Terminal Evaluation of the UN Environment / GEF Project: Mitigation Options of GHG Emissions in Key Sectors in Brazil

Final Report

Evaluation Office of UN Environment

June 2018

Evaluation Office of UN Environment

Photo Credits (front cover): Ministério do Meio Ambiente do Brasil

This report has been prepared by Pamela Ransom, Phd, Gonçalo Cavalheiro at CAOS, Lda and Gustavo Ribeiro and is a product of the Evaluation Office of UN Environment.

For further information on this report, please contact:

Evaluation Office of UN Environment
P. O. Box 30552-00100 GPO
Nairobi Kenya
Tel: (254-20) 762 3389
Email: chief.eou@unep.org

Mitigation Options of GHG Emissions in Key Sectors in Brazil

GEF ID: 4254
January/2018

Acknowledgments

The evaluation team would like, first of all, to thank Zahra Hassanali, at the Evaluation Office of UN Environment, for her ongoing and tireless support to our work, very often going well beyond the call of duty to ensure success. Additionally, this evaluation was only possible due to the great contributions from Francine Vaurof at UN Environment Brazil, who provided guidance on many countless details throughout our journey to become familiar with the project. We also express appreciation for the other UN Environment staff particularly Ruth do Coutto and Leena Darlington.

We also wish to acknowledge the Government of Brazil for their contributions that were an important part of the foundation of the project. The evaluation team is especially thankful to the project team, which openly collaborated and facilitated our fact-finding efforts. In particular, we would like to thank the project national director Ricardo Vieira Araújo. We would like to express appreciation to members of the project steering committee and many others whom we met during the work in Brasilia and Rio de Janeiro for their hospitality and the efforts they made to discuss the results of the project in the field.

Last, but certainly not least, the evaluation team thanks all the other stakeholders who shared their time and knowledge with us, providing a solid basis for the findings included in this report. Without exception, the evaluation team felt that all stakeholders reached out to, supported our work.

Evaluation Team

Pamela Ransom, Phd

Gonçalo Cavalheiro

Gustavo Ribeiro

Evaluation Office of UN Environment

Zahra Hassanali – Evaluation Manager

Mercy Mwangi– Evaluation Administrator

About the Evaluation[1]

Joint Evaluation: No

Report Language(s): English

Evaluation Type: Terminal Project Evaluation

Brief Description: This report represents the results of the terminal evaluation (TE) of the GEF funded project Options for Mitigation of Greenhouse Gas Emissions in Key Sectors in Brazil, Project No. 4254. The primary objective of the Project was to assist the Government of Brazil to strengthen technical capacity in supporting the implementation of its mitigation actions for greenhouse gas emissions in key economic sectors: industry, energy, transportation, household and services, agriculture, forestry and other land use (AFOLU)[2], waste management and other cross-sector alternatives. Implemented from 22 May, 2013 to 31 January 2018, the project spent USD $3,865,130 (provisional as of Dec 2017), against a GEF grant of USD 4,180,000 (total cash and in-kind budget at approval-including GEF grant: USD 16,172,400).

Key words: agriculture, forestry and other land use; Brazil; climate change; emissions; energy; GEF; Greenhouse Gases; household; industry; low carbon; mitigation; modelling; Nationally Determined Contribution; project evaluation; service sector; terminal evaluation; TE; transportation; UN Environment; waste

[1] This data is used to aid the internet search of this report on the Evaluation Office of UN Environment Website

[2] This sector was previously referred to as Land use, land-use change and forest (LULUCF)

Table of Contents

Abbreviations Table

ABONG	Brazilian Association of Non-Governmental Organizations)
AFOLU	Agriculture Forestry and Other Land Use
ABC	Brazilian Cooperation Agency
Brazil Forum	Brazil Forum on Climate Change
BNDES	National Bank for Economic and Social Development
CH4	Methane
CO	Carbon Monoxide
CO2	Carbon Dioxide
CO2eq	Carbon Dioxide Equivalent
COP	Conference of the Parties
CPLP	Community of Portuguese Language Speaking Countries
EMBRAPA	Brazil Agricultural Research Corporation
FIFA	Federal International Football Association
EE	Energy Efficiency
EFES	Economic Forecasting Equilibrium System
EPE	Energy Research Company
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas Project (Options for Mitigation of Greenhouse Gas in Key Sectors Project)
GTP	Global Temperature Potential
GW	Gigawatt
GWP	Global Warming Potential
HFCs	Hydrofluoro carbons
IES	Project "Economic and Social Implications
IPCC	Intergovernmental Panel on Climate Change
IPEA	Institute of Applied Economic Research
IR	Inception Report
IW	Inception Workshop
kW	Kilowatt
LPG	Liquefied Petroleum Gas
LULUCF	Land Use, Land Use Change and Forestry
MMA	Ministry of Environment
M&E	Monitoring and Evaluation
MDIC	Ministry of Development, Industry and Foreign Trade
MAPA	Ministry of Agriculture, Livestock and Food Supply
MCTIC	Ministry of Science, Technology, Innovation and Communication
MF	Ministry of Finance
Message	Model for Energy Supply Strategy Alternatives
MME	Ministry of Mines and Energy
MP	Ministry of Planning, Budget and Management
MW	Megawatt
MRV	Monitoring Verification and Reporting
NAMA	Nationally Appropriate Mitigation Action
NFCC	National Fund on Climate Change (Climate Fund)
NDC	Nationally Determined Contribution
NGO	Non-governmental organization
NMVOCs	Non- Methane Volatiles Organic Compound Gases

N2O	Nitrous Oxide
NOx	Nitrogen Oxides
PDE	Decennial Plan 2020
PFCs	Perfluorocarbons
PDE	Decennial Plan 2020
PNE	National Energy Plan 2030
PIR	Project Implementation Review
PMR	Partnership for Market Readiness
PMU	Project Management Unit
PNMC	National Plan on Climate Change (Plano Nacional sobre Mudança do Clima)
REDE Clima	Brazil Research Network on Climate Change
R&D	Research and Development
RE	Renewable Energy
SMART	Specific Measurable Realistic Timebound
SAE	Secretariat of Strategic Affairs
TCC	Technical Consultative Committee
Toe	Tons of oil equivalent
TE	Terminal Evaluation
TPR	Terminal Project Report
TOC	Theory of Change
UN ENVIRONMENT	United Nations Environment Programme
UN DTIE	UN Environment's Division of Technology, Industry and Economics
UNFCCC	United Nations Framework Convention on Climate Change

Biography of the Consultants

Pamela Ransom PhD, United States has been active as an administrator, environmentalist, planner, educator and community activist. As Associate Professor at Metropolitan College in the School of Public Affairs and Administration she teaches courses on program evaluation, research methods and policy. After completing her undergraduate education at Harvard University and earning a doctorate in Urban Planning from Massachusetts Institute of Technology, she served as Deputy Director of Town Planning for the Government of Jamaica and consultant for US Agency for International Development. She served as Co-director of Harvard Africa Volunteers in East Africa. For almost eight years, she was Special Assistant for Environmental Affairs for the Manhattan Borough President and the New York City Mayor. She then became Program Director for the Women's Environment and Development Organization, managing a global program on health and environment. She taught Public Administration at Long Island University for 14 years and is lecturer of policy with Northwestern University School of Professional Studies. She has served as Research Scientist at the New York City Department of Environmental Protection, and a consultant and policy advisor for the Huairou Commission in their international programs on women, land, governance and climate change. She has also been active as a researcher and consultant for a variety of other international and government agencies, health institutions and community organizations and has numerous publications on public administration, policy and environmental issues.

Goncalo Cavalheiro, Portugal is a climate change consultant. He holds a graduate degree in International Relations and has over 18 years of professional experience on all aspects of climate change policy, both related to adaptation and mitigation. He has provided consultancy services to governments (such as the Portuguese, Brazilian, Cape Verdean, Mozambican, Vietnamese among others), international organizations (such as the European Commission and the United Nations) and private companies (from banks, to airport managers, mobile phone and internet providers). Design and implementation of public climate change policies, both in terms of mitigation and adaptation, including matters related to market mechanisms, investment and financing have also been at the core of Gonçalo Cavalheiro's work. Recently Gonçalo Cavalheiro coordinated the elaboration of the Azores Regional Climate Change Plan and of the Serbian Climate Change Strategy and Action Plan, where he provided support and training to governments, civil services and other stakeholders on design, monitoring and evaluation of climate change mitigation strategies and policies. In his current work in Serbia, Gonçalo Cavalheiro is coordinating the effort to evaluate all relevant sectoral policies (energy, forestry, agriculture and waste) in relation to their effectiveness and impacts on climate change policy (namely in terms of GHG emissions).

Gustavo Ribeiro, Brazil has been working with energy and climate change since 2008, providing support for corporations and government institutions in development and implementation of climate change policies and Low-Emission Development Strategies (LEDS). His broad experience with climate mitigation and adaptation projects includes work with different sectors such as power, mining, metal, oil and gas, transport, waste management, and forestry. During his professional life he has gained experience dealing with challenges of team coordination and project management.

