

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

**MEXICO**

**GEF PROGRAM FOR THE IMPLEMENTATION OF PRIORITIZED ESC  
PROJECTS IN THREE MEXICAN CITIES**

**(ME-G1012)**

**GRANT PROPOSAL**

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2.	<a href="#">Monitoring and Evaluation Arrangements</a>
3.	<a href="#">Environmental and Social Management Report (ESMR)</a>
4.	<a href="#">Procurement Plan</a>
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2.	<a href="#">Technical analysis of the solar energy project</a>
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ABBREVIATIONS	
AOP	Annual Operational Plan
AP	Action Plan
Banobras	National Bank of Public Works and Services
CEL	Clean Energy Certificates
CFE	Federal Electricity Commission
Conagua	National Water Commission
EA	Environmental Assessment
ERR	Economic Rate of Return
ESC	Emerging and Sustainable Cities Program
ESFD	Energy Sector Framework Document
ESMP	Environmental and Social Management Plan
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIZ	German Agency for International Cooperation
GoM	Government of Mexico
ICAS	Institutional Capacity Assessment
IDB	Inter-American Development Bank
NIGGE	National Inventory of Greenhouse Gas Emissions
IRR	Interest Return Rate
LGEEPA	General Law of Ecological Equilibrium and Environmental Protection
LPGIR	Law for Prevention and Integrated Waste Management
NPV	Net Present Value
OM	Operational Manual
PECC	Special Program on Climate Change
PIMUS	Sustainable Urban Mobility Plan
PIR	Project Implementation Reports
PMR	Project Monitoring Report
PND	National Development Plan
PNH	National Water Program
PUP	Public Utilities Policy
PV	Photovoltaic
RMP	Risk Management in Projects
Sedatu	Secretary of Agrarian, Territorial and Urban Development
Sener	Secretary of Energy
Semarnat	Secretary of the Environment and Natural Resources
SFP	Secretary of Public Administration
SHCP	Secretary of Finance
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization

## PROJECT SUMMARY

### MEXICO

## GEF PROGRAM FOR THE IMPLEMENTATION OF PRIORITIZED ESC PROJECTS IN THREE MEXICAN CITIES (ME-G1012)

Financial Terms and Conditions				
<b>Beneficiary:</b> United Mexican States				
<b>Executing Agency:</b> The National Bank of Public Works and Services (Banobras)				
Source	Amount (US\$)	%		
<b>IDB (GEF)Total:</b>	13,761,468	100	<b>Disbursement Period:</b>	5 years
			<b>Execution Period:</b>	60 months
			<b>Currency of Approval:</b>	US Dollars
Project at a Glance				
<p><b>Project Objective:</b> 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, solid waste management and sanitation sectors. Furthermore, it will also establish guidelines to incentivize the replication of the projects in other Mexican cities.</p>				
<p><b>Special Contractual Clauses prior to the first disbursement of the IDB/GEF resources:</b> (i) the entry into effect of the Operational Manual (OM), in accordance with the terms previously agreed with the Bank; and (ii) the establishment of a Program Coordination Unit in Banobras to manage the operation (¶3.9).</p>				
<p><b>Special Contractual Clauses of execution:</b> Banobras will disburse to each state or beneficiary municipality once the corresponding implementation agreement between Banobras and the respective state or municipality has been signed (¶3.10). Banobras and the states and/or beneficiary municipalities will undertake to comply with the environmental and social contractual conditions set forth in Section VI of the Environmental and Social Management Report (<a href="#">ESMR</a>).</p>				
<b>Exceptions to Bank Policies:</b> None.				
Strategic Alignment				
<b>Challenges<sup>(a)</sup>:</b>	SI <input type="checkbox"/>	PI <input checked="" type="checkbox"/>	EI <input type="checkbox"/>	
<b>Cross-Cutting Themes<sup>(b)</sup>:</b>	GD <input type="checkbox"/>	CC <input checked="" type="checkbox"/>	IC <input type="checkbox"/>	

<sup>(a)</sup> SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

<sup>(b)</sup> GD (Gender Equality and Diversity); CC (Climate Change and Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

## I. DESCRIPTION AND RESULTS MONITORING

### A. Background, problem addressed and justification

- 1.1 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.<sup>1</sup>
- 1.2 During the last decade, the country's economic growth and urbanization trends have increased Greenhouse Gas (GHG) emissions. Mexico is today the 12<sup>th</sup> largest GHG producer by energy consumption worldwide. According to the National Inventory of Greenhouse Emissions (NIGGE) 1990-2010, the country's total emissions in 2010 were 748 million equivalent tons of CO<sub>2</sub>. This represented a 19% increase with respect to 2001. If the tendency prevails, the Government of Mexico (GoM) estimates that by 2020 this amount will increase by 28% and reach 1 billion CO<sub>2</sub> equivalent tons.<sup>2</sup>
- 1.3 The aforementioned situation has been exacerbated by the country's rapid urbanization, which has been especially visible in intermediate cities. During recent years, population in cities of more than 100,000 inhabitants in Mexico has increased substantially. In 1990, 47.9 million people were living in urban areas and in 2010 this number rose to 88 million. By 2015, 79% of the total population (94 million inhabitants) resided in cities.<sup>3</sup> This urbanization trend is expected to continue for the foreseeable future. This shows the importance of developing successful projects that tackle both emissions and climate change adaptation challenges in these cities. These projects should be easily replicable in other intermediate Mexican cities, hence creating national impact.
- 1.4 These climate change vulnerability challenges, and GHG emissions and rapid urbanization trends, have prompted the GoM to take efficient and solid actions to address them. Amongst the actions taken by the GoM was to request IDB support in the implementation of the Emerging and Sustainable Cities (ESC) program in three medium sized cities.<sup>4</sup> This process helped prioritize the most sensitive issues in each city and define the strategic sectors and projects that would be supported by this operation: solid waste (Xalapa), energy (La Paz), and sanitation (Campeche).
- 1.5 **Solid waste sector.** Solid waste generation has increased by 182% in 18 years (1992-2010).<sup>5</sup> In many regions, this situation has caused ecosystem degradation

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<sup>1</sup> Semarnat, *Primer Informe Bianual de Actualización ante la Convención Marco de las Naciones Unidas sobre el Cambio Climático*. 2015, p.42.

<sup>2</sup> Semarnat, Special Program for Climate Change 2014-2018 (PECC).

<sup>3</sup> *Población Urbana en el Mundo*. World Bank.  
<http://datos.bancomundial.org/indicador/SP.URB.TOTL.IN.ZS>

<sup>4</sup> The Emerging and Sustainable Cities (ESC) Program is an IDB's technical and financial assistance program which provides direct support to national and subnational governments in the development and execution of city Action Plans. ESC employs an integrated and interdisciplinary approach to contribute to the environmental, urban, and fiscal sustainability of the cities of the region. Currently, ESC applies the methodology in 71 emerging cities of the region and works with around 40 private institutions. ESC methodology has been applied in La Paz, Baja California Sur (2012); Xalapa, Veracruz (2014); and Campeche, Campeche (2014). <http://www.iadb.org/en/topics/emerging-and-sustainable-cities/implementing-the-emerging-and-sustainable-cities-program-approach,7641.html>

<sup>5</sup> Semarnat, *Compendio de Estadísticas Ambientales 2012*.

and human health risks, mainly due to open dump sites. Therefore, authorities at different levels have been focusing on the consolidation of the national solid waste legislation and the construction of controlled disposal sites. This has resulted in the construction of 230 landfills within the last 15 years. However, 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.<sup>6</sup> Therefore, the GoM still faces sustainability challenges in the solid waste sector, especially related to emissions reduction and control and recovery of materials.<sup>7</sup> There is also a potential to propagate the implementation of waste to energy, compost and recycling systems and technologies nationwide.

- 1.6 According to ESC's analysis of Xalapa's metropolitan area, daily waste generation reaches 396 tons from which 364 tons (92%) are disposed of in a landfill. Additionally, the solid waste sector accounts for 16% of the city's total GHG emissions, representing the second largest source in the city. This is expected to grow by 45% and 70% by 2030 and 2050, respectively. Exponential urban and population growth over the last 30 years<sup>8</sup> and limited long-term planning in Xalapa have hindered the development of a comprehensive solid waste management system. Therefore, the project that will be financed by this operation aims to provide support for the: (i) implementation of pilot technologies<sup>9</sup> to improve solid waste management; (ii) strengthening of technical capacities to operate biodigester systems;<sup>10</sup> and (iii) enhancement of public awareness of adequate solid waste disposal methods.

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<sup>6</sup> Municipal waste GHG emissions increased 232% between 1990 and 2010 (SEMARNAT – *Compendio de Estadísticas Ambientales* 2012). ([http://apps1.SEMARNAT.gob.mx/dgeia/informe\\_12/conjuntob/conjunto\\_basico/10.100.8.236\\_8080/ibi\\_apps/04\\_residuos\\_solidos/indicador\\_4\\_2.html](http://apps1.SEMARNAT.gob.mx/dgeia/informe_12/conjuntob/conjunto_basico/10.100.8.236_8080/ibi_apps/04_residuos_solidos/indicador_4_2.html)).

<sup>7</sup> According to the study "Conceptual design for a waste management system with energy production for Xalapa" undertaken by the IADB, only 7.1% of the urban solid waste of the city is recovered.

<sup>8</sup> In the last 30 years, the population in Xalapa has doubled (210,000 inhabitants in 1980 and 460,000 in 2014), while the urban footprint has increased eightfold (from 917 hectares in 1980 to almost 8,000 hectares in 2010). These figures place Xalapa among the Mexican cities with the highest urban growth rates in the country.

<sup>9</sup> Although biodigestion is broadly known in Latin America for the treatment of solid waste from the agroindustry and wastewater treatment plants, there is not much experience in the municipal solid waste management sector. Up to now, there are only two known cases: one in Atlacomulco, Mexico, a plant which does not work adequately because the technology used requires source separation (currently not implemented) and a plant in Sao Paulo, Brazil, which is still under construction. For this pilot project under consideration in Xalapa, both scenarios -with and without source separation- will be considered. This pilot project will allow testing this technology in the Latin American context as a part of a comprehensive waste management system and proving it as an option to reduce GHG that are usually generated in landfills.

