

TC Document

I. Basic Information for TC

▪ Country/Region:	MEXICO
▪ TC Name:	Energy efficiency (EE) for water operators in Mexico
▪ TC Number:	ME-T1500
▪ Team Leader/Members:	Riquelme, Rodrigo (INE/WSA) Team Leader; Urteaga Dufour, Jose Antonio (INE/ENE) Alternate Team Leader; Barragan Crespo, Enrique Ignacio (LEG/SGO); Carolina Alcala (INE/WSA); Guerrero Rivera, Marilyn Ivette (INE/WSA); Lopez, Liliana M. (INE/WSA); Martinez Lagunes, Ricardo (INE/WSA); Suber, Stephanie Anne (INE/ENE) Alternate Team Leader; Barragan Crespo, Enrique Ignacio (LEG/SGO); Carolina Alcala (INE/WSA); Guerrero Rivera, Marilyn Ivette (INE/WSA); Lopez, Liliana M. (INE/WSA); Martinez Lagunes, Ricardo (INE/WSA); Suber, Stephanie Anne (INE/ENE); María Eugenia de la Peña (INE/WSA); Keisuke Sasaki (INE/WSA); and Uriel Barrios (CID/CME).
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	
▪ Date of TC Abstract authorization:	24 Nov 2022.
▪ Beneficiary:	Mexico's National Water Commission (CONAGUA) and water commissions from states and municipal water operators
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	United Kingdom Sustainable Infrastructure Program(SIP)
▪ IDB Funding Requested:	US\$500,000.00
▪ Local counterpart funding, if any:	US\$0
▪ Disbursement period (which includes Execution period):	23 months
▪ Required start date:	May 2023
▪ Types of consultants:	
▪ Prepared by Unit:	INE/WSA-Water & Sanitation
▪ Unit of Disbursement Responsibility:	INE/WSA-Water & Sanitation
▪ TC included in Country Strategy (y/n):	No
▪ TC included in CPD (y/n):	No
▪ Alignment to the Second Update of the Institutional Strategy 2020-2023:	Productivity and innovation; Environmental sustainability; Gender equality

II. Objectives and Justification of the TC

2.2 Mexico has become the second largest destination for foreign direct investment in the region, after Brazil. Nonetheless, per capita economic growth has been weak (1.5% on average since 1996) and poverty rates are high (42% in 2018). This is partly the result of gaps in access to social services, labor market deficiencies, and weak investment growth, all against a backdrop of persistent regional disparities¹. Before COVID-19, the country had made little progress in reducing poverty over the last 10 years, in 2020 poverty affected 44% of the population, with extreme poverty affecting 8.5%. Moreover, 17.9% of the population lacks access to basic services in the

¹ [IDB. \(2019\). IDB Group Country Strategy \(2019-2024\).](#)

household². Efforts to improve access to social services have led to moderate improvements in indicators that reflect the multiple causes of poverty (compared to purely monetary measures).