Project Identification Table

Project Summary			
Executing Agency:	Ministry of Science, Technology and Innovation (MCTI)		
Sub-programme:	Climate Change Mitigation Unit, Energy, Climate, and Technology Branch Economy Division	Expected Accomplishment(s):	Low emission growth: Energy efficiency is improved and the use of renewable energy is increased in partner countries to help reduce greenhouse gas emissions and other pollutants as part of their low emission development pathways;
UN Environment approval date:	April 5, 2013	Programme of Work Output(s):	1. Energy efficiency is improved and the use of renewable energy is increased in partner countries to help reduce greenhouse gas emissions and other pollutants as part of their low-emission development 2. Scientific knowledge generated on emerging issues relevant to low-emission development decision-making and policy 3. Tools and approaches designed and piloted in countries that allow them to develop mitigation plans, policies, measures and low-emission development strategies, and to spur investment and innovation within selected sectors 4. Technical support provided to countries and partners to plan and implement and scale up sectoral initiatives and to make renewable energy and energy efficiency projects affordable and replicable
GEF project ID:	4254	Project type:	FSP
GEF Operational Programme #:	4	Focal Area(s):	Climate Change
GEF approval date:	October 16, 2012	GEF Strategic Priority:	Climate Change
Expected start date:	December 2012	Actual start date:	May 22, 2013[3]
Planned completion date:	30 November 2015	Actual completion date:	31 January 2018*
Planned project budget at approval:	$16,172,400	Provisional cumulative expenditures as of Dec 2017	US $3865,130 [4]

[3] Project start date reported PIR 2014; Progress report notes start of project implementation as August 2013

[4] Provisional cumulative expenditure verified L. Darlington—final project expenditure reports still to be issued.

GEF grant allocation:	$4,180,000	GEF grant expenditures provisional reported as of [Dec2017]	(Provisional cumulative) = $3,865,130 against the GEF grant.	
Project Preparation Grant - GEF financing:	Budget- 47,273 Actual- 46,928.06	Project Preparation Grant - co-financing:	Nil	
Expected Medium-Size Project/Full-Size Project co-financing:	$11,992,600	Secured Medium-Size Project/Full-Size Project co-financing:	$14,455,564 (2018)	
First disbursement:	26 Dec 2013[5] (1.13 M USD)	Date of financial closure:	30 Nov 2017	
No. of revisions:	4 revisions	Date of last revision:	Nov 2017	
No. of Steering Committee meetings:	4	Date of last/next Steering Committee meeting:	Last: Oct 3, 2017	
Mid-term Review/ Evaluation *(planned date):*	Didn't have one	Mid-term Review/ Evaluation (actual date):	Did not have one. 2015 UNEP evaluation team Nairobi query/ determination that time required to complete mid-term evaluation would be too close start of Terminal Evaluation and removal would not cause problems.	
Terminal Evaluation *(planned date):*	Aug – Dec 2017	Terminal Evaluation (actual date):	Aug 2017- Feb 2018	
Coverage - Country(ies):	Brazil	Coverage - Region(s):	Latin America	
Dates of previous project phases:	n/a	Status of future project phases:	n/a	

[5] Alternate dates reported in reports May 6 2013 reported in PIR 2014

Executive Summary

1. The Mitigation Options for Greenhouse Gas Emissions in Key Sectors in Brazil Project (ID 4254) has been an ambitious effort to assist the world's seventh largest emitter of greenhouse gases, the Government of Brazil, strengthen technical capacity to support implementation of mitigation actions for greenhouse gas emissions in key sectors of the economy, including industry, energy, transport, household and services, Land Use, Land Use Change and Forestry (LULUCF), waste management and other cross sector alternatives. The project was implemented over a period from May, 2013 through to the end of January 2018, spanning just under five years instead of an envisioned three. The $18,635,564 budget compared to the $16,172,400 originally approved, arose because of additional Brazilian government in-kind contributions through the Brazil Ministry of Science, Technology, Innovation and Communication (MCTIC), the lead government agency involved in the project. Funding also included a GEF grant of $4,180,000 of which provisional data shows $3,865,130 was spent by December 2017. $14,455,564 was received in the form of in-kind co-financing mainly from MCTIC.

2. This report presents results of the Terminal Evaluation (TE) that involved several phases including, initial review of project design quality and stakeholder analysis, development of a Reconstructed Theory of Change, desk review and extensive interviewing with a wide range of project actors during a field trip to Sao Paolo and Rio de Janiero for a two- week period in October 2017, with subsequent thematic analysis of results.

3. The project is determined to be Satisfactory overall, with strengths, particularly in the project's strategic relevance, where it is rated Highly Satisfactory. As we can see in Table 1, the areas of nature of external context, project design, monitoring and reporting and financial management the project were rated as Satisfactory. Other aspects of the project rated as Moderately Satisfactory included efficiency, effectiveness, and sustainability.

4. With respect to objectives, the project successfully generated 395 public policy instruments for the different sectors, with some evidence, that will need future additional future verification, of an increase in fund portfolio allocations for low carbon financing of technologies and processes during the project's duration[6]. This increase is despite constraints in federal spending and in private investment, (attributable, at least partially to the financial crisis that hit the country during project implementation).

5. The project's strategic relevance stands out as a particular strength due to the clear alignment with a range of priorities and policies of UN Environment and GEF as well as the various levels of the Brazilian government. The project clearly serves to inform forward movement on policy for all GHG emitting sectors in the Brazilian economy. The project design was rated as Satisfactory, reflecting strengths of the original plan in areas including strategic relevance, governance and supervision, replication/catalytic effects which helped moderate some weaknesses and needs for improvements in the logframe, (including conceptual formulation of outcomes), plan for communication, partnerships and budget. The strategic relevance of the project was strengthened due to the ambitious decision to

[6] Project team reported to 4th Steering Committee (2017) an average increase of 23% of resource allocation for emission mitigation actions in Brazil, stressing clearly, however, that no definitive cause and effect relationship with the Project could be established.

have the project include all the GHG emitting sectors (industry, energy, transport, household and services, LULUCF, waste management and other inter sectoral alternatives). This allowed for integrated modeling of potential costs and benefits, taking into account positive and negative synergies among the different policy proposals, otherwise not present in the policy framework in Brazil, the Planos Setoriais – Sectoral Plans.

6. Project outputs are another project strength. This includes the generation of a wealth of technical reports (141), and final publications (23) on matters including sectoral and integrated mitigation and economic modelling and public policy instruments needed to achieve required GHG emissions reductions. The project worked successfully with highly respected experts and institutional partners, unleashing new levels of talent and energy to address the Brazilian economic and environmental future. Analysis generated scenarios of greenhouse gas emissions for the key sectors including a reference or baseline, low carbon and low carbon scenarios with innovation and updated data through projections for two future periods (2012-2035 and 2036-2050). The project produced useful lists of priority policies for target years based on considerations of barriers and costs. There is also evidence of success in sponsorship of events and training, on a range of events in the capital as well as throughout the country covering at least eleven different topics, including construction of low carbon scenarios, GHG emissions' reduction potential, costs for the different sectors of the economy and low carbon technologies for the key sectors[7]. Outreach took place over several years including not only to government agencies, but also some of the private sector and civil society. In addition to trainings, the project sought to engage through workshops with industrial sector associations, that although sometimes controversial, also brought enhanced attention to the issues surrounding mitigation options (including leading actors in this sector to hire a consultant to respond to reports).

7. In the area of financial management, there is much evidence that the project faced significant challenges in factors outside of its control from transitions in the UN IT financial system, although there is evidence that this may have strengthened some aspects of adaptive and financial management. Stakeholders affirm sufficiency of funding for project operations, with the project delivering within budget partly due to the devaluation of the Brazilian currency. Thus, financial management is rated Satisfactory because of similar ratings in financial communication and reporting, however it is important to note that final financial reports will not be available until a time period after submission of this evaluation report.

8. Several areas of the project are rated Moderately Satisfactory including likelihood of impact, achievement of direct outcomes, efficiency, and sustainability. Likelihood to achieve impact is dependent on an array of assumptions, including that the Paris Agreement will remain in force. Other challenges related to assessment of likelihood of achieving impact at this stage include the fact that none of the intermediate states (see chapter on Reconstructed Theory of Change) such as having mitigation policies adopted, implemented and monitored, reported and verified for the key sectors as a results of project outputs and outcomes has been achieved.

[7] As of February, 21st 2018, the Project outputs can be consulted here: http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/brasil/Opcoes_de_Mitigacao_de_Emissoes_de_Gases_de_Efeito_Estufa_GEE_em_SetoresChave_do_Brasil.html

9. With respect to the three direct outcomes identified in the reconstructed Theory of Change - (understanding and acceptance of project findings by government, civil society and funders; secondly endorsement of project recommendations for policies and strategies to overcome barriers to mitigation by the Brazilian Forum on Climate Change, the Climate Change Committee and the Climate Change Executive Group and finally, increased technical capacity), there is evidence that significant strides have been made, although it is also determined that additional steps are needed for full achievement. Substantial progress includes key government actors demonstrating understanding, particularly because of the active engagement in a project-created Technical Consultative Committee of 14 government Ministries[8]. A number of civil society actors and funders including those in the Brazil Forum, the central mechanism for engagement with civil society, also show signs of support. As previously indicated, while the project built technical capacity in universities and through the numerous (37) training events reaching 659 participants, of which over half were federal government employees and the rest from state, municipal governments and civil society, surveys also suggest that additional efforts are needed. Good news includes suggestions that advances from this project may be influencing a range of agencies in Brazil but also internationally because of the use of innovative methodologies.

10. While the project allowed for the production of many in-depth studies, the broad, six- sector scope of the project did not permit a uniform, consistent, communication process for each involved sector. In addition, the release of final reports, including conclusions on proposals for policy, also came at the final conclusion of the project, with some concerns expressed about the timing of the final release. Thus, we can only report a *trend*, rather than a definitive conclusion, towards acceptance of recommendations across sectors that provides a good foundation for what will be needed to ensure movement through all stages of the policy process. The broad scope of the project, and resulting policy proposals, necessitates continued communication and engagement to ensure that progress continues to be made.

11. The efficiency of the project is rated as Moderately Satisfactory with some evidence of problems and delays particularly in the early stages of implementation and again in the mid-point related to changes in the financial systems, requiring moderation during various project phases by factors such as project extensions and the use of adaptive management to help mitigate stakeholder impacts.

12. In terms of monitoring and reporting, the robust monitoring system and effective work of the Steering Committee had a positive impact on the overall rating of Satisfactory, with some instances of a lack of clarity in reporting having some negative impacts.

