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BOLIVIA

PROGRAM FOR THE DEVELOPMENT OF ENERGY EFFICIENCY IN STREET LIGHTING SYSTEMS IN BOLIVIA

(BO-L1230)

LOAN PROPOSAL

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ABBREVIATIONS

AETN	Autoridad de Fiscalización de Electricidad y Tecnología Nuclear (Electricity and Nuclear Technology Oversight Authority)
CO_2	Carbon dioxide
ENDE	Empresa Nacional de Electricidad (National Electricity Company)
ENPV	Economic net present value
ESA	Environmental and social analysis
ESAP	Environmental and social action plan
ESMF	Environmental and social management framework
ESMP	Environmental and social management plan
GWh	Gigawatt-hour
ICB	International competitive bidding
ICAP	Institutional Capacity Assessment Platform
IEA	International Energy Agency
INE/ENE	Energy Division
INE	Instituto Nacional de Estadística (National Institute of Statistics)
IRR	Internal rate of return
kWh	Kilowatt-hour
LED	Light-emitting diode
MDB	Multilateral development bank
MHE	Ministry of Hydrocarbons and Energy
NCB	National competitive bidding
NDC	Nationally Determined Contribution
PEU	Program execution unit
QCBS	Quality- and cost-based selection
SDG	Sustainable Development Goal
SIGEP	Sistema De Gestión Pública (Public Management System)
SIN	Sistema Interconectado Nacional (National Interconnected System)
TSA	Treasury Single Account
VMEER	Office of the Deputy Minister for Electricity and Renewable Energies

PROJECT SUMMARY
BOLIVIA
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(BO-L1230)

<table>
<tr><th colspan="6">Financial Terms and Conditions</th></tr>
<tr><td colspan="3">Borrower: Plurinational State of Bolivia</td><td colspan="3">Flexible Financing Facility[a]</td></tr>
<tr><td colspan="3" rowspan="2">Executing agency: Ministry of Hydrocarbons and Energy (MHE), acting through the Office of the Deputy Minister for Electricity and Renewable Energies (VMEER)</td><td>Amortization period:</td><td colspan="2">20 years</td></tr>
<tr><td>Disbursement period:</td><td colspan="2">5 years</td></tr>
<tr><td colspan="3" rowspan="2">Loan modality: Global multiple works</td><td>Grace period:</td><td colspan="2">10 years[b]</td></tr>
<tr><td>Interest rate:</td><td colspan="2">SOFR-based</td></tr>
<tr><td>Source</td><td>Amount (US$)</td><td>Percentage</td><td>Credit fee:</td><td colspan="2">[c]</td></tr>
<tr><td rowspan="2">IDB (Ordinary Capital):[g]</td><td rowspan="2">35 million</td><td rowspan="2">100%</td><td>Inspection and supervision fee:</td><td colspan="2">[c]</td></tr>
<tr><td rowspan="2">Total:</td><td rowspan="2">35 million</td><td rowspan="2">100%</td><td>Weighted average life:</td><td colspan="2">15.20 years</td></tr>
<tr><td>Approval currency:</td><td colspan="2">U.S. dollars</td></tr>
<tr><th colspan="6">Project at a Glance</th></tr>
<tr><td colspan="6">Program objective/description: The general objective of the program is to contribute to the decarbonization of Bolivia’s electricity system by implementing energy efficiency measures in street lighting systems. The specific objectives are: (i) to reduce the electric power consumption and expenditure of street lighting systems by replacing conventional light fixtures with LED-type fixtures and by incorporating digital technologies; and (ii) to contribute to the institutional strengthening of autonomous municipal governments for management of street lighting systems.</td></tr>
<tr><td colspan="6">Special contractual conditions precedent to the first disbursement of the financing: (i) The program executing agency has approved and put the program Operating Regulations into effect (link 5), including the environmental and social management plans (ESMP) of the projects in the representative sample for the program, the environmental and social management framework (ESMF), and the environmental and social action plan (ESAP) as annexes, on the terms and conditions previously agreed upon with the Bank; and (ii) the executing agency has established the program execution unit and formally appointed or selected the coordinator and key staff listed in paragraph 3.3 (paragraph 3.4). For other environmental and social special contractual conditions precedent to the first disbursement, see Annex B of the environmental and social review summary (link 2).
Special contractual conditions of execution: Before the goods and services contracts are awarded for replacement of the lighting fixtures in beneficiary municipios of projects under the program, the borrower, acting through the executing agency, will provide evidence to the Bank’s satisfaction that an intergovernmental agreement has been signed and has entered into effect between the executing agency and the corresponding autonomous municipal government, establishing each party’s responsibilities in program execution, including maintenance of the works and equipment, as well as procedures for the final disposal of waste (paragraph 3.5).</td></tr>
<tr><td colspan="6">Exceptions to Bank policy: None.</td></tr>
<tr><th colspan="6">Strategic Alignment</th></tr>
<tr><td>Challenges:[d]</td><td colspan="2">SI ☒</td><td colspan="2">PI ☒</td><td>EI ☐</td></tr>
<tr><td>Crosscutting themes:[e]</td><td colspan="2">GE ☒ and DI ☒</td><td colspan="2">CC ☒ and ES ☒</td><td>IC ☒</td></tr>
<tr><td>Sustainable Development Goals:[f]</td><td colspan="5">SDG1 ☐ SDG2 ☐ SDG3 ☐ SDG4 ☐ SDG5 ☒ SDG6 ☐ SDG7 ☒
SDG8 ☒ SDG9 ☒ SDG10 ☒ SDG11 ☐ SDG12 ☒ SDG13 ☒ SDG14 ☐
SDG15 ☐ SDG16 ☐ SDG17 ☐</td></tr>
</table>

(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, interest rate, and commodity conversions. The Bank will take operational and risk management considerations into

account when reviewing such requests.

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

(c) The credit fee and 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) SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

(e) GE (Gender Equality) and DI (Diversity); CC (Climate Change) and ES (Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

(f) Sustainable Development Goal (SDG). For more information on the SDGs, click here. To consult the IDB Group SDG Project Classification Methodology, click here.

(g) Pursuant to document AB-2990, "Enhancing Macroeconomic Safeguards at the Inter-American Development Bank," the disbursement of the Ordinary Capital resources of the loan will be subject to the following restrictions: (i) a maximum of 15% in the first 12 months; (ii) a maximum of 30% in the first 24 months; and (iii) a maximum of 50% in the first 36 months, counted in all instances from the date the loan operation is approved by the Bank's Board of Executive Directors (paragraph 2.2). These restrictions may not apply if the requirements established in the relevant Bank policy have been met, provided that the borrower has been notified in writing.

I. Description and Results Monitoring

A. Background, problem addressed, and rationale

1.1 **Bolivia's economic and social context.** The country's economy has experienced average GDP growth of 3.65% compared with 1.84% for Latin America and the Caribbean.[1] Per capita income rose from less than US$1,000 to more than US$3,500 in 2010-2021.[2] BETWEEN 2005 and 2021 poverty fell from 60.6% to 36.4%,[3] and extreme poverty fell from 38.2% to 11.1%. The country also experienced a reduction in income distribution inequality, as measured by the Gini coefficient, which fell from 0.59 to 0.41.

1.2 **Energy efficiency as a priority strategy in the energy transition.** Energy efficiency is the first fuel of a sustainable global energy system, as the International Energy Agency (IEA) puts it, contributing to simultaneously meet affordability, supply security, and climate goals.[4] Before the COVID-19 pandemic, modest improvements had been achieved in global energy intensity[5] from an annual 2% in 2010-2015 to 1.3% in 2016-2019. Yet a pace of at least an annual 4% is needed, to achieve the IEA's net-zero emissions scenario.[6] Energy efficiency has a strong impact on reducing consumption of fossil fuels, and consequently on climate change mitigation. For example, in electricity systems with a high share of thermal sources in electricity generation, such as Bolivia's (paragraph 1.8), reducing energy demand through energy efficiency measures decreases the consumption of fossil fuels, since the first power plants to stop generating energy are those based on natural gas or diesel. This also prevents the carbon dioxide (CO_2) emissions associated with burning such fuels.[7] Energy efficiency is extremely cost-effective, resulting in direct savings for end-consumers and public budgets. Additional benefits include improvements in air quality and human health, as well as job creation for a just energy transition.[8]

1.3 **The role of cities in the energy transition.** Cities consume around 80% of the world's energy and produce 70% of greenhouse gas emissions.[9] More than half the world's population now lives in urban areas, and this share is expected to increase to 60% by 2030, and to 66.4% by 2050. Ninety percent of this growth will be in low-income countries. Estimates are that around 50% more energy and

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1 World Bank (2021). GDP growth indicators (annual %).

2 IDB Group Country Strategy with Bolivia (2022-2025).

3 National Institute of Statistics (INE) (2021).

4 In the 2050 Sustainable Development Scenario of the IEA's World Energy Outlook 2019, energy efficiency contributes to reducing CO_2 emissions by 37%, compared to 32% from the incorporation of renewable energies.

5 Energy intensity, a key measure of the energy efficiency of the economy (Özdemir, 2014), measures how much energy each country or region requires to generate one unit of its GDP (Junsong and Canfei, 2009).

6 IEA, 2022. Energy efficiency.

7 Reducing energy demand through energy efficiency measures decreases generation from thermal sources, so the share of renewable energies increases because the amount generated from renewables remains the same.

