

**SUPPORT FOR THE DEVELOPMENT OF RENEWABLE DISTRIBUTED GENERATION AND ENERGY
EFFICIENCY PROJECTS IN BRAZILIAN MUNICIPALITIES**

BR-T1395

CERTIFICATION

I hereby certify that this operation was approved for financing under the **Japan Special Fund (JSF)**, through a communication dated June 22, 2018 and signed by Michiko Tamashiro. Also, I certify that resources from said fund are available for up to **US\$400,000** in order to finance the activities described and budgeted in this document. This certification reserves resource for the referenced project for a period of six (6) calendar months counted from the date of eligibility from the funding source. If the project is not approved by the IDB within that period, the reserve of resources will be cancelled, except in the case a new certification is granted. The commitment and disbursement of these resources shall be made only by the Bank in US dollars. The same currency shall be used to stipulate the remuneration and payments to consultants, except in the case of local consultants working in their own borrowing member country who shall have their remuneration defined and paid in the currency of such country. No resources of the Fund shall be made available to cover amounts greater than the amount certified herein above for the implementation of this operation. Amounts greater than the certified amount may arise from commitments on contracts denominated in a currency other than the Fund currency, resulting in currency exchange rate differences, representing a risk that will not be absorbed by the Fund.

Certified by:	<u>original signed</u>	<u>08/10/2018</u>
	Sonia M. Rivera	Date
	Chief	
	Grants and Co-Financing Management Unit	
	ORP/GCM	

Approved by:	<u>original signed</u>	<u>08/21/2018</u>
	Rigoberto Ariel Yopez-Garcia	Date
	Division Chief	
	Energy Division	
	INE/ENE	

**SUPPORT FOR THE DEVELOPMENT OF RENEWABLE DISTRIBUTED GENERATION AND ENERGY EFFICIENCY PROJECTS IN BRAZILIAN MUNICIPALITIES
(BR-T1395)**

I. Basic Information for the Technical Cooperation (TC)

▪ Country/Region:	Brazil / CCS
▪ TC Name:	Support for the development of renewable distributed generation and energy efficiency projects in Brazilian municipalities
▪ TC Number:	BR-T1395
▪ Team Leader/Members:	Arturo Alarcon (ENE/CBR); Team Leader; Sylvia Larrea (INE/ENE), Alternate Team Leader; Karisa Maia Ribeiro (TSP/CBR); Cristina Celeste Marzo (LEG/SGO); María Julia Molina, Stephanie Suber, Jeanette Bonifaz, Misa Haratsu (INE/ENE).
▪ Taxonomy:	Operational Support BR-L1503
▪ Date of TC Abstract authorization:	June 22, 2018
▪ Beneficiary:	Banco do Brasil S.A, Brazilian Municipalities and Brazilian States
▪ Executing Agency:	Inter-American Development Bank (IADB)
▪ Donors providing funding:	Japan Quality Infrastructure Initiative (JQI)
▪ IDB Funding Requested:	US\$400,000.00
▪ Local counterpart funding, if any:	US\$0.00
▪ Disbursement period:	24 months (Execution Period 24 months)
▪ Required start date:	November 13, 2017
▪ Types of consultants:	Consulting firms and individual consultants
▪ Prepared by Unit:	Energy Division (INE/ENE)
▪ Unit of Disbursement Responsibility:	Bank Representation in Brazil (ENE/CBR)
▪ TC included in Country Strategy (y/n):	Yes
▪ TC included in CPD (y/n):	Yes
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	This TC is aligned to: (i) support climate change initiatives; (ii) renewable energy; and (iii) environmental sustainability.

II. Objectives and Justification of the TC

- 2.1 Brazil has an electricity matrix based mainly on hydroelectricity (65% of generation in 2017)¹. While this allows a low-cost electricity supply, it in turn increases the risk of drought or climate change. Given the importance of electricity for economic activity, the Government of Brazil (GoB) has been promoting the diversification of electricity generation with other renewable sources (wind and solar, including centralized and distributed generation), small hydroelectric plants, and thermal generation (natural gas). The goals proposed by the GoB at Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC) propose the development of non-conventional Renewable Energy (RE) and Energy Efficiency (EE). The GoB's Ten-Year Energy Expansion Plan estimates an average

¹ [Ministry of Mines and Energy – Monthly Energy bulletin](#)

annual growth of 3.4% of electricity demand for the 2016-2021 period, increasing to 4% thereafter. On the other hand, the energy intensity of the Brazilian economy has remained relatively constant since the 1970s, even though the country has a long history of promoting EE at the end user level. There is a clear need to further promote efficiency in the use of energy and electricity, including the use of energy in the public sector.