13. With respect to sustainability, the project was also rated Moderately Satisfactory based on an assessment of socio-political, institutional, financial[9] issues, taking into account the high levels of dependency of a variety of possible risks to maintaining awareness, understanding and support for project results.

8 Technical Consultative Committee participants: MCTI, Finance, Environment, Development, Industry and Commerce, Chief of Staff of the President, Mining and Energy, Cities, Transport, Agriculture, External Relations, Special Secretariat for Strategic Affairs of the Presidency of the Republic, Institute of Applied Economic Research, Budget Planning and Management

[9] The socio-political, institutional and financial elements assessed are external to project and not under its direct or indirect control; these are related to the macro-context, in which the project outputs and outcomes will result in project impact.

14. In terms of factors affecting performance, while country ownership and driveness and management were rated Highly Satisfactory; project challenges included lack of attention to gender and marginalized groups and some weaknesses in communication planning and implementation.

Table 1 - Summary of Evaluation Findings

Criterion	Findings	Recommendations/Lesson Link
A. Strategic relevance	The project combined strategic thinking with clear relevance to both respond to, and move forward, a range of critical policies aimed to guide the future of Brazil's response to climate change	
B. Quality of Design	Several areas of this project have a strong potential for replication through the design of other projects (approaches to integrated modelling, policy mapping etc.) although the original log frame and indicators required further attention	Lesson 4: Usefulness of Project Dual Structures: Technical Consultative Committee + Project Citizens Advisory Committee or Sectoral Working Groups or Task Forces (NGO's Academia, private sector) to meet regularly Lesson 1: Start with an Engagement Plan and get input on the plan
C. Nature of External Context	Adaptive management was central to addressing ongoing challenges from politics and economics	
D. Effectiveness		
1. Achievement of Outputs	This project's diverse outputs of reports, modelling, events and training involved complex interactions with a range of government and private sector actors in sensitive sectors and presented needs for strategies for working across institutions;	Lesson 2, 3 Initial Industry outreach key as well as meeting structure and methods Lesson 6: Strengthen cross institutional modelling linkages Recommendation 5: Formulate strategies future data use/access Lesson 8/Rec'd 6: Training survey participant satisfaction questions/Event Suggestion boxes
2. Achievement of Direct Outcomes	The relationships built through the Technical Consultative Committee and Brazil Forum have been critical to forward movement on Direct Outcomes although more work is needed	Recommendations 1, 2: MCTIC helps move forward a follow up Action Plan
3. Likelihood of Impact	Projects involving such a wide	Recommendations 1, 2: Action

Criterion	Findings	Recommendations/Lesson Link
	range of sectors and policies necessitate long term action for transformational change	Plan and Action Plan Meeting
E. Financial Management	Challenges faced from the transition of the UN systems can have both positive and negative impacts for projects	Lesson 7: Back Up Financial Systems Key for Crises Management
F. Efficiency	-	-
G. Monitoring and Reporting	Despite strengths, current reporting systems sometimes need new strategies for cross institutional/donor communication about project complexities	Lesson 7: Methods of direct GEF Interaction/feedback
H. Sustainability	The richness of data and research generated by the project is useful for a range of actors and institutions in and outside of government; All endings of projects involving research are the point of new beginnings and nuanced mapping may further project benefits and mitigate any possible risks from future staff turnover and issues identified in participant training surveys.	Recommendations 1,2: Action Plan Recommendation 5: Formulate strategies future data use/access Recommendation 2: Process mapping of titles
Factors Affecting Performance		
Preparation and Readiness	Initial administrative delays eventually overcome although early principles emerged from this stage about tighter control over information release that permeate later stages of the project.	
Project Management and Supervision	Initial turnover challenges are sometimes mediated through key staff that enhance good will through strong reputations and historical memories as a result of staying with a project over the long term.	Lesson 9: Technical Coordinator
Stakeholder Participation/ Cooperation	The cross- sectoral nature of this project meant that many stakeholders were impacted both in and outside of government; Useful structures such as the Technical Working Group and Brazil Forum for this project can be replicated and strengthened	Recommendation 4: Technical Consultative Committee Lesson 4: Project Dual Structures Lesson 1: Engagement Plan Lesson 2: Meeting planning

Criterion	Findings	Recommendations/Lesson Link
	for other projects	Lesson 3: Early negotiations
Responsiveness Human Rights/ Gender Equity	Innovative strategies and methodologies can help institutions embrace differentiated audiences and constituencies however this necessitates initial attention, careful planning or strategic follow-up to bridge gaps	Recommendation 5: Task Force/Resource Guide
Country Ownership and Driven-ness	Project country ownership and drivenness, reflects strong engagement from public sector institutions through the Technical Consultative Committee. Follow up public policy actions will need not only these institutions but also involvement from civil society including climate policy networks and private sector institutions involved in the key sectors, especially GHG emitters in energy, agriculture, forestry and industry	-
Communication/Public Awareness	Communication is a key lifeblood to a project that is strengthened through consistency, access to the right technical expertise, and use of varied tools	Lesson 5: Stabilize communication through outreach tools and back up strategies

15. To conclude, the project demonstrates many positive elements although there are also challenges that stem from not only the breadth of impacted sectors, but also extent of variation in policies, range of involved entities, limitations in outreach to marginalized groups and sustained proactive communication. Thus, a follow up strategy is suggested with five recommendations stemming from this evaluation, encompassing at least another two years for implementation. Seven lessons were learned, about issues including strategies to strengthen engagement with specific sectors, particularly those that were somewhat controversial such as the industrial sector. The usefulness of greater consistency and follow up, carefully structured engagement plans, tools that create better linkages between models and the utility of back up financial management systems are examples. We conclude with four central recommendations including the need for a targeted project follow up action plan involving monitoring of follow up to project recommendations by relevant agencies, MCTIC and the Brazil Climate Change Forum, continuation of the Technical Consultative Committee, consultation with think tanks related to data access as well future strategies for increased engagement related to gender and marginalized groups.

1. Introduction

16. The Mitigation Options of Greenhouse Gas (GHG) Emissions in Key Sectors in Brazil, is a project critical to balancing national climate change needs with development priorities. The project (UNEP ID 4254), was approved by GEF Chief Executive Officer (CEO) on October 16, 2012, almost two years after Council approval June 8, 2010, with endorsement delayed because of the Brazilian Presidential elections. The Brazil Government through the Ministry of Science, Technology, Innovation and Communication (MCTIC)[10] and Brazil Cooperation Agency signed the project in February 2013, with the United Nations Environment Program signature on April 5, 2013. The project commenced work May 22, 2013 with final closure January 31, 2018, extending 56 months instead of an envisioned 36, because of extensions due to administrative delays and work plan changes. Figure 1 presents the project timeline.

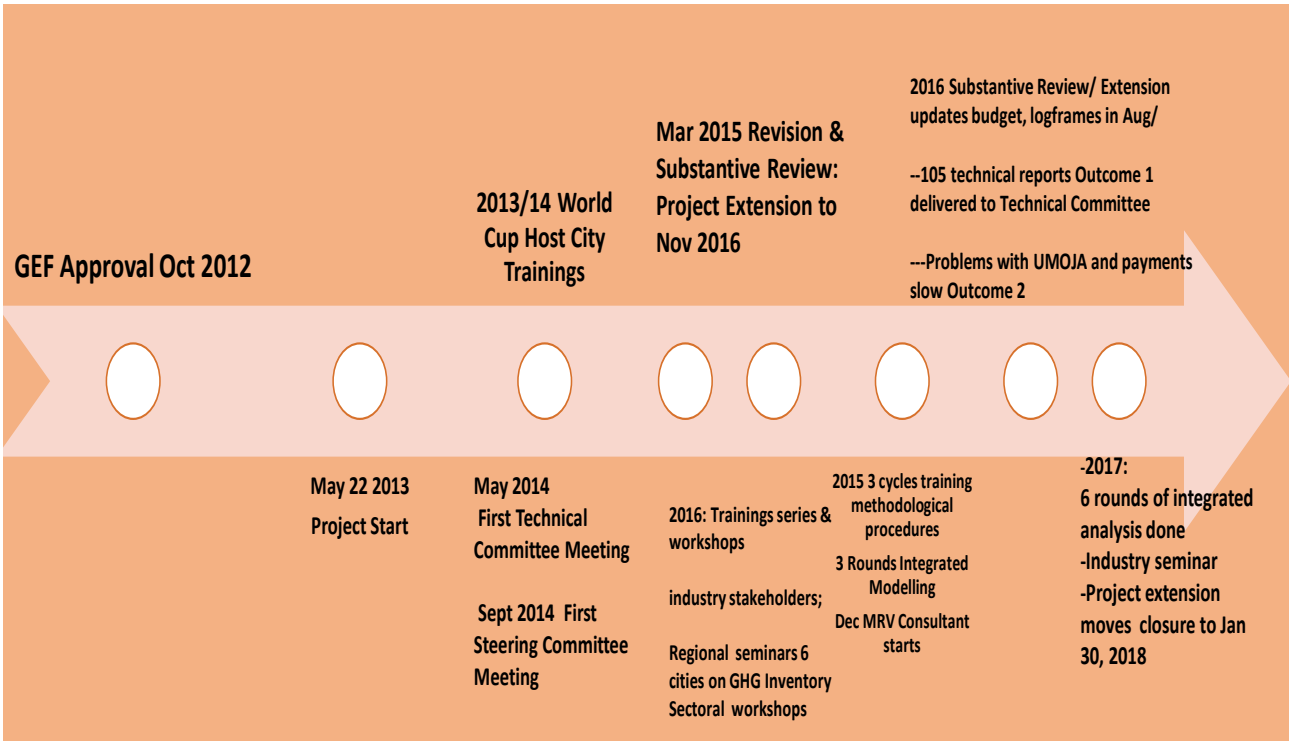


Figure 1 – Highlights in Project Timeline

17. The project implementing agency is UN Environment's Division of Technology, Industry and Economics (UN Environment DTIE) through its office in Brazil (UN Environment Brazil) and the executing agency is the Brazil Ministry of Science, Technology, Innovation and Communication.

