

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

**ECUADOR**

**INVESTMENT PLAN TO SUPPORT THE TRANSITION OF THE ENERGY MATRIX  
IN ECUADOR**

**(EC-L1160)**

**LOAN PROPOSAL**

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## ABBREVIATIONS

AIFk	Average interruption frequency per kVA installed
CELEC-EP	Empresa Pública Estratégica Corporación Eléctrica del Ecuador [Electricity Corporation of Ecuador, Strategic Public Enterprise]
CGE	Contraloría General del Estado [Office of the Comptroller General]
CME	Cambio de la Matriz Productiva [Energy Matrix Transition]
CRF	Corporate Results Framework
CUT	Cuenta Única del Tesoro [General Treasury Account]
DEM	Development Effectiveness Matrix
EIC	Electric induction cookstove
EIRR	Economic internal rate of return
ENPV	Economic net present value
e-SIGEF	Sistema de Administración Financiera [financial administration system]
ESMP	Environmental and Social Management Plan
ESMR	Environmental and Social Management Report
FCE	Fondo de Cocción Eficiente [Efficient Cooking Fund]
FERUM	Fondo de Electrificación Rural y Urbano Marginal [Electrification Fund for Rural and Marginal Urban Areas]
GWh	Gigawatt-hour
ICB	International competitive bidding
IRR	Internal rate of return
KIF	Korea Infrastructure Development Cofinancing Facility for Latin America and the Caribbean
kV	Kilovolt
kVA	Kilovolt-ampere
kWh	Kilowatt-hour
LOSPEE	Ley Orgánica del Servicio Público de Energía Eléctrica [Public Electric Power Service Act]
LPG	Liquefied petroleum gas
MEER	Ministry of Electricity and Renewable Energy
MVA	Megavolt-ampere
MW	Megawatt
MWh	Megawatt-hour
NCB	National competitive bidding
NPV	Net present value
PME	Plan Maestro de Electrificación [Master Plan for Electrification]
PMU	Program management unit
PNBV	Plan Nacional Buen Vivir [“Good Life” National Plan]
PNCE	Programa Nacional de Cocción Eficiente [National Efficient Cooking Program]
POM	Program Operations Manual
SIGPRO	Sistema de Información de Gestión de Proyectos [project management information system]
SENPLADES	Secretaría Nacional de Planificación y Desarrollo del Ecuador [National Planning and Development Department]
SINEA	Sistema de Interconexión Eléctrica Andina [Andean Electrical Interconnection System]
SND	Sistema Nacional de Distribución [National Distribution Network]
SNT	Sistema Nacional de Transmisión [National Transmission Network]
TITk	Total interruption time per kVA installed
V	Volt

## PROJECT SUMMARY

### ECUADOR INVESTMENT PLAN TO SUPPORT THE TRANSITION OF THE ENERGY MATRIX IN ECUADOR (EC-L1160)

Financial Terms and Conditions						
Borrower: Republic of Ecuador			Flexible Financing Facility <sup>(a)</sup>		KIF	
			Amortization period:	25 years	25 years	
Executing agency: Ministry of Electricity and Renewable Energy (MEER)			Original weighted average life: <sup>(b)</sup>	15.25 years	N/A	
			Disbursement period:	4 years	4 years	
Source	Amount (US\$)	%	Grace period:	5.5 years	7 years	
IDB (Ordinary Capital):	118,000,000	73.7	Inspection and supervision fee:	(c)	N/A	
			Facility fee:	N/A	0.1%	
Korea Infrastructure Development Cofinancing Facility for Latin America and the Caribbean (KIF): <sup>(e)</sup>	25,000,000	15.6	Interest rate:	LIBOR-based	2.5%	
			Credit fee:	(c)	N/A	
Local:	17,090,000	10.7	Approval currency: U.S. dollars	From the Ordinary Capital	From the KIF	
Total:	160,090,000	100				
Project at a Glance						
<b>Program objective/description:</b> The overall objective is to support the progress of the Energy Matrix Transition, improve the sector's indicators, and support the recovery plan for the areas damaged by the earthquake. The specific objectives are to: (i) pursue National Transmission Network projects that facilitate transportation of energy from new generation and reinforce domestic infrastructure; (ii) strengthen and expand the National Distribution Network in rural and marginal urban areas and contribute to rebuilding the infrastructure in areas damaged by the earthquake; (iii) support the progress of the National Efficient Cooking Program; and (iv) provide institutional strengthening in service management.						
<b>Special contractual conditions precedent to the first disbursement:</b> The executing agency will comply with the following, to the Bank's satisfaction: (i) signature and entry into effect of a subsidiary agreement between the Ministry of Finance and the executing agency, indicating that loan proceeds will be transferred to, and recorded in a timely manner under, the program's codified account and used according to the terms and purposes agreed upon in the loan contract; (ii) approval of the Component I and II procurement guarantees by the Ministry of Finance; (iii) creation of a Third Party Fund account in the Central Bank for Efficient Cooking Fund administration; (iv) establishment by the executing agency of a program management unit for program execution, comprised of at least a general coordinator, a procurement specialist, a financial specialist, a planning and monitoring specialist, an environmental specialist, and an electrical engineer; (v) presentation and entry into force of a Program Operations Manual approved by MEER that includes a frame of reference for the environmental and social management of the projects through monitoring records; and (vi) demonstration by the executing agency that enough resources have been earmarked for program execution, at least during the first calendar year (paragraph 3.2).						
<b>Special contractual conditions of execution:</b> In order to begin the works under Components I and II, and pursuant to the Environmental and Social Management Report, the executing agency will submit the following to the IDB: (i) environmental impact studies and the Environmental and Social Management Plan (ESMP), including an execution budget; (ii) environmental license and permits pursuant to Ecuadorian legislation; (iii) the easement order pertaining to the new transmission and subtransmission lines; (iv) evidence of legal ownership of the land where substations will be located; (v) inclusion of the applicable environmental technical specifications and of the ESMP in the works and supervision contracts; (vi) evidence of at least one public consultation, including: (a) project description; (b) description of probable impacts; (c) description of measures to manage the impacts identified in the ESMP; (d) description of the system for receiving and processing complaints and claims; and (e) a channel for receiving suggestions on the proposed project (paragraph 2.3).						
Exceptions to Bank policies: Not applicable						
Strategic alignment						
Challenges: <sup>(e)</sup>	SI	<input checked="" type="checkbox"/>	PI	<input type="checkbox"/>	EI	<input checked="" type="checkbox"/>
Cross-cutting themes: <sup>(f)</sup>	GD	<input checked="" type="checkbox"/>	CC	<input checked="" type="checkbox"/>	IC	<input type="checkbox"/>

- (a) Under the terms of the Flexible Financing Facility (document FN-655-1), the borrower has the option of requesting changes to the amortization schedule, as well as currency and interest rate conversions. The Bank will take operational and risk management considerations into account when reviewing such requests.
- (b) The maximum original weighted average life of the loan and the grace period may be shorter depending on the effective signature date of the loan contract.
- (c) The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the applicable policies.
- (d) The program will receive cofinancing (15.6% of the total amount) from the KIF (see Cofinancing approval from the Government of Korea). These resources will fulfill the fund's financial priorities by financing, among others, key soft infrastructure.
- (e) SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).
- (f) GD (Gender Equality and Diversity); CC (Climate Change and Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

## I. DESCRIPTION AND RESULTS MONITORING

### A. Background, problems addressed, and rationale

- 1.1 **Background.** Ecuador has undertaken an ambitious project to transform the electricity sector through a nationwide initiative, the Energy Matrix Transition (CME). The CME is one of the pillars of the ["Buen Vivir" \[Good Life\] National Plan \(PNBV\) 2013-2017](#),<sup>1</sup> to support the Transition of the Production Matrix. The CME improves electricity supply and service quality by strategically exploiting renewable resources, taking into account the recurrent energy crises that the country experienced in 1995,<sup>2</sup> 1999,<sup>3</sup> and 2009. Thanks to some of the CME's initial outcomes, Ecuador is ranked fifth on energy security worldwide and first in Latin America and the Caribbean, according to the World Energy Council (<https://www.worldenergy.org>).
- 1.2 **Macroeconomic situation.** Between 2008 and 2015, Ecuador's gross domestic product (GDP) grew at an average rate of 4.1%, higher than the regional average of 2.6%. During this period, fiscal policy became a key engine of growth, with public spending rising from US\$21.7 billion (35.7% of GDP) to US\$38.7 billion (39% of GDP). A significant part of the increase in public spending was due to major investments in roads and the construction of hydroelectric plants, among other large works, as well as investment in education and health care. However, the recent drop in oil prices has had a negative impact on Ecuador's economy.<sup>4</sup> Despite the fact that the oil sector only accounted for 11% of the GDP between 2008 and 2015, it generated almost 30% of public sector revenue and 50% of exports.
- 1.3 The CME is expected to provide macroeconomic benefits in the short and medium term.<sup>5</sup> With regard to the balance of payments, when evaluating scenarios with and without the CME, a net decrease in imports of at least US\$1.1 billion per year is expected, due to the displacement of thermal generation capacity starting in 2017.<sup>6</sup> On the taxation front, the net contribution will be at least US\$250 million per year,<sup>7</sup> because of subsidy reductions. In addition, the net contribution from electricity consumption for the National Efficient Cooking Program (PNCE)—taking into account a temporary subsidy in electricity rates for the transition to using electric induction cookstoves (EICs), minus the rate increase in 2014—translates into additional revenue of US\$149.3 million per year for the sector. Another project that replaced fuel with electricity was the Esmeraldas-Quito multi-product pipeline,

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<sup>1</sup> <http://www.senplades.gob.ec/>.

<sup>2</sup> Energy crises: (i) 1995, caused by a drought that impacted the Paute hydroelectric plant, which provided 70% of the installed capacity for generation; (ii) 1998-1999, caused by the El Niño phenomenon, a drop in oil prices (Ecuadorian oil blend fell below US\$10 per barrel), and the Asian crisis, which impacted emerging economies; and (iii) 2009, caused by a lengthy drought that resulted in nationwide energy cuts.

<sup>3</sup> Between 1999 and 2012, thermal generation increased from 47% to 56%, while hydroelectric capacity dropped from 53% to 44%. Given this energy-thermal scenario, the installation of internal combustion engines became a priority, climbing from 13% to 26% over the same period. *2013 National Energy Balance Sheet*.