8 IEA, 2014. Capturing the Multiple Benefits of Energy Efficiency.

9 United Nations, 2020.

40% more water will be necessary by 2030.[10] According to the World Cities Report 2022, cities can contribute to the transition toward net-zero emissions by changing consumption patterns, modernizing their infrastructure, and increasing energy efficiency, along with other low-carbon measures.[11] Incorporating smart-city technologies tailored to the local context can increase the energy infrastructure's efficiency and benefits. Local governments play a very significant role in leading the transformation of cities through energy efficiency investments in public infrastructure,[12] and national governments can promote innovation through standards for new technology adoption.[13]

1.4 **Energy efficiency in street lighting systems.** Implementing energy efficiency in street lighting systems is one of the most cost-effective measures most certain to produce an outcome because it depends more on each lighting fixture's installed power than on changing how it is used. Replacing conventional high-pressure sodium, mercury vapor, and halogen lighting fixtures with fixtures using light-emitting diode (LED) technology can reduce energy consumption between 40% and 60%, which in turn reduces greenhouse gas emissions. Additionally, installing telecontrol and digital smart metering systems can increase efficiency by making it possible to detect problems such as light fixtures staying on during daylight hours, or to lower lighting intensity at times of low traffic. LED technology can also reduce operating and maintenance costs because these lighting fixtures have a much longer useful life (more than 50,000 hours, versus 32,000 for high-pressure sodium and 12,000 for mercury vapor fixtures).[14]

1.5 **Other benefits of street lighting.** LED lighting technology also makes the population safer because it has a higher chromatic reproduction index. LED technology allows the human eye to perceive 80% of the colors it would see in daylight, versus 23% with high-pressure sodium fixtures.[15] Studies have shown that street lighting can reduce crime by up to 20%[16] and decrease the number of fatal traffic accidents by 35%.[17] In New York, for example, improved lighting levels reduced serious crimes, including homicide and robbery, committed outdoors at night by up to 39%.[18] Street lighting also promotes economic growth by increasing the amount of time that people can devote to economic activities such as entertainment and dining out.[19]

1.6 **The problem to be addressed and rationale.** One of the main objectives of the Government of Bolivia's Social and Economic Development Plan 2021-2025[20] is

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10 United Nations Environment Programme, 2019. Sixth Global Environment Outlook.

11 United Nations Human Settlements Programme (UN-Habitat), 2022.

12 IEA, 2022. Seventh Annual Global Conference on Energy Efficiency.

13 IEA, 2022. Lighting.

14 Energy Sector Management Assistance program (ESMAP), 2017.

15 Ibid.

16 Farrington and Welsh, 2002.

17 Jackett and Frith, 2013. Quantifying the Impact of Road Lighting on Road Safety.

18 Crime Lab New York, 2017.

19 U.S. Bureau of Labor Statistics, 2015. Consumer Expenditures, 2014.

20 Economic and Social Development Plan 2021-2025.

altering the country's energy mix to make it more sustainable, setting the target of increasing the share of renewable energy in electricity generation. Bolivia's Nationally Determined Contribution (NDC)[21] also set specific goals for making progress on the energy transition and altering the energy mix by 2030. These goals, in addition to increasing the share of renewable energy sources from 37% in 2022 to 79% (goal 3), include an energy efficiency goal of replacing 6% of the national public lighting inventory with LED technology, and 12% if international cooperation is obtained (goal 8). However, Bolivia still has higher energy intensity levels than the rest of the region: a ratio of 3.55 megajoules/GDP versus an average of 3.43 megajoules/GDP for Latin America and the Caribbean. Bolivia also far exceeds the values of countries below 2.5 megajoules/GDP, such as Panama, Costa Rica, Colombia, and Peru.[22] Bolivia's energy intensity is heightened by the low levels of energy efficiency in several sectors. This, coupled with an electricity system characterized by the high share of fossil fuels in the energy mix, generates high CO_2 emissions. These energy efficiency levels, in turn, are the result of inefficient infrastructure on the consumption side and the limited capacity of institutions for managing energy efficiency projects, as described below.

1.7 **High proportion of fossil fuels in the energy generation matrix,[23] to serve demand from the National Interconnected System (SIN).** In 2022, the total gross energy generated, including the SIN and stand-alone systems, was 11,408 gigawatt-hours (GWh), 63% of which was from thermal generation using natural gas or diesel, and 37% from renewable energy comprised of hydroelectric (25%), solar (3%), wind (4%), and biomass (4%).[24] The SIN generates 93% of total gross energy, and stand-alone systems generate 7%. In 2022, total electricity demand was 9,505 GWh, and demand from the SIN was 9,069 GWh. Street lighting systems accounted for almost 6% of this demand (500.7 GWh),[25] which varied by department with the highest demand in La Paz (7.7%), Cochabamba (8.9%), and Tarija (10.8%) (Figure 1).

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21 NDC Bolivia 2021-2030.

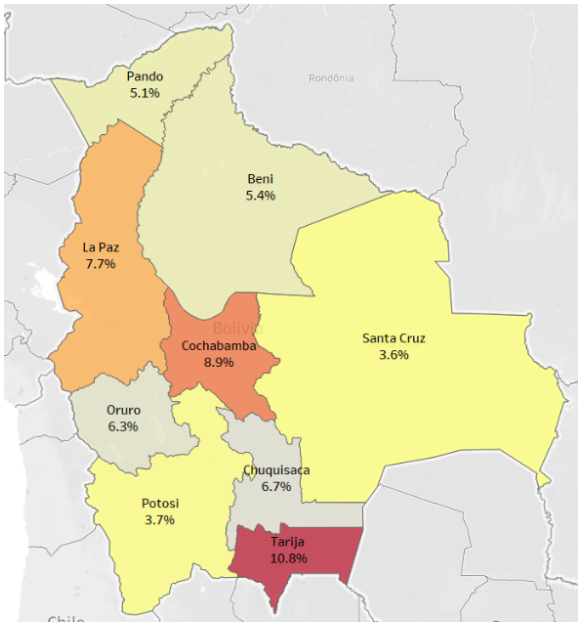
22 Energy intensity level of primary energy. World Bank.

23 Bolivia's electricity system is comprised of the SIN and stand-alone systems. The main sector stakeholders are the Ministry of Hydrocarbons and Energy (MHE), which through the Office of the Deputy Minister for Electricity and Renewable Energies (VMEER) is responsible for formulating electricity sector policies; the Electricity and Nuclear Technology Oversight Authority (AETN), responsible for setting and regulating rates; and the National Load Dispatch Committee (CNDC), responsible for electricity planning and dispatch.

24 AETN, 2023. Statistical Yearbook 2022.

25 Ibid.

Figure 1. Percentage of street lighting electricity consumption by department[26]



1.8 **Stand-alone systems supply electricity generated from diesel.** In 2022, stand-alone systems accounted for almost 5% of the country's total electricity demand (436.1 GWh), supplying approximately 750,000 inhabitants in 46 municipios. Nearly 28% of the electricity for stand-alone systems is generated by diesel power plants, which use more than 62 million liters of diesel per year. Like the SIN, nearly 6% (24.6 GWh) of stand-alone system demand is for street lighting systems.[27]

1.9 **Inefficient street lighting infrastructure.** Estimates are that Bolivia now has around one million streetlights, approximately 99% of them conventional fixtures that mainly use high-pressure sodium, and 1%, LED-type fixtures.[28] If the current scenario continues, street lighting consumption is projected to rise from 525.3 GWh in 2022 to 812.0 GWh by 2030.[29] Bolivia also ranks third in the region, after Jamaica (15%) and Ecuador (6.1%), in terms of countries where street lighting accounts for a large share of final electric power consumption (paragraphs 1.7 and 1.8).[30] Given the current generation mix, mainly from thermal sources, electricity consumption avoided means less generation from fossil fuels. For the SIN, this involves consuming less natural gas, which has an emissions factor of 469 grams of CO_2 per kilowatt-hour (kWh) generated. For stand-alone systems, burning diesel to generate electricity produces 80% more CO_2 than natural gas per unit of generated energy.[31]

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26 Prepared by the authors with data from AETN, 2023.

27 AETN, 2023.

28 NDC Bolivia 2021-2030.

29 AETN, 2023 and United Nations Environment Programme, 2020.

30 OLADE, 2021.

31 IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation.

1.10 **Limited institutional capacity for managing street lighting systems.** The autonomous municipal governments are responsible for providing street lighting services because they own the infrastructure and operate and maintain it with their own resources and specifically-tasked personnel. These electrical technicians, some trained on the job, work mainly in the field, identifying faulty streetlights and performing maintenance or replacing them. Many of these municipal governments have no inventory of their installed streetlights (type of fixture, power, location, etc.) or plan for managing street lighting system assets. Although some municipios have begun replacing streetlights as part of corrective maintenance activities, they are outliers, and the absence of standards for technical characteristics of streetlight efficiency and useful life, sufficient savings are not ensured within a certain time to offset the cost of installing the streetlights.[32] This, along with insufficient technical capacity and limited human and financial resources, means that street lighting systems are being managed inefficiently.

1.11 The municipal budget covers the cost of energy consumed by street lighting and the cost of infrastructure maintenance, all or some of which are passed on to the municipio's electricity service users through a separate fee on their electric bills[33] under a bilateral collection agreement with the electricity distribution company operating in the city.[34] The rates paid by the municipio to the distribution company for energy consumption correspond to a special category for street lighting. The Electricity and Nuclear Technology Oversight Authority (AETN) sets these rates every four years under the Pricing and Rates Regulation approved via Supreme Decree 26094 of 2 March 2001. In 2022, the average rate for end-users nationwide was US$0.1069/kWh, whereas the average rate for street lighting was US$0.1261/kWh.[35]

1.12 In Bolivia, street lighting systems must be installed according to the relevant standards set by the Bolivian Institute of Standardization and Quality.[36] Standard NB-1412001:2:2013 establishes the ground rules for beneficiaries and users to travel safely on public roads, including certain requirements for each class of lamp with respect to illumination levels, uniformity, and glare conditions. Street lighting systems in the main cities generally have equipment based on the type of road and required illumination levels. In other cases, the lights are installed too far from the road, making adequate lighting difficult to achieve. There are also no

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32 The quality of the LED lamps on the market varies in terms of hours of useful life and sustained lumen brightness; the ones lasting less than 100,000 hours may not be cost-effective.