18. In terms of GEF's strategic long-term objective, this project is a Climate Change Enabling Activity aligned with UN Environment's Medium-term Strategy (2018-2030), namely with its climate change objective: that countries increasingly transition to low GHG emissions development strategies through investment in clean technologies as well as through

[10] The current name of the ministry is: Ministry of Science, Technology, Innovation and Communication.

implementation of forest-friendly policies and measures that deliver quantifiable emissions reductions as well as social and environmental benefits.

19. The project budget of $18,635,564 was reached in comparison to the $16,172,400 originally approved, as a result of additional Brazilian government in-kind contributions through MCTIC.

20. The project involved a GEF grant of $4,180,000 of which provisional data shows $3,865,130 was spent by December 2017 (including expenditures and obligations). The project spent against target without major discrepancy in any given reporting period.

21. The project had four revisions including three extensions (see Table 2 below) of implementation periods and four final Project Implementation Reviews (PIR's)

Purpose

22. This document presents the Terminal Evaluation (TE) of the UN Environment/GEF project "Mitigation Options of Greenhouse Gas (GHG) Emissions in Key Sectors in Brazil" (ID 4254). The evaluation addresses the need for accountability through assessment of whether the project achieved expected results against the original objectives. Underlying factors influencing performance are also explored. This report seeks to provide guidance to inform future funding, management and implementation. The aim is to increase learning through exploration of varied perspectives of many involved actors including project managers, governmental and nongovernmental stakeholders and those in the broader Brazilian climate change policy environment.

23. The target audience for this evaluation includes not only the project funders at GEF, the project team at MCTIC, the 14 ministerial agencies represented at the Technical Consultative Committee and civil society represented in the project primarily through the Brazilian Forum on Climate Change, a multi-stakeholder entity chaired by the President of Brazil that includes both government officials and representatives from academia, NGO's and corporations.

2. Evaluation Methods

24. The Terminal Evaluation involved a series of stages with data collection through both primary and secondary methods. The first stage of literature reviews included desk review of a wide range of documents (See Appendix A). The documents include a) general background literature on topics relevant to the project's core issues such as climate change mitigation and policy in Brazil, b) official project related materials such as the original project document description (ProDoc), ongoing project supervision reviews (PIR's), sample progress memos and financial reports and finally c) material generated by the project itself, including: samples of technical reports (9), executive summaries of the project reports including those on the key sectors of the project (10), the communication plan (1), media articles and project presentations (circa 30), training materials, minutes of technical consultative committee meetings (18) and all annual steering committee meetings (4).

25. A project design quality assessment was then conducted, including review and formal rating of various aspects of the original design. Through a stakeholder analysis the government and public institutions at the federal, state and city levels were identified and assessed and

civil society organizations identified in the original project document were analyzed, based on policy expert input, for their interest, influence, expertise and the degree to which they were affected by the project.

26. A Reconstructed Theory of Change model was developed and validated by initial interviews with the project team and experts in the policy networks on climate change in Brazil to guide assessment of factors such as effectiveness, sustainability and likelihood of impact.

27. An evaluation matrix (see Appendix D: Evaluation Matrix) was developed aimed at answering questions on criteria including relevance, effectiveness, likelihood of impact, financial management, efficiency, monitoring and evaluation, sustainability and factors affecting performance as well answering the strategic questions in the TORs for the terminal evaluation which were:

    - **How were the project reports disseminated**? For example, how did ministry/ parliamentary committees take forward policy proposals- which sectors / why/ why not? Potential for scale up/ sustainability?

    - **To what extent has project built individual and institutional capacity** to support implementation of mitigation actions (Brazilian NAMAs aimed at reducing GHG emissions from 36.1 to 38.9 % by 2020 at local level)

    - **What is the GHG mitigation policy change process in Brazil**? Who are the key stakeholders, including civil society, to take forward project outputs/ outcomes at the state and federal levels respectively?

    - **How did the project identify and work with the relevant stakeholders** to catalyse use of project outputs and outcomes in the GHG mitigation policy change process in Brazil?

    - **How has inter-ministerial collaboration supported sustainability and likelihood of impact** of this project? (explore sharing information, capacity and any other issues)

28. The evaluation matrix was further customized into interview guides and administered via Skype and in-person to the diverse project stakeholders.

29. The team conducted purposive sampling, interviewing a diverse array of stakeholders representative of the key sectors relevant to the project such as industry (Ministry of Development Industry and Commerce, National Confederation of Industry, Steel Association, Cement Association), energy (Ministry of Mines and Energy, Company of Energy Planning, lead consultant), agriculture (Ministry of Agriculture, Ministry of Rural Development, IPAM), transportation (Ministry of Transportation), waste (Ministry of Cities), and other key actors in environment (Ministry of Environment, Climate Observatory, Brazil Forum on Climate Change) and finance (Ministry of Treasury, Banco do Brasil, BNDES, FINEP). These interviews took place in a data collection field trip to Brazil over a two-week period in early October 2017. In all, 30 semi-structured interviews were conducted with most being held in person in Rio de Janeiro and Brasilia and some by skype. In addition to government and civil society stakeholders, interviews took place with project managers and UN Environment staff (see Appendix B). To ensure that the approach to the evaluation was sensitive to indigenous populations and gender, interviews with NGO's and Ministries working on projects

representing these stakeholder groups were conducted (Social and Environmental Institute, IPAM, Ministry of Agrarian Development) and questions on these issues incorporated in the other interviews[11]. Data analysis involved taping, transcribing and translating of the interviews with thematic analysis. Data was triangulated from all sources to first refine the reconstructed Theory of Change into a Theory of Change at Evaluation, forming the basis especially of effectiveness and sustainability findings. The Evaluation Office Ratings Criteria[12] was then applied to generate the ultimate ratings recorded in the findings.

30. Evaluation judgments were based on sound evidence, applying the Evaluation Office's "Evaluation Criteria Ratings Matrix", leading to conclusions found in this terminal evaluation report. The analysis was built on sound evaluation principles including integrity, honesty, confidentiality, systematic inquiry and cultural sensitivity. The project team sought to identify not only what happened in this project but where possible, to explain underlying issues influencing why, exploring various complex dynamics related to project performance, presenting diverse perspectives about project challenges and successes. Limitations related to language were overcome with the inclusion of two bilingual Portuguese/English speaking members in the evaluation team, including one native to Brazil, to assure appropriate translation and communication throughout the evaluation process. Other limitations included not only the inability to schedule some desired interviews, but also some challenges due to a project extension during the course of the evaluation, which impacted the availability of some final project documents, namely outputs and those documents related to final financial closure reports.

3. The Project

3.1. **Context**

31. The primary objective of the project was to assist the Government of Brazil to strengthen technical capacity at the national, sub-national and city levels in supporting the implementation of its mitigation actions for greenhouse gas emissions in key economic sectors: industry, energy, transportation, household and services, agriculture, forestry and other land use (before LULUCF, now AFOLU)[13], waste management and other cross-sector alternatives. The project is comprehensive in scope, covering all emissions sectors in the economy defined in accordance with methodologies of the Intergovernmental Panel on Climate Change (IPCC) and included in the country's climate change mitigation policy. This broad sectoral coverage allows for a robust integrated assessment of direct and indirect economic impacts of emission reduction measures, also taking into account with respect to emission reduction potential, positive and negative synergies among the different sectoral polices. This constitutes advancements from the previous policy framework, in which sectoral plans were prepared independently.

32. During project design, mobilization for the 2014 FIFA World Cup was high on the national agenda, influencing the decision to build mitigation and Measuring, Reporting and

[11] Efforts were also made to schedule interviews with a gender specialist on mitigation but there was no response received to the request

[12] Please refer to the Evaluation Office for a copy

[13] This sector was previously referred to as Land use, land-use change and forest (LULUCF)

Verification (MRV) related capacity in the 12 cities[14] hosting World Cup events. Given the fact that the World Cup took place during the initial stages of the project, the focus on these cities soon lost traction, with later activities organized on a regional basis as is customary in Brazil.

33. The project aimed at improving the likelihood of achieving global environmental benefits through the identification and analysis of options for the reduction of GHG emissions in each of the key economic sectors mentioned above and through cross-cutting policies, thus ensuring an ambitious contribution of Brazil to their agreement to reduce emissions of greenhouses gases by 37 percent in 2025 and 43 percent by 2030 (as, agreed under the Paris Agreement, adopted 2015, ratified in 2016 and signed in 2017).

34. Information resulting from the project was intended to support Brazil in implementing and further negotiating its pledges and commitments under the United Nations Framework Convention on Climate Change (UNFCCC), while ensuring sustainable, low emissions and climate resilient development.

35. The project aimed at moving the Brazilian government and relevant stakeholders a step forward from the Sectoral Plans, enacted following submission of Nationally Appropriate Mitigation Actions (NAMA's, in the scope of the Copenhagen Agreement and Cancun Accords) which were designed independently from each other, thus giving rise to substantial gaps in the policies and in quantitative estimates of their respective potential impacts. The integrated analysis with the medium-term outlook of the project aimed at supporting the country in participating in the enhanced and global effort that has been, during project implementation, subsequently enshrined in the Paris Agreement.

36. The project has been implemented during a very dynamic and intense period of international negotiations at the UNFCCC level, which heightened some concerns about project information and confidentiality so that the negotiation position of the country was not compromised through publication of sensitive information. Therefore, the project was careful about sharing draft reports only with targeted stakeholders.

