

Mid -Term Review

Global Environment Facility (GEF) – Program for the Implementation of
Prioritized Emerging Sustainable Cities Projects in Three Mexican Cities

GEF 9649

IDB ME-G1012 / GRT/FM-16409-ME

GEF Implementing Agency: Inter-American Development Bank
Executing Agency: Banco Nacional de Obras y Servicios Públicos, SNC (Banobras)
with
State of Campeche
State of Baja California Sur
Municipality of Xalapa, Veracruz

David L. Rogers, Consultant

December 4, 2020

Contents

I.	Executive Summary.....	4
II.	Introduction and Context.....	8
A.	Purpose and Methodology of the Mid-Term Review	8
B.	Program Goals, Objectives and Outputs	8
III.	Program Implementation Analysis.....	14
A.	Effectiveness – Progress Towards Achieving Results.....	14
B.	Program Rationale and Relevance	21
C.	Efficiency – Project Implementation and Adaptive Management.....	25
D.	Sustainability – Risk Management.....	31
IV.	Conclusions, Recommendations and Lessons Learned.	32
A.	Conclusions	32
B.	Recommendations	33
C.	Lessons learned.....	34
V.	Annexes.....	35
A.	Documents Reviewed	35
B.	List of Interviewees	36
C.	Results Matrix	67
D.	Initial Report	71

Acronyms and Abbreviations

AOP	Annual Operating Plan
CENACE	National Energy Control Center
CFE	Federal Electricity Commission
CONAGUA	National Water Commission
DGAFATG	Adjunct General Directorate for Financing and Technical Assistance to Governments
DLP	Draft Loan Proposal
ESC	Emerging Sustainable Cities
GEF	Global Environment Facility
GHG	Greenhouse Gases
GoM	Government of Mexico
IDB	Inter-American Development Bank
INECOL	Ecological Institute
INEGEI	National Inventory of Greenhouse Emissions
MTR	Mid-Term Review
PCU	Project Coordination Unit
PMPGIRSU	Municipal Program for the Prevention and Comprehensive Management of Urban Solid Waste
PMS	(IDB) Project Monitoring System
PROAGUA	Federal Potable Water and Sanitation Program
[RX#]	Recommendation <i>number</i>
SEDATU	Secretariat for Agrarian, Land and Urban Development
SEMARNAT	Secretariat of Environment and Natural Resources
SENER	Secretary of Energy
SHCP	Ministry of Finance and Public Credit
TORs	Terms of Reference
UNESCO	United Nations Educational, Scientific and Cultural Organization

I. Executive Summary

Table 1. Program Information

Project Title	Implementation of projects prioritized by the Sustainable and Emerging Cities Program in three Mexican cities		
GEF Agency Project ID	ME-G1012	PIF Approval Date:	June 4, 2015
GEF Project ID (PMIS #):	9649	CEO Endorsement Date:	July 12, 2017
ATLAS Business Unit, Award Project ID:		Project Document Signature Date (date project began):	Dec. 7, 2017 June 7, 2018
Country:	Mexico	Date project manager hired:	
Region:	LAC	Inception Workshop date:	
Focal Area:	Climate Change	Midterm Review completion date:	Dec 4, 2020
GEF Focal Area Strategic Objective:	CCM-1 Program 1 IAP- Sustainable Cities	Planned closing date:	Dec. 7, 2022
Trust Fund [indicate GEF TF, LDCF, SCCF, NPIF]:	GEF TF	If revised, proposed op. closing date:	N/A
GEF Agency: Executing Partner:	Inter-American Development Bank Banco Nacional de Obras y Servicios Públicos (BANOBAS)		
Other execution partners:	Xalapa Municipal Government Baja California Sur State Campeche State		
Project Financing	<i>Budgeted at CEO Endorsement (US\$)</i>	<i>Expensed by Midterm Review (US\$)</i>	
[1] GEF financing:	\$13,761,468	\$183,191	
[2] Government:	\$98,300,000	\$2,030,620	
[3] Other partners:		\$0	
[4] Total cofinancing [2 + 3]	\$98,300,000	\$2,030,620	
PROJECT TOTAL COSTS [1 + 4]	\$112,061,468	\$2,213,811	

GEF resources are from (i) Integrated Approach Pilot for Cities program (US\$9,174,312); and (ii) the Climate Change Mitigation-1 program (US\$4,587,156).

1. Project description

Objective. The project is designed to enhance climate change mitigation and adaptation capacities of three Mexican cities (Xalapa, La Paz and Campeche), through the preparation and implementation of projects identified under the Emerging Sustainable Cities program for clean energy, solid waste management and sanitation. Furthermore, the project will support the federal initiative for GHG emission reduction and establish guidelines to incentivize the replication of ESC projects in other Mexican cities. The operation includes four components: one for each of the three cities and a fourth one for institutional and technical support and the communications strategy.

- Component 1 addresses the lack of local expertise and technical skills in producing energy through a biodigestion process, lack of incentives to reduce solid waste generation and GHG emissions; and the low technical capacity to operate and maintain the system by the construction of a biodigester plant that will use solid waste to produce energy;

- Component 2 tackles the diversification of the energy matrix in a high fossil-fuel dependent grid and the lack of resilience of the energy system from extreme climate events by developing self-supply solar power plants in public buildings;
- Component 3 produces a comprehensive study that will address the lack of planning tools for the sanitation of the largest bay of Mexico, including adaptation measures for the city and ensuring the protection of the mangroves. The study will also provide guidelines to ensure that the project reaches a feasibility stage easing its access to finance including public funds; and
- Component 4 promotes capacity building and replication of the pilot projects. This component will establish a communication strategy to bring stakeholders and citizens together in the pilot projects and develop effective and strong monitoring schemes.

2. Progress Summary and Performance Rating

This section summarizes the program's expected results and describes the associated achievements. The mid-term review ratings use the GEF's six-point rating system.

Table 2. MTR Ratings and Achievement Summary

Measure	MTR Rating	Achievement Description
The project objective is to enhance the mitigation and adaptation capacities in three Mexican cities (Xalapa, La Paz and Campeche) through the preparation and implementation of ESC prioritized projects for clean energy, waste management, and sanitation sectors. Furthermore, it will also establish guidelines to incentivize the replication of the projects in other Mexican cities.	N/A	<p>The program design continues to be an effective roadmap for implementation.</p> <p>The program is as relevant today as it was when conceived five years ago. The three projects are aligned with national climate change strategies and targets, through their contributions to GHG mitigation actions, innovative clean energy technologies, integrated water resource management, integrated waste management, and knowledge sharing to build sustainability and replicability.</p> <p>Project preparation and implementation based on the ESC prioritization of clean energy, solid waste management and sanitation sectors has provided a solid and effective foundation.</p>
Outcome 1: Improve and increase the solid waste management and the generation of low-carbon energy to reduce greenhouse emissions in Xalapa.	S	Various studies on the design and management of the solid waste, environmental and social safeguards, and the TORs for the design phase have been completed. A complete engineering study and plans for construction of the biodigester plant are expected by late 2020.
Outcome 2: Increase the production of low carbon energy to reduce greenhouse gas emissions in La Paz	S	Bidding documents for the design and build of the photovoltaic plants for public buildings were approved and tendered. Physical work on phase one is expected to begin in fourth quarter 2020
Outcome 3: The municipality (sic) and stakeholders have the technical, environmental and economic information needed to decide whether to make the investment in Campeche	S	Having completed the analysis and adaptation of the legal framework for comprehensive water-resource management, TORs for the subsequent studies (user census, sanitation sewerage and treatment plant, and storm-water drainage) will be tendered in third quarter 2020.

Measure	MTR Rating	Achievement Description
Outcome 4: Improve and promote solid waste management –control and recovery of materials- in order to encourage the generation of low-carbon energy and the reduction of GHG emissions	U	This component has remained dormant for the first two years of implementation. The development of a knowledge management plan and initiation of this component is contingent on completion and operationalization of the physical works.
Project Implementation and Adaptive Management	S	<p>Banobras is a capable administrator. The cities and states are highly motivated to complete the program. Management arrangements are suitable for effective implementation.</p> <p>Resources earmarked for project management, monitoring and evaluation and Component 4 have not been utilized. As of June 30, 2020, US\$ 183,191, or 1.3% of total financing, has been expensed in project goods and services.</p> <p>The program is approximately one year behind schedule, but the pace of execution is accelerating.</p> <p>Communications are open and effective for addressing issues in a timely manner.</p>
Monitoring and Evaluation	MU	There are inconsistencies in the way outcomes, outputs have been incorporated and used through the project. Indicators, however, are SMART and consistent. Monitoring and evaluation activities have not begun yet.
Sustainability	ML	Important factors, such as personnel turnover, lack of support during political transitions, lack of knowledge needed for international financing, the covid-19 pandemic, high-impact meteorological events, and stakeholder support have been identified as continued risks to achieving and sustaining the project objectives. These factors, along with risks identified during program design, may affect implementation and sustainability.

The table uses a 6-point scale to rate the project's progress towards the objective and each project outcome: Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U), or Highly Unsatisfactory (HU). The sustainability rating uses a 4-point scale: Likely (L), Moderately Likely (ML), Moderately Unlikely (MU), and Unlikely (U).

3. Recommendations

The following recommendations should be addressed by the project team and executors during the preparation of the 2021 Annual Operations Plan. The RX # are indexed to the discussion in the text.

RX #	Recommendation
RX1	In La Paz, the issue of certification for connecting the photovoltaic systems needs to be addressed early in Phase 2, to ensure that the designs in this much larger phase adapt to the limited absorptive capacity of the local energy grid, or identify an alternative course of action.
RX2	Implementation of the institutional strengthening, dissemination and communication activities under Component 4 should consider: (i) The knowledge products need to focus on the unique characteristics of each of the three cities; (ii) The states and municipalities should have primary responsibility for developing their own knowledge management strategies; and (iii) cities will need dedicated technical support under Component 4.
RX3	IDB and Banobras should decide as soon as possible how to implement Component 4, as this decision will have a significant impact on developing the 2021 AOP.
RX4	All monitoring instruments and reports should adhere to the original results matrix of the CEO Endorsement document, and the monitoring and evaluation plan should be updated accordingly.
RX5	The executing agencies should review the indicators and targets to ensure that all parties understand them and are committed to measuring and using them effectively. If necessary, specific targets could be revised based on recently completed technical analyses.
RX6	Steps to address the foreseeable delays caused by the upcoming electoral process should be proactively addressed in the updated project action plan.
RX7	Highly skilled procurement specialist support should be made available to all cities at critical moments in their procurement processes, in order to forestall common mistakes and expedite the tendering process,
RX8	Specific, targeted consultancies should provide the expertise to (i) deepen technical capacity (operating the biodigester and the photovoltaic plants, and procurement), (ii) accelerate implementation and ensure sustainability, (iii) develop dissemination and replication efforts, and (iv) measure project impact indicators.
RX9	IDB and Banobras should seek a common understanding to operationalize the management, and monitoring and evaluation components of the program
RX10	The IDB and Banobras should provide incentives for informal, multilateral communication and creative dialogue with team members and stakeholders that respect formal decision-making authorities and responsibilities.
RX11	The coordination units and Banobras should monitor and report on the planned-versus-actual cofinancing commitments, on a semiannual basis.
RX12	The project team should review and appraise the full list of risks and opportunities, identified both at project inception and during execution, in preparing the 2021 operational plan.

II. Introduction and Context

A. Purpose and Methodology of the Mid-Term Review

This Mid-Term Review monitors achievements made during implementation of the program for the period of June 7, 2018 to June 30, 2020, and outlines corrective actions to ensure that the project is on track to achieve maximum results by its completion date. MTRs are a mandatory requirement for all full-sized GEF-Financed projects. An Initial Report outlined the principal elements of the MTR, and a collaborative approach engaged the project team and executing partners, in a discussion on challenges and corrective actions. The documents consulted for the review are listed in Annex A, and the Initial Report can be found in Annex D.

The covid-19 pandemic limited the customary mid-term review process, by not permitting mission travel to Mexico, in-person meetings with executing partners or project site inspections. The MTR conducted virtual interviews with project managers, consultants and stakeholders, which were individual, confidential and non-attributable. Approximately 30 officials and stakeholders were identified to provide their insights on the project's relevance, implementation process and prospects. Evaluative questions were shared in advance with the interviewees, along with the project results matrix. See Annex B. for the list of persons interviewed.