33 Since street lighting is a nonresidential public service, the fees or rates applied to cover the cost of consumption and maintenance are set and approved by municipal councils. The program will not have any actions involving the electricity service supply chain.

34 According to the regulations governing public electricity supply service, distribution companies need to include energy consumption amounts for street lighting in their bills separately from the total amount of electricity consumption, and then transfer these funds to the autonomous municipal governments. When the net balance between the cost of the street lighting service and the revenues collected is negative, the deficit is covered by the autonomous municipal governments. For this reason, some municipios have incurred debts with the distribution company.

35 AETN, 2023. Statistical Yearbook 2022.

36 Technical standards.

regulations on standards for the energy efficiency of lighting fixtures, their useful life, and lumen output degradation, so in some cases fixtures have degraded considerably, impacting illumination levels.

1.13 **The solution.** Faced with these problems, the Bolivian government has planned three main actions to advance its goals for decarbonization of the electricity sector through energy efficiency. The first is to implement energy efficiency measures in street lighting systems, replacing conventional light fixtures with LED technologies and incorporating digital technologies and tools for their operation, control, and energy consumption measurement. These actions will be carried out by individual municipios across its entire urban area or some percentage as it may determine, and will include removal of existing lights and installing new LED fixtures, adaptation of infrastructure to improve lighting in the targeted areas, such as by replacing fixture arms with longer ones, and final disposal of lighting fixtures and other removed materials and waste. The implementation of telemanagement systems includes installing supplementary equipment in the lamps, mainly those located along main streets, in business and tourist areas, and in plazas. For smart metering, in addition to meters, conductors will be installed to separate the circuits. All systems will meet international quality standards, including cybersecurity measures.

1.14 Second, the Government of Bolivia seeks to build institutional capacity in autonomous municipal governments regarding energy efficiency standards, integrated management of street lighting infrastructure, data analysis, and smart street lighting system management. Lastly, energy efficiency standards and regulations will be established, promoting the transition of street lighting systems toward LED technology. To implement these actions, the government has requested financing from the IDB for a program to replace more than 65,000 conventional streetlights in around 10 municipios.

1.15 This program will contribute to surpassing Bolivia's NDC target of replacing 6.5% of the national public lighting inventory with LED technology (paragraphs 1.6 and 1.9). It will also make significant savings in electricity consumption possible (40% to 60%) (paragraph 1.4). This will reduce the fossil fuels burnt to generate electricity, such as natural gas and diesel (paragraph 1.7), depending on the location, contributing to reduced greenhouse gas emissions. Locally, for the autonomous municipal governments, savings in electricity consumption will mean similar savings in the budget allocated to paying electricity bills and maintenance costs. Measuring consumption directly using smart digital meters will result in accurate billing based on consumption, instead of estimates. This will increase transparency in service delivery and make it possible to analyze electricity consumption to formulate of strategies focused on energy efficiency and continuous improvement.

1.16 With their high chromatic reproduction index, LED lighting fixtures are closer to natural light, so it is easier to distinguish objects and colors, making traffic safer at night and increasing citizen security, as well as extending economic and recreational activities into the nighttime (paragraph 1.5). In communities off the grid, energy savings will not only help reduce greenhouse gas emissions but also lower subsidies for diesel and natural gas. Lastly, developing technical and regulatory standards to ensure the transition of street lighting systems to energy-

efficient technology and prevent future installation of inefficient streetlights will increase the availability in the market of light fixtures that meet high technical standards. It will also promote other financially sustainable initiatives, both public and private, to replace street lighting in municipios.[37]

1.17 **Innovation, digitalization, and smart cities.** Implementing LED technology along with telemanagement and smart metering platforms not only lowers costs but lays the infrastructure foundation for creating a smart city. Telemanagement makes smart lighting control possible, which increases savings by, for example, reducing illumination levels depending on the environment and presence of pedestrians,[38] and setting schedules for periods of higher luminous flux. Other applications can be added to leverage the communications platform, delivering other types of services such as air quality monitoring, security systems, and public Internet services. This technology also enables data collection, processing, and analysis to anticipate needs, optimize resources, and make decisions for more proactive urban management. This type of investment increase efficiency in energy use and lays the technological foundation for future innovations in such areas as mobility, security, and urban management.[39]

1.18 **Gender and diversity.** In Bolivia, the women's labor market participation rate is 62%, versus 82% for men.[40] Only 21.3% of Bolivian women work at electricity, gas, and water companies, compared to 20.86% in the region.[41] In the electricity sector, specifically, fewer than 20% of employees are women, and only 13% work in technical areas.[42] Despite gains in access to education, gender gaps persist in years of schooling (10.6 years for men versus 9.4 years for women). There is also a gap in years of schooling between the non-Indigenous population (11.1 years) and the Indigenous population (7.5 years).[43] Eighty percent of the population works in the informal sector, 87% women.[44] Regionally, the informality rate is 85% for Indigenous men and women.[45] Moreover, 41% of Bolivia's population is Indigenous, and approximately 60% live in urban areas. There is a shortage of skills to meet the labor market's demand and human capital needs, including basic work skills, as well as technological and digital skills.[46] The digital divide is wider for women. For example, in 2021, 18.8% of men said they had used their mobile phone to pay bills, versus 8.7% of women.[47] Many studies

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37 The transition to LED technology creates new business opportunities in the areas of financial services, maintenance, and technical solutions. Lighting the Way: Perspectives on the Global Lighting Market, McKinsey & Company, 2012.

38 Juntunen, E., Tetri, E., Tapaninen, O., et al., 2015.

39 European Union, 2018.

40 2020 Household Survey.

41 Energy HUB, IDB, 2023.

42 Hanko, J., 2018.

43 Figures from the 2019 Household Survey.

44 Panorama laboral de los pueblos indígenas en América Latina, International Labour Organization, 2022.

45 Ibid.

46 Results from the STEP Skills Measurement survey (2012) demonstrate the skills gap of Bolivia's labor force.

47 World Bank Data Portal.

demonstrate the relationship between lighting and violence in public places.[48] Violence in public places include aggressions ranging from insults and offensive words to rape. The most frequent violent aggressions were: catcalling and phrases of an offensive sexual nature (60%); in educational environments (51%) and in workplaces (54%).[49] According to the National Institute of Statistics (INE), 3 out of 100 people in Bolivia have some type of disability. The departments with the highest percentage of persons with disabilities[50] are La Paz (31.7%), Santa Cruz (23.5%), and Cochabamba (15.9%). The most frequent disabilities are visual (47.2%), mobility disabilities (17.1%); hearing disabilities (14.9%); speech or communication disabilities (9.4%); recall or concentration disabilities (7.4%); and unspecified disabilities (3.9%). There is evidence that municipal officials have little ability to implement national regulations for the inclusion of persons with disabilities.

1.19 **The Bank's experience in the sector.** The IDB has been a key partner in closing the access gap and in decarbonization of the electricity sector in Bolivia. Since 2010, the IDB has supported a succession of programs for energy efficiency, high-voltage transmission, hydroelectric power generation, and rural electrification through investment loans, policy-based loans, and technical cooperation operations totaling more than US$500 million. Noteworthy loans in chronological order are the Misicuni Renewable Energy Hydroelectric Project (loan 2238/BL-BO, US$101 million); Rural Electrification Program I (loan 2460/BL-BO, US$60 million); Cochabamba–La Paz Electric Power Transmission Line (loan 2654/BL-BO, US$78 million); Rural Electrification Program II (loan 3725/BL-BO, US$100 million); and Electricity Infrastructure Expansion Program (loan 4633/BL-BO, US$78 million). Loan 4633/BL-BO is now in execution and financing, under its Component 2, the replacement of more than 35,000 LED lamps in the street lighting systems of the municipios of Oruro and Potosí. The Bank also financed the Program to Strengthen the Electricity Sector (loan 4606/BL-BO, US$51.6 million), which strengthened the sector's regulatory framework through policy reforms. In terms of technical cooperation operations, in addition to many that support loans, operations ATN/OC-13520-BO, ATN/JF-17675-BO, ATN/OC-18216-BO, and ATN/OC-19319-BO have supported the development and promotion of sustainable energy, implementation of energy efficiency measures, changes in the energy mix, review of the business model for the electricity industry, and other advancements. This operation will leverage the experience of the executing agency, which has fully or partially executed projects 4633/BL-BO, 2460/BL-BO, and 3725/BL-BO and the Rural Electrification Program III (loan BO-L1222), now in preparation. This operation will also benefit from the technical and procurement know-how gained during the competitive bidding stage for Component 2 of operation 4633/BL-BO.

1.20 **The Bank's experience in the sector and lessons learned.** This program builds on lessons learned from Bank-financed operations that have implemented energy efficiency measures in street lighting systems or public buildings. Lessons

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48 How Better Ambient and Street Lighting Reduces Crime, IDB, 2019.

