SUPPORTING THE CARIBE ENERGY EFFICIENCY PROGRAM

CO-T1470

CERTIFICATION

I hereby certify that this operation was approved for financing under the **Japan Special Fund (JSF)** through a communication dated April 26, 2018 and signed by Michiko Tamashiro (ORP/GCM). 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 four (4) 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, represent a risk that will not be absorbed by the Fund.

Certified by: (original signed) — 7/2/2018

Sonia M. Rivera
Chief
Grants and Co-Financing Management Unit
ORP/GCM

Date

Approved by: (original signed) — 7/6/2018

Rigoberto Ariel Yepez-Garcia
Division Chief
Energy Division
INE/ENE

Date

SUPPORTING THE CARIBE ENERGY EFFICIENCY PROGRAM

(CO-T1470)

I. Basic Information for the Technical Cooperation (TC)

▪ Country/Region:	CAN - Andean Group
▪ TC Name:	Supporting the Caribe Energy Efficiency Program
▪ TC Number:	CO-T1470
▪ Team Leader/Members:	Maria Alexandra Planas, Team Leader (INE/ENE); Andrea Giraldo (CAN/CCO); Mónica Centeno Lappas (LEG/SGO); Juan Carlos Cardenas, Stephanie Suber, Cecilia Seminario and Misa Haratsu (INE/ENE)
▪ Taxonomy:	Client Support
▪ Date of TC Abstract authorization:	April 26th, 2018
▪ Beneficiary:	National Planning Department (NPD)
▪ Executing Agency:	Inter-American Development Bank (IDB) (Maria Alexandra Planas, INE/ENE)
▪ 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:	June, 2018
▪ Types of consultants:	Individuals and Firms
▪ Prepared by Unit:	Energy Division (INE/ENE)
▪ Unit of Disbursement Responsibility:	IDB Country Office in Colombia (CAN/CCO)
▪ TC included in Country Strategy (y/n):	No
▪ TC included in CPD (y/n):	Yes
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	This TC is aligned to: (i) productivity and innovation; and (ii) Climate change

II. Objectives and Justification of the TC

2.1 The Caribbean region of Colombia includes seven provinces (Guajira, Cesar, Magdalena, Atlántico, Bolivar, Córdoba, and Sucre). It covers 132,288 Square Meters (SQM) and has a population of about 10 million (around 21% of the total Colombian population). This region presents a high consumption of energy, partly due to the tropical climate conditions of the area, and partly due to a generalized culture of high energy demand and low energy savings behavior. Total power demand for the last five years represented 13,632 Giga Watts Hours (GWh) per year, with a total average consumption of 10,982 Gwh/year and losses averaging 2,650 GWh (23% of total national energy consumption, but over 33% of total losses).

2.2 Most of the energy consumption in households is used for refrigeration (38%), TVs (18%), and lighting (14%). The remaining 30% is divided between air conditioners, fans, washing machines and water heaters.[1] It is estimated that about 30% of lamps are incandescent (about 3 million lamps) and consumed approximately

[1] *Plan de Acción Indicativo de Eficiencia Energética 2017-2022.*

390 GWh in 2015. Total power consumption used for home refrigerators represented 1,862 GWh in 2015, out of which 713 GWh corresponds to small fridges,[2] and 297 GWh are represented by consumption from refrigeration equipment older than ten years (i.e. around 168,000 refrigerators).[3] Tables No. 1 and 2 illustrate the type of energy savings and potential Carbon Dioxide ($CO_{2)}$ emission reductions from replacing old, inefficient refrigerators by more efficient equipment and incandescent bulbs for Light-Emitting Diode (LED) in the Caribbean Region.

