modernization of the National Distribution System	**121,218,971**									
Subcomponent II.1. National Distribution System infrastructure	**60,296,792**									
2.1.1. Distribution projects inspected and energized.	60,296,792	Number of projects	0	0	16	37	25	5	83	Project status report
Subcomponent II.2. Rural and marginal urban electrification	**34,517,417**									
2.2.1. Rural electrification projects with grid extension, inspected and energized.	34,517,417	Number of projects	0	0	230	259	75	0	564	Project status report
Subcomponent II.3. Electrification of agroindustry	**26,404,762**									
2.3.1. Distribution projects for agroindustry, inspected and energized.	26,404,762	Number of projects	0	0	10	22	17	0	49	Project status report
Component III: Support for implementation of PLANEE and institutional capacity-building	**3,808,000**									
3.1. Regulatory framework prepared for PLANEE.	224,000	Study	0	0	0	1	0	0	1	Project status report
3.2. Labeling standards prepared.	224,000	Study	0	0	0	1	0	0	1	
3.3. Program executed to support energy efficiency in agroindustry.	2,240,000	Program	0	0	0	0	0	1	1	
3.4. Pro-Gender strategy designed in the electricity sector.	672,000	Strategy	0	0	1	0	0	0	1	
3.5. Strategy developed for universal access to electric power in Ecuador.	448,000	Strategy	0	0	0	1	0	0	1	

(*) Progress in % includes the following stages: For transmission lines and substations: studies and designs (5%); precontractual (5%); supplies, equipment, and materials (40%); civil works (20%); electromechanical works (20%); testing and energization (10%) - Reference: Electricity Regulation and Control Agency reporting blueprint.

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Country:	Ecuador
Project number:	EC-L1223
Name:	Support for the Advancement of the Energy Matrix Transition in Ecuador
Executing agency:	Ministry of Electricity and Renewable Energy (MEER)
Prepared by:	Marcela Hidrovo (FMP/CEC), Pilar Locano (DTC FMP/CEC), and Francisco Echeverría (DTC FMP/CEC - Procurement)

I. SUMMARY

1.1 The institutional assessment for the project's fiduciary management was based on: (i) the country's fiduciary context (although there was a change in administration, the project teams remain the same); (ii) the results of the fiduciary risk assessment; (iii) activities to supervise execution of loans 3087/OC-EC, 3167/OC-EC, 3187/OC-EC, 3188/CH-EC, 3494/OC-EC, 3494/CH-EC, 3710/OC-EC, and 3711-KI-EC; and (iv) input from work meetings with the MEER's Project Management Unit (PMU) and the entities involved in project execution.

1.2 The program will be cofinanced by the Japan International Cooperation Agency (JICA).

II. THE COUNTRY'S FIDUCIARY CONTEXT

2.1 **Country procurement system.** The respective agreement was signed on 13 May 2014; the country system began to be used on 24 September 2014, and Resolution RE-SERCOP-2014-0000014 was published on 4 November 2014. Use of the system applies to the procurement and contracting of: (i) goods and nonconsulting services and works for an estimated value below the Bank's threshold for international competitive bidding (ICB), in keeping with the procurement methods stipulated in Ecuadorian law; and (ii) consulting services by firms, contracts for which the shortlist can be comprised entirely of national firms, in accordance with the policies for the selection and contracting of consultants.

2.2 **Financial management system.** Since January 2008, government entities have been using the eSIGEF financial management system that effectively integrates the budget, accounting, treasury, and electronic payment processes and an information technology centralization and web technology use scheme. Moreover, the central government entities are subject to supervision and oversight by the supreme audit institution: the Office of the Comptroller General of the State (CGE). Generally speaking, the financial management country systems have an adequate level of development, but need to be complemented, for now, for execution of

Bank-financed projects as regards specific financial reporting and external auditing (paragraph 7.11).

III. The Executing Agency's Fiduciary Context

3.1 The program executing agency is the MEER, with the participation of the electricity distribution companies and the Electrical Corporation of Ecuador, through Transelectric.

3.2 The MEER uses the country procurement and financial management systems. Internal control of the Ministry is performed by the CGE, through its Internal Auditing Unit.

3.3 The execution structure for this program is the same one used successfully in the operations mentioned in paragraph 1.1. As the executing agency, the MEER demonstrated that it stores all documented, approved, official activities through its information system and it has staff that has gained experience in administering financial management and procurement processes for Bank-financed operations.

3.4 In addition, in April 2015, an analysis of the Project Management Information System (SIGPRO) yielded satisfactory results. That system focuses on systematizing the MEER's current project prioritization, monitoring, control, and settlement processes, and includes the lessons learned through execution of operation 2608/OC-EC, which has been completed.