The MTR assessed the progress against its original goals and objectives set forth in the results framework. Institutional strengths and weaknesses, management issues and risks were identified. Recommendations attempt to provide useful guidance for improving performance. The final approved document will be translated into Spanish.

B. Program Goals, Objectives and Outputs ¹

1. Background and Context

Due to its geographic conditions, Mexico is highly vulnerable to the adverse impacts of climate change. The country has become warmer by an average of 0.85°C and has suffered an increased number of extreme weather events which resulted in economic losses of over US\$1.4 billion, between 2000 and 2012. During the last decade, the country's economic growth and urbanization trends have increased greenhouse gas emissions. Mexico is today the 12th largest GHG producer by energy consumption worldwide. According to the National Inventory of Greenhouse Emissions 1990-2010, the country's total emissions in 2010 were 748 million equivalent tons of CO₂.

Rapid urbanization in intermediate cities has exacerbated the situation. During recent years, population in cities of more than 100,000 inhabitants in Mexico has increased substantially. In 1990, 47.9 million people lived in urban areas and in 2010 this number rose to 88 million. By 2015, 94 million inhabitants, or 79% of the total population, resided in cities. Urbanization is expected to continue for the foreseeable future, which underscores the importance of tackling both emissions and climate change

¹ The foundation documents used throughout this report are (i) GEF Program for the implementation of prioritized ESC projects in three Mexican cities and (ii) Draft Loan Proposal Document of the Inter-American Development Bank. August 4, 2017.

adaptation challenges in these cities. Projects should be easily replicable in other intermediate Mexican cities, hence contributing to national impact.

Climate change vulnerability, GHG emissions and rapid urbanization have prompted the GoM to take concrete actions to address them, including requesting IDB support for the implementation of the Emerging and Sustainable Cities program in three medium sized cities. The ESC is an IDB technical and financial assistance program that supports national and subnational governments in the development and implementation of city action plans. ESC employs an integrated and interdisciplinary approach that contributes to the environmental, urban, and fiscal sustainability of cities. This process helped prioritize issues in each city and define the strategic projects that are supported by this operation: solid waste in Xalapa, energy in La Paz, and sanitation in San Francisco de Campeche.

Solid waste sector. In Mexico, solid waste generation has increased by 182% between 1992-2010, which has contributed to ecosystem degradation and human health risks, mainly due to open dump sites. Consequently, authorities at different levels have consolidated national solid waste legislation and supported construction of controlled disposal sites. This has resulted in the construction of 230 landfills within the last 15 years. Although landfills mitigate several environmental impacts by reducing the pollution of water catchments, decreasing the risk of explosions and eliminating smells; they also have the potential to produce large methane emissions when not managed properly. The GoM faces sustainability challenges in the solid waste sector, especially related to emissions reduction, and control and recovery of materials. There is a potential to propagate the implementation of waste to energy, compost and recycling systems and technologies nationwide.

According to an ESC analysis, metropolitan Xalapa's daily waste generation reaches 396 tons, of which 364 tons (92%) are disposed of in a landfill. The solid waste sector accounts for 16% of the city's total GHG emissions, representing the second largest source in the city, which is expected to grow by 70% by 2050. Exponential urban and population growth over the last 30 years and limited long-term planning have hindered the development of a comprehensive solid waste management system in Xalapa.

Although biodigestion is broadly known for the treatment of solid waste from the agroindustry and wastewater treatment plants, there is little experience in the municipal solid waste management sector. This pilot project will test biodigestion technology in the context of a comprehensive waste management system and assess it as an option for reducing GHG generated by landfills. The project promotes an integrative approach using proven technology to develop sustainable waste management in a medium-sized city.

Energy Sector. In 2010, CO₂ emissions caused by energy consumption reached 407.3 megatons, of which energy generation contributed 28% and, between 1990 and 2012, GHG emissions associated with electricity production in the public sector grew at an annual rate of 3.1%. This has prompted the GoM to implement a series of policies to increase the share of renewable sources in the national energy matrix. The goal is to achieve 35% clean energy generation by 2024 and 50% by 2050.

In the case of La Paz, curbing air pollutants and GHG emissions caused by electricity generation are important sustainability challenges, where GHG emissions have increased by 17% between 2005 and

2010. Electricity production represents 36% of the city's total GHG emissions, and it is estimated that this number will grow by 110% by 2030 due to the obsolescence of the current power plants.

Neither the city of La Paz, nor the state of Baja California Sur, is connected to the national electric grid. In La Paz, energy generation by high-cost, traditional thermal plants using carbon-intensive sources such as heavy fuel oil and diesel, with additional costs for filtration to reduce air pollution. The increased use of air conditioning exerts additional pressure on the electric grid. The sector lacks a strategy to promote distributed generation using the world-class solar energy available locally.

Sanitation Sector. Urbanization processes, uncontrolled household and industrial discharges, and water stress exacerbated by increasing temperatures, threaten the welfare of local communities throughout the country. Although Mexico has reached high levels of wastewater collection (91.4%), there are still important challenges concerning wastewater treatment and reuse. According to CONAGUA, roughly 47% of municipal wastewater that is produced still does not receive any kind of treatment. These challenges have significant impacts on water quality and the preservation of aquatic and coastal ecosystems. The case of Campeche clearly illustrates this point, as it is one of the few states whose beaches have failed to meet the bacteriological quality of sea water standards, as defined by the World Health Organization.

The city of Campeche faces important water challenges. The aquifer that provides the city with water is under high risk of pollution, mainly because it is unconfined. Approximately 85% of households discharge their wastewater into septic tanks without any treatment, thus contributing to the pollution of the aquifer and ultimately to the bay. Additionally, the city's water distribution system operates inefficiently due to: (i) infrastructure that is no longer operational; the high levels of water hardness that affect the water measuring equipment; and (iii) the unplanned expansion of the city's water network over time.

UNESCO declared Campeche's city center a World Heritage Site in 1999. As a result, federal, state and local authorities have invested resources to upgrade water, drainage and wastewater systems. This operation supports these efforts by financing a detailed study to identify potential solutions to Campeche's water challenges, particularly concerning cleaning up bay and designing climate-change adaptation measures for the city.

The three beneficiary cities are in distinct regions of Mexico, which will facilitate each component's replicability. These cities have above-average economic and population growth, and are the capital cities of their respective states, making them reference points for other intermediate cities in the country.



2. Project Design

The program will enhance the mitigation and adaptation capacities of three Mexican cities through the preparation and implementation of clean energy, solid waste management and sanitation projects prioritized under the Emerging Sustainable Cities initiative. The program incentivizes the replication of the projects in other Mexican cities. The project has four components, one for each of the three cities, and a fourth one for institutional and technical support, communications strategy and the monitoring system:

Component 1. Biodigester for Xalapa's solid waste management system. This component supports design, construction and commissioning of a biodigester plant for the treatment of the organic fraction of the municipal solid waste of Xalapa, Veracruz. The component includes: (i) detailed designs for all components and phases of the plant; (ii) pretreatment equipment; (iii) the installation of a biodigester and the equipment to generate electricity; (iv) post-treatment and composting equipment; and (v) the required civil works. The operation and maintenance of the biodigester plant and the landfill will be headed by the private sector through a concessional agreement with the municipality.

The municipal plant will receive and process an estimated 200 tons of solid waste daily and will have an installed capacity to produce 450 kW of electricity. Processing solid waste will (i) extend the lifespan of the landfill by three years, (ii) reduce the average annual GHG production by 5,127 tons of CO_{2eq}, and (iii) provide 26 ton/day of soil conditioner (compost).

Component 2. Solar photovoltaic power plants in public buildings and schools in La Paz. Solar photovoltaic plants in seven municipal buildings and two schools will deliver the following benefits: (i) diversify the local energy matrix; (ii) reduce an estimated 39,700 tons CO_{2eq} throughout the plants' lifecycle; and (iii) reduce energy costs. Together, the photovoltaic plants will generate 1840 MWh of energy on average per year. It is estimated that the energy produced will cover 48.2% of electricity consumption in municipal and state public buildings during its first operational year.

La Paz has developed plans to become energy efficient. The city is not connected to the national grid and it obtains its energy from highly polluting and GHG-emitting sources. The pilot project will have a demonstrative effect showing that: (i) it is possible to produce energy in a more sustainable way, (ii) the technology is mature and ready to be deployed; and (iii) the excellent local solar energy can be tapped as an effective source of electricity generation.

State and municipal governments are working together towards improving the energy matrix of La Paz. The bidding documents and contracts developed under this pilot project send a positive market signal for the development of solar technology and associated services. Operation and maintenance of the plants will be provided by the private sector under a service provision contract, which will serve as a useful example to other jurisdictions interested in developing public-private partnerships in the sustainable energy sector. The GEF pilot project in public buildings and schools will provide important lessons for the operation of photovoltaic systems in hot climates and will leverage future IDB interventions in this field. The project will be developed in two phases by which the large second phase may take advantage of lessons-learned from the small initial phase.

Component 3. Comprehensive executive study for the clean-up of the Bay of Campeche. This component supports a detailed study that addresses the lack of planning tools for the sanitation of the second largest bay in Mexico. Notably, it includes climate-change adaptation measures for the city, ensuring the protection of the coastal mangroves. The study also offers guidelines to ensure project feasibility and facilitate access to public funds.

Component 4. Capacity building, communication and dissemination. Together, the three projects set forth a framework to mitigate GHG emissions, to consolidate urban development, improve integrated water-resource management and improve climate-adaptation capacity. This vision aligns with national and global objectives to mitigate GHG in a sustainable manner, and disseminates environmental sustainability in urban planning and management. Project success may contribute to further investments to support climate-adaptation measures and reduce vulnerability. As regional hubs, Xalapa, La Paz and Campeche, will offer unique lessons for innovativeness, sustainability, scaling up and replication. Involvement in the IDB's ESC program and the use of the GEF Sustainable Cities Integrated Approach Pilot increase the potential for replication of these projects and outcomes in other cities worldwide.

Specifically, Component 4 provides for workshops and actions to strengthen technical capacities of public officials and stakeholders for the preparation of sustainable infrastructure projects, as well as for the operation and maintenance of the technologies implemented under this operation. This component supports the development of guidelines for public policies and regulations to foster the replicability of the pilot projects within the country. The IDB supports Banobras in the design of the terms of reference for this component.

3. Project Outcomes

The principle expected outcomes are summarized in the table below. The complete Results Matrix is presented in Annex C.

Table 3. Expected project outcomes.

Outcomes	Units of measure	Baseline	Target
Power production from low-carbon energy sources in Xalapa	MWh/year	0	3,962
Tons of compost produced by the biodigester plant in Xalapa	ton/day	0	26
Tons of greenhouse gas emissions avoided associated with energy production by the biodigester plant in Xalapa	Tons of CO ₂ eq/y	0	1,792
Tons of greenhouse gas emissions avoided through solar panels in La Paz	tons of CO ₂ eq/y	0	1,590
Power production from low-carbon energy sources in La Paz	MWh/y	0	1,840

4. Project implementation arrangements / Stakeholders

An Operations Manual, approved by IDB as a condition to first disbursement, regulates project execution and use of project resources. The OM establishes: (i) organizational structure and execution mechanism, as agreed between IDB and Banobras; (ii) activities and responsibilities of Banobras, the state, federal and municipal beneficiaries and other stakeholders; (iii) fiduciary requirements, rules and procedures related to the financial and procurement administration; (iv) technical execution of the four components; and (v) planning, financial administration, communication, monitoring and evaluation.

Banobras is the executing agency for the project. For this, it relies on several areas of the institution's organizational structure, both in central offices and from state delegations. Banobras manages this operation, through the Dirección General Adjunta de Financiamiento y Asistencia Técnica a Gobiernos (DGAFATG), where it created the Program Coordination Unit with the human and technical resources to support project execution and to serve as the program focal point. Staffing the PCU technical team, including specialized consultants in the relevant technical topics of the program, was a condition for first disbursement program resources. The PCU organizes the meetings and workshops with the relevant stakeholders to ensure efficient implementation of each project. Banobras' Administrative Department manages the financial resources.