Table No. 1: Energy Savings and Potential Carbon Dioxide Emission (CO_2 e) Reductions from Replacing Refrigerators per Year

Number of Small Refrigerators Older than Ten Years	Annual Consumption of Energy in Small Refrigerators Older than Ten Years (GWh/y)	Energy Saving from Replacing Small Energy Efficient Refrigerators (GWh/y)	Energy Bill Savings (US$)	CO_2 Emissions Saved (tCO_2e/y)
168,611	297.67	156.03	23.4 million	60,543[4]

Table No. 2: Energy Savings and Potential CO_2 e Reductions from Replacing Incandescent Bulbs per Year

Number of Incandescent Bulbs Replaced by LED Lamps	Annual Electricity Consumption 2015 (GWh/y)	Energy Saving from Replacing Bulbs (GWh/y)	Energy Bill Savings (US$)	CO_2 Emissions Saved (tCO_2e/y)
3,013,000	582.67	313	46.9 million	121,444

2.3 On the other hand, according to the Indicative Action Plan for Energy Efficiency PAI PROURE 2017-2022, prepared by the Mining-Energy Planning Unit (UPME), energy consumption by sector shows that the buildings sector[5] is one of the biggest consumers, representing 22% of national consumption (just behind the transport sector 40.9% and industry 29.36%). In addition, the results of audits carried out by the UPME to some public entities at the national, regional and local levels, show that there are potential savings in energy consumption of 42% in these buildings (view Table No. 3).

Table No. 3:[6] Energy Savings Potential in National Government Buildings by Activity

Equipment Replacement	Architectural Improvements	Best Practices	Use of Renewable Energies	Total
24.0%	10.0%	5.30%	2.70%	42.0%

[2] Between 11 and 13 cubic feet.
[3] Caribe Energy Efficiency Program (CEEP), Green Climate Fund (GCF) Concept Note. Interamerican Development Bank and National Planning Department.
[4] *UPME. Factores de Emisión del Sistema Interconectado Nacional, Octubre 2017.* The emission factor for electricity generation in Colombia is 0.367 tCO_2/MWh.
[5] This sector includes building used by government entities, residential and commercial sectors.
[6] Document No. 3919. *Consejo de Política Económica y Social.*

2.4 Based on the above-mentioned information, it is important to promote measures in the Caribbean region that allow the reduction of electricity consumption in government buildings (including hospitals, educational institutions and official entities); which, in conjunction with measures that will promote energy efficiency in low-income users, will allow a significant reduction of this region's high consumption and electricity subsidies.

2.5 To take advantage of these energy efficiency opportunities, the Inter-American Development Bank (IDB) has been supporting the Government of Colombia to prepare the Caribbean Energy Efficiency Program (CEEP), which seeks to develop the first large scale energy efficiency program to promote the adoption of energy efficient technologies by: (i) replacing inefficient household refrigerators and incandescent bulbs, with energy efficient appliances and LED lamps; (ii) replacing refrigeration, air conditioning and illumination equipment at selected government and official buildings; and (iii) Installing solar photovoltaic panels in public buildings (i.e. government offices, hospitals, schools, etc.) for self-consumption. It is expected that the CEEP will bring the following benefits:

i. Efficient appliances and LEDs in approximately 800,000 households;[7]

ii. Gains in energy efficiency in the Caribbean region of approximately 5,175 GWh over the life of the project;

iii. Reduction of CO_2e associated with reduced total kWh saved, which is approximately 3.1 mtCO_2e over the ten-year project lifespan;

iv. Enhanced power generation resiliency as power demand lowers during peak hours;

v. Improved energy demand management in official buildings;

vi. Lower electricity bills for low income households and the official sector;

vii. Reduced transfer of subsidies provided by the government, which can then be diverted to other needs such as education or health care;

viii. Reduced adverse health effects because of better air quality around the coal and natural gas fired power plants; and

ix. Global environmental benefits from climate change mitigation efforts resulting from lower energy use and substitution with renewable energy.

2.6 CEEP has been prioritized by the Colombian Committee for the Green Climate Fund (*Cuerpo Colegiado para el Fondo Verde del Clima)* to be co-financed by the Green Climate Fund (GCF), with IDB acting as the accredited entity. The estimated cost of the project is US$200 million with an expected financing from the GCF in the amount of US$70 million (loan and grant); US$10 million from the Colombian Government; and US$120 million to be financed by the IDB and potentially KfW.