<sup>10</sup> The World Bank (2011) identified and assessed the technologies available worldwide for treatment and disposal of municipal solid waste and made a general assessment of the applicability of these technologies to various waste management "settings" within LAC. Each technology was evaluated for a number of key attributes, including the demonstration of commercial viability, economics, institutional factors, sustainability metrics, and environmental attributes. In this analysis, they concluded that the anaerobic digestion provides an opportunity for substantial resource recovery. The biogas produced is used as a renewable energy fuel to produce electric energy and the solid residue –the composted digestate– is marketed as an organic fertilizer. Their study is based in European countries where this technology has been widely implemented. Additionally, in Vancouver (Earth Tech Canada Inc., 2005) a detailed technical analysis of a range of alternative solid waste management methods was conducted, and it concludes that the main advantage of employing anaerobic digestion process for the management of waste are the associated ability to generate biogas which can be used to provide electricity, and the significant reduction in waste weight and volume that is achieved through the process.

- 1.7 **Energy Sector.** The power sector is the second most important source of GHG emissions in Mexico after the transport sector. In 2014, total CO<sub>2</sub> emissions in Mexico reached 436.1 megatons from which 115.82 megatons (26.6%) were caused by fossil fuel consumption for electricity generation.<sup>11</sup> Furthermore, between 1990 and 2012, GHG emissions associated with electricity production in the public sector had an annual growth rate of 3.1%.<sup>12</sup> 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.<sup>13</sup>
- 1.8 In the case of La Paz, curbing air pollutants and GHG emissions caused by energy generation are some of the main local sustainability challenges. Energy production is at the local level. One of the main air pollution sources, GHG emissions in La Paz, has increased by 17% from 2005 to 2010. Furthermore, 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.<sup>14</sup>
- 1.9 Neither the city of La Paz, nor the state of Baja California Sur, are connected yet to the national electric grid. The also isolated Baja California's electric system, close to the US border, is more than 600 km away from the nearest point of the Baja California Sur system and a possible interconnection with the Main Interconnected System (SIN) in Mexico is only possible through the Sea of Cortez via an 88 km submarine cable, but the high cost of the cable solution and the sensitive environmental issues make this endeavor very challenging in the short and medium term. Thus, in La Paz, energy generation is fueled by traditional thermal plants using carbon-intensive sources such as heavy fuel oil and diesel, with corresponding high generation costs and additional investments for filters in order to reduce air pollution. Although the GoM has also articulated plans to supply in the long term natural gas to the Peninsula, including La Paz, the shift will remain uncertain in the light of environmental challenges and high investment needs for the new gas infrastructure.
- 1.10 The extreme temperatures throughout the year also exert an additional pressure on the electric grid due to the increased use of air conditioning systems. Other challenges of the sector include the absence of a strategy to promote distributed generation using the world-class solar energy resource available locally. This operation aims to overcome the following issues: (i) dependency from expensive liquid fossil fuels leading to increased GHG emissions and local air pollution; and (ii) vulnerability to extreme climate-related events,<sup>15</sup> as distributed systems are less likely to be affected by adverse weather conditions.
- 1.11 **Sanitation Sector.** Mexico has made important progress in monitoring and improving water quality for drinking and recreational purposes, as well as in restoring water ecosystems. Nevertheless, urbanization processes, uncontrolled urban and industrial discharges, and water stress exacerbated by increasing

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<sup>11</sup> INECC, 2014. National Inventory of Gas Emissions and Components of Greenhouse Effect.

<sup>12</sup> Sener, *Prospectiva del Sector Eléctrico 2015-2019*, p. 75.

<sup>13</sup> Semarnat. *Primer Informe Bianual de Actualización ante la Convención Marco de las Naciones Unidas sobre el Cambio Climático*. 2015 p.13.

<sup>14</sup> *Plan de Acción ante Cambio Climático para La Paz y sus Zonas Colindantes*, 2013, p.175.

<sup>15</sup> In September 2014, the impact of Hurricane Odile on the city's electric grid and the fuel scarcity paralyzed the city for several days and brought attention to the need to build resilient energy infrastructure.



temperatures, threaten the welfare of local communities throughout the country. Although Mexico has reached high levels of coverage in wastewater collection (91.4%), there are still important challenges concerning the increase of wastewater treatment and reuse.

- 1.12 According to Conagua, national coverage of treated wastewater reached 52.7% by the end of 2014. Even though this figure demonstrates a notable improvement over coverage in 2000, which hardly reached 23%, more than 47% of municipal wastewater that is produced within the country still does not receive any kind of treatment. In addition, the sanitation sector faces an increase in the underuse of wastewater treatment infrastructure and unequal levels of coverage between states. There are only three Mexican states that treat 100% of their wastewater (Aguascalientes, Nayarit and Nuevo León), while the states of Campeche and Yucatan do not even reach 6%. These challenges have significant impacts on water quality and the preservation of aquatic 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 (WHO).<sup>16</sup>
- 1.13 The city of Campeche currently faces important water challenges. The aquifer that provides the city with water is under high risk of pollution mainly because it is unconfined, and approximately 85% of households discharge their wastewater into septic tanks without any treatment, 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;<sup>17</sup> (ii) the high levels of water hardness that affect the water measuring equipment;<sup>18</sup> and (iii) the unplanned expansion of the city's water network over time.
- 1.14 Campeche's city center was declared a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site in 1999. As a result, federal, state, and local authorities have invested resources to improve local infrastructure including upgrades to water, drainage and wastewater systems. This operation will further support these efforts by financing a detailed study to identify potential solutions to Campeche's water challenges, particularly concerning the sanitation of its bay and the design of climate change adaptation measures for the city.
- 1.15 **Previous IDB Group involvement and/or lessons learned from past IDB experience.** Solid Waste and Biodigesters. Regarding the reuse and recovery of municipal solid waste, the Bank has not yet developed any biodigester projects to date. However, it has been involved in several operations associated with the recycling and recovery of solid waste as part of integrated solid waste management systems. This has provided a good understanding of pre- and

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<sup>16</sup> Mexico's State of the Environment Report, Semarnat, 2012.

<sup>17</sup> According to a tariff study undertaken by Conagua in 2013, 16% of the storage tanks, 21% of the pumping stations and 13% of the collection wells are not in service. In addition, there is an absence of macrometers in 36% of the infrastructure.

<sup>18</sup> Mexico's Official Norm for Testing Water for Human Use and Consumption in Potable Water systems (NOM-014-SSA1-1993) establishes that water will be considered hard if the amount of CaCO<sub>3</sub> exceeds 300 milligrams per liter (mg/l). According to the most recent available physicochemical tests for potable water performed daily by Campeche's water operator in 2012, the city's potable water had an average of 650 mg/l.

post-treatment requirements for the implementation of integrated waste management solutions.<sup>19</sup>

- 1.16 Distributed generation with solar Photovoltaic (PV) energy. The former private sector division of the IDB has previously financed projects where aggregated solar PV power plants at the distribution level were built and operated by a third party via lease or power purchase agreements with final consumers. These are the cases of recent loans in Honduras (3626A/OC-HO; 3626/SX-HO; 3626/CA-HO); and Mexico (3633/CA-ME; 3633/TC-ME; 3633A/OC-ME). However, this is the first IDB operation that will finance self-supply PV plants for public buildings in municipalities<sup>20</sup>. Although distributed self-supply solar PV projects represent a different risk profile than utility scale grid-connected PV plants some of the lessons learned<sup>21</sup> by the private sector of the IDB have been incorporated into the design of this operation. As an example, resource and technical risks are being mitigated by a state-of-the-art resource assessment analysis and the development of specific technical interconnection conditions for PV technology in the future tender documents, respectively ([OEL#11](#)).
- 1.17 **Project area.** The selected cities (Xalapa, Campeche and La Paz) are strategically located in the northern, central and southern region of Mexico; this national coverage will facilitate each component's replicability. These cities also have economic and population growth levels above the national average, and are the capital cities of their respective states, making them reference points for other intermediate cities in the country.
- 1.18 **ESC in Mexico.** In 2012, ESC began operations in Mexico starting with La Paz, followed by Xalapa and Campeche in 2014. These three cities have completed their respective Action Plans (AP) and the Bank is working with local, state and federal authorities to implement them as part of the execution phase of ESC methodology.<sup>22</sup> In Xalapa, ESC has supported the design of a public space revitalization strategy; the formulation of a value capture scheme based on the revitalization of the area around the local railroad tracks; and the development of a proposal for the renewal and improvement of the landfill concession. In La Paz, ESC has facilitated the design and implementation of a Sustainable Urban Mobility Plan (PIMUS) and has developed an infrastructure resiliency strategy after hurricane Odile. In Campeche, support has been focused on developing prefeasibility studies for the clean-up of the bay, a proposal to revitalize degraded urban areas, and also the design of an urban mobility study.
- 1.19 Mexico's National Bank of Public Works and Services (Banobras) and the IDB are developing a program that will expand ESC to six additional Mexican intermediate

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<sup>19</sup> Some of the operations associated with the recovery of waste and improvement of waste management systems: 3249/OC-AR; 3249/OC-AR-2; 3249/OC-AR-1; 2056/OC-BL' and 1270/OP-BL.

<sup>20</sup> The current IDB project in Chile (GRT/FM-13501-CH) supported by the GEF is being restructured now in order to accommodate self-supply projects in national public buildings.

<sup>21</sup> As described in the IDB document "Credit Risk Best Practice – Solar Energy Financing" developed by the Risk Management Unit (RMG) and support from the Energy Division (ENE).