IV. Fiduciary Risk Evaluation and Mitigation Measures

4.1 The following were identified as medium level fiduciary risks: (i) delay in the execution of projects due to the authorization process for contracting works by the Ministry of Economy and Finance (MEF), which will be mitigated with the advanced approval of the guarantees for the program's contracts by the MEF; and (ii) delay in the transfers of program resources by the MEF to the executing agency, which will be mitigated by including in the interagency agreements the timely transfer of the resources allocated to the executing agency once the disbursements are received as funds advances from the Bank.

V. Considerations for the Special Conditions of Contracts

5.1 It is important to bear in mind the conditions precedent to the first disbursement and the execution conditions set forth in Section III-A, paragraphs 3.2 and 3.3 of the loan proposal. In addition, taking into account the mechanism for execution and disbursements by the IDB and JICA, the Project Operating Manual should indicate that a special bank account specifically for each source of financing will be needed for transferring IDB and JICA funds to the project.

VI. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

6.1 **Procurement execution.** The initial procurement plan will be for the first 18 months. It will be updated annually or as needed. The procurement plan will be managed using the Procurement Plan Execution System (SEPA).

a. **Procurement of goods, works, and nonconsulting services (procurement policy, document GN-2349-9).** The threshold for use of ICB will be laid out for the MEER at www.iadb.org/procurement. Contracts for goods, works, and nonconsulting services generated under the program and subject to ICB will use the Standard Bidding Documents issued by the Bank. Procurements subject to national competitive bidding and shopping will use the documents agreed on with the Bank.

b. **Selection and contracting of consultants.** For selecting and contracting consulting services (document GN-2350-9), any of the methods described in the Policies can be used, provided the method has been identified in the procurement plan approved by the Bank. The threshold determining the make-up of the shortlist with international consultants will be posted for the program at www.iadb.org/procurement. Contracts for consulting services with firms generated under the program will use the Standard Request for Proposals issued by the Bank.

c. **Selection of individual consultants.** In cases identified in the approved procurement plans, contracting of individual consultants will involve establishing a shortlist of qualified individuals, obtained through local or international expressions of interest, pursuant to document GN-2350-9, Section V, paragraphs 5.1 to 5.4.

d. **Training.** The procurement plan will list the procurements for the project components that including training elements and will be contracted as consulting or nonconsulting services.

e. **Use of the country procurement system.** The National Public Contracting System[1] in Bank-financed projects will be used for contracts for goods and nonconsulting services and for the construction of works that have an estimated cost of less than the Bank's threshold for Ecuador for ICB, and for consulting services for amounts below the threshold for an international shortlist.

f. **Domestic preference.** Bids for goods originating in the borrowing country will have a margin of preference[2] on price equivalent to 15% in contracts subject to ICB.

g. **Retroactive financing and recognition of expenditures.** The Bank may retroactively finance from loan proceeds, up to US$30 million (20% of the financing from Ordinary Capital resources), and recognize out of the local contribution, up to US$17.8 million (20% of the local contribution), eligible expenditures made by the executing agency before the loan approval date, for payments made for advance contracting and progress on works for the

[1] If the Bank validates another system or subsystem, it will be applicable for the operation, as set forth in the loan contract.

[2] Policies (document GN-2349-9) Appendix 2 and the loan contract.

projects, provided that requirements substantially similar to those in the loan contract have been met. Such expenditures must have been made on or after 8 June 2017 (the project profile approval date), but in no case will they include expenditures made more than 18 months prior to the loan approval date. Regarding JICA resources, pursuant to the Framework Agreement, and to facilitate the pari passu of JICA cofinancing, JICA can recognize expenditures eligible for Ordinary Capital financing, which can be included in the disbursement request/justification to JICA.

6.2 Threshold amounts for ICB and international shortlist.

Table VI-1. Table of threshold amounts (US$)

Works			Goods			Consulting services	
ICB	**NCB**	**Shopping**	**ICB**	**NCB**	**Shopping**	**Consulting services with international advertising**	**Shortlist 100% National**
> 3 million	< 3 million > 250,000	< 250,000	> 250,000	< 250,000 > 50,000	< 50,000	> 200,000	< 200,000

6.3 The main procurements, to be part of the Fiduciary Agreements and Requirements, are the responsibility of the Procurement Officer. The program's most relevant procurements are to be prepared with the information generated for preparing the procurement plan, which is a joint effort by the Procurement Officer and the technical and procurement units of the lead institution for the program and the Sector Specialist, who ensures that procurements are on track to achieve the operation's outcomes and outputs. Once the loan is approved, the executing agency will be responsible for preparing the procurement plan[3,4] and the Procurement Officer will furnish the plan and ensure that it is adequate and of the expected quality as per the procurement policies.