The state and municipal agencies are responsible for implementing their projects through their respective execution units:

(i) The Dirección de Medio Ambiente y Sustentabilidad del H. Ayuntamiento de Xalapa for the implementation of Component 1.;

(ii) The Secretaría de Planeación Urbana, Infraestructura y Movilidad del Gobierno de Baja California Sur for the implementation of Component 2.; and

(iii) The Comisión de Agua Potable y Alcantarillado del Estado de Campeche for Component 3.

Each state/city has created an executing unit consisting of a director (or similar position), responsible for procurement, contracting, execution and technical supervision activities of their respective projects. These agencies have designated the necessary personnel to support project execution according to their technical and geographic area of intervention and mandate. They have signed an implementation agreement establishing specific roles and responsibilities. The execution units do not directly manage financial resources, but request disbursements to payees through Banobras.

Banobras is expected to coordinate closely with the following federal agencies: (i) Secretariat of Environment and Natural Resources (Semarnat) for supporting the implementation and scalability of the overall project and its effects on GHG emissions reduction; (ii) Secretariat for Agrarian, Land and Urban Development (Sedatu), for supporting the implementation of activities contained in the four components; (iii) Secretary of Energy (Sener), for supporting the implementation of activities contained in Components 1, 2 and 4.

III. Program Implementation Analysis

A. *Effectiveness – Progress Towards Achieving Results*

In late 2019, the pace of implementation picked up considerably. Early delays gave way to a productive phase, during which successful intermediate steps centered on contracting of consultancies and finalization of preliminary studies. Assuming no further delays, the projects will achieve output goals on time. Concrete results, in terms of mitigation of GHG emission and energy savings, will be observable in late Year 4 or Year 5, after project completion. The three projects are in distinct geographic locations, each with a unique set of stakeholders, agendas and political considerations. Banobras, the executing agency, supports each project with an individualized line of communication. The state and municipal governments' engagement and ownership are strong and continue to grow in all three localities.

1. Xalapa

The consultancies needed for the design and construction of the biodigester plant in the Municipality of Xalapa have moved forward. Highlights include:

- September 2019, approval of a consulting services contract with the Veracruzana University to carry out the Design and Development of the Municipal Program for the Prevention and Comprehensive Management of Urban Solid Waste (PMPGIRSU).
- October 2019, Mr. Pablo Andrés Alarcón Montero started a consulting contract to develop the terms of reference for tendering the detailed engineering of the biodigestion plant.
- October 2019, the Instituto de Ecología, A.C. (INECOL) initiated a consulting services contract to study the technical, normative and social criteria for the environmental viability of the urban solid waste management infrastructure.
- Based on the above products, in March 2020, the Department of Environment and Sustainability of the Municipality of Xalapa initiated the procurement of the detailed engineering study / plan for the construction of the biodigestion plant. As of July 6, 2020, technical and price proposals had been received, and the evaluation committee had reviewed the proposals for selection of the consultant.
- A total of US\$126,484.57 has been expensed as of June 30, 2020, which represents % allotted to Component 1. Financial progress is approximately one year behind schedule, as compared to the initial project execution plan.

Cofinancing:

- The Municipality of Xalapa contributed cofinancing to the program through: (i) reconstruction and rehabilitation of the access roads, and (ii) physical works for the construction of a new disposal cell for solid waste, at the municipal sanitary landfill.
- The value of cofinancing as of June 30, 2020 is US\$2,027,000 in land purchases.

The timeline going forward is expected to:

- Once selected, the consulting firm will produce the detailed engineering study for the construction of the biodigestion plant. This is expected to be completed by late 2020.
- The business model for the operation and maintenance of the biodigester will be completed by the end of 2020.
- Once the design of the biodigestion plant is approved, tendering for construction will begin in late 2020, and works will commence in early 2021.

2. La Paz, Baja California Sur

During the semester January – June 2020, Component 2 showed significant implementation progress towards the installation of photovoltaic solar panels in seven public building and two schools:

- Consulting firm, Enertis México, SA de CV, commenced a contract to review the design of phase one, assist with the bidding process and supervise the construction and startup of the photovoltaic plants.
- The final bidding documents for the acquisition and installation of photovoltaic plants for public buildings was approved and published. Over 40 companies submitted expressions of interest.
- Unexpectedly, after publication of the bidding documents, CENACE (Centro Nacional de Control de Energía) withdrew authorization for the interconnection of the Salvaterra Hospital, due to technical reasons related to a change in the electric loading conditions of the hospital complex. This change subsequently resulted in having to formally amend the bidding documents mid-course during the tendering process, and extend the deadline for presentation of proposals to late August 2020.
- This component is approximately 18 months behind schedule, but is now on track for completion and operationalization by the end of project.
- A total of US\$19,321, or 0.4% of the budget, has been expended as of June 30, 2020.

Cofinancing:

- The State of Baja California Sur has provided general project management through the monitoring of energy consumption load centers, performing due diligence before the Federal Electricity Commission for the integration of solar systems to the distribution network, developing agreement with the managers of each beneficiary property, and assisting with conflict resolution.
- The value of cofinancing as of June 30, 2020 is US\$3,620 in prefeasibility studies.

Going forward, key steps in the timeline include:

- Conclude the procurement process, award and sign contract for purchase and installation of phase 1 systems by late September 2020. The photovoltaic plants in nine buildings are expected to be operational by end-January 2021

- Once construction is finished and the systems are operational, Enertis México SA de CV will prepare a supervisory report on the quality of the engineering, issues during construction and compliance with environmental measure.
- Once Phase 1 is completed, and considering relevant lessons learned, the tendering process for Phase 2 will begin immediately.

[RX1]. Going forward, the certification from CENACE for connecting the photovoltaic systems needs to be addressed early in Phase 2, to ensure that the design adapts to the limited absorptive capacity of the local energy grid. Project managers, senior stakeholders and policymakers may need to identify alternative technological solutions to ensure maximization of the opportunity presented under the GEF funding. Banobras could be instrumental in facilitating consultation, resolution of technical differences and consensus building.

3. San Francisco de Campeche, Campeche

Work on Component 3 began in late 2019, advancing the studies to address the lack of planning tools for water and wastewater management and climate change adaptation in the Campeche Bay. Due to impacts of the covid-19 pandemic, the tendering of the studies has been delayed. Progress to-date includes:

- The consulting firm López-Elías Abogados SC, hired in December 2019, completed the analysis and adaptation of the legal framework for comprehensive water-resource management, applicable to the State Campeche and its eleven municipalities.
- Terms of reference have been developed and approved for the next three studies for the City of Campeche, which are: (i) a census of potable water users; (ii) an analysis for the adaptation of the sanitary drainage system (sewerage) and design of a new urban wastewater treatment plant; and (iii) an improvement of storm-water drainage systems.
- As of June 30, 2020, Component 3 has expensed US\$37,385.70, or 3.7% of its budget.

Cofinancing:

- Program partners, CONAGUA and PROAGUA, support project execution and, together with the State of Campeche, are beneficiaries of the final product of this Component. No monetary value has yet to be ascribed to these contributions.

Next steps include:

- The publication of the requests for expressions of interest for the three above-mentioned consultancies for the City of San Francisco de Campeche, has been scheduled for August 2020. These consultancies are expected to be contracted during second semester 2020.

4. Institutional strengthening, dissemination and communication.

Component 4. – Institutional strengthening, dissemination and communication has been dormant for the first two years of implementation. It is hard to overstate the importance of knowledge management

based on actual experiences, to address complex environmental problems and engage stakeholders to take collective action. The strength of GEF initiatives lies in the interface of technical, institutional and social-science considerations, when taken together link local actions, national policies, international initiatives and global benefits. Component 4 is designed to help the program generate a shared vision, reinforce coalitions among diverse stakeholders, and build trust and motivation for future initiatives.

One valid argument for not having implemented Component 4 is that the project has not achieved enough results to document and share them. Only after the physical works are operational will there be solid results, observable benefits and lessons learned. [RX2] As the project enters Year 3, planning for the institutional strengthening, dissemination and communication component should consider: (i) The knowledge products need to focus on the unique characteristics in each of the three cities, reflecting their specific stakeholders and issues. (ii) The states and municipalities should have primary responsibility for documenting their own results, convening workshops and developing communication materials and strategies. In order to develop and sustain knowledge management efforts, cities will need dedicated technical support under Component 4.

Evidence suggests that Banobras has some administrative difficulties for assuming the facilitative role necessary to carry out Component 4. [RX3] In this regard, IDB and Banobras should consider building on IDB's experience in knowledge management, and transfer the responsibility and resources for Component 4 to the IDB. Once parties agree, and since no funds have been expended, this would be an expedient solution, transferring the budget and reassigning responsibilities. A decision should be made as soon as possible, and an updated workplan for Component 4 should be included in the 2021 AOP.

5. Progress towards achieving program outcomes and outputs

The following table presents the status of the program achievements to date. It is too soon to measure progress on project outcomes or results. In most cases, measurement of indicators will begin in late Year 4, and more fully in Year 5, after project completion. This version of the Results Matrix is consistent with the GEF CEO Endorsement document.

Table 4. – A Progress Towards Results Matrix – Outcomes

Results Matrix							
Project Objective	The objective is to enhance the mitigation and adaptation capacities in three Mexican cities (Xalapa, La Paz and Campeche) through the preparation and implementation of ESC prioritized projects for clean energy, waste management, and sanitation sectors. Furthermore, it will also establish guidelines to incentivize the replication of the projects in other Mexican cities. The specific objectives of the project are to reduce greenhouse emissions by improving the solid waste management system in Xalapa and increasing the production of low-carbon energy in La Paz; additionally, in Campeche, information will be generated so the relevant stakeholders can decide whether or not to construct sanitation infrastructure.						
Outcomes							
Indicator	Unit of Measure	Baseline 2016	Reported Year-1	Midterm Year 2 Target	End of Project Target	Midterm Achievement Rating *	Justification for Rating
Outcome 1: Improve and increase the solid waste management and the generation of low-carbon energy to reduce greenhouse emissions in Xalapa							
Tons of greenhouse gas emissions avoided associated to energy production by the biodigester plant in Xalapa	Tons of CO ₂ eq/y	0	0	0	1,792	S	End-of-project target is likely to be achieved by end of the project
Tons of municipal solid waste disposed at the sanitary landfill of Xalapa	ton/day	490	0	0	430	S	
Power production from low-carbon energy sources in Xalapa	MWh/year	0	0	0	3,962	S	
Tons of compost produced by the biodigester in Xalapa	ton/day	0	0	0	26	S	
Outcome 2: Increase the production of low-carbon energy to reduce greenhouse gas emissions in La Paz							
Tons of greenhouse gas emissions avoided through solar panels in La Paz	Tons of CO ₂ eq/y	0	0	1,692	1,589*	S	End-of-project target is likely to be achieved by end of the project
Power production from low-carbon energy sources in La Paz	MWh/y	0	0	1,959	1,840*	S	

Indicator	Unit of Measure	Baseline 2016	Reported Year-1	Midterm Year 2 Target	End of Project Target	Midterm Achievement Rating *	Justification for Rating
Outcome 3: The municipality and stakeholders have the technical, environmental and economic information needed to make a decision on whether or not to make the investment in Campeche							
Technical, environmental and economic studies agreed and approved by the Municipality and stakeholders to build the Campeche infrastructure project.	# of times	0	0	0	1	S	End-of-project target is likely to be achieved by end of the project
Outcome 4: Improve and promote solid waste management -- control and recovery of materials – in order to encourage the generation of low-carbon energy and the reduction of GHG emissions.							
Number of times that the pilot projects have served as a reference for other projects in the country	# of times	0	0	0	2	U	End-of-project target is unlikely to be achieved under current approach.

Progress towards the end-of-project outputs examines the efficiency of project implementation and adaptive management in achieving the outputs identified in the results matrix.