<sup>22</sup> Several Technical Cooperations have supported these activities. The preinvestment studies for Component 1 were financed with resources from ATN/KK-14720-RG. The implementation of CES program in Xalapa was financed by ATN/OC-13915-ME and ATN/SS-13916-ME; and for Campeche, the resources came from ATN/FG-15392-ME. The preinvestment studies carried out for Component 2 were financed by the ATN/OC-13832-RG.

cities through a Fee Based Service contract between both institutions.<sup>23</sup> As Banobras is executing both the Global Environment Fund (GEF) and ESC programs in Mexico, there is an opportunity to replicate this operation's pilot projects to other cities.<sup>24</sup>

- 1.20 The projects supported by this operation have been selected from the prioritized interventions listed in Xalapa, Campeche and La Paz's ESC-AP. After a thorough analysis and negotiation with local and federal authorities, it was concluded that these projects had a potential for GHG emission reduction which will best contribute to local sustainability and GoM goals. Moreover, prefeasibility studies for each of the proposed projects have already been developed, and their technical viability, scope and potential benefits have received full endorsement of the GoM. This will facilitate the implementation of the projects and will also have a significant role in their potential for replicability.
- 1.21 **Beneficiaries of the project.** Given the expected results, the installation of the biodigester and energy production plant in the city of Xalapa will directly benefit the city's 460,000 inhabitants by: (i) the decrease in CO<sub>2eq</sub> emissions; (ii) a delay in the need to expand the local landfill; and (iii) lower energy costs. Whereas the installation of solar panels in public buildings and schools in La Paz will benefit 4,600 people using these buildings directly, by providing them with cleaner and cheaper energy, while reducing emissions and diversifying the local energy matrix. Additionally, if spending in solid waste management in the first case and electricity bills in the second case are reduced and, therefore, savings in public budgets are achieved as expected through the implementation of these two projects, they will constitute an important demonstration effect for other cities in Mexico wanting to promote private sector participation as a mean to improve local sustainability. In the city of Campeche, around 200,000 people could be benefit by the reduction of floods and better wastewater collection and treatment system, once the studies are implemented.

## 1. Country/States strategy

- 1.22 **Institutional Framework.** Solid Waste Sector. In Mexico, the GoM through the Secretary of the Environment and Natural Resources (Semarnat) is in charge of setting the legal and institutional framework for urban solid waste management. The two laws that regulate this sector are: (i) the General Law of Ecological Equilibrium and Environmental Protection (LGEEPA); and (ii) the Law for Prevention and Integrated Waste Management (LGPGIR). Based on this federal framework, state governments develop their own local laws.
- 1.23 According to Article 115 of the Mexican Constitution, municipalities are in charge of waste removal, collection, transport, treatment, and final disposal. Currently, large urban areas of the country, as well as most of the intermediate municipalities, have their own regulations, which establish the responsibilities of solid waste service providers and users. The current legal framework promotes integrated solid waste management as well as gas recovery and energy production from urban waste.

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<sup>23</sup> The Fee Based Service contract between the Bank and Banobras for the Support to the implementation of ESCI's methodology in 6 Mexican cities (ME-R1002) was signed on the 5th of September, 2016.

<sup>24</sup> There are 56 cities in Mexico with populations between 150.000 and 500.000 and according to the PECC 75 are vulnerable to the effects of climate change.

- 1.24 **Solid Waste and Biodigesters.** In 2014, the Secretary of Energy (Sener), Semarnat and the German Agency for International Cooperation (GIZ) established a partnership to promote energy generation through the use of solid waste sources, while also improving the lifespan and management of landfills.<sup>25</sup> The partnership focuses on: (i) capacity building; (ii) financing; (iii) legal and regulatory framework; and (iv) knowledge transfer and replicability. The Bank is currently working with these institutions in order to enhance the technical, institutional and financial structuring of the Biodigester project and to develop mechanisms for its eventual replicability.
- 1.25 **Energy Sector.** Mexico's electricity sector is in the process of ongoing reforms and is in a period of regulatory transition. These changes aim to attract private capital and enable the development of a cleaner energy mix. The "Law for the Use of Renewable Energy and Financing of the Energy Transition"<sup>26</sup> promotes and regulates the use of renewable energy technologies generated outside the Federal Electricity Commission (CFE) distribution grid, including self-supply solar rooftop projects. Currently, self-supply solar PV systems are attractive to end consumers in segments that are subject to high electricity tariffs. This incentive applies to municipalities as well, since they cover the electricity costs of their public facilities.
- 1.26 **Sanitation Sector.** Semarnat, through the National Water Commission (Conagua), is in charge of the administration and preservation of national waters. Wastewater discharges are regulated by a solid legal and normative framework that includes the Mexican Constitution, the General Law on Ecological Balance, the National Water Law, the Federal Law of Rights and Official Mexican Standards concerning maximum pollutant limits established by the Semarnat. State governments are responsible for planning activities, prioritizing investments and providing technical assistance to rural areas and small municipalities through Water and Sanitation Commissions. Municipal governments, through a local utility, are responsible for the provision of drinking water and sanitation services. They also have the capacity to approve administrative rules of general compliance in order to regulate the local provision of these services.
- 1.27 Alongside the National Development Plan (PND), the GoM established the National Water Program (PNH) 2014-2018 which seeks to achieve water security and sustainability in Mexico. The PNH establishes the following goals: (i) establish an integrated and sustainable approach to water management; (ii) strengthen water security in the face of droughts and floods; and (iii) increase water provision and access to water, drainage and sanitation services.
- 1.28 **Country Strategy.** GoM's PND (2013-2018)<sup>27</sup> includes five areas to achieve sustained growth in the country: (i) Mexico in peace; (ii) inclusive Mexico; (iii) Mexico with quality education; (iv) prosperous Mexico; and (v) Mexico with global responsibility. Within these pillars, a number of strategies to consolidate a sustainable urban model are being developed by different government institutions. These strategies include: (i) strengthening a sustainable urban development model; (ii) improving interagency coordination; (iii) promoting regional, urban and metropolitan development; (iv) promoting private sector participation in

<sup>25</sup> For more information on this partnership: <https://www.giz.de/en/worldwide/29020.html>.

<sup>26</sup> *Ley para el Aprovechamiento de Energías Renovables y el Financiamiento de la Transición Energética.* <http://www.diputados.gob.mx/LeyesBiblio/pdf/LAERFTE.pdf>.

<sup>27</sup> National Development Plan 2013-2018. Pag.77.

infrastructure development and service delivery; and (v) implementing a comprehensive environmental and climate change policy through the transition to low carbon development for urban services.

- 1.29 Since 2000, Mexico has implemented three National Strategies on Climate Change. In 2009, the GoM adopted its first Special Program on Climate Change, and has presented five National Communications with their respective GHG accounting to the United Nations Framework Convention on Climate Change (UNFCCC).<sup>28</sup> The GoM has also adopted different policies and regulations to promote sustainable growth: (i) the General Law on Climate Change (GLCC); (ii) the National Strategy on Climate Change; (iii) the Special Program on Climate Change 2014-2018; and (iv) the Intended Nationally Determined Contribution submitted by the GoM to the UNFCCC in 2015 which provides the local framework on climate change mitigation and adaptation. This last regulatory mechanism also aims to engage states, local municipalities and the private sector in projects that contribute to reaching the goals set for mitigation and adaptation to climate change. The projects included in this operation will support the efforts of the GoM in the achievement of the aforementioned commitments.
- 1.30 This operation is consistent with Mexico's ambitious GLCC target, which aims to reduce national GHG emissions by 50% in 2050. Included in this target is the pledge that by 2024, 35% of national energy production will come from clean energy sources. The operation will also support the enhancement of local infrastructure and ecosystem resilience.

## **2. Bank strategy**

- 1.31 The operation is consistent with the Bank's Country Strategy for Mexico 2013-2018 (GN-2749), through the strategic objective to support the implementation of national climate change policy mechanisms fostering adaptation measures taking a long-term approach, which prioritizes the cross-cutting issues of climate change and sustainable development. It will support GoM's climate change agenda at national and subnational levels through the development of pilot projects that seek to reduce GHG emissions and stimulate capacity building. The project is also consistent with the priority area of Regional Development, especially in the Urban Development sector, that promotes the orderly, safe and sustainable growth of cities. It is also consistent with the Update to the Institutional Strategy (UIS) 2010-2020 (AB-3008) and aligned directly with the challenge of development productivity and innovation through: (i) the provision of adequate infrastructure to produce energy with clean energy technologies; and (ii) the use of an innovative technology to reduce the amount of solid waste that is being disposed in the landfill, using it to produce compost and energy. The implementation of these technologies will reduce greenhouse gas emissions, improving health<sup>29</sup> and contributing to increased productivity.<sup>30</sup> The project is also aligned with the cross-cutting theme of climate change and environmental sustainability, through the implementation of technologies for climate change mitigation that will reduce greenhouse gas emissions. These technologies will also reduce pollution by producing energy through clean sources, and by lowering the amount of solid waste that is being disposed in the landfill.

<sup>28</sup> <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Mexico/1/MEXICO%20INDC%2003.30.2015.pdf>.

<sup>29</sup> Remais et al (2014). <http://ehp.niehs.nih.gov/wp-content/uploads/122/5/ehp.1306744.pdf>.

<sup>30</sup> EPA (2015). <https://www3.epa.gov/climatechange/EPAactivities/economics/scc.html>.