Table VI-2. Main procurements

Activity	Procurement method	Estimated invitation date	Estimated amount (US$)
1.- Works			
Construction of civil works, provision of materials and equipment, electromechanical assembly, testing and bringing on line the 230/138 kV transmission systems – four lots.	ICB	Q2 2018	154,750,247.00
Construction of civil works, provision of materials and equipment, electromechanical assembly, testing and bringing on line the 67 MVA autotransformer, 138 kV switchyard, and modernization of the Posorja substation automation system.	ICB	Q2 2018	14,452,883.00

[3] Policies (document GN-2349-9) paragraph 1.16; Policies for the Selection and Contracting of Consulting Services (document GN-2350-9) paragraph 1.23. The borrower shall prepare and, before loan negotiations, furnish to the Bank for its approval a procurement plan acceptable to the Bank for an initial period of at least 18 months.

[4] See Guía para la preparación y aplicación del PA[18].

6.4 **Procurement supervision.** Contracts subject to ex post review by the Bank will conform with the provisions of Appendix 1 of the Policies; contracts for amounts equal to or greater than those indicated in Table VI-3 will be supervised ex ante. Ex post review missions by the Bank will be conducted at least once every 12 months. Ex post review reports will include at least one physical inspection visit, as appropriate.

Table VI-3. Ex Post Review Threshold (US$)

Works	Goods	Consulting services	Individual consulting
< 3,000,000	<250,000	< 200,000	< 50,000

Note: The threshold amounts established for ex post review apply based on the executing agency's fiduciary capacity for execution and can be modified by the Bank should that capacity change.

6.5 **Special provisions.** Measures to reduce the likelihood of corruption: The provisions of the Policies for the Procurement of Goods and Works Financed by the IDB (document GN-2349-9) and the Policies for the Selection and Contracting of Consultants Financed by the IDB (document GN-2350-9) relating to prohibited practices (list of companies and individuals ineligible to work with multilaterals) will apply.

6.6 **Records and files.** The executing agency will keep the records up-to-date and maintain procurement and contracting documentation organized in a single file; and the processes financed from each of the sources under the program are to be able to be perfectly differentiated.

VII. Financial Management Agreements and Requirements

7.1 **Programming and budget.** The Organic Code on Planning and Public Finances is the legislation establishing the general standards governing programming, formulation, approval, execution, control, evaluation, and settlement of the budgets. These general standards apply to execution of Bank-financed programs in Ecuador. The eSIGEF integrated system orchestrates and standardizes implementation of these general standards through the national public management apparatus. The program budget will be calculated based on the annual work plan agreed on by the Bank and the executing agency. It will serve as the basis for the program's formal inclusion in the MEER's overall budget, including in the pro forma budget submitted to the legislature for approval.

7.2 The MEER will see to it that the program is included in the Annual Government Investment Plan, handle the respective budget allocations for the program, obtain the necessary guarantees for contracting processes, and monitor budget execution every three months through its internal systems.

7.3 **Accounting and information systems.** Government accounting is through the eSIGEF system, the parameters for which were set in keeping with the government accounting chart of accounts issued by the Ministry of Finance. Official accounting for projects that receive external financing is done through the eSIGEF system, in keeping with the government accounting chart of accounts and the budget classifier. Although the eSIGEF currently allows for the preparation of reports related to resources from the IDB's Ordinary Capital and other sources of financing

(e.g. JICA), these reports do not provide the level of detail and transparency necessary for all specific required elements, so the status and progress of the project will have to be indicated through additional reports.

7.4 In view of this, it was agreed with the executing agency that, for the loan operation, the SIGPRO system developed by the MEER will be used for technical and financial monitoring of execution progress and preparation of detailed financial and project reports.

7.5 **Disbursements and cash flows.** In 2008, the Government of Ecuador installed the National Treasury Single Account (CUT) mechanism, which unified the treasury of all central government entities.

7.6 Implementing this mechanism did not eliminate the Central Bank of Ecuador's (BCE) system of special accounts or special-purpose accounts for financing from multilateral loans, including from the IDB. In this regard, to receive the loan proceeds, the MEER will open two special accounts for the program in the BCE—one for financing from the IDB's Ordinary Capital and one for JICA resources. All program payments will be made through the eSIGEF system by debiting the CUT.

7.7 The executing agency will arrange disbursements with the IDB. Program disbursements will be made according to the project's actual liquidity needs, taking into account the two separate sources of financing, using funds advances as per a detailed Financial Plan reflecting the project's actual resource needs, for a period of up to nine months. The Financial Plans are to be prepared at the outset of the project, maintaining a 12-month horizon, and are to be updated as execution evolves.