Table 4 – B. Progress Towards Results – Outputs

Indicator	Unit of Measure	Baseline 2016	Reported Year-1	Midterm Year 2 Target	End of Project Target	Midterm Achievement Rating
Component 1. Biodigester for Xalapa's solid waste management system operating						
Final design of the biodigester plant in Xalapa finalized	Study	0	0	1	1	MS
Biodigester and energy production plant in Xalapa built	Plant	0	0	0	1	S
Component 2. Solar photovoltaic power plants for self-supply in public building and schools in La Paz						
kW of generation capacity installed – low carbon sources in La Paz	kW	0	0	1040	1540	MS
Component 3. Comprehensive program for the sanitation of the Bay of Campeche						
Detailed design of the sanitation infrastructure in Campeche complete considering climate change adaptation measures	Study	0	0	1	1	MS

Indicator	Unit of Measure	Baseline 2016	Reported Year-1	Midterm Year 2 Target	End of Project Target	Midterm Achievement Rating
Component 4. Institutional Strengthening, dissemination and communication						
Bio-digester and solar photovoltaic power-plant events conducted.	Seminars Conferences Lesson-learned activities	0	0	1	3	U
Technical training workshops in Xalapa, La Paz and Campeche conducted	Training	0	0	1	3	U
Technical guidelines developed to replicate the biodigester technology	Document	0	0	0	1	U
Performance assessment study of solar PV technologies in schools developed	Report	0	0	0	1	U
Review paper with lessons learned from the experience on photovoltaic plants in public schools developed	Paper	0	0	0	1	U

Indicator Assessment Key:

Green= Achieved

Yellow= On target to be achieved

Red= Not on target to be achieved

* The GEF uses a 6-point scale to rate progress towards objectives and outcomes: Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U), or Highly Unsatisfactory (HU).

B. Program Rationale and Relevance

1. Validity of program logic and design

The program is as relevant today as it was when conceived five years ago. The three projects are aligned with the National Strategy on Climate Change and the General Law on Climate Change, which aim to reduce national GHG emissions by 50% in 2050, and reach 35% of national energy production from clean energy sources by 2024. The program is aligned with the Nationally Determined Contribution submitted in 2015 to the United Nations Framework Convention on Climate Change, through its contribution to GHG mitigation actions, innovative clean energy technologies, integrated water resource management, and sharing good practices and lessons learned to build sustainability and replicability. The program is aligned with the Sustainable Development Goals 6, 7 and 11, by promoting improvement to water and sanitation management, adopting energy efficient technologies for reducing GHG emissions, and reducing adverse environmental impact of cities.

In Xalapa, the project is aligned with national policies on efficient management of solid waste systems. The challenges continue to be (i) lack of long-term planning; (ii) exponential urban and population growth; (iii) low technical capacity; and (iv) the lack of alternative waste processing measures (recycling, composting and waste-related energy production). The project address weak market mechanisms and inefficient regulatory instruments related to: (i) reduce the volume of waste generation; (ii) implement recycling measures; (iii) recover landfill gas for electricity generation; and (iii) reduce overall costs for Xalapa.

In La Paz, the persistent challenges for clean energy generation are: (i) the remote, peninsular location of the city renders a physical connection with the rest of the country economically unfeasible, therefore La Paz's electric system is not connected to Mexico's national energy grid; (ii) the cost to transport fuel from the mainland is high, which has made local electric tariffs the highest within Mexico. Alternative sources of energy are absent, and the cost of adopting other renewable technologies is high. The outdated technology based on bunker and diesel fuel is inefficient, with high emission levels even after installing costly filtering equipment.

The La Paz project will address several important issues: (i) Baja California has significant solar energy, but government has prioritized large-scale solar plants and small-scale systems have not been adopted. (ii) Until recently, high cost of distributed energy plants did not incentivize their installation, however price of solar energy plants has dropped significantly. (iii) Photovoltaic technology is vulnerable to extreme weather-related events which can affect generation capacity.

In Campeche, the project pursues improvements in wastewater treatment in coastal areas. Scarce domestic sewage coverage is the root water-sector challenge, where 15% of households are connected to wastewater systems, but only 3% of sewage is properly treated. Most inhabitants use septic tanks and the remainder discharge waste directly into the environment, which aggravates pollution levels in the freshwater aquifer and in the Bay of Campeche. Local investment has focused on San Francisco de Campeche city center, which was declared a UNESCO World Heritage Site in 1999. Although state and

local laws prohibit discharging domestic wastewater into the environment, local enforcement is lax, and widespread violation contributes to further degradation of the aquifer and bay.

In Campeche, potable water and sanitation services are provided by two distinct entities: (i) the Municipal Water and Drainage System is the water-service utility, and (ii) the Department of Public Services manages sanitation. This division of labor impedes implementation of an integrated water-management system. It also has negative financial implications for the sanitation system as resources are contingent on municipal budget allocations. Coordination between these two institutions is necessary to increase wastewater treatment and comprehensively address the sanitation of the bay. The bay provides important ecosystem services that are not fully appreciated or understood by the general public, so there are few incentives to fund conservation efforts.

2. Results Management

An analysis of the Results Framework reveals an important inconsistency. The Outcomes (*Resultados*) and Outputs (*Productos*) have evolved from the original GEF CEO Endorsement document (CEO), to the IDB Draft Loan Proposal document (DPL) and, finally, as they appear in Banobras'/Sub-executors' semi-annual reports. The initially-approved higher-order objectives have ceded space to operationally-oriented outputs. This likely occurred unintentionally as different writers attempted to clarify and appropriate the objectives, but it results in an inconsistency that diminishes the intent of initially-approved objectives and may lead to mission creep. The following table illustrates:

Table 5. Evolution of Objectives and Outcomes in Project Documents

	GEF CEO	IDB DPL	Banobras / Sub-executors
Project Objective	The <u>objective</u> is to enhance the mitigation and adaptation capacities in three Mexican cities (Xalapa, La Paz and Campeche) through the preparation and implementation of ESC prioritized projects for clean energy, waste management, and sanitation sectors. Furthermore, it will also establish guidelines to incentivize the replication of the projects in other Mexican cities.	The objective is to enhance the mitigation and adaptation capacities in three Mexican cities through the preparation and implementation of ESC prioritized projects for clean energy, waste management, and sanitation sectors.	The <i>objetivo general del programa</i> (translated into Spanish) is the same as GEF CEO.
Specific Objective	The <u>specific objectives</u> of the project are to reduce greenhouse emissions by improving the solid waste management system in Xalapa and increasing the production of low carbon energy in La Paz; additionally, in Campeche, information will be generated so the relevant stakeholders can decide whether or not to construct sanitation infrastructure.	Furthermore, it will also establish guidelines to incentivize the replication of the projects in other Mexican cities. No specific objective identified	No specific objective identified

	GEF CEO	IDB DPL	Banobras / Sub-executors
Outcome 1.	Improve and increase the solid waste management and the generation of low-carbon energy to reduce greenhouse emissions in Xalapa	Climate change mitigation measures in Xalapa implemented	<i>Llevar a cabo el diseño pormenorizado, la construcción y la puesta en servicio de una planta biodigestora para el tratamiento de la fracción organica de los residuos sólidos municipales de Xalapa</i>
Outcome 2.	Increase the production of low carbon energy to reduce greenhouse gas emissions in La Paz	Climate change mitigation measures in La Paz implemented	<i>Implementar la instalación de centrales solares fotovoltaicas en, por lo menos, siete edificios y dos escuelas públicas del municipio.</i>
Outcome 3.	The municipality and stakeholders have the technical, environmental and economic information needed to decide on whether or not make the investment in Campeche	Detailed design study has been used in an infrastructure project	<i>Realizar un estudio detallado, que abordará la falta de herramientas de planificación para el saneamiento de la segunda bahía más grande de México, incluyendo medidas de adaptación al cambio climático y el desarrollo de guías para replicar en el país/ciudades de México.</i>
Outcome 4.	Improve and promote solid waste management –control and recovery of materials- in order to encourage the generation of low-carbon energy and the reduction of GHG emissions	Institutions strengthened in biodigester and solar panels technologies	Not monitored or reported.
Outcome 5	Not identified	Biodigester and power plants replicated in other Mexican cities.	Not identified.

At the end of the project, the executing agencies will be required to render accounts on the original objectives and outcomes for which the funding was approved. The IDB Project Monitoring System (which is the basis for reporting to the GEF) indicates no changes were made to the results matrix. [RX4] The executing agency and sub-executing agencies should: (i) For the remainder of the project, ensure that all monitoring instruments and reports adhere to the results matrix of the CEO Endorsement document. (ii) Initiate the Monitoring and Evaluation Plan, confirm the instruments and methodologies needed to verify the fulfillment of project goals, and adjust the 2021 AOP accordingly. (iii) The PMS should be adjusted to reflect the objectives, outcomes and outputs approved in the GEF CEO Endorsement document. No additional review or modification of the results matrix is recommended at this time. Using the originally approved results matrix will save considerable headache at the end of project.

3. Indicators and Targets

An analysis of project indicators found that (i) the indicators used throughout the three above-mentioned project documents are identical to the results matrix of original CEO Endorsement

document; and (ii) the project indicators and their respective targets are SMART, i.e., Specific, Measurable, Achievable, Relevant and Time-bound.

[RX5] In the context of the 2021 AOP, the executing agencies should review the indicators and targets to ensure that all parties understand them and are committed to measuring and using them effectively. If necessary, specific targets could be revised based on recently completed technical analyses and project plans. Nonetheless, the executing units will need support to develop the mechanisms to measure the reduction of GHG, the hydrocarbon offsets from renewable energy, or the economic impact of the completed project.

Executing units expressed the need for additional indicators related to their operations. Whereas cities need some latitude in selecting indicators for their locally specific work, there should be a common conceptual framework to ensure that the indicators are appropriate. This means that, in addition to measuring performance of the specific interventions, indicators should also be relevant to and aligned with national goals and policies, as well as the GEF Integrated Approach Pilot, for knowledge sharing, benchmarking and comparability. Cities wishing to enhance their capacity for measuring urban sustainability can receive guidance from the Global Platform for Sustainable Cities, for developing or adopting evidence-based, integrated approaches, drawing on a suite of locally-specific indicators based on common criteria. Open-source indicators related to resilience and adaptation, such as the Notre Dame Global Adaptation Index (ND-GAIN), might be further consulted for assistance with indicator selection, data sources and selection criteria.

4. Gender Equity

A gender-equality and women's-empowerment analysis was conducted during project preparation that found no potential gender issues and, therefore, the project does not have a gender-responsive results framework or sex-disaggregated indicators. At approval, the operation complied with national laws and regulations regarding women's rights, gender, the environment and indigenous peoples. The executing units monitor gender-equity issues throughout project implementation and have reported the following:

Xalapa. The technical committee for evaluating procurement, the interdisciplinary municipal work groups (legal, treasury, audit, etc.) and the consulting firms all encourage equitable gender participation.

Campeche. The State of Campeche and its various dependencies are governed under the principles of gender equality and equity, as established in the 2019-2021 State Development Plan, aligned with the National Development Plan. Because integrated water resource management covers the entire population of the State of Campeche, the project ensures gender equity.

La Paz. The State of Baja California Sur has a regulatory framework aligned to national and international good practice to advance equality between men and women. State planning instruments incorporate the gender perspective. The project coordination unit maintains gender parity.

C. Efficiency – Project Implementation and Adaptive Management

1. Project Implementation and Adaptive Management

The program faced several challenges that affected implementation over the first two years. This section draws on the anecdotal evidence from the interviews, briefly describes the situations that arose, and identifies progress moving forward.

a) Personnel rotation

Significant turnover of human talent generated a palpable loss of institutional memory, momentum and ownership. During the ESC-design phase and throughout the startup phase, the municipalities had deep understanding and ownership of their respective projects. Then, in mid-2018, state and municipal elections took place, which resulted in substantial turnover in leadership, and in technical and administrative personnel responsible for implementation. In one case, the new government was of a different political party and required an extensive review of all project documentation before endorsing it. This required significant time and effort. It has taken a long time to build the skills needed to administer external funding, particularly in the area of procurement. Fortunately, the upshot is that the new state and municipal governments are fully committed to achieving results in the remaining two years, have built effective coordinating units with skills needed to administer external funding.