<sup>4</sup> Ecuadorian crude blend prices fell from an average of US\$94 per barrel between 2011 and 2014 to less than US\$30 per barrel in early 2016.

<sup>5</sup> [Economics - 2015 Summary and evaluation of the Energy Matrix Transition](#).

<sup>6</sup> The country would have the capacity to increase its exports of fuel oils No. 4 and No. 6.

<sup>7</sup> In 2014 the local sales subsidy for liquefied petroleum gas (LPG) totaled US\$208.9 million (2015 prices).

which was launched in 2015 and generated annual savings of US\$725,000. The Electricity Generation Optimization project, which decreased the use of imported diesel for electricity generation, yielded additional annual savings of US\$105 million.<sup>8</sup>

- 1.4 **Electricity sector.** The 2013-2022 Master Plan for Electrification (PME) and the Master Plan for Hydrocarbons are governing documents for the sector and guide investment priorities according to the PNBV's guidelines, in order to: (i) strengthen primary and secondary energy supply beyond current demand, through local processing of higher volumes of fuel, production, use, or reuse of endogenous fuels, and rational exploitation of renewable resources for electricity generation; (ii) promote demand based on intensive use of electricity as an alternative to reduce the use of conventional fuels in the domestic economy; and (iii) increase energy exchanges in the Andean region to support the development of a regional energy market.<sup>9</sup>
- 1.5 The PME highlights the need to increase electricity supply and reinforce and expand the National Transmission Network (SNT) and the National Distribution Network (SND), the latter to provide 220 volts (V).<sup>10</sup> The plan also anticipates the need to automate the electricity network with modern systems for protection, measurement, and communication. For its baseline demand scenario as of 2022, the PME takes into account macroeconomic and demographic variables and sector and customer indicators, in order to determine the expected development. Annual growth of 3.7% is expected from 2012-2022, reaching 26,542 gigawatt-hours (GWh) of energy by the end of the period. This demand reflects the inclusion of loads resulting from the CME and, to meet it, an additional 4,728 megawatts (MW) must be generated on top of the current capacity of 5,063 MW.
- 1.6 **Progress in transitioning to the new energy matrix (generation, transmission, and distribution).** The construction of the CME's initial, emblematic hydroelectric projects began in 2010 with investments from the Government of Ecuador and external financing, totaling US\$4.456 billion. In the short term, these projects will provide new generating capacity of 2,832 MW of power and 17,222 GWh of energy. In late 2015, the average progress of construction for the most significant projects in terms of installed power was 80%. In addition, the commissioning of the 65-MW Manduriacu hydroelectric plant and of the first four turbines of the 1,500-MW Coca Codo Sinclair project was confirmed. The rest of the hydroelectric projects are expected to be commissioned in 2016 and 2017.
- 1.7 Since 2010, investments in electricity transmission have totaled US\$600 million, resulting in: a current installed transformation capacity of 10,420 megavolts-amperes (MVA); 4,456 kilometers of 230-kilovolt (kV) and 138-kV transmission lines; Ecuador's first 500-kV high-voltage system; and 53 electrical substations,

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<sup>8</sup> Based on the price of projected imported diesel to 2017.

<sup>9</sup> This operation promotes integration of the Andean Electrical Interconnection System (SINEA) with investments in the SNT that contribute to a greater exchange of energy using existing connections. Similarly, it strengthens the binational integration process with Colombia by bolstering and expanding the SND, benefiting the border region; [Technical Annex on Regional Integration \(document GN-2565-4\)](#).

<sup>10</sup> With regard to electricity transmission and distribution, the PME actions are implemented through the Distribution Improvement Program, the Transmission Expansion Program, and the Electrification Program for Rural and Marginal Urban Areas, to ensure an adequate supply of energy for initiatives that promote the shift away from conventional fuels, including: the PNCE, the Electricity Generation Optimization project from EP PETROAMAZONAS, the Quito metro, the Cuenca streetcar, and SINEA.



including four mobile substations. Investments in distribution total US\$1.156 billion—ensuring the SND’s current capacity of 875 MVA and starting a process to switch from 110 V to 220 V by expanding 16,218 kilometers of distribution lines and 454 kilometers of subtransmission lines, and building and/or upgrading 61 additional electrical substations.

- 1.8 **IDB support for the CME.** In order to support the CME with the investments planned for the SNT and the SND, the IDB agreed to finance the first three operations, which were satisfactorily executed in 2014 and 2015 ([2608/OC-EC](#), [2457/OC-EC](#), [2472/OC-EC](#)), and five new operations whose execution began during the same period. Of these, the operation “Support for the Transition of the Energy Matrix in Ecuador” ([3420/OC-EC](#)) was fully executed, and the others—“National Transmission System Strengthening Program” ([3167/OC-EC](#)); “Electrification Program for Rural and Marginal Urban Areas II” ([3087/OC-EC](#)); and “Program to Strengthen the National Electricity Distribution Network of Ecuador I and II” ([3187/OC-EC](#), [3188/CH-EC](#), [3494/CH-EC](#), and [3494/OC-EC](#))—have achieved financial execution levels of 60%, 93%, 91%, and 56%, respectively.<sup>11</sup>
- 1.9 The IDB’s support for the sector has helped generate good practices, resulting in a proper level of execution in financed operations. The good practices reflected in this operation include: (i) preparation of financing in close cooperation with executing agencies; (ii) selection of projects for financing prioritized in the sector’s governing documents; (iii) continuous strengthening of executing agencies; (iv) continuous interaction with executing agencies to facilitate understanding of the IDB’s procurement and monitoring procedures; and (v) permanent monitoring of outcomes by Ecuadorian government authorities.
- 1.10 In line with the CME’s targets, the outcomes expected from the approved operations being executed include:<sup>12</sup> (i) 18,505 households with new and/or improved electricity service in rural and marginal urban areas; (ii) 178 kilometers of medium-voltage lines and 2,737 kilometers of low-voltage lines, new and/or upgraded; (iii) 78 new and/or upgraded electrical substations; (iv) design of the PNCE’s management system; (v) 171 MVA of new capacity in the SND; (vi) 970 MVA of increased reserve capacity; and (vii) 775 MVA of average maximum load level in the SNT.
- 1.11 These investments, accompanied by reforms in the sector’s legal, regulatory, and institutional framework, have helped to maintain and improve indicators and their sustainability. This has resulted in: a reduction in total electricity losses of up to 12.3% in 2014; improved service quality values (total interruption time per kVA installed (TITk) = 7.17 and average interruption frequency per kVA installed (AIFk) = 8.27);<sup>13</sup> 97.1% electricity coverage; approval of two electricity rate increases in 2014 and 2015;<sup>14</sup> and increased energy transactions with Colombia

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<sup>11</sup> The physical progress in 2015 was 10%, 82%, 82%, and 10%, respectively.

<sup>12</sup> In addition to financing for infrastructure, the IDB is supporting the CME with a programmatic operation (EC-L1140, first tranche approved in 2015) that reflects the priority decision of the National Planning and Development Department to execute the Program to Strengthen the SND and facilitate the implementation of the CME.

<sup>13</sup> Interruption time and frequency per kVA values were measured during the 2015 rolling year.

<sup>14</sup> Electricity rate increases were approved in 2014 and 2015. A review of the Dignity Rate began in 2016, to improve its targeting mechanisms.

and Peru.<sup>15</sup> The CME's investments helped by: decreasing the use of fossil fuels in the residential sector in 2015, displacing 43.3 annual tons of LPG; substituting one million gallons of diesel per year with electricity in the operations of EP PETROECUADOR's Esmeraldas-Quito multi-product pipeline; and displacing 96.8 million gallons of diesel per year with flare gas power generation by EP PETROAMAZONAS.

- 1.12 In 2015, the PNCE sought to use the more efficient induction cookstoves (EICs) to replace LPG stoves,<sup>16</sup> achieving a 12% rate, i.e. 357,000 households benefitted, out of 3 million. The EICs are distributed through suppliers of domestic and imported equipment. The PNCE provides incentives to users who decide to use EICs, including: (i) three-year financing for the EIC, a set of induction pots, and electrical equipment for water heating; (ii) free delivery until 2018 to residential users of 80 kilowatt-hour (kWh) per month for cooking and 20 kWh per month for water heating; (iii) free delivery of EICs to Human Development Bonus users;<sup>17</sup> (iv) duty and value-added-tax exemptions for imports of EICs and heating equipment; and (v) sales tax imposed on LPG stoves to discourage their sale. The loans issued for EIC sales are backed by the Efficient Cooking Fund (FCE), which the Ministry of Finance manages. After review<sup>18</sup> and upon request of the Ministry of Electricity and Renewable Energy (MEER), the Ministry of Finance pays EIC suppliers on a monthly basis for sales on credit. For users who lack access to electricity and cook with wood, the PNCE provides for the introduction of improved stoves.<sup>19,20</sup>
- 1.13 In rural areas, the PNCE receives support from the Electrification Fund for Rural and Marginal Urban Areas (FERUM). Since 2011, the IDB has financed FERUM through two operations, [2608/OC-EC](#) and [3087/OC-EC](#), which have helped improve the access to energy indicator, and boosted the financing of initiatives that promote the productive use of electricity,<sup>21</sup> as well as the development of sustainable stand-alone electrical systems.<sup>22</sup> The program helps pursue the CME's progress on the supply side, by strengthening the SNT and SND, and on the demand side, by facilitating the PNCE's progress with the deployment of the EIC program.

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<sup>15</sup> As of February 2016, Ecuador began exporting energy to Colombia (400 MWh) to address the energy deficit that the El Niño phenomenon caused in that country, achieving 90% of the current 500 MW capacity. As of May 2016, 40 MWh are being exported through the interconnection with Peru.

<sup>16</sup> [Annex "Estudio sobre el consumo energético y hábitos de cocción en el hogar & sustitución energética" \[Study of household energy consumption and cooking habits, and energy substitution\]](#).

<sup>17</sup> The Human Development Bonus is a program to support individuals over 65 in vulnerable conditions and without public insurance, and people with disabilities.

<sup>18</sup> Monitoring and control of the PNCE is carried out through the Efficient Cookstoves System, financed under operation 3187/OC-EC.

<sup>19</sup> National Institute of Statistics and Censuses, 2010: 18% of households that lack access to electricity cook with biomass fuel. Improved stoves allow efficient cooking with wood, provide heating, and remove smoke from the household.