2.7 **Objective.** The TC's overall objective is to support the Government of Colombia to prepare a large-scale energy efficiency program for the Caribbean region (hereinafter called Caribbean Energy Efficiency Program-CEEP) to improve the region's energy

[7] The measures to be adopted are included in the 25 Bright Ideas for Energy Efficiency in Latin America and the Caribbean published by the IDB, based on the 25 Bright Ideas of the International Energy Association (EIA). In 2012, EIA estimated that if all 25 recommendations were adopted globally, they would potentially reduce worldwide energy consumption by 17% and prevent up to 7.6 gigatons of CO_2 e per year by 2030, equivalent to 1.5 times current United States annual CO_2 e.

efficiency and mitigate climate change by increasing the use of energy efficient technologies in residential and government sectors. The program will promote best practice energy efficiency investments in the Colombian Caribbean region that could be replicated throughout the country.

2.8 Specifically, the TC will support the preparation of the CEEP by financing: (i) the technical design and implementation mechanism for the program including the identification of beneficiaries, development of the on-lending mechanism for the non-subsidized portion of the appliances, the economic and financial assessment, the development of the monitoring, evaluation and reporting mechanism, and the evaluation of the regulatory framework; (ii) the preparation of environmental and social management plans; and (iii) the dissemination of activities in the Caribbean region.

2.9 **IDB's Country Strategy for Colombia 2014-2018 (GN-2832).** The TC is consistent with the objectives of increasing economic productivity by progressively reducing the subsidies in public sectors and promoting economic efficiency in view of life-cycle cost, that matches the principal concept of quality infrastructure. It will also contribute with the objective of strengthening the resilience of infrastructure to climate change. Particularly, this TC will support developing mechanisms to implement quality infrastructure by: (i) ensuring alignment with socioeconomic development and development strategies of developing countries/regions as well as comprehensive response to the needs; and (ii) economic efficiency of infrastructure.

2.10 **Update to the Institutional Strategy 2010-2020 (AB-3008).** The TC objective is consistent and aligned with the development challenge of productivity and innovation, by promoting the use of energy efficiency technologies in the households and public buildings in the Colombian Caribbean region. The TC is also aligned with the cross-cutting theme of climate change and environmental sustainability, by supporting the design of an Energy Efficient Program, which is expected to reduce approximately 3.1 $mtCO_2e$ over the ten-year project lifespan. Additionally, the TC is also aligned with the sustainable infrastructure strategy of the IDB in terms of supporting ongoing improvements in infrastructure governance to enhance efficiency in the delivery of infrastructure. Moreover, this TC will help develop an efficient implementation scheme and adequate monitoring tools to ensure that energy and subsidy savings are adequately captured. The TC is also consistent with the Energy Sector Framework Document (GN-2830-3), in the thematic area of sustainability and the Climate Change Framework in the area of mitigation as it will support the development of an Energy Efficient Program.

III. Description of Activities/Components and Budget

3.1 To achieve the proposed objectives, the TC will finance three components:

3.2 **Component I: Caribbean Energy Efficiency Program's (CEEP) Preparation Activities.** It will support the design of the CEEP by: i) completing the technical design; ii) carrying out the financial and economic evaluation; iii) estimating the reduction of electricity consumption and emissions; iv) defining the mechanism for the selection of beneficiaries; v) developing an energy audit for a government building; vi) evaluating the program's impact in the electricity subsidies; and vii) financing studies about the regulatory framework energy efficiency programs/tools in Colombia. As a result, it is expected that the Government of Colombia has an Energy Efficiency Program for the Country´s Caribbean Region designed and ready to be implemented on a large scale.