Municipal elections are every three years, and the risk of repeating this scenario in the 2021 electoral cycle is high. A concerted effort is required to communicate the merits of the project to the new administrations, address opposing opinions, engender support and, if necessary, consider changes. The complexity is compounded where the state is the primary beneficiary and the municipal government is secondary. Adding to the complexity, the primary responsibility for communicating and defending the program lies with the local executing unit, which is subject to restructuring. [RX6] Steps to address the foreseeable delays caused by the upcoming electoral process should be proactively addressed in the 2021 AOP. During these transitions, Banobras, the IDB and the SHCP may need to assume a proactive role in inter-institutional coordination, project support and oversight regarding to assure continuity of support with transitioning local governments.

b) Knowledge gap – procurement

None of the coordinating units in the cities had experience managing external donor resources, and therefore lacked technical knowledge and practical experience with international competitive procurement. The lack of experience with IDB policies and procedures was identified as a medium-level risk at project approval, and was to be mitigated by continuous training of procurement officials. The IDB did offer short workshops on procurement, which served as general orientations, but they were insufficient for the specific needs of the individual projects. To close this gap, IDB hired a senior expert in procurement, to closely accompany the tendering process in Xalapa and La Paz. This consultant support helped move the complex tendering for the biodigester and solar panels forward significantly. Having highly skilled support on call worked very well to forestall common mistakes and expedite the process, and [RX7] should be made available to the other cities at critical moments in their procurement

processes. A lesson learned here is that IDB and Banobras could have responded more proactively when it was apparent that the local governments effectively did not have the expertise to fully undertake procurement responsibilities.

c) Covid-19 pandemic

The covid-19 pandemic generated the difficulties common everywhere but, ironically, the program showed significant progress during the first semester of 2020. Offices were closed, routines disrupted and one key official contracted covid-19 (who fortunately recovered). Due to travel restrictions, the program effectively transitioned to online work relationships, even though the public sector in Mexico generally does not have a culture of working remotely. Thanks to the existing close relationship of IDB and Banobras with the cities, conducting meetings in a virtual format was relatively easy. Virtual project site visits and environmental consultations were successful, as everyone contributed to get the work done. Despite the constraints of the pandemic, substantial progress was made, and is expected to continue and accelerate through second semester 2020.

d) Banobras' scope of work

Banobras has demonstrated managerial acumen and professionalism. It has maintained close contact with the coordinating units and concentrated its efforts under the grant agreement to support the procurement process, financial management, processing disbursements and attendant calculus fabarum. Yet, as mentioned, the three local-level coordinating units had reduced institutional memory, and a knowledge gap on policies and procedures needed to manage international financing. Additionally, the heads of coordination units are persons with other significant responsibilities in their organizations. The grant provides Banobras, as executing agency, a budget of \$850,000 to explicitly support functions related to project management, monitoring and evaluation. These resources were earmarked to allow Banobras to allocate additional human resources to ensure the presence of technical and administrative personal in the operation sites, in coordination with the technical counterparts. (¶ 3.3 DLP). Nevertheless, Banobras has not hired additional staff to support the municipal coordination units, and has been reticent about exercising its convening authority to accelerate implementation. For example, the state-level branch offices in each participating city have little role in representing or supporting the projects.

Evidence would suggest that additional implementation support at the local level is needed and justified. [RX8] Specific, targeted technical consultants should provide the expertise as needed (i) to deepen technical capacity (particularly about operating the biodigester and the photovoltaic plants, as well as procurement), (ii) to accelerate implementation and ensure sustainability, (iii) to develop materials for dissemination and replication under Component 4, and (iv) to measure project impact indicators. The consultancies would need to be customized to, and physically located in, each municipality, yet they would all be individuals with technical expertise relevant to the international development context.

Furthermore, the Monitoring and Evaluation Plan provides extensive detail on the instruments, methodologies and responsibilities of the parties involved in this important activity. The M&E plan assigns Banobras the responsibility for preparing and consolidating and up-dating the monitoring and

evaluation instruments, and carrying out these activities in accordance with IDB and GEF procedures. To date, activities to monitor and evaluate impact have not begun.

[RX8] The project management component, and the monitoring and evaluation component of the program should be operationalized during the second half of the program. As with Component 4, IDB could manage these functions directly or through a parallel project management structure. Prior to preparing the 2021 AOP and for the second half of the program, IDB, Banobras and relevant stakeholders should reach a common understanding how to effectively implement the management, monitoring and evaluation functions.

e) Communication

Internal communication is open and constructive, and is a key strength to the progress made to date. All parties make the effort to identify problems and move towards viable solutions, bringing the diverse group's strengths and perspectives into the solution. Initially, however, there were communication problems with the cities, related to Banobras' role as intermediary with the IDB. These communications issues have been resolved, primarily through frequent phone calls and status updates often with IDB participation, building on IDB's ongoing relationship and communication with the three beneficiary cities, which began during the ESC design phase.

In some cases, formal communications and decision making has been characterized as slow and bureaucratic. Attempts to expedite decisionmaking have skirted established channels, which has led to miscommunication, triangulation of conversations and confusion surrounding final decisions. As implementation accelerates, [RX10] IDB and Banobras should provide incentives for informal multilateral communication and creative dialogue between project team members and stakeholders. However, this informal communication must respect formal decision-making authorities, fiduciary responsibilities and follow the established chain of command. A transparent agreement along these lines will build a foundation of trust that will facilitate creative, participatory problem solving.

2. Financial Management

a) Financial execution -- Efficiency vis-à-vis initial program budget

Banobras' management control and financial execution permit agile, informed and accurate accounting of project resources. Program resources are satisfactorily administered while adhering to the national and IDB fiduciary norms.

Implementation delays have resulted in slow disbursement. The first financial transaction occurred on July 24, 2019, when IDB disbursed US\$2,172,408 to Banobras to create the project revolving fund. As of June 30, 2020, a total of US\$183,191.36, or 1.3% of total financing, has been expensed in project goods and services.

Table 6. Summary of Project Expenditures as of June 30, 2020.

COMPONENT	INVESTMENT CATEGORY	BUDGET ASSIGNED USD	DISBURSED AS OF 06/30/2020	AVAILABILITY USD
1	Biodigestion and Energy Generation Project in the City of Xalapa.	7,181,093.00	126,484.57	7,054,608.43
2	Photovoltaic Cell System for Public Buildings in the City of La Paz	4,500,000.00	19,321.10	4,480,678.90
3	Comprehensive Program for the Sanitation of the Bay of Campeche.	1,000,000.00	37,385.70	962,614.30
4	Establishment of Mechanisms for Replication, Institutional Support, Dissemination and Monitoring.	1,080,375.00	-	1,080,375.00
		13,761,468.00	183,191.36	13,578,276.64
	REVOLVING FUND BALANCE		1,989,216.64	
	TOTALS	13,761,468.00	2,172,408.00	13,578,276.64

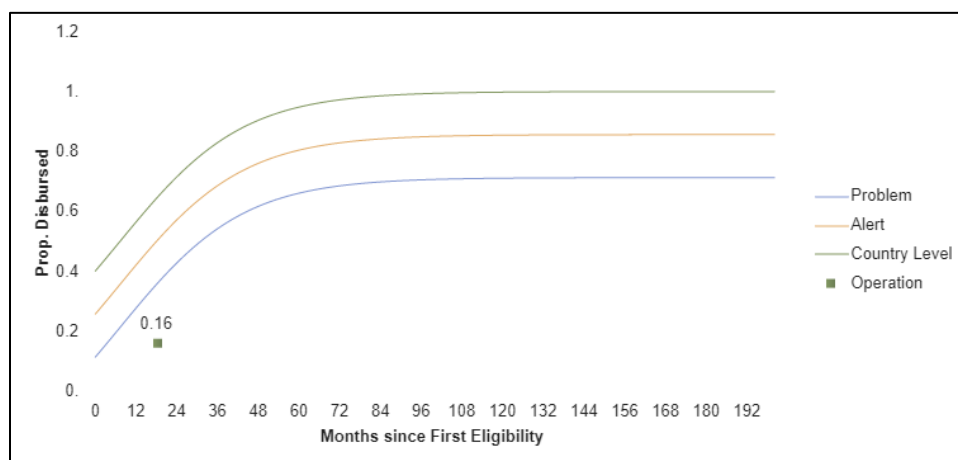
In terms of efficiency vis-à-vis the initial program budget, the IDB's financial monitoring indicators from the Project Management Report system, as of June 30th, 2020, rate the project's disbursement performance as "problem".

Table 7. Disbursement Monitoring Indicators (Stage 2: After Eligibility)

Indicator	Project Indicator Value	Benchmark Values		Traffic Light
		Satisfactory	Problem	
Synthetic Indicator (SI)	1	$2.5 \leq I$	$I < 2$	PROBLEM
Accumulated disbursements to country's historic disbursements	0.16	$1 \geq I > 0.5$	$0.36 > I \geq 0$	PROBLEM
Cost Performance Index - CPI	0	$0.80 \leq I \leq 2.00$	$0.00 \leq I < 0.40$	PROBLEM
Cost Performance Index (annual - CPI(a))	0	$0.80 \leq I \leq 2.00$	$0.00 \leq I < 0.40$	PROBLEM
Schedule Performance Index - SPI	0	$0.80 \leq I \leq 2.00$	$0.00 \leq I < 0.40$	PROBLEM
Schedule Performance Index (annual)- SPI(a)	0	$0.80 \leq I \leq 2.00$	$0.00 \leq I < 0.40$	PROBLEM

The following graph demonstrates the relationship between the proposed disbursement schedule over time, in months, since eligibility, adjusted to country-level disbursement performance.

Graph 1. Actual to Expected Disbursements



Source: IDB's Project Monitoring System

b) Co-finance

Preliminary reports on cofinancing applied to the project include the following:

The Municipality of Xalapa constructed a new disposal cell for urban solid waste, and reconstructed the access road that enters the sanitary landing. These activities are valued at US\$2,027,000

In La Paz, the Federal Electricity Commission supported the interconnection of the photovoltaic system to the existing distribution network, collaborated in securing agreements with the beneficiary property managers, and reconciled controversies arising from the project. The estimated value of these contribution is US\$3,620

The Campeche study is in partnership with the State of Campeche, CONAGUA and PROAGUA which support execution and are beneficiaries of the final product. Monetary value has yet to be ascribed to these contributions.

The following table shows the cofinancing commitments made at CEO Endorsement. No formal data on actual co-financing contributions are available at midterm.

Table 8. Cofinancing as of June 30, 2020

Sources of Cofinancing	Name of Co-financer	Type of Cofinancing	Amount Confirmed at CEO Endorsement (US\$)	Actual Amount Contributed at stage of Midterm Review (US\$)	Actual % of Expected Amount
National Government	National Development Bank (BANOBRA)	Loans	30,000,000	0	0%
National Government	National Water Commission (CONAGUA)	In Kind	1,000,000	0	0%
National Government	Ministry of Natural Resources (SEMARNAT)	In Kind	250,000	0	0%

Sources of Cofinancing	Name of Co-financer	Type of Cofinancing	Amount Confirmed at CEO Endorsement (US\$)	Actual Amount Contributed at stage of Midterm Review (US\$)	Actual % of Expected Amount
National Government	Federal Electricity Commission (CFE)	In Kind	250,000	0	0%
State Government	Baja California Sur State	In Kind	1,000,000	3,620	0.36%
Municipal Government	Xalapa Municipal Government	In Kind	800,000	2,027,000	253.36%
State Government	Campeche State	In Kind	65,000,000	0	0%
		TOTAL	98,300,000	2,030,620	2.06%

[RX11] The coordination units and Banobras should monitor and report on the planned-versus-actual cofinancing commitments, providing a brief description of resources leveraged, and how they contribute to the project's ultimate objectives, on a semiannual basis.

c) Audits

No audit has been performed on the project to-date. The first audited financial statement will cover transactions from start up to December 31, 2020, and is due 120 days afterwards.

3. Knowledge generation

Knowledge management has mostly focused on training for discrete project implementation or procurement. The officials and personnel who participated in these trainings have applied this knowledge to improving project performance.

There is no indication that systematic information gathering and knowledge generation, as part of a knowledge management strategy, has begun. It is the purview of Component 4 to identify a strategic vision for dissemination and replication of the knowledge and lessons learned throughout the program. An effective knowledge management strategy, based on objective indicators, will permit clear information flow to other cities, national agencies, donors and GEF partners.