- 2.2 **Public Energy Consumption.** In 2016, the combined energy consumption of Public Lighting (PL), public sector and public services was 45 Tera-Watts-hour (TWh) (9.8% of the total demand in the country)². The municipal expenses in electricity represent the second largest municipal expenditure, after salaries. Municipal public expenditure on electricity includes: (i) PL; (ii) energy management of municipal public buildings (mainly interior lighting and cooling and/or heating in schools, hospitals, and other municipal buildings); and (iii) electricity consumption due to public services of municipal responsibility (like water and sewage).
- 2.3 **Public Buildings.** Data from the National Energy Efficiency Plan estimate the existence of 483,282 public properties, among which 31% are municipal. Much of these buildings are old, and use old technologies for lighting, air conditioning and cooling. The items with higher energy consumption are air conditioning and lighting systems, which can be modernized with lower consumption equipment. Investments in EE could reduce energy consumption up to 20% for buildings depending on the type of establishment.³ Likewise, the use of solar Distributed Generation (DG) could enable larger reductions in energy consumption and energy costs, for municipalities and states, promoting a more efficient use of public funds.
- 2.4 **Public Lighting.** According to current regulations in Brazil, PL is a municipal responsibility. Currently, it represents 3.1% of the total demand for electricity in the country (15 TWh in 2016). The PL park is composed of approximately 18.4 million points of light⁴, which are mostly old technology lamps (sodium vapor and mercury vapor) and are mainly found in municipalities with less than 500,000 inhabitants (75% of the total). The total annual expenditure on PL is estimated at US\$2,400 million per year, with a tendency to grow due to the increase in electricity rates.⁵ This expenditure has a greater impact on smaller municipalities. The replacement of sodium and mercury lamps with similar LEDs would reduce half of the PL energy consumption, with the corresponding impact on municipal expenses. Additionally, LED lamps have a longer service life (two to four times longer than a sodium vapor lamp), which would also help reduce the maintenance costs of PL systems. Moreover, the latest technologies in lamps permit the integration of PL with other services such as Wi-Fi, traffic control, and others. However, due to the higher investment cost of more efficient technologies (which cost between two to three times than traditional technologies), the penetration of new efficient PL technologies still does not exceed 3% (according to the latest official numbers).

² [Anuário Estadístico 2017 – Empresa de Pesquisa Energetica \(EPE\)](#)

³ Source: [Market Assessment for Promoting Energy Efficiency and Renewable Energy through Local Financial Institutions in Brazil](#)

⁴ World Bank study [“Iluminando Cidades Brasileiras. Modelos de negócio para Eficiência Energética em Iluminação Pública”](#)

⁵ Source: [Diagnóstico de Iluminación Pública y Eficiencia Energética](#)

2.5 **Distributed Generation (DG)** of electricity, defined as small-scale electricity generation that is connected to the distribution grid, is becoming a complement to large centralized power plants, as it offers different benefits such as: (i) reduction of technical losses in transmission and distribution lines (by having electricity generation close to the demand); (ii) reduction of power outages in the power supply (and increased reliability); (iii) allows the exploitation of non-conventional energy resources (solar, wind, biomass), with the alternative to interact with the grid through the purchase or sale of electricity and simultaneously reducing fossil fuel consumption; (iv) by involving the final user in generating electricity, they can become more aware of their energy use, and as a result, implement EE measures. In 2012, ANEEL (the electricity sector regulator) enacted Resolution No. 482 which determines the rules for DG connections and creates a compensation system for users who install DG. With this rule, DG owners who export energy to the grid will receive an energy credit in compensation, which they can use for 60 months. In 2015 this resolution was updated (Resolution 687/2015), to include the possibility of dispersed DG installations to be considered as a single DG unit, simplify connection procedures, and increase the limits of what is considered DG (up to 5 MW for mini generation based in solar technologies). These new rules have had a considerable effect, increasing DG connections from 1,200 (in September 2015) to over 33,000 in June 2018, with a total installed power of 250 MW.

Table 1 Participation of credit operations for municipal investments by population size - 2016 (FNP⁶)

Population of the municipalities (inhabitants)	Total investment made by municipalities (US\$ million)	Total amount of credit operations for municipal investments (US\$ million)	Share of credit operations in municipal investments
Up to 20.000	2,315.8	104.2	4.5%
From 20.000 to 50.000	1,826.4	113.2	6.2%
From 50.000 to 100.000	1,165.4	127.0	10.9%
From 100.000 to 200.000	1,138.6	107.0	9.4%
From 200.000 to 500.000	2,098.0	373.4	17.8%
More than 500.000	4,349.9	1,422.4	32.7%
Total	12,894.1	2,247.2	-