49 Prevalence Survey, INE, Bolivia, 2016.

50 INE, cited by Noticiasfides, 2016.

learned from the Electricity Infrastructure Expansion Program (loan 4633/BL-BO, US$78 million) include: (i) avoid delays by municipios in formally joining the program via the Public Credit Operation Start Registries; (ii) involve the beneficiary population in all stages of the program; and (iii) ensure the proper final disposal of waste according to the Bank's environmental requirements. The program will incorporate these lessons by: (i) including a special condition of execution requiring autonomous municipal governments to previously register the start of operations with the Bank providing technical support under a technical cooperation operation for each municipio, to help complete the necessary documents and processes (Table 3); (ii) strengthening the communication plan for the beneficiary population, using the stakeholder dissemination plan and working with local authorities and various social-sector organizations; (iii) outsourcing solid waste management for the operation to specific operators. These companies must have an environmental license. Another lesson learned from operations 4633/BL-BO, Implementation of the Dominican Republic's Energy Efficiency Program (loan 4962/OC-DR, US$39 million), and Expansion of the High-voltage Transmission System and Energy Efficiency Actions (loan 5023/OC-PR, US$70 million) was the need for technical capacity-building of the entity responsible for service delivery after the works are complete, and for the preparation of bidding documents in advance with clear technical specifications, including resilient infrastructure considerations and requiring guarantees of at least five years.[51] The program will address these needs by identifying and training a technical entity to be responsible for managing street lighting services, as well as processing and analyzing data for each municipio, after the program's completion. The IDB will also continue supporting the preparation and review of bidding documents, to ensure the quality of equipment and services. Lastly, lessons learned from the Energy Management and Efficiency Programme (loan 3877/OC-JA, US$15 million), Development of Renewable Energy, Energy Efficiency, and Electrification of Suriname (grant GRT/FM-13774-SU, US$4.4 million), and European Union Caribbean Investment Facility (EU-CIF) investment grant for the Energy Management and Efficiency Programme (grant GRT/ER-16412-JA, US$10 million) were the need for training of executing agencies on the Bank's procurement and monitoring procedures, and for ongoing supervision of environmental and social management. The program will incorporate these lessons by strengthening the executing agency's technical, project management, and execution capabilities, including environmental and procurement issues related to street lighting systems and smart cities.

1.21 **Value added by the Bank.** This program will enable the IDB to establish a dialogue to support subnational governments, in this case municipios, on issues related to the role of cities in climate change mitigation, including management models for efficient energy use, digital transformation, and smart cities. It will also allow standards, rules, and regulations to be established for the transition towards efficient public lighting technologies, such as LED technology, along with benchmarking of project costs, service levels, and project quality and sustainability, which will subsequently result in more diverse markets and

[51] Guía de Arreglos Institucionales para Programas de EE (2016). IDB.

facilitate other public and private initiatives for total replacement at the national level (paragraph 1.16). In this effort, program execution will be supported by technical cooperation operation ATN/OC-20335-BO,[52] "Data Intelligence for Energy Planning, Policy Design, and Decision-Making," which under Component 2 will focus on: (i) studies for the design of systems for smart metering and telemanagement of street lighting circuits and for data analysis of consumption and system operations; (ii) preinvestment technical studies for street lighting, including applications for smart cities; and (iii) training on new technologies. Technical cooperation operation RG-T4323, now in preparation by the Housing and Urban Development Division, will also provide support for evaluating additional opportunities through pilot projects in several of the country's municipios, to adopt data-based solutions and smart city infrastructure for urban planning and management.

1.22 **The country's sector strategy (paragraph 1.6).** Energy efficiency is a pillar of the energy transition and a priority for the Bolivian government. One of the main goals of the Economic and Social Development Plan 2021-2025 is to increase the share of renewable energies in electricity generation to 75% by 2025. As targets to be achieved by 2030, Bolivia's NDC 2021-2030 aspires to increase the share of renewable energy sources to 79%, and to increase energy efficiency through various measures, including the replacement of 12% of the national public lighting inventory with LED technology.

1.23 **IDB Group Country Strategy with Bolivia.** The operation is aligned with the IDB Group Country Strategy with Bolivia 2022-2025 (document GN-3088) through: (i) the objective to promote universal access to quality basic and social services, by contributing to strengthen street lighting infrastructure services through the implementation of new technologies and digital systems, which in addition to reducing electricity costs can change the perception of safety and provide new opportunities for nighttime business, recreational, and community activities; and (ii) the crosscutting areas of climate change, environmental sustainability, institutional capacity, and gender equality and diversity, by reducing the country's greenhouse gas emissions to help mitigate climate change impacts, and by developing training technical capacity-building of the autonomous municipal governments, women, persons with disabilities, and Indigenous communities.

B. Objectives, components, and cost

1.24 **Objective.** The general objective of the program is to contribute to the decarbonization of Bolivia's electricity system by implementing energy efficiency measures in street lighting systems. The specific objectives are: (i) to reduce the electric power consumption and expenditure of street lighting systems by replacing conventional light fixtures with LED-type fixtures and by incorporating digital technologies; and (ii) to contribute to the institutional strengthening of autonomous municipal governments for management of street lighting systems.

1.25 **Component 1. Energy efficiency investments in street lighting systems (US$32.75 million).** This component seeks to reduce the electricity consumption

[52] Nonreimbursable technical-cooperation operation for US$250,000, approved on 14 September 2023.

of street lighting systems by financing the following: (i) replacement of conventional lighting fixtures with LED-type fixtures and final disposal of hazardous and nonhazardous waste (paragraph 2.9); (ii) telemanagement and digital smart metering systems, system control and monitoring centers, and other smart city equipment and investments to improve lighting in the program target areas; and (iii) supervision of system installation and quality control of goods and services.

1.26 **Component 2. Institution-strengthening with a focus on digitalization and inclusion (US$1 million).** This component seeks to build the institutional capacity of autonomous municipal governments for managing street lighting systems by financing the following: (i) training to strengthen processes for managing street lighting system infrastructure and related services; (ii) definition of energy efficiency standards and operation and maintenance and cybersecurity procedures for street lighting systems; (iii) training on procurement, metrology, data analysis, and management of smart street lighting systems; and (iv) programs for: (a) training and technical certification for women in energy efficiency and street lighting system infrastructure management;[53] (b) education for women on basic electrical facilities and digital technologies in rural areas and Indigenous communities; and (c) awareness-raising and experiences in inclusion of persons with disabilities in the energy sector for the participating municipios.[54]

1.27 **Administration, monitoring, evaluation, and audit (US$1.25 million).** This amount will finance: (i) the administration costs of the operation, including the key staff necessary for program execution, logistics, and equipment; (ii) monitoring, verification, and evaluation of the results of the operation; and (iii) the financial audit.

1.28 **Expected outcomes.** The principal outcome of the operation will be the reduction in the total consumption of electric power associated with the street lighting systems. This will contribute to reduced CO_2 emissions from electricity generation for the SIN and stand-alone systems, and lower expenditure on energy and maintenance of street lighting systems for the autonomous municipal governments, as well as strengthen the autonomous municipal governments for managing street lighting systems.

1.29 **Beneficiaries.** The investments in street lighting will directly benefit: (i) approximately 810,177[55] inhabitants (51% women, 49% men) of the selected municipios through better quality lighting in public places; and (ii) the program's beneficiary autonomous municipal governments through technical capacity-building and lower operation and maintenance costs and electricity consumption for street lighting systems, resulting in savings of approximately 50% on their electricity bill. The operation will indirectly benefit women, persons with

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[53] The competitive bidding documents for sustainable works execution will include as a hiring criterion for line personnel the participation of at least a minimum number of women.

[54] The proposed actions will be coordinated with each municipio's Human Development Department, which has a specialized unit.

[55] This preliminary calculation considers the total population of the 10 municipios currently prioritized by the MHE, based on the latest census, multiplied by a factor of 0.7 representing the average share of the urban population.

disabilities, and Indigenous communities through training and/or certification with workshops and educational programs (paragraph 1.26).

C. Strategic alignment

1.30 The operation is aligned with the second Update to the Institutional Strategy (document AB-3190-2), through the development challenges of: (i) social inclusion and equality, by financing efficient street lighting infrastructure that contributes to lower electricity bills for end-consumers and increases citizen security, particularly the safety of the most vulnerable segments of the population; and (ii) productivity and innovation, by promoting the development of new technologies and smart city equipment in street lighting systems. The operation is aligned with the crosscutting areas of: (i) gender equality and diversity, by including certified training for women in nontraditional occupations to promote their workforce integration, certified education programs for Indigenous communities on electricity basics and digital technologies, and training for public officials of the participating municipios on inclusion of persons with disabilities in the energy sector; (ii) climate change and environmental sustainability, by promoting the use of more efficient technologies that contribute to reduced greenhouse gas emissions; and (iii) institutional capacity and rule of law, by building capacity at executing agencies and in autonomous municipal governments for managing street lighting infrastructure to promote good practices and transparency. The operation is aligned with the IDB Infrastructure Strategy: Sustainable Infrastructure for Competitiveness and Inclusive Growth (document GN-2710-5) through: (i) the construction of socially and environmentally sustainable infrastructure; and (ii) improvements in infrastructure governance to increase efficiency in providing electricity. This operation is also consistent with the Corporate Results Framework 2020-2023 (document GN-2727-12), contributing to the Level 2 indicators of: (i) households with improved access to energy services; (ii) women beneficiaries of economic empowerment initiatives; (iii) emissions avoided; and (iv) agencies with strengthened digital technology and managerial capacity. The operation is aligned with the Employment Action Framework with a Gender Perspective (document GN-3057), by promoting women's labor participation in the energy sector. The program is consistent with the Energy Sector Framework Document (document GN-2830-8) under the pillars of energy sustainability and energy governance; and with the Climate Change Sector Framework Document (document GN-2835-13) under line of action 2, decarbonize rapidly, which includes improving energy efficiency as one of its measures.