4. Overall Rating for Project Implementation

Although the project represents different cities with technically distinct projects, they share many challenges and systemic issues: climate change, urban development, energy usage, the covid-19 pandemic, administrative capacity and public policymaking. The project has demonstrated growing vision, creativity and operational agility, which will need to be cultivated and sustained during the second half of the project. The project has a very diverse and multi-layered team, that could promote peer-to-peer learning and collaborative problem solving.

The project has successfully advanced on most of the components leading to efficient and effective project implementation. The MTR assigns an overall rating for project implementation of SATISFACTORY.

Banobras and the three executing units are highly optimistic about achieving the program's environmental objectives within the initial timeframe. The June 30, 2020 semester reports include the following self-rating of project performance.

Table 9. Executing Units' Self-Evaluation of Performance

	Xalapa	Baja California Sur	Campeche
Probability of achieving the environmental goals of the project. Scale: 1=highly satisfactory; 6=highly unsatisfactory	1	1	2
Implementation progress Scale: 1=highly satisfactory; 6=highly unsatisfactory	3	1	2
General risk Scale: 1=high risk; 4=low risk	3	3	3

D. Sustainability – Risk Management

Both the GEF CEO Endorsement and the IDB DLP documents identified multiple risks, ranging from natural disasters, viability and performance of selected technologies, long-term financial sustainability, human health, environmental and social safeguards risks, and lack of coordination among local, state and federal authorities. Whereas operational, fiduciary and institutional considerations were given a “low” risk rating, the overall risk of the operation (i.e., magnitude of risk likelihood) was considered “medium” at the time of approval. Likewise, the environmental and social risk classification was “B”.

The executing and coordination units monitored implementation and identified the following ongoing risks: (i) Lack of continuity and budgetary allocation for follow up operations by new administrations after elections. (ii) Conditions resulting from the pandemic do not allow for contracting and executing work according to schedule. (iii) High-impact meteorological events (hurricanes) cause flooding and wind damage to project infrastructure. And specifically for La Paz, (iv), the insular characteristic of Baja California Sur's electric system limits the incorporation of energy from a variable source, and the limit is close to being reached, therefore (v) approvals for the interconnection of photovoltaic power plants to the grid may expire again. In order to mitigate the risks mentioned above, the following strategies were identified: (i) strengthen stakeholder commitment and maintain open communication to ensure that the project is a priority for future administrations. (ii) demonstrate the relevance of the project as part of the integral development of the municipality, as well as part of the economic recovery and source of jobs for the participating cities. (iii) development of a disaster risk reduction and disaster risk management plan. (iv) identifying alternatives such as energy storage in batteries. (v) working closely with related authorities to prevent interconnection permits from expiring or getting renewed.

The interviews identified additional risks to project sustainability: (i) reduction in the price of petroleum, which could reduce the economic impact (in the short run) of the solar energy production; (ii) the effect in the medium-term of climate change impact, such as sea-level rise in Campeche; and (iii)

the need for sophisticated cybersecurity to protect the blockchain technology to be used in the collective generation scheme for the payment of energy distributed to multiple users.

[RX12] The project team should review and appraise the full list of risks and opportunities, identified at project inception and experienced during execution, as a key component of the 2021 operational plan and for the remainder of the program. The team has already arranged the dialogue with the transition team in Xalapa to discuss and re-appraise and update the risks of the project.

IV. Conclusions, Recommendations and Lessons Learned.

A. *Conclusions*

Progress: Several external challenges affected implementation over the first two years. Progress is approximately one year behind schedule, but the pace of execution is accelerating, and there is a high probability that execution will be completed on time. It is premature to measure progress on outcomes or results, which will likely begin in Year 4.

Risks: Important factors, such as personnel turnover, lack of support during political transitions, lack of knowledge needed for international financing, the covid-19 pandemic, high-impact meteorological events, and stakeholder support have been identified as continued risks to achieving and sustaining the project objectives. These factors, along with risks identified during program design, may affect implementation and sustainability.

Relevance: The program is as relevant today as it was when conceived five years ago. The three projects are aligned with national climate change strategies and targets, through their contributions to GHG mitigation actions, innovative clean energy technologies, integrated water resource management, and sharing good practices and lessons learned to build sustainability and replicability. Project preparation and implementation based on the ESC prioritization of clean energy, solid waste management and sanitation sectors has provided a solid and effective foundation.

Component 1. Xalapa: Key studies on the design and management of the solid waste, environmental and social safeguards, and the TORs for the design phase have been completed. A complete engineering study and plans for construction of the biodigester plant are expected by late 2020.

Component 2. La Paz: Bidding documents for the design and build of the photovoltaic plants for public buildings were approved and tendered. Physical work on phase one is expected to begin in fourth quarter 2020

Component 3. Campeche: Having completed the analysis and adaptation of the legal framework for comprehensive water-resource management, TORs for the subsequent studies (user census, sanitation sewerage and treatment plant, and storm-water drainage) will be tendered in third quarter 2020.

Component 4. Institutional strengthening, dissemination and communication: This component has remained dormant for the first two years of implementation. The development of a knowledge management plan and initiation of this component is contingent on completion and operationalization of the physical works.

Monitoring and Evaluation: There are inconsistencies in the way outcomes, outputs have been incorporated and used through the project. Indicators, however, are SMART and consistent. Monitoring and evaluation activities have not begun yet.

Management: Banobras is a capable administrator. The cities and states are highly motivated to complete the program. Management arrangements are suitable for effective implementation. Resources earmarked for project management have not been utilized. Communications are open and effective for addressing issues in a timely manner.

B. Recommendations

The following recommendations should be addressed by the project team and executors during the preparation of the updated Annual Operations Plan for 2021. The RX # are indexed to the discussion in the text.

Table 10. Summary of Recommendations

RX #	Recommendation
RX1	In La Paz, the issue of certification for connecting the photovoltaic systems needs to be addressed early in Phase 2, to ensure that the designs in this much larger phase adapt to the limited absorptive capacity of the local energy grid, or identify an alternative course of action.
RX2	Implementation of the institutional strengthening, dissemination and communication activities under Component 4 should consider: (i) The knowledge products need to focus on the unique characteristics of each of the three cities; (ii) The states and municipalities should have primary responsibility for developing their own knowledge management strategies; and (iii) cities will need dedicated technical support under Component 4.
RX3	IDB and Banobras should decide as soon as possible how to implement Component 4, as this decision will have a significant impact on developing the 2021 AOP.
RX4	All monitoring instruments and reports should adhere to the original results matrix of the CEO Endorsement document, and the monitoring and evaluation plan should be updated accordingly.
RX5	The executing agencies should review the indicators and targets to ensure that all parties understand them and are committed to measuring and using them effectively. If necessary, specific targets could be revised based on recently completed technical analyses.
RX6	Steps to address the foreseeable delays caused by the upcoming electoral process should be proactively addressed in the updated project action plan.
RX7	Highly skilled procurement specialist support should be made available to all cities at critical moments in their procurement processes, in order to forestall common mistakes and expedite the tendering process,
RX8	Specific, targeted consultancies should provide the expertise to (i) deepen technical capacity (operating the biodigester and the photovoltaic plants, and procurement), (ii) accelerate implementation and ensure sustainability, (iii) develop dissemination and replication efforts, and (iv) measure project impact indicators.
RX9	IDB and Banobras should seek a common understanding to operationalize the management, and monitoring and evaluation components of the program
RX10	The IDB and Banobras should provide incentives for informal, multilateral communication and creative dialogue with team members and stakeholders that respect formal decision-making

RX #	Recommendation
	authorities and responsibilities.
RX11	The coordination units and Banobras should monitor and report on the planned-versus-actual cofinancing commitments, on a semiannual basis.
RX12	The project team should review and appraise the full list of risks and opportunities, identified both at project inception and during execution, in preparing the 2021 operational plan.

C. Lessons learned.

Project implementation offers several insights and lessons.

1. Due to the increasing capacity and decreasing cost of photovoltaic solar power technology, the tendering process emphasized acquisition of cutting-edge technology, as opposed to establishing predetermined technical specification. This change in approach will increase efficiency, reduce costs and therefore expanded beneficiaries covered in this component.
2. Although the knowledge management, dissemination and communication component has not begun, the delay may have a positive effect. Rather than developing generic information on the whole program, once the components have matured, the documentation and education can reflect their individual achievements.
3. The local government's lack of knowledge about IDB procurement policies and procedures was identified during project preparation and foreseen as a medium risk, nevertheless it was not effectively addressed until it began to impede implementation progress. This experience shows the importance of periodically reviewing risks and mitigation strategies.
4. Xalapa reports that the multidisciplinary, integrated management approach and the capacity building inputs of the project have had a spin-off effect of improving communication and reduced bureaucracy among the key functional areas in the municipal government.
5. Adapting to the delays, disruptions and personnel absences caused by the covid-19 pandemic has resulted in coping strategies that include new work processes and protocols, mandating the use of digital tools that previously were optional, and adjusting to loss of capacity. The experience and lessons learned kept the process on track and will continue to help in scheduling and executing subsequent work.
6. The high visibility of the program increases transparency to the hiring process and supports continuity when government authorities change.

V. Annexes

A. *Documents Reviewed*

The following items were reviewed and consulted in carrying out the mid-term review.

Draft Loan Proposal GEF Program for the Implementation of Prioritized ESC Projects in Three Mexican Cities (ME-1012)

GEF6CEO SCIAP Mexico – Implementation of projects prioritized by the Sustainable and Emerging Cities Program In Three Mexican Cities

Plan de Ejecución Plurianual (PEP)– Plan Operativo Anual (POA)

Reglas de Operación FMAM

Plan de Seguimiento y Evaluación

Informe de Gestión Ambiental y Social

PMR Operacional Report

GEF Tracking Tool MX PESC

Presentación Xalapa 2018

Agreements between Banobras and the local coordinating units in Xalapa, La Paz and Campeche

Mission report

IDB Project Monitoring Report

Guidance Midterm Review EN 2014

GEF6 CCM Tracking Tool AB May 16, 2014

GRT-FM-16409-ME Informe Semestral Enero-Junio 2020 Xalapa

GRT-FM-16409-ME Informe Semestral Enero-Junio 2020 La Paz

GRT-FM-16409-ME Informe Semestral Enero-Junio 2020 Campeche

Informe de Avance PCES GEF ENE – JUN 2020

B. List of Interviewees

Daniel Adams
Jefe del Departamento de Energía
Secretaría de Planeación Urbana,
Infraestructura y Movilidad de Baja California
Sur

José Aguilar
Director de Obras
Comisión de Agua Potable y Alcantarillado del
Estado de Campeche

Arq. Bianca Penelope Silva Ruiz
Directora General de Planeacion
Secretaría de Planeación Urbana,
Infraestructura y Movilidad de Baja California
Sur

Salomón Herejón
Consultor de Adquisiciones
BID

Itzel Xanath Sanchez S
Subgerente de Organismos e Instituciones
Financieras Internacionales
Banobras

Dr. Juan Carlos Olivo Escudero
Director de Medio Ambiente y
Sustentabilidad y Titular de la Unidad
Coordinadora del Proyecto
H. Ayuntamiento Xalapa

Dr. Rafael Villegas Patraca
Consultor
H. Ayuntamiento Xalapa

Daniel Mendoza
Director General de Infraestructura

Secretaría de Planeación Urbana,
Infraestructura y Movilidad de Baja California
Sur

Sandra Romero
Gerente de Organismos e Instituciones
Financieras Internacionales
Banobras

Uriel Cervantes
Subgerente de Cooperación Internacional y
Sustentabilidad
Banobras

Ing. Jorge Carlos Hernández Pereya
Encargado del Despacho de la Unidad de
Planeación
Comisión de Agua Potable y Alcantarillado del
Estado de Campeche