<sup>20</sup> Average EIC sales during the first quarter of 2016 reached 20,000 stoves per month, according to MEER.

<sup>21</sup> [Video on productive uses of electricity through FERUM](#).

<sup>22</sup> Fifty-four projects are being executed in 30 Achuar communities, which will provide electricity to 120 service centers and 833 households (39 individual photovoltaic projects, 5 with stand-alone mini-grids, 10 mixed individual mini-grid). The systems used range from 150 Wp to 330 Wp. The capacity of mini-grid systems ranges from 2.5 kW to 15.5 kW.

- 1.14 **Need to rehabilitate and expand the SNT.** The SNT presents specific challenges in some areas, which threaten operational security and service quality. Under certain operating conditions, the system operates at the limit of the criteria that local regulations establish. There are records of busbars with voltage profiles below the acceptable minimum and transmission links (lines and transformers) with load levels that exceed the limits set in the regulations.<sup>23</sup> With the introduction of new hydroelectric and thermal plants, new or upgraded transmission lines are required to meet the demand, transport new energy generated to the main distribution centers, and help to shift from stand-alone thermal generation to hydroelectricity.
- 1.15 **Need to rebuild electrical infrastructure in areas damaged by the April 2016 earthquake.** A magnitude 7.8 earthquake, which affected six coastal provinces, damaged 11% of the area's electrical infrastructure. The damages mainly occurred in distribution lines. In order to respond to the area's electricity needs, MEER is working on the following three essential projects (reference prices): (i) rehabilitation plan (US\$25 million); (ii) reconstruction plan (US\$103 million); and (iii) economic and production reactivation plan with sector support (US\$35 million).
- 1.16 **Distribution network reliability and dependability.** The most important challenge that the SND faces is service quality. Challenges are associated with interruption frequency values (AIFk of 8.27 times/year) and duration values (TITk of 7.17 hours/year) that are still high. The factors that explain these values are: (i) lack of automation at substations; (ii) inappropriate location and lack of reclosers, and their inefficient operation; and (iii) lack of equipment to detect network failures.
- 1.17 **Replacing LPG with electricity by using EICs.** As per the 2010 census, 3,493,549 households have access to electricity. The highest consumption of LPG is in the residential sector, motivated by:<sup>24</sup> (i) the low price of LPG (US\$1.60 per 15-kilogram cylinder, which is equal to an annual subsidy of US\$208 million);<sup>25</sup> (ii) the adverse effect of the LPG subsidy policy, which encourages the misuse of this resource for purposes other than cooking; and (iii) the lack of incentives for new cooking and water heating alternatives different from LPG. These factors have resulted in: (i) inefficient use of LPG; (ii) higher volumes of LPG imported; (iii) health and safety problems for the population; and (iv) increased greenhouse gas emissions. As a result, the Government of Ecuador proposed intensive use of electricity for cooking based on a new renewable supply, using EICs.
- 1.18 **Rationale.** The PME estimates that programmed investments in the SND to support CME progress<sup>26</sup> total US\$200 million and in the SNT, US\$65 million per year, which include expansion and strengthening of high-, medium-, and low-voltage systems; adaptation of the SND to complete its capacity to provide 220 V; and improvements of service quality to reach established goals of AIFk = 4 and TITk = 8. While the CME's works are a priority for the Ecuadorian government, decreased revenue from oil sales has caused a budget adjustment that impacted

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<sup>23</sup> <https://www.celec.gob.ec/electroguayas/files/vol3.pdf>.

<sup>24</sup> Efficient Cooking Program, project profile - update of priority decision, June 2015.

<sup>25</sup> In 2014, Ecuador imported the equivalent of 84.3% of its total LPG demand.

<sup>26</sup> Includes construction of transmission systems, strengthening, and expansion to increase electricity exchanges in the region.

investment spending.<sup>27</sup> The effective execution of investments supporting the CME through Bank financing has been essential for this sector. The Ecuadorian government would therefore like to continue having the Bank's support in financing the infrastructure projects prioritized by MEER and approved by Ecuador's National Planning and Development Department (SENPLADES), in order to ensure the continuity of the CME.<sup>28,29</sup>

- 1.19 **Ecuador's strategy.** Ecuador has a strategy for the sector that is defined in its governing documents, the PNBV and the PME. The CME is one of the Ecuadorian government's policy pillars, along with the PNCE, which is considered a priority for the sector.
- 1.20 **Alignment with the Bank's country strategy with Ecuador.** The program is aligned with the objectives of the Bank's country strategy with Ecuador 2012-2017 (document GN-2680) and the PNBV, which promote the development of a sustainable energy strategy based on energy efficiency. The program is instrumental in promoting the actions embedded in the CME national initiative, because it fosters the use of electricity based on renewable energy, contributes to improving service quality and electricity service coverage, encourages the substitution of fossil fuels with hydroelectricity, and improves conditions for increased energy exchanges in the region.
- 1.21 The program is consistent with the Update to the Institutional Strategy 2010-2020 (document AB-3008), and is aligned with the following challenges: (i) economic integration, through the following Corporate Results Framework (CRF) (document GN-2727-4) indicators for Regional Context and Country Development Results: the growth rate of total exports of goods and services (%) and the installed capacity for energy generation from renewable energy sources (%); and (ii) social inclusion and equality, by providing infrastructure to supply electricity to low-income rural and marginal urban populations. The program is aligned with the following cross-cutting areas: (i) climate change and environmental sustainability, through the following CRF indicators for Regional Context and Country Development Results: greenhouse gas emissions (kg CO<sub>2</sub> per \$1 of GDP (power purchase agreement)) and reductions in emissions with financing support from the IDB Group (millions of tons of CO<sub>2</sub> equivalent per year), by substituting LPG with electricity for cooking and by supplying electricity that comes mainly from renewable sources; and (ii) gender equality and diversity, by promoting the participation and training of women in electricity sector activities. The program will contribute to the CRF through the following output indicators: (i) households connected to the electricity network; and (ii) distribution and transmission lines built. Similarly, the program is aligned with the priority areas of the Sustainable Infrastructure for Competitiveness and Inclusive Growth Strategy (document GN-2710-5), because it finances the

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<sup>27</sup> The 2015 modified budget for electricity sector projects totaled US\$1.49 billion, while the 2016 pro forma budget totaled US\$1.18 billion, a decrease of 21%.

<sup>28</sup> The effectiveness of the selected intervention (in this case, expansion and strengthening of the SNT and the SND, and implementation of the PNCE with support for EICs) is based on existing evaluations of interventions in the Latin American and Caribbean region, where the applicability of the intervention can be reproduced. This condition is met in several countries of Latin America, Asia, and Africa. IDB-financed projects of this type include the projects mentioned above from the Bank's Ecuador portfolio, Phases I and II of the Paraguay Power Transmission Program, and various transmission programs in Argentina's Norte Grande region. There was a pilot project for EIC implementation in Ecuador's Carchi region.

<sup>29</sup> As part of the strategy to support the financing of such investments, the Ecuadorian government is supported by the current Public Private Partnership framework.

expansion and strengthening of the electricity transmission and distribution infrastructure, which helps meet projected demand and improve energy exchanges in the Andean region. The program is consistent with the Energy Sector Framework (document GN-2830), since it: (i) supports universal, sustainable access to electricity service in rural and marginal urban areas, and those isolated from the electricity network; and (ii) improves the sector's operational efficiency. The program adheres to the Climate Change Sector Framework (document GN-2835-3) in that it promotes policies and technologies for the use of renewable energy systems and efficient energy use in urban and rural areas alike. This operation is included in the 2016 Operational Program Report (document GN-2849).

- 1.22 **Consistency with the Sector Strategy to Support Competitive Global and Regional Integration (document GN-2565-4).** The strategy indicates that regional integration operations will be identified according to four non-mutually exclusive indicative criteria. This program supports three of those criteria: (i) cross-country focus - Components I and II contribute to aligning internal policies and future national investments with cross-border impacts (energy exports); (ii) national subsidiarity - Component II finances electrical infrastructure that facilitates access to energy for communities located in border areas, in line with the agenda for binational integration with Colombia; and (iii) regional additionality - incorporates international and/or regional cooperation objectives, by supporting investments to strengthen the SNT in order to improve energy exchanges in the region.<sup>30</sup>
- 1.23 **Public Utilities Policy (document GN-2716-6).** The program is consistent with the pillars of the Public Utilities Policy, since it fulfills the following conditions: (i) financial sustainability, determined by improved revenue from rates as a result of: (a) supplying unmet demand that is not addressed through normal growth; (b) reducing electricity service interruptions by improving the quality and reliability of the supply; (c) reducing electricity losses; and (d) adding new customers; (ii) economic evaluation, since the selection of the portfolio of projects to be financed is in line with a strict analysis of financial, economic, and technical viability (paragraph 1.31) (see [Program Justification Under the Public Utilities Policy \(document GN-2716-6\)](#)). The sector is consistent with the principles of support for basic needs, transparency, financial sustainability, and an effective institutional framework, since it has clearly defined: (i) the separation of roles among MEER as lead agency; the Electricity Regulation and Control Agency as the regulator; and generation, transmission and distribution enterprises; (ii) private participation in electricity generation; (iii) the reform of public enterprises to improve their management; and (iv) rate adjustments to ensure the system's operation and maintenance, and contributions from the Ecuadorian government to ensure the sector's expansion.
- 1.24 **Diversity and gender considerations.** The program will promote the participation and training of women in electricity sector activities related to project design, management, assessment, and monitoring. As part of the outcomes, the program will benefit Afro-descendant and indigenous populations by improving access to and the quality of electricity service in rural areas and areas that are geographically isolated from the electricity network, through the use of renewable energy.