1.31 **Climate change.** Based on the MDB joint methodology, 100% of the IDB resources will finance climate change activities (link 8).

1.32 **Paris alignment.** The operation has been reviewed using the Joint MDB Assessment Framework for Paris Alignment and the IDB Group Paris Alignment Implementation Approach (document GN-3142-1) and is deemed to be: (i) aligned with the adaptation objective of the Paris Agreement; and (ii) universally aligned with the mitigation objective of the Paris Agreement.

D. Viability analysis

1.33 **Economic analysis.** A cost-benefit analysis was performed for the sample works, showing the following benefits: (i) savings in electric power generation from natural gas for the SIN and from diesel for stand-alone systems, based on lower energy consumption of the street lighting system, including grid losses; (ii) CO_2 emissions avoided; and (iii) savings in operation and maintenance. The costs for the light fixtures, installation, final waste disposal, and telemanagement and smart metering systems were considered as part of the investment. The analysis for the sample work located in an area connected to the SIN yielded an economic net present value (ENPV) of US$12,680,000 and an economic internal rate of return (EIRR) of 24.13%. The analysis for the work located in a stand-alone system yielded an ENPV of US$3,980,000 and an EIRR of 49.10%. The EIRR for the program's total sample was 26.4%. A sensitivity analysis was done, assuming a lower cost of generation by avoiding the use of natural gas, a higher investment cost, and a lower value per ton of CO_2. In all cases, the EIRRs remain above 21.62%, and the ENPVs are greater than zero. The benefits of telemanagement systems were not quantified in this analysis, so this methodology would not impact the analysis and results for projects that are not part of the sample and do not include telemanagement systems.

II. Financing Structure and Main Risks

A. Financing instruments

2.1 **Instrument and modality.** The program is proposed as an investment loan under the global multiple-works modality because it will finance projects that are similar but independent of each other, located in different municipios, and of sizes that do not warrant individual operations, meeting the requirements of the Operations Processing Manual, Section PR-202, "Multiple Works Programs." Projects may be added or subtracted without affecting the others. There are 29 preidentified potential projects in different municipios that are not part of the sample with individual investments starting at US$600,000. These projects are located throughout the country and will meet all the eligibility criteria set by the Office of the Deputy Minister for Electricity and Renewable Energies (VMEER) (paragraph 2.7).

2.2 **Cost and financing.** The operation has a total cost of US$35 million and will be financed with the IDB's Ordinary Capital resources.

Table 1. Estimated program costs (US$ million)

Components	IDB	Total	%
Component 1. Energy efficiency investments in street lighting systems	32.75	32.75	93.57%
Component 2. Institution-strengthening with a focus on digitalization and inclusion	1	1	2.87%
Administration, monitoring, evaluation, and audit	1.25	1.25	3.57%
Total	**35**	**35**	**100%**

2.3 **Disbursement schedule.** The disbursement period will be five years. Pursuant to document AB-2990, "Enhancing Macroeconomic Safeguards at the Inter-American Development Bank," the disbursements will be subject to the following restrictions: (i) a maximum of 15% in the first 12 months; (ii) a maximum of 30% in the first 24 months; and (iii) a maximum of 50% in the first 36 months, counted in all instances from the date the loan operation is approved by the Bank's Board of Executive Directors (paragraph 2.2). The table below shows the total disbursement flow for the program. These restrictions may not apply if the requirements established in the relevant Bank policy have been met, provided that the borrower has been notified in writing.

Table 2. Disbursement projection (US$ million)

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IDB	3.03	5.43	5.88	14.29	6.37	35
Total	**3.03**	**5.43**	**5.88**	**14.29**	**6.37**	**35**
	9%	**15%**	**17%**	**41%**	**18%**	**100%**

2.4 **Physical start of works.** Considering the quantity of works expected to be executed, and that the duration of each work is less than 18 months, the time limit for the physical start of the last works under the program will be up to 18 months before the end of the disbursement period.

2.5 **Representative sample.** A representative sample of US$22,090,000 was considered during this program's preparation stage, equivalent to 63.11% of the total cost of the program that includes 626,303 beneficiaries of two projects in the municipios of El Alto and Cobija. Both projects include investments to remove conventional light fixtures, install new LED-type fixtures and telemanagement systems, and make infrastructure upgrades (paragraph 1.13). El Alto, which is connected to the National Interconnected System (SIN), is densely populated, experiences high migration flows from the country's interior (paragraph 2.10), and has highly involved social-sector organizations. In contrast, Cobija is connected to a stand-alone system with diesel generation, located in Bolivia's Amazon region, and is the country's least populated departmental capital.[56] The projects are thus diverse and representative in terms of degree of difficulty and service area and include one municipio connected to the SIN and one that uses a stand-alone system.

[56] INE, 2020.

2.6 **Technical evaluation.** The representative sample was analyzed and reviewed to verify its technical, economic, environmental, and social viability. The projects were checked to ensure that they satisfy all eligibility criteria (paragraph 2.7) and were sufficient to determine the program's viability. The interventions associated with the execution of the sample projects are grouped under Component 1 of this operation (paragraph 1.25).

2.7 **Eligibility criteria.** To be eligible for financing as part of Component 1, the projects: (i) must have been prioritized by the Ministry of Hydrocarbons and Energy (MHE) as established in the program Operating Regulations (link 5); (ii) must satisfy the requirements established in the environmental and social management framework (ESMF), including that the projects are not classified as category "A;" (iii) must produce economic and financial returns; (iv) must have completed technical studies; (v) must meet international standards for the efficiency, useful life, and guarantee of the lighting fixtures; and (vi) the municipios where the projects will take place must have sufficient public borrowing capacity for the street lighting project.

B. Environmental and social safeguard risks

2.8 Pursuant to the Bank's Environmental and Social Policy Framework and based on the assessment during the due diligence process, this program is classified as category "B" because the program activities will cause moderate to low environmental and social impacts that are local, short-term, and related mainly to the generation of solid waste, hazardous materials, and the risk of accidents on worksites and in communities. The expected impacts during the execution stage are altered air quality due to emissions of combustion gases and suspended particulate matter, noise emissions, and potential grease, oil, and fuel spills resulting from the use of equipment, vehicles, and tools.

2.9 Hazardous waste (including high-pressure sodium, mercury vapor, oils, grease, fuels) will be handled by an operator holding an environmental license, authorized by the relevant departmental environmental authority. This will ensure the correct handling, transportation, treatment, and final disposal of such waste. It will also ensure that hazardous waste such as high-pressure sodium, mercury vapor, and halogen lamps are prevented from entering the black market, generating environmental liabilities. The socioenvironmental documents establish that the autonomous municipal governments make the following commitments, as environmental and social criteria for their selection: (i) compliance with integrated management of all hazardous waste generated; and (ii) guarantee that the lighting fixtures replaced are reused in any way, except for the components external to the lamp (nonhazardous waste). These criteria will also be included in the environmental and social management plan (ESMP) and the program Operating Regulations.

2.10 Given the technical features of the program, no impacts are expected on protected species of fauna and flora, diversity, or cultural sites. The program will not cause any involuntary displacement of dwellings or families, nor economic displacement. No presence of Indigenous peoples has been identified since the operation will take place in urban areas. However, during due diligence, the presence of an Aymara population, resulting from rural-urban migration, was identified, mainly in El Alto. The ESA/ESMP therefore includes a sociocultural

analysis summarizing the norms, rites, customs, and Andean cosmology of the Aymara peoples, and describing their organizational patterns for decision-making. A stakeholder engagement plan was based on the results of this sociocultural analysis and reflects the social and cultural context of the service area in these two projects.

2.11 During the due diligence process, the sample projects were evaluated to address the requirements established in the Environmental and Social Policy Framework and in the ten environmental and social performance standards. In this context, the executing agency has prepared: (i) an ESA/ESMP for the sample works (El Alto and Cobija); (ii) an environmental and social management framework (ESMF); and (iii) an environmental and social management system.

2.12 The socioenvironmental risk has been classified as substantial because the projects will be implemented in capital cities and intermediate urban areas with a high concentration of population, so they are associated with potential health and safety risks for workers and the community.

2.13 The execution unit has limited experience implementing the Environmental and Social Policy Framework. The disaster risk due to natural hazards was classified as low because the hazards identified, such as wind and rainfall, are considered low, and the criticality of the infrastructure is low. Prevention and safety measures for workers have been included when there are risky weather events. These measures are built into the occupational health and safety plan and the labor management and working conditions plan of the ESMP for the sample works.

2.14 Pursuant to the stakeholder dissemination plan that is part of the ESMF and the ESMPs for the sample projects, two consultation processes were conducted separately between 4 and 8 August 2023. The participants were the stakeholders notified by each autonomous municipal government. In El Alto, 263 organizations participated, including Central Obrera Regional El Alto, Federación de Juntas Vecinales de la Ciudad de El Alto, Federación de Gremiales El Alto, Federación de Choferes de la Ciudad de El Alto, and the executive authorities of the El Alto municipal government. In Cobija, 41 social-sector organizations participated, including neighborhood councils, labor unions, merchants, and health and education sector institutions with cooperation from the MHE. The main concerns related to the start of works execution, mechanisms for receiving and addressing complaints, the social engagement plan, and impacts on public electricity utility service rates. Each ESMP for the sample projects was supplemented with the outcomes of the respective consultation. Specifically, a chapter was added with the consultation's outcomes, including all the means of verification for the completed processes. The stakeholder engagement plan has thus been fully executed, strengthening measures for the engagement of groups in the service area of the projects.