Edgar Vasquez
Director de Desarrollo Empresarial
ENERTIS, México

Alejandro DeGyves
Analista de Operaciones
BID

Ing. Pablo Alarcón
Consultor
H. Ayuntamiento Xalapa

Rodrigo Riquelme
Especialista de Agua y Saneamiento
BID

Paola Lisette Gordon
Especialista de Agua y Saneamiento
BID

C. Results Matrix (Spanish)

MATRIZ DE RESULTADOS

Nombre del proyecto	Programa del FMAM para Implementar Proyectos Prioritarios en Tres Ciudades Mexicanas en el Marco de la PCES									
Objetivo del proyecto	El objetivo consiste en mejorar la capacidad de mitigación y adaptación de tres ciudades mexicanas (Xalapa, La Paz y Campeche) mediante la preparación y ejecución de proyectos prioritarios de la Programa Ciudades Emergentes y Sostenibles (PCES) en los sectores de energía limpia, gestión de desechos sólidos y saneamiento. Además, se establecerán directrices para promover la replicación de los proyectos en otras ciudades de México. Los objetivos específicos del proyecto son reducir las emisiones de gases de efecto invernadero mejorando el sistema de gestión de desechos sólidos en Xalapa y aumentando la producción de energía de fuentes bajas en carbono en La Paz. Por otra parte, en Campeche se generará información a fin de que los actores pertinentes puedan decidir si se construye o no la infraestructura de saneamiento.									
Resultados										
Resultado 1: Mejorar y aumentar la gestión de desechos sólidos y la producción de energía partir de fuentes bajas en carbono para reducir las emisiones de gases de efecto invernadero en Xalapa										
Indicador	Unidad de medida	Valor de referencia	Año de referencia	Año 1	Año 2	Año 3	Año 4	Año 5	Final del proyecto	Observaciones/ Medios de verificación
Toneladas de emisiones de gases de efecto invernadero evitadas gracias a la producción de energía por la planta biodigestora de Xalapa ¹	Toneladas de CO ₂ eq/año	0	2016					1.792	1.792*	*Promedio anual BANOBRAS suministrará la información basándose en los informes que presente el operador
Toneladas de desechos sólidos municipales eliminados en el vertedero sanitario de Xalapa	Toneladas/día	490	2016					430	430	Registro de las entradas y salidas de desechos sólidos que realiza el operador y que se incluye en la evaluación final
Producción de energía de fuentes bajas en carbono en Xalapa	MWh/año	0	2016					3.962	3.962	Energía: 452 KW. Registro de las operaciones documentadas por el medidor que se incluye en la evaluación final

¹ La reducción de emisiones gracias a la producción de energía por gas de desechos será positiva desde el primer año de operación de las plantas. En cambio, la reducción de emisiones relacionada con la captación de metano será positiva hasta el tercer año, cuando la acumulación de desechos orgánicos desviados del vertedero compensará las emisiones fugitivas y del proyecto.

Indicador	Unidad de medida	Valor de referencia	Año de referencia	Año 1	Año 2	Año 3	Año 4	Año 5	Final del proyecto	Observaciones/ Medios de verificación
Toneladas de composta producidas por el biodigestor de Xalapa	Toneladas/día	0	2016					26	26	Registro de las entradas y salidas de compost que realiza el operador y que se incluye en la evaluación final
Resultado 2: Aumento de la producción de energía a partir de fuentes bajas en carbono para reducir las emisiones de gases de efecto invernadero en La Paz										
Toneladas de emisiones de gases de efecto invernadero evitadas gracias a los paneles solares en La Paz	Toneladas de CO ₂ eq/año	0	2016		1.692	1.684 ²	PC ³	PC	1.589*	*Promedio anual durante la vigencia del proyecto teniendo en cuenta los edificios públicos de la primera fase. Informe semestral de avance de la producción total
Producción de energía eléctrica de fuentes bajas en carbono en La Paz	MWh/año	0	2016		1.959	1.949	PC	PC	1.840*	*Promedio anual durante la vigencia del proyecto teniendo en cuenta los edificios públicos de la primera fase. Registros de las lecturas agregadas de los medidores de todas las centrales fotovoltaicas
Resultado 3: El municipio y las partes interesadas tienen la información técnica, ambiental y económica necesaria para tomar la decisión de si hacer o no la inversión en Campeche										
Estudios técnicos, ambientales y económicos convenidos y aprobados por el municipio y las partes interesadas para construir el proyecto de infraestructura en Campeche	Número de veces	0	2016					1	1	Informe del municipio al aprobar el proyecto

² Las cifras de reducción de emisiones disminuyen levemente con el tiempo a medida que la producción de electricidad de las centrales fotovoltaicas también disminuye por la degradación normal de las celdas solares.

³ Está por calcular (PC) la reducción de emisiones de la segunda fase del proyecto, que corresponde a un segundo grupo de edificios que aún no se seleccionan para dicha fase. Esta reducción sería adicional a la reducción de emisiones obtenida de los edificios de la primera fase.

Indicador	Unidad de medida	Valor de referencia	Año de referencia	Año 1	Año 2	Año 3	Año 4	Año 5	Final del proyecto	Observaciones/ Medios de verificación
Resultado 4: Mejorar y promover la gestión de desechos sólidos —el control y la recuperación de materiales— para impulsar la generación de energía de fuentes bajas en carbono y reducir las emisiones de gases de efecto invernadero										
Número de veces que los proyectos piloto han servido como referencia para otros proyectos en el país	Número de veces	0	2016					2	2	Información suministrada por BANOBRAS que se incluirá en la evaluación final

Productos											
Componente 1: Biodigestor para el sistema de gestión de desechos sólidos de Xalapa											
Producto	Unidad de medida	Resultados relacionados	Costo (en US\$)	Valor de referencia	Año 1	Año 2	Año 3	Año 4	Año 5	Final del proyecto	Observaciones/ Medios de verificación
Biodigestor para el sistema de gestión de desechos sólidos de Xalapa en operación	Biodigestor	1	7.181.093	0				1		1	
Hitos: 1. Diseño final del biodigestor de Xalapa terminado	Estudio	1	500,000	0		1				1	Estudio terminado y presentado por el consultor y aprobado por el jefe de equipo
2. Obras preliminares ⁵ ejecutadas	Obras	1		0			1				Certificado provisional de aceptación
3. Planta de biodigestor y producción de energía en Xalapa construida	Planta	1		0				1		1	Certificado provisional de aceptación

⁴ Estos estudios serán incluyentes y se llevarán a cabo mediante consultas públicas con actores pertinentes.

⁵ Las obras preliminares incluyen la preparación del terreno y obras estructurales.

Componente 2: Centrales de energía solar fotovoltaica para autoabastecimiento en edificios públicos y escuelas de La Paz											
Producto	Unidad de medida	Resultados relacionados	Costo (en US\$)	Valor de referencia	Año 1	Año 2	Año 3	Año 4	Año 5	Final del proyecto	Observaciones/ Medios de verificación
kW de capacidad de generación instalada – fuentes bajas en carbono en La Paz	kW	2	4.500.000	0		1.040		1.500		1.540	Capacidad en CC verificada por un ingeniero independiente
Componente 3: Estudio ejecutivo integral para el saneamiento de la Bahía de Campeche											
Diseño pormenorizado de la infraestructura de saneamiento en Campeche terminado, tomando en consideración las medidas de adaptación al cambio climático	Estudio	3	1.000.000	0		1				1	Estudio terminado y presentado por el consultor y aprobado por el jefe de equipo
Componente 4: Creación de capacidad, comunicación y divulgación											
Seminarios, conferencias, creación de capacidad y lecciones aprendidas en relación con el biodigestor y las centrales de energía solar fotovoltaica impartidos	Seminarios, conferencias, actividades	1, 2 y 4	30.000	0		1	1	1		3	Informes finales con las conclusiones y resultados de los eventos aprobados por el jefe de equipo
Seminarios de capacitación técnica sobre biodigestores, centrales de energía solar fotovoltaica y saneamiento en Xalapa, La Paz y Campeche impartidos	Capacitación	1, 2 y 4	50.000	0		1	1	1		3	Informes finales con las conclusiones y resultados de los eventos aprobados por el jefe de equipo
Directrices técnicas ⁶ elaboradas para replicar la tecnología de biodigestores	Documento	4	50.000	0				1		1	Estudio concluido y presentado por el consultor y aprobado por el jefe de equipo
Estudio de evaluación del desempeño de la tecnología solar fotovoltaica en escuelas realizado	Informe	4	50.000	0				1		1	Estudio concluido y presentado por el consultor y aprobado por el jefe de equipo
Documento de revisión con las lecciones aprendidas de la experiencia con las centrales fotovoltaicas en escuelas públicas preparado	Documento	4	50.000	0				1		1	Estudio concluido y presentado por el consultor y aprobado por el jefe de equipo

⁶ Las directrices técnicas consistirán en recomendaciones para seleccionar la tecnología de biodigestión más apropiada y ejecutar el proyecto de biodigestión tomando en cuenta las condiciones locales

D. Initial Report (Spanish)

Informe Inicial -- Revisión Intermedia

Programa del FMAM para la Ejecución de Proyectos Prioritarios del Programa de Ciudades Emergentes y Sostenibles (PCES) en Tres Ciudades Mexicanas GRT/FM-16409-ME (ME-G1012)

1. Introducción

Este informe inicial presenta los elementos básicos para la Revisión Intermedia del *Programa del FMAM para la Ejecución de Proyectos Prioritarios del Programa de Ciudades Emergentes y Sostenibles (PCES) en Tres Ciudades Mexicanas GRT/FM-16409-ME*. La Revisión está programada para realizarse entre el 1º de agosto al 30 de octubre de 2020 por un consultor externo. Debido a la pandemia del coronavirus, se realizará de forma externa a través de medios de telecomunicación electrónicos. Este Informe Inicial sirve de insumo para programar y acordar los elementos principales de esta revisión, detallados a continuación.

2. Descripción y Contexto

El Programa: Esta operación financiada por el FMAM (Fondo para el Medio Ambiente Mundial) tiene el objetivo de mejorar la capacidad de mitigación y adaptación al cambio climático de tres ciudades mexicanas (Xalapa, La Paz y Campeche) mediante la implementación de tres proyectos que derivan del Programa de Ciudades Emergentes y Sostenibles (PCES) del BID, en los sectores de manejo de residuos sólidos, energía limpia y saneamiento, respectivamente; adicionalmente, establecerá directrices para promover la replicabilidad de los proyectos en otras ciudades de México.

Las acciones se realizan a través de los siguientes cuatro componentes: (1.) Biodigestor para el sistema de gestión de residuos sólidos de Xalapa, por US\$7.2 millones. (2.) Centrales de energía solar fotovoltaica para autoabastecimiento en edificios públicos y escuelas de La Paz, por US\$4.5 millones. (3.) Estudio ejecutivo completo para el saneamiento de la Bahía de Campeche, por US\$1.0 millón. (4.) Fortalecimiento institucional, comunicación y disseminación, por US\$0.23 millón.

Banobras es la agencia ejecutora del proyecto. Los municipios tienen responsabilidad para sus respectivas actividades de adquisición e implementación, bajo la supervisión de Banobras y el BID. Banobras es responsable para la ejecución del Componente 4.

El Contexto: De acuerdo con los convenios que rigen el Programa, se requiere realizar una evaluación (o revisión) intermedia después de dos años de ejecución o cuando el 50% de los recursos de la contribución del BID/FMAM hayan sido desembolsados, cualquiera que suceda primero. Hasta 30 de junio de 2020, se han recorrido 24 meses desde el inicio oficial del programa el 7 de junio de 2018, sobre un período de ejecución de 60 meses, equivalente al 40% del tiempo transcurrido

3. Enfoque de la Revisión Intermedia

El objetivo general de la Revisión es examinar el progreso en la implementación del programa y evaluar los logros alcanzados hasta la fecha. La Revisión examina el desempeño del programa contra sus metas originales y objetivos operativos, la matriz de resultados e indicadores, así como otros aspectos relevantes de ejecución, con el fin de proponer ajustes necesarios para el período de ejecución restante para mejorar el desempeño del Programa y cumplir con los objetivos. Específicamente, la Revisión:

- Determina en qué medida se han cumplido los objetivos definidos en la matriz de resultados y evaluar la probabilidad de alcanzarlos una vez finalizado el Programa. La Revisión revisa el progreso sobre indicadores de resultados informados más reciente, y dará constancia si las metas (i) hayan sido logradas, (ii) están parcialmente logradas y bien encaminadas, o (iii) si existe riesgo que no se logren antes de finalizar el proyecto. Para este ejercicio, se utilizará la Matriz de Progreso Hacia los Resultados, que se reproduce abajo en la Sección 9 de este Informe.
- Identifica las fortalezas y debilidades institucionales de Banobras como la Agencia Ejecutora del Programa, así como evaluar el papel de las diferentes entidades involucradas en el proyecto; e
- Identifica las posibles opciones para mejorar el Programa, que pueden incluir la modificación de actividades, roles, responsabilidades, cronograma de actividades, arreglos de gestión y asignaciones presupuestarias, entre otros. Finalmente, proponer un proyecto de cronograma modificado que incluya los hallazgos anteriores

Otros temas específicos de la Revisión incluyen:

- Análisis crítico de los indicadores de la matriz lógica y su grado de “SMART” (Específicos, Medibles, Asequibles, Relevantes y en Tiempo definido), y si son claros, prácticos, factibles y necesarios.
- Examinar temas de equidad de género, empoderamiento de mujeres, mejoramiento de gobernanza, etc.
- Comparar el GEF Tracking Tool de la línea de base con la versión preparada para la Revisión.
- Gerencia operativa y gestión adaptiva
- Sostenibilidad / Riesgos
- Cambios al calendario de implementación.
- Gestión financiera y cofinanciamiento
- Sistemas de monitoreo y evaluación
- Participación de Partes Interesados (Stakeholders)
- Comunicaciones e Informes

La Revisión es un ejercicio independiente de monitoreo con enfoque colaborativo que abre oportunidades de discusión para identificar retos y para bosquejar acciones correctivas que aseguren el logro de los principales objetivos. Se enfatiza un enfoque para identificar recomendaciones útiles. El Informe de la Revisión Intermedia se presenta al FMAM conjuntamente con el próximo informe anual.