- 1.32 The operation is aligned to the Corporate Results Framework (CRF) 2016-2019 (GN-2727-6) through: (i) the outcome indicator of regional context of GHG emissions; and (ii) the country development result indicator of power generation from renewable energy sources. Additionally, the operation is aligned and will contribute to the indicator of intermediate result of reducing emissions through projects financed by the Bank.
- 1.33 The operation is also aligned with the IDB Infrastructure Strategy Sustainable Infrastructure for Competitiveness and Inclusive Growth (document GN-2710-5), by: (i) promoting access to infrastructure services; and (ii) supporting the construction and maintenance of an environmentally and socially sustainable infrastructure. It is also aligned with the Bank's target to promote sustainable development in Latin America and the Caribbean by mainstreaming adaptation and mitigation actions in its operations and it follows the principles of the Climate Change Sector Framework Document that guide Bank's interventions (GN-2835-3). According to the [joint MDB approach on climate finance tracking](#), 100% of total IDB funding for this project is invested in climate change mitigation and adaptation activities. This contributes to the IDBG's climate finance goal of 30% of combined IDB and IIC operational approvals by year's end 2020. It is also consistent with the dimensions of success outlined in the Water and Sanitation Sector Framework Document (document GN-2781-3) with respect to strengthening sector governance through multisectoral initiatives, efficient and sustainable management, and social and environmental sustainability. The operation is also consistent with the Energy Sector Framework Document (document GN-2670-1) through Components 1 and 2, which will deliver clean electricity from renewable sources; contribute to the reduction of GHG emissions; and will help reduce subsidies to fossil fuels; thereby promoting the Energy Sustainability and Energy Security pillars of the ESFD.
- 1.34 The private sector will be involved in the projects under Components 1 and 2 of the operation. For the Component 1, they will be involved in the 2018 landfill concession review process and subsequent operation and maintenance of the biodigester plant in Xalapa. For the Component 2, the technology supply and the operation and maintenance services for the photovoltaic power plants in La Paz will be provided by the private sector.
- 1.35 **Consistency with Bank Public Utilities Policy.** The operation and national sector objectives are consistent with the principles of the Bank's Public Utilities Policy (PUP) (document GN-2716-6) and meet the financial sustainability and economic evaluation conditions: (i) the works to be financed in Components 1 and 2 are viable from a socioeconomic standpoint ([OEL#4](#) and [OEL#3](#)); and (ii) the municipality of Xalapa allocates part of its budget annually to pay for local solid waste related activities ([OEL#7](#)). In addition, the estimated revenues to be generated by the biodigester will exceed its operating costs ([OEL#8](#)); and similarly, the self-supply PV solar systems to be installed in public buildings in La Paz will produce revenues for the state and the municipality (in the form of savings in their energy bill), that exceed capital recovery and maintenance costs over the project lifetime ([OEL#4](#)). These facts make the projects sustainable in the long term ([OEL#10](#)).

### 3. Project strategy

- 1.36 In order to ensure the success of the pilot projects and generate the expected outcomes and benefits at the local, regional and national level, this operation will include four components: (i) Component 1 will tackle 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; (ii) Component 2 will tackle 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; (iii) Component 3 will develop a comprehensive detailed study that will tackle 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 (iv) Component 4 will tackle the need for capacity building as well as the need to replicate the pilot projects within this operation. This component will ensure the establishment of an adequate communication strategy to bring stakeholders and citizens together in the pilot projects and develop effective and strong monitoring schemes. The proposed project will support the federal initiative for GHG emission reduction and promote the replicability of the ESC program in the country.

#### B. Objective, components and cost

- 1.37 **Objective.** The objective is to enhance the mitigation and adaptation capacities of three Mexican cities (Xalapa, la Paz and Campeche), through the preparation and implementation of ESC prioritized projects for the clean energy, solid waste management and sanitation sectors. Furthermore, it will also establish guidelines to incentivize the replication of the projects in other Mexican cities. In order to achieve this objective, the operation includes four components, one for each of the three cities and a fourth one for institutional and technical support, communications strategy and the monitoring system.
- 1.38 **Component 1. Biodigester for Xalapa's solid waste management system (US\$7,181,093).** This component will fund the detailed design, construction and commissioning of a biodigester plant for the treatment of the organic fraction of the municipal solid waste of Xalapa. The component will finance: (i) detailed designs for the entire set of 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 concession agreement with the municipality.
- 1.39 It is estimated that the plant will receive 200 tons of municipal solid waste daily and will have an installed capacity of 450 kW. The processing of solid waste by the plant will provide the local landfill with 3 additional operating years. Furthermore, throughout its life cycle, the plant will decrease an annual average of 5,127 tons of CO<sub>2eq</sub> and a total of 56,400 emissions. In addition, the plant will delay for some



years the expansion of the landfill; lower the costs of electricity for the city and provide 26 ton/day of soil conditioner (considering the production of compost).

- 1.40 **Component 2. Solar photovoltaic power plants for self-supply in public buildings and schools in La Paz (US\$4,500,000).** The pilot project will install solar photovoltaic plants in a minimum of seven municipal buildings and two public schools. This will provide the following benefits: (i) diversify the local energy matrix; (ii) reduce an estimated 39,700 tons CO<sub>2eq</sub> throughout the plants' life cycle; and (iii) reduce energy costs for the municipality. The aggregated solar PV power plants will produce 1840 MWh of energy on average per year during their lifetime. 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.
- 1.41 The city of La Paz has developed plans to become an energy efficient municipality. The city is not connected to the national grid and it obtains its energy from highly polluting and GHG emitting sources. Development of the pilot project will have a demonstrative effect in the city and the region as it will show 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 resource can be tapped in an effective manner. Most importantly, it will enable the city and the whole region to consider solar energy as a viable generation source.
- 1.42 The two levels of government (state and municipal) will work together towards improving the energy matrix of a city, in this case La Paz. The documentation developed under this component (procurement policies, tender and contracting) will constitute a valuable pilot project which will give a good market signal for the development of technology and services associated to solar energy. It will set a best practice example for other municipalities interested in developing public-private partnerships in the sustainable energy sector. Operation and maintenance of the plants will be provided by the private sector under a service provision contract.
- 1.43 This component will also finance the implementation of solar a self-supply system in two local schools of La Paz. The GoM, through its Secretary of Education, has recently launched an initiative to provide all public schools in Mexico with electricity, including those located in off grid regions. For urban grid-connected schools, the initiative will study the provision of self-supply systems with solar energy. In this regard, the GEF pilot project in public buildings and schools will provide important lessons for the operation of solar PV systems in hot climates and will leverage future IDB interventions in this field.
- 1.44 **Component 3. Comprehensive executive study for the clean-up of the Bay of Campeche (US\$1,000,000).** This component will finance the development of a detailed study that will address the lack of planning tools for the sanitation of the second largest bay in Mexico. Most notably, this project will include climate change adaptation measures for the city thereby ensuring the protection of the local mangroves. The study will also provide guidelines that will ensure the feasibility of the project, which in turn will facilitate the possibility of securing access to public funds.
- 1.45 **Component 4. Capacity building, communication and dissemination (US\$230,000).** This component will finance various 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, to guarantee local and regional ownership. The activities will benefit the cities, the states, national entities and other actors to ensure the sustainability of interventions. The beneficiaries of the activities will be selected based on criteria such as: (i) the relevance of the sector for the agency considering their project pipeline; (ii) the need to strengthen specific technical capacities; and (iii) the need to coordinate activities with other sectors, stakeholders and government agencies, among others.

- 1.46 This component will also finance the development of guidelines to support public policies and regulations to foster the replicability of the pilot projects within the country. For the project in Xalapa, the pilot project will create the technical capacities to operate the biodigester, and the experience will be materialized in manuals and guidelines to enable other cities and metropolitan areas to develop similar projects. The guides will also expand on financial mechanisms (from government entities and international sources) to finance the implementation and operation of such systems. In the proposed workshops, the project will promote the participation from other cities interested in the implementation of similar projects.
- 1.47 In the city of La Paz, this component will promote the development of guidelines, including the technical experience acquired by the different levels of government and the detailed process of selecting the technology, adequate installation, insurance options and financial mechanisms promoting private and public sector participation. For the study that will be developed under the third component, the capacity building programs will bring together experts from different countries that have faced the same challenges, with the purpose of identifying common issues and best practices to be applied. Other cities within Mexico and the region may also benefit from these events. The Bank will support Banobras in the design of the terms of reference for this component.
- 1.48 The total cost of the operation is US\$13,761,468, which will be financed with resources from the GEF on a non-reimbursable basis.

**Table 2. Project costs and financing (US\$)**

Cost categories	IDB/GEF (US\$)
Component 1	7,181,093
Component 2	4,500,000
Component 3	1,000,000
Component 4	230,000
Project Management	635,375
Monitoring and evaluation	215,000
<b>TOTAL</b>	<b>13,761,468</b>

Note: Contingency costs are included in the budget of each one of the first two components.

**Table 3. Disbursements table**

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IDB/GEF	654,075	3,379,075	4,199,622	5,324,621	204,075	13,761,468
%	4.8%	24.6%	30.5%	38.7%	1.5%	100%

## C. Key Results Indicators

- 1.49 The main expected outcomes of the project are described in the table below. The complete Results Framework is presented in Annex II.

**Table 4. Main Outcomes**

Outcome	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 to energy production by the biodigester plant in Xalapa	Tons of CO <sub>2</sub> eq/y	0	1,792
Tons of greenhouse gas emissions avoided through solar panels in La Paz	tons of CO <sub>2</sub> eq/y	0	1,590
Power production from low-carbon energy sources in La Paz	MWh/y	0	1,840

## II. FINANCING STRUCTURE AND MAIN RISKS

### A. Financing instruments

- 2.1 This project is structured as a non-reimbursable investment operation to be financed with resources from GEF<sup>31</sup> for up to the amount of US\$13,761,468, with a disbursement period of 60 months, which will be managed by Banobras as the executing agency. The Bank, according to GEF policies, will supervise the use of the resources as a GEF Implementing Agency. In addition to the resources being provided by the GEF, the National Government of Mexico, State Governments and the beneficiary municipalities of the project have already committed and allocated resources up to US\$98,300,000, aligned to the objective of the program. This contribution is not included in the total cost of the program.

### B. Environmental and social safeguard risks

- 2.2 The operation has been classified as “B” (REL#3) in accordance to Bank’s Environment and Safeguard Compliance Policy (OP-703). An Environmental Assessment (EA) was prepared for the construction and operation of the biodigester in Xalapa (Component 1). Additionally, a specific Environmental and Social Management Plan (ESMP) will be prepared by the construction firm, as well as by the entity that will operate the biodigester. For the installation of the solar panels (Component 2), an ESMP will be prepared to manage the health and safety risks, as well as a plan for the adequate disposal of the panels.
- 2.3 The main negative environmental impacts will be during the construction phase and are related to the loss of vegetation and disturbance of terrestrial and aquatic fauna, generation of noise, gases and waste during the construction and operation phases. There will be no resettlement of population caused by the projects. Therefore, the main social impacts could result from decreasing comfort of the population by changes in their daily activities arising from the presence of the works. The main risks are related to accessibility and road traffic, natural disasters

<sup>31</sup> The resources from the GEF come from the: (i) Integrated Approach Pilot for Cities program (US\$9,174,312); and (ii) the Climate Change Mitigation-1 program (US\$4,587,156).

as well as health and safety. These impacts and risks will be mitigated through specific mitigation measures such as training, use of personal protective equipment, integrated waste management, technical analysis and adequate mitigation measures for natural disaster risk, adequate effluent management and stakeholder engagement. The measures will be managed through the implementation of the ESMPs and the incorporation of environmental, health, safety and social specifications in the bidding documents of the contractors (to be monitored by Banobras) ([see ESMR for details](#)).