C. Fiduciary risks

2.15 The IDB conducted an institutional capacity assessment of the VMEER program execution unit (PEU) in July 2023 using the Institutional Capacity Assessment Platform (ICAP). It confirmed that the institution has sufficient capacity to execute the program's planned procurements, disbursements, reports, and monitoring

and supervision. The assessment looked at the PEU's ability to execute this program simultaneously with two other Bank operations (paragraph 1.19) and determined that the operations needed separate PEUs, although these units can share certain resources to create synergies. The opportunities for improvement and measures to address the identified gaps are to: (i) describe the specific technical and operational arrangements and coordination bodies for program procurements, financial management, budget, internal control, and audit in detail in the program Operating Regulations; and (ii) strengthen the teams responsible for financial and procurement management (documents GN-2349-15 and GN-2350-15) as program execution moves forward. The executing agency is considered capable of performing the actions identified in the short term and executing the program.

2.16 **Sustainability of investments.** The MHE, acting through the VMEER, will be responsible for program execution. The autonomous municipal governments will participate in the review of designs and bidding documents and technical inspection of the installation of street lighting systems. The technical specifications of the streetlights will meet international quality standards for: (i) efficiency, (ii) minimum useful life, and (iii) guarantee to ensure the return on the program. Once the light fixtures have been installed, the MHE, acting through the VMEER, will transfer them to the respective autonomous municipal government. These governments will be responsible for the operation and maintenance of the systems throughout their useful life, using technical personnel specialized in street lighting. They will also ensure compliance with service quality standards under applicable rules and regulations and with any operation and maintenance procedures that may be established.

D. Other key issues and risks

2.17 A risk management analysis identified the medium-high risks described in Table 3.

Table 3. Identification of other risks

(Medium-high risk) Risk description	Risk taxonomy	Mitigation strategy
If exchange rate fluctuations occur, it could disincentivize the participation of offerors in the competitive bidding processes to supply streetlights and cause delays of 6 to 8 months in program execution.	Economic and financial environment	The bidding documents will establish that bid prices can be denominated in foreign currency and will be awarded in that currency.
If there are delays by municipios in formally joining the program, including submission of the Public Credit Operation Start Registries, it could cause delays of 6 to 18 months in program startup and adherence to planning.	Institutional environment	As a special condition of execution, before the goods and services contracts are awarded for replacement of the lighting fixtures in beneficiary municipios, the borrower will provide evidence that an intergovernmental agreement has been signed and has entered into effect between the MHE and the corresponding autonomous municipal government, requiring the autonomous municipal government to previously register the start of operations (paragraph 3.4). Technical support will be provided under a technical cooperation operation for each municipio, to complete the necessary documents and

(Medium-high risk) Risk description	Risk taxonomy	Mitigation strategy
		processes.
If the LED lighting systems installed fail to meet performance expectations regarding efficiency, useful life, and quality of lighting, it could affect achievement of the specific objectives for expected energy savings and economic viability.	Technical design	The eligibility criteria for the proposed projects include that they must meet international standards for the efficiency, useful life, and guarantee of the lighting fixtures, and must produce positive economic returns. Additionally, the intergovernmental agreement will include these criteria, so that municipios accept and later incorporate them into the technical specifications of the bidding documents for LED lamps.

III. Implementation Arrangements and Arrangements for Monitoring and Evaluation of Results

A. Implementation arrangements

3.1 **Borrower and executing agency.** The borrower is the Plurinational State of Bolivia. The executing agency will be the Ministry of Hydrocarbons and Energy (MHE), acting through the Office of the Deputy Minister for Electricity and Renewable Energies (VMEER), which will be responsible for administrative and operational management and execution of the program, including: (i) planning, coordination, evaluation, monitoring, and supervision of the entire program; (ii) procurement processes for works, goods, and consulting services; (iii) disbursement requests and financial record-keeping for the program; (iv) management of the supervision and inspection of works (projects); (v) environmental and social management of the program; (vi) preparation of the program execution plan, annual work plan, procurement plan, six-monthly status reports, audited financial reports, midterm evaluation, and final evaluation (the two evaluations will follow the format of a program completion report); and (vii) acting as interlocutor with the Bank.

3.2 **The executing agency's experience.** The MHE, acting through the VMEER program execution unit (PEU), has experience in the execution of Bank-financed programs (paragraph 1.19). Specifically, it executed the Rural Electrification Program I, connecting approximately 14,000 new users. In Rural Electrification Program II, it was responsible for the preinvestment, productive uses, and stand-alone hybrid and photovoltaic systems subcomponents. The PEU is now executing Component 2 of the Electricity Infrastructure Expansion Program (loan 4633/BL-BO), which finances the replacement of light fixtures in the street lighting systems of two Bolivian municipios. That program achieved eligibility in March 2023 and recently launched the main bidding process for Component 2 for US$14 million. That program and this one will be executed simultaneously by separate PEUs (paragraph 2.15).

3.3 **PEU structure.** The PEU will have at least the following key staff: (i) a coordinator; (ii) a monitoring and supervision specialist; (iii) a procurement specialist; (iv) a financial specialist; (v) a legal specialist; (vi) two specialists in street lighting systems; and (vii) an environmental and social specialist. The PEU

may share personnel with the PEUs of other IDB-financed programs that are in execution simultaneously with the same executing agency and have the capacity to do so, based on the institutional capacity assessment. The hiring of any additional staff and shared use of resources will be established in the program Operating Regulations and will require the Bank's prior no objection.

3.4 **Special contractual conditions precedent to the first disbursement of the financing: (i) The program executing agency has approved and put the program Operating Regulations into effect, including the environmental and social management plans (ESMP) of the projects in the representative sample for the program, the environmental and social management framework (ESMF), and the environmental and social action plan (ESAP) as annexes, on the terms and conditions previously agreed upon with the Bank; and (ii) the executing agency has established the program execution unit and formally appointed or selected the coordinator and key staff listed in paragraph 3.3.** The first condition is necessary to ensure effective program execution because the Bank's experience in the region indicates that approval of the program Operating Regulations prior to the first disbursement contributes to the internal organization of the executing agency for implementation of the operation. The second condition is essential to assure the Bank that the executing agency will have the right team in place to start program execution.

3.5 **Special condition of execution:** Before the goods and services contracts are awarded for replacement of the lighting fixtures in beneficiary municipios of projects under the program, the borrower, acting through the executing agency, will provide evidence to the Bank's satisfaction that an intergovernmental agreement has been signed and has entered into effect between the executing agency and the corresponding autonomous municipal government, establishing each party's responsibilities in program execution, including maintenance of the works and equipment, as well as procedures for the final disposal of waste. This condition is necessary to ensure the participation of the autonomous municipal governments in the program and their compliance with proper operation and maintenance of the equipment and the integrated management of hazardous waste, as established in the operation's environmental and social management plan and framework.

3.6 **Program Operating Regulations.** The operation's execution will be governed by the provisions of its program Operating Regulations, previously agreed upon with the Bank as necessary to ensure effective program execution. They will address all procedures to be used during program execution and may be modified with the IDB's written no objection. The program Operating Regulations will include at least: (i) a detailed execution mechanism and the institutional and operational roles and responsibilities of the participating entities; (ii) the selection and contracting procedures for works, goods, and services; (iii) rules and procedures for administrative and financial management; (iv) procedure for turning the works over to the corresponding municipios for operation, maintenance, and service delivery; (v) monitoring and supervision procedures; (vi) eligibility criteria for projects under the program; and (vii) measures, actions, and procedures established in the ESMPs and the ESMF.

3.7 **Procurement policies.** Procurements will be conducted in accordance with the Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (document GN-2349-15) and the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (document GN-2350-15), and with the procurement plan. The MHE, acting through the VMEER, will conduct procurements for the program in direct coordination with the Bank for the necessary no objections and reviews. For efficiency, framework agreements may be entered into for the recurring selection of consulting services (paragraphs 4.5 and 4.6 of document GN-2350-15). The principles and criteria of the Financial Management Guidelines for IDB-Financed Projects (document OP-273-12, or current version) will be followed.

3.8 **Audits.** During execution, the MHE, acting through the VMEER, will deliver the program's audited financial statements annually on the terms required by the Bank. The program will require the selection of Bank-eligible independent audit firms in Bolivia. These reports will be delivered within 120 days after the close of the fiscal year, and the final one within 120 days after the effective date of the last disbursement.

B. Arrangements for monitoring and evaluation of results

3.9 The program has a monitoring and evaluation plan (link 3). The monitoring arrangements will include: (i) procurement plan; (ii) annual work plan; (iii) annual verification that targets are met; and (iv) six-monthly reports containing: (a) activities during that period, progress on execution, problems arising, and how they were solved; (b) evaluations of the Results Matrix, procurement plan, and annual work plan; and (c) analysis of the IDB's program monitoring report, evaluating whether the outcome and output indicator targets in the Results Matrix were met. The report will evaluate execution during that period and include planning for the next six-month period. The executing agency will be responsible for preparing six-monthly status reports and delivering them to the Bank within 60 days after the last business day of each six-month period during the disbursement period or as extended. Additionally, the executing agency and the IDB will hold regular monitoring meetings, and the IDB will conduct supervision visits and administration missions.