- 2.3 Gaps in water and sanitation (W&S) services, among others, affect people of all ages but have the greatest impact on the low-income population, women, children, the elderly, and indigenous communities. In addition to this, climate events tend to exacerbate inequality as they have a greater impact on vulnerable groups. These populations suffer from the lack of critical social infrastructure, such as W&S infrastructure, and they have also lagged in terms of adaptation measures to face the effects of climate change.
- 2.4 This TC is aligned with the Second Update to the Institutional Strategy 2020-2023 (AB-3190-2) in the development challenge of Productivity and Innovation, by helping water operators to improve operational practices related to energy efficiency in order to reduce operating costs and GHG emissions. It is also aligned with the cross-cutting areas of (i) Climate Change (CC) and Environmental Sustainability, by promoting innovation and strengthening resilience to climate impacts in water operators; (ii) Gender Equality and Diversity, by considering institutional strengthening with a GyD approach for EE projects; and (iii) Institutional Capacity and Rule of Law, by strengthening of planning capacities in the public sector through the availability of business model for water operators under an energy efficiency program that includes legal and financial feasibility, private sector participation and socio-economic benefits.
- 2.5 The United Nations General Assembly recognized in July 2010 the human right to water and sanitation. In Mexico, through constitutional reform to the sixth paragraph of article 4, published on February 8, 2012, in the Official Gazette of the Federation, the human right to water and sanitation was elevated to constitutional rank. The current National Development Program of Mexico has as the most important objective of the government that in 2024 the population of Mexico is living in a well-being environment, and for this the adequate provision of drinking water and sanitation services (WASH) is essential. For its part, the National Water Program 2020-2024 raises the need to progressively guarantee human rights, especially in the most vulnerable population, and establishes that it will focus efforts on the institutional strengthening of the water operators that provide water and sanitation services.
- 2.6 According to national data, access to drinking water (piped water from the public network, community, or private wells, or from a public tap) was 95.5% in 2020, and that of sewerage (population with drainage to the public network and pit septic) 96.5%.
- 2.7 However, these high levels of coverage do not imply that the quality of the service is acceptable in all cases. In 2020 only 61% of the population had access to drinking water and sewerage services 24/7 a low level compared to other countries in the region. Throughout the country there is a high disparity in the levels of service.

² CONEVAL. (2021). Resultados de pobreza en México 2020.

According to INEGI's in the state of Nuevo León 96% of the population reported having water every day, while in nine states less than 50% had service daily, and only 17% of the inhabitants of the state of Guerrero have piped water in their homes daily. Although there is a National Monitoring Network to measure the water quality of bodies of water, there are no data that allow knowing the conditions of water quality at the household level.

- 2.8 Regarding sanitation, although the country has an infrastructure of 2,536 municipal wastewater treatment plants, in 2016 only 57.6% of the wastewater collected in the sewerage network was treated, and it is estimated that more than 20 % of the wastewater treatment plants do not operate properly (they do not respond to the bacteriological quality required by the standards).
- 2.9 Regarding climate change, the National Water Commission (CONAGUA)³ pointed out that during 2020 the increasing temperature trend was observed again. From 2004 to the present, national average temperature anomalies have been registered above the 1981-2010 climatological average. In 2020, a national average temperature of 22.4°C was recorded and an anomaly of 1.4°C above the average, in this way it was located together with 2017 and 2019 as the warmest year according to the historical record since 1953. Also, during 2020, for the second consecutive year, the total annual rainfall was deficient at the national level. The 722.5 mm of annual rainfall represented 2.7% below the annual average (1981-2010), which is 742.2 mm, and was classified as the 21st driest year according to records from 1941. In the last 50 years, (i) average temperatures in the country have increased by approximately 0.85°C above the climatological normal and equivalent to the global increase reported by the Intergovernmental Panel on Climate Change (IPCC)⁴; (ii) projections of mean annual rainfall is set to decrease between 10 and 20%; (iii) between 13 and 18% increase in total annual precipitation on extreme rainfall days; (iv) sea level rise of between 0.5 to 0.7m on the Pacific coastline, and 0.4 to 0.7m on the Atlantic coastline by 2090, relative to 1986-2005; (v) the saltwater intrusion into coastal aquifers from rising seas will further deplete freshwater supply; and, (vi) intensity and frequency of tropical cyclones will increase in both the Gulf of Mexico and East Pacific, causing greater devastation and potential loss of life.
- 2.10 The National Water Commission (CONAGUA) has defined a national strategy to improve water services based on the efficiency improvement of water operators. Water operators could significantly improve their service quality if they improve their commercial and operational practices in order to increase revenue and reduce operation costs, respectively. The most significant operational cost for a water operator after personnel salaries is energy expenditures. The high levels of energy consumption could reach up to 35% of the operational costs. With pumps, motors, and other equipment operating 24 hours a day, seven days a week, water and wastewater