### **C. Fiduciary risks**

- 2.4 An institutional evaluation of Banobras was recently conducted by the Bank. Such assessment resulted in a “Low” risk rating Annex III. However, considering that procurement processes will be carried out mainly by the municipalities (except for Component 4), the final risk of the operation is considered medium as they do not have experience in working with Bank financed projects; hence, the risk of delayed acquisition processes in Banobras and the local governments will be mitigated by continuous training to the acquisition officials.

### **D. Other key issues and risks**

- 2.5 **Other Risks.** As part of the project preparation activities, a risk assessment was undertaken under IDB’s “Risk Management in Projects” (RMP) methodology. Based on the individual risks identified, a risk mitigation plan has been prepared and includes the following mitigation strategies for the risks classified as “medium”: (i) lack of coordination between local, state and federal authorities during the implementation phase. To mitigate, the IDB and Banobras will closely monitor the inter-institutional coordination and project implementation in order to advise when lack of communication is detected; there will be quarterly meetings from all the stakeholders to ensure compliance with the individual technical and institutional commitments of each participating agency; (ii) change on the priorities of the local governments due to the recent elections in Xalapa and the elections in 2018 in Campeche. To mitigate this, Banobras with the support of the IDB technical team has already established communication with the elected mayor of Xalapa to introduce the project and the same strategy will be conducted in Campeche; (iii) decrease of the income projected for the biodigester due to inability to sell compost and CELs. To mitigate, a market study on compost will be carried out to promote the adequate commercialization of compost; (iv) delay or unprecise information regarding cash flows. To mitigate, the program incorporates training for both the executing agency and local governments to ensure that they have the required capabilities; (v) unreliable data for monitoring results. To mitigate, a baseline and a monitoring frequency was established for each indicator in the results matrix and in the monitoring and evaluating agreement, additionally in the supervising missions, the quality of the information will be assessed and reviewed by external auditors with specific terms of reference; (vi) lack of raw material for energy production in Xalapa and La Paz. To mitigate, for Xalapa a detailed business model will be conducted to ensure the availability of the required amount of urban solid waste, and for La Paz an energy production assessment will be conducted; and (vii) unsatisfactory performance of the solar panels. To mitigate, the procurement process will include technical specifications for the required equipment as well as guarantees from the provider.

- 2.6 **Technical viability.** Component 1. Xalapa's solid waste management system operates satisfactorily (i.e. robust collection, transportation, and disposal systems in place). Additionally, Mexico has implemented top-down strategies for solid waste management, and also has a strong commitment to reduce emissions associated with climate change. Considering these factors and the data explained in the technical analysis, the proposed design is feasible from a technical point of view because it considers an approach that is replicable, encourages recovery prior to final disposal, reduces disposal of organic waste in sanitary landfills, and reduces greenhouse gas emissions ([OEL#1](#)).
- 2.7 **Component 2.** In order to quantify the benefits of the project, the technical feasibility analysis includes a state-of-the-art solar resource assessment carried out by a recognized independent engineer. After a detailed evaluation of different satellite databases, the assessment concluded that the solar horizontal irradiation on the sites is equivalent to 2250 kWh/m<sup>2</sup> or 6.1 kWh/m<sup>2</sup>/d, which sets La Paz as one of the best spots worldwide in terms of solar resources. According to operational experience, solar PV projects tend to slightly over perform compared to theoretical estimations presented in solar resource assessments. The independent engineer will also develop the technical conditions for the tender documents in order to mitigate any risk associated with the technology providers and be able to assure the quality of the equipment installed and the maintenance and operation provider ([OEL#2](#)).
- 2.8 **Financial viability.** For Component 1, the municipality of Xalapa allocates part of its budget annually to pay for the solid waste activities in the municipality; the resources are transferred each fiscal year to the agency that provides the service, "*Dirección de Servicios Municipales*" ([OEL#7](#)). It is estimated that for the biodigester, the revenue generated by energy savings, the sale of Clean Energy Certificates (CEL), and the sale of composting, will exceed the operational and maintenance costs of the facility ([OEL#8](#)). The contract will include a clause to ensure that the works to be financed are operated and maintained in a timely and adequate fashion (§3.12).
- 2.9 In the case of Component 2, regarding the intervention, a financial analysis was performed for each one of the self-supply PV solar energy systems to be installed on the roofs of public buildings. All projects show positive Interest Return Rate (IRR) values in a range between 4.8% and 13.1% (aggregated IRR of 7.7%) and also positive Net Present Value (NPV) with a payback time of 13 years when all projects are grouped into a single intervention. The savings to the public budget<sup>32</sup> of the self-supply plants will amount to US\$190,000 per year on average during the lifetime of the project ([OEL#2](#) and [OEL#4](#)).
- 2.10 An interagency agreement will be signed between Banobras, the municipalities, and the State of Baja California Sur. It will include the requirement to adequately and timely operate and maintain the works to be financed. Previous to this, the Bank must accept that both entities have the adequate operating capacity (§3.12). It is foreseen that the initial operation and maintenance of the facilities will be carried out by an experienced operator, at least during a reasonable amount of

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<sup>32</sup> Due to the fact that the electric bill for the two schools included in the intervention is paid by the Secretary of Education the savings for the State of Baja California Sur and the Municipality of La Paz will be slightly less than the stated amount.

time while the capacity of the institutions is being reinforced and strengthened to develop this activity on an independent basis.

- 2.11 **Institutional Viability.** Banobras has the institutional structure, experience and conditions for the efficient, effective and transparent execution of the operation. This has been proven by previous programs executed for the Bank (i.e. 2053/OC-ME, ME-L1017; 2550/OC-ME, ME-L1059 and most recently 3313/OC-ME, ME-L1111). This is also reflected in the Institutional Capacity Assessment (ICAS) ([OEL#5](#)). Likewise, during the preparation of the operation, an expanded analysis of the procurement areas was conducted for the three municipalities in accordance with ICAS methodology. This analysis concluded that they have the capacity to make acquisitions for the operation, but need to be trained on Bank's fiduciary policies ([OEL#6](#)).
- 2.12 **Socio-economic viability.** For Components 1 and 2, Cost-Benefit Analyses were performed. The evaluation of Component 1 ([OEL#3](#)) shows that the biodigester is economically viable, with an Economic Rate of Return (ERR) of 26.6% and, using a discount rate of 12%, an Economic NPV of US\$3,490,182. The analysis was complemented by an appropriate sensitivity assessment of the main assumptions and of the investment costs, and demonstrates that the project is viable even under a conservative scenario.
- 2.13 In the case of Component 2, in order to review the intervention's economic feasibility, the economic analysis considered all solar systems as a single project, quantifying additional benefits to society, resulting in an IRR of 12.6% and an economic NPV of US\$49,135 (at a 12% discount rate) and the results are robust to the sensitivity analysis. Therefore, the undertaking of this intervention is justified from an economic perspective. This ERR is considered a lower bound value since: (i) the non-quantified project benefits are likely to exceed the non-quantified project costs; (ii) many of the assumptions, such as the increase of fossil fuel prices in the long term remain conservative; and (iii) other benefits such as savings in electricity subsidies were not taken into account ([OEL#4](#)).
- 2.14 **Sustainability.** The project will support the enhancement of mitigation capacities and adaptation measures in the beneficiary states and cities. During project execution, beneficiary states and municipalities will contribute with resources, including cash and in kind contributions. In addition, the states and municipalities will seek funding to guarantee the long-term sustainability of the pilot projects, through public funds, climate change funds, and environmental financial-related facilities, among others.

### III. IMPLEMENTATION AND MANAGEMENT PLAN

#### A. Summary of implementation arrangements

- 3.1 **Project Execution Mechanisms.** Banobras will be the executing agency for this operation and the procurement activities will be performed by the municipalities for Component 1 and 3, and by the State of Baja California Sur for Component 2 under Banobras and IDB supervision. Component 4 will be executed directly by Banobras. The technical unit in charge of managing the financial resources will be Banobras' Trust Department/Division following principals and processes implemented in similar projects. Banobras' Trust Department/Division has the required institutional knowledge and technical capacity ([OEL#9](#)).

- 3.2 Banobras will create a Program Coordination Unit within its organizational structure and will allocate the necessary human and technical resources needed for project execution.<sup>33</sup> In addition, the project will use Banobras' information systems for integrated procurement, financial administration and reporting, as well as project management and monitoring systems, while ensuring their compatibility with the Bank's norms, procedures and control and reporting systems. The establishment of the Program Coordination Unit staffed with the technical team that will coordinate the program's execution (integrated by specialized consultants in the relevant technical topics of the program) is a contractual condition for the first disbursement of the IDB/GEF resources.
- 3.3 Banobras will designate a Project Leader and will allocate the required additional technical and administrative human resources, based on a pro-rated cost reimbursement structure that is included in the project's budget. Banobras will ensure the presence of its technical personnel in the operation sites, in coordination with the technical counterparts assigned to the project by the state and federal agencies, in accordance with the OM.
- 3.4 **Government beneficiaries participating in the project.** Banobras will coordinate its activities with the relevant federal, state and municipal agencies including among others: (i) Semarnat for supporting the implementation and scalability of the overall project and its effects on GHG emissions reduction; (ii) Secretary of Agrarian, Territorial and Urban Development (Sedatu), for supporting the implementation of activities contained in the four components; (iii) Sener, for supporting the implementation of activities contained in Components 1, 2 and 4; (iv) the State of Veracruz and the municipality of Xalapa, for the implementation of activities contained in the first component; (v) the State of Baja California Sur and the Municipality of La Paz, for the implementation of activities in the second component; and (vi) the State of Campeche and the Municipality of Campeche for the third component.
- 3.5 These agencies will designate the necessary personnel to support the project execution process according to their technical and geographic area of intervention and mandate. They will also sign an "Implementation Agreement" establishing specific arrangements and responsibilities among the parties. The Program Coordination Unit will then organize for each project the necessary meetings and workshops with the relevant stakeholders to assure an efficient coordination between them and the accomplishment of the "Implementation Agreement".
- 3.6 **OM.** Project execution will be regulated by the OM, to be approved by the IDB as a condition for first disbursement of the IDB/GEF resources. The OM establishes: (i) organizational structure and execution mechanism, as described in the "Implementation Agreement" prepared by the participating institutions; (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 ([OEL#9](#)).
- 3.7 **Retroactive Financing.** The Bank may finance retroactively under the grant, eligible expenses incurred by the Borrower prior to the date of grant approval<sup>34</sup> up

<sup>33</sup> This Unit will also serve as Banobras counterpart for the project.