7.8 The executing agency will present to the IDB each disbursement request, accompanied by the Financial Plan and project cash flow for a period of up to 270 days. When requesting an advance of funds, the executing agency will submit its rendering of accounts, demonstrating that at least 80% of the balance pending justification has been used, attaching the reconciliation of the available program funds. The rendering of accounts for advances will be done pursuant to document OP-273 (Financial Management Guide for IDB-financed Projects).

7.9 For expenditures made that are not considered eligible by the Bank, the IDB and the executing agency will agree whether or not they should be repaid to the Bank, replaced by other eligible program expenditures, or have the amounts involved be paid off.

7.10 **Internal control and internal auditing.** Regarding the internal control system, the Constitution of Ecuador stipulates that the CGE is responsible for running the public sector control system. As part of that sector, the MEER has it own internal audit area that reports directly to the CGE; however, the Bank will not use its services, since that area's audit plans do not include reviewing the project. The Project Operating Manual will include the main internal control processes needed to ensure that controls are operating properly. During execution, the fiduciary team will assess compliance with and the quality of those processes.

7.11 **External control and reporting.** Since the CGE does not currently have sufficient capacity for external control of projects financed with external loans, external auditing of the project will be performed by independent auditors acceptable to the Bank (international audit firms), in keeping with IDB requirements. During

execution, the MEER will present annually, within 120 days following the close of the fiscal year, the audited financial reports for the project (including all sources of project financing, plus the local contribution) based on terms of reference previously approved by the Bank, which will include independent validation of the use of loan proceeds for each source of financing and validation of internal operational controls and processes done by the executing agency. Audit costs will be covered using loan proceeds. The executing agency will present the final audited financial report to the IDB within 120 days following the period for the last disbursement. The Bank may also request unaudited financial reports for the project, which can be prepared by the MEER.

7.12 There is no national policy on public disclosure of audit reports; however, as per the current access to information and information disclosure policy, the audited project reports are to published in the Bank's systems.

Table VI-4. Supervision plan

Supervision activity	Supervision plan			
	Nature and scope	Frequency	Responsible Party	
			Bank	Third party
Operational	Review of progress report	Semiannual	Fiduciary and sector team	
	Portfolio review with the executing agency and MEF	As per MEF requirements	Fiduciary and sector team	MEER and MEF
Financial	Supervision visits	Annual	Fiduciary specialist	MEER
	Review of audited and unaudited financial reports	Annual	Fiduciary specialist	MEER
	Review of disbursement requests	Periodic	Fiduciary and sector team	
Procurement	Ex ante review of procurements	In accordance with the Procurement Plan	Project Team Leader with support from the Procurement Specialist	MEER
	Update of the Procurement Plan	Annual	Project Team Leader with support from the Procurement Specialist	MEER
Compliance	Fulfillment of the conditions precedent	One time	Fiduciary and sector team	MEER
	Budget allocation review	Annual	Fiduciary and sector team	MEER
	Analysis of audited financial reports presented by the MEER	Annual	Project Team Leader and Fiduciary Specialist	

7.13 **Execution mechanism.** The MEER, as the project executing agency, is responsible for the operation's financial administration and internal control, with technical assistance from the Transelectric team and from the electricity

distribution companies, to contract the warranted worked, in keeping with their concession areas.

7.14 Within the MEER, the Planning Coordination Unit will spearhead both program execution and the commissioning and review of any necessary studies.

7.15 All administrative activity (budget, accounting, payments, etc.) will be done by the MEER through its Financial Office, with support from the Planning Coordination Unit, which will monitor the contracts, payments, documentation, and respective reports.

7.16 The PMU will prepare the cash flow projections, the respective requests and justifications for use of funds, presenting to the Bank the corresponding documents, in keeping with the requested formats and requirements. It will also provide program leadership vis-à-vis the Bank, coordinating with the involved parties and preparing all the management information to be presented, including the progress reports, annual work plan, program execution plan, and audit and evaluation reports.

7.17 Since the program has external financing from two different sources (IDB Ordinary Capital and JICA), the financial and management information mentioned in the previous paragraph must follow the breakdown by source to allow for planning, monitoring, and rendering of accounts by individual source and overall.

7.18 The Program Operating Manual will outline the program execution mechanism, the make-up of the PMU, and the recording, communicating, and reporting mechanisms that govern collaboration among electricity distribution company contractors, Transelectric, and the MEER. See Procurement Table.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-____/17

Ecuador. Loan ____/OC-EC to the Republic of Ecuador
Support for the Advancement of the Energy
Matrix Transition in Ecuador

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 Ecuador, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a program of support for the advancement of the energy matrix transition in Ecuador. Such financing will be for the amount of up to US$150,000,000 from the resources of the Bank's Ordinary Capital, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

(Adopted on _____ 2017)

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