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<sup>30</sup> [See Technical Annex on Regional Integration \(document GN-2565-4\).](#)

## **B. Objectives, components, and cost**

- 1.25 The program's overall objective is to support CME progress, improve the sector's indicators, and support the recovery plan in the areas damaged by the earthquake. The specific objectives are to: (i) provide continuity for SNT projects that facilitate the transportation of energy from new generation and reinforce domestic infrastructure; (ii) strengthen and expand the SND in rural and marginal urban areas and contribute to rebuilding the infrastructure in areas damaged by the earthquake; (iii) support the progress of the PNCE; and (iv) provide institutional strengthening for managing the service.
- 1.26 **Component I. Expansion and strengthening of the SNT.** This component will finance two transmission systems: (i) a 230-kV system in Milagro-Babahoyo, including a transmission line and expansion of two electrical substations: Milagro (138 kV) and Babahoyo (138/69 kV); (ii) Stage II of a 230-kV system in Quevedo-San Gregorio and a 230-kV system in San Gregorio-San Juan de Manta, including expansion of two electrical substations, in Quevedo and San Gregorio; construction of the San Gregorio-San Juan de Manta transmission line; and a new 230-kV/69-kV electrical substation in San Juan de Manta. These works will (i) strengthen energy supply in the province of Manabí, which was damaged by the earthquake, and (ii) reinforce the National Interconnected System to increase energy exchanges southward.
- 1.27 **Component II. Expansion and modernization of the SND.** This component will help to: (i) improve the quality of electricity service in the SND's low-performance feeders;<sup>31</sup> (ii) improve sustainable access to energy in rural and marginal urban areas; (iii) continue to strengthen the SND's 220-V capacity and contribute to rebuilding the electricity infrastructure in areas damaged by the earthquake. The following will be financed: procurement of equipment to modernize 11 electrical substations and automate 40 feeders, by installing reclosers and fault localizers, as well as equipment to maximize the capacity of the Advanced Distribution Management System;<sup>32</sup> construction of 9 strengthening projects at the subtransmission level; 18 low-voltage strengthening projects; 390 projects to expand and improve the network in rural areas;<sup>33,34</sup> and 7 rural electrification projects in communities isolated from the electricity network, in the provinces of Pastaza and Orellana (benefitting 154 families and 7 community centers). Nonconventional renewable solutions will be used to provide electricity to families and community, health care, and education centers.
- 1.28 **Component III. Implementation of the PNCE.** This component will provide financing to the Efficient Cooking Fund (FCE), which the Ministry of Finance

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<sup>31</sup> These are new works and upgrades of 13.8 kV electricity networks.

<sup>32</sup> [Modernization of Distribution, Technical Annex.](#)

<sup>33</sup> The process for construction or service improvement will be in stages and includes excavation, pole installation, medium- and low-voltage structure assembly, conductor cable tightening, transformer and equipment connection, outdoor lighting installation, service connection and meter installation, and energized network.

<sup>34</sup> The execution of FERUM works with a medium-voltage network promotes the development of interconnections with Colombia (13.8 kV), which are part of an effort by both countries to provide electricity to border-area communities. Currently, 250 families in Puerto Ospina, Colombia, benefit from an interconnection with Puerto el Carmen, Ecuador, which provides a monthly average of 75,000 kWh. [Presidential Summit and Fourth Colombia - Ecuador Binational Cabinet, Cali, 15 December 2015. Presentation on the Infrastructure and Connectivity Action Focus.](#)



currently manages through a consolidated account. Through this account, payments to certified suppliers are guaranteed for the sale of EICs that residential users purchase on credit. Residential users who, through the [Efficient Cookstove Information System](#), comply primarily with not having past due electricity bills and having basic 220 V electricity infrastructure are eligible for loans. Loans have a three-year tenor at an interest rate of 7%, and are amortized through electricity bills. EIC loan repayments are transferred to the FCE consolidated account. EIC-certified suppliers process their sales through the Efficient Cookstove Information System. Every 15 days, MEER receives and reviews documentation for sales on credit, and requests applicable payments from the Ministry of Finance. By financing the FCE, the program will facilitate payments to suppliers for approximately 96,000 EICs sold on credit, as well as basic electricity installation.<sup>35,36</sup> As a result, the program will help achieve 15.8% of cumulative progress for the PNCE, based on a goal of 3 million EICs ([Efficient Cooking Program - Project Profile - 2013 Priority Update](#)) (paragraph 1.17).

- 1.29 **Component IV. Institutional capacity building.** This component will provide continuity for the process of institutional capacity building, pursuant to Public Electric Power Service Act (LOSPEE) guidelines. The program will finance studies of regional integration by the National Electricity Operator, as well as training workshops on project design, management, and monitoring for officials from the following electricity sector companies and institutions: electricity companies, MEER, and the Electricity Regulation and Control Agency.
- 1.30 **Cost and financing.** The program will have an estimated cost of US\$160.09 million, of which US\$118 million will be financed by the IDB from Ordinary Capital resources, US\$25 million by the Korea Infrastructure Development Cofinancing Facility for Latin America and the Caribbean (KIF), and US\$17.09 million from local resources.<sup>37</sup>

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<sup>35</sup> The estimated average sale price of an EIC is US\$520 (60% at US\$680 and 40% at US\$280).

<sup>36</sup> [Study of Cooking Habits. MEER-IDB, August 2014.](#)

<sup>37</sup> Subject to an agreement between the Japan Bank for International Cooperation and the Government of Ecuador, parallel financing of up to US\$50 million is expected to support progress of the PNCE through the FCE.

**Table 1. Program costs (in US\$000s)**

COMPONENTS	FINANCING			TOTAL
	OC	KIF <sup>38</sup>	LOCAL	
<b>Component I. Expansion and strengthening of the SNT</b>	<b>53,000</b>	<b>-</b>	<b>7,420</b>	<b>60,420</b>
Milagro-Babahoyo transmission system	17,587	-	2,462	20,049
Quevedo-San Juan de Manta transmission system	35,413	-	4,958	40,371
<b>Component II. Expansion and modernization of the SND</b>	<b>14,000</b>	<b>25,000</b>	<b>5,460</b>	<b>44,460</b>
Strengthening of the SND	-	9,439	1,322	10,761
Automation of the SND	-	5,432	760	6,192
FERUM with network expansion	13,007	10,129	3,239	26,375
FERUM without network expansion	993	-	139	1,132
<b>Component III. Implementation of the PNCE</b>	<b>50,050</b>	<b>-</b>	<b>3,269<sup>39</sup></b>	<b>53,319</b>
Efficient Cooking Fund	50,050	-	3,269	53,319
<b>Component IV. Institutional capacity building</b>	<b>727</b>	<b>-</b>	<b>159</b>	<b>886</b>
Institutional strengthening studies	727	-	102	829
Training workshops on management and monitoring	-	-	57	57
<b>Program administration</b>	<b>223</b>	<b>-</b>	<b>782</b>	<b>1,005</b>
Monitoring	-	-	151	151
Management unit	-	-	600	600
Midterm and final evaluations	90	-	13	103
External audits	133	-	18	151
<b>TOTAL</b>	<b>118,000</b>	<b>25,000</b>	<b>17,090</b>	<b>160,090</b>

**1.31 Economic and financial analysis.** An analysis that demonstrates the viability of investments was performed for each of the components and for the program as a whole. Returns were assessed at market prices and efficiency prices, using shadow prices. The economic assessment of each investment component, discounted at 12%, provided the following numbers for economic internal rate of return (EIRR) and economic net present value (ENPV): (i) Component I - EIRR = 32.9%; ENPV = US\$230,131,855; (ii) Component II - EIRR = 35.0%; ENPV = US\$40,872,661; and (iii) Component III - EIRR = 59.1%; ENPV = US\$51,990,540. An analysis of market prices provided the following numbers for internal rate of return (IRR) and net present value (NPV): (i) Component I - IRR = 21.7%; NPV = US\$123,214,670; (ii) Component II - IRR = 24.8%; NPV = US\$30,340,729; and (iii) Component III - IRR = 56.1%; NPV = US\$53,813,218. The results for the program overall yielded an EIRR of 36.6% and an ENPV of benefits to the country, discounted at 12%, of

<sup>38</sup> The program will receive cofinancing (15.6% of the total amount) from the KIF (see [Cofinancing approval from the Government of Korea](#)). These resources will fulfill the fund's financial priorities by financing key soft infrastructure, among others.

<sup>39</sup> Local contribution for household installation of the specific circuit that makes it possible to connect the EIC at 220 volts.



US\$320.5 million. At market prices, the IRR equaled 26% and the NPV equaled US\$204.4 million.

- 1.32 A sensitivity analysis was performed, varying the following identified parameters by +/-15%: (i) investment; (ii) volume of LPG for cooking; (iii) average sales price of energy; (iv) average energy consumption; (v) number of FERUM households with an informal connection; (vi) overconsumption factor via informal connection; (vii) average price of energy purchased; (viii) increase in customer base; (ix) energy losses; (x) price elasticity of demand; (xi) cost of unserved energy; (xii) service quality as TITk; and (xiii) average cost of maintenance. The parameters with the highest sensitivity are: (i) the electricity companies' energy sales price, which generates a  $\Delta$ NPV of US\$12 million and  $\Delta$ ENPV of US\$3.7 million; (ii) investment, which generates a  $\Delta$ NPV of US\$11 million and  $\Delta$ ENPV of US\$9.5 million; and (iii) monthly consumption per customer, which generates a  $\Delta$ NPV of US\$8 million and  $\Delta$ ENPV of US\$3.4 million. The program's [Economic and Financial Assessment](#) annex presents the various assumptions, scenarios, and outcomes from the assessment of each component and the entire program.

### C. Key results indicators

- 1.33 **Results Matrix.** The program has a Results Matrix that presents the outputs, outcomes, and impacts associated with the objectives and components. The expected impacts are: (i) improved quality of electricity service; (ii) increased average annual volume of regional energy exchange; (iii) improved electricity distribution service; (iv) reduced annual CO<sub>2</sub> emissions (kt of CO<sub>2</sub> equivalent/year); and (v) volume of LPG displaced by the PNCE.

## II. FINANCING STRUCTURE AND MAIN RISKS

### A. Financing instruments

- 2.1 The program is structured as a multiple-works loan, which is justified since the projects are physically similar but independent of each other. Of the 483 projects evaluated, 85% have final designs, equivalent to 55% of the program amount.<sup>40</sup> The program's procurement processes are described in the [procurement plan](#). The eligibility criteria are: (i) prioritization by SENPLADES; (ii) inclusion in the expansion plans for least-cost projects; (iii) contribution to strengthening the SND by 220 V; (iv) contribution to improving the quality of electricity service; and (v) fulfillment of economic and financial assessment criteria (paragraph 1.31).<sup>41</sup> Resources will be disbursed over four years:

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<sup>40</sup> [Technical Feasibility Report](#).

<sup>41</sup> Projects must have an EIRR of 12% or more, and the present value of billing must at least cover operating and maintenance costs.