<sup>34</sup> The eligible expenses are included in p. 1.38 – 1.47.



to the amount of US\$2,752,293.60 (20% of the proposed grant amount), provided that all the requirements are substantially similar to those set out in the grant agreement requirements. These expenses must have been incurred on or after May 27, 2016 (approval date of the Project Profile), and under no circumstances shall expenditures incurred more than 18 months prior to the grant approval date be included.

- 3.8 **Procurement.** Procurement processes will be carried out by the state of Baja California Sur for Component 2, by each beneficiary municipality for Component 1 and 3 and Banobras for Component 4, in accordance with IDB policies (GN2349-9 and GN-2350-9). Given that the Municipalities do not have experience working with Bank financed projects, the Bank and Banobras will provide training and support in IDB's procurement policies. If necessary, Banobras can assign a consultant to provide such support ([OEL#6](#), [OEL#9](#), and Annex III).
- 3.9 **The following will be special conditions precedent to the first disbursement of the financing: (i) the entry into effect of the Operational Manual (OM), in accordance with the terms previously agreed with the Bank; and (ii) the establishment of a Program Coordination Unit in Banobras to manage the operation. These conditions will allow Banobras with the start-up of the execution of the program with the operational and coordination guidelines described in the OM, and the necessary execution team.**
- 3.10 **Execution conditions** Banobras will disburse to each beneficiary -state of BCS and municipalities- once the corresponding implementation agreement has been signed.<sup>35</sup> This condition is required to ensure that both the Borrower and the beneficiaries are coordinated during the execution of the program.
- 3.11 Banobras and the states and/or beneficiary municipalities will undertake to comply with the environmental and social contractual conditions set forth in section VI of the ESMR.
- 3.12 **Operation and maintenance of works.** The works financed using operation's resources will be operated and maintained in accordance with generally accepted technical standards by the respective units in charge of these services at the municipal or state level.<sup>36</sup> At minimum, the annual maintenance plan in each sector will contain: (i) details on the organization responsible for maintenance; (ii) information on the resources that will be invested in maintenance activities for the current year and the amounts that will be allocated in the budget for such activities in the coming years; and (iii) a report on maintenance conditions, based on the evaluation system established by the executing agency and the Bank.
- 3.13 **Audit.** The financial statements of the project will be subject to annual external audits to be conducted by a firm of external public accountants eligible for the Bank, which will be contracted by Banobras and designed by the Secretary of Public Administration (SFP) with IDB/GEF resources. The audited financial statements will be presented 120 days after each calendar year (see Annex III for details).

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<sup>35</sup> In Annex III p. 4.23 – 4.25, further details on the execution conditions and the disbursement mechanism is included.

<sup>36</sup> When the municipalities or the state authorities do not show enough capacity for O&M, a capacity building strengthening program will be carried out while the facilities will be monitored and maintained during a reasonable period of time by an experienced operator.

## **B. Summary of Arrangements for Monitoring Results**

- 3.14 **Monitoring results and evaluation.** Project monitoring and evaluation will be conducted in accordance with IDB and GEF procedures, at three levels: (i) project outcomes and impacts as stated in the projects' Results Framework; (ii) delivery of project outputs in accordance with the AOP; and (iii) monitoring of project implementation and performance through two project evaluations (REL#2).
- 3.15 The project's Results Framework will be the main monitoring instrument (Annex II). The project team will supervise the achievement of the outcomes and results associated to BID/GEF funding and will incorporate them in the Project Monitoring Report (PMR); the project team will also incorporate all project outcomes and results associated to the financing into the Project Implementation Reports (PIR), to be reported periodically to GEF. The AOP will be used to monitor progress in physical implementation.
- 3.16 **Performance evaluations.** Two evaluations are planned for the project: (i) a mid-term evaluation, two years after program eligibility or when 50% of IDB/GEF contribution has been disbursed, whichever comes first including: (i) feedback for the activities in Components 1, 2, 3 and 4; (ii) progress in the implementation of the monitoring system in the three participating cities; and (iii) progress in the identification of required guidelines and policies reviews. The final evaluation will take place when 90% of GEF/IDB contribution has been disbursed and will focus on the overall achievement of results and the perceived impact of the project, as well as fulfillment of the project's objectives. As part of the final evaluation, ex post economic evaluations will be conducted for Components 1 and 2. These evaluations will be done through cost-benefit analyses, using the same methodology as the ex ante socioeconomic evaluations (REL#2). The terms of reference and selection process for these evaluations will be approved by the IDB in advance.
- 3.17 To promote the replicability of the projects, for Component 1, given the lack of experience on biodigestion technology for municipal solid waste in the region, the performance of the biodigestion will be monitored to ensure that it works properly (e.g. amount of waste treated versus energy generated and diversion of landfilling). If it succeeds, the technology can be considered as an alternative to be used in any integrated waste management strategy, not only in Mexico but also in other countries of the region. Additionally, the reduction of greenhouse gas emissions versus a scenario without this technology will be analyzed. Regarding Component 2, although solar PV plants can be considered as a mature technology, their implementation as an option for electricity self-supply in the public sector in Mexico is limited.<sup>37</sup> Therefore, the execution mechanism through Banobras and other procurement arrangements involving the municipalities (supply and O&M agreements with technology providers, etc.) will provide important lessons learned for scale-up and for other Mexican cities and states interested in implementing similar initiatives. Although the performance indicators are focused in terms of energy produced and emission reductions they will help consolidate the replication factor and quantify the benefits of the intervention.

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<sup>37</sup> The State of Baja California and 34 municipalities in the State of Chiapas have implemented similar self-supply projects to reduce public spending in electricity. However, the technology implemented was in both cases wind energy with projects of 10MW and 30MW, respectively.



Development Effectiveness Matrix		
Summary		
I. Corporate and Country Priorities		
1. IDB Development Objectives	Yes	
Development Challenges & Cross-cutting Themes	-Productivity and Innovation -Climate Change and Environmental Sustainability	
Country Development Results Indicators	-Reduction of emissions with support of IDBG financing (annual million tons CO2 e)* -Installed power generation from renewable energy sources (%)*	
2. Country Development Objectives	Yes	
Country Strategy Results Matrix	GN-2749	i) Support the implementation of national climate change policy mechanisms fostering adaptation measures taking a long-term approach, and ii) Promote the orderly, safe, and sustainable growth of cities.
Country Program Results Matrix		The intervention is not included in the 2017 Operational Program.
Relevance of this project to country development challenges (If not aligned to country strategy or country program)		
II. Development Outcomes - Evaluability	Evaluable	
3. Evidence-based Assessment & Solution	10.0	
3.1 Program Diagnosis	3.0	
3.2 Proposed Interventions or Solutions	4.0	
3.3 Results Matrix Quality	3.0	
4. Ex ante Economic Analysis	10.0	
4.1 The program has an ERR/NPV, a Cost-Effectiveness Analysis or a General Economic Analysis	4.0	
4.2 Identified and Quantified Benefits	1.5	
4.3 Identified and Quantified Costs	1.5	
4.4 Reasonable Assumptions	1.5	
4.5 Sensitivity Analysis	1.5	
5. Monitoring and Evaluation	7.0	
5.1 Monitoring Mechanisms	2.0	
5.2 Evaluation Plan	5.0	
III. Risks & Mitigation Monitoring Matrix		
Overall risks rate = magnitude of risks*likelihood	Medium	
Identified risks have been rated for magnitude and likelihood	Yes	
Mitigation measures have been identified for major risks	Yes	
Mitigation measures have indicators for tracking their implementation	Yes	
Environmental & social risk classification	B	
IV. IDB's Role - Additionality		
The project relies on the use of country systems		
Fiduciary (VPC/FMP Criteria)	Yes	Financial Management: Budget, Treasury, Accounting and Reporting, External Control, Internal Audit.
Non-Fiduciary		Procurement: Information System.
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:		
Gender Equality		
Labor		
Environment		
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project		
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan		

Note: (\*) Indicates contribution to the corresponding CRF's Country Development Results Indicator.

The objective of the program 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. The program will also establish guidelines to incentivize the replication of the projects in other Mexican cities. To achieve these objectives, the program supports the construction of a biodigester for the city of Xalapa's solid waste management system, solar photovoltaic power plants for self-supply in public buildings and schools in the city of La Paz, and a comprehensive executive study for the clean-up of the Bay of Campeche.

The project presents a cost-benefit assessment for the waste management and photovoltaic systems, clearly establishing the assumption of the analysis, and providing sensitivity analysis. The diagnosis and vertical logic presented in the POD are clearly spelled out. The monitoring and evaluation annex is appropriate and correctly identifies the steps, responsibilities, budget, and timelines. The proposed ex post evaluation is a before and after comparison and an ex post cost-benefit economic analysis.