2.6 **Justification.** Brazil has 5,570 municipalities where more than 5,000 of them have less than 50,000 inhabitants. Most of these small municipalities have less access to external funding, and fewer technical capabilities to develop and implement EE and DG projects, which could help them to modernize and improve sustainability and living conditions. Moreover, given its smaller size, most of the EE and PL projects in small municipalities are not attractive for private initiatives, and must be implemented directly by the municipalities. Due to the current economic crisis, municipalities in Brazil do not have enough resources for investments in expansion, modernization and maintenance of municipal PL systems, with modern and more efficient technologies. In this context, the Bank is preparing a global credit loan operation to Banco do Brasil in the amount of US\$600 million (BR-L1503), to finance a credit line of Banco do Brasil,⁷ which will

⁶ *Frente Nacional de Prefeitos (FNP)*

⁷ The BB is a financial institution having as its majority shareholder the Federative Republic of Brazil, with the largest financial services network in the country, (99.7% of the municipalities).

support projects that increase efficiency at the municipal level, including PL and EE projects.

- 2.7 **Objective.** The objective of this Technical Cooperation (TC) is to support small and medium size municipalities of Brazil to implement GD and EE projects (including PL) to improve the sustainability of energy consumption. The specific objectives are: (i) support the development of standardized DG and EE projects and training for Brazilian municipalities; and (ii) to support the development of innovative tools and financing mechanisms for DG and EE in Brazilian states and municipalities. The products of this TC will support the implementation of the loan operation BR-L1503 (currently under preparation), which will have funding for EE, PL, and DG at the municipal level. Given recent technological developments, emphasis will be given to propose modern technologies to increase the sustainability of energy use in PL and public buildings.
- 2.8 **IDB's Country Strategy for Brazil 2016-2018 (GN-2850).** This TC is consistent with the country strategy with Brazil, as it aims to promote the dialogue between energy sector actors regarding energy costs in Brazil and their potential impact on productivity. One of the possible solutions to this problem is the development of non-conventional RE (solar) and EE that could help reduce the business sector's costs. Also, it supports the strategy's objective to enhance efficiency in the management of public resources, by supporting EE measures that have a direct impact in public resources.
- 2.9 **Update to the Institutional Strategy 2010-2020 (AB-3008).** The TC objective is consistent and aligned with the development challenge of productivity and innovation and with the cross-cutting issues of climate change and environmental sustainability. The TC is also consistent with the Energy Sector Framework Document (GN-2830-3), as it will support the development of alternative energy, and the strengthening of the sector's institutions. This operation will contribute with the Corporate Results Framework (CRF) 2016-2019 (GN-2727-6) by the Country Development Results (CDR) indicator: government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery, by means of the result indicator 1.2 "Municipalities in energy efficiency and Renewable energy, strengthened". In addition, according to the joint MDB approach on climate finance tracking, 100% of total IDB funding for this operation result in climate change mitigation activities. This contributes to the IDBG's climate finance goal of 30% of combined IDB and IIC operational approvals by year's end 2020.
- 2.10 The results of this TC will help to promote economic efficiency in view of life-cycle cost, particularly increasing the efficiency of energy use at municipal level, and it matches the principal concept of quality infrastructure. The TC is also aligned with the strategy for Infrastructure for Competitiveness and Inclusive Growth (document GN-2710-5) in terms of promoting the ongoing improvements in infrastructure governance to enhance efficiency in the delivery of infrastructure.
- 2.11 The Bank is already supporting the development of sustainable energy measures in Brazil, by means of the implementation of the TC ATN/JF-16079-BR (Support for Diversification of Sao Paulo's Energy Matrix), which has the main objective of supporting the state of Sao Paulo to develop, implement and demonstrate sustainable energy measures, particularly DG with solar energy, and power generation with waste. The lessons learnt in the development and implementation of the TC ATN/JF-16079-BR, and the preliminary results, will also serve as an input for this TC.