³ [CONAGUA. \(2021\). El Reporte del Clima en México. Reporte anual 2020.](#)

⁴ [Intergovernmental Panel on Climate Change \(IPCC\). \(2019\).](#)

facilities can be among the largest consumers of energy in a community—and thus among the largest contributors to the community's total Green House Gases (GHG) emissions. The reduction in energy costs via an energy efficiency program will have high impacts on cost savings and avoidable emissions. The National Water Commission (CONAGUA) and the Secretary of Finance and Public Credit (SHCP) have already identified an opportunity to develop a national program of energy efficiency.

- 2.11 CONAGUA has recently created the Gender Equality Unit (UIG) whose function is to promote the strengthening of the capacities of the members of the Institution in matters of gender equality, inclusion, non-discrimination, human rights and prevention of violence against women. In December 2018, Conagua had 12,310 employees, of which 36% are female personnel so increasing the participation of women, people with disabilities and/or indigenous people in the Commission could be part of the UIG's actions. In this sense, this Technical Cooperation could promote an institutional diagnosis of G&D within CONAGUA and/or a G&D Strategy to support said actions. Although there are no statistics for CONAGUA, in 2014 in Mexico there were 7.7 million people with disabilities (PwD) of which 3.7MM are men and 4MM are women, and in 2020, a total of 23.2 million people aged three years and over self-identified as indigenous. Of these, 51.4% (11.9 million) were women and 48.6% (11.3 million) men. It is considered that intersectionality should be included within the categories of analysis in the diagnoses and/or G&D strategies that are carried out with this TC
 - 2.12 The general objective of this TC is to support the efforts of the Mexican government to improve the efficiency of water operators through their improvement in energy efficiency. Through these actions there will be also supported on the compliance with National Determined Contributions (NDC) by reducing GHG as a result of the operation of drinking water and sanitation systems. The specific objectives are:
 - Increase the financial capacity of water utilities to serve populations without access to drinking water and sanitation and improve the quality of the service provided to current users.
 - Create a business model that will support the achievement of operational sustainability of the water utilities by increasing the energy efficiency of the processes.
 - 2.13 The Gender Equality Policy (OP-761) will be applied across all program actions to promote equal participation in benefits and development opportunities within the program. Although the sample does not include indigenous populations, the possible application of the Indigenous Peoples Policy (OP-765) is considered in the event that cities with indigenous populations are incorporated into the program.
- III. Description of activities/components and budget**
- 3.1 This TC will support the development of a national energy efficiency program that will include new financial instruments taken from the models developed by this TC. It is now a national recommendation to define self-sustainable projects in energy efficiency

and this TC will provide the tools to achieve this goal. The TC is structured in three components:

- 3.2 **Component 1. Energy Audits (US\$140,000)** This component will carry out energy audits with a selected group of water operators that will enter in the program; criteria would be established to select 6 water operators across the country according to previous studies in the sector, variables to be included are geographical location, socio economic status, climate factors and technical status of the water operator among others. These energy audits will include a study on the critical assets responsible for the main portion of energy consumption in the water operators. The expected results are state of the assets, asset life, replacement cost, tariff study, new scenarios with adequate operation and maintenance, return periods. The component will also include estimates based on simulation models (e.g. ECAM) that will provide estimates on GHG emissions reduction. Regarding the evaluation of feasible options, the audits will include emission reduction as a critical variable for investment decision making.
- 3.3 **Component 2. Business Model (US\$200,000)** This component will include the development of a business model for water operators under an energy efficiency program and will be simultaneously developed with component 1. The model will define scenarios including legal and financial feasibility. The component will include studies in institutional capacity, private sector participation and socio-economic benefits. Institutional strengthening programs could include awareness raising for staff regarding gender equality and inclusion of diversity, as well as training for staff in charge of W&S projects on methodologies for mainstreaming the gender approach and inclusion of diversity in said projects.
- 3.4 **Component 3. Implementation Scheme (US\$160,000)** Develop an operational plan for the execution of the schemes including indicators and monitoring activities after the completion of component 2 activities. This component will include a guidance manual that will include selection criteria, appraisal methods, financial appraisal and a route map for the implementation of an energy efficiency program. Information brochures training materials and workshops will be also carried out. Training will include institutional framework, financial scheme, GHG emission mitigation impact and risk. The scheme will include the implementation of the scheme in 1 pilot. The scheme will include all the relevant institutional stakeholders and other relevant parties including CONAGUA, State Water Commissions (CEAs), municipalities and water operators. Practical cases will be communicated to demonstrate the benefits of EE.
- 3.5 Regarding the alignment of the above results and outputs they align with UKSIP's logframe. This intervention will deliver on the 2nd and 4th indicators from the SIP's logframe.