Results Matrix										
Project Name	GEF Program for the implementation of prioritized ESC projects in three Mexican cities									
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, solid 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										
Outcome 1: Improve and increase the solid waste management and the generation of low-carbon energy to reduce greenhouse emissions in Xalapa										
Indicator	Unit of Measure	Baseline	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5	End of Project	Comments/ Means of Verification
Tons of greenhouse gas emissions avoided associated to energy production by the biodigester plant in Xalapa <sup>1</sup>	Tons of CO2eq/y	0	2016					1,792	1,792*	*Annual Average The information will be provided by Banobras based on the reports delivered by the operator
Tons of municipal solid waste disposed at the sanitary landfill of Xalapa	ton/day	490	2016					430	430	Operation log of incoming and outgoing solid waste conducted by operator and included in the Final Evaluation
Power production from low-carbon energy sources in Xalapa	MWh/year	0	2016					3,962	3,962	Power: 452 KW. Operation log tracked by the meter and included in the Final Evaluation
Tons of compost produced by the biodigester in Xalapa	ton/day	0	2016					26	26	Operation log of incoming and outgoing compost conducted by the operator, and included in the Final Evaluation
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 CO2eq/y	0	2016		1,692	1,684 <sup>2</sup>	TBC <sup>3</sup>	TBC	1,589*	*Annual Average during project lifetime taking into account public buildings from first phase. Semester Progress Report of overall production
Power production from low-carbon energy sources in La Paz	MWh/y	0	2016		1,959	1,949	TBC	TBC	1,840*	*Annual Average during project lifetime taking into account public buildings from first phase. Operational logs from meter readings aggregated over all PV plants

<sup>1</sup> Emission reductions associated to energy production by waste gas will be positive since the first year of the plants operation. In contrast, emissions reductions associated to methane collection will be positive until the 3rd year when the accumulation of organic waste diverted from the landfill will offset fugitive and projects emission.

<sup>2</sup> Emission reduction figures slightly decrease with time as electricity production from the PV plants also decreases due to normal degradation of the solar cells.

<sup>3</sup> Emission reductions for the second phase of the project need to be calculated (TBC) corresponding to a second group of buildings still to be selected for the Phase II of the project. These would be additional to the existing emission reductions from Phase I buildings.

<b>Outcome 3: The municipality and stakeholders have the technical, environmental and economic information needed to make a decision on whether or not make the investment in Campeche</b>											
Technical, environmental and economic studies agreed and approved by the Municipality and stakeholders to build the Campeche infrastructure project <sup>4</sup> .	# of times	0	2016						1	1	Report of the municipality approving the project
<b>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</b>											
Number of times that the pilot projects have served as a reference for other projects in the country	# of times	0	2016						2	2	The information will be provided by Banobras and included in the Final Evaluation
<b>Outputs</b>											
<b>Component 1: Biodigester for Xalapa's solid waste management system</b>											
<b>Output</b>	<b>Unit of Measure</b>	<b>Associated Outcomes</b>	<b>Cost (US\$)</b>	<b>Baseline</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>End of Project</b>	<b>Comments/ Means of Verification</b>
Biodigester for Xalapa's solid waste management system operating	Biodigester	1	7,181,93	0				1		1	
Milestones: 1. Final design of the biodigester plant in Xalapa finalized	Study	1		0		1				1	Study finalized and submitted by consultant and approved by Team Leader
2. Preliminary works <sup>5</sup> executed	works	1		0			1				Provisional Certificate of Acceptance
3. Biodigester and energy production plant in Xalapa built	Plant	1		0				1		1	Provisional Certificate of Acceptance
<b>Component 2: Solar photovoltaic power plants for self-supply in public buildings and schools in La Paz</b>											
kW of generation capacity installed – low carbon sources in La Paz	kW	2	4,500,000	0		1040		1500		1540	DC capacity verified by Independent engineer
<b>Component 3: Comprehensive program executive study for the clean-up of the Bay of Campeche</b>											
Detailed-design of the sanitation infrastructure in Campeche completed considering climate change adaptation measures	Study	3	1,000,000	0		1				1	Study finalized and submitted by consultant and approved by Team Leader

<sup>4</sup> These studies will be inclusive and will be developed under public consultations with relevant actors.

<sup>5</sup> Preliminary works include site preparation and structural works.

Component 4: Capacity building, communication and dissemination											
Biodigester and solar photovoltaic power plants seminars, conference, capacity building and lesson-learned activities conducted	Seminars, conference, activities	1, 2 and 4	30,000	0		1	1	1		3	Final reports with the conclusion/results of the events approved by the Team Leader
Biodigester, solar photovoltaic power plants, and sanitation technical training workshops in Xalapa, La Paz and Campeche conducted	Trainings	1, 2 and 4	50,000	0		1	1	1		3	Final reports with the conclusion/results of the events approved by the Team Leader
Technical guidelines <sup>6</sup> developed to replicate the biodigester technology	Document	4	50,000	0				1		1	Study finalized and submitted by consultant and approved by Team Leader
Performance assessment study of solar PV technologies in schools developed	Report	4	50,000	0				1		1	Study finalized and submitted by consultant and approved by Team Leader
Review paper with lessons learned from the experience on photovoltaic plants in public schools developed	Paper	4	50,000	0				1		1	Study finalized and submitted by consultant and approved by Team Leader

<sup>6</sup> Technical guidelines will consist on recommendations to select the most appropriate biodigestion technology and to execute a biodigestion project considering local conditions.

## FIDUCIARY ARRANGEMENTS AND REQUIREMENTS

<b>COUNTRY:</b>	Mexico
<b>NAME:</b>	GEF Program for the Implementation of Prioritized ESC Projects in Three Mexican Cities
<b>PROJECT No.:</b>	ME-G1012
<b>EXECUTING AGENCY:</b>	<i>Banco Nacional de Obras y Servicios Públicos, S.N.C.</i> (Banobras)
<b>FIDUCIARY TEAM:</b>	German Zappani (FMP/CME); Victor Hugo Escala (FMP/CME); and Uriel Barrios (FMP/CME).

### I. EXECUTIVE SUMMARY

- 1.1 The *Banco Nacional de Obras y Servicios Públicos* (Banobras), was established in 1933 and serves as a Mexican national development institution. Banobras is a state-owned public company, with legal personality and assets. It aims to finance or refinance public infrastructure and services projects, which can be directly or indirectly related to public or private investment. Through this financing, this institution provides support to the institutional strengthening for the country's federal, state and municipal levels.
- 1.2 Banobras has broad experience executing Inter-American Development Bank's (IDB) loans. Among the IDB's loan operations in which Banobras has been the executing agency are: (i) 2053/OC-ME<sup>1</sup>, signed on September 9<sup>th</sup> 2009 (US\$350 million); and (ii) 2550/OC-ME<sup>2</sup>, signed on September 29<sup>th</sup> 2011 (US\$310 million). Currently, this institution is executing operation 3313-OC-ME,<sup>3</sup> which was signed on December 10, 2014 (US\$400 million).
- 1.3 In March 2014, the Bank updated the institutional capacity analysis for Banobras. This analysis concluded that the institution has an acceptable development rating (98.21%).
- 1.4 Considering Banobras' experience and the results of the IDB's updated ICAS analysis, this operation has a low-risk rating.

### II. EXECUTING AGENCY AND FIDUCIARY CONTEXT

- 2.1 As part of its operating procedures, Banobras has a series of internal regulations and policies, solid transparency policies, and budgetary and fiscal procedures. Additionally, this institution has to follow the guidelines set by Mexico's Banking

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<sup>1</sup> *Primer Programa de Crédito Subnacional para la Infraestructura Pública, Servicios Públicos y Fortalecimiento Institucional.*

<sup>2</sup> *Programa de Crédito Subnacional para Infraestructura Pública, Servicios Públicos, Fortalecimiento Institucional y Proyectos de Desarrollo Sostenible en Estados y Municipios; Segundo Programa del Convenio de Línea de Crédito Condicional para Proyectos de Inversión (CCLIP ME-X1002).*

<sup>3</sup> *Programa de Crédito Subnacional para Infraestructura, Servicios Públicos y Proyectos de Desarrollo Sostenible, tercer Programa de la Línea de Crédito Condicional para Proyectos de Inversión (ME-X1002).*

and Securities Commission (CNBV). This makes Banobras a highly regulated and monitored entity, supervised by various governmental institutions such as the Secretary of Public Administration (SFP) and the Superior Audit Office (ASF).

- 2.2 Banobras, also, has vast experience operating with International Financial Institutions (IFI). Within its internal structure, Banobras has a specialized unit, which focuses specifically in managing IFI related issues and requirements. It also has a budgetary and financial system that allows the efficient identification and control of the budgetary and accounting aspects of IDB programs.

### **III. FIDUCIARY RISK ASSESSMENT AND MITIGATION MEASURES**

- 3.1 To perform the update of Banobras' institutional capacity analysis, the IDB organized several meetings focused on the Institutional Capacity Assessment System (ICAS) questionnaire. These meetings were held with Banobras' representatives from key operational units. Each of the seven sub-systems were analyzed through interviews, document reviews and public information published in Banobras' website.
- 3.2 The conclusion of the assessment for each system indicates that Banobras has an adequate, solid and mature organizational structure with well-defined procedures. Banobras has a strong execution capacity, based on an efficient operational and regulatory framework. These factors were taken into consideration to determine its low risk rating.
- 3.3 Banobras is constantly going through modernization processes to update its infrastructure. Similarly, Banobras' authorities are continuously attending training seminars and courses to update their understanding of the changes in development banking procedures and operations. Furthermore, this institution has a low personnel rotation ratio, which enhances and strengthens its experience and knowledge capacities.
- 3.4 Given Banobras' low institutional risk rating, the procurement of goods and services which are not related to consulting services is eligible for an ex post procurement review, except when an ex ante review is requested for specific cases.

#### **A. Aspects to be considered in contract clauses**

- 3.5 For the expenses review, the exchange rate shall be set according to the effective payment date in Mexican pesos.
- 3.6 Delivery of Annual Audited Financial Statements for the program. This audit has to be performed by a specialized external firm, eligible by the Bank. The auditing process has to be performed according to the terms of reference set by the Bank within 120 days after the closure of the executing agency's fiscal year. The last auditing process shall take place within 120 days after the last disbursement date.

## B. Retroactive Funding

- 3.7 The Bank may finance retroactively under the grant, eligible expenses incurred by the Borrower prior to the date of grant approval<sup>4</sup> up to the amount of US\$2,752,293.60 (20% of the proposed grant amount), provided that all the requirements are substantially similar to those set out in the grant agreement requirements. These expenses must have been incurred on or after May 27, 2016 (approval date of the Project Profile), and under no circumstances shall expenditures incurred more than 18 months prior to the grant approval date be included.