III. Description of Activities/Components and Budget

- 3.1 To achieve the objectives of this TC, the execution of three components are contemplated as follows:
- 3.2 **Component I: Development of Projects for Energy Efficiency, Street Lighting and Distributed Generation.** This component will finance consultancies and trainings to: (i) training and capacity building for small and medium size municipalities for EE (including PL) and DG, including the design of a platform for online training, and “*open innovation*” workshops with star-ups that could provide innovative solutions for energy management at a municipal level; (ii) develop standardized projects for EE (including PL) and DG at a municipal level. These projects should propose the use of modern and innovative technologies to reduce and optimize energy use. These standardized projects will be disseminated, with the support of project BR-L1503, and will facilitate the implementation for small municipalities.
- 3.3 **Component II: Development of Tools and Financing Mechanisms.** This component will finance a consultancy to support: (i) development of financing mechanisms to support a faster implementation of EE, DG and PL projects in municipalities and states. The objective of these financing mechanisms is to expand the use of EE, efficient PL and DG beyond the scope of the operation BR-L1503 with Banco do Brasil, including the possibility for public-private partnerships, and other structures; (ii) the development of standardized evaluation tools for EE and DG projects, to enable municipalities for a faster and automated assessment of projects. These tools should make use of the latest technologies, be user-friendly, web-based and include apps. These tools will facilitate the evaluation of sustainable energy measures by small municipalities.
- 3.4 **Other Costs: Coordination.** Will fund the administration and coordination of the TC by means of a project coordinator.
- 3.5 The TC total budget is US\$400.000 financed with resources of the Japan Quality Infrastructure Initiative (JQI). It was determined that no counterpart was required, given the scope and number of beneficiaries, and in order to expedite the execution of the TC, to obtain results that can be implemented in the BR-L1503 program. The eligible expenditures for financing will be limited to: (i) consultancies, including firms and individual consultants; (ii) travel cost and per-diem for consultants; and (iii) monitoring and supervision costs. Table No.3 shows the detailed budget by component.

Table No. 3: Indicative Budget (in US\$)

Activity/Component	Description	JQI Fund US\$
Component I. Development of projects for energy efficiency, street lighting and distributed generation.	Design Standard projects for EE (including Public Lighting) and Distributed Generation (DG)	100,000
	Design and implement online training course for municipalities	60,000
	Provide open innovation workshop	40,000

Activity/Component	Description	JQI Fund US\$
Component II. Development of tools and financing mechanisms.	Develop standardized evaluation tools for energy efficiency and distributed generation projects	100,000
	Develop financing mechanisms to support a faster implementation of EE (including Public Lighting) and DG projects in municipalities and states.	50,000
Other Costs. Coordination	Project Management	50,000
Total		400.000

IV. Executing Agency and Execution Structure

- 4.1 At the request of Banco do Brasil, the IDB will act as executing agency for this TC, aiming to accelerate the acquisition of consultancies and guarantee the quality of the analysis' activities, assuring the effectiveness of the work. In view of the Bank's international recognition and extensive experience in projects that promote EE, its role as executing agency will ensure the quality of results and efficiency in the allocation of resources. Finally, the Bank execution is also supported as component II activities go beyond the scope of the loan BR-L1503.
- 4.2 The Bank will: (i) only hire consulting services (firms and individuals) and not works or purchase goods; (ii) hire individual consultants in accordance with the guidelines set out in the AM-650 (Complementary Workforce Policy); and (iii) hire consulting services of an intellectual nature only. The procurement process for consulting firms follows the Bank Policy for the Selection and Contracting of Consulting Firms for Bank-executed Operational Work (GN-2765-1) and related Operational Guidelines (OP-1155-4). For the dissemination expenses and other services (workshops, catering, printing and publishing, etc.), policies of corporate procurement (GN-2303-20) will be followed. The monitoring of each specific task will be done through a direct and regular supervision by the team leader and the beneficiary could provide technical inputs to the reports produced under this TC.
- 4.3 In compliance with the Operational Guidelines for Technical Cooperation Products-Revised version (GN-2629-1), this TC is classified as Operational Support. The technical responsibility is in INE/ENE.
- 4.4 The focal point designated and sector specialist responsible for executing this TC will be the Bank's Energy Specialist based in the Bank Country Office in Brasilia, Brasil, with the support of the Bank Country Office in Brasil (CSC/CBR) and the INE/ENE Team.

V. Major Issues

- 5.1 The main risk is that due to elections this year, some changes on the federal and state government may cause changes in local administration that, if not well prepared, can generate some delay on the initiative. To mitigate this risk, the Bank will maintain a constant dialogue with the GoB and the new authorities.

VI. Exceptions to Bank Policy

- 6.1 No exceptions to Bank's policies are requested.

VII. Environmental and Social Strategy

- 7.1 According to the Environmental and Safeguards Compliance Policy (OP-703), this TC has been classified as Category "C". The latter ratifies a negative minimum or inexistent environmental, social and/or cultural impact; therefore, no environmental assessment studies or consultations are required for Category "C" operations. (see [Safeguard Policy Filter Report](#) and [Safeguard Screening Form Report](#)).

Required Annexes:

- Annex I: [Request from the Banco do Brasil](#) and [Non-objection from "Ministério do Planejamento, Desenvolvimento e Gestão" of Brazil](#)
- Annex II: [Results Matrix](#)
- Annex III: [Terms of Reference](#)
- Annex IV: [Procurement Plan](#)