**Table 2. Projected disbursements**

SOURCE	BUDGET	2016	2017	2018	2019	2020
Ordinary Capital	118,000,000	83,520,500	13,208,929	18,429,071	2,233,250	608,250
KIF <sup>42</sup>	25,000,000	12,500,000	7,842,850	4,657,150	0	0
<b>IDB TOTAL:</b>	<b>143,000,000</b>	<b>96,020,500</b>	<b>21,051,779</b>	<b>23,086,221</b>	<b>2,233,250</b>	<b>608,250</b>
Counterpart	17,040,000	3,319,220	6,660,158	6,002,578	735,275	322,769
<b>TOTAL:</b>	<b>160,040,000</b>	<b>99,339,720</b>	<b>27,711,937</b>	<b>29,088,799</b>	<b>2,968,525</b>	<b>931,019</b>

## **B. Environmental and social risks**

- 2.2 According to the Bank's Environment and Safeguards Compliance Policy (OP-703), the program has been classified as a category "B" operation. Projects will be implemented mostly in areas where there has already been intervention, taking advantage of existing transmission line corridors or urban and rural roads that are in service, streets, fences, or other linear structures. Clearing of vegetation will be minimal and will only be done in specific cases to prevent interference with conductor cables. There are no plans for involuntary resettlement or displacement of people. The program will produce positive impacts by improving the reliability and quality of the national electricity supply, reducing electricity losses, and helping to transport hydroelectricity. The potential negative social and environmental impacts will happen mainly during the new transmission and distribution line construction phase<sup>43</sup> and, to a lesser extent, during the operation of those lines. These impacts will be low or moderate and can be managed through standard procedures. The operation also triggers policies OP-102 (due to the possible lack of project environmental information), OP-704 scenario I (because of the need to incorporate resilience elements in the designs), and OP-765 (because of the inclusion of projects in indigenous areas),<sup>44</sup> the provisions for which will be considered in the Environmental and Social Management Plan (ESMP).
- 2.3 **Special contractual conditions of execution:** In order to begin the works under Components I and II, and pursuant to the Environmental and Social Management Report (ESMR), the executing agency will submit the following to the IDB: (i) environmental impact studies and the ESMP, including an execution budget; (ii) environmental license and permits pursuant to Ecuadorian legislation; (iii) the easement order pertaining to the new transmission and subtransmission lines; (iv) evidence of legal ownership of the land where substations will be located; (v) inclusion of the applicable environmental technical specifications and of the ESMP in the works and supervision contracts; (vi) evidence of at least one public consultation for each project, including: (a) project description; (b) description of probable impacts; (c) description of measures to manage the impacts identified (ESMP); (d) description of the system for receiving and processing complaints and claims; and (e) a channel for receiving suggestions on the proposed project. Every

<sup>42</sup> The scope of the KIF includes financing for the electricity distribution infrastructure under Component II.

<sup>43</sup> These include: (i) impact on air quality from the uncontrolled emission of particulate matter into the atmosphere as a result of the construction work involving transmission lines, distribution lines, and electrical substations; (ii) noise generated in the vicinity of works by operating construction machinery and equipment, particularly to install towers; (iii) generation of liquid, solid, and gaseous waste; and (iv) increased risk of accidents due to the presence of machinery, improper disposal of debris or materials, or lack of signage in work areas.

<sup>44</sup> [Environmental and Social Management Report](#).

six months, the Bank will oversee the environmental and social development of the projects, including visits to the works.

**C. Fiduciary risks**

- 2.4 Project completion reports for operations 2608/OC-EC and 2457/OC-EC showed that MEER and CELEC-EP successfully executed similar projects. However, given the level of coordination necessary to execute the program and the formation of a new program management unit (PMU), opportunities to improve the accountability processes through financial and procurement reports were identified. Improvements will be implemented as follows: (i) replicate the best practices identified in the execution of previous operations; (ii) use the SIGPRO project management system as the main support method for communications and monitoring of financing programs executed by MEER; and (iii) continue the IDB's training and support workshops for the executing agency. The identified risks are considered medium and are associated with delays in the transfer of loan proceeds from the Ministry of Finance to the executing agency, and the approval of procurement guarantees,<sup>45</sup> which impact execution time. Mitigation measures include conditions precedent to the first disbursement in the form of a subsidiary agreement and approval of the respective guarantees (paragraph 3.1). [Annex III \(Fiduciary Agreements and Requirements\)](#).
- 2.5 **Procurement risk.** The risks identified involve a lack of interest in the market in responding to bid solicitations and the capacity of the executing agency to conduct procurement in a timely manner pursuant to the Bank's policies (documents GN-2349-9 and GN-2350-9). The proposed mitigation measures are timely publication of the General Procurement Notice, continuation of training workshops on the proper preparation of bid documents, and early approval from the Ministry of Finance of the program's procurement guarantees. The IDB will oversee bidding through ex ante review in the case of works that exceed US\$3 million, goods over US\$250,000, consulting services over US\$200,000, and US\$50,000 for individual consultants. All others will be reviewed ex post.
- 2.6 **Execution risks.** The identified risks are considered low and are associated with: (i) changes in staff at the PMU and their commitment to the program; (ii) the capacity of the electricity companies to conduct environmental inspection of works; and (iii) the capacity of the executing agency to oversee the work of the electricity companies. The proposed mitigation measures are: (i) establish the basic team to be assigned full-time to the program and agree upon the selection profile; and (ii) contract supervision services, chargeable to the program, to support the electricity companies. Other identified risks that are considered medium are delays in program execution due to natural and anthropic phenomena. As a mitigation measure, the executing agency will propose the execution of priority works as part of the National Contingency Plan.

**D. Other special considerations and risks**

- 2.7 [Technical and economic viability](#). The program will finance investments in the SNT and the SND in order to provide continuity for the CME's investments. A

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<sup>45</sup> Pursuant to Ministerial Agreement 149 of 13 April 2015, the Ministry of Finance is required to prioritize and optimize public investment in procurement processes. This applies to all government agencies and institutions as well as public enterprises. After the budget certification is issued, in order to start the contracting processes, these entities will request that the Ministry of Finance issue procurement guarantees for the amounts certified and/or committed.

technical feasibility analysis of the projects was conducted, taking into account that the program was prepared as a multiple-works operation (paragraph 1.31). As part of the evaluation, a rigorous analysis of the financial and economic viability of the projects was conducted in parallel to determine their sustainability, in addition to a sensitivity analysis (paragraph 1.30).

### III. IMPLEMENTATION AND MANAGEMENT PLAN

#### A. Summary of implementation arrangements

- 3.1 MEER, as the sector's lead agency, will be the executing agency, pursuant to the same arrangement implemented in operations 2608/OC-EC, 3087/OC-EC, 3187/OC-EC, and 3188/CH-EC. MEER will have support from the PMU and technical assistance from the electricity companies. Based on MEER's experience with the aforementioned operations and the design of the program's management documents, the operation's execution period is four years (paragraph 2.1).
- 3.2 Execution of the following activities will be part of the special contractual conditions precedent to the first disbursement<sup>46</sup> and must have the IDB's no objection: **(i) signature and entry into effect of a subsidiary agreement between the Ministry of Finance and the executing agency, indicating that loan proceeds will be transferred to, and recorded in a timely manner under, the program's codified account and used according to the terms and purposes agreed upon in the loan contract; (ii) approval of the program's Component I and II procurement guarantees by the Ministry of Finance; (iii) creation of a Third Party Fund account at the Central Bank for FCE administration; (iv) establishment by the executing agency of a PMU that will execute the program, comprised of at least a general coordinator, a procurement specialist, a financial specialist, a planning and monitoring specialist, an environmental specialist, and an electrical engineer; (v) presentation and entry into force of a Program Operations Manual approved by MEER that includes a frame of reference for the environmental and social management of the projects through monitoring records; and (vi) demonstration by the executing agency to the Bank's satisfaction that enough resources have been earmarked to cover program execution, at least during the first calendar year.**
- 3.3 **Program Operations Manual (POM).** The program must have procedures and eligibility criteria clearly established in the POM (paragraph 2.1), including an extensive system for monitoring and evaluation of actions and outcomes. Submission of the POM duly approved by MEER, and its entry into effect, will be a special condition precedent to the first disbursement (paragraph 3.1).
- 3.4 **Procurement plan and procurement policies.** A procurement plan has been agreed upon for the first 12 months of execution. The executing agency will update the procurement plan annually to coincide with annual evaluations and before the end of each calendar year, or whenever substantial changes occur. An execution and monitoring system to be determined by the IDB will be used to update the procurement plan. The different types of procurement of goods, works, and

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<sup>46</sup> Program execution will be based on the documents included in the initial report, pursuant to paragraph 4.01(d) of the General Conditions of the loan contract. The PMU will review and update these documents as established in the General Conditions and submit them to the Bank for its no objection.

consulting services will be conducted pursuant to policy documents GN-2349-9 and GN-2350-9, respectively.

- 3.5 **Disbursements and advances of funds.** Loan disbursements will be made using the advance of funds modality, according to the program's estimated liquidity needs, based on the [annual work plan](#) and the [procurement plan](#). The programming of cash needs will have a moving horizon of 12 months, and advances will cover the requirements for six months of execution (paragraph 2.1).
- 3.6 **Retroactive financing and recognition of expenditures.** The Bank may retroactively finance up to US\$28.6 million (20% of the loan) against the loan proceeds, and recognize up to US\$3.4 million (20% of the local contribution) as part of the local contribution, in eligible expenditures incurred by the executing agency prior to the loan approval date, for payments made for advance procurement and progress on the works, provided that they satisfied requirements substantially analogous to those established in the loan contract. Such expenditures must have been made on or after 25 February 2016 (project profile approval date), but in no case may they include expenditures made more than 18 months prior to the loan approval date.
- 3.7 **Audits.** External audit services for the program will be provided by a firm of external auditors acceptable to the IDB, to be paid from the loan proceeds and contracted based on terms of reference agreed upon with the executing agency.

**B. Summary of arrangements for monitoring results**

- 3.8 **Monitoring arrangements.** The IDB team will conduct semiannual technical visits to the executing agency in order to review progress of works and make adjustments based on execution. Fiduciary oversight visits will be conducted once a year. External audits of accounting and operations are planned, to validate the use of the loan proceeds and the operational internal controls and processes to be implemented by the executing agency. The information compiled will be analyzed every six months and the monitoring and progress report will be prepared on an annual basis (see [Monitoring and Evaluation Plan](#)).
- 3.9 **Evaluation arrangements.** Program evaluation includes one midterm and one final evaluation, financed by the executing agency from loan proceeds. The executing agency will commission the midterm evaluation within a maximum of two months after 50% of loan proceeds are committed. The executing agency will commission the final evaluation within a maximum of two months after 95% of the loan proceeds are disbursed. These evaluations will be conducted according to the Bank's Project Completion Report guide. The final evaluation will determine the level of attainment of the targets established in the Results Matrix. The executing agency will present semiannual and annual reports in accordance with the program's Monitoring and Evaluation Plan.