## IV. PROCUREMENT AGREEMENTS AND REQUIREMENTS

- 4.1 All consulting procurement operations will be executed by Banobras, as well as the states and municipalities which are beneficiaries of this operation. These entities should follow the 2011 Bank's Policies for the Procurement of Goods and Works (GN-2349-9) and the Policies for the Selection and Contracting of Consultants (GN-2350-9). If these are modified, the newest version should be applicable, provided that the executing agency gives it written acceptance.
- 4.2 **Procurement of Works, Goods and Services different from Consulting:** Works, goods and services different from consulting services financed with this operation and subject to an International Bidding Process (IBP) and those subject to National Bidding Process (NBP), will be executed under the harmonized bidding documents agreed between the Bank and the SFP. These documents can be obtained at the following website address: <http://www.funcionpublica.gob.mx/unaopspf/credito/normace.htm>. The review of the technical characteristics of procurements during the selection process will be the responsibility of the project's sector specialist.

### A. Consultants Selection and Contracts

- 4.3 **Service Contracts for Firms** will be executed using the Standard Request for Proposals (SRFP), agreed upon by the Bank and SFP. These documents can be retrieved from the following webpage: <http://www.funcionpublica.gob.mx/unaopspf/credito/normace.htm>.
- 4.4 The Requests for Proposals that exceed US\$200,000 will be published internationally. In the cases of procurements, and below US\$500,000 the shortlist can be comprised exclusively by national firms.
- 4.5 **Selection of individual consultants:** Contracts for individual consultants will be based upon the qualifications for the position and the comparison between at least three candidates. Contracts will be made using the individual consulting contract format approved by SFP and the Bank. This contract can be retrieved in the following webpage: (<http://www.funcionpublica.gob.mx/unaopspf/credito/normace.htm>).
- 4.6 The review of the terms of reference for individual consultants will be the responsibility of the project's sector specialist.

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<sup>4</sup> The eligible expenses are included in p. 1.38 – 1.47.

- 4.7 **Use of the National Procurement System:** On February 2013, the Bank accepted the use of the Mexican public procurement and contracting system. This is established in the Bank's country strategy (GN-2595-3),<sup>5</sup> which can be used once the implementation agreement with the Mexican government is established.

**Limit amounts for Procurement Processes (US\$)**

Works			Goods <sup>6</sup>			Consulting	
International Public Bidding	National Public Bidding	Price Comparison	International Public Bidding	National Public Bidding	Price Comparison	International Public Bidding	100% Domestic Shortlist
>15.000.000	< 15.000.000 and > 500.000	< 500.000	> 3.000.000	<3.000.000 >=100.000	<100.000	> 200.000	<500.000

- 4.8 **Main procurement.** The main procurement processes per city are:
- La Paz: Design, implementation and operation of a solar panel system for public buildings.
  - Xalapa: Detailed design, implementation and equipment of a biodigester plant for solid waste. The plant will produce energy and compost as byproducts.
  - Campeche: Executive study for the Clean-up of Campeche Bay, including an Action Plan.
- 4.9 Due to the differences between the procurement processes required for this operation, and taking into account the institutional and operational capacities of the municipalities, a procurement plan will be made for each city. This plan will be approved by the Bank and by Banobras.
- 4.10 **Procurement Supervision:** Based on the low-risk rating for this operation, procurement processes will be reviewed ex post. The procurement plan should include those cases in which an ex ante review is required. The Bank and BANOBRAS can provide training workshops and advisory focused on the use of Bank's policies for procurement processes to state and municipal authorities.
- 4.11 **Procurement Registry and Archiving:** Archives should be available at any time for procurement review whenever the Bank deems pertinent.

<sup>5</sup> The use of Mexico's public procurement and contracting system will be accepted in all contracts with a value equal or below the IBP threshold for the procurement of works (US\$15 million), goods and services (US\$3 million). For those contracts which are above these amounts, the applicable policy is the Bank's GN-2349-9 and GN-2350-9. The use of this system does not include: (i) consulting service contracts; (ii) PEMEX contracts; (iii) contracts using state and municipal regulation; and (iv) direct hire between public entities (administration contracts). It will not include the requirements of the federal system for the exclusion of foreigners and national integration requirements.

<sup>6</sup> Includes services different from consultancy.



## **B. Financial Management**

### **1. Programing and Budget**

- 4.12 For its accounting, Banobras uses a Classification by Object of Expenditure, which is applicable to all Mexican Federal Public Administration. The use of this classification is mandatory for all the entities and institutions of the Public Federal Administration. The Classification by Object of Expenditure used by Mexico's Federal Public Administration is a generic budgetary instrument with a basic structure (chapter, concept and generic entry). This system facilitates the systematic, ordered and homogeneous classification of: personnel services; materials, supplies; transferances; subsidies and other grants; real estate and furniture; public investment; financial investments; contributions; public debt; etc.
- 4.13 For its budgeting, Banobras uses Mexico's Federal Government System for Accounting and Budgeting (SICOP). This system allows the operation and integration of the institutional financing information.

### **2. Accounting and information systems**

- 4.14 Banobras uses SICOP to fulfill the requirements set forth by SHCP and CNBV for financial institutions. Banobras also uses accounting (Financial Accounting System "SICOFIN"), and credit control systems that fulfill the regulatory requirements. For its credit portfolio management, Banobras uses its "Integrated Portfolio System" (SIC). This system has accounting guidelines to register its institutional accounting and includes detailed information of each transaction. It also includes a detailed catalogue which facilitates both the production of reports for the CNBV. Treasury transactions are registered in the "Ikos Cash" system."
- 4.15 Banobras has an Information Technology Unit which incorporates and maintains all information systems. It is also in charge of supervising the correct operation of the computer network, software, communication and computer systems. The Unit applies the policies and strategic plans that regulate Banobras' operations.

### **3. Registries and accounting archives**

- 4.16 Banobras' Accounting Unit is in charge of generating financial accounting and fiscal information. It also manages the programming and budgetary control activities in accordance to the current legal and policy framework. The official accounting registries are managed through SICOFIN.
- 4.17 Banobras has an "Operating Manual for Document Archiving", which usage is mandatory. This manual describes the procedure for documents saving, custody and microfilming.

### **4. Internal control and audit**

- 4.18 Banobras has a Comptroller and an Internal Audit Control Unit. The Comptroller is appointed by Banobras' authorities while the Internal Audit Control Chief is appointed by SFP. This ensures that reports are made independently. ICAS

analysis showed a 100% of fulfillment rate to these units, which indicates a low-risk rating.

## **5. External Control and Reports**

- 4.19 Given that Banobras is a development bank, its operation and procedures must comply with the accepted banking practices established by CNBV. It must provide all the reports -required by the Commission. For external control, Banobras is audited by CNBV, SHCP, ASF and external auditors for External Financial Auditing (EFA) of projects.
- 4.20 Each year, SFP appoints an independent auditing firm, negotiates its royalties and instructs Banobras to process the contract. In previous Bank's operations with Banobras, the audit opinions included in the EFAs have been positive.
- 4.21 For transparency issues, Banobras must provide SFP with a series of reports and documentation.
- 4.22 Banobras EFAs are published on its website annually.

## **C. Execution Mechanism**

- 4.23 The project will be executed by Banobras in three Mexican cities (Xalapa, Campeche and La Paz). Procurement processes might be performed by Banobras, the beneficiary states or municipalities in accordance to the procurement plan for each city. The activities that each municipality should perform will be defined by a collaboration agreement between each beneficiary city, its state government and Banobras.
- 4.24 The disbursement mechanism will be by advance of funds. The Bank, at the request of Banobras, will transfer the grant funds according to the liquidity requirements for the three municipalities. The funds will be deposited in a Payment Trust Fund created by Banobras.
- 4.25 The objective of the Payment Trust Fund is to facilitate the fulfilment of the financial management obligations of the project. This mechanism allows an efficient control of the use, review, conciliation, and accountability of the project's funds.
- 4.26 Once the beneficiary municipality agrees with the received goods or products, it will inform Banobras of its approval. It will also deliver all the pertinent supporting documentation of the received good or product and will request the direct payment to the supplier via the Payment Trust Fund.
- 4.27 Considering the aforementioned execution mechanism and in accordance to IDB's Financial Management Guidelines (OP-273-6), the required expense report should have a percentage of 60% for a subsequent disbursement. This is recommended as the project fulfills the requirements of the Guideline's Clause 3.3 (iii)(a). This clause states that "The execution mechanism is complex, decentralized and includes several co-executors, different authorization levels (federal, state or any subnational government), or a combination of them".

**-\*GEF PROGRAM FOR THE IMPLEMENTATION OF PRIORITIZED ESC PROJECTS IN THREE MEXICAN CITIES**

**ME-G1012**

**CERTIFICATION**

I hereby certify that this operation was approved for financing under the **Global Environment Facility (FMM)** through a communication dated July 17, 2017 and signed by Brady Martin (ORP/GCM). Also, I certify that resources from said fund are available for up to **US\$13,761,468** in order to finance the activities described and budgeted in this document. The commitment and disbursement of these resources shall be made only by the Bank in US dollars. The same currency shall be used to stipulate the remuneration and payments to consultants, except in the case of local consultants working in their own borrowing member country who shall have their remuneration defined and paid in the currency of such country. No resources of the Fund shall be made available to cover amounts greater than the amount certified herein above for the implementation of this operation. Amounts greater than the certified amount may arise from commitments on contracts denominated in a currency other than the Fund currency, resulting in currency exchange rate differences, represent a risk that will not be absorbed by the Fund.

(original signed)

\_\_\_\_\_  
Sonia M. Rivera

Chief

Grants and Co-Financing Management Unit

ORP/GCM

\_\_\_\_\_  
7/20/2017

Date

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-\_\_\_/17

Mexico. Nonreimbursable Investment Financing GRT/FM-\_\_\_\_-ME  
GEF Program for the implementation of prioritized ESC projects  
in three Mexican cities

The Board of Executive Directors

RESOLVES:

That the President of the Inter-American Development Bank ("Bank"), or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, as Administrator of the Global Environment Facility (GEF) Trust Fund ("Fund"), to enter into such agreement or agreements as may be necessary with the United Mexican States, for the purpose of granting it a nonreimbursable investment financing for a sum of up to US\$13,761,468 chargeable to the resources of the Fund, and to adopt any other measures as may be pertinent for the execution of the project proposal contained in document PR-\_\_\_\_\_.

(Adopted on \_\_\_\_ 2017)