3.10 **Evaluation.** Link 3 includes the evaluation arrangements, which seek to determine whether the agreed targets in the Results Matrix have been met. The executing agency will select and contract consulting services to conduct: (i) a midterm evaluation in the format of a program completion report, once 50% of program resources have been disbursed and justified, or 30 months after the first disbursement of the loan, whichever occurs first. This evaluation will concentrate on analyzing progress achieved, coordination and execution considerations, the degree of fulfillment of contractual obligations, recommendations for meeting the proposed targets, and sustainability of the investments; (ii) a final evaluation, no later than 90 days before the last disbursement date, with the final report delivered within 30 days after the evaluation. The final evaluation will determine the degree to which the targets set in the Results Matrix were met, the performance of the executing agency, factors that impacted program implementation, and recommendations for future operations; and (iii) an ex post

cost-benefit analysis using the same methodology as the ex ante economic evaluation.

Development Effectiveness Matrix		
Summary	BO-L1230	
I. Corporate and Country Priorities		
Section 1. IDB Group Strategic Priorities and CRF Indicators		
Development Challenges & Cross-cutting Issues	-Social Inclusion and Equality -Productivity and Innovation -Gender Equality and Diversity -Climate Change -Institutional Capacity and the Rule of Law	
CRF Level 2 Indicators: IDB Group Contributions to Development Results	-Households with improved access to energy services (#) -Women beneficiaries of economic empowerment initiatives (#) -Emissions avoided (annual tons CO2 equivalent) -Agencies with strengthened digital technology and managerial capacity (#)	
2. Country Development Objectives		
Country Strategy Results Matrix	GN-3088	(i) contribute to promoting the universalization of quality basic and social services; (ii) improve gender and diversity conditions; (iii) contribute to the strengthening of institutional capacities; and (iv) contribute to environmental sustainability, adaptation to climate change and the implementation of NDCs.
Country Program Results Matrix	GN-3154-1	The intervention is included in the 2023 Operational Program.
Relevance of this project to country development challenges (If not aligned to country strategy or country program)		
II. Development Outcomes - Evaluability		Evaluable
3. Evidence-based Assessment & Solution		9.0
3.1 Program Diagnosis		1.9
3.2 Proposed Interventions or Solutions		3.2
3.3 Results Matrix Quality		4.0
4. Ex ante Economic Analysis		6.5
4.1 Program has an ERR/NPV, or key outcomes identified for CEA		1.5
4.2 Identified and Quantified Benefits and Costs		3.0
4.3 Reasonable Assumptions		0.0
4.4 Sensitivity Analysis		2.0
4.5 Consistency with results matrix		0.0
5. Monitoring and Evaluation		9.5
5.1 Monitoring Mechanisms		4.0
5.2 Evaluation Plan		5.5
III. Risks & Mitigation Monitoring Matrix		
Overall risks rate = magnitude of risks*likelihood		Medium Low
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, External Control.
Non-Fiduciary		
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:		
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project		

Evaluability Assessment Note: ***The program is proposed under the modality of a Global Investment Loan of Multiple Works (GOM) since it finances projects of similar characteristics but independent of each other, distributed in different municipalities and because their sizes do not justify individual operations. The general objective of the program is to contribute to the decarbonization of the Bolivian electricity system through the implementation of energy efficiency measures in Public Lighting (PL) systems. The specific objectives are: (i) to reduce the consumption and expenditure on electrical energy of AP systems by replacing conventional luminaires with Light-Emitting Diode (LED) technology and incorporating digital technologies; and (ii) contribute to the institutional strengthening of the Municipal Autonomous Governments (GAM) for the management of PL systems.***

The diagnosis is adequate, since it clearly presents the problem on which the program focuses, as well as its determinants. The Results Matrix has a vertical logic, although there is a risk for the evaluability of the Specific Objective 2, since it only has one results indicator. The indicators included for Specific Objective 1 are adequate and recommendations are made for improvement. The economic analysis consisted of estimating the net benefits of the program through a Cost-Benefit Analysis (CBA), based on the expected benefits of replacing conventional luminaires with LED luminaires and the positive environmental externalities associated with this change.

The program has a Monitoring and Evaluation Plan that specifies: (i) the methodology for measuring indicators; (ii) attribution of project results; (iii) data requirements; and (iv) those responsible and the estimated budget. The evaluation of results will be done with a before and after analysis for the indicators of the results matrix, where the attribution of the results depends on the link between the specific outputs of each component and the associated results.

RESULTS MATRIX

Program objective	The general objective of the program is to contribute to the decarbonization of Bolivia's electricity system by implementing energy efficiency measures in street lighting systems. The specific objectives are: (i) to reduce the electric power consumption and expenditure of street lighting systems by replacing conventional light fixtures with LED-type fixtures and by incorporating digital technologies; and (ii) to contribute to the institutional strengthening of autonomous municipal governments for management of street lighting systems.

General Development Objective

Indicators	Unit of measure	Baseline value	Baseline year	Expected year achieved	Target	Means of verification	Comments
General development objective: To contribute to the decarbonization of the electricity system in Bolivia by implementing energy efficiency measures in street lighting systems							
Carbon dioxide equivalent (CO_2e) emissions associated with street lighting systems avoided	tCO_2e/year	0	2022	2028	20,043	Statistical yearbook of electricity generation, Electricity and Nuclear Technology Oversight Authority (AETN)	The baseline corresponds to estimated CO_2 emissions for 2022 without the project.

Specific Development Objectives

Indicators	Unit of measure	Baseline value	Baseline year	End of project (2028)	Means of verification	Comments
Specific development objective 1: To reduce the electric power consumption and expenditure of street lighting systems by replacing conventional light fixtures with LED-type fixtures and by incorporating digital technologies						
Electricity consumption savings associated with energy efficiency in street lighting[1]	MWh/year	0	2023	42,736	Billing data from municipios	
Electricity expenditure savings associated with energy efficiency in street lighting	US$ million/year	0	2023	4.47	Billing data from municipios	
Specific development objective 2: To contribute to the institutional strengthening of autonomous municipal governments for management of street lighting systems						
Autonomous municipal governments operating and maintaining street lighting systems under standards and procedures for management of new technologies	Number of autonomous municipal governments	0	2023	6	Administrative resolution	See monitoring plan for details on the methodology for calculating the indicator.

Outputs

Indicators	Unit of measure	Baseline value	Baseline year	Year 1	Year 2	Year 3	Year 4	Year 5	End of project	Means of verification	Comments
Component 1: Energy efficiency investments in street lighting systems											
LED light fixtures installed	Number of fixtures	0	2023	0	11,379	13,011	31,434	22,757	78,581	Six-monthly reports	
Telemanagement or digital smart metering systems installed	Number of systems	0	2023	0	0	0	1	0	1	Six-monthly reports	

[1] The baseline is calculated according to the component's technical analysis.

Indicators	Unit of measure	Baseline value	Baseline year	Year 1	Year 2	Year 3	Year 4	Year 5	End of project	Means of verification	Comments
Component 2: Institution-strengthening with a focus on digitalization and inclusion											
Workshops on energy efficiency and management of street lighting system infrastructure conducted	Number of workshops	0	2023	0	0	0	4	3	7	Implementation report	Technical training to municipios for operation and maintenance personnel.
Women trained and certified on energy efficiency and management of street lighting system infrastructure	Number of women trained and certified	0	2023	0	0	0	30	10	40	Implementation report	Women with technical knowledge of the sector will attend, including women who are not part of the autonomous municipal government's technical team. In addition, minimum hiring criteria for women will be included in the sustainable procurement bidding documents.
Operation and maintenance procedures for street lighting infrastructure prepared	Number of procedures	0	2023	0	0	0	1	0	1	Final report on operation and maintenance procedures	
Study to update energy efficiency regulations and standards for street lighting systems conducted	Number of studies	0	2023	0	0	0	1	0	1	Final report of study	

Indicators	Unit of measure	Baseline value	Baseline year	Year 1	Year 2	Year 3	Year 4	Year 5	End of project	Means of verification	Comments
Study to establish cybersecurity standards for telemanagement systems conducted	Number of studies	0	2023	0	0	0	1	0	1	Final report of study	
Trainings on data analysis and management of smart systems conducted	Number of trainings	0	2023	0	0	0	4	3	7	Implementation report	
People from rural and/or Indigenous communities trained in the program for education on electricity basics and digital technologies	Number of people from rural and/or Indigenous communities educated	0	2023	0	0	0	40	40	80	Implementation report and certificates issued	The education program calls for persons with disabilities and/or their parents or guardians to account for at least 10% of participants. It will focus on rural areas and Indigenous communities in all the municipios.
Municipal training program on the rights and inclusion of persons with disabilities, geared toward the energy sector, conducted	Number of programs	0	2023	0	0	0	1	0	1	Implementation report	The program includes a series of training sessions for each of the municipios involved in the operation.

Country: Bolivia **Division**: INE/ENE **Operation no.:** BO-L1230 **Year:** 2023

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Executing agency: Ministry of Hydrocarbons and Energy (MHE), acting through the Office of the Deputy Minister for Electricity and Renewable Energies (VMEER)

Operation name: Program for the Development of Energy Efficiency in Street Lighting Systems in Bolivia

I. Fiduciary Context of the Executing Agency

1. Use of the country systems in the operation [1]

☒ Budget	☐ Reports	☒ Information systems	☐ National competitive bidding (NCB)
☒ Treasury	☐ Internal audit	☐ Shopping	☐ Other
☒ Accounting	☐ External control	☐ Individual consultants	☐ Other

2. Fiduciary execution mechanism

☒	Special features of fiduciary execution	The borrower will be the Plurinational State of Bolivia. The executing agency will be the Ministry of Hydrocarbons and Energy (MHE), acting through the Office of the Deputy Minister for Electricity and Renewable Energies (VMEER), which will be responsible for administrative and operational management of the program. The VMEER handles financial transactions in the Public Management System (SIGEP), which reliably and securely presents information on budgetary execution. This system provides financial information in the country's official currency according to accounting classifier by expenditure item. Accounting records for the operation will be kept in accordance with the government's accounting system. For the financial reports required by the Bank, the program will use the Bank's integrated project administration system, since the SIGEP external financing module is still in development.