Development Effectiveness Matrix			
Summary			
I. Strategic Alignment			
1. IDB Strategic Development Objectives		Aligned	
Development Challenges & Cross-cutting Themes		-Social Inclusion and Equality -Economic Integration -Gender Equality and Diversity -Climate Change and Environmental Sustainability	
Regional Context Indicators		-Growth rate of the value of total exports of goods and services (%) -Greenhouse gas emissions (kg of CO2 e per \$1 GDP (PPP))	
Country Development Results Indicators		-Reduction of emissions with support of IDBG financing (annual million tons CO2 e) -Installed power generation from renewable energy sources (%)	
2. Country Strategy Development Objectives		Aligned	
Country Strategy Results Matrix		GN-2680	(i) Increase in electricity coverage, (ii) Diversified national energy matrix, (iii) Increased energy efficiency.
Country Program Results Matrix		GN-2849	The intervention is included in the 2016 Operational Program.
Relevance of this project to country development challenges (If not aligned to country strategy or country program)			
II. Development Outcomes - Evaluability		Highly Evaluable	WeightMaximum Score
		9.2	10
3. Evidence-based Assessment & Solution		10.0	33.33%10
3.1 Program Diagnosis		3.0	
3.2 Proposed Interventions or Solutions		4.0	
3.3 Results Matrix Quality		3.0	
4. Ex ante Economic Analysis		10.0	33.33%10
4.1 The program has an ERR/NPV, a Cost-Effectiveness Analysis or a General Economic Analysis		4.0	
4.2 Identified and Quantified Benefits		1.5	
4.3 Identified and Quantified Costs		1.5	
4.4 Reasonable Assumptions		1.5	
4.5 Sensitivity Analysis		1.5	
5. Monitoring and Evaluation		7.5	33.33%10
5.1 Monitoring Mechanisms		2.5	
5.2 Evaluation Plan		5.0	
III. Risks & Mitigation Monitoring Matrix			
Overall risks rate = magnitude of risks*likelihood		Low	
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.
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		Yes	Workshops on procurement and financial analysis were delivered, including one on the SIGPRO system for the executing agency and staff from the energy distribution companies.
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 is Highly Evaluable.

Since 2014, the Bank has been supporting the Electrification Master Plan (EMP). As in previous operations, the diagnosis is complete. The EMP raises the need to increase electricity supply, strengthen and expand the National Transmission System and the National Distribution System, and advance the transition to a new energy matrix. In addition, and as Ecuador suffered a severe earthquake in April 2016 that affected energy infrastructure, the program also funds repairing the affected infrastructure.

The proposed project is clearly linked with the diagnosis and will continue supporting the transformation of the energy matrix, financing four components: (i) Expansion and strengthening of the National Transmission System, (ii) Expansion and modernization of the National System Distribution, (iii) Implementation of the National Program for Efficient Cooking, and (iv) Development of institutional capacities.

The intervention has clear vertical logic and its ultimate impacts are associated with the project's contribution to improving the quality and continuity of service climate change mitigation. The proposed project has a comprehensive economic analysis for each component and for the entire project, and proposes an evaluation plan which includes an ex post economic analysis and a before-after evaluation.

## RESULTS MATRIX

<b>Project objective:</b>	The objective is to support the progress of the Energy Matrix Transition, improve the sector's indicators, and support the recovery plan for the areas damaged by the earthquake. The specific objectives are to: (i) pursue National Transmission Network (SNT) projects that facilitate transportation of energy from new generation and reinforce domestic infrastructure; (ii) strengthen and expand the National Distribution Network (SND) in rural and marginal urban areas and contribute to rebuilding the infrastructure in areas damaged by the earthquake; (iii) support the progress of the National Efficient Cooking Program (PNCE); and (iv) provide institutional strengthening in service management.
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## EXPECTED IMPACT

Indicators	Unit of measure	Baseline		Targets		Means of verification	Remarks
		Value	Year	Value	Year		
Impact							
Improvement in SNT service quality (reduction in unserved energy due to failures and maintenance)	MWh/year	233,662	2015	93,586	2020	Program progress report	Empresa Pública Estratégica Corporación Eléctrica del Ecuador (CELEC-EP) - Transelectric
Average annual volume of regional energy exchanges (Ecuador-Colombia-Peru)	GWh/year	496	2015	867	2020		
Improvement in continuity of electricity distribution service - reduction in unserved energy	MWh/year	0	2015	600	2020		
Climate change mitigation - reduction in annual CO <sub>2</sub> emissions as a result of shifting from liquefied petroleum gas (LPG) to electricity (kt of CO <sub>2</sub> eq/year)	kt of CO <sub>2</sub> eq/year	169.81	2015	41.58	2020		
Volume of LPG displaced by the National Efficient Cooking Program (PNCE)	BOE	434,543	2015	94,200	2020		

<sup>1</sup> Methodology for calculating reduced CO<sub>2</sub> emissions from LPG.

### OUTCOMES EXPECTED

Outcomes expected	Unit of measure	Baseline		Intermediate		Targets		Means of verification	Remarks
		Value	Year	Value	Year	Value	Year		
Component I - Expansion and strengthening of the SNT									
Increase in kilometers of 230-kV transmission lines	Kilometers	2,166.4	2015	2,175	2018	2,253.4	2020	Program progress report	CELEC EP- Transelectric
New transformation capacity installed in the SNT	MVA	9,343	2015	9,409.7	2018	9,634.7	2020		
Component II - Expansion and modernization of the SND									
AIFk: Average interruption frequency per kVA	Times/year	8.27	2015	7.01	2018	6.87	2020	Program progress report	MEER
TITk: Total interruption time per kVA (hours)	Hours/year	7.17	2015	6.85	2018	6.82	2020		
Households without electricity service and households with improved electricity service, covered by the program	Number	0	2015	8,272	2018	16,544	2020		
Afro-Ecuadorian and indigenous customers who benefit from the program	Number	0	2015	4,579	2018	8,718	2020		



Outcomes expected	Unit of measure	Baseline		Intermediate		Targets		Means of verification	Remarks
		Value	Year	Value	Year	Value	Year		
Component III - Implementation of the PNCE									
Number of electric induction cookstoves (EICs) sold using the Efficient Cooking Fund (FCE) <sup>2</sup>	Number	270,000	2015	366,000	2018	366,000	2020	Program progress report	MEER
Component IV - Institutional capacity building									
Institutions strengthened on regional energy integration	Number of institutions	0	2015	1	2018	2	2020	Program progress report	MEER
Electricity companies and institutions trained on management and monitoring as per the Public Electric Power Service Act (LOSPEE)	Number of electricity companies	0	2015	16	2018	21	2020		
Women trained under the program	Number of women	0	2015	15	2018	20	2020		

<sup>2</sup> With this program, 96,000 EICs are expected to be incorporated. An average weighted price per kitchen is considered to be US\$520.

## PRODUCTS

Products	Estimated cost (US\$)	Unit of measure <sup>3</sup>	2015 baseline	Year					Final target	Means of verification	
				1	2	3	4	5			
Component I: Expansion and reinforcement of the SNT											
C I.1 Milagro - Babahoyo transmission system											
Construction of the Milagro - Babahoyo 230-kV, 47-kilometer, double-circuit, 1200-ACAR transmission line	15,163,582	%	5	10	50	70	90	100	100	Program progress report	
Milagro electrical substation, 138-kV expansion	1,188,621	%	5	10	50	70	90	100	100		
Babahoyo electrical substation, 138-kV/69-kV expansion	3,696,406	%	5	10	50	70	90	100	100		
C I.2 Stage II Quevedo - San Gregorio transmission system and San Gregorio - San Juan de Manta transmission system											
Quevedo electrical substation, 230-kV expansion, Bahía line 1 expansion	1,332,340	%	5	10	50	70	90	100	100	Program progress report	
San Gregorio substation, 230-kV yard expansion, Quevedo and San Juan de Manta connection	4,383,377	%	5	10	50	70	90	100	100		
Construction of the San Gregorio - San Juan de Manta 230-kV, 35-kilometer, double-circuit, 1200-ACAR transmission line (installation of two circuits)	13,491,316	%	5	10	50	70	90	100	100		
Construction of the San Juan de Manta electrical substation, 230 kV/69 kV, 225 MVA	21,164,358	%	5	10	50	70	90	100	100		

<sup>3</sup> The progress in percentages includes these stages: for transmission lines and electrical substations: study and designs (5%); precontract (5%); supplies, equipment, and materials (40%); civil works (20%); electromechanical works (20%); testing and electrification (10%) - Reference: report from Electricity Regulation and Control Agency.

Products	Estimated cost (US\$)	Unit of measure <sup>3</sup>	2015 baseline	Year					Final target	Means of verification
				1	2	3	4	5		
Component II: Expansion and modernization of the SND										
C II.1 Strengthening										
Subtransmission projects, inspected and operational	5,640,967	Number of projects	0	0	2	7	0	0	9	Program progress report
Distribution projects, inspected and operational	5,119,493	Number of projects	0	0	4	14	0	0	18	
C II.2 Automation										
Projects to automate substations, inspected and operational	720,480	Number of projects	0	0	3	8	0	0	11	Program progress report
Projects to automate feeders, inspected and operational	5,472,000	Number of projects	0	0	12	28	0	0	40	
C II.3 Electrification in rural and marginal urban areas										
Rural electrification projects with network expansion, inspected and operational	26,374,796	Number of projects	0	0	79	119	192	0	390	Program progress report
Rural electrification projects without network expansion, inspected and operational	1,132,264	Number of projects	0	0	0	2	5	0	7	
Component III: Implementation of the PNCE										
Induction cookstoves financed under this program	50,000,000	Units sold	0	40,000	56,000	0	0	0	96,000	
Express circuits, installed	3,269,000	Number of circuits	0	40,000	56,000	0	0	0	96,000	

Component IV: Institutional capacity building										
Studies performed to support institutional strengthening in the electricity sector based on the LOSPEE and for regional electricity integration	828,780	Number of studies	0	0	3	2	1	0	6	
Capacity-building training workshops on management and monitoring (companies and institutions), following the LOSPEE's guidelines, conducted	57,000	Number of training workshops	0	0	1	0	0	0	1	

## FIDUCIARY AGREEMENTS AND REQUIREMENTS

<b>Country</b>	Ecuador
<b>Project number:</b>	Investment Plan to Support the Transition of the Energy Matrix in Ecuador (EC-L1160)
<b>Executing agency:</b>	Ministry of Electricity and Renewable Energy (MEER)
<b>Prepared by:</b>	Gumersindo Velázquez and Gustavo Palmerio (FMP/CEC)

### I. SUMMARY

- 1.1 The institutional assessment for the program's fiduciary management was based on: (i) the fiduciary context of the country; (ii) the outcomes of the fiduciary risk assessment; (iii) the supervision activities for execution of projects 3087/OC-EC, 3167/OC-EC, 3187/OC-EC, 3188/CH-EC, 3494/OC-EC, and 3494/CH-EC; and (iv) inputs from meetings with personnel from MEER and entities involved in program execution. As a result, the following fiduciary agreements have been prepared.