3.3 **Component II: Environmental and Social Management Plan**. This component will finance: (i) the preparation of an environmental management plan, including the design of a system for the adequate collection, transport, disassemble, recycling, and disposal of the replaced equipment, considering ozone depleting substances and other toxic dangerous waste, and the monitoring and evaluation of potential carbon savings; (ii) mapping of key beneficiaries and an initial communication's strategy to better reach the target population; and (iii) the design of a social management plan including education and training on energy efficiency. The expected result of this component is to have the CEEP´s environmental and social management plans designed and ready to be implemented.

3.4 **Component III: Communication, Dissemination, and Administration.** This component will finance at least three workshops to support the program dissemination in the Colombian Caribbean region with the seven departments that will benefit from the program. It will also finance monitoring activities, such as missions to the towns where the project will be implemented and consultancies in the field that can support the program design implementation. It is expected that these activities will facilitated the design of CEEP and spread its expected benefits amount its target population.

3.5 The TC total budget is US$400,000 financed with resources from the Japan Quality Infrastructure Initiative (JQI). 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.

3.6 The Bank, in coordination with the National Planning Department (NPD), will be responsible for taking appropriate measures to ensure proper compliance with visibility and disseminations agreed with the JQI.

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

Activity/Component	Description	Total Funding (JQI)
Component I. CEEP's preparation activities	CEEP Designed	**200,000**
	Energy audit in a local government building	**50,000**
Component II. Environmental and Social Management Plan	Environmental management plan for the CEEP	**50,000**
	Social management plan and communication and promotion campaign for the CEEP designed	**50,000**
Component III. Communication, dissemination, and administration.	Workshops with local governments, businesses, equipment suppliers and beneficiaries	**50,000**
	Total	**400,000**

IV. Executing Agency and Execution Structure

4.1 By request of the DNP and in accordance with Point D of Annex 10 of GN-2629-1 and Point D of Annex 10 of OP-1155-2, the TC will be executed by the IDB, to: (i) avoid lengthy internal budgeting procedures that can jeopardize the achievement of its objectives by delaying the start of the TC execution and consultants' payments, as the TC is not included in the DNP 2018 budget, and (ii) facilitate coordination between the

different public-sector entities (DNP, Ministry of Mines and Energy, UPME and Renewable Energy and Energy Efficiency Fund (FENOGE)).

4.2 The Energy Division (INE/ENE) will be responsible for its execution, in coordination with the IDB Country Office in Colombia (CAN/CCO). The Bank will contract individual consultants, consulting firms, and non-consulting services in accordance with the Bank's current procurement policies and procedures: (i) the individual consultants will be hired in accordance with the guidelines set out in the AM-650; (ii) the procurement process for consulting firms will follow the Bank Policy for the Selection and Contracting of Consulting Firms for Bank-executed Operational Work (GN-2765-1) and the related Operational Guidelines (OP-1155-4), and (iii) the procurement of non-consultant services will follow the Bank Corporate Procurement Policy (GN-2303-20).

4.3 In compliance with the Operational Guidelines for Technical Cooperation Products-Revised version (GN-2629-1), this TC is classified as Client 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 Senior Energy Specialist based in Bogota, Colombia, with the support of the Bank Country Office in Colombia (CAN/CCO) and the INE/ENE Team.

V. Major Issues

5.1 No major risks are anticipated for the development of the TC. However, there could be eventual delays in the development of the studies, due to potential difficulties in coordinating the different counterparts involved: DNP, MME, UPME, and FENOGE. This risk can be mitigated by involving the counterparts from the beginning of the execution of the TC. The execution from INE/ENE, with the support of specialized consultants, will help to mitigate these potential risks. The draft of Terms of Reference (ToR) of the studies to be financed have been prepared and agreed by the counterparts. The ToR for the key studies are ready and the consultants will be procured once the funds become available.

VI. Exceptions to Bank Policy

6.1 No exceptions to the 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 "B". 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 client
- Annex II: Results Matrix
- Annex III: Terms of Reference
- Annex IV: Procurement Plan