En adición a las entrevistas, la Revisión tomará en cuenta toda la documentación pertinente a la identificación, aprobación, acuerdos de ejecución, guías y manuales, planes operativos y de adquisición, contratos con proveedores y consultores, informes de supervisión, memorándums, informe de ejecución y financieros, auditorías, entre otros. La lista de documentación se encuentra abajo en la Sección 11.

4. Metodología y Roles

Revisión de Documentación: Como primer paso, el consultor revisa los documentos principales de planificación, ejecución, y los productos del programa. El BID, Banobras y las ciudades implementadoras proveen los insumos, datos programáticos, informes y documentación necesarios para la preparación del Informe de Revisión de Medio Término.

Reunión Inicial con Banobras: El equipo del programa, Banobras y el consultor participarán en una reunión inicial con otros participantes claves, dentro las primeras dos semanas de la Revisión. El propósito de esta reunión es consensuar el alcance y resultados esperados de la Revisión, los servicios del consultor y el plan de trabajo.

Misión de Análisis y Visitas a Campo: Debido a la pandemia del coronavirus, no habrá misión o visitas de campo. La interacción entre el consultor y los ejecutores y participantes del Programa será por medios de telecomunicación electrónicos.

Entrevistas: El consultor realizará una serie de entrevistas virtuales con personas directa- e indirectamente involucradas con el Programa, para conocer sus opiniones y percepciones relacionadas con la implementación del proyecto. Las entrevistas son individuales y confidenciales de una duración de aproximadamente 30 minutos. La información compartida en las entrevistas no se atribuye a ninguna persona, pero el nombre y cargo de los entrevistados se registran en el informe. Se puede solicitar que se organice un grupo focal entre participantes afines para profundizar un tema especial. Se entrevistan al personal de Banobras, de las ciudades participantes en Campeche, La Paz y Xalapa, con firmas consultoras y otras personas responsables para realizar elementos del programa, beneficiarios finales, así como profesionales con experiencia con proyectos similares en otros contextos. La lista de personas a entrevistar se prepara conjuntamente con Banobras y las ciudades. Un guion indicativo de entrevistas que se encuentra abajo en la Sección 8.

Consolidación: El consultor analizará la información recolectada en las entrevistas y la documentación presentada en cuanto a: (i) el estado de ejecución referente a los resultados esperados, (ii) estado de cumplimiento de las condiciones contractuales, (iii) eficiencia en el uso de recursos, (iv) fortalezas y debilidades de ejecución, (v) retos y limitaciones encontrados en la ejecución, (vi) el involucramiento de los stakeholders y colaboradores, (vii) contribuciones y cofinanciamiento, y (viii) el grado de materialización de los supuestos principales que guiaron el diseño del proyecto. Desarrollará recomendaciones para mejorar la efectividad y eficiencia del proyecto para el periodo restante de ejecución, y agregar valor a los productos.

Borrador del Informe: El consultor preparará un borrador del informe en inglés 15 días después de haber concluido las cinco fases anteriores. Habrá un período de 10 días hábiles, hasta el 9 de octubre, para enviar comentarios por escrito al consultor.

Taller técnico para la presentación y análisis de los principales hallazgos: Una vez distribuido el borrador del informe, el equipo del Programa, Banobras y otros stakeholders estarán invitados a participar en una reunión técnica de aproximadamente dos horas (por video/teleconferencia) en la cual el consultor presentará los resultados de la Revisión. El análisis y discusión sobre el borrador del informe se tomarán en cuenta en el informe final.

El Informe Final de la Revisión de Medio Término se entrega aproximadamente quince días después cerrar el período de recepción de comentarios. El informe final será traducido al español.

5. Estructura del Informe de la Revisión Intermedia

Se propone la siguiente estructura del Informe:

- I. Executive Summary
- II. Introduction
 - A. Purpose and methodology of the Mid-Term Review
 - B. Program Description – Goals, Objectives and Outputs
 - C. Program Status as of June 30, 2020
- III. Project Implementation Analysis
 - A. Effectiveness – Progress Towards Results
 - B. Efficiency – Project Implementation and Adaptive Management
 - C. Financial execution
 - D. Program Rationale – Relevance of the Project Strategy
 - E. Sustainability – Risk Management
- IV. Conclusions, Recommendations and Lessons Learned
 - A. Conclusions
 - B. Recommendations – Measures to improve performance
 - C. Lessons Learned
- V. Annexes
 - A. Progress Towards Results Matrix
 - B. List of Interviewees
 - C. Documentation reviewed
 - D. Others TBD

6. Calendario

El proceso y la consultoría de la Revisión de Medio Término será de cuarenta días durante un período de tres meses, a partir del 1 de agosto de 2020. El calendario propuesto se presenta a continuación:

Fechas	Actividades
3 agosto 2020	Inicio de consultoría
3 agosto a 18 septiembre	Revisión de documentación, datos, herramientas técnicas
7 agosto	Reunión inicial BID y Banobras
10 agosto	Entrega del Informe Inicial
10 a 31 agosto	Entrevistas (no hay misión)
1 a 25 septiembre	Consolidación y preparación del informe
25 septiembre	Entrega de borrador del informe y PPT de resumen en español.
Entre 2 a 8 de octubre	Taller técnico para presentación de hallazgos
9 octubre	Cierre recepción de comentarios / retroalimentación
12 octubre	Preparar control de comentarios
23 octubre	Entrega Informe de Revisión de Medio Término completo

7. Lista inicial de entrevistas (borrador-preliminar)

El BID, Banobras y las Ciudades participantes completarán oportunamente la nómina de entrevistas para la Revisión Intermedia.

8. Guion de Entrevistas

El Plan de Seguimiento y Evaluación del Programa establece la metodología y los mecanismos de evaluación de los resultados del Programa, con el fin de verificar el logro de los objetivos y el cumplimiento de las metas acordadas en la Matriz de Resultados. Es importante constatar que, en la etapa de la Evaluación Final, se realizará una medición del nivel de progreso de los objetivos, sino que además se realizará una evaluación económica ex-post para constatar si la rentabilidad estimada en la

evaluación ex-ante se ha materializado. Específicamente, la evaluación busca responder a interrogantes con respecto a los impactos y resultados:

Preguntas Evaluativas
A. Efectividad – Progreso hacia Resultados
1. ¿Si lo que están haciendo está conduciendo a los resultados deseados del programa?
2. ¿Se ha logrado evitar emisiones de GEI debido al biodigestor en Xalapa?
3. ¿Se ha logrado disminuir las toneladas de residuos sólidos municipales que son dispuestas diariamente en el relleno sanitario en Xalapa?
4. ¿Se ha producido electricidad a partir de fuentes de energía bajas en carbono en Xalapa?
5. ¿Se ha generado compostaje a partir del biodigestor en Xalapa?
6. ¿Se han logrado los ahorros estimados gracias a los sistemas de auto abasto con energía solar FV en La Paz?
7. ¿Se ha producido electricidad a partir de fuentes de energía bajas en carbono en La Paz?
8. ¿Cuántas veces el estudio realizado en Campeche ha sido utilizado para el diseño de proyectos de infraestructura?
9. ¿Cuántas veces los proyectos pilotos han servido como referencia para otros proyectos en el país?
B. Eficiencia – Implementación y Gestión Adaptiva
1. ¿Cuáles son los retos principales encontrados en la implementación del Programa?
2. ¿Es la gestión costo-eficiente? ¿Ágil?
3. ¿De qué forma los sistemas de monitoreo y comunicación apoyan la ejecución del Programa?
4. ¿Hay suficiente atención en los resultados y puntualidad?
5. ¿Cómo es la calidad y oportunidad del apoyo de la agencia ejecutora, y el equipo del proyecto?
6. ¿Hay franqueza en análisis de problemas e identificación de recomendaciones en comunicación e informes?

7. ¿Hay temas salientes en cuanto a la duración del programa, posibles demoras que pueden afectar los resultados y la sostenibilidad?
8. ¿A qué grado los procesos gerenciales responden proactivamente a problemas de implementación?
9. ¿Hay suficiente compromiso [ownership] de las autoridades con el programa?
10. ¿Cuáles son los factores principales que contribuyen al ritmo de ejecución actual?
11. ¿Los procesos de planificación y comunicación son orientados a resultados?
12. ¿Es el sistema de monitoreo y evaluación apropiado para el contexto del programa? ¿Eficiente? ¿Costo-efectivo?
13. ¿El sistema de MyE provee información necesaria? ¿Es alineado con sistemas nacionales?
C. Ejecución Financiera
1. ¿Los sistemas de control financiero permiten tomar decisiones ágiles, informadas y acertadas?
2. ¿El flujo de recursos permite la puntualidad en el pago de entregables satisfactorios?
3. ¿Hay diferencias significativas entre gastos planificados y efectuados?
4. ¿Se ha hecho algún ajuste o revisión presupuestaria?
5. ¿Se han realizado los compromisos de cofinanciamiento?
6. ¿Existen mecanismos para captar / comprobar los aportes de socios?
D. Justificación y Relevancia de la Estrategia del Programa
1. ¿Hasta qué grado el Programa continúa siendo el mejor vehículo para alcanzar los resultados deseados?
2. ¿El Programa sigue relevante para las prioridades del País y para las localidades ejecutoras? ¿Por qué?
E. Sustentabilidad y Gestión de Riesgos

1. ¿Cuáles son los riesgos que podrían limitar la sostenibilidad de los logros a largo plazo? (financieros, institucionales, sociales, económicos, etc.)
F. Inclusión de Stakeholders
1. ¿Los participantes principales continúan apoyando los objetivos del programa?
2. ¿Participantes tienen un papel activo en la toma de decisiones? ¿En la implementación eficiente?
3. ¿Hay impedimentos a la participación del público que afecten el logro de los objetivos?
G. Comunicación / Informes / Lecciones Aprendidas
1. ¿El ejecutor informa a los participantes sobre como la gestión adaptiva ha modificado la ejecución del programa?
2. ¿Los informes cumplen con los requisitos del FMAM y del BID?
3. ¿Cómo se documentan las lecciones aprendidas que surgen del proceso de gestión? ¿Cómo se incorporan las lecciones en la ejecución?
4. ¿Qué tan efectiva es la comunicación interna entre participantes del proyecto? ¿Existen mecanismos de retroalimentación?
5. ¿Cuáles son los mecanismos de comunicación externa? ¿Y cómo se verifica que los mensajes lleguen al público destinatario deseado?
6. ¿Cuáles son las posibilidades para activar un sólido programa de comunicación, educación y conocimientos? ¿El proyecto tiene la capacidad de producir materiales de calidad?

Filename: C:\Users\David_2\Documents\MX FMAM\MX PESC final dec 4.docx / saved 10/27/2021 10:59 AM