### II. FIDUCIARY CONTEXT OF THE COUNTRY

- 2.1 **Procurement system.** On 25 February 2013, the Bank's Board of Executive Directors approved the use of the National Public Procurement System for procurement below the threshold for international competitive bidding (ICB) (smaller works below US\$3,000,000, goods and services below US\$250,000, and consulting firm services below US\$200,000). For all other cases, the IDB's procurement and consulting services policies will apply.
- 2.2 **Financial management system.** Since January 2008, government entities have been using the e-SIGEF financial administration system, which efficiently integrates the budget, accounting, treasury, and electronic payments processes, a centralized information technology structure, and the use of web technology. In addition, central government entities are subject to control and monitoring by the supreme audit institution, the Office of the Comptroller General (CGE). In general, the country financial management systems have an acceptable level of development. However, they need to be supplemented for the time being in order to execute Bank-financed projects, as far as specific financial reports and external audits (to be performed by a firm acceptable to the Bank).

### III. FIDUCIARY CONTEXT OF THE EXECUTING AGENCY

- 3.1 The executing agency is MEER, with participation from electricity companies and the Corporación Eléctrica del Ecuador [Electricity Corporation of Ecuador] (CELEC-EP). MEER is the lead agency for electricity sector policy, subject to the Public Electric Power Service Act (LOSPEE) and MEER policies.

- 3.2 MEER uses Ecuador's country procurement and financial management systems. The CGE exercises internal control of MEER through MEER's internal audit unit.
- 3.3 The same execution structure used in this program is used successfully in the operations mentioned in paragraph 1.1. As the executing agency, MEER demonstrated that it documents, approves, and formalizes all its activities through its information system and that it has employees who have been gaining experience in administering financial management and procurement processes in Bank-financed operations.
- 3.4 In April 2015, an analysis with the SIGPRO project management system showed satisfactory outcomes. SIGPRO systematizes the prioritization, monitoring, control, and settlement processes of MEER's current projects, and includes lessons learned during the execution of the operations mentioned in paragraph 1.1.

#### IV. FIDUCIARY RISK EVALUATION AND MITIGATION MEASURES

- 4.1 Based on the assessments conducted and using the information available from the program, fiduciary risks were identified and included in the respective risk matrix:
  - a. **Weaknesses in the accountability process.** Factors: (i) multiple actors and works; (ii) lack of uniformity in the procedures used by the electricity companies for project execution; and (iii) geographically decentralized records at the electricity companies. Impact: Delays in proper delivery of reports and financial statements. Mitigation measures: (i) replicate the best practices identified from the execution of operations 2608/OC-EC, 3087/OC-EC, 3187/OC-EC, and 3494/CH-EC; (ii) continue to support monitoring and improvement of SIGPRO, which is the main communications and monitoring system for the programs; (iii) conduct training and awareness workshops on processes for key electricity company personnel; and (iv) provide support, training, and assistance for program execution through the Bank's fiduciary team.
  - b. **Insufficient market capacity to respond to bid solicitations.** Factors: The local and international markets must have the capacity to provide the materials, equipment, and labor called for in the bid solicitations for project construction. Impact: Execution delays and lost opportunity costs. Mitigation measures: (i) solicitations will take into account materials, equipment, and labor that meet domestic and international standards; and (ii) the program's General Procurement Notice will feature business opportunities, and efforts will be made throughout the year to announce bid solicitations in the media outlets as necessary to ensure broad dissemination.
  - c. **Cash flow delays from the Ministry of Finance to the executing agency.** Factors: The current fiscal situation may cause delays in transferring proceeds from the National General Treasury Account (CUT) to the executing agency. Impact: Execution delays and lost opportunity costs due to nonpayment to contractors and suppliers. Mitigation measures: Include in interagency agreements a commitment to transfer loan proceeds to the executing agency in a timely manner once each fund advance is received from the Bank.

- d. **Execution delays in the program's procurement plan.** Factors: Because of a complicated fiscal situation, the Ministry of Finance may have delays in issuing procurement guarantees<sup>1</sup> for the program. Impact: Execution delays due to a failure to initiate contracting processes. Mitigation measures: Early approval of the program's procurement guarantees by the Ministry of Finance.

## **V. CONSIDERATIONS FOR THE SPECIAL CONDITIONS OF THE CONTRACT**

- 5.1 For consideration: approval of the Program Operations Manual (POM).

## **VI. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION**

- 6.1 **Procurement execution.** The executing agency is expected to use the execution and monitoring system that the Bank determines. The initial procurement plan will cover the first 18 months and will be updated annually or as necessary.
  - a. **Procurement of goods, works, and nonconsulting services (procurement policy document GN-2349-9).** The threshold for the use of ICB<sup>2</sup> will be made available to MEER at [www.iadb.org/procurement](http://www.iadb.org/procurement). Contracts for goods, works, and nonconsulting services generated under the program and subject to ICB will be executed using the standard bidding documents issued by the Bank. Bid solicitations subject to national competitive bidding (NCB) and the shopping method will be executed using documents agreed upon with the Bank.
  - b. **Selection and contracting of consultants.** For the selection and contracting of consulting services (document GN-2350-9), any of the methods described in those policies may be used, provided that said method has been identified in the procurement plan approved by the Bank, which may be updated as necessary. The threshold for the formation of the shortlist with international consultants<sup>3</sup> will be made available to the program at [www.iadb.org/procurement](http://www.iadb.org/procurement). Contracts for consulting services firms generated under the program will be executed using the standard request for proposals issued by the Bank.
  - c. **Selection of individual consultants.** In the cases identified in the approved procurement plans, the contracting of individual consultants may be requested through notices in order to create a shortlist of qualified candidates, as set out in document GN-2350-9, section V, paragraphs 5.1 to 5.4.

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<sup>1</sup> Pursuant to Ministerial Agreement 149 of 13 April 2015, the Ministry of Finance is required to prioritize and optimize public investment in procurement processes. This applies to all government agencies and institutions as well as public enterprises. After the budget certification is issued, in order to initiate contracting processes, these entities will request that the Ministry of Finance issue procurement guarantees for the amounts certified and/or committed.

<sup>2</sup> For works, the current threshold for ICB is applicable for amounts of US\$3,000,000 or more. For goods and nonconsulting services, ICB is applicable for amounts of US\$250,000 or more.

<sup>3</sup> For contracting consulting firms, the threshold is for amounts of US\$200,000 or more. For amounts below that, the shortlist may comprise national consulting firms.

- d. **Training.** The procurement plan lists the program procurement processes that involve training and are contracted as nonconsulting services.
- e. **Use of the country procurement system.** The National Public Bidding System<sup>4</sup> will be used in IDB-financed projects for contracts to supply goods and nonconsulting services, and construction works with an estimated cost below that established by the Bank for Ecuador for ICB,<sup>5</sup> as well as for consulting services involving amounts below those for the international shortlist.
- f. **National preference.** Offers of goods originating in the country of the borrower will have a price preference<sup>6</sup> equivalent to 15% in contracts subject to ICB.
- g. **Retroactive financing and recognition of expenditures.** The Bank may retroactively finance up to US\$28.6 million (20% of the loan) against the loan proceeds, and recognize up to US\$3.4 million (20% of the local contribution) as part of the local contribution, in eligible expenditures incurred by the executing agency prior to the loan approval date, for payments made for advance contracting and progress on the works, provided that they satisfied requirements substantially analogous to those established in the loan contract. Such expenditures must have been made on or after 25 February 2016 (project profile approval date), but in no case may they include expenditures made more than 18 months prior to the loan approval date.
- h. **Others.** Component III: Implementation of the National Efficient Cooking Program (PNCE). This component will provide financing to the Efficient Cooking Fund (FCE), which backs the loans issued to users for electric-induction cookstoves (EICs). The fund will guarantee payments for approximately 96,000 EICs, which cost an average of US\$520. At this time, there are approximately 1,230 points of sale (retailers) where users can purchase the cookstoves.

## 6.2 Threshold amounts for ICB and shortlist with international consultants.

**Table VI-1. Table of threshold amounts (US\$000)**

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

- 6.3 The procurement specialist will be responsible for the main procurement processes, since they are part of the Fiduciary Agreements and Requirements. The program's most significant procurement processes will be prepared with

<sup>4</sup> If the IDB validates another system or subsystem, it will apply to the operation, pursuant to the provisions of the loan contract.

<sup>5</sup> For amounts below these thresholds, NCB or other competitive methods may be used, depending on the value and nature of the procurement.

<sup>6</sup> Policies for the Procurement of Goods and Works Financed by the IDB ([GN-2349-9](#)), Appendix 2, and the loan contract.



information generated to prepare the procurement plan, through joint work by the procurement specialist, the executing agency's purchasing and technical units, and the sector specialist, aligned with the operation's outcomes and outputs. After the loan has been approved, the executing agency will be responsible for preparing the procurement plan,<sup>7,8</sup> and the procurement specialist will verify that it complies with procurement policies.