37. During the life of the project, concerns of national policy about climate change and the environment have continued to evolve. The project emerged in a period of complex dynamics with respect to the institutional context of climate policy in the country, with uncertainty in relation to the permanence of the institutional framework, including roles and responsibilities. Brazilian climate change policy is dominated primarily by two agencies, the Ministry of Science, Technology, Innovation and Communication (MCTIC) and Ministry of the Environment. Originally, MCTIC was responsible for conducting climate change (CC) policy (namely since the Rio Conference in 1992), although more recently, and as the international negotiations evolved to the point where Brazil was expected to formulate and communicate a national climate change policy, including mitigation goals, the Environment Ministry's role and influence increased. MCTIC is primarily responsible for issues related to GHG inventory measurement, reporting and verification (MRV), while the Environment Ministry is responsible for issues related to mitigation goals and policies, including their respective MRV. The Ministry of Foreign Affairs and the Executive Office of the President have an important role in coordination. Other sectoral ministries, such as Energy and Agriculture are

[14] The cities are : Belo Horizonte, Brasília, Cuiabá, Curitiba, Fortaleza, Manaus, Natal, Porto Alegre, Recife, Rio de Janeiro, Salvador, São Paulo.

also highly influential in the decision-making process (in particular, because energy and agriculture, forestry and other land use are key emitting sectors in Brazil).

38. The dynamic international situation and uncertainty in the institutional framework cannot be said to have had a great impact on the project outputs, however, institutional uncertainty, may become a barrier down the road to sustaining project outcomes and impact.

3.2. **Project Objective and Components**

39. The project´s objective is to assist the Government of Brazil to strengthen its technical capacity in supporting the implementation of its mitigation actions for greenhouse gas emissions in key economic sectors (industry, energy, transportation, household and services, AFOLU, waste management and other cross-sector alternatives). The project is organized into three project outcomes. The first two outcomes relate primarily to policy-oriented data analysis and reporting, while the third is focused on capacity building and training.

40. Regarding project outputs and outcomes, the designations included in the original project PRODOC did not follow some aspects of UN Environment Theory of Change guidance, which defines an output as a service or products delivered directly by the intervention and an outcome as a change in stakeholder capacity or behavior resulting from outputs. Therefore, for the purposes of this evaluation, there was a redesignationof project outputs and outcomes[15]. Table 4 in the Reconstructed Theory of Change Section, describes project outputs and outcomes in the original PRODOC and the reformulation in the Theory of Change at Evaluation. For the purposes of this evaluation, project components now include three outputs and three outcomes:

Outputs:

- **Output 1:** Mitigation alternatives identified and respective potential and costs quantified for industry, energy, transport, household and services, LULUCF, waste and cross-sector mitigation alternatives for the periods 2012-2035 and 2035-2050

- **Output 2:** Conducted integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification (MRV) of proposed mitigation alternatives

- **Output 3:** Capacity building delivered for federal, state and 2014 FIFA World Cup host cities government institutions, as well as civil society organizations, for implementation of mitigation actions for GHG emissions in key economic sectors

[15] Hereinafter, references to outputs and outcomes are to be understood as references to reconstructed outputs and reconstructed outcomes, i.e. those listed in the fourth column of Table 4 and in the Reconstructed Theory of Change at Evaluation contained in Figure 4.

Outcomes:

- **Outcome 1:** Acceptance and endorsement of project findings in relation to GHG mitigation technologies, potentials, costs, and economic trade-offs by government, civil society, private sector and funders

- **Outcome 2:** Endorsement of project recommendations for policies and strategies to overcome barriers to mitigation by the Brazilian Forum on CC, the CC Committee and the CC Executive Group

- **Outcome 3a):** Increased technical capacity demonstrated in public and civil society organizations at federal, state and city level on mitigation actions and their MRV and

- **Outcome 3 b):** Increased use of SIRENE by technicians at city, state, federal level for mitigation action planning and MRV

3.2.1. Stakeholders

41. The project involved an array of government and non-governmental stakeholders that played a variety of roles in the project. The table of stakeholders in Appendix B: Stakeholder Ratings as per the inception report, which shows those originally identified in the ProDoc. As a rule of thumb, such stakeholders rank B or higher in relation to the categories of Interest, Influence, Expertise and in terms of Extent of being Affected by the project. Engagement with public/government level stakeholders was frequent, intense and structured, namely through the monthly meetings of the Consultative Technical Committee. Engagement with civil society stakeholders took place mostly through the Brazilian Forum on Climate Change and through trainings and other public events in the key regions/cities of the country.

3.2.2. Government Stakeholders

42. Government stakeholders, in particular at federal level, were clearly the focus and primary target of the project. The key government stakeholders targeted by the project are: ten federal ministries (Finance; Environment; Mines and Energy; External Relations; Finance; Planning, Budget and Management; Development Industry and Foreign Trade; Cities; Transport; Agriculture, Livestock and Food Supply; Rural Development), the Executive Office of the President and Secretariat for Strategic Affairs of the Presidency of the Republic[16]. Additionally, public planning companies such as EMBRAPA (agriculture) and EPE (energy), were important project stakeholders. These agencies were members or frequent attendees of the Technical Consultative Committee composed of 14 Ministries[17], formed for the project soon after it began, was the most important mechanism for regular public agency stakeholder engagement and coordination which met regularly throughout the project. Others such as the Brazilian Cooperation Agency, which is part of the Ministry of External Relations, also participated in project steering committee meetings.

[16] No longer exists.
[17] Technical Consultative Committee participants: MCTI, Finance, Environment, Development, Industry and Commerce, Chief of Staff of the President, Mining and Energy, Cities, Transport, Agriculture, External Relations, Special Secretariat for Strategic Affairs of the Presidency of the Republic, Institute of Applied Economic Research, Budget Planning and Management

43. Public institutions at sub-national level (state and local), were targeted, but to a slightly more limited extent, particularly those concerning the FIFA 2014 World Cup host cities[18]. State agency representatives, particularly from environmental agencies, participated in project activities, such as seminars and capacity building initiatives.

3.2.3. Non-governmental Stakeholders

44. Engagement of non-governmental stakeholders was a bit less intense than that of government stakeholders. This is because the Brazilian Forum on Climate Change, the main stakeholder engagement mechanism foreseen in the ProDoc, was inactive for several years after 2013 during the project implementation period. After the Forum's resumption of activities in early 2017, it became quite active as a stakeholders' engagement mechanism for the project. Other efforts for this level of non-governmental engagement took place through specific targeted project events or consultant outreach.

45. Key non-governmental stakeholders include CNI (the National Confederation of Industry); CAN (the Agriculture and Livestock Confederation). Environmental NGOs, such as the World Wildlife Fund (WWF) and the World Resources Institute (WRI)) are included in ABONG (the Association of Environmental NGOs), even though ABONG itself is not considered a relevant stakeholder. The interviews confirm that the industrial and energy sector were the most organized in terms of providing project contributions. Other entities not specifically identified in the ProDoc as stakeholders who became involved were, for example, the Brazil Steel Institute, the ABI Vidro (Brazilian Technical Association of Automatic Glass Industries), ABAL (Brazilian Aluminum Association) and Petrobras (a semi-public Brazilian multinational petroleum industry corporation).

46. The project's original list of stakeholders did not include any specific stakeholders representing gender issues or under-represented groups, although at least one or two entities representing marginalized groups, particularly indigenous groups (and with some work focused on women), participate in the Brazil Forum. The initial assessment of the quality of the project design did not highlight this issue and interviews revealed the prevailing notion that groups linked to gender or under-represented / vulnerable communities are generally considered more relevant to adaptation than mitigation. The team probed several stakeholders on this matter during the interviews, and found a rather unanimous opinion that approaches oriented towards these types of stakeholders did not stand out in the project, despite strengths in economic analysis. The team believes this is a weakness in project design and implementation.

47. For purposes of comparison between the stakeholders planned at the start and later evolution of the project, **Figure 2** shows an array of planned invitees for a final dissemination meeting of project results (originally scheduled for Fall 2017 and held 2018—list is the preliminary draft available at the time of report preparation in Fall 2017). While the different array of actors is not meant to be definitive of constant project engagement, it does serve as an interesting point of comparison to the original conceptualization of stakeholders from the project design stage to get some sense of the direction of change in the portfolio of actors from the public, nonprofit and private sectors with interest as the project evolved over time.

[18] Belo Horizonte, Brasília, Cuiabá, Curitiba, Fortaleza, Manaus, Natal, Porto Alegre, Recife, Rio de Janeiro, Salvador, São Paulo.

Figure 2: Stakeholders invited to final dissemination event

48. We see represented in the graphic many of the same government entities (highlighted in yellow text), in the original ProDoc (project document) with the emergence of some Ministries not previously explicitly mentioned (highlighted in white text). With respect to civil society, there were originally only five civil society stakeholder groups in the ProDoc. The Brazil Forum on Climate Change was noted to be the primary representative for civil society for the project and they remain so. However, by 2017 we also see an array of additional civil society NGOs, and much fuller representation of associations and private sector entities not represented in the original conceptualization of stakeholders. This may reflect both changes in the ongoing process of consultation as well as increased understanding and appreciation of the complex intersection of the project issues with many sectoral civil society and private sector interests. In addition, we also see a fuller list of financing organizations including BNDES, the Bank of Brazil and FINEP represented.

3.3. **Project Implementation structure and partners**

49. The project **Implementing Agency** is UN Environment's Division of Technology, Industry and Economics (UN Environment DTIE), through a project Task Manager and Financial Management officers. The UN Environment office in Brazil provided execution support to project management at MCTIC through a project officer and financial assistant. UN Environment's responsibility was to provide overall coordination and overall project supervision to ensure consistency with GEF and UN Environment policies and procedures." In addition, UN Environment provided the overall coordination.

50. MCTIC, as the **Executing Agency**, had the responsibility to implement the project in accordance with the objectives and activities outlined in the ProDoc.

51. According to the ProDoc, the **Project Management Unit** was to be housed at Rede Clima, a network of research institutions under MCTIC and based at the National Institute of Space Research. Fig. 3 illustrates the configuration of staff of the Project Management Unit now based at MCTIC that includes a National Director, Agency Executor and Director Coordinator, with a contracted Technical Coordinator. Although all research institutions participating in the project as consultants are members of Rede Clima, interview responses suggest the Rede Clima relationship did not have a formal role in the project. Since all relevant research institutions working with the project are members of Rede Clima, all the consulting universities are members of Rede Clima.

52. Political and strategic guidance was provided to the project through a **Project Steering Committee** (PSC). In the ProDoc, the composition of the Steering Committee included "UN Environment, MCTI and other key institutions that have a strategic or practical interest in the Project, e.g. INPE, Ministry of Environment, Ministry of Finance, Ministry of Mines and Energy, Ministry of Development, Industry and External Commerce, Ministry of Transport, Ministry of Agriculture and Livestock." However, the PSC was actually composed of UN Environment, MCTI and the Brazilian Cooperation Agency. The PSC met once a year (the last meeting during the team mission to Brasilia) and was responsible for overseeing and approving annual work plans, budgets, and make strategic decisions.

53. The **Technical Consultative Committee**, (see section on Stakeholders) not foreseen in the ProDoc took over the key tasks and composition originally foreseen for the PSC. This Committee praised in interviews fills a gap identified related to problems with interagency coordination and communication and issued several recommendations regarding project management and direction, which were addressed by the executing agency.

54. The term "**partners**" is used widely in the different project documents. While in the PRODOC Rede Clima is mentioned as the project partner, this evaluation report identifies all relevant ministries and other public entities and university related organizations as project partners. Key project agreements for technical work involved the Project Coordination Foundation, Research and Technological Studies /Federal University of Rio de Janeiro (COPPETEC/UFRJ); Economic Foundation Research Institute /University of Sao Paulo (FIPE/USP); Fundacao Euclides de Cunha/Federal Fluminesense University (FED/UFF) and Research Development Foundation/Federal University of Minas Gerais FUNDEP/UFMG)

55. Figure 3 illustrates the project implementation structure[19].

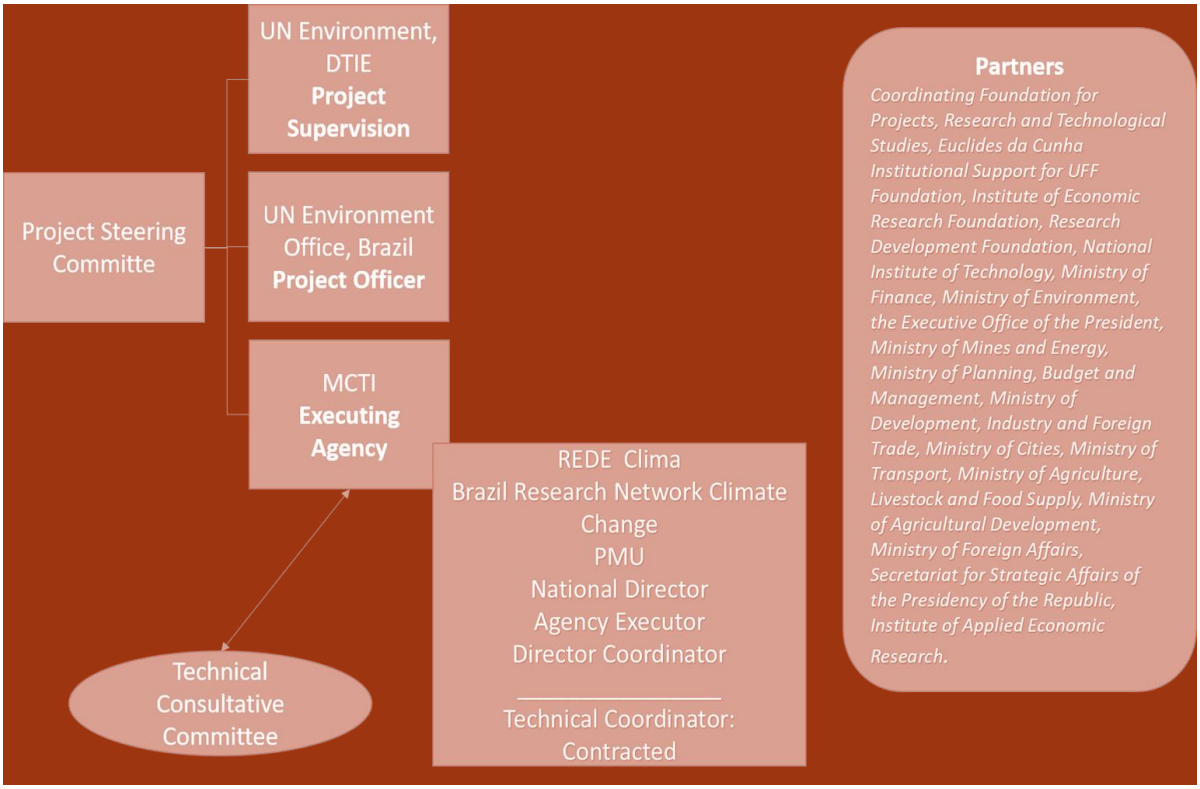


Figure 3 – Project Implementation Structure[20]

3.4. **Changes in Design during Implementation**

56. The project was formally signed February 2013 by the Ministry of Science, Technology and Innovation (MCTIC) and the Brazilian Government, through the Brazilian Cooperation Agency of the Ministry of Foreign Affairs (ABC/MRE) and then in April 2013 by UN Environment. Table 2 shows project changes through revisions and extensions. The initial ICA for the PPG signed in Feb 2010 by GEF and Dec 2010 by UNEP anticipated a project start by December 2012 but this was eventually pushed back a year through (ICA amendment 1) to enable contracts to be signed between the project management and consultants and partners. The project ICA was formally signed with dual signatures by UN Environment on the 5th and 19th of April 2013, with one amendment noted above signed in February 2015. The first project sub-allotment was in April 2013. The initial project start reported in late May of 2013 was noted in other early progress reports to be August of that year.

[19] The Universities that conducted the sectoral research are represented by the respective foundations listed at the top of the list of partners (these foundations are the entities with legal standing to engage contractually on behalf of the Unversities).

[20] This figure does not include a representation of the members of the Steering Commitee, rather it shows that project supervision, project officer and executing agency work under the guidance of the steering committee. The members of the Project Steering Committee are described above and include: UN Environment, MCTIC and the Brazilian Cooperation Agency.

Table 2 - Project Changes through reviews and extensions

Change	Description
Revision April 1, 2015	Revises unexpended budget and moves 2013 balance to future year—total project cost unchanged Extends project from Nov 2015 to Nov 2016 due to delay in implementation caused by long process of signing contracts between partners and consultants
Revision September 2016	Updates workplan and budget Adds sub-activities to output 2.2.6 (Analysis of innovation costs and financing sources) and 3.1.1 (Development of training and information materials) and revisions to indicators and targets in the Logical Framework of the Project based on Steering Committee approval of the following change: -- change to indicator for project objective, end of project target: *"At least one policy instrument for each sector (industry, energy, transport, household and services, LULUCF, waste management and cross-sector)*" changed to: *"At least one policy instrument **proposed** for each sector (industry, energy, transport, household and services, LULUCF, waste management and cross-sector)"*; - altered indicator: *"Increase in government resources allocated to mitigation activities as a result of information produced and awareness raising among key decision makers"* changed to: *"Percentage of increase of resources allocated by Government to finance mitigation options proposed by the Project"*, because it is increase of resources in itself which indicates the achievement of objective, while % increase is the target to be achieved. - amendment to target: *"Percentage of increase of government allocation to the Climate Fund to finance mitigation options proposed by the Project (percentage to be determined after project inception on the basis of an appraisal to be carried out)"* changed to: *"Increase in the allocation of resources by Govt to finance mitigation options proposed by the Project (percentage to be defined by April, 2016),"* because the Climate Fund is not the only source of funding to promote mitigation and necessary to identify amount of resources to fund them. -Change to two indicators with reference to Outcome 3 identified, (see detailed changes in M & E chapter) because they have no relation to the specific objective of Component 3 *"Capacity building for federal, state and 2014 World Cup host cities government institutions, as well as civil society organizations, for implementation*

Change	Description
	of mitigation actions for GHG emissions in key economic sectors"; also these indicators have as targets actions which go beyond project duration and, do not meet SMART criteria
Revision September 2016	Extends project until November 30, 2017 and rephases unexpended budget
Revision November 2017	Extends project (to allow for conclusion of the impressions of publications and electronic tool); Project extended from Nov 2017 to l 31 January 2018; Rephases small unexpended budget (small balance of funds)

57. The table above documents the four revisions to the original project design that took place during the project. The 2015 change in design was justified due to delays in project implementation largely due to UN Environment administrative issues. In 2016, an extensive review resulted in changes to indicators and targets, additional sub-activities and budget with a budgetary surplus resulting from a depreciation of the Real compared to the US Dollar. An extension also occurred in 2016. In 2017 the project conclusion was again moved back to early 2018. The four Project Implementation Reviews (PIR's) covered: a) July 1, 2013 to June 30, 2014 with a final version approved in October 2014; b) a second PIR for the period between July 1, 2014 and June 30, 2015, which was approved by MCTIC and UN Environment; c) a third PIR covering the same period the following year 2015 to 2016 and d) a final PIR conducted for the same period in 2017.

3.5. **Project Financing**

58. The total approved budget for the project was $16,172,400 as we see outlined in Table 3 under Total Cost. The cost to the GEF Trust Fund was $4,180,000 shown in the first line. With PPG (Project Preparation Grant) cost additions the original project total was US$ 16,227,673.

Table 3 Project budget summary

Particulars	**Amount US $ Planned**
Cost to GEF	4,180,000
Co financing (cash) MCTI	1,078,000
Sub Total (cash)	**5,258,000**
Co financing (In Kind)	
UNEP	102,400
MCTI	10,812,000
Sub- total (In kind)	**10,914,400**
Total Cost of the Project	**16,172,400**
PPG Cost to GEF	47,273
PPG co-financing	8,000
Total Cost of the PPG	**55,273**
Project Total	**US$ 16,227,673**

4. Theory of Change

59. At the time of the design of this project no Theory of Change (ToC) was required, so it was necessary to develop the Theory of Change from the Prodoc, project revisions and PIRs. A ToC methodology adopted by UN Environment is recommended for evaluations to help describe processes of change stimulated by projects through modelling factors including causal pathways linking project outputs (goods and services delivered), direct outcomes (changes resulting from use of outputs) through intermediate states leading to impact. The model also helps illustrate relevant assumptions that are the given conditions beyond project control, and key drivers that influence movement between outcomes and intermediate states. ToC models have a long history of use in evaluations over the last thirty years and are designed as a tool to help all engaged in the evaluation process go beyond sole emphasis on project log frames towards greater focus on more strategic, thinking about the "big picture" of how desired change comes about (Julian, 2005; Brown, 2016; Clark & Anderson, 2004). For this project, three models were formulated, the first from the existing project log frame. Following UN Environment guidance for use of a ToC, a second ToC at Design (see Appendix G: Theory of Change at Inception) model was then formulated and validated based on a holistic approach to the project, building on a review of the original log frame, with consultation and input from country climate change experts and the project team. A third model, the present ToC at Evaluation, was constructed as a refinement of the Theory of Change at Design following consideration of information gathered through the interviews conducted in the country and review of the project outputs. The reconstructed ToC at Evaluation that resulted from this process shifts what the log frame terms as

outcomes to the output level to accommodate the view that this ensured greater consistency with UN Environment and GEF definitions of outcomes and outputs. The reconstructed ToC at Evaluation includes, therefore, a set of outcomes which were not included in the Prodoc, that are proposed by the evaluation team. Table 4 below lists the original definition of outputs and outcomes from UN Environment guidance on developing the Theory of Change and the ProDoc and the reconstructed definition proposed by the team in accordance with the reconstructed Theory of Change at Evaluation. It also includes brief explanations on the components proposed in the reconstructed Theory of Change at Evaluation that is shown in Figure 4. A Theory of Change thus provided the basis for discussion about project components and assumptions and a more holistic framework for use in the project evaluation process to help with assessment of a range of issues including project effectiveness and likelihood of impact.

Table 4 - Project components and results as per the ProDoc and ToC at evaluation – Output Level

OUTPUTS				
Components and results	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
Output: services and products delivered directly by the intervention e.g. guidance material, policy advice, a local pilot project (UN Environment—source same as note 21)	(The chapeau for outputs 1.1 to 1.7[21] was originally classified as an outcome[22] in the ProDoc, which is not consistent with the UN Environment Theory of Change definition)	The chapeau for outputs 1.1 to 1.7[23] the ProDoc classified as outcome 1 is now output 1[24].	Output 1. Mitigation alternatives identified and respective potential and costs quantified for industry, energy, transport, household and services, LULUCF, Waste and for cross-sector mitigation alternatives for the periods 2012-2035 and 2035-2050	The seven sub-outputs (1.1 to 1.7) of output 1, represent the result of the application of the same methodological approach to the six sectors (plus cross-sector alternatives), aimed at identifying the potential for GHG emissions reductions. These outputs are materialized in a set of reports published in the project web-site[25].
	Output 1.1: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the industrial sector.	No change	Output 1.1: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the industrial sector.	
	Output 1.2: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the energy sector. Energy sector, as analyzed in this Project, refers to the	No change	Output 1.2: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the energy sector. Energy sector, as analysed in this Project, refers to the activities that produce	

[21] Mitigation alternatives identified and respective potential and costs quantified for industry, energy, transport, household and services, LULUCF, Waste and for cross-sector mitigation alternatives for the periods 2012-2035 and 2035-2050
[22] *Outcome* is a change in stakeholder capacity resulting from outputs e.g. increased awareness, improved knowledge or skills, positive attitudinal and motivational changes, institutional or policy changes, availability of financing (see UN Environment : Theory of Change definitions) Retrieved from https://www.unenvironment.org/about-un-environment/evaluation/our-evaluation-approach/theory-change
[23] See footonote above
[24] See first line of next column
[25] As of February, 21st 2018, the Project outputs can be consulted here:
http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/opcoes_mitigacao/Opcoes_de_Mitigacao_de_Emissoes_de_Gases_de_Efeito_Estufa_GEE_em_SetoresChave_do_Brasil.html

OUTPUTS				
Components and results	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
	activities that produce and transform energy, as defined in the Brazilian National Energy Balance.		and transform energy, as defined in the Brazilian National Energy Balance.	
	Output 1.3: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the transport sector.	No change	Output 1.3: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the transport sector.	
	Output 1.4: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the household and services sectors (energy consumption in buildings).	No change	Output 1.4: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the household and services sectors (energy consumption in buildings).	
	Output 1.5: Assessment of mitigation alternatives and estimation of abatement costs for land use, land use change and forestry (LULUCF).	No change	Output 1.5: Assessment of mitigation alternatives and estimation of abatement costs for land use, land use change and forestry (LULUCF).	
	Output 1.6: Assessment of mitigation alternatives and estimation of abatement costs for the Waste Management Sector.	No change	Output 1.6: Assessment of mitigation alternatives and estimation of abatement costs for the Waste Management Sector.	
	Output 1.7: Assessment of GHG emission reduction potential and estimation of abatement costs for cross-	No change	Output 1.7: Assessment of GHG emission reduction potential for cross-sector mitigation alternatives	

OUTPUTS				
Components and results	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
	sector mitigation alternatives.			
	(The chapeau for outputs 2.1 and 2.2[26] was classified as an outcome, which is not consistent with the UN Environment ToC definition)	The chapeau for output 2[27] the ProDoc classified as outcome 2 is now output 2[28].	Output 2: Conducted integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification (MRV) of proposed mitigation alternatives	Output 2 integrates all sectoral exercises done under output 1, ensuring all positive and negative synergies between sectoral actions are modeled and estimated.
	Output 2.1: Testing MRV and integrated analysis of GHG emission abatement alternatives in an optimization model comprising all energy chains and all GHG emitting sectors analyzed for Brazil.	No change	Output 2.1 Testing of MRV of mitigation alternatives. Integrated analysis of GHG emission abatement alternatives in an optimization model comprising all energy chains and all GHG emitting sectors.	
	Output 2.2: Analysis of the impacts of low carbon	No change	Output 2.2 Analysis of the impacts of low carbon policies	

[26] Integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification (MRV) of proposed mitigation alternatives
[27] See footnote above
[28] See first row of next column

OUTPUTS				
Components and results	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
	policies on the Brazilian economy.		on the Brazilian Economy.	
	(The chapeau for output 3.1[29] was classified as an outcome, which is not consistent with the GEF definition)	The chapeau for output 3[30] the ProDoc classified as outcome 3 is now output 3[31].	Output 3. Capacity building of federal and state and 2014 FIFA World Cup host cities level institutions and civil society organizations on climate change mitigation actions	The capacity building activities aim at providing key stakeholders with knowledge to actively participate in project discussion and to facilitate and promote identification, planning, implementation and MRV of mitigation action by all relevant stakeholders at federal, state and city levels.
	Output 3.1: Targeted training of federal and state level institutions, as well as 2014 FIFA World Cup host cities and civil society organizations, on climate change mitigation actions.	No change	Output 3.1. Targeted training of federal and state level institutions, as well as 2014 FIFA World Cup host cities and civil society organizations, on climate change mitigation actions.	
Driver: external conditions necessary for project results to lead to next-level results, over which the project has a certain level of control e.g. strong support from other development	Not defined	A driver between the outputs and the outcomes has been defined in the reconstructed Theory of Change.	Driver 1: Relevant stakeholders (ministries and public agencies-city, state and federal level, private sector representatives – industry, energy, transport, residential and services, LULUCF, waste - and NGOs are adequately engaged and have access to project outputs and	By adequately engaged, the evaluation team understands an engagement that is performed in different stages of project/policy planning and implementation. This engagement should facilitate receiving inputs from stakeholders at an early stage and discussing results and integrating comments at later stages.

[29] Capacity building of federal and state level institutions (including 2014 World CUP) and civil society organizations on climate change mitigation actions

[30] See footnote above

[31] See first row of next column

OUTPUTS				
Components and results	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
partners in-country, public pressure on policy makers and			information.	The evaluation team believes that all entities represented in the Brazilian Forum on Climate Change need to be adequately engaged. The public members of the Forum are determined by a Presidential Decree (current Decree in force is Decree 9082 of 26 June 2017). These are[32]: Ministries[33] – Environment; President Office; Defense; Exterior Relations; Finance; Transport, Ports and Aviation; Agriculture, Livestock and Feeding; Education; Health; Industry, External Trade and Services; Mines and Energy; Planning, Development and Management; Science, Technology, Innovation and Communication; National Integration National agencies and regulatory authorities: Water (ANA); Electricity (ANEEL); Oil, Natural Gas and Biofuel (ANP); Civil Aviation (ANAC); River Transportation (ANTAQ); Land Transportation (ANTT); Transport Infrastructure (DNIT); Railways infrastructure (VALEC); Airport Infrastructure (INFRAERO); Logistics

[32] Entities in bold are particularly important for GHG mitigation policy and for the subject of this Project.
[33] While the Ministry of Cities is not part of the Forum, the interviews showed its relevance in particular in relation to transport, but also residential and services. It should also be noted that the State level governments play an importante role, namely through their respective State Secretariats for the Environment. Existing coordination mechanisms between Federal and State level governments should be enhanced and used for this purpose.

OUTPUTS				
Components and results	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
				(EPL); Project Financing (FINEP); Space Science (INPE); Energy Research (EPE)34 Other public authorities: Chamber of parliamentarians; Federal Senate; Mayor of State Capital Cities; General Attorney and the following financial institutions: Central Bank of Brazil; Banco do Brazil; Caixa Econômica Federal; Banco do Nordeste do Brasil and Banco da Amazônia. The president will invite representatives of NGOs[35], the private sector[36] and from Academia[37] to be members. The driver[38] between output 3 and outcome 3 is specifically related to engaging the right staff in the trainings. In the scope of output 3[39], institutions at city level[40] are more relevant than at the level of the other two outputs.
Assumption: external conditions	Not defined	An assumption has been proposed between the	Assumption 1: political and institutional stability allow for an	In accordance with the interviews, the institutional set up for the climate change

[34] While not listed, the follwoing entities are also deemed important: EMBRAPA - Brazilian Agricultural Research Corporation; IBAMA – Brazilian Institue for the Environment and Natura, Resources; ABC – Brazilian Cooperation Agency; ABDI – Brazilian Agency for Industrial Development.
[35] The following seem to be the most relevant NGOs: ABENGO, in particular its members WWF and WRI; Instituto Clima e Sociedade; Observatório do Clima; ICLEI.
[36] The following seem to be the most relevant representatives of the private sector. For the industry sector: National Industry Confederation; sectoral associations, in particular, cement (SNIC), steel, glass, textile, food and beverage, chemicals (ABIQUIM). For the Energy Sector: energy associations – oil and gas as well as renewables; Petrobras. For the AFOLU Sector CNA - Agriculture and Livestock Confederation. For the waste sector, ABRELPE (waste management associataion). For transportation, residential and services, no specific, outstanding private sector representatives have been identified.
[37] Rede Clima and the Painel Brasileiro de Mudanças Climáticas (Brazilian Climate Change Panel) gather all scientific organizations and individuals relevant to climate change.
[38] Driver 1 : Relevant stakeholders (ministries and public agencies- city, state and federal level, private sector representatives – industry, energy, transport, residential and services, LULUCF, waste - and NGOs are adequately engaged and have access to project outputs and information.
[39] Capacity building of federal and state level institutions (including 2014 World CUP) and civil society organizations on climate change mitigation actions
[40] Given the size of Brazil, only bigger cities should be considered here, namely State capitals.

OUTPUTS				
Components and results	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
necessary for project results to lead to next-level results, over which the project has no control e.g. turn-over of government officials, global financial situation, technological advances.		outputs and outcomes in the reconstructed Theory of Change.	ordinary policy making process.	policymaking could be up for review. In addition, the upcoming presidential elections cast an additional layer of uncertainty, as it makes it even unclearer if, and when, such a review will take place. Finally, due to upcoming presidential elections, it is likely that the discussion of climate change mitigation policy may not take place before mid-2019 (this means that the "endorsement" foreseen in outcome 1 may be delayed up to then.

Table 5 - Project components and results as per the ProDoc and ToC at evaluation – Outcome Level

OUTCOMES				
Components and results:	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
Outcome: changes in stakeholder capacity resulting from outputs e.g. increased awareness, improved knowledge or skills, positive attitudinal and motivational changes, institutional or policy changes, availability of financing (UN Env ToC)	Outcome 1: Mitigation alternatives identified and their respective potentials and costs quantified for the periods 2012-2035 and 2035-2050	Log frame outcome 1 has been shifted to Output 1 in the reconstructed Theory of Change (see table above on outputs). A new outcome 1 has been defined in the scope of the reconstructed theory of change (see next column).	Outcome 1. Acceptance and endorsement of project findings in relation to GHG mitigation technologies, potentials, costs, and economic tradeoffs by government, civil society, private sector and funders	By acceptance, the evaluation team understands that the stakeholders mentioned know, recognize the quality and engage in discussions based on the outputs. This does not require stakeholders to fully accept each specific finding, result or proposal. Endorsement is related in particular to government stakeholders and is materialized by the use of the outputs in the decision- making process.
	Outcome 2: Integrated analysis of the different mitigation alternatives in an	Log frame outcome 2 has been shifted to Output 2 in the reconstructed	Outcome 2. Endorsement of project recommendations for policies and strategies to	Endorsement is materialized by the use of the outputs in the decision- making process.

OUTCOMES				
Components and results:	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
	integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification (MRV) of proposed mitigation alternatives	Theory of Change (see table above on outputs). A new outcome 2 has been defined in the scope of the reconstructed theory of change (see next column).	overcome barriers to mitigation by the Brazilian Forum on CC, the CC Committee and the CC Executive Group	This endorsement already took place at the level of the Brazilian Climate Change Forum (a presidential advisory body, composed of all relevant stakeholders invited by the president).
	Outcome 3: Capacity building for federal, state and 2014 FIFA World Cup host cities government institutions, as well as civil society organizations, for implementation of mitigation actions for GHG emissions in key economic sectors	Log frame outcome 3 has been shifted to Output 3 in the reconstructed Theory of Change (see table above on outputs). A new outcome 3 (with two parts) has been defined in the scope of the reconstructed Theory of Change (see next column).	Outcome 3a). Increased technical capacity in public and civil society organizations at federal, state and city level on mitigation actions[41] and their MRV Outcome 3b) Increased use of SIRENE by technicians at city, state, federal level for mitigation action planning and MRV	3a) Public organizations are to understand mitigation action in their respective field (understand GHG emissions and how they can be reduced, identifying barriers and ways to overcome them) and are to understand the systems, processes and methodologies to measure, report and verify those actions. A level of awareness and knowledge about mitigation and MRV is also required of relevant civil society in order to facilitate and promote the implementation of mitigation action and the collection of the

[41] Increased capacity in relation to the design and implementation, in addition to the MRV already explicitly referred to in the outcome.

OUTCOMES				
Components and results:	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
				relevant data for MRV purposes. Such organizations include most importantly, the private sector (taking into account its role in adopting low carbon technologies). 3b) SIRENE is a tool containing all relevant national data for GHG emissions, including assumptions and emission factors. The use of this information by all dealing with mitigation action planning and MRV, will enhance consistency and comparability across the different levels of planning and implementation.
Driver external conditions necessary for project results to lead to next-level results, over which the project has a certain level of control e.g. strong support from other development partners in-country, public pressure on policy makers	Not defined	A driver between outcomes 1 and 2 and intermediate states 1 and 2 been defined in the scope of the reconstructed theory of change.	Driver 2: Relevant Stakeholders (ministries) are adequately engaged and have access to project outputs and information.	While the project cannot control whether or not all relevant ministries are adequately engaged in the decision-making process (e.g. at the level of the Interministerial Committee on CC), it can control whether or not they have access to project data and information. In addition to the reports (for the outputs), the project has constructed an accessible database and MCTI has entered an agreement with Ministry of Finance for use of data.
Assumption external conditions necessary for project results to lead to next-level results, over which the	Not defined	Three assumptions have been proposed between outcomes and intermediate states and one additional assumption is being	Assumption 1: Political and Institutional stability for an ordinary policy making process	In accordance with the interviews, the institutional set up for the climate change policymaking could be up for review. In addition, the upcoming presidential elections cast an additional layer of uncertainty, as it makes even unclearer if

OUTCOMES				
Components and results:	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
project has no control e.g. turn-over of government officials, global financial situation, technological advances.		proposed specifically between Outcome 3 and Intermediate State 3.		and when such review will take place. Finally, due to the presidential elections, it's likely that the discussion of climate change mitigation policy may not take place before mid-2019 (this means that the "endorsement" foreseen in outcome 1 may be delayed up to then.
			Assumption 2: Engagement during the policy making process promotes buy in, including private sector	See comments to Driver 1.
			Assumption 3: Brazil's commitments under the Paris Agreement hold	This assumes that the Paris Agreement remains in force and that Brazil remains committed to moving forward on climate change reduction goals, including those in its current and subsequent NDC.
			Assumption 6: public institutions at city, state and federal level maintain technical capacity despite turnover.	This assumption applies specifically between Outcome 3 and Intermediate State 3. It assumes that, even if the staff which has been trained directly by the project leave the organization, there are mechanisms in place that ensure knowledge has cascaded down to people remaining or entering the organization.
Intermediate State: changes required in between project outcomes and impact, e.g. wide-scale adoption of improved natural resource	Not defined	Four intermediate states have been proposed in the reconstructed theory of change.	Intermediate State 1. Mitigation policies adopted /enacted for each of the 5 sectors and for cross-sector alternatives	This intermediate state means that the decision-making process was successfully completed and that GHG mitigation policies have been adopted in accordance with Brazilian Law.
			Intermediate State 2. Mitigation policies implemented for each of the sectors - energy;	This intermediate state follows intermediate state 1 and implies that the policies adopted are now being

OUTCOMES				
Components and results:	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
management practices, country-wide shift towards renewable energy sources			transport; household and services; AFOLU, waste- and for cross-sector alternatives	implemented (see assumptions 4 and 5).
			Intermediate State 3. Mitigation policies MRVed	This intermediate state follows intermediate state 2 and implies that each policy is being subject to measurement, reporting and verification, thus providing feedback to the policy making process (intermediate state 1) as to their respective effectiveness. In this intermediate state, all stakeholders have access to information about the positive and negative impacts of the policies, not only in terms of GHG emissions reductions, but also in terms of costs and other co-benefits (see assumption 6).
			Intermediate State 4: Transformational change[42] in all sectors	Intermediate State 4 is a consequence of successful cycles of intermediate states 1 to 3. The following are brief illustrations of what transformational change could entail for each of the sectors: Industry: Emissions reduced in key sectors; / efficiency in heat /