IV. Budget

- 4.1 The total IDB funding for this TC comes from the United Kingdom Sustainable Infrastructure Program (UK SIP) and is US\$500,000. The details are presented below.

Indicative Budget

Activity/Component	Description	IDB/Fund Funding	Total Funding
Component 1: Energy Audits	Consulting services on hydraulics, energy balance and technology options	140,000	140,000
Component 2: Business model	Consulting services on legal and institutional analysis	30,000	30,000
	Consulting on business structure, financial model, institutional strengthening with a GyD approach for EE projects	170,000	170,000
Component 3: Implementation scheme	Consulting services for the design of the implementation scheme including multi-stakeholder analysis, institutional structure and developing an operation manual.	50,000	50,000
	Development of training documents for the implementation of EE projects	10,000	10,000
	Training sessions to water operators on implementation on EE projects	10,000	10,000
	Pilots implemented with the developed financial model	90,000	90,000
TOTAL		500,000	500,000

V. Executing agency and execution structure

- 5.1 Due to federal budgetary reasons in the country the TC will be executed by the bank. The tendering documents will be agreed with CONAGUA, and the execution will be co-supervised with CONAGUA's International Cooperation office.
- 5.2 The Bank will contract individual consultants, consulting firms and other services in accordance with current Bank procurement policies and procedures. Specifically, Section AM-650 of the Administrative Manual "Complementary Workforce" will be applied in the case of individual consultants, the Policy for the Selection and Contracting of Consulting Firms for Bank-executed Operational Work (GN-2765-4) and its Operational Guidelines (OP-1155-4) for hiring consulting services of intellectual nature and the Corporate Procurement Policy (GN-2303-28) for other services."
- 5.3 Monitoring will be carried out by the Bank's technical team with the support of the Country Office and individual consultants, through the review of the progress and final reports prepared by the consultants contracted to carry out the activities of this TC. This will be a permanent process through the execution of the TC. The progress will be promptly reported in the Bank's system (Convergence) with details on product

achievement, technical notes, and press cuts. This will be done at least each semester.

VI. Project Risk and issues

- 6.1 The major risk during the execution of this TC is the potential delay in execution of the consulting services due to a lack of coordination between CONAGUA, states, and water operators. Several lessons learned about coordination with these stakeholders have been acquired by IDB and CONAGUA specially with ME-T1360 and ME-T1424 and other operations which will mitigate this risk.
- 6.2 Regular follow-up meetings will be established with a steering committee to be made up of representatives of Conagua, IDB, water operators, civil society and other relevant stakeholders to brief updates and discuss key processes that require consensus.

VII. Environmental and Social Strategy

- 7.1 In accordance with the guidelines of the Policy Environment and Safeguards Compliance (OP -703) the proposed operation was classified as category C. (see filters [SPF](#) and [SSF](#)).

Required Annexes:

[Request from the Client - ME-T1500](#)

[Results Matrix - ME-T1500](#)

[Terms of Reference - ME-T1500](#)

[Procurement Plan - ME-T1500](#)