GGGI Mexico Country Program Independent Evaluation Report

Under Consultant Agreement

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Prepared for

Impact & Evaluation Unit (IEU)
The Global Green Growth Institute (GGGI)

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Acronyms

AMEXCID	Mexican Agency for International Development Cooperation
BANOBRAS	National Bank of Public Works and Services
BRT	Bus Rapid Transit
CABP	Comparative Analysis of Bus Public Transport Concession Models
CAM	Metropolitan Environmental Commission
CAMe	Environmental Commission of the Megalopolis
CAPT	Comparative Analysis of Public Transport Concession Models
CDM	Clean Development Mechanism of the Kyoto Protocol
CEDES	Commission of Ecology and Sustainable Development of the State of Sonora
CEMDA	Mexican Center for Environmental Law
CEMIE Geo	Mexican Center for Innovation in Geothermal Energy
CEMIEs	Mexican Centers for Innovation in Energy
CEPEP	Center for Studies for the Preparation and Socioeconomic Evaluation of Projects
CERs	Certified Emissions Reductions
CMM	Mario Molina Center for Strategic Studies on Energy and the Environment
COFECE	Federal Commission of Economic Competition
CONAFOR	National Forest Commission
CONAPO	National Population Council
CONAVI	National Commission for Housing
CONUEE	National Commissions for the Efficient Use of Energy
CPF	Country Planning Framework
CRF	Corporate Results Framework
DAC	Development Assistance Committee of the OECD
DANIDA	Danish International Development Agency
DOF	Official Journal of the Federation
ENCC	National Climate Change Strategy
EU	European Union
FIDEME	Trust for the Development of Projects in the Megalopolis
FONADIN	National Fund for Infrastructure
GDP	Gross domestic product
GCF	Green Climate Fund
GG	Green Growth
GGGI	The Global Green Growth Institute
GGSS	Green Growth Strategy of Sonora
GHG	Greenhouse gases
GIZ	German Cooperation for Development
GoM	Government of Mexico
GoMorelos	Government of Morelos State
GoSonora	Government of Sonora State
HCA	Host Country Agreement
HDV	Heavy Duty Vehicles
IEU	Impact & evaluation unit at GGGI
INAES	National Institute of the Social Economy
INECC	National Institute of Ecology and Climate Change

KEQ	Key Evaluation Questions
LDC	Least-Developed Countries
LEZ	Vehicular control zone or eco-zone
MCMA	Mexico City Metropolitan Area
MCP	GGGI Mexico Country Program
MIT	Massachusetts Institute of Technology
MoU	Memorandum of Understanding
NGSS	National Green Growth Strategy
NO_x	Nitrogen oxides
NOM	Mexican Official Standard
NMT	Non-Motorized Transportation
O_3	Ozone
OBD	On-Board Diagnostics
OECD	Organization for Economic Cooperation and Development
OED	Operations enabling division at GGGI
PECC	Special Program for Climate Change
PND	National Development Plan
PM_{10}	Particle matter with 10 micrometers or less in diameter
$PM_{2.5}$	Particle matter with 2.5 micrometers or less in diameter
Proaire	Air Quality Improvement Program
PROTRAM	Federal Mass-transit Support Program
PV	Photo-voltaic
PVV	Emission Testing Program
SCT	Secretariat of Communications and Transport
SE	Secretariat of Economy
SEDEMA	Secretariat of Environment of Mexico City
SEDESOL	Secretariat od Social Development
SEDUVIs	Secretariats of Urban Development and Housing at State level
SEMARNAT	Secretariat of the Environment and Natural Resources
SEMOVIs	Secretariats of Mobility at State level
SENER	Secretariat of Energy
SOs	Strategic Outcomes
SRE	Secretariat of Foreign Affairs
SSA	Secretariat of Health
SDGs	Sustainable Development Goals
SWOT	Strengths – Weaknesses – Opportunities – Threats
TINA	Technology Innovation Needs Assessment
TOC	Theory of Change
UK FCO	United Kingdom - Foreign and Commonwealth Office
ULSD	Ultra Low Sulfur Diesel
US AID	United States Agency for International Development
USD	Dollars from the United States of America
VOC	Volatile organic compounds
WB	World Bank
WPB	Work Program and Budget
WRI	World Resources Institute

Executive summary

The Global Green Growth Institute (GGGI) was established in 2012 to support countries to pursue a model of economic development known as "green growth", which aims to simultaneously promote economic growth, social inclusion and environmental sustainability. To achieve this, GGGI works with partner countries to design and deliver programs that demonstrate practical pathways to achieve green growth through a set of 6 Strategic Outcomes: 1) GHG Emission Reductions, 2) Creation of Green Jobs, 3) Increased Access to Sustainable Services, 4) Improved Air Quality, 5) Adequate Supply of Ecosystem Services Ensured, and 6) Enhanced adaptation to climate change.

A key task for GGGI is to credibly demonstrate its contribution to the strategic outcomes. As part of this effort, GGGI's Impact and Evaluation Unit (IEU) commissioned this independent evaluation with the purpose of gathering evidence on the results the GGGI Mexico Country Program has achieved to date and providing recommendations for improvements in future program design and delivery.

The Mexico Country Program comprises of 5 program areas: Air Quality, Public Transport, Green Growth Planning, Climate Technologies, and Knowledge Sharing. Projects under these program areas are expected to generate intermediate outcomes, which in turn are expected to generate long-term outcomes through the logic of the Theory of Change (ToC) 2013-2017.[1] The ToC is based on evidence and assumptions that should enable achievement of those outcomes and is elaborated in the Evaluation Approach Paper developed by IEU in preparation for this independent evaluation. The approach paper also describes the evaluation methodology and highlights three key evaluation questions (KEQs):

A. What are the main outcomes (intended/ unintended/ positive/ negative) achieved by the Mexico Country Program from 2013-present, across all 5 program areas?
B. Under the transport and air quality program areas, how much progress has been made against the program logic to enable the development of clean, high quality, efficient and inclusive public transport and improving air quality in Mexico? Is there sound evidence to support the theory of change underpinning this logic?
C. How can GGGI Mexico Country Program build on previous results to scale, replicate and maximize impacts in the transport and air quality program areas?

In response to these questions, this evaluation has a major focus on the Air quality and Public transportation program areas, which are subjected to further analysis regarding the soundness of the program logic in terms of causal pathways to longer-term outcomes, and the evidence to support these pathways. Also, insights are provided on how the Mexico Country Program can build on previous results to scale, replicate and maximize impacts.

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[1] The TOC was retrospectively developed by IEU in discussion with the country team as part of the development of the approach paper to this evaluation.

The evaluation included a comprehensive assessment of the different program areas. The following **key achievements** of the program were identified:

- Developed high quality and technically sound outputs across the different projects under the Mexico Country Program.
- Supported the initial work of the Environmental Commission of the Megalopolis (CAMe) as part of the air quality program area. In addition, specific inputs contributed to the development of the Mexican Official Standard (NOM) for the air quality index, which is expected to be adopted in 2018.
- Promoted the implementation of an integrated mass transportation system in Cuernavaca under the public transport program area. Also contributed to reform the Transportation Law of Morelos to allow for such a new system to be implemented.
- Contributed with the Municipalities Risk Management and Vulnerability Diagnosis to the National Strategy on Climate Change (ENCC) to serve as a baseline to identify specific lines of action under the adaptation section of the strategy.
- Worked with the Government of Sonora that has publicly endorsed and committed to a Green Growth Strategy and has installed a Green Growth Cabinet to coordinate the actions under the strategy.
- Delivered to the Mexican government a strategic framework to inform policy and investment on innovations in energy technologies under the climate technologies program area.

In addition to program specific recommendations provided further below, the following are the **main cross-cutting recommendations** aimed to guide future programming in Mexico:

1. Complete the development of the Country Planning Framework (CPF) as the guiding strategy describing the rationale and considerations for the selection of specific program priorities going forward, with corresponding details of actions to be taken under each priority. The CPF should also identify all relevant stakeholders (social, academic, private and government sectors) and consider their interest from the inception of any specific program area.
2. Assign measurable targets for project implementation, as well as performance and outcome indicators to quantify its contribution to the strategic objectives to be identified in the CPF and GGGI's Strategic Outcomes.
3. Secure formal commitments from the government-implementing counterparts to unlock intermediate- and long-term outcomes for each program area.
4. Prepare internal reports and keep records of results of each project to allow for monitoring of impact and transparency for partners and donors.
5. Expand from the prevailing environmental focus, towards a more balanced focus with the economic and social aspects of green growth.
6. Take advantage of the upcoming elections to strengthen the national partnership and increase the number of sub-national partners, as well as to secure continuity of current work and pursue the launching of new projects.

The following table presents all 5 program areas and provides a brief description of the main outputs (KEQ A), a summary of how much progress has been made against the program logic to enable the intermediate and long-term outcomes (KEQ B), and concise recommendations as to how the GGGI Mexico Country Program can build on previous results to scale, replicate and maximize impacts (KEQ C).

Program area	Main outputs under the specific program area (KEQ A)	Progress vs. the program logic to enable intermediate and long-term outcomes (KEQ B)	How to build on previous results to scale, replicate and maximize impacts (KEQ C)

Air quality (2013-2015)	GGGI focused on the collaboration with CAMe:[2]
	
	a) Contributed to the establishment of CAMe by funding personnel who promoted air quality issues (air quality monitoring, air quality index, air quality improvement programs, contingency programs, vehicle emission testing, etc.); and
	
	b) Funded 4 studies on economic instruments for the CAMe region:
	   i) Green license – plate environmental criteria,
	   ii) Vehicular control zone design – Low Emission Zone (LEZ),
	   iii) Vehicle ownership tax, and
	   iv) Surcharge tax for fuels in the megalopolis.
		The work done under the air quality program is relevant and of high quality. Nevertheless, there are issues regarding the possibility of implementing and/or measuring its impact.
		
		The air quality index work promoted from CAMe was formalized into public policy and is expected to become a Mexican official standard during 2018.[3]
		
		The impact of the other work is hard to trace; i.e. work on air quality monitoring and air quality programs; evidence is in the form of internal working documents, making it hard to track the outputs and measure the outcomes.
		
		Recommendations provided on LEZ were considered in three cities, but momentum was lost due to changes in local governments. The other economic instruments are not being endorsed by any government due to their political implications.
			7. Consider supporting the control of emissions sources other than vehicles.
			
			GGGI Mexico previously supported work focused on mobile sources but it is highly recommended to explore other significant emission sources from industrial and area (disperse) sources [4].
			
			8. Expand the attention outside the Megalopolis of central Mexico and work with other Mexican States or cities.
			
			There is need to support coordination among parties to the CAMe and implementation of measures to solve the challenges of the region. There are other cities that could benefit from the support to make a significant difference.

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[2] The Megalopolis includes Mexico City, municipalities of the State of Mexico, Hidalgo, Morelos, Puebla Tlaxcala, and Queretaro, as well as the federal government represented by the Ministry of Environment and Natural Resources (SEMARNAT).

[3] The draft of the Mexican standard PROY-NOM-172-SEMARNAT-2017 was published for public comments on January 2018.

[4] For example, the Mexico City Metropolitan Area emissions inventory reports other equally important emissions sources, such as point and area sources, that represent numerous industrial, service and commerce facilities, as well as other significant emission sources like off-road vehicles, construction, roads, waste, etc. These account for major emissions of $PM_{2.5}$ and emissions of VOC and NO_x (that are precursors of secondary $PM_{2.5}$ and O_3).

Program area	Main outputs under the specific program area (KEQ A)	Progress vs. the program logic to enable intermediate and long-term outcomes (KEQ B)	How to build on previous results to scale, replicate and maximize impacts (KEQ C)
Public Transport (2015-Ongoing)	a) Compiled best practice concession models to transform the bus transport system in Morelos. b) Provided recommendations on technical aspects of mobility for the Transportation Law of the State of Morelos. c) Developed a tool for economic options modeling for the State of Morelos to determine the break-even point for bus operations and facilitate decisions on the type of operating model and tariffs charged for the services. d) Provided recommendations to leverage an existing megalopolitan trust fund to finance bus fleet renewal in the Megalopolis region. e) Developed a transport externalities calculator to determine the environmental, economic and social externalities of public transport under different intervention scenarios.	Outputs under this program area are recognized as having good technical quality. However, further work is needed to address specific issues that may facilitate the adoption of a political decision or a specific action by a government. The Government of the State of Morelos adopted recommendations on mobility and reformed the Transportation Law to allow for an integrated massive transit system and new concession models. Although now legal, these actions have not been implemented yet due to a switch in local government priorities after the September 2017 earthquake. Therefore, there is an intermediate outcome, but additional efforts should be made to unlock the long-term outcomes. There is no evidence yet of effective implementation of the proposed leverage for the existing megalopolitan trust fund to finance bus fleet renewal in the Megalopolis region. There is no evidence yet of a current use of the transport externalities calculator by any government agency.	9. Support other aspects of mobility; it is necessary to look at other modes and infrastructure elements of mobility and accessibility. For example, to make mobility more efficient, it is necessary to consider the interactions of mass transit and other mobility alternatives, like non-motorized transportation: sidewalks, bikes, etc. 10. Include the latest key commitments of the New Urban Agenda to broadly address public transportation issues as part of an urban challenge. For example, interventions in mobility shall ensure that all citizens have access to equal opportunities and face no discrimination, promote measures that support cleaner cities, establish partnerships with businesses and civil society to find sustainable solutions to urban challenges, etc. These considerations can allow to foresee and prevent or mitigate associated undesired outcomes and also for a balance on the environmental, social and economic aspects of green growth.
Green Growth Planning (2013-Ongoing)	a) Municipalities Risk Management and Climate Change Vulnerability Diagnosis for the National Strategy on Climate Change (ENCC) and the Special Program on Climate Change (PECC).	The ENCC and the PECC have incorporated the analysis conducted by GGGI and helped set the scene for long-term climate change adaptation at the municipality level; both ENCC and PECC are the basic references for	11. Promote a National Green Growth Strategy to complement the ENCC and to scale and frame national efforts towards a strong, inclusive and sustainable economic growth. Approach other Mexican States to

Program area	Main outputs under the specific program area (KEQ A)	Progress vs. the program logic to enable intermediate and long-term outcomes (KEQ B)	How to build on previous results to scale, replicate and maximize impacts (KEQ C)
	b) Development and implementation of the Green Growth Strategy for the State of Sonora (GGSS).	planning for adaptation at the national and sub-national level. The Government of Sonora has publicly endorsed and committed to the GGSS and has installed a Green Growth Cabinet to coordinate the actions under the Strategy.	replicate the effort in Sonora and develop more sub-national green growth strategies.
Climate Technologies (2015-2016)	a) Evaluation of the Mexican innovation ecosystem and of 13 clean energy technologies. b) Preliminary prioritization of technologies. c) A detailed analysis for solar photovoltaic. d) Extensive consultation with stakeholders to create a strategic framework for policy innovation.	These studies contributed to foster governmental involvement in promoting energy technological innovation. The work is relevant and, according to interviewees, the strategic framework has influenced the operation of the Mexican Center for Innovation in Geothermal Energy (CEMIE[5] Geo). However, there is no documented evidence or measurable targets to determine the extent of the impact.	12. Provide an open and participative space to adjust and adapt the strategic framework for policy innovation to be used by other CEMIEs and oversee the replication process. In order to do so, it is necessary to approach CEMIE Geo and document how they are using the framework and what has been the impact or results of using it.
Knowledge sharing (2016-Ongoing)	GGGI Mexico co-organized the following meetings: a) "Long Term strategies for the Implementation of the Paris Agreement", in June 2017. b) "First Regional Forum on Green Cities: Achieving Green Growth	SEMARNAT wants to continue this cooperation and the Mexican Agency for International Development (AMEXCID) is interested in further cooperation. However, high-level actors within these entities may change with the upcoming elections. According to interviewees, Mexico is a potential "Regional Hub" since it has connectivity to Mesoamerica and South-	13. Prepare a compelling Regional Knowledge Hub proposal focused on relevant issues (public transportation, air quality, etc.) for the new federal government and specific relevant potential partners, such as AMEXCID and the Ministry of Foreign Affairs (SRE).

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[5] CEMIEs are groups of public and private research centers, universities, private sector and government entities intended to jointly work on developing technologies, products and services based on Mexico's potential on main renewable energies. These Centers are autonomous but supervised by the Ministry of Energy.

Program area	Main outputs under the specific program area (KEQ A)	Progress vs. the program logic to enable intermediate and long-term outcomes (KEQ B)	How to build on previous results to scale, replicate and maximize impacts (KEQ C)
	through Climate Change and Air Quality Management", in 2016. c) "Technologies for Climate Change Adaptation and Mitigation", in 2016.	America; has experience on green growth; participates in the Green Climate Fund (GCF); and has institutional capabilities.	

The following table presents a set of general findings regarding the **non-programmatic aspects** of the GGGI Mexico Country Program and a set of recommendations for improving and strengthening future work.

General non-programmatic issues	Findings	Recommendations
Funding	According to GGGI, most of the Country Program's funding in the past has come from GGGI's core resources. In order to scale up the program and meet the priorities of the new CPF there is a need to initiate complementary resource mobilization through external earmarked sources.	14. Build capacity to prepare for the new combined funding model. Transition from core-funding to external earmarked-funding requires the GGGI Mexico team to develop capabilities to execute with the highest quality two main activities: preparation of proposals (to obtain funding) and results reporting (for accountability purposes).
Personnel	The current staff includes two well-qualified persons. However, the number of personnel should match the size (number of projects) and scope (targeted strategic objectives) of the new Country Planning Framework (CPF).	15. Review and adjust the number and expertise of personnel so it corresponds to the number and ambition of projects included in the new CPF. The expertise of the personnel should include managerial skills and should match the topics covered (strategic objectives).
Branding	GGGI is part of a vast group of international organizations working with the Government of Mexico (GoM). Some interviewees do not have clear knowledge of the GGGI Mexico Program.	16. Build a branding and outreach strategy and specific work-plans for each program area, to increase the recognition of GGGI and differentiate it from other organizations working in Mexico, to present the work and initiatives supported, and to add value for GGGI, its partners and all stakeholders.

1. Introduction

The Global Green Growth Institute (GGGI) was established in 2012 to support countries to pursue a model of economic development known as "green growth", which aims to simultaneously promote economic growth, social inclusion and environmental sustainability. To achieve this, GGGI works with partner countries to design and deliver programs that demonstrate practical pathways to achieve green growth. In November 2014, GGGI released a Strategic Plan 2015-2020 and a biennial Work Program and Budget (WPB). The first WPB period covered 2015-2016 and GGGI is currently implementing its second biennial WPB during 2017-2018.

In 2017, GGGI reflected on progress against the Plan and concluded that aspects of the plan should be 'refreshed' to remain relevant. The result was a "Refreshed" Strategic Plan and corresponding Corporate Results Framework (CRF). A key addition was the introduction of a set of strategic outcomes that reflect the intended green growth impact of GGGI's work. The 6 Strategic Outcomes (SOs) identified are:

1. GHG Emission Reductions
2. Creation of Green Jobs
3. Increased Access to Sustainable Services
    3.1. Increased Access to Clean Affordable Energy
    3.2. Increased Access to Improved Sanitation
    3.3. Increased Access to Sustainable Waste Management
    3.4. Increased Access to Sustainable Public Transport
4. Improved Air Quality
5. Adequate Supply of Ecosystem Services Ensured
6. Enhanced adaptation to climate change

A key task for GGGI is to credibly demonstrate its contribution to such results. Thus, an evaluation function was established in GGGI in late 2016. The Impact and Evaluation Unit (IEU) is responsible for commissioning country and thematic evaluations to assess the impacts of GGGI's work and to inform improvements to program design and delivery.[6]

This independent evaluation contributes to this task and is performed by an independent evaluation team comprised of two Mexican experts. The evaluation report includes an executive summary, an introduction and the following sections.

Section 2 provides a broad overview of the Mexico Country context in terms of recent and relevant data on economic, environmental and social issues. Also, it includes a general overview of GGGI's Mexico Country Program, including a timeline that highlights key partnerships and major milestones in the program from January 2013 to August 2017, and the Theory of Change that was created to frame the efforts. Also, a

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[6] GGGI Mexico Country Program Evaluation Approach Paper, December 2017.

table is included to show the main outputs that have been generated within all the 5 program areas that are part of the Program.

Section 3 consists of a summary of the evaluation approach and methodology. It states the overall purpose of the independent evaluation and the Key Evaluation Questions (KEQs) that are being addressed. More detailed information on the methodology is included in the Evaluation Approach Paper.

Section 4 is the core section of this independent evaluation. It separately addresses each program area: Air quality, Public transportation, Green growth planning, Climate technologies, and Knowledge sharing. It also reports on the analysis conducted based on the KEQs. Each program area is reported on in three subsections. The 'description' sections provide general information of each program area, such as the budget allocated and the outputs that have been generated so far. The 'findings' sections presents the facts that are directly derived from the document review and the interviews with key stakeholders that were conducted by the independent evaluation team specifically for this evaluation. More information of the data collection tool can be found in Appendix A. The 'conclusions and recommendations' sections are built upon the information reported in the findings sections. The conclusions are derived from what has been exposed as facts from the documents and the interviews. And the recommendations are specific suggested courses of action that, according to the interviews and the independent evaluation team, can improve the GGGI Mexico Country Program. The essence of these recommendations is that they are implementable proposals and suggestions that can be readily considered in line with the new Country Planning Framework for Mexico.