3. Fiduciary capacity

Fiduciary capacity of the executing agency		A fiduciary capacity assessment using the Institutional Capacity Assessment Platform (ICAP) determined that the VMEER has sufficient capacity to execute the program. The level of fiduciary risk is low based on the VMEER's prior experience with the Bank (operation BO-L1117). The recommendation based on the ICAP assessment to contract three people for the positions of administrative/financial specialist, accounting professional, and treasury management professional, as well as two people to support the procurement area, as part of the execution mechanism of the designed programs. The final team will be identified in the program Operating Regulations, along with the specific technical and operational arrangements and coordination bodies for program procurements, financial management, budgeting, internal control, and audit.

[1] Any system or subsystem that is subsequently approved may be applicable to the operation, in accordance with the terms of validation by the Bank.

4. Fiduciary risks and risk response

Risk taxonomy	Risk	Risk level	Risk response
Organizational structure	Procurement management	Low	To strengthen the unit, the additional support of one procurement specialist and one procurement professional on a full-time basis is recommended.
Organizational structure	Financial management	Low	For the VMEER, the contracting of three people for the positions of administrative/financial specialist, accounting professional, and treasury management professional on a full-time basis is recommended.

5. Policies and guidelines applicable to the operation: Procurement processes will be listed in the procurement plan approved by the Bank and conducted under the Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (document GN-2349-15) and the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (document GN-2350-15), or such policies as may be in effect.

6. Exceptions to policies and guidelines: Not applicable.

II. Considerations for the Special Provisions of the Loan Contract

Special contractual conditions precedent to the first disbursement of the financing: Not applicable.
Exchange rate: For the purposes of Article 4.10 of the General Conditions, the parties agree that the exchange applicable exchange rate will be the rate stipulated in Article 4.10(b)(i). For the purpose of determining the equivalency of expenditures incurred in local currency chargeable against the local contribution, or the reimbursement of expenditures chargeable against the loan, the exchange rate will be the rate in effect on the effective date on which the borrower, the executing agency, or any other person or corporation with delegated authority to incur expenditures makes the respective payments to the contractor, vendor, or beneficiary.
Type of audit: Audited financial reports for the program. The VMEER will deliver the annual and final audited financial statements for the program (including information from both executing agencies) within 120 days after the close of each fiscal year of the executing agency during the original disbursement period, or as extended, and within 120 days after the date of the last loan disbursement, audited by an independent audit firm acceptable to the Bank, according to the terms of reference agreed upon between the Bank and the VMEER.

III. Procurement Execution Agreements and Requirements

☒	Bidding documents	Procurements of works, goods, and nonconsulting services conducted under the Bank's procurement policies (document GN-2349-15) and requiring international competitive bidding (ICB) will use the Bank's standard bidding documents or those agreed upon between the executing agency and the Bank for the specific procurement. Consulting services will be selected and contracted in accordance with the consultant selection policies (document GN-2350-15) using the standard request for proposals issued by the Bank or a request for proposals agreed upon between the executing agency and the Bank for the specific selection. The program's sector specialist will be responsible for reviewing the technical specifications and terms of reference for procurements during the preparation of selection processes. This technical review may be ex ante and is independent of the procurement review method.
☒	Special procurement provisions	(1) Sustainable procurement: For the eligibility and selection of bidders, as well as for bid evaluation and contract award, and requirements established in the technical specifications and contract, procurement processes may incorporate sustainability criteria (environmental, social, or economic) into each of their different stages,

<table>
<tr><td></td><td>applicable to the operation</td><td>including planning, preparation of standard bidding documents, definition of specifications, and contractual conditions.
(2) Framework agreements: Because the program involves the recurring selection of the same type of consulting services, in order to increase efficiency in selection and contracting processes, it is recommended that individual consultants or consulting firms be contracting using indefinite service delivery contracts (paragraph 4.5 of document GN-2350-15) and/or that framework agreements be established between the national electricity company, ENDE, and individual consultants or consulting firms, establishing the terms and conditions applicable to specific consulting services (paragraph 4.6 of document GN-2350-15).</td></tr>
<tr><td>☒</td><td>Procurement supervision</td><td>The supervision method will be ex post, except where ex ante supervision is justified. For procurements executed using the country system, supervision will be conducted using the country supervision system. Use of the (i) ex ante, (ii) ex post, or (iii) country system supervision method will be determined for each selection process. Ex post reviews will be every 12 months in accordance with the program supervision plan, subject to change during execution. Ex post review reports will include at least one physical inspection visit, selected from procurement processes subject to ex post review [no less than 10%]. The inspection verifies the existence of the procurement, leaving the verification of quality and compliance with specifications to the sector specialist. The thresholds for ex post review are as follows:
<table>
<tr><th>Executing agency</th><th>Works</th><th>Goods and services</th><th>Consulting services</th></tr>
<tr><td>MHE, acting through the VMEER</td><td>US$3 million</td><td>US$200,000</td><td>US$200,000 firms;
US$30,000 individuals</td></tr>
</table></td></tr>
<tr><td>☒</td><td>Records and files</td><td>The MHE, acting through the VMEER, will be responsible for establishing the necessary controls for safekeeping and integrity of the documentation generated by the ex ante or ex post execution of the program. The Bank may verify the standards of organization, control, and security of the records at any time.</td></tr>
</table>

Main procurements

Procurement description	Selection method	New procedures/ tools	Estimated date	Estimated amount (US$)
Goods				
Energy efficiency in municipal street lighting (7 processes in different municipios)	ICB		8/15/2024	31,074,766
Firms				
Supervision of street lighting system installation	QCBS		8/15/2024	2,175,233
Consulting services for strengthening of beneficiary municipios	QCBS		8/15/2024	500,000
Individuals				
Individuals Execution unit personnel	3CV		5/2/2024	1,000,000

See procurement plan.

IV. Financial Management Agreements and Requirements

☒	Programming and budget	Since the borrower is the Plurinational State of Bolivia, the funds of this operation will be incorporated into the national budget, and subsequently transferred to the VMEER for incorporation into its budget. No issues that may affect execution are foreseen.
☒	Treasury and disbursement management	**Prior to the first disbursement**, the key staff of the VMEER will be appointed/contracted on the terms agreed upon with the Bank, with a minimum of members having the qualifications, experience, and skills required for the position and working on a full-time basis. The **disbursement method** will be advance of funds and/or reimbursements. The **disbursement mechanism** will be against disbursement requests submitted electronically using the Online Disbursements platform and/or fiduciary interface, if already implemented at the executing agency. **Bank account.** The borrower/executing agency will maintain the loan proceeds disbursed by the IDB in an exclusive bank account, opened at the Central Bank of Bolivia to administer the proceeds in U.S. dollars under the Treasury Single Account (TSA) mechanism, and as a separate ledger (designated account). For payments to be made in local currency, the executing agency will open a separate ledger in local currency under the TSA, which will also be used exclusively for the operation. This ledger will only receive resources via transfers from the separate TSA ledger in U.S. dollars, to make payments in local currency. For the **financial plan**, advances will be made for periods of up to six months (180 days) to cover liquidity needs, based on commitments. The **percentage for rendering of accounts** is 80% of the accumulated balance of advances pending justification.
☒	Accounting, information systems, and reporting	The specific accounting standards to be followed for execution will be the legal and regulatory framework of the Plurinational State of Bolivia. The SIGEP, as the country technology platform, will be used to record accounting entries for the operation. Accounts will be kept on an accrual basis, but the financial reports to be submitted to the Bank will be prepared on a cash basis in U.S. dollars. Reports for the rendering of accounts will be statements of cash received and disbursements made, and statements of cumulative investments, with their respective annotations, prepared based on records from the Public Financial Information System. The program Operating Regulations, which describe workflows and internal controls, will be used to supplement the policies and guidelines applicable to the operation.
☒	External control and financial reports	The executing agency will select and/or contract external audit services pursuant to the terms of reference previously agreed upon between the executing agency and the Bank, which will establish the type of review, timing, and scope of the audit. The external auditor selected, and the audit standards applied, will be acceptable to the Bank. Based on the nature and risk of the operation, annual financial audits will be required, submitted by 30 April of the year subsequent to the audit. The type of audit and degree of eligibility required for the auditors may be adjusted throughout the life of the operation, depending on the results of the Bank's supervision. The final audit for the program will be delivered within 120 days after the last disbursement date. Audits will be conducted in accordance with the Financial Management Guidelines for IDB-Financed Projects (document OP-273-12).
☒	Financial supervision of the operation	The operation requires onsite financial supervision of the VMEER. The responsibilities of the financial management specialist include inspection visits to the executing agency, activities related to reviews, and onsite and desk support. This work will be supported by consultants, if necessary, and the audit firm engaged to perform the annual audit of the financial statements. This supervision may be adjusted based on experience in program execution.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-__/24

Bolivia. Loan ____/OC-BO to the Plurinational State of Bolivia
Program for the Development of Energy Efficiency
in Street Lighting Systems in Bolivia

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 Plurinational State of Bolivia, as borrower, for the purpose of granting it a financing aimed at cooperating in the execution of the Program for the Development of Energy Efficiency in Street Lighting Systems in Bolivia. Such financing will be for the amount of up to US$35,000,000, 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 ___ _____ 2024)

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