**Table VI-2. Main procurement processes**

Activity	Bidding method	Estimated date for consulting services/notice	Estimated amount (US\$)
<b>1.- Works</b>			
Construction of the Milagro - Babahoyo transmission system	ICB	2nd half 2016	20,048,608.63
Construction of the Quevedo - San Gregorio - San Juan transmission system			40,371,391.37
Installation of CNEL GUAYAQUIL electricity networks			5,239,146.65
<b>2.- Goods</b>			
Materials to automate feeders	ICB	2nd half 2016	4,651,200.00
<b>3.- Consulting services firms</b>			
Oversight, supervision, and publicizing of works. See expanded procurement plan	QCBS	2nd half 2017	2,826,277.54
<b>4.- Individual consulting services</b>			
Works supervision. See expanded procurement plan	Comparison of qualifications	2nd half 2016	207,473.21
<b>5.- Transfers</b>			
Implementation of the PNCE	Financing for FCE	2nd half 2016	50,000,000.00

- 6.4 **Procurement supervision.** Contracts subject to ex post review by the Bank will be listed below and performed according to the provisions of Appendix I of the respective policies. Contracts for amounts equal to or greater than those indicated in that table will be subject to ex ante review. Ex post review visits by the Bank will be conducted at least once every 12 months and reports will include at least one physical inspection visit, when applicable.

**Table VI-3. Ex post review thresholds (US\$)**

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

Note: The threshold amounts for ex post review are based on the fiduciary capacity of the executing agency and may be modified by the Bank in the event of changes in such capacity.

<sup>7</sup> Policies for the Procurement of Goods and Works Financed by the IDB (document [GN-2349-9](#)), paragraph 1.16; Policies for the Selection and Contracting of Consultants (document [GN-2350-9](#)), paragraph 1.23: The borrower must prepare, and, prior to loan negotiations, submit to the IDB for approval, a procurement plan acceptable to the Bank for an initial period of at least 18 months.

<sup>8</sup> See [Guide for the Preparation and Implementation of the Procurement Plan](#).

- 6.5 **Special provisions.** Measures to reduce the likelihood of corruption: Adherence to the provisions of documents GN-2349-9 and GN-2350-9 regarding prohibited practices (lists of ineligible firms and individuals of multilateral organizations).
- 6.6 **Records and files.** The executing agency will maintain updated records and files duly organized with procurement-related documentation in a single file or folder, so they can be clearly differentiated from processes financed with local counterpart resources or financed with program resources.

## VII. FINANCIAL MANAGEMENT AGREEMENTS AND REQUIREMENTS

- 7.1 **Programming and budget.** The legal instrument establishing the general rules governing budget programming, formulation, approval, execution, control, evaluation, and settlement is the Planning and Public Finance Code. These general rules apply to the execution of Bank-financed programs. The integrated e-SIGEF implements and standardizes the application of these general rules for national public management. The program budget will be calculated on the basis of the annual work plan and will serve as the basis for its formal inclusion in MEER's general budget, which is included in the budget proposal submitted to the legislature for approval.
- 7.2 MEER will manage disbursements and budgetary allocations for the program and will monitor quarterly budget execution through its internal systems.
- 7.3 **Accounting and information systems.** The e-SIGEF is used for government accounting, with parameters based on the government accounting chart of accounts issued by the Ministry of Finance. Official accounting for projects receiving external financing is conducted through the e-SIGEF, pursuant to the government accounting chart of accounts and the budget classifier. Although the e-SIGEF currently allows reports to be prepared for the resources provided by the IDB from the Ordinary Capital and other sources of financing (e.g. Korean Fund), they do not provide the necessary level of detail and breakdown on all specific aspects. Therefore, separate reports are needed to show the status and development of the projects.
- 7.4 Based on the above, an agreement was reached to use the SIGPRO system for the program's technical and financial monitoring.
- 7.5 **Disbursements and cash flow.** Since 2008, the Government of Ecuador has been using the CUT mechanism, unifying treasury management for all central government entities.
- 7.6 The implementation of this mechanism did not eliminate the system of special accounts, or of specific-purpose accounts, which are kept at the Central Bank of Ecuador to receive financing from multilateral loans, including those of the IDB. Therefore, to receive loan proceeds, MEER will open accounts for the program at the Central Bank of Ecuador, one corresponding to the IDB-Ordinary Capital financing and the other to the Korea Infrastructure Development Cofinancing Facility for Latin America and the Caribbean (KIF).<sup>9</sup> All program payments will be made through the e-SIGEF by debiting the CUT.

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<sup>9</sup> Subject to an agreement between the Japan Bank for International Cooperation and the Government of Ecuador, parallel financing of up to US\$50 million is expected to support PNCE, through the FCE.

- 7.7 In addition, in order to manage the proceeds for Component III, implementation of the PNCE, a Third Party Fund account will be opened in the Central Bank of Ecuador to administer the FCE. This account will be used to receive loan proceeds and make payments for this component.
- 7.8 Program disbursements will be made according to the program's actual liquidity requirements, taking financing sources into account separately, using the advance of funds modality and following a financial plan for a nine-month period. The financial plans will be prepared at the start of the program and updated pursuant to its development.
- 7.9 The executing agency will submit each disbursement request to the IDB, along with the financial plan, cash flow, and a reconciled accounting of funds available for each source of financing. Advances of funds will be justified as established in the "Financial Management Policy for IDB-financed Projects" (document OP-273). Supporting documentation for disbursements will be provided with the next request, once a minimum of 80% of the total advances have been executed.
- 7.10 Supporting documentation for expenditures or payments made for each source will be subject to ex post review after the Bank disburses the resources.
- 7.11 **Internal control and internal audit.** The Constitution of the Republic of Ecuador establishes that the CGE is responsible for directing the public sector control system. As part of that sector, MEER has its own internal audit unit that reports directly to the CGE. However, the Bank will not use its services, since that unit did not include review of the project in its audit plans. The POM will include the main internal control processes necessary to ensure that the controls are operating effectively.
- 7.12 **External control and reporting.** Given that the General Planning Coordination Office does not, at this time, have sufficient capacity to exercise control of projects financed with external borrowing resources, external audits will be conducted by level-one independent auditors acceptable to the Bank (international audit firms), in accordance with IDB requirements. During execution, on an annual basis within 120 days after the closing date of each fiscal year, MEER will submit audited financial reports for the program and reports on the eligibility of expenditures, in accordance with the Bank's guidelines and pursuant to the previously approved terms of reference. The costs of the audit will be covered by the IDB loan proceeds (Ordinary Capital).
- 7.13 There is no national policy regarding public disclosure of audit reports; however, pursuant to the current policy on information access and disclosure, the program's audited reports must be published in the Bank's systems.

**Table VII-1. Supervision plan**

Supervision	Nature and scope	Frequency	Responsible party	
			IDB	Third party
Operational	Review of the progress report	Semiannual	Fiduciary and sector team	
	Review of the portfolio with the executing agency and Ministry of Finance	Pursuant to the Ministry of Finance's requirements		
Financial	Inspection visits	Annual	Fiduciary specialist	
	Review of audited and unaudited financial reports			MEER
	Ex post review of disbursements			
	Review of disbursement requests	Periodic	Fiduciary and sector team	
Procurement	Ex ante review of procurement	Initially, during first year	Project team leader and procurement specialist	MEER
	Updated procurement plan	Annual		
Compliance	Fulfillment of conditions precedent	Once	Fiduciary and sector team	
	Review of budget allocation	Annual		MEER
	Delivery of audited financial statements	Annual	Project team leader and fiduciary specialist	

- 7.14 **Execution mechanism.** MEER will be responsible for the program's financial administration and internal control.
- 7.15 Within MEER, the General Planning Coordination Office will lead program execution as well as the contracting and review of studies, if necessary.
- 7.16 All administrative activity (budget, accounting, payments, etc.) will be handled by MEER through its Finance Division with support from the General Planning Coordination Office, which will monitor the applicable contracts, payments, documentation, and reports. To do so, a program management unit (PMU) will be formed and devoted full-time to program execution. The PMU must be made up of professionals with relevant experience in executing programs of this kind and have personnel trained to perform accounting and financial reporting functions.
- 7.17 The PMU will prepare its cash flow projections, applicable requests, and supporting documentation for the use of funds, submitting the relevant documents to the Bank pursuant to the requested formats and requirements. It will be responsible for program leadership vis-à-vis the Bank, coordinating with the parties involved, and preparing any management information to be submitted, including progress reports, annual work plans, multiyear execution plans, and audit and evaluation reports.

- 7.18 Given that there will be external financing from different sources within the same program (the Ordinary Capital and the KIF), the financial and management information referenced in the preceding paragraph must provide breakdowns per funding source, to allow for planning, monitoring, and accounting separately, as well as in consolidated form.
- 7.19 The POM will establish in detail the program execution mechanism, the composition of the PMU, and the mechanisms for recording, communications, and reporting.
- 7.20 Procurement plan:  
<https://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=40193625>.

**Investment Plan to Support the Transition of the Energy Matrix in Ecuador**

**EC-L1160**

**CERTIFICATION**

The Grants and Co-Financing Management Unit (ORP/GCM) certifies receipt of the non-objection from Mr. Sungsik Jeon, of Ministry of Strategy and Finance Republic of Korea dated May 31, 2016 for the amount of **US\$25,000,000** chargeable against the Korea Infrastructure Development Co-financing Facility for Latin America and the Caribbean (KIF).

Original Signed

Sonia M. Rivera

Chief

Grants and Co-Financing Management Unit  
ORP/GCM

06/17/2016

Date

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-\_\_\_/16

Ecuador. Loan \_\_\_\_/OC-EC to the Republic of Ecuador  
Investment Plan to Support the Transition of the  
Energy Matrix 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 an investment plan to support the transition of the energy matrix in Ecuador. Such financing will be for the amount of up to US\$118,000,000 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 \_\_\_\_ 2016)

EC-L1160  
LEG/SGO/CAN/IDBDOCS#40371621

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-\_\_\_/16

Ecuador. Loan \_\_\_\_/KI-EC to the Republic of Ecuador  
Investment Plan to Support the Transition of the  
Energy Matrix 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, acting as Administrator of the Korea Infrastructure Development Co-financing Facility for Latin America and the Caribbean (hereinafter, the "Facility"), to enter into such contract or contracts as may be necessary with the Republic of Ecuador, as Borrower, for the purpose of granting it a financing to cooperate in the execution of an investment plan to support the transition of the energy matrix in Ecuador. Such financing will be for an amount of up to US\$25,000,000 from the resources of the Facility, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

(Adopted on \_\_\_\_ 2016)