In addition, this section includes cross-cutting recommendations that have been elaborated for the 5 program areas, and it finally addresses general non-programmatic issues, such as funding and personnel related. Conclusions and recommendations regarding these issues, again, are derived from the findings and based on the document review, the interviews and a Likert Scale Survey. This survey was developed specifically for this evaluation and was distributed among the same interviewees. Although there were time and resource constraints on use of the survey, it provides valuable insights regarding specific qualifications of the GGGI Mexico team and the Mexico Country program outputs and outcomes. More information on this data collection tool can be found in Appendix B.

This independent evaluation should be useful to allow GGGI to appreciate the extent of their work and the impact they had in Mexico and Mexicans through the GGGI Mexico Country Program. It is also expected that the results and recommendations collected by the evaluation team and presented here can be helpful in the process of designing, implementing and evaluating other programs, in or outside of Mexico.

2. Country and Program overview

2.1. Mexico´s economic, social, environmental and political context

This section intends to provide general information about Mexico to contextualize the GGGI Country Program. Most of the information presented has been taken from the Evaluation Approach Paper provided by GGGI and complemented with other valuable data and information.

Economic context

During the first half of 2017, Mexico's annual GDP growth rate was 2.3%, which was higher than forecasts made by the World Bank [7]. However, growth has not been inclusive enough to achieve better living conditions for many Mexican families. Disparities between a highly productive modern economy (North and Centre) and a lower-productivity traditional economy (South) have increased (see Figure 2.1.).[8]

(GDP per capita, 2005 = 100)
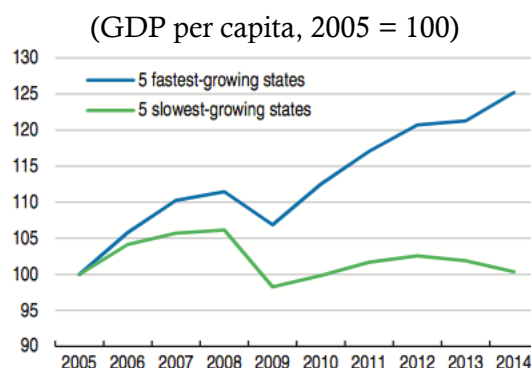
Figure 2.1. Growth disparities across Mexican states

Source: OECD Economic Surveys, Mexico, January 2017

The National Development Plan 2013-2018 (PND) recognizes that Mexico's economic growth potential is held back by a number of relevant factors, such as low productivity and unequal opportunities across sectors, regions and population groups.[9] It is worth mentioning that Mexico's productivity growth has recently picked up in sectors that benefitted from structural reforms – energy (electricity, oil and gas), financial, and telecom sectors. Trade openness, foreign direct investment, integration into global value chains and innovation incentives have boosted exports, notably of cars. Yet, other sectors lag, suffering from overly stringent local regulations, weak legal institutions, rooted informality, corruption and insufficient financial development. Further reforms and reprioritizing public spending towards infrastructure, training, health, and poverty reduction are essential to address Mexico's growth problems.[10]

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[7] World Bank Country Profiles: Mexico - https://data.worldbank.org/country/mexico
[8] OECD Economic Surveys, Mexico, January 2017 - www.oecd.org/eco/surveys/economic-survey-mexico.htm
[9] Mexico National Development Plan (PND) 2013 – 2018. Available at: http://pnd.gob.mx
[10] OECD Economic Surveys, Mexico, January 2017 - www.oecd.org/eco/surveys/economic-survey-mexico.htm

Social context

Findings from the Global Competitiveness ranking are reflected in OECD's Economic Survey of Mexico (2017) released in January 2017, which summarizes that productivity growth is picking up, but poverty is a critical issue and disparities persist across Mexico in terms of income inequality, gender gaps and regional inequality.[11] According to the World Bank, the percentage of the population living below the national poverty line in 2016 was 50.6% and this percentage has remained somewhat stable (around 50%) since 2008.[12]

Disparities, as mentioned earlier, are related to a highly productive, modern economy in the north and center but a lower-productivity, traditional economy in the south. The southern areas are comprised of groups of indigenous people and include 33% of all marginalized municipalities. These are characterized as such due to limited access to public services in the dwellings (water, electricity, sanitation), lack of formal education (below primary level) or illiteracy condition, and overcrowded living conditions.[13] Mexico ranks 24th in terms of inequality, measured by the Gini Index.[14]

Environmental context

Since the mid-20th century, Mexico has warmed by an average of 0.85 °C and has experienced an increase in hydro-meteorological events such as tropical cyclones, floods and droughts.[15] In response, Mexico has played a leadership role on climate action through comprehensive legislation, strategies and plans. In 2015, it was one of the first countries to join the "high ambition" coalition pushing for a global goal to limit global warming to 1.5 °C.[16]

These efforts have resulted in the decline of total GHG emissions since 2011, as shown in
Figure 2.2. In 2015, Mexico's GHG emissions were estimated at 709 $MtCO_2e$, which shows a further decline. However, if persistent efforts are not ensured, a scenario analysis by the World Resources Institute shows that GHG emissions can increase up to 1009 $MtCO_2e$ by 2030.[17]

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[11] OECD Economic Survey of Mexico 2017 - http://www.oecd.org/eco/surveys/economic-survey-mexico.htm
[12] World Bank Country Profiles: Mexico - https://data.worldbank.org/country/mexico
[13] National Population Council (CONAPO)
[14] Gini index measures the degree of inequality in the distribution of family income in a country. The more nearly equal a country's income distribution, the lower its Gini index. With an index of 48.2 in 2014, Mexico has a high degree of inequality. Source – CIA, World Factbook - https://www.cia.gov/library/publications/the-world-factbook/rankorder/2172rank.html
[15] DOF (Official Journal of the Federation). 2014. "Programa Especial de Cambio Climatico 2014-2018." - http://dof.gob.mx/nota_detalle.php?codigo=5342492&fe
[16] Altamirano, J., E. Ortiz Sánchez, J. Rissman, K. Ross, T. Fransen, C. Brown Solá, and J. Martinez. 2016. "Achieving Mexico's Climate Goals: An Eight-Point Action Plan." Working Paper. Washington, DC: World Resources Institute.
[17] IBIDEM

A sectorial analysis of GHG emissions in 2015 shows that the major contribution comes from the industrial sector (56%) followed by transportation (24%). This is particularly important in urban areas like Mexico City where an estimated 1,823 residents died prematurely in 2015 due to air pollution.[18]
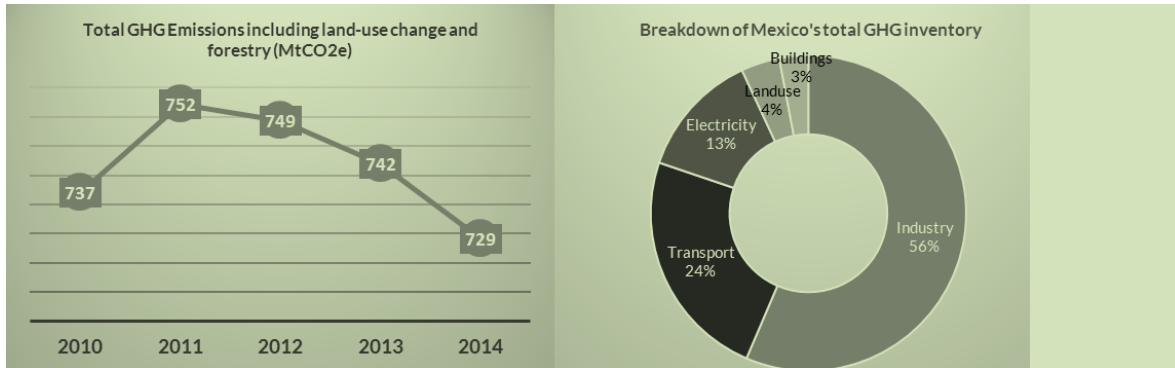
Figure 2.2. Mexico's GHG emissions, amounts and sources

Source: CAIT Climate Data Explorer. 2017. Washington, DC: World Resources Institute.

Political context

Mexico will hold its general election on July 1, 2018. Some States have adjusted their elections calendar with the Federal one, making this election the biggest in the country´s history; it will include:

- President of the Republic,
- 8 State Governors and the Chief of Government of Mexico City,
- 128 Senators,
- 500 representatives (*Diputados*) to the Federal Lower Chamber of Congress,
- 972 representatives (*Diputados*) to the Local Chamber of Congress in 31 States and the Assembly of Representatives in Mexico City,
- 1,596 municipality presidents in 31 States and 16 mayors in Mexico City,
- 160 Councilors in Mexico City and 24 municipal boards in one State.

In total, 3,406 elected positions are up for grabs, making the 2018 election unprecedented in its scope and impact on Mexico's political landscape. As can be seen, the country will undergo a strong transformation after the election; this creates an enormous opportunity to influence the new Development Plans and new regulations and budgets, at the National and Sub-national levels.

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[18] CEMDA (Mexican Center for Environmental Law). 2016. "*Los derechos humanos y la calidad del aire en Mexico*." - http://www.cemda.org.mx/wpcontent/uploads/2016/05/Los-Derechos-Humanos-y-la-calidad-dei-aire-en-Me%CC%81xico.pdf

2.2. GGGI Mexico Country Program Framework overview

Mexico is one of GGGI's founding members. GGGI's country team is based in Mexico City and has been working with the Government of Mexico (GoM) since 2013 to promote green growth. GGGI has been involved in two ways: By means of the provision of technical assistance to specific projects; by sponsoring specific personnel members within strategic government organizations, and by providing funding for specific projects. By means of the support of knowledge sharing between Mexico and countries in the region through its principal counterpart in the GoM, the Secretariat of the Environment and Natural Resources (SEMARNAT).

During the past years, the initial work done in Mexico by GGGI was the launching of the Program on a National and Sub-national level. Since 2013, planning and implementation of projects responded to the context and needs existing at the time and the opportunities to work with some key actors such as SEMARNAT and CAMe.

provides a timeline of GGGI's Mexico Country Program. It highlights key partnerships with the GoM and major milestones in the program. Based on that scope, covering the period showed on the timeline and addressed by this evaluation–from January 2013 to August 2017–a Theory of Change was created to frame the efforts and to direct them towards GGGI's Strategic Outcomes (see Figure 2.4).

2013
- Commenced operations in Mexico, established an office and hired staff
- Initiated collaboration with the National Institute of Ecology and Climate Change (INECC) relating to the National Climate Change Strategy (ENCC)
- Secretary Juan Jose Guerra Abud of SEMARNAT pledged financial and in-kind support to GGGI
- Initiated collaboration with the Environmental Commission of the Megalopolis (CAMe) on air quality and mobility issues

2014
- Received office space from SEMARNAT as part of GoM's support to GGGI
- Agreement between GoM and GGGI is ratified by the Mexican Senate following which Mexico becomes an official member of GGGI

2015
- The public transport workstream is strengthened with a clear work plan and defined focus areas
- Knowledge sharing activities are initiated with participation in a workshop in Costa Rica

2016
- GoM's first financial contribution of USD 500,000 is received by GGGI
- Initiated collaboration with the State of Sonora to develop a GG strategy
- Initiated long term planning in Mexico through the development of a Country Planning Framework (CPF)

2017
- Progress is expected in developing Mexico as a "Knowledge Hub" for GGGI in Latin America
- Expected to initiate activities to increase GoM's access to international climate finance
- The Host Country Agreement (HCA) is expected to be finalized

Figure 2.3. GGGI Mexico Country Program timeline

Source: GGGI Mexico Country Program, Evaluation Approach Paper, Program overview and proposed evaluation design, methodology and work plan; IEU, OED, GGGI; December 2017

Figure 2.4. GGGI Mexico Theory of Change 2013-2017

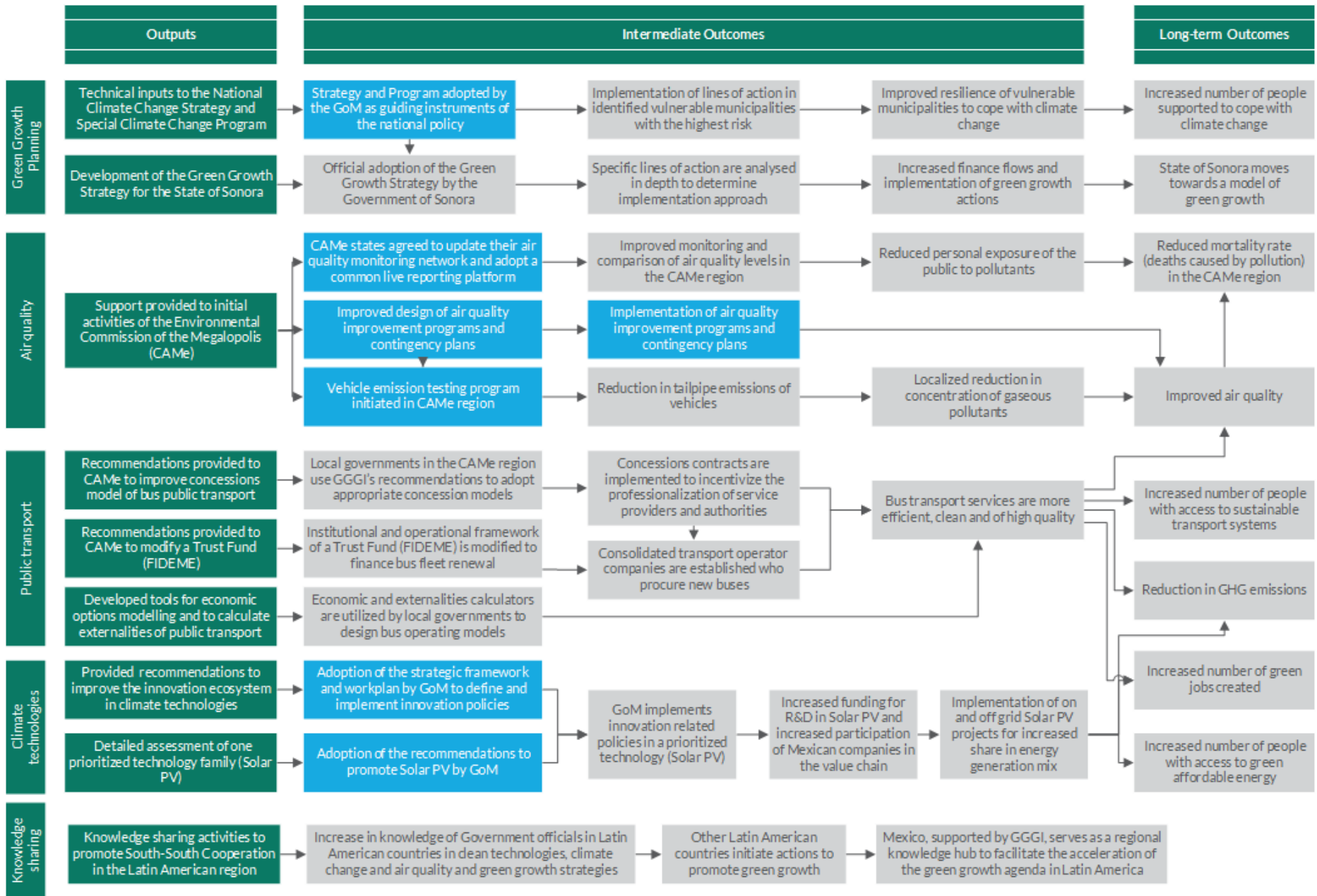|	Outputs	Intermediate Outcomes			Long-term Outcomes
Green Growth Planning	Technical inputs to the National Climate Change Strategy and Special Climate Change Program	Strategy and Program adopted by the GoM as guiding instruments of the national policy	Implementation of lines of action in identified vulnerable municipalities with the highest risk	Improved resilience of vulnerable municipalities to cope with climate change	Increased number of people supported to cope with climate change
	Development of the Green Growth Strategy for the State of Sonora	Official adoption of the Green Growth Strategy by the Government of Sonora	Specific lines of action are analysed in depth to determine implementation approach	Increased finance flows and implementation of green growth actions	State of Sonora moves towards a model of green growth
Air quality	Support provided to initial activities of the Environmental Commission of the Megalopolis (CAMe)	CAMe states agreed to update their air quality monitoring network and adopt a common live reporting platform	Improved monitoring and comparison of air quality levels in the CAMe region	Reduced personal exposure of the public to pollutants	Reduced mortality rate (deaths caused by pollution) in the CAMe region
		Improved design of air quality improvement programs and contingency plans	Implementation of air quality improvement programs and contingency plans		
		Vehicle emission testing program initiated in CAMe region	Reduction in tailpipe emissions of vehicles	Localized reduction in concentration of gaseous pollutants	Improved air quality
Public transport	Recommendations provided to CAMe to improve concessions model of bus public transport	Local governments in the CAMe region use GGGI's recommendations to adopt appropriate concession models	Concessions contracts are implemented to incentivize the professionalization of service providers and authorities	Bus transport services are more efficient, clean and of high quality	Increased number of people with access to sustainable transport systems
	Recommendations provided to CAMe to modify a Trust Fund (FIDEME)	Institutional and operational framework of a Trust Fund (FIDEME) is modified to finance bus fleet renewal	Consolidated transport operator companies are established who procure new buses		Reduction in GHG emissions
	Developed tools for economic options modelling and to calculate externalities of public transport	Economic and externalities calculators are utilized by local governments to design bus operating models			
Climate technologies	Provided recommendations to improve the innovation ecosystem in climate technologies	Adoption of the strategic framework and workplan by GoM to define and implement innovation policies	GoM implements innovation related policies in a prioritized technology (Solar PV)	Increased funding for R&D in Solar PV and increased participation of Mexican companies in the value chain	Increased number of green jobs created
	Detailed assessment of one prioritized technology family (Solar PV)	Adoption of the recommendations to promote Solar PV by GoM		Implementation of on and off grid Solar PV projects for increased share in energy generation mix	Increased number of people with access to green affordable energy
Knowledge sharing	Knowledge sharing activities to promote South-South Cooperation in the Latin American region	Increase in knowledge of Government officials in Latin American countries in clean technologies, climate change and air quality and green growth strategies	Other Latin American countries initiate actions to promote green growth	Mexico, supported by GGGI, serves as a regional knowledge hub to facilitate the acceleration of the green growth agenda in Latin America	

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Five Program areas are part of the Theory of Change:

1. Green Growth Planning
2. Air Quality
3. Public Transport
4. Climate Technologies
5. Knowledge Sharing

These 5 program areas seem to fall mainly into 2 of the 4 thematic strategies in which GGGI impacts are being maximized[19], sustainable energy and green cities. The other thematic areas, water and sanitation and sustainable landscapes, are not yet heavily present on the Mexico Program, although these are key issues that are also important in Mexico.

In terms of results, the theory of change[20] elaborates the different kinds of results, distinguishing between outputs and outcomes. The outputs are the main products of each activity under the respective program area, while the outcomes are the impacts that each output is expected to generate. Those impacts are distributed in time, considering intermediate and long-term outcomes. Long-term outcomes are aligned with GGGI's mission of supporting and promoting strong, inclusive and sustainable economic growth[21] and with GGGI's strategic outcomes.

Table 2.1 presents a brief description of the main outputs delivered according to the Theory of Change 2013-2017 and under each program area since the beginning of the Mexico Country Program:

Program area	Main outputs
1. Green Growth Planning (2013-Ongoing):	a. Technical inputs on assessment of climate change vulnerability of municipalities, provided to the ENCC and PECC. b. Development and implementation of the Green Growth Strategy for the State of Sonora is an ongoing project.
2. Air quality (2013-2015):	a. Supported the establishment of the CAMe and various activities to improve the management of air quality in the Megalopolis region. b. Specific studies to evaluate potential economic instruments to promote the use of public transport and cleaner and more efficient vehicles were commissioned by GGGI in partnership with GoM and United States Agency for International Development (USAID).
3. Public transport (2015-Ongoing):	a. Compiled best practice concession models from 7 international cities along with key lessons to establish a concession model to transform the bus transport system in the State of Morelos.

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[19] GGGI Thematic strategies. Available at: http://gggi.org
[20] The ToC was retrospectively developed by IEU in discussion with the country team as part of the approach paper to this evaluation.
[21] IBIDEM

Program area	Main outputs
	b. Provided recommendations on technical aspects of a new mobility law in the State of Morelos including framework to introduce a new concession model for bus operations.
	c. Developed a tool for economic options modeling for the State of Morelos to determine the break-even point for bus operations and facilitate decisions on the type of operating model and tariffs charged for the services.
	d. Provided recommendations to leverage an existing megalopolitan trust fund to finance bus fleet renewal in the Megalopolis region.
	e. Developed a transport externalities calculator to determine the environmental, economic and social externalities of public transport under different intervention scenarios.
	f. Utilizing the previous studies and tools, the program has planned to support one local government to improve its public transportation system.
4. Climate technologies (2015-2016):	The following activities were completed in partnership with the United Kingdom's Foreign & Commonwealth Office (UK FCO):
	a. Assessed the innovation ecosystem in climate technologies and issued recommendations for improvement.
	b. Identified technologies with the greatest potential for GHG mitigation and generation of economic opportunities for the country.
	c. Assessed in greater detail a priority technology (solar PV) and developed recommendations to promote the implementation of the technology.
5. Knowledge sharing to promote South-South Cooperation (2016-Ongoing):	a. GGGI, the GoM, and other international partners organized a Regional Forum on Technologies for Mitigation and Adaptation to Climate Change held in Mexico City in February, 2016.
	b. GGGI, SEMARNAT and the Mexican Agency for International Development Cooperation (AMEXCID) organized the 1st Regional Forum on Green Cities: Achieving Growth through the Management of Climate Change and Air Quality in Mexico City in August, 2016.
	c. GGGI, the Government of Mexico, and other international partners organized a Regional Forum on Long-term Green Growth strategies for the implementation of the Paris Agreement held in Mexico City in June 2017.

Table 2.1. GGGI Mexico summary of outputs by program area

Source: GGGI Mexico Country Program, Evaluation Approach Paper, Program overview and proposed evaluation design, methodology and work plan; IEU, OED, GGGI; December 2017

3. Evaluation approach

The overall purpose of this independent evaluation is to gather evidence on the results of the GGGI Mexico Country Program (MCP) that have been achieved to date, and to advise improvements for future program design and delivery. In 2018 the planning work has started for the next biennium (2019-2020) on the Mexico Program; thus, this evaluation hopes to contribute to that planning process through clear and readily implementable recommendations.

As established in the Inception Report, GGGI Mexico Program´s independent evaluation is done by assessing three key evaluation questions (KEQs), along with the indicative issues to be considered as part of each question. The questions selected are a combination of descriptive (determine the status of the program), cause and effect (determine the impact of the program) and normative issues (contrast the progress of the program versus the planning).

The evaluation was aimed to analyze all 5 program areas in terms of describing the status of the program and conduct a deep-dive analysis of two specific program areas – transport and air quality – to determine the progress towards achieving impact.

The three key evaluation questions are:

A. What are the main outcomes (intended/ unintended/ positive/ negative) achieved by the Mexico Country Program from 2013-present, across all 5 program areas?

The aim of this question is to capture supporting evidence on the outcomes that have been achieved so far by the country program. This also includes determining the level of quality of outputs delivered, partnerships developed and the operational processes that have helped achieve the program outcomes. The question is critical to better understand how the design of the MCP aligns with GGGI's Strategic Plan 2015-2020 and if it is contributing to the achievement of green growth outcomes in Mexico.

B. Under the transport and air quality program areas, how much progress has been made against the program logic to enable the development of clean, high quality, efficient and inclusive public transport and improving air quality in Mexico? Is there sound evidence to support the theory of change underpinning this logic?

This question seeks to better understand the program logic underpinning GGGI's transport and air quality work and determine the robustness of the causal pathways to longer-term outcomes. In addition, the aim is to gather adequate evidence and determine if the program outputs and medium-term outcomes under these two program areas will contribute to the intended longer-term outcomes.

C. How can GGGI Mexico Country Program build on previous results to scale, replicate and maximize impacts in the transport and air quality program areas?

Through an analysis of the forecasted theory of change, the answer to this question consists of actionable recommendations on how to scale, replicate and maximize the intended impacts of the program. The most critical issues in the public transport sector and air quality management in Mexico are analyzed to determine how the program can contribute to transformational change (large scale focus, potential to be replicated, innovative and leverage other resources to increase results).

4. Key findings and recommendations

This section looks at the 5 program areas to address the specific evaluation questions. The main topics included in KEQ A refer to the outcomes that have been achieved so far as well as the evidence underpinning the achievement of the program outcomes and how efficient the program was in delivering these outcomes. Also, some comments are included on the extent to which GGGI has been able to mainstream safeguards, poverty reduction, and social inclusion (including gender) into delivered outputs.

For 2 specific program areas, air quality and public transportation, further analysis was conducted to address the main topics included in KEQ B and C. These questions refer to the soundness of the program logic in terms of causal pathways to longer-term outcomes, and to the evidence to support that program outputs and intermediate outcomes will contribute to longer-term outcomes. Also, insights are provided on how GGGI Mexico Country Program can build on previous results to scale, replicate and maximize impacts.

4.1. Air quality program area

Figure 4.1 shows the theory of change developed for this program area.

4.1.1. Description

The Mexico Program worked on air quality during the period of 2013-2015. The budget for the air quality program area was shared with the green growth planning program area and in total was USD 855,757. During 2015-2016, the budget for the air quality program area was shared with the public transportation program area and in total was USD 534,739.

The key outputs are listed below:

a) Supported the establishment of the CAMe and funding personnel who promoted various activities within the organization with the aim to improve air quality management in the Megalopolis[22] region.

b) Specific studies to evaluate potential economic instruments to promote the use of public transport and cleaner and more efficient vehicles were commissioned by GGGI in partnership with GoM and United States Agency for International Development (USAID).

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[22] The Megalopolis includes Mexico City, municipalities of the State of Mexico, Hidalgo, Morelos, Puebla Tlaxcala, and Queretaro, as well as the federal government represented by SEMARNAT.
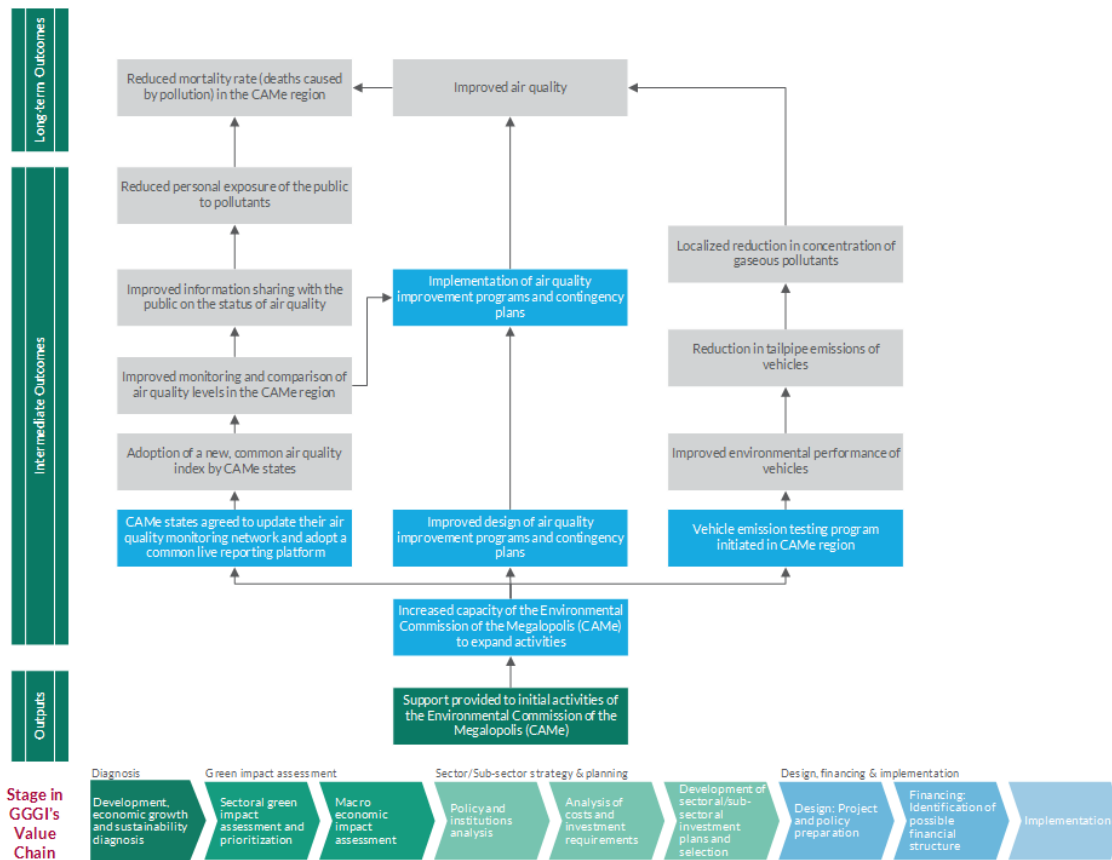
Figure 4.1. Air quality´s theory of change

4.1.2. Findings

The support provided by GGGI was crucial for the Environmental Commission of the Megalopolis (CAMe) to initiate its operations. It was an opportunity to expand the work previously done by the Metropolitan Environmental Commission (CAM) on environmental issues in the Mexico City Metropolitan Area (MCMA), to a broader geographical region with intense economical activities and interconnected ecosystems and air and water sheds: the megalopolis region of central Mexico.

GGGI contributed by funding personnel to work as full-time staff within CAMe and later, funded specific projects that were considered as a priority. That made it possible for this Commission to advance the priorities agreed by members of its governing body and advised by the technical staff, including the efforts towards improving air quality monitoring and a common reporting platform, support the development of an air quality index, update of the air quality improvement programs (Proaire) and contingency plans. The work within CAMe was focused on the following main outcomes:

- The parties to CAMe agreed to upgrade their respective air quality monitoring networks and adopt a common reporting platform. This is an urgent issue (not

only for States that are part of CAMe but in general in the Country), because State governments commonly do not invest enough in this[23]. But there are problems that hinder its achievement. It appears that there are no specific and measurable goals for such an agreement and the parties to CAMe face resource scarcity that prevent them from implementing the agreement. At the same time, there are other internal factors that are preventing several parties of CAMe from implementing air quality monitoring networks, as required by the law[24].

Air quality monitoring addresses people's right to know the quality of the air they breathe and provides information for the air quality management process to support and evaluate interventions to enhance air quality, and hence protect public health, among other uses. However, each individual monitoring network requires vast investments in terms of money, time, personnel, political will and technical expertise (to set, operate, maintain, validate data and produce and disseminate the information) and they normally do not receive enough operation budget. One of the main challenges is to incentivize and ensure the provision of enough funding for these networks from the State's annual budget. Even if GGGI allocates resources to this, it appears it would not be enough for ensuring that each State of the Megalopolis maintain a reliable air quality monitoring network.

Improve air quality monitoring is an important step and represents an intermediate outcome in the TOC. Although, reduction of emissions and actual people´s exposure needs further intermediate steps to be undertaken. These desired long-term outcomes would require, for instance, a parallel set of emission reduction and public awareness interventions.

- The parties to CAMe also discussed ways to agree on their air quality indexes, air quality improvement programs (Proaire) and contingency programs. These were developed for the MCMA over 25 years ago, and the support from GGGI was focused on ways to improve them. It contributed to a series of actions taken by the two governments that cover most of the territory of the MCMA: Mexico City and the State of Mexico. These three are important tools (to inform, reduce emissions and personal exposure during episodes of high concentrations of pollutants), but the specificities of each populated area within the Megalopolis makes them not as equally important for all of them. Moreover, these cannot be applied in those places where air quality information is not readily available (because it is not monitored, or it is not reliable, or it is not processed in the required ways).

There are relevant stakeholders that do not participate actively in consultations for the elaboration of these programs, such as the main polluters who are supposed to restrict their activities (vehicle owners, as well as service, commercial

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[23] The exception to this is the network on the MCMA, funded and operated by the government of Mexico City, which has been the provider of reliable information for this metropolitan area since the decade of the 1980´s.
[24] General Law of Ecological Balance and Environmental Protection.

and industrial facilities' owners). Therefore, it is advisable to include them from the early stages of this work, so they get involved and feel compelled to comply.

In terms of the impact achieved, it is not possible to determine if any emissions, concentrations or exposure levels have been lowered due to this specific work; however, it is assumed that measures intended to reduce emissions should contribute to reduce concentrations and hence people's exposure.

- Expand and seek approval for a vehicle emissions testing program covering the entire megalopolitan region. The emission testing programs (PVV) started in the MCMA in the early 1990's (one for Mexico City and one for the municipalities of State of Mexico that are part of the MCMA), are revised each year and turned more stringent and sophisticated over the years. To avoid the stringent PVV and Mexico City´s traffic tickets, cars circulating in the MCMA are being registered in nearby States, forcing local authorities to redesign vehicle policies in the region. This standardization of vehicle testing programs is a possible intervention to reduce emissions; however, sophisticated programs are expensive and not all the megalopolitan States are ready or even need to implement such a stringent program. Simultaneously, as pointed out by interviewees, Mexico City decided to modify their own PVV, to make it more stringent and to include the review of physical conditions.

  These PVVs are directed to incentivize good maintenance of light duty vehicles, mainly used for private transportation, whilst heavy duty vehicles (HDV) might represent a high emitting sector, such as public services vehicles and freight vehicles under federal jurisdiction. HDV are subject to the PVV but the methods to measure are not as efficient[25] and if vehicles are rejected, the maintenance activities have a limited effect on emissions reduction since most of the vehicles in this fleet are quite old and their technology do not allow to further reduce emissions. This can be an area of opportunity for GGGI to contribute to in the future.

  Moreover, there is evidence of other equally important polluting sources, such as point and area sources that represent numerous industrial, service and commerce facilities, as well as other main emission sources like off-road vehicles, construction, roads, wastes, etc.[26] These are also major contributors to direct emissions of $PM_{2.5}$ and to emissions of precursors of secondary $PM_{2.5}$ and ozone.

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[25] The corresponding standard requires the use of the Snap-Acceleration Smoke Test Procedure for Heavy-Duty Diesel Powered Vehicles; since the diesel engine is not subjected to effort in the procedure, and it is precisely during episodes of effort when the greatest emissions occur, that the method is not effective to assess most of the emissions. Also, the standard uses a light beam to measure light dispersion as a surrogate to concentration of particulate matter, however, the wavelength of it is bigger than the smaller particles, making them invisible for the test.

[26] According to the Mexico City Metropolitan Area emissions inventory 2014, in the Metropolitan area there are 70,000 industrial facilities and 826,000 commerce and service facilities. Also, the area sources that include off-road vehicles, waste, construction, roads, etc., are the main contributor to PM_{10} (65.4%), $PM_{2.5}$ (50.2%), and ozone precursors VOC (63.7%). As established by the same inventory, the only criteria pollutant concentrations in the metropolitan area that do not comply with Mexican health standards are PM_{10}, $PM_{2.5}$ and O_3.

Then it is important to consider supporting the control of emissions from sources other than vehicles.

- GGGI also helped to guide the discussion for an agreement on the air quality index. Mexico City has had such an index for over 25 years. Some States used the same index, but others used a different one, making it difficult for the people to understand and have a common tool to understand air quality problems. The National Institute of Ecology and Climate Change (INECC) started addressing this issue and hired the National Institute of Public Health (INSP) to develop the technical part of it. During the discussion of the proposed National Air Quality Index, GGGI staff played a relevant role representing CAMe. After the discussion and the standards making process, the draft of the National official standard of the AQ index is under public consultation at the time of preparation of this report and is expected to be published and become a National official standard (NOM) during 2018. The participation in the development of this air quality index is a relevant intermediate outcome for GGGI.

This work performed by GGGI personnel within CAMe is relevant but hard to trace; evidence is in the form of internal working documents, making it hard to track the outputs and measure the outcomes of it.

There are some issues to be considered when looking at CAMe as a partner/client. CAMe does not have legally binding mechanisms to enforce common decisions made in terms of standardizing actions or sharing projects. Member States can be interested in participating in a common project, but nothing prevents them from changing and using their scarce resources into what they think is best for their State. Also, there are different institutional capabilities and expertise in each State agency; hence, all of them commit simultaneously to the same obligations. Emission types, magnitudes and sources, as well as specific air quality problems also vary among CAMe States; this situation creates specific challenges and needs for each State. These facts have unfortunately challenged the primary assumption of the TOC: the capacity and technical capability of local governments to adopt a comprehensive set of strategies to make a major difference in the region. This has hindered the implementation of some outputs and, thus, inhibited the expected intermediate and long-term outcomes.

GGGI also supported some projects that were developed by the Mario Molina Center (CMM) who analyzed economic instruments that could help reduce the demand of travel by private cars into specific areas or in the whole Megalopolis (commonly known as *demand management*), reducing their emissions and hence improving air quality. The studies were the following:

- Green license-plate environmental criteria
- Vehicular control zone design - LEZ (eco-zone)
- Vehicle ownership tax for megalopolis
- Surcharge tax for fuels in the megalopolis

These studies address interesting issues that are being explored to control vehicle congestions and emissions not only in Mexico but also around the world. From a technical point of view these are relevant and valuable studies that explore alternatives and provide some sense of what could be done in terms of air pollution from vehicle sources, specifically in city centers. These studies were delivered to CAMe, and then presented to members of the governing body of CAMe to be considered for implementation.

Although these topics were chosen as research topics to inform policy makers, the final reports are not readily implementable and not as useful as expected. Recommendations provided on LEZ were considered in three cities, but momentum for their implementation was lost due to changes in local governments (either at the State or the municipality level). The three other economic instruments proposed are not yet being endorsed by any government, due to their political implications. That creates some concerns about the possible application of these projects and the possibility of realizing long-term outcomes. Firstly, related to implementation, it seems there is no political willingness to put in place measures like these in any of the States of the megalopolis. Politicians still perceive a high political cost associated to limiting or taxing the use of private vehicles and, therefore, interviewees agreed that no authority is willing to implement these measures in the near future. A possible course of action for the future is to approach the local authorities in the early stages of planning for this type of studies, to discuss what could be the interventions they see as acceptable; then shape agreed interventions based on the discussed topics and opinions and analyze the impact of such interventions. That may help to increase the chances of implementation.

Another concern is that other major contributors to air pollution, like industrial and area sources, contribute as much as light vehicles to emissions of ozone precursors (VOC and NO_x)[27]. Therefore, even if the proposed interventions were implemented, it may not result in significant reduction of pollution in the area. Although it is important to address emissions from vehicles, it is also relevant to address emissions from other relevant sources. At the same time, these studies are not specific for the cities within the Megalopolis region and it may be useful to explore other cities where these can be implemented.

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[27] Cfr. Mexico City Metropolitan Area emissions inventory, 2014.

4.1.3. Conclusions and recommendations

The air quality program area has delivered relevant and high-quality outputs. It contributed to the initial work of CAMe when recently established, by funding personnel who worked on CAMe's priority agenda, like air quality issues (air quality monitoring, air quality index, air quality improvement programs, contingency programs, vehicle emission testing, etc.) and funded four studies on economic instruments, that were prepared for the CAMe region but could be used elsewhere.

The air quality index, in which GGGI participated in discussions representing CAMe, was formalized into public policy and is expected to become a Mexican official standard during 2018. Other work is hard to trace; i.e. work on air quality monitoring and air quality programs; the evidence is in the form of internal working documents, making it hard to track the outputs and measure the outcomes. It will be useful to have a robust yet concise documentation of future work of this type, to demonstrate the strategy followed and the consideration of all major emissions sources.

Interviewees recommended the simultaneous consideration of other alternatives for mobility, attention to other relevant sources of emissions and the work towards denser urban design. The GGGI staff mentioned that the work in public transportation program area started as the answer to the need for creating such alternatives to the use of private cars in the Megalopolis region. Currently, as the Mexico Program is preparing a new CPF, they are reviewing the approach to this program area to decide where to focus, based on the multiple needs identified.

Unfortunately, implementation of the proposed interventions under this program area have not yet been undertaken (like the monitoring networks update) or are likely to not be implemented in the near future (economic instruments studies by CMM). The consequence is that although there are valuable pieces of work to inform policy makers, long-term outcomes are under risk to not being achieved. As for the activities promoted and implemented from inside CAMe, these are hard to track and there are no measurable ways yet of determining if they have contributed, and to what extent, to the intermediate- or long-term outcomes or strategic objectives.

The air quality program area has mostly focused on emissions from private vehicles. However, it is important that in the future it addresses other sources of pollution and helps understand how bad air quality affects not only people and ecosystems health, but also productivity in the cities and then negatively affects green growth. Also, future work and projects should focus more on vulnerable or excluded groups (such as indigenous, poor, women, farmers, local producers, sustainable entrepreneurs, etc.) and then include aspects that can contribute to generation of green jobs that will increase equity whilst reducing emissions.

The topics covered by the air quality program area are important in terms of identified national urgent needs; however, results have been marginal because the resources and efforts have been invested on incremental activities as opposed to innovative

interventions. For example, the work has been done to address air quality issues particularly for mobile sources, and mainly in the MCMA, that already have previous relevant achievements; but there are other equally important emission sources and other States where interventions to reduce emissions could generate transformational change.

For the activities in the future, it is advisable to build a broad strategy under Strategic Outcome 4 if the air quality program area is to be considered in the Mexico CPF being finalized. This broad strategy should consider the early approach to a broad array of stakeholders and include a set of measurable targets that can allow tracking the accomplishment of intermediate and long-term outcomes.

Engaging new partners and stakeholders can help build a stronger strategy, gain acceptance and streamline resources for new projects. The year 2018 is an opportunity to reach out to government partners and stakeholders, since the coming elections mobilize people and agendas that could benefit from working with GGGI. It will be necessary to ensure binding and public commitments with the implementing counterparts, to ensure implementation during the inception phase of every project. This can be enhanced by developing implementation plans for each activity which include stakeholders, a joint effort to determine urgent needs, feasible and prioritized interventions, as well as clear timelines and responsible entities for each activity.

Co-designing and co-creating innovative projects are required to generate the desired impact on emissions and concentrations' reduction, as well as on exposure reduction. There is the need to promote creative thinking to address root-causes of air pollution, working together with all key stakeholders to look at the various existing and high contributing emission sources beyond mobile sources.

Building scalable and replicable models and processes, rather than tailor made interventions, can increase the possibilities to implement and maximize the impacts of the program, allowing for transformational change. Measuring, reporting and publishing the results in terms of emissions, concentrations and exposure reduction should be done to allow stakeholders and interested parties to be informed.

The main interactions between air quality and the three aspects of green growth (environmental, economic and social) should be made explicit to fully accomplish the mission of GGGI. The new CPF, the revised TOC and future projects should either address the improvement of a specific production process or some productivity issue (resources, technology, capacity building, employment, etc.); involve vulnerable or minority groups; and/or address an environmental or social aspect of production or productivity (capacity building, personnel training, civil society awareness, air quality forums). By explicitly approaching these aspects, it is possible to design projects that are unequivocally oriented towards the transition to green growth.

The Table 4.1 below summarizes the conclusions and recommendations. Other recommendations that apply in a crosscutting sense to all of the program areas are included in Table 4.6.

Conclusions	Recommendations
The work done under the air quality program is relevant and of high quality. Nevertheless, there are issues regarding the possibility of implementing and/or measuring its impact. The air quality index work promoted from CAMe was formalized into public policy and is about to become a Mexican official standard.[28] The impact of the other work is hard to trace; i.e. work on air quality monitoring and air quality programs; evidence is in the form of internal working documents, making it hard to track the outputs and measure the outcomes. Recommendations provided on LEZ were considered in three cities, but momentum was lost due to changes in local governments. The other economic instruments developed by GGGI are not being endorsed by any government due to their political implications.	Consider supporting the control of emissions sources other than vehicles. GGGI Mexico previously supported work focused on mobile sources but it is highly recommended to explore other significant emission sources from industrial and area (disperse) sources[29]. Expand the attention outside the Megalopolis of central Mexico and work with other Mexican States or cities. There is need to support coordination among parties to the CAMe and implementation of measures to solve the challenges of the region. There are other cities that could benefit from the support to make a significant difference.

Table 4.1. Air quality conclusions and recommendations

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[28] The draft of the Mexican standard PROY-NOM-172-SEMARNAT-2017 was published for public comments on January 2018.

[29] For example, the Mexico City Metropolitan Area emissions inventory reports other equally important emissions sources, such as point and area sources, that represent numerous industrial, service and commerce facilities, as well as other significant emission sources like off-road vehicles, construction, roads, waste, etc. These account for major emissions of $PM_{2.5}$ and emissions of VOC and NO_x (that are precursors of secondary $PM_{2.5}$ and O_3).

4.2. Public transportation program area

Figure 4.2 shows the theory of change developed for this program area.

4.2.1. Description

The Mexico Program has worked on Public Transportation since the biennial period 2015-2016 and is continuing efforts during 2017-2018. During 2015-2016, the budget for the Public transportation program area was shared with the Air quality program area and was USD 534,739. In 2017-2018, the budget is USD 590,000 and is exclusive for public transportation.
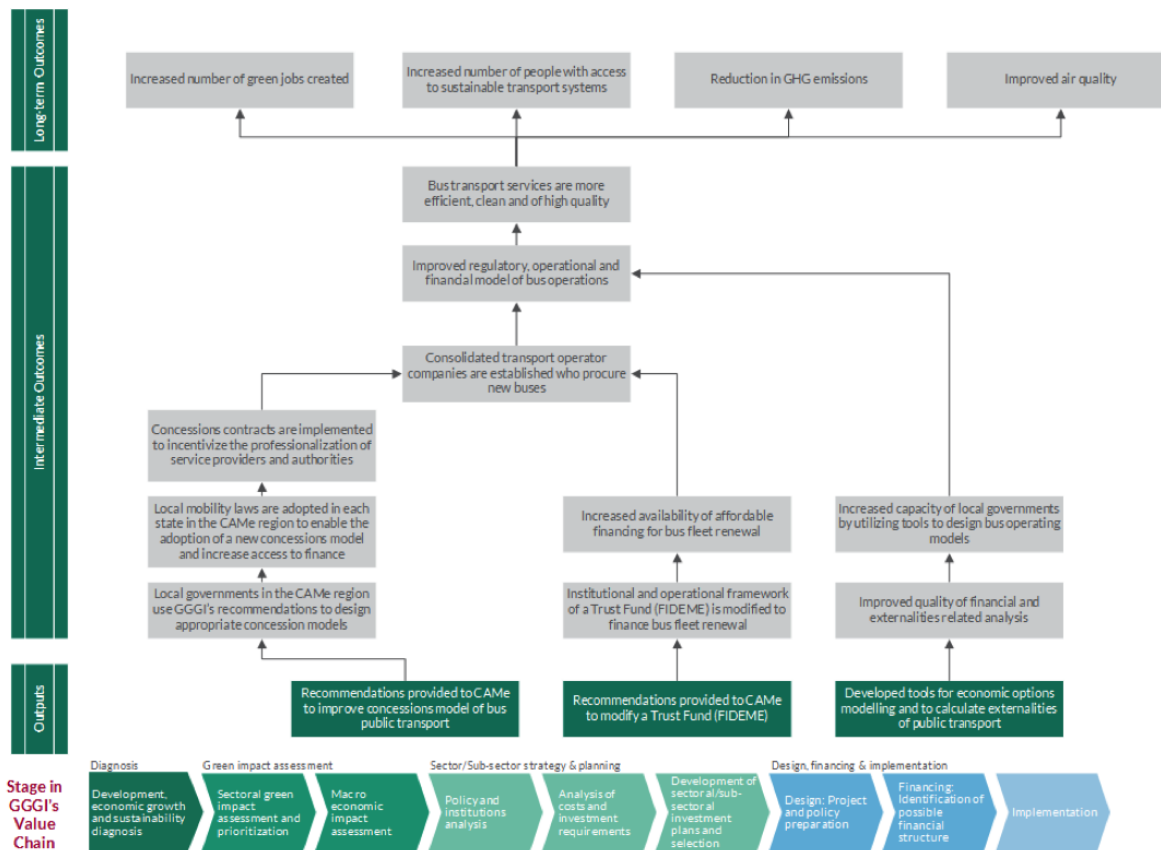

Figure 4.2. Public transportation theory of change

The key outputs or results are listed below:

a) GGGI commissioned a study that compiled best practices for concession models from 7 international cities (including Mexico City and Leon, both in Mexico) along with key lessons, to develop a best practice report to serve as a basis for recommendations to improve concession models to transform the bus transport system in the State of Morelos.

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b) Provided recommendations on technical aspects of a new mobility law in the State of Morelos, which provides a legal framework to introduce a new concession model for bus operations.

c) Provided recommendations to leverage an existing megalopolitan trust fund to finance bus fleet renewal in the Megalopolis region.

d) Developed a tool for economic options modeling for the State of Morelos to determine the break-even point for bus operations and facilitate decisions on the type of operating model and tariffs that can be charged for the services.

e) Developed a transport externalities calculator to determine the environmental, economic and social externalities of public transport under different intervention scenarios. A separate tool to measure health externalities was also developed.

4.2.2. Findings

The work in this program area has been done through the funding of specific studies performed by different teams. These teams were part of well-known and well-reputed think-tanks and/or consulting companies. The GGGI Mexico team played a close supervisory role and has followed-up the work to be responsive to arising needs and ensure the achievement of the outputs.

GGGI supported CAMe through a study titled "Renovation and Transformation of Public Transport" that provided guidelines and best practices that can help guide the transformation of the current public transport systems, that are based on the owner-operator model (known in Mexico as man-bus or *hombre-camion* in Spanish). The final objective of the project was "to structure a framework that can lead to an organized and regulated public transport" for the CAMe region. The outputs and outcomes of that project are discussed below.

One of the working lines of the project had the objective of provide government officials with information on several different models of bus operation concessions, to help them attain mobility and environmental goals, considering the circumstances of each State and Ministry. Accordingly, two reports were developed:

- Comparative Analysis of Public Transport Concession Models (CABP). This report presents a review of operation and concession models for 7 cities around the world: London (UK), Bogota and Pasto (Colombia), Mexico City and Leon (Mexico), Stockholm (Sweden) and Uberlandia (Brazil).

- Comparative Analysis of Public Transport Concession Models (CAPT). It is a synthesis summary of the main report mentioned above that incorporates a proposal for a concession model in Cuernavaca, Morelos state and includes a critical path for implementation.

Specific case studies for five of the seven cities present information to describe the city and its public transport sector, institutional arrangements, stakeholders and their roles, the regulatory framework and the most relevant clauses of the concession contracts (to

help understand the main characteristics of the contracts, quality of service indicators and incentives, roles of stakeholders and allocations of risks). They include an overall review of costs and revenues of the system, a summary of the key results of each concession model and conclusions. They also incorporate a useful benchmark matrix displaying a comparative analysis of characteristics of each public transport system.

The case studies for Pasto and Leon are included to show how those cities transformed their transport systems, from owner-operator models to integrated bus systems. Among the features of this description, it is interesting and useful to note the inclusion of the challenges faced by the local authorities, the concerns of the bus operators and the way resistance to change was handled. Finally, the main report presents a section focused on the public transport services in Cuernavaca, Morelos State, and the steps for a general Implementation Plan that the city should follow to implement a BRT system.

When describing the current situation of public transportation in Cuernavaca, the document mentions that the owner-operator model prevails (widely used by Mexican local governments to allocate concessions in exchange for votes and electoral support) and recognizes the common political interest from both, local governments and leaders of the owner-operators, to keep this model in place. This model has led to deficiencies in the service quality and to bad conditions of the fleet. These issues are difficult to approach because government and owner-operators are resistant to change and would like to maintain the status quo. The analysis provides a list and a general description of activities to be accomplished to implement a BRT system in Cuernavaca. However, the level of detail necessary to implement the system was not included in the scope.

It is important to highlight the dilemma described in the document between the reorganization of the service with the current concessionaries and the renewal through a tendering process. The former mitigates the social and economic impacts whilst the latter facilitates implementation of a completely new system and can include mitigation of the associated externalities. Public transportation in Mexican cities is mostly based on the owner-operation model, and it has historically been a way for politicians to profit and gain political and economic support from those who get a concession. So, there will be resistance from them to the implementation of any new system and provision should be taken to ensure a proper dialogue and open the participation of stakeholders into the panning of the new transportation systems.

A significant progress towards an integrated massive transit system in Morelos was the effort to provide inputs to the reform of the Transportation Law of Morelos. However, even though Morelos was working on the preparation for implementation of the BRT based on the proposal, the two earthquakes of September 2017 caused the State government to change priorities and direct attention and resources towards the mitigation of damages and support for the affected population. Consequently, the BRT project has been suspended for the time being.

- The study Megalopolitan Fund to Support the Transformation of Public Transport, performed by CTS-Embarq-Mexico, now named as the World Resources Institute (WRI) office in Mexico.

The document is an interesting and complete piece that analyzes the current regulations and proposes one option to build a trust fund that can help renew the public transportation buses in the States that are part of the Mexico Megalopolis. The document includes a review of the current legal framework and administrative bodies that take part in the provision of regulation, funds and rules to create or modify the trust fund.

Regarding the proposal that the trust fund can be partially funded by the income of the transport service providers, it is necessary to further analyze if it is possible to set aside a portion of the fare revenue for such a targeted purpose fund and if subsidies should be considered if there is a negative financial balance. Part of the problem faced by public transportation is that the fare does not cover the actual cost and makes it necessary to subsidize the services. There is an experience in Leon, Guanajuato., where the tariff is about double than the tariff in Mexico City, and some money is injected into a Renovation Fund. However, further research should be conducted to determine how this could work in Mexico City and other cities.

As part of the stakeholders' identification, their roles and their participation, it is necessary to acknowledge the political power of the associations of drivers and owners of buses. Their specific stand may be determined not by the technical appropriateness, business opportunities or social needs, but by the political interest of their leaders. Commonly these leaders respond to some of the political parties represented in the Representatives Chamber (*Cámara de diputados* in Spanish), one of the two legislative bodies and the one that can propose the necessary changes to the legal framework. If governments want to implement changes in the operating model, they need to create dialogue and involve these associations and political parties.

The approach to conducting the study did not include consultations with the key stakeholders prior to the design of the proposed intervention. An earlier consultation process with stakeholders would have helped to identify the feasible intervention *vs.* the actual intervention proposed by the consultants. That may help increase the chances of implementation, by creating momentum, involving the implementing parties from the shaping of the proposed intervention to the implementation strategy.

The output document was delivered to CAMe, who in turn presented the proposal to the State governments that participate on the Commission. There is no evidence on the intention to implement such recommendations. In 2018, being a year of elections, it seems to be difficult for any initiative as such to be executed. In the 8 participating States in CAMe, 4 are holding elections this year: The Federal government as well as the governments from Mexico City, Morelos and Puebla. But that creates the opportunity to include the need for establishment of a trust fund into their working plans for the upcoming years.

The English version of the document available for this evaluation was translated from the original in Spanish. The quality of the translation is low and makes it difficult to understand. That diminishes the quality of the output and reduces the possibilities to use it in GGGI programs in other countries.

- Design and Implementation of a Trust to Facilitate the Renewal of the Urban Public Transportation Vehicular Fleet in the Megalopolis.

This project´s objective is to assess the possibility for the Trust for the Development of Projects in the Megalopolis (*Fideicomiso para el desarrollo de Proyectos en la Megalópolis*, FIDEME in Spanish) to act as the fund channeling mechanism for projects of vehicular fleet renewal in the six-member states of CAMe. This project has a final report, which is clear, based on a good review of relevant information and concise. The study was divided into three phases: 1) Identification of possible financing sources and analysis of the conditions for their contracting; 2) Development of the strategy for trust financing; and 3) Proposal of a roadmap for the setting up of the trust.

Phase 1 of the report includes a review of best practices in 5 different cities (Bogota, Curitiba, Santiago de Chile, Madrid and Berlin) to show measures taken for the restructure of urban public transportation systems and the renewal of the vehicular fleets. That is followed by an analysis of the regulatory framework for planning on public transportation at the federal and at the state level[30]. Among the findings and conclusions, it is important to highlight the lack of coordination between different states and different approaches within the same state; the lack of strong institutional capabilities to promote, supervise or operate these services; the narrowness of the legal framework that sets the basis for the predominant services model of the owner-operator. Then funding sources are analyzed to see opportunities and challenges to access them to support the objectives of the necessary renewal and restructuring.

In phase 2 there is a description of the historical and recently remodeled FIDEME, the institutional arrangements to obtain and manage funds, as well as to assign funds to projects. It concludes that the objective of the trust is open, which allows for funding not only for fleet renovation but also for projects aimed at reorganizing the transportation system. It also recognizes some challenges, like the fact that the rules of operation do not contain the necessary elements for thorough project follow-up and evaluation. Then, strategies to adapt the existing FIDEME to the goals required by CAMe are presented.

Phase 3 presents additional suggestions for the modification of the rules of operation and proposes specific text that should be modified in the agreement that created CAMe to be consistent with the modifications to FIDEME. There are also specific texts proposing to modify the current operation rules of FIDEME. They are aimed at creating a specific program of urban public transportation, as well as three complementary programs: public policy, non-motorized mobility and transportation-oriented development.

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[30] At the time the report was prepared, CAMe was integrated by the Federal government and the governments of Mexico City and its surrounding 5 States. Later, on August 10, 2017, CAMe's governance body approved the entrance of Queretaro to the CAMe.

As with other reports in this program area, this shows a good level of understanding of the problem, digging into the root-causes and making specific proposals to update the existing mechanisms for funding projects of common interest in the Megalopolis region of Mexico. Nevertheless, there is no evidence of specific plans to make the necessary modifications to fund re-organization of public transport systems and renewal of the fleet in the CAMe region. The current political environment, with the elections this year, does not seem to favor the possibilities for this to be implemented.

- Development of the Economic Model of the Public Transport System in Cuernavaca, Morelos.

The main objectives of this consulting study are:
  i.   Conduct market research on the costs of the key components of the Integrated Transportation System throughout its life cycle.
  ii. Build an economic calculator that allows to evaluate, and integrate its main actors (bus operators, authorities, service providers and users), when considering different implementation scenarios in the horizon of the project.
  iii. Modeling scenarios that correspond to 2 or 3 implementation options of the integrated public transport system, which will be defined in conjunction with the Secretariat for Mobility and Transport of Morelos (SMyT) and the GGGI.
  iv. Define a cascade of payments that considers the financial sustainability of the public transport system and an operation based on a centralized collection system.

As part of the study there is a series of outputs and the following were available for review during evaluation:
  o Deliverable 2 – Technical tariff model.
  o Deliverable 3.A – Model of Integrated System
  o Deliverable 3.B - Economic Calculator.

Regarding the output Deliverable 2 – Technical tariff model, the output itself mentions it corresponds to the delivery 2 "First advance of the development of the economic model of the public transport system in Cuernavaca, Morelos". Then there is no clear match for the reader between the objectives of the broader consultancy and the specific deliverables.

This output is divided into eight principle sections that cover the regulatory framework; a review of secondary information available in previous studies for the operation of a trunk-fed BRT system in Cuernavaca, from where the main operational parameters for the technical tariff estimate are taken; generation of primary information (which describes the methodology used to obtain market references and characteristics of the operation by the current operators of the system); the technical tariff model developed; the financial model of the intelligent transport system, which presents the basic design

characteristics and assumptions used to estimate the cost of the system; results of the cost estimates for different scenarios of implementation; and, results of the Technical Tariff.

The output uses and refers to the Cost-Benefit Analysis for the BRT project in Cuernavaca (known as Morebus) which was not available for review during the evaluation. There are some findings that are related to the emissions standards allowed in Mexico: Euro III buses using diesel fuel are considered. For example, the Table 6 presents the cost estimation for 10 m buses for feeding the trunk route; Also, table 12 presents the monthly maintenance cost for those buses. The cost is based on Euro III technology. Table 8 also includes fuel economy of buses with technology Euro III and Euro V. Nevertheless, the official standard NOM-044-SEMARNAT-2006 (that was in force at the time this output was prepared), did not allow the commercialization of vehicles equivalent to Euro III, but only equivalent to Euro IV. Although that may have a minor impact on costs, it is important to update to the requirements established on the updated NOM-044-SEMARNAT-2017. The standard now requires that starting 2019, vehicles and their engines must fulfill the Euro V or Euro VI/EPA-2010 emissions standards. Euro V or better will be allowed for sale in the market during 2019 and 2020; afterwards, only Euro VI/EPA 2010 or better will be allowed. It is important to note that before July 2018, Euro V buses can only be propelled by natural gas, since there is no Ultra Low Sulfur Diesel (ULSD) available yet in Cuernavaca. According to the NOM-016-CRE-2016, the ULSD will be available nationwide in July 2018.

The output entitled Deliverable 3.A – Model of the Integrated System also includes modeling of scenarios. The document describes the different types of tariff models commonly used in public transportation systems and compares their advantages and disadvantages from the point of view of the stakeholders participating in the system, including users, government and services providers. The tariff model to the user is developed, presenting the assumptions of costs, demand and income in scenarios for different tariff structures. There is a description of the collection and compensation processes, emphasizing the remuneration types and the characteristics of the trust fund that would manage the resources. The document presents the challenges relating to the availability of information, technology needs and costs. It is a high-quality document developed to inform policy makers and help them decide which tariff model they think would be best for the Cuernavaca system.

For the specific case of Cuernavaca, there is a choice to evaluate the flat-rate tariff scheme and the transfer-charge tariff scheme for the BRT System with trunk and pre-trunk services. The document also presents as a reference and comparison, the tariff schemes with distant-charge and zones-charge.

Regarding the output titled Deliverable 3.B – Economic Calculator, this document presents and economic evaluation for two scenarios: a) business-as-usual (to do nothing or to do the minimum), and b) implementation of the BRT in Cuernavaca. The economic evaluation is divided in three main components: financial, economic and externalities. The financial component includes the investment and maintenance cost of

the infrastructure and the costs of operation of the BRT. The economic component includes the variation on the generalized cost for users and the excess to transport operators. The externalities include the changes in emissions of CO_2 and particulate matter, inconveniences due to construction and maintenance of infrastructure and change in road safety.

In the study, the investment cost in infrastructure (to be incurred by the government) is separated from the initial cost of investment in buses and the information technology to manage the operation (to be incurred by the private companies designated to operate the system). Then the result is as can be expected: the net present value of the infrastructure is negative. Nevertheless, there are social and economic benefits due to the project. The first are due to reduction in time mainly and the second are the profit to the system operators providing the transportation service.

The general approach of the document seems to be correct but there is no detailed explanation on the methodology used and the data and assumptions used for the two scenarios. For instance, if under business-as-usual there were considered interventions to optimize the current situation and their costs. In another example, the chart 2 in page 8 refers to the number of vehicles in the two scenarios, but the title does not make it possible to understand if those are the vehicles under the public service, private or combined (which is just clear when the reader reaches page 16). There are also problems in the formatting, so the formulas do not display correctly, charts have labels overlapping and the data used to prepare those are not shown.

The cost of CO_2 emissions utilized in the document is confusing; it refers to the tax amount imposed to fossil fuels as the social value of the emissions. This is misleading and does not reflect the actual damages caused by such emissions. According to the Interagency Working Group on Social Cost of Greenhouse Gases (IWGSCGG), of the United States Government, there is a social value of CO_2 emissions due to the negative impacts those cause at a global scale. The social cost of greenhouse gases emissions (previously referred as the social cost of carbon) was estimated around USD 20.77 in the year 2009 and there is further work that have allowed a more detailed valuation, depending on the reference year and the acceptable discount rate.

There are other important aspects related to the kind of projects with a higher social value: if regular commuters leave their car and switch to public transportation to go to the areas served by the BRT, the public health benefits due to their physical activity (walking to the BRT station, to home or to work) can be estimated and their magnitude can surpass the benefits from climate change mitigation and reduction of air pollution. Although this is not directly related to the BRT system and all the necessary data is not yet developed for Mexico, it can be an indication of significant achievable positive social impacts. It seems that providing support to adapt these methodologies and to produce the necessary local data, can be a significant way for the GGGI Mexico Program to create indirect positive impact, since that can be the use to produce more reliable project proposals.

In Mexico, there is a Methodology for the Evaluation of Urban Mass Transport Projects published by the Center for Studies for the Preparation and Socioeconomic Evaluation of Projects (CEPEP), which is a trust created in 1994 by the Federal Government, through the SHCP and administered by the National Bank of Public Works and Services (BANOBRAS). Similarly, the Operation Rules of the Federal Mass-transit Support Program (PROTRAM) which is part of the National Fund for Infrastructure (FONADIN), require that proposals for projects should be supported by the following list of studies, to access financial resources to fund the investment in massive public transportation:

    a. Diagnosis of the current situation
    b. Comprehensive Plan for Sustainable Urban Mobility, or its equivalent
    c. Technical feasibility study
    d. Analysis of the Urban Context of the Project
    e. Cost and Benefit Analysis of the Project
    f. Scheme and financial structure
    g. Legal framework that establishes the legal viability of the Project
    h. Institutional organization of the Project

4.2.3. Conclusions and recommendations

The theory of change of the public transportation program area seems to be oversimplified and overlooks some relevant aspects. For example, reorganization of the transportation system and fleet renewal might reduce direct employment, and although the remaining jobs could be considered as green jobs, it is important to have alternatives for the people that would be left out. Those interventions may also be improving the service for the existing users but might still be leaving behind marginalized populations with no access, thus specific provision should be taken to reduce the inequity gap (for example subsidizing to the elderly and students). Therefore, the ToC should beware of undesired and counterproductive impacts, as well as to plan and foresee how to compensate for or prevent them.[31]

The ongoing finalization of the CPF is an opportunity to frame a broader strategy under Strategic Outcome 3, Increased Access to Sustainable Services, and specifically 3.4 Increased Access to Sustainable Public Transport. The strategy should be designed and documented as a process, so the result does not appear as a collection of isolated outputs. It should explicitly present the overall urban and local public transportation situation, then point out the specific areas in which GGGI decided to work and make the case or justify the intervention and the impact.

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[31] A good example was provided by interviewees and relates to the BRT implementation in Mexico City known as Metrobus. Even though it was a broad strategy that involved projects on many different aspects (social, economic, urban, transportation, concession model, etc.), according to interviewees it overlooked some unexpected and counterproductive effects. With the first Metrobus line a decreasing motorization rate in the closer neighborhoods was expected, but further analysis showed that the project might have increased housing prices and, thus, boosted motorization due to the fact that lower income people moved away and higher income population (with a higher rate of cars ownership) arrived to the area. Overall, it is not clear if there are fewer emissions or not. This issue could have been controlled if the broad strategy would have included a component of housing policy.

It is important to create a written and public binding commitment with an implementing counterpart, particularly with an implementation partner or stakeholder, so it can contribute to strengthen the process of implementation. The outputs under this program area are relevant and necessary, have good quality and are focused on specific problems and challenges; these outputs have provided technical assistance to advice policy makers and in some sense served the intended purpose, although the recommendations have not been fully implemented. For example, the study Megalopolitan Fund to Support the Transformation of Public Transport, presents an alternative that can be a relevant piece to help fund such a big change. As a follow up, the study Design and Implementation of a Trust to Facilitate the Renewal of the Urban Public Transportation Vehicular Fleet in the Megalopolis explores the possibilities to adapt an existing fund (FIDEME) to finance such a transformation. Experts agreed that if implemented, these outputs could help achieve substantive change and could be transformational.

Early engagement with new partners and stakeholders can provide insights, expertise and commitment from the key stakeholders. The public transportation program area is addressing a main concern for Mexican cities. Concession models and fleet renewal, for example, are relevant issues that affect the public transportation system in several cities, regardless of their size. Nevertheless, there is a political aspect that involves long-standing and deep arrangements with bus owners that makes it difficult to implement such projects. Implementation of these kind of projects is complicated, but considering a broad and participative strategy, the right stakeholders, public and binding commitments, social, environmental and economic impacts (positive and negative), they are feasible.

Incorporating or creating new transportation data and information on the upcoming proposals for GGGI to work on public transportation is recommended. A broad public transportation strategy should be based on a thorough understanding of the link between urban development and the need for transport. It should incorporate new data and information on public transportation, non-motorized transportation (NMT) and the New Urban Agenda, as well as relevant data and information (origin-destination surveys, public transportation route reorganization surveys, remote access, innovative alternatives to private cars, etc.). For upcoming projects on public transportation, it will be advisable that GGGI supports the efforts to access funds from the public expenditures budget, as that will be the only way to ensure enough funding and sustainability to these types of projects. GGGI can then support the production of specific studies or production of necessary information that is currently not available. One example is origin-destination studies, which are available and recently updated for the Metropolitan Area of Mexico City, but not for other cities.

The use of co-designing and co-creating innovative strategies can allow for new ways to impact the urban fabric[32] from a bottom-up perspective (as opposed to a top-down one).

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[32] Urban fabric refers to the physical urban environment (elements, materials, form, scales, density and networks), and to its psychological, socio-cultural, ecological, managerial and economic structures. - https://www.tudelft.nl/en/architecture-and-the-built-environment/research/research-programmes/urbanism/design-of-the-urban-fabric/

A bottom-up perspective refers to a deep understanding of the urban fabric and the design and implementation of interventions that can change the socio-technical regime of the city[33] (as opposed to only generate direct investments or push for specific technological innovations, which can result in counterproductive outcomes and in an increase of social inequity). In Mexican cities it is fundamental to leave behind the prevalent owner-operator model and move towards provision of high quality public transportation services delivered by professional and specialized companies (that can be private, public-private partnerships –PPP–, cooperatives, etc.). It is necessary not only for the mass transportation services (like the BRT), but also for the secondary or feeding routes in cities with a certain level of population or demand.

Measuring, reporting and publishing results are vital actions considering the upcoming elections in Mexico. Elections make it difficult to implement the outputs in 2018, but also create an opportunity for implementation in the near future. There is a critical need to transform public transportation systems in the CAMe region and in the rest of the country. Thus, provisions can be taken to not only increase the possibilities for implementation, but also to ensure continuity of the activities and their impact over time and after GGGI's direct intervention. This can be done via increasing political willingness and public awareness regarding these activities. To do so, the outputs should be revised for translation issues and be published in Spanish for Mexican users and in English for international reporting purposes. Also, public policy summaries in both languages should be available to candidates and new officials so they can include them into political platforms, legislative working programs and government plans, like in the National and/or the States Development Plans.

Also, it may be useful for GGGI to standardize and improve the quality of the reports by implementing a supervision or third-party quality-assurance process. This can be done by creating a steering committee to supervise and review the reports or by hiring a technical consultant if the local staff does not have specific technical expertise.

The work under this program are should also address the linkages of public transportation to the different aspects of green growth. Addressing economic, social, and environmental issues of public transportation can be a way to reduce inequity in access to public space and mobility, it can contribute to mitigate climate change and reduce vulnerability and reduce emissions of local pollutants and reduce exposure of the commuters, and it can increase productivity by reducing the travel time. As addressed by the New Urban Agenda[34], new intervention-patterns are based on the idea that isolated investment projects generate more inequality. Then the theory of change for this program area needs to include the key commitments from the New Urban Agenda and other new ideas and information to put together a broader strategy, to ensure consistency between studies, their outputs and intermediate and long-term outcomes.

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[33] Ideas regarding this approach can be consulted at https://www.ams-amsterdam.com/category/research-programs/
[34] The New Urban Agenda: Key Commitments. Available at:
http://www.un.org/sustainabledevelopment/blog/2016/10/newurbanagenda/; consulted on February 27, 2018.

Table 4.2 presents a summary of conclusions and recommendations for this specific program area. Other recommendations that apply in a crosscutting sense to all of the program areas are included in Table 4.6.

Conclusions	Recommendations
Outputs under this program area are recognized as having a very good technical quality. However, further work is needed to address specific issues that may facilitate the adoption of a political decision or a specific action by a government. The Government of the State of Morelos adopted recommendations on mobility and reformed the Transportation Law to allow for an integrated massive transit system and new concession models. Although now legal, these actions have not been implemented yet due to a switch **i**n local government priorities after the September 2017 earthquake. Therefore, there are intermediate outcomes, but additional efforts should be made to unlock the long-term outcomes. There is no evidence yet of effective implementation of the proposed leverage for the existing megalopolitan trust fund to finance bus fleet renewal in the Megalopolis region. There is no evidence yet of a current use of the transport externalities calculator by any government agency.	Support other aspects of mobility; it is necessary to look at other modes and infrastructure elements of mobility and accessibility. For example, to make mobility more efficient, it is necessary to consider the interactions of mass transit and other mobility alternatives, like non-motorized transportation: sidewalks, bikes, etc. Include the latest key commitments of the New Urban Agenda to broadly address public transportation issues as part of an urban challenge. For example, interventions in mobility shall ensure that all citizens have access to equal opportunities and face no discrimination, promote measures that support cleaner cities, establish partnerships with businesses and civil society to find sustainable solutions to urban challenges, etc. These considerations can allow to foresee and prevent or mitigate associated undesired outcomes and also for a balance on the environmental, social and economic aspects of green growth.

Table 4.2. Public transportation conclusions and recommendations

4.3. Green Growth Planning program area

Figure 4.3 shows the theory of change developed for this program area.
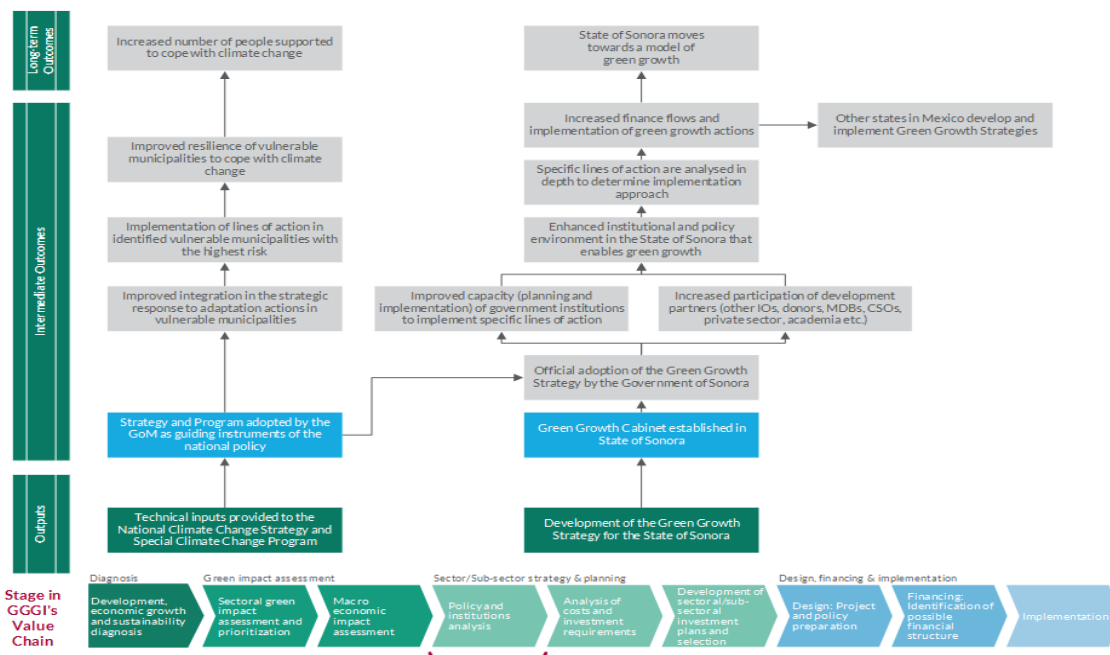

Figure 4.3. Green growth theory of change

4.3.1. Description

The Mexico Program has worked on Green growth planning during the annual periods of 2013 and 2014 and is currently working in it for the biennial period 2017-2018. The budget allocated to Green growth planning was shared with the air quality program area during the annual periods of 2013 and 2014; the shared budget on those years was USD 425,954 and USD 429,803, respectively.

The key outputs or results are listed below:

1. Technical inputs provided to the National Climate Change Strategy (ENCC) and the Special Climate Change Program (PECC). The inputs included an approach to determining the level of vulnerability and prioritization of municipalities to implement adaptation measures. It was developed during 2013.

2. Development and implementation of the Green Growth Strategy for the State of Sonora is an ongoing project. This is an ongoing effort that started in 2017 and there are some working documents that are used for the evaluation.

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4.3.2. Findings

A) In 2013-2014, the GGGI Mexico Program supported INECC in developing technical documents for the preparation of the ENCC and the PECC. GGGI´s support was through the funding and supervision of the study titled "Support for the Preparation of the National Strategy on Climate Change - Framework for Risk Management and Climate Change Vulnerability Diagnosis". This was the first study of the GGGI Mexico Program. It sets a framework and methodology for risk and vulnerability diagnosis of municipalities in the country, as the basis for the development of adaptation measures and action plans, all as part of the ENCC and PECC.

One of the challenges faced by the study was the integration of different methods developed and available information into a homogeneous methodology that combines probability of occurrence and intensity of climate related events, vulnerability of the human systems (social, health, agriculture, etc.) and human exposure to the risk of disaster. The methodology enabled a risk diagnosis related to climate events.

The main findings presented on the study are: a) Increase in risk is related to higher temperature which affects agriculture yields; b) The agriculture and livestock sectors have a higher risk from climate events; c) It is probable to see an increase in drought, especially in the north of the country, which could affect the livestock sector; and d) Population in municipalities with high health risks is larger than the population exposed to flood and landslides. And, based on the analysis by municipalities, main findings are: a) The proportion of municipalities that present a high livestock vulnerability index is 64%; b) Population living in municipalities with high health vulnerability is around 12 million people; c) The number of municipalities that are vulnerable to more than one climate event are 1,224 out of 2457.

The study accomplished the objectives it intended and was in fact used to feed information and analysis into the ENCC prepared by SEMARNAT on behalf of the Federal Government. The ENCC was released in 2013 and has a long-term view described as a 10-20-40 years route. The PECC is the planning instrument of the current 2013-2018 Federal Administration to implement specific tasks in order to put the country into the desired path of mitigation and adaptation. The PECC also includes information produced by this project into its vulnerability and adaptation sections.

B) In 2016, SEMARNAT (Federal Government) and the Commission of Ecology and Sustainable Development of the State of Sonora (CEDES), approached GGGI Mexico Program requesting support to develop the Green Growth Strategy of Sonora (GGSS). Having a subnational scope, it required alignment with other programs and initiatives at the national level.

The diagnostic was straightforward and based on a few indicators. It allowed the definition of the four main challenges to be addressed: Energy use and GHG emissions; Economy, which is not achieving its potential and relies on traditional, primary sectors that are socially exclusive; High intensity and pressure over natural resources; and

Quality of life and climate resilience, which varies along the State. Based on that diagnosis, the four main objectives of the GGSS were defined as: De-carbonization and energy independence; Promote an innovative and inclusive economy; Increase the efficiency, productivity and responsibility in the use of natural resources; Improve quality of life and climate resilience among Sonoran population.

Although the Strategy is under development and an Action Plan is being produced, several observations may be relevant:

- The document Green Growth Strategy for Sonora (GGSS)[35] makes a general review of the current situation, challenges and opportunities faced by Sonora State in the selected aspects of Green Growth.
- It can benefit from a rearrangement to make sure every aspect is fully addressed in one chapter. The current structure forces repetition of diagnosis data in different chapters and makes it difficult to follow each theme and make sure there is a deep analysis and consistency.
- The diagnostic for the energy intensity of the economy presents data that seems to be inconsistent and the description of the energy sector needs to be clarified to avoid confusions.
- The consistency and specificity between indicators used in the diagnostics, the objectives, the action lines, the Action Plan, and specific actions should be revised to ensure all those are consistent and measurable. For example:

  o Diagnostic 1 states that Sonora's economy uses large amounts of energy and is a major generator of GHG emissions.
  o The Objective 1 derived from this diagnostic is written as: Moving towards de-carbonization and energy independence.
  o It seems there is not clear follow-up to the energy intensity aspect (large amounts of energy); at the same time, energy dependence from other States arises but was not mentioned in the title of the diagnostic.
  o In general, the selected indicators should be able to provide information on whether the action line is progressing and achieving the target or not.

- Under the Objective 1 – De-carbonization and energy independence:

  o The chosen indicators (generation and use of renewable energies) are taken from the Renewable Energy Prospective 2016-2030 and the chosen target values are the same as the National goals; since Sonora has a great potential due to high insolation[36], those indicators could be higher than the national average.

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[35] File name "Draft ECV 30.01.18.doc"
[36] See for example Renewable Energies Potential for Sonora State (*Potencial de Energías Renovables para el Estado de Sonora*), available at http://www.coees.sonora.gob.mx/images/descargas/Energias-Renovables/Potencial-de-Energias-Renovables-Sonora.pdf; and "Sunny Mexico: An Energy Opportunity" available at: https://www.greentechmedia.com/articles/read/sunny-mexico-an-energy-opportunity#gs.7vtbST8; consulted on February 28, 2018.

- For energy efficiency of new houses and home appliances, it is important to refer to the energy efficiency standards and regulation already issued by the National Commission for Housing (CONAVI) and the National Commissions for the Efficient Use of Energy (CONUEE), respectively.
- For the Sustainable mobility theme, it is worth clarifying the difference between and be more specific in these two action lines: Reduce dependence on private cars and Encourage modal shift to more sustainable mobility alternatives.

- Under Objective 2 - Innovative and inclusive economy:

  - The two chosen themes (New growth engines and Efficiency with inclusion) appear very general and leave out many other aspects of the economic growth policy than can be relevant, like the guidelines for the use of the State Public budget, Tax policy, etc.
  - It is focused on developing new technologies and new companies, but it seems to be overlooking the needs in other sectors of the economy that may need to be transformed as well.
  - There are action lines that appear to be more a task: Choose key sectors (hubs); foster the creation of new enterprises; create one-stop offices to simplify and reduce bureaucratic and administrative procedures. It may need, instead, to refer to develop specific plans to boost key economic sectors where green growth aspects are relevant.

- Under Objective 3 – Responsible use of materials and resources

  - There is a need for a detailed explanation of the reasoning process that leads from high intensity of natural resources used in the primary sector, to the selection of 3 themes: Use of waste, water management and conservation and biodiversity. Then, the proposed indicators need to be described in a more precise way to avoid confusion.
  - The concept of waste reduction doesn't seem to be considered.
  - In the proposal for waste-to-energy there should be specific targets to protect the atmosphere and public health from methane and emissions.
  - The action line for water management appears to be too broad and it is not clear if it addresses the reduction of disparities in drinking water quality and supply.
  - The action line for a responsible and efficient use of water at the agricultural sector appears to have a low ambition and not specific goals, considering that this sector uses 87% of the clean water in the State.

- Under objective 4 - Quality of life resilient to climate change

  - It seems that Transport-oriented Development policies will be a good approach to increase density along mass transport corridors but will not be enough to control the increase in urbanization. Additional policies and

incentives may be necessary to lower the pace of urban sprawl and increase density in existing and new urban areas.

- o Indicators for air quality improvement should be reformed to be specific and related to the attainment of Mexican Official Standards (NOM) published by the Secretariat of Health (SSA). Intermediate steps, like reliable, real-time air quality monitoring, continuous air quality index communication, programs to reduce emissions to the atmosphere, emission standards and its enforcement, can be included as necessary intermediate steps.

- The general description available[37] could be reviewed to ensure all the objectives are clear and embrace a concrete action; make sure that there are quantitative goals and a specific description of the desired impact.

Some findings related to the sustainable mobility action line are:

- The definition of a desired mobility model for the users, operators and the government should be among the first tasks; it should include a wider view considering all transportation modes, especially non-motorized transportation.

- The proposal to buy van-trucks to transport people under deterred physical conditions does not seem to be a good idea, as it will maintain segregation and create the need for a separate fleet, making the system less efficient.

- The proposal to use the Clean Development Mechanism (CDM) of the Kyoto Protocol to fund the BRT project may not be feasible: a) Experience shows that to demonstrate additionally in public transport projects is very complex, requires extensive reliable data and few projects have been able to do so. b) The European Union is the main market for certified emissions reductions (CERs) and was the major buyer of CERs in Mexico; under the current EU policies and guidelines, reductions will be bought only in least-developed countries (LDC)[38] and Mexico is not considered as one. So, the EU will not purchase any CERs from Mexico, in any sector. If there will be just few other international buyers for the reductions, then the risk of not selling is very high. c) This alternative could produce a financial flux that can support operational costs but will not be available or significant for investment costs. It is important to note that accessing this type of carbon finance is intensive in time and requires both up-front investment and a long-term horizon for return.

In May 2017, the Governor of Sonora and GGGI Mexico signed an agreement of cooperation to formalize the implementation of the GGSS. In November 2017, the

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[37] A one-page document titled: "*Estrategia de Crecimiento Verde para el Estado de Sonora*", file name "OP ECV Sonora (esp).pdf".
[38] For example: "…the use of new project credits/CERs after 2012 is prohibited, unless the project is registered in one of the least developed countries (LDC)". Use of International Credits, available at: https://ec.europa.eu/clima/policies/ets/credits_en; consulted on February 28, 2018.

Governor installed the Green Cabinet and chaired the first work session. The State government, the environmental commission and the ministries of economy, social development, agriculture and urban development integrate the Cabinet. During the first quarter of 2018, the GGSS is being presented to different sectors in the State so they get informed and involved in its final definition and implementation.

4.3.3. Conclusions and recommendations

The study "Support for the Preparation of the National Strategy on Climate Change - Framework for Risk Management and Climate Change Vulnerability Diagnosis" was useful to contribute valuable information that was used into the planning for adaptation, first in the medium- and long-term perspective but also in the short-term at the national level. Indirectly, it also made an impact as well, since the ENCC and PECC are the basic references for planning for adaptation at the sub-national level.

The GGSS is an ambitious document that covers a wide spectrum of selected themes. It is a valuable effort to pursue green growth at the subnational level and the local government in Sonora has successfully endorsed it. This project has the potential to be scaled and replicated by taking advantage of the upcoming elections and approaching federal and local candidates and eventual new officials. At the national level, the scaling effort can lead to a National Green Growth Strategy (NGGS) that could be complementary of the ENCC. Although the ENCC addresses the issue of climate change in terms of production and economic growth, it could be complemented with a NGGS that could frame the economic growth effort and strengthen the social and environmental aspects of it (other than climate change, such as water use, air pollution, waste management, land use, etc.). At the subnational level, it can lead to additional successful State Green Growth Strategies. It would be advisable to approach the 10 States that together with Sonora produced 66.5% of the national GDP at basic prices in 2016: Mexico City, the State of Mexico, Nuevo León, Jalisco, Veracruz, Guanajuato, Coahuila, Chihuahua, Puebla and Baja California.[39]

Table 4.3 summarizes the conclusions and recommendations for this program area. Other recommendations that apply in a crosscutting sense to all of the program areas are included in Table 4.6.

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[39] GDP by federal entity, 2016. Published by INEGI and available on line at:
http://www.beta.inegi.org.mx/contenidos/saladeprensa/boletines/2017/pibef/pibef2017_12.pdf?platform=hootsuite

Conclusions	Recommendations
The ENCC and the PECC have incorporated the analysis conducted by GGGI and helped set the scene for long-term climate change adaptation at the municipality level; both ENCC and PECC are the basic references for planning for adaptation at the national and sub-national level. The Government of Sonora has publicly endorsed and committed to the GGSS and has installed a Green Growth Cabinet to coordinate the actions under the Strategy.	Promote a National Green Growth Strategy to complement the ENCC and to scale and frame national efforts towards a strong, inclusive and sustainable economic growth. Approach other Mexican States to replicate the effort in Sonora and develop more sub-national green growth strategies.

Table 4.3. Green growth planning conclusions and recommendations

4.4. Climate technologies program area

The Figure 4.4 shows the theory of change developed for this program area.

4.4.1. Description

The climate technologies program area was active throughout 2015-2016. During this period, the allocated budget for climate technologies was USD 445,087.

As part of the work done under this program area, GGGI in partnership with INECC and the UK FCO, and with the collaboration of the Carbon Trust, prepared and submitted:

- Evaluation of the Mexican innovation ecosystem and of 13 clean energy technologies for which Mexico appears to have greater potential utilizing the Technology Innovation Needs Assessment (TINA) methodology.
- Preliminary prioritization of technologies based on multiple criteria, in order to identify the deployment readiness level, as well as general areas for Mexico to innovate on.
- A more detailed analysis for solar photovoltaic, which identifies opportunities for innovation at the sub-component level.
- Extensive consultation with stakeholders was carried out with the objective of creating a multi-year work plan to define innovation policies according to an agreed framework.
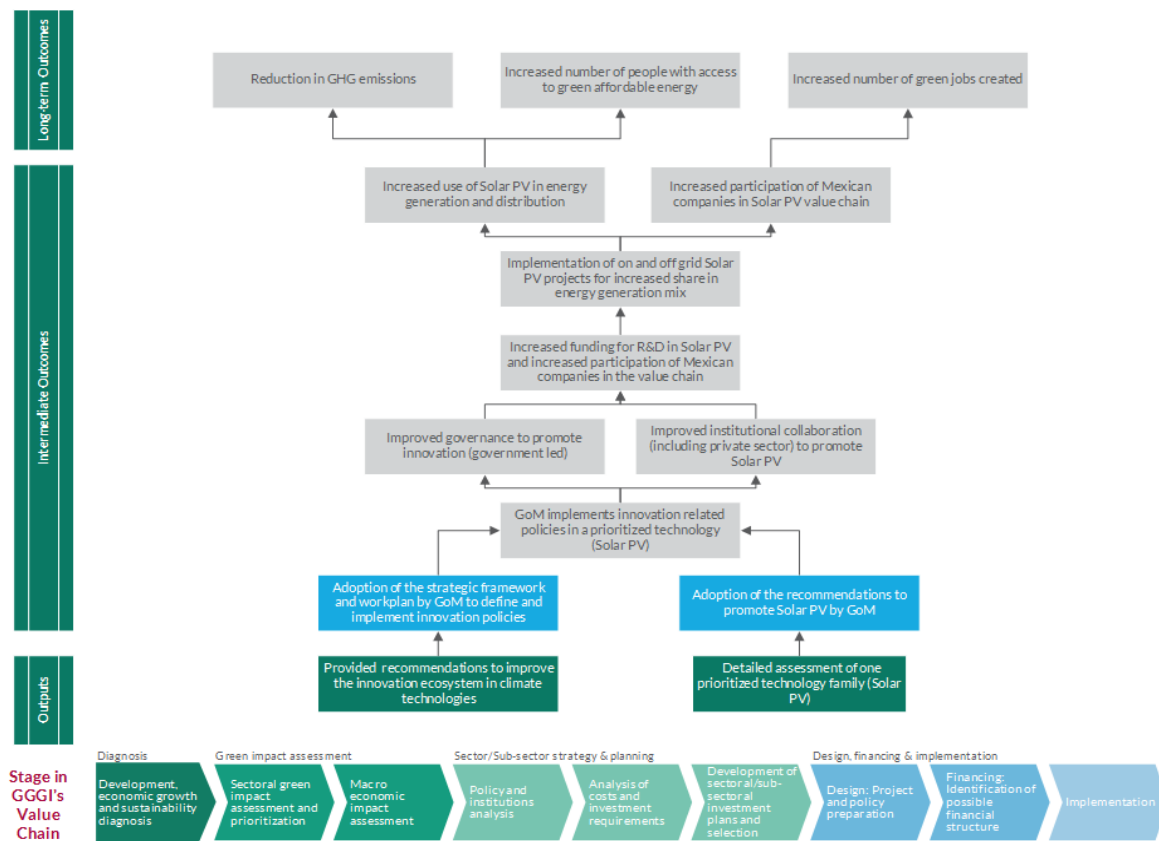
Figure 4.4. Climate technologies theory of change

Long-term Outcomes

Intermediate Outcomes

Outputs

Reduction in GHG emissions

Increased number of people with access to green affordable energy

Increased number of green jobs created

Increased use of Solar PV in energy generation and distribution

Increased participation of Mexican companies in Solar PV value chain

Implementation of on and off grid Solar PV projects for increased share in energy generation mix

Increased funding for R&D in Solar PV and increased participation of Mexican companies in the value chain

Improved governance to promote innovation (government led)

Improved institutional collaboration (including private sector) to promote Solar PV

GoM implements innovation related policies in a prioritized technology (Solar PV)

Adoption of the strategic framework and workplan by GoM to define and implement innovation policies

Adoption of the recommendations to promote Solar PV by GoM

Provided recommendations to improve the innovation ecosystem in climate technologies

Detailed assessment of one prioritized technology family (Solar PV)

Stage in GGGI's Value Chain

Diagnosis — Development, economic growth and sustainability diagnosis

Green impact assessment — Sectoral green impact assessment and prioritization — Macro economic impact assessment

Sector/Sub-sector strategy & planning — Policy and institutions analysis — Analysis of costs and investment requirements — Development of sectoral/sub-sectoral investment plans and selection

Design, financing & implementation — Design: Project and policy preparation — Financing: Identification of possible financial structure — Implementation

4.4.2. Findings

These studies contributed to the identified need for governmental involvement in terms of market and policy interventions to foster technological innovation in Mexico. This is aligned with the evidence showed in terms of GHG emissions reduction depending mainly on the market for a specific technology and the maturity level of the technology to enable adoption by the private sector. Therefore, by procuring the appropriate public interventions to reduce market failures, the GHG emissions reduction impact can be maximized.[40]

As the output of this project, a strategic framework was created to enrich policy and investments in innovations in energy and clean technologies. Following this, GGGI engaged with relevant stakeholders to seek progress towards implementation, including holding a regional workshop with government officials from Latin America, in February 2016 in Mexico City.

Before this effort, the work was developed closely and almost exclusively with INECC-SEMARNAT, and less work was done with SENER and other stakeholders that would

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[40] STI Policy Profiles: Facing New Challenges, OECD Science, Technology and Industry Outlook, 2012. Cited in GGGI Mexico Country Program Evaluation - Approach Paper provided by GGGI.

have been the natural authorities or organizations to be involved in the development and implementation of such a framework. During the subsequent socialization process other key stakeholders had the opportunity to get involved and participate in the process. However, it was later in the implementation process when finally, these stakeholders got involved, and this late participation led to design, review and modification. With SENER's further involvement, it was agreed that the last part of the project should switch focus on geothermal (as opposed to Solar PV or other) energy technology innovation. This was a precise and relevant topic that SENER had been working on and wanted to specifically address. Therefore, in order to account for the knowledge, expertise and interest of this key stakeholder, the final recommendations elaborated by the Carbon Trust (in a subsequent study funded by the UK FCO) were built around geothermal energy technology innovation.

Although there are no written agreements in order to implement the recommendations, and even though the main assumption of this theory of change is not valid anymore (the UK FCO is not following up this project any longer), according to interviewees, the recommendations are useful to the Mexican Center for Innovation in Geothermal Energy (CEMIE Geo)[41] and are expected to be replicated in other Mexican Centers for Innovation in Energy (CEMIEs). This aligns with other assumptions in terms of the existence of a strong counterpart in the GoM at the federal level that would assume leadership of the agenda to enable the implementation of the recommendations and unlock the long-term outcomes.

Social inclusion, though, is still a pending topic under this program area; there is no evidence that the climate technologies program has had a specific component in that regard. Although the central idea of social inclusion should be present, since it is part of the objectives of the involved organizations, there is no clear and specific component of these projects that could have been directed towards social equality.

4.4.3. Conclusions and recommendations

The activities and outputs under this program area are aligned with the expected intermediate and long-term outcomes according to the theory of change. The strategic framework for innovation policies has the potential to improve governance to promote technological innovation in terms of energy generation. This, in turn, can result in GHG emission reductions, increase the number of people with access to green affordable energy and create green jobs.

The implementation of the activities under this program area has been effective in the sense that they produced the desired outputs. The development of a framework to define and implement innovation policies is a valuable result that can be effective to produce the desired intermediate and long-term outcomes. However, the last part of the implementation and follow-up phases have been less effective because these phases were

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[41] CEMIEs are groups of public and private research centers, universities, private sector and government entities intended to jointly work on developing technologies, products and services based on Mexico's potential on main renewable energies. These Centers are autonomous but supervised by the Ministry of Energy.

not followed by GGGI but left to other organizations under two assumptions: that the GoM would take over the agenda and implement the recommendations, and that the UK-CFO would follow-up. That created the risk of no implementation at all, but the participation of the CEMIEs has been a fortunate turn of events. Nonetheless, it is recommended to plan and coordinate the design, implementation and follow-up of every activity with the various partners and stakeholders. This implementation plan should be part of binding commitment document to ensure stakeholders and partners actions.

Although interviewees consider that the activities have been effective, there is no documentation on how the recommendations have permeated into government policies or interventions, and there is no information on how many policies or other instruments have been shaped based on these studies or the resulting framework. Therefore, with no measurable targets, it is difficult to keep track of the impacts that are being generated and to determine if the intermediate and long-term outcomes are being achieved. To explicitly and objectively measure the effectiveness of this program area, it would be useful to account for measurable targets in terms of GHG emissions, number of people with access to green and affordable energy and number of green jobs created. These measurable targets can allow tracking of the accomplishment of intermediate and long-term outcomes that are consistent with GGGI's Strategic Outcomes and with the evidence and the assumptions made on the theory of change.

The Solar PV energy technology innovation project under the climate technologies program area was developed with INECC-SEMARNAT as the sole stakeholder involved. Although it covered the environmental aspect and the study was technically strong, when involving SENER as a key implementation agency they switched the focus of the project and directed it towards a different energy technology (geothermal), as opposed to the studied one (Solar PV). In order to ensure value for money, it is necessary to plan every major step of each activity included in each program area of the CPF and theory of change. It will be useful to engage the relevant stakeholder from the beginning of each project and have them on board for the selection and design of activities.

The TINA analysis and recommendations could also be integrated by other CEMIEs related to other energy technologies. Therefore, there is an opportunity to scale, replicate and maximize the impacts of these studies and the developed framework. However, it is important to create synergies with other potential partners/stakeholders' agendas to promote coordination and collaboration and to streamline efforts and resources towards further implementation and increase impacts.

Having the project's outputs (recommendations and results framework) being implemented in diverse CEMIEs without GGGI's direct intervention is a good start to enable sustainability. Nevertheless, the administration of SENER is about to change this year and it would be useful to compile, document and make the results available to the public. By documenting the evidence of the produced results, impacts and outcomes and by sharing them with partners, stakeholders and the public, it may be possible to demonstrate their value to new officials. In addition, GGGI could help build the case for the need to continue this work with the new administration.

The Table 4.4 below summarizes the conclusions and recommendations. Other recommendations that apply in a crosscutting sense to all of the program areas are included in Table 4.6.

Conclusions	Recommendations
These studies contributed to foster governmental involvement in promoting energy technological innovation. The work is relevant and, according to interviewees, the strategic framework has influenced the operation of the Mexican Center for Innovation in Geothermal Energy (CEMIE-Geo). However, there is no documented evidence or measurable targets to determine the extent of the impact.	Provide an open and participative space to adjust and adapt the strategic framework for policy innovation to be used by other CEMIEs and oversee the replication process. In order to do so, it is necessary to approach CEMIE Geo and document how they are using the framework and what has been the impact or results of using it.

Table 4.4. Climate technologies conclusions and recommendations

4.5. Knowledge Sharing program area

Figure 4.5 shows the theory of change developed for this program area.

4.5.1. Description

The activities under this program area started in 2016. There have been three meetings co-organized by the GGGI Mexico Program and other cooperation organizations that also support the Mexican government:

a) Workshop titled "Long Term strategies for the Implementation of the Paris Agreement". Held in June 2017. Co-organized with the Danish International Development Agency (DANIDA), the German Cooperation for Development (GIZ) and the Canadian Embassy in Mexico.

b) "First Regional Forum on Green Cities: Achieving Green Growth through Climate Change and Air Quality Management". Held in 2016. Co-organized with the UK FCO, DANIDA, GIZ and the Canadian Embassy in Mexico.

c) Workshop on "Technologies for Climate Change Adaptation and Mitigation". Held in 2016.
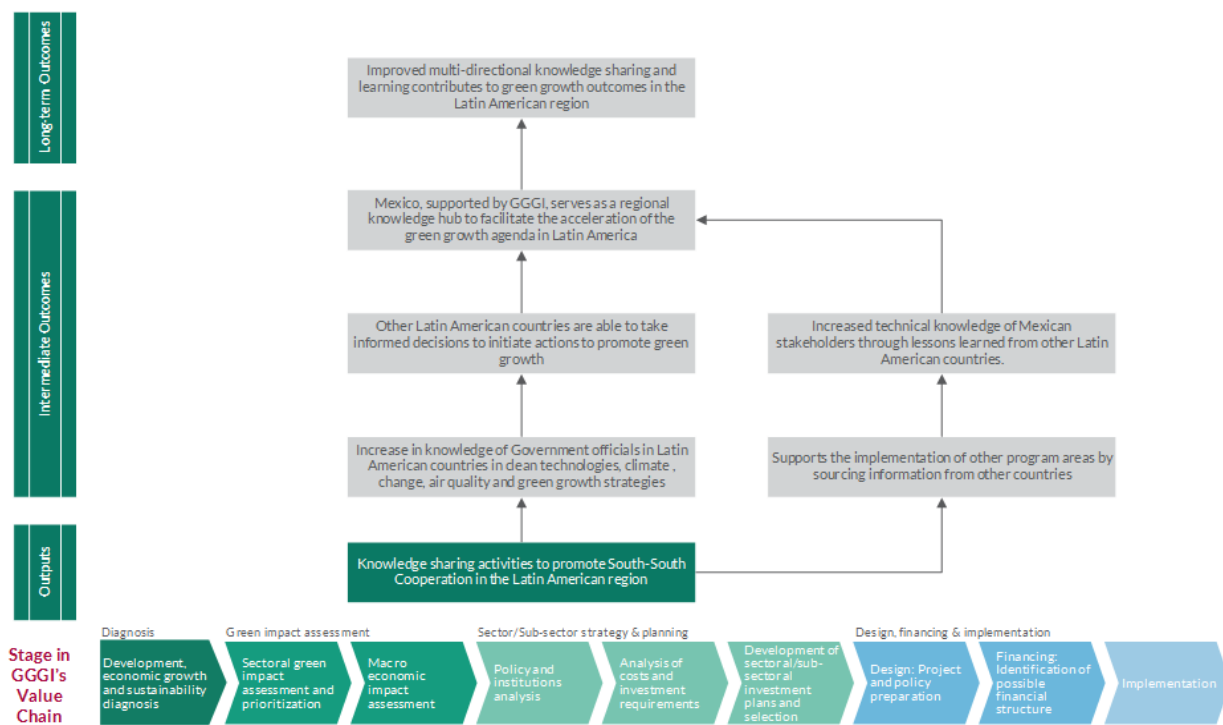
Figure 4.5. Knowledge sharing theory of change

4.5.2. Findings

The available information for the "Long Term strategies for the Implementation of the Paris Agreement" workshop is that 51 delegates attended the meeting, held in the offices of the Secretariat for Foreign Affairs (SRE) in Mexico City. From those, 22 were women and 29 men; 33 were Mexicans and 18 from other countries: Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Guatemala, Paraguay, Panama and Uruguay.

The staff from the GGGI Mexico Program received positive feedback from the attendees on the relevance of the content presented and on the organization of the event. Also, the Mexican Government was satisfied with the workshop. The Mexican Agency for International Development (AMEXCID) expressed their interest to explore further opportunities of cooperation.

The Federal government has a clear mandate as to the countries in the region they have to cooperate with: The Mesoamerican Region[42] is the priority followed by the rest of Latin America and the Caribbean.

SEMARNAT sees the GGGI Mexico Program as a partner to continue this type of cooperation and views them as sharing the same vision. They understand and value the differentiating advantages of the work with GGGI; among those, the fact that many other cooperation initiatives are only focused on the environmental side but do not

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[42] The seven countries of Central-America and the nine southeastern states of Mexico integrate the Mesoamerican economical region.

create the basis for green growth. For SEMARNAT the work done so far in this field is just starting and there is the need for continuity. There is the need to identify specific actions necessary to implement the interventions that will lead to GHG emissions reductions and put the Mesoamerican and Latin American countries in the path of accomplishing their NDCs. These actions include both technical and decision-making capabilities.

Regarding the interest of GGGI to create a regional hub in Mexico for the knowledge sharing program area, SEMARNAT sees this as an important step but also a challenge. The upcoming changes in the federal government create some uncertainty. According to the interviewees, the GGGI Mexico Program can make the case for a regional hub based in Mexico since it has good connectivity to all Mesoamerican and South-American countries; there is experience working in green growth and the advantages of Mexico participating in the Green Climate Fund (GCF); there are the institutional and regulatory capabilities and results of the work of GGGI in Mexico. In building the case for a knowledge sharing regional hub in Mexico, it will be important for GGGI to prepare a proposal focused on relevant issues, such as public transportation, air quality, energy efficiency and renewable energy sources. It will also be important to collaborate with AMEXCID, which is expected to expand operations in the Mesoamerican and Latin American regions.

4.5.3. Conclusions and recommendations

The interventions till date are valued by SEMARNAT and AMEXICD and there is potential to explore and support opportunities for further cooperation. It was also noted that there is the need for continued cooperation on green growth not only in Mexico, but also in the Mesoamerican and Latin American regions. Coupled with the election in Mexico in 2018, this creates a challenge and an opportunity for GGGI to find ways to ensure the new federal government gets interested and recognizes the importance of international cooperation on green growth. It is imperative to reach-out and present results achieved so far and propose collaboration opportunities to continue the previous work and to launch new initiatives.

Table 4.5 summarizes the conclusions and recommendations for this program area. Other recommendations that apply in a crosscutting sense to all of the program areas are included in Table 4.6.

Conclusions	Recommendations
SEMARNAT wants to continue this cooperation and the Mexican Agency for International Development (AMEXCID) is interested in further cooperation. However, high-level personnel within these entities may change with the upcoming elections. According to interviewees, Mexico is a potential "Regional Hub" since it has connectivity to Mesoamerica and South-America; has experience on green growth; participates in the Green Climate Fund (GCF); and has institutional capabilities.	Prepare a compelling Regional Knowledge Hub proposal focused on relevant issues (public transportation, air quality, etc.) for the new federal government and specific relevant potential partners, such as AMEXCID and the Ministry of Foreign Affairs (SRE).

Table 4.5. Knowledge sharing conclusions and recommendations

4.6. General non-programmatic issues

The Figure 4.6 shows the results-based program management cycle used by GGGI.

4.6.1. Description

GGGI's Mexico Country Program is moving forward, a new CPF is being developed to outline the agenda and efforts of the organization in Mexico until the year 2021. This section analyzes the general non-programmatic aspects of the Mexico Program. It is important to highlight the laudable components of the work done so far that are oriented to results and contributed to successful production of outputs. It is also vital to identify areas for improvement and suggest new or improved ways to make sure the Mexico Program can achieve GGGI's Strategic Outcomes.

The program cycle used by GGGI to implement results-based management includes a strategic planning stage, followed by the development of the Country Program (CP). A CP might include one or more program areas that include one or more projects or activities that are aligned with GGGI Strategic Outcomes. The next stage involves two dimensions of implementation: The first one consists of the implementation of the projects or activities included in the CP and the effective generation of the expected outputs.[43] The second dimension consists of the actual implementation or adoption of those outputs or products by a national or sub-national government entity creating the intermediate outcomes.[44] If the whole effort is relevant and effective, under the logic of

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[43] Outputs are technical studies to support policies, investment or capacity building proposals.
[44] Intermediate outcomes can be policies adopted, investment mobilized, or knowledge improved.

the theory of change, it will be possible to generate impacts in terms of environmental, economic or social changes, which in turn contribute to the achievement of the expected long-term outcomes aligned to GGGI's Strategic Outcomes.[45]
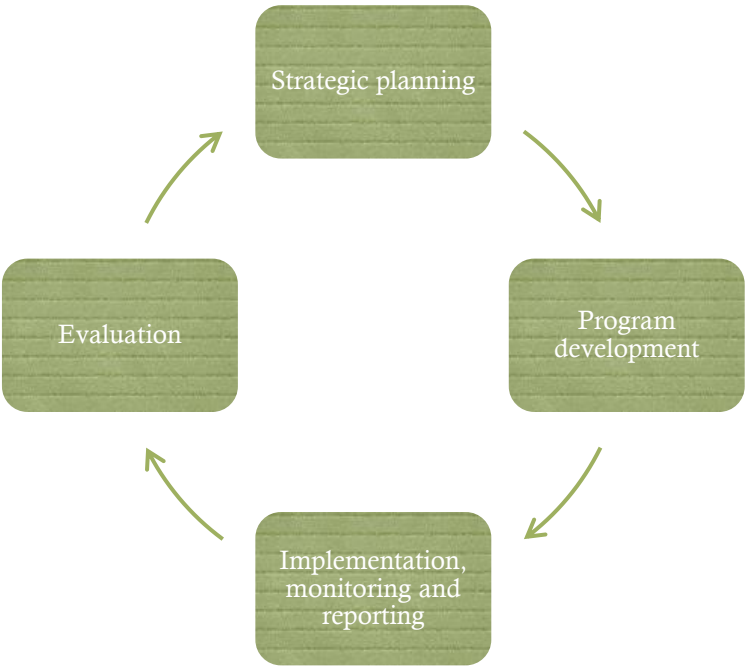

Figure 4.6. GGGI result based management program cycle

The implementation phase also includes an essential set of actions: monitoring and reporting. These actions support the implementation of the outputs and their potential to generate the expected outcomes. The follow-up and documentation processes are vital for supporting the replication, scaling and maximizing of impacts. To do this, it is necessary to learn from previous experiences. Therefore, although they may seem like bureaucratic activities, monitoring and reporting constitute the basis and foundation of transformational change.

Finally, evaluation is essential to reinitiate the cycle with new and fresh ideas on how to improve the previous phases.

4.6.2. Findings

In terms of the inputs, hereby understood as the CP budget (funds) and the personnel (the people who are part of the team at the Mexico local office), this evaluation documented the following findings:

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[45] Long-term outcomes or Strategic Objectives are GHG Emission Reductions, Creation of Green Jobs, Increased Access to Sustainable Services, Improved Air Quality, Adequate Supply of Ecosystem Services Ensured, and Enhanced adaptation to climate change.

- **Budget availability.** So far, considering 2013-2016 budget and 2017-2018 planned budget, GGGI has invested USD 2,875,583 on the Mexico CP. According to GGGI, all of this has come from GGGI core funding[46] and has been allocated the CP and its program areas following a very structured consultation process with government counterparts and donors and is approved by GGGI's Council under the biennial Work Program and Budget (WPB). According to interviewees, under this approach, the managerial features of the organization have been perceived as flexible and adaptable. To scale up and deliver on the ambitions of the new Mexico CPF, it has been pointed out by GGGI that earmarked funds[47] need to be mobilized. That creates the need for the Mexico Team to propose projects, identify potential donors and present proposals to obtain such funds, while maintaining precision, transparency and accountability in the use of funds.

- **Office and personnel issues.** Concerning the office physical space, the GGGI Mexico Program is located in Mexico City hosted by the National Forest Commission (CONAFOR), a part of SEMARNAT. The general idea of being embedded with SEMARNAT is to reciprocally support each other as partners on the implementation of the CP.

  Regarding the staff, it has been changing over time. At the time of this assessment there are two persons working on the CP. According to interviewees the team is well qualified and it has been responsive to partners and clients' needs, according to the majority of the participants of the survey (55.5% strongly agree and 22.2% agree). However, a couple of external issues might affect the efficacy of the team. There are different activities that the program must undertake; for example, there are a number of administrative tasks that need to be undertaken to run the Program, and also there are a number of technical and professional activities that should be performed to manage the projects. It might benefit the Program to have specific personnel for administrative issues and other for technical issues. The number of required technical personnel depends on the size of the new CPF (the number of projects to be included) and the scope of the CP (the topics addressed by the aimed strategic objectives). It might also be beneficial to procure enough personnel[48] with expertise on the targeted program areas (air quality, transport, energy, climate change, etc.) but also with a broad understanding of the essence of Green Growth and the national and sub-national context of Mexico (economic, social, and environmental).

Considering the internal GGGI systems, in terms of the program cycle and the results-based management, this evaluation documented the following findings:

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[46] Core funds are funds from GGGI donors that are not tied to specific programs or projects.
[47] Earmarked funds are funds approved by individual donors tied to specific projects.
[48] Management literature suggests that a project manager can properly handle approximately 3-5 projects at a time; but this is not a strict rule and GGGI may determine otherwise.

- **Strategic planning.** According to the information provided by interviewees and the survey (44.4% strongly agree and 44.4% agree) most projects developed so far by GGGI Mexico are relevant and address urgent needs.[49] However, 2 out of 5 program areas (air quality and public transportation) need a broader strategy, rigorously aligned with GGGI strategic objectives and with measurable targets and goals. Also, all projects included in 3 of the 5 program areas of the CP (except green growth planning and knowledge sharing) address only environmental issues. Although environmental protection intuitively accounts for the sustainability part of green growth, the available evidence suggested there is lower consideration of other equally important issues, namely economic or social aspects, which can contribute to strong and inclusive economic growth.

- **Program development.** According to the information provided by interviewees and outputs review, 3 out of 5 program areas (air quality, public transportation and climate technologies) have at some point, left relevant stakeholders out of the design stage. Also 2 out of 5 program areas (air quality and public transportation) have been found to have overlooked new data and information regarding the main addressed issues.

- **Implementation.** According to the information provided by interviewees and the survey (33.3% strongly agree and 55.5% agree) only some outputs have been implemented till date.[50] This is consistent with the fact that some program areas lack a binding written and public commitment document that can help ensure implementation.

  Also, 2 out of 5 program areas (air quality and public transportation) have generated outputs that seem not to be possible to implement in the near term: there is not a government counterpart interested in its implementation at this time or had one that changed priorities and interest (there was previous interest in Cuernavaca and Toluca) due to events beyond GGGI's scope (political issues, earthquakes).

As for the general performance and recognition of the GGGI Mexico Country Program so far, this evaluation documented the following findings:

- **Performance.** According to SEMARNAT, GGGI is part of a group of more than 200 international initiatives, organizations and partnerships in which SEMARNAT participates and collaborates to support their mutual work in the environmental sector. Specifically, for SEMARNAT it is important to find partners that can differentiate themselves from the rest of the organizations by

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[49] Opinion regarding the responsiveness of the team is slightly higher than regarding relevance of the outputs: 55.5% of responses strongly-agree the team were responsive and 44.4% strongly agree the outputs are relevant and address urgent needs.

[50] Opinion regarding the relevance of the outputs is slightly higher than the perception of their usefulness and implementation: 44.4% of responses strongly-agree they are relevant and 33.3% responses strongly agree they are useful or have been implemented.

demonstrating competitive and comparative advantages and can assure support and continuity. SEMARNAT also values the fact that GGGI is focused on green growth rather than just on environmental issues.

- **Recognition.** According to interviewees, there are some people at the federal environmental sector that do not know the GGGI Mexico Program. They have heard about some projects or activities, such as the work done inside CAMe, but did not know GGGI was participating by funding the personnel. At the same time, there are interviewees who are well acquainted with GGGI's work but that have not seen the final outputs produced.

4.6.3. Conclusions and recommendations

The GGGI Mexico Country Program is relatively new and has only been implemented for around 5 years. There have been several initiatives related to green growth and not all have thrived, while GGGI seems to be on the right path building a name and recognition for itself. As a young organization, it is expected to be flexible and adjust projects to emerging needs; however, it is time to reinforce structured work and to focus it towards a strategic agenda to find and define GGGI's niche.

For now, the organization has created some momentum and it is worth to take advantage of it to leverage the Program; the challenge for the near future is to show endurance and continue to pursue pending and new outcomes.

Moving from a core-funding scheme to an earmarked-funding scheme will require resource mobilization capabilities from the Mexico team, while maintaining precision, transparency and accountability in the use of such external funds.

Currently the staff includes two well-qualified professionals. However, the number of personnel should match the size (number of projects) and scope (targeted strategic objectives) of work under the next Country Planning Framework (CPF).

Strengthening each stage of the management program cycle, according to the conclusions and recommendations of the examination of each program area, would also be favorable. This can be achieved by implementing the following actions:

- Build a broad strategy aligned to GGGI´s mission and strategic objectives. As observed in the provided drafts of the Mexico CPF 2017-2021, a broad strategy aligned to strategic objectives is now being finalized.
- Consider new data and information on the urban agenda and the latest research on the addressed issues (air quality, public transportation, etc.) for project scoping and for building/updating the theory of change.
- Include all relevant stakeholders in the project design stage and ensure continuous engagement during project implementation.
- Assign measurable targets, to each project and for each phase in time, which could be evaluated to determine if the intermediate and long-term expected

outcomes have been achieved. As observed in the provided drafts of the Mexico CPF 2017-2021, measurable targets assigned to each project are now part of the planning process.

- <u>Formalize commitment from partners</u>, particularly with those responsible for implementation and plan and follow-up on the status of implementation to assure the generation of intermediate and long-term outcomes.

Expanding from the prevalent environmental focus towards a more integral and holistic view that encompasses other crucial aspects of GG is the natural way to differentiate GGGI from other environmental organizations. This can include ongoing engagement with SEMARANT, CAMe, GoSonora, GoMorelos, etc., and also new partners and clients such as government departments of energy (SENER), transportation (SCT, SEMOVIs) social development (SEDESOL, INAES, SEDUVIs), economic competitiveness (SE, COFECE) and many other federal and local sectors that could be potential partners. This year (2018) is particularly suitable for this outreach exercise considering the upcoming elections.

Integrating other key actors can ensure continuity of the implementation of the projects and achievement of the intermediate and long terms outcomes. These actors can come from various sectors, such as civil society, academia, private sector, etc., and can collaborate to the extent they do not compromise the neutrality of GGGI's work and contribute to leverage resources and scale-up impacts.

Attaining and showcasing results, based on a broad strategy with measurable targets, is a strong path to position GGGI as a valuable organization. By documenting and reporting the development of each project, as well as reporting and publicizing accomplishments, it is possible to let more people get familiarized with GGGI and to demonstrate its value.

Building a branding strategy can also be beneficial, since the organization is not well known yet – i.e. some outputs are known but GGGI is not recognized to have participated in their development. This could aid the process to create synergies, make potential partners or clients interested, raise additional funding and collaborations, and add value for partners and clients. The Table 4.6 below summarizes the conclusions and recommendations related to general non-programmatic issues.

Conclusions	Recommendations
Funding. According to GGGI, all of the Country Program's funding in the past has come from GGGI's core resources. In order to scale up the program and meet the priorities of the new CPF there is a need to initiate complementary resource mobilization through external earmarked resources.	Build capacity to prepare for the new combined funding model. Transition from core-funding to external earmarked-funding requires the GGGI Mexico team to develop capabilities to execute with the highest quality two main activities: preparation of proposals (to obtain funding) and results reporting (for accountability purposes)
Personnel. The current staff includes two well-qualified persons. However, the number of personnel should match the size (number of projects) and scope (targeted strategic objectives) of the new Country Planning Framework (CPF).	Review and adjust the number and expertise of personnel so it corresponds to the number and ambition of projects included in the new CPF. The expertise of the personnel should include managerial skills and should match the topics covered (strategic objectives).
Branding. GGGI is part of a vast group of international organizations working with the Government of Mexico (GoM). Some interviewees do not have clear knowledge of the GGGI Mexico Program.	Build a branding and outreach strategy and specific work-plans for each program area, to increase the recognition of GGGI and differentiate it from other organizations working in Mexico, to present the work and initiatives supported, and to add value for GGGI, its partners and all stakeholders.

Table 4.6. General program issues conclusions and recommendations

References

Altamirano, J., E. Ortiz Sánchez, J. Rissman, K. Ross, T. Fransen, C. Brown Solá, and J. Martinez. 2016. "Achieving Mexico's Climate Goals: An Eight-Point Action Plan." Working Paper. Washington, DC: World Resources Institute.

Amsterdam Institute for Advanced Metropolitan Solutions. Research projects. Available at: https://www.ams-amsterdam.com/category/research-programs/

CEMDA (The Mexican Center for Environmental Law). 2016. "*Los derechos humanos y la calidad del aire en Mexico*." (In Spanish). Available at: http://www.cemda.org.mx/wpcontent/uploads/2016/05/Los-Derechos-Humanos-y-la-calidad-dei-aire-en-Me%CC%81xico.pdf

Central Intelligence Agency (CIA); The World Factbook; Distribution of family income – Gini index. Available at: https://www.cia.gov/library/publications/the-world-factbook/rankorder/2172rank.html

Design of the Urban Fabric. Technical University of Delft (TU Delft). Available at: https://www.tudelft.nl/en/architecture-and-the-built-environment/research/research-programmes/urbanism/design-of-the-urban-fabric/

GGGI Mexico Country Program Evaluation Approach Paper. IEU, OED, GGGI; December 2017.

GGGI Thematic strategies. Available at: http://gggi.org

Mexico City Metropolitan Area Emissions Inventory 2014. Available at: http://www.aire.cdmx.gob.mx/default.php?opc=Z6BhnmI=&dc=Zg==

Mexico National Development Plan (PND) 2013 – 2018 (In Spanish). Available at: http://pnd.gob.mx

The New Urban Agenda: Key Commitments. Available at: http://www.un.org/sustainabledevelopment/blog/2016/10/newurbanagenda/

OECD Economic Surveys, Mexico, January 2017. Available at: www.oecd.org/eco/surveys/economic-survey-mexico.htm

Renewable Energies Potential for Sonora State (*Potencial de Energías Renovables para el Estado de Sonora*) (in Spanish). Available at: http://www.coees.sonora.gob.mx/images/descargas/Energias-Renovables/Potencial-de-Energias-Renovables-Sonora.pdf

Strategies for mitigating air pollution in Mexico City – International best practices. Findings of a workshop organized by the International Transport Forum (ITF-OECD) and the Development Bank for Latin America (CAF) together with the Secretariat of Environment of Mexico City (SEDEMA) in January 2017. Cited in GGGI Mexico Country Program Evaluation - Approach.

Special Program for Climate Change (*Programa Especial de Cambio Climatico*) 2014-2018. DOF (Official Journal of the Federation). 2014. Available at: http://dof.gob.mx/nota_detalle.php?codigo=5342492&fe

STI Policy Profiles: Facing New Challenges, OECD Science, Technology and Industry Outlook, 2012. Cited in GGGI Mexico Country Program Evaluation – Approach.

"Sunny Mexico: An Energy Opportunity". Available at: https://www.greentechmedia.com/articles/read/sunny-mexico-an-energy-opportunity#gs.7vtbST8

Use of International Credits. European Commission – Climate Action. Available at: https://ec.europa.eu/clima/policies/ets/credits_en

World Bank Country Profiles: Mexico. Available at: https://data.worldbank.org/country/mexico

Appendix A. Data collection tool: interviews

The first step under data collection phase was the designing of instruments for data collection. One of the main participatory research tools that were included was a set of key stakeholder interviews.

Name	Organization	Documented in
James Kang	GGGI International	Written notes, audio
Pablo Martínez	GGGI Mexico	Written notes, audio
Enrique Lendo	SEMARNAT	Written notes
Mario Duarte	SEMARNAT	Written notes, audio
Victor H. Páramo	INECC	Written notes, audio
Stephanie Montero	GoMorelos	Written notes, audio
Adolfo Castillo	GoSonora	Written notes, audio
Jorge Macías	WRI	Written notes, audio
Andrés Flores	WRI	Written notes, audio
Rocío Rodríguez	WRI	Written notes, audio
Gustavo Jiménez	GIZ	Written notes, audio
Antonio Mediavilla	CMM	Written notes, audio
Julieta Leo	CMM	Written notes, audio
Gabriela Rodríguez	UK FCO	Written notes, audio

Table A.1. Key stakeholders interviewed

The evaluation team conducted 14 interviews (see Table A.1.). Some of the key actors are now part of different organizations than the ones they collaborated with at the beginning of GGGI Mexico Program. Nevertheless, they are still considered key actors, with knowledge and expertise, and some of them are now part of organizations that are still related to GGGI Mexico. The guiding questions are organized by program area and guided by the theory of change logic and the criteria established by the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD):

- Relevance of program activities to the priorities and policies of Mexico;
- Effectiveness to test how the program outputs achieved their objectives;
- Efficiency with which outputs were delivered to ensure value for money;
- Positive or negative impacts resulting from program activities and outputs that have been realized till date; and
- Sustainability of program activities in the future and the likelihood that previous activities will lead to longer term outcomes.

Appendix B. Data collection tool: Likert scale survey

In order to find out what people who have been working with GGGI Mexico believe in terms of the outputs and outcomes generated by the GGGI Mexico Country Program, the independent evaluation team shared a Likert scale short survey with all the interviewees; only 9 of them responded. Having a small number of responses limits the statistical representativeness of the survey, but still presents interesting and useful opinions on the GGGI Mexico Program provided by people who have closely worked with them. Following are the general results of the survey.

Regarding the expected general support and responsiveness of the GGGI Mexico team in order to accompany and assist the process by which main outputs were generated, 55.5% of the participants of the Likert scale survey referred that they strongly agree that GGGI was responsive and met their expectations, 22.2% agree, 11.1% had no opinion and 11.1% disagree (see figure B.1.).

GGGI was responsive to my needs and met my expectations to complete outputs in a timely manner?
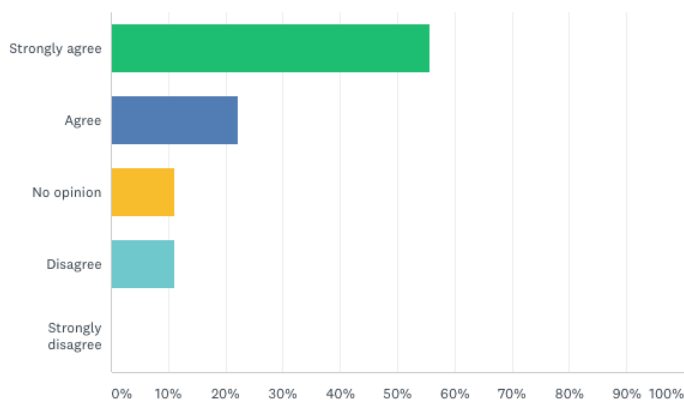
Figure B.1. Responsiveness of GGGI Mexico team

In terms of the relevance of the issues addressed by the projects implemented by GGGI Mexico from 2013 to 2017, 44.4% of the participants of the Likert scale survey referred that they strongly agree that the outputs and products were based on identified big-scale and urgent needs, 44.4% agree, and 11.1% disagree (see figure B.2.).

The outputs/products delivered are based on identified big-scale and urgent needs.
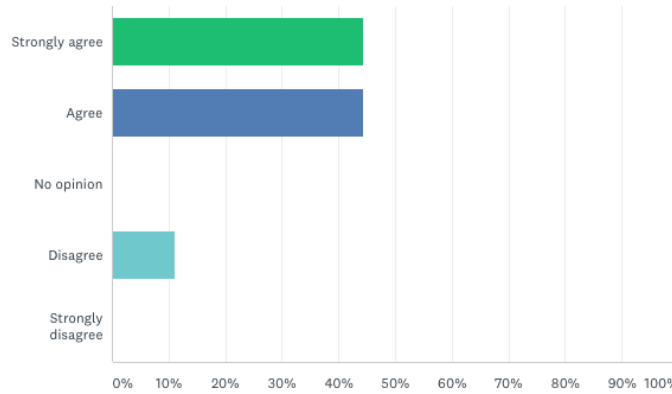
Figure B.2. Relevance of outputs/products

Implementation of the generated outputs has been a persistently convoluted issue throughout the different program areas of the GGGI Mexico Program. This is mainly because, from its origin, some of the projects do not belong to a broader strategy and do not include an implementation plan, and some of them consist of isolated studies. Overall, 33.3% of the Likert scale survey participants strongly agree that the outputs/products are useful and have been implemented, 55.5% agree, and 11.1% disagree (see figure B.3.).

The outputs/products are useful and have been implemented within the local context for which they have been developed.
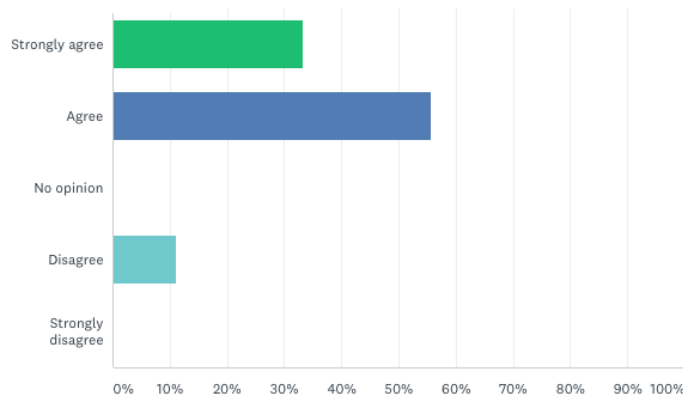

Figure B.3. Implementation of outputs/products

Along with implementation of the outputs/products, generation of impacts in the future is compromised by external factors (natural disasters, political issues, etc.) that are beyond GGGI's scope and by planning and design factors (lack of commitment, no follow-up, etc.) that can´t be remediated by GGGI; nevertheless, there are lessons that can be applied to increase the opportunities to implement and make an impact. Overall,

33.3% of the Likert scale survey participants strongly agree that the outputs/products are expected to generate outcomes/results in the immediate future, 55.5% agree, and 11.1% disagree (see figure B.4.).

The outputs/products are expected to generate outcomes/results that are effective to start meeting those big-scale urgent needs in the immediate future.
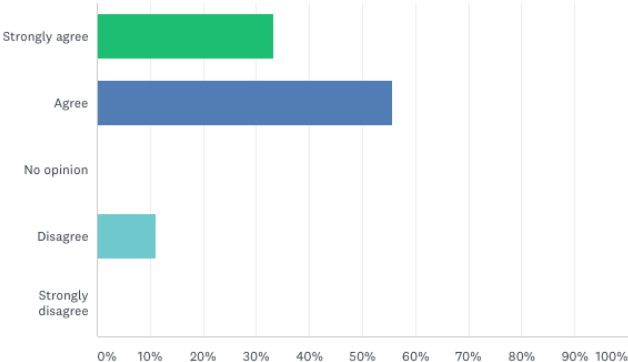
Figure B.4. Potential of outputs to generate outcomes

Finally, the transition towards green growth requires a transformational change that entails large scale, innovative and encouraging projects. In this regard, 55.5% of the Likert scale survey participants strongly agree that the outcomes/results are scalable, replicable, innovative and do leverage other resources to increase results in terms of big-scale urgent needs, 33.3% agree, and 11.1% disagree (see figure B.5.).

The outcomes/results are scalable, replicable, innovative and do leverage other resources to increase results in terms of big-scale urgente needs.
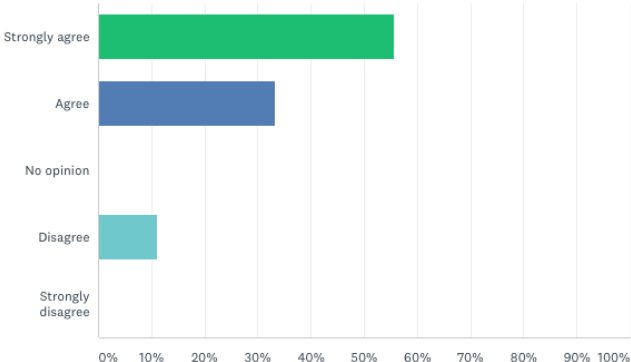
Figure B.5. Potential of outcomes to be transformational

MANAGEMENT RESPONSE TO THE RECOMMENDATIONS FROM THE INDEPENDENT EVALUATION OF GGGI MEXICO COUNTRY PROGRAM

No.	RECOMMENDATIONS	MANAGEMENT RESPONSE (MR)	IMPLEMENTATION TIMELINE
Cross-cutting – Program level			
1	**Complete the development of the Country Planning Framework (CPF)** as the guiding strategy describing the rationale and considerations for the selection of specific program priorities going forward, with corresponding details of actions to be taken under each priority. The CPF should also identify all relevant stakeholders (social, academic, private and government sectors) and consider their interest from the inception of any specific program area.	**Agreed** The CPF is currently in the process of being finalized and provides the rationale and the specific program interventions under 3 main program areas – sub-national green growth planning and resource mobilization, unlocking green growth through low-carbon, resource efficient public transport services and air quality. The CPF development process involved stakeholders from a wide range of government and development partners. Specific projects to be designed in the future will carefully consider the involvement of other relevant stakeholders including academia and civil society organizations. The involvement of these stakeholders will be examined based on the needs of the specific project and in line with GGGI's mandate of being a trusted advisor to the Government of Mexico. In addition, the importance of involving technical specialists for the review of project outputs is noted. The Green Growth Strategy for Sonora is a strong example of involving all relevant stakeholders and technical specialists in the development of the strategy. This will be replicated in future projects.	**CPF to be submitted to MT: June 30, 2018** **CPF to be completed: October 31, 2018** **Involvement of relevant stakeholders in project design: Ongoing and based on specific project needs**

No.	RECOMMENDATIONS	MANAGEMENT RESPONSE (MR)	IMPLEMENTATION TIMELINE
2	**Assign measurable targets** for project implementation, as well as performance and outcome indicators to quantify its contribution to the strategic objectives to be identified in the CPF and GGGI's Strategic Outcomes.	**Agreed** GGGI has adopted six strategic outcomes in the Refreshed Strategy 2015-2020, approved in October 2017 by its Council. These connect GGGI's strategy and activities to the long-term commitments of its partner countries in the context of the Agenda 2030. Currently, GGGI is undertaking an exercise to identify causal linkages of operational activities with the six strategic outcomes on the work expected to be completed by the end of 2018. Based on these linkages, measurable targets will be developed for each country program, including Mexico.	**Exercise on causal linkages: December 31, 2018** **Country-level target setting: June 30, 2019**
3	**Secure formal commitments** from the government-implementing counterparts to unlock intermediate- and long-term outcomes for each program area.	**Agreed** GGGI's management recognizes that projects implemented in the early years of the Mexico program did not secure "formal" commitments from government counterparts to secure future implementation. It is also recognized that some projects did not undertake an adequate level of consultation with all relevant stakeholders during the inception phase of the project. This was due to various reasons including the operating model adopted by GGGI during the first few years of operation in Mexico. Lessons learned have already been applied in ongoing projects including formal commitments that have been secured for the Sonora Green Growth Project including high level political buy-in through the establishment of the Green Growth Cabinet chaired by the Governor of the State of Sonora.	**Ongoing**
4	**Prepare internal reports and keep records of results** of each	**Agreed**	**Ongoing**

No.	RECOMMENDATIONS	MANAGEMENT RESPONSE (MR)	IMPLEMENTATION TIMELINE
	project to allow for monitoring of impact and transparency for partners and donors.	GGGI's internal reporting systems have matured considerably including the development of project level results reports being published for the first time as part of the 2016 Annual Report. This practice will be strengthened and continued in the future.	
5	**Expand from the prevailing environmental focus**, towards a more balanced focus with the economic and social aspects of green growth.	**Agreed** GGGI's management recognizes the need to explicitly create and report on linkages with the three aspects of green growth. The efforts with the new Strategic Outcomes and mainstreaming of safeguards, gender and social inclusion in all projects is a high priority. In addition, the ongoing Sonora project is an example of this mainstreaming effort and the increased focus to clearly articulate the economic and social outcomes of GGGI's interventions.	**Ongoing**
6	**Take advantage of the upcoming elections in order to strengthen the national partnership and increase the number of sub-national partners**, as well as to secure continuity of current work and pursue the launching of new projects	**Partially Agree** GGGI recognizes that the planning process the incoming administration in late 2018 must undertake, brings unique opportunities to influence national policy, particularly through the National Development Plan. For this opportunity, GGGI is in conversations with partners to identify these opportunities. It is important to also be very clear that as a neutral advisor to governments and respecting the electoral and transition process, GGGI will only engage with the incoming administration once the electoral process concludes and in consultation with the current administration. In addition, GGGI is deepening its engagement with different government counterparts including the Secretariat of Foreign Affairs (SRE), AMEXCID and the Secretariats of the Economy and	**Initiated and to be continued during 2019**

No.	RECOMMENDATIONS	MANAGEMENT RESPONSE (MR)	IMPLEMENTATION TIMELINE
		Finance amongst others. This effort is part of establishing a GGGI regional hub in Mexico City which is underway in 2018.	
Project level – Air quality			
7	**Consider supporting the control of emissions sources other than vehicles.** GGGI Mexico previously supported work focused on mobile sources but it is highly recommended to explore beyond those, as there are also significant emissions from industrial and area (disperse) sources	**Partially Agree** GGGI has considered all different emission sources in the scoping of previous work and in the development of the CPF. Going forward GGGI will continue to analyze controlling which emissions sources can bring the most benefits on improving air quality and health, but it will also do so considering the comparative advantage that GGGI has built in the transport sector and the capabilities and programs that other partners have in mitigating the various emission sources. However, GGGI work in air quality will be properly contextualized to identify gaps not being addressed or being addressed by others.	**New CPF period – 2019-2023**
8	**Expand the attention outside the Megalopolis of central Mexico and work with other Mexican States or cities.** There is need to support coordination among parties to the Environmental Commission of the Megalopolis (CAMe) and implementation of measures to solve the challenges of the region. There are other cities that could	**Partially Agree** GGGI worked on air quality management with CAMe between 2013-2016, and with the National Institute of Public Health in developing a proposal for a National Air Quality Index. Thus, GGGI work always considered the borderless nature of air quality. However, going forward GGGI will consider whether working with national or local governments is likely to lead to better air quality outcomes.	**New CPF period – 2019-2023**

No.	RECOMMENDATIONS	MANAGEMENT RESPONSE (MR)	IMPLEMENTATION TIMELINE
	benefit from the support to make a significant difference.		
Project level – Public transport			
9	**Support other aspects of mobility beyond bus public transport by considering other modes and infrastructure elements of mobility and accessibility.** For example, to make mobility more efficient, it is necessary to consider the interactions of mass transit and other mobility alternatives, like non-motorized transportation: sidewalks, bikes, etc.	**Partially Agree** Recognizing the need to consider other transport modes and infrastructure elements, GGGI has a comparative advantage in the bus public transport space with an increasing focus on "soft" interventions. This is in keeping with GGGI's limited resources and the identified need in the area to create transformational change. Future projects in this program area will be focused on the implementation of targeted soft interventions (e.g. concession models, IT and dispatch systems, integrated fare collection systems, etc.) as demonstrational projects to showcase system-wide benefits. The focus will also be on specific areas which are relatively underserved including the need to de-risk system operational conditions to facilitate financial flows towards long-term planning and implementation of public transport improvements at a city level. Additionally, support to the federal government is proposed in terms of a national strategy for electromobility and a national financial vehicle for the implementation of urban transport projects.	**New CPF period – 2019-2023**
10	**Include the latest key commitments of the New Urban Agenda in order to broadly address public transportation**	**Agreed** Key aspects of the New Urban Agenda will be incorporated in the design of new projects under this program area. In addition, one of GGGI's strategic outcomes (SO3) specifically aims to	**CPF to be submitted to MT: June 30, 2018**

No.	RECOMMENDATIONS	MANAGEMENT RESPONSE (MR)	IMPLEMENTATION TIMELINE
	issues as part of an urban challenge. For example, interventions in mobility shall ensure that all citizens have access to equal opportunities and face no discrimination, promote measures that support cleaner cities, establish partnerships with businesses and civil society to find sustainable solutions to urban challenges, etc. These considerations can allow to foresee and prevent or mitigate associated undesired outcomes and also for a balance on the environmental, social and economic aspects of green growth.	increase access to sustainable services, such as, clean affordable energy, sustainable public transport, improved sanitation, and sustainable waste management. There will be a focus on mainstreaming safeguards, social inclusion and poverty reduction in programming. The approach to this will be highlighted in the CPF document.	**CPF to be completed: October 31, 2018**
Project level – Green Growth Planning			
11	**Promote a National Green Growth Strategy to complement the National Strategy on Climate Change (ENCC)** and to scale and frame national efforts towards a strong, inclusive and sustainable economic growth and **approach other Mexican States in order to**	**Partially Agree** GGGI is working with a coalition of development partners to engage with the incoming administration with the aim of mainstreaming green growth in the 2019-2024 National Development Plan. As there are a number of existing strategies in place at the federal level, it may be more beneficial to mainstream green growth into existing policies rather than developing a separate National Green Growth Strategy. In	**New CPF period – 2019-2023**

No.	RECOMMENDATIONS	MANAGEMENT RESPONSE (MR)	IMPLEMENTATION TIMELINE
	replicate the work from Sonora and develop more sub-national green growth strategies.	addition, GGGI recognizes the need to work with sub-national governments as many of the levers of green growth (particularly in areas of sustainable cities such as transport, waste management and urban planning) fall within their mandate. In terms of sub-national green growth strategies, the goal is to replicate the success in Sonora directly in 3 other state governments (to be chosen based on demand and in consultation with SEMARNAT), while seeking opportunities to influence other states into mainstreaming green growth in their own planning. Further, efforts to mobilize finance for the implementation of the Sonora Green Growth Strategy will be a key focus area going forward.	
Project level – Climate technologies			
12	**Provide an open and participative space to adjust and adapt the strategic framework developed by GGGI on the Mexican innovation system to be replicated by the different Mexican Centers for Innovation (CEMIE[1]) responsible for specific areas of development.** In order to do so, it is necessary to approach CEMIE Geothermal	**Partially Agree** Based on GGGI's current resources and comparative advantage in Mexico, there is a need to focus efforts on the three program areas identified in the draft of the new CPF. GGGI's management recognizes the need to leverage the work in the climate technologies program area and apply it, where relevant, in the three identified program areas. The strategic framework for promoting innovation in energy technologies and the feedback received from the CEMIE Geothermal Energy and/ or our implementing partner The Carbon Trust will be a useful	**Initiated in 2018 and to be continued during new CPF period – 2019-2023**

[1] CEMIEs are groups of public and private research centers, universities, private sector and government entities intended to jointly work on developing technologies, products and services based on Mexico's potential on main renewable energies. These Centers are autonomous but supervised by the Ministry of Energy.

No.	RECOMMENDATIONS	MANAGEMENT RESPONSE (MR)	IMPLEMENTATION TIMELINE
	Energy and document how are they using the framework and what has been the impact or results of using it.	input in promoting innovative approaches under the sub-national green growth planning program area going forward.	
Project level – Knowledge sharing			
13	**Prepare a compelling Regional Knowledge Hub proposal** focused on relevant issues (public transportation, air quality, etc.) for the new federal government and specific relevant potential partners, such as Mexican Agency for International Development (AMEXCID) and the Ministry of Foreign Affairs (SRE).	**Agreed** GGGI is in the process of establishing Mexico as a regional hub and through this process is already deepening engagement with different government counterparts including the Secretariat of Foreign Affairs (SRE), AMEXCID and the Secretariats of the Economy and Finance, amongst others. The documented strategy for this regional hub will be elaborated in the WPB 2019-2020 document to be presented for approval to GGGI's Council in October 2018.	**New WPB approval: November 30, 2018**
Non-programmatic			
14	**Build capacity to prepare for the new combined funding model.** Transition from core-funding to external earmarked-funding requires the GGGI Mexico team to develop capabilities to execute with the highest quality two main activities: preparation of proposals (to obtain funding) and results reporting (for accountability purposes).	**Agreed** GGGI has considerably scaled up resource mobilization (RM) efforts since 2017. The responsibility for RM has been decentralized to country teams with strong coordination and capacity building support from the Partnerships unit in Headquarters. As part of these efforts, the two members of GGGI's Mexico team recently participated in a resource mobilization and proposal development training in Seoul in March 2018. In addition, ongoing involvement of different units in HQ is expected to support the country team in its RM efforts.	**Ongoing**

No.	RECOMMENDATIONS	MANAGEMENT RESPONSE (MR)	IMPLEMENTATION TIMELINE
		Staff members to be recruited in the future will be expected to have transferable skills relevant for RM. The country business plans currently being developed in preparation for the WPB 2019-2020 will identify opportunities for partnerships and RM, including the need to secure government co-financing for the program.	
15	**Review and adjust the number and expertise of personnel so it corresponds to the number and ambition of projects included on the new CPF.** The expertise of the personnel should include managerial skills and should match the topics covered (strategic objectives).	**Agreed** GGGI's management recognizes the need to increase the capacity of the Mexico country team. With three of its staff leaving within an 8-month period, and the program undertaking the planning process for the 2019-2020 biennium and the new CPF period – 2018-2021, the Mexico program is restructuring its staff composition to better match the ambitions of the upcoming projects. Additionally, the establishment of the regional hub in Mexico is expected to increase the staff headcount, particularly on management and administrative tasks. Additional staff focused on the Mexico country program will be added based on the resource mobilization efforts currently underway.	**Restructuring of the Mexico program with new headcount by: July 31, 2018** **Regional Hub to be officially established and staffed: December 31, 2018** **Increase in capacity: Ongoing based on RM efforts**
16	**Build a branding and outreach strategy** and specific work-plans for each program area, to increase the recognition of GGGI and differentiate it from other organizations working in Mexico, to present the work and initiatives supported, and to add value for	**Agreed** GGGI's management is keenly aware of the need to improve communication efforts to increase the recognition of GGGI. In past years there was a conscious decision to work with the government "behind the scenes", which severely limited awareness of GGGI. Progressively, there has been an increased focus on communicating results widely through the annual results	**December 31, 2018**

No.	RECOMMENDATIONS	MANAGEMENT RESPONSE (MR)	IMPLEMENTATION TIMELINE
	GGGI, its partners and all stakeholders.	reporting process, new website, increased social media presence and press releases of major events. The need for a strategy is recognized and this will be further explored in the context of the new WPB planning process currently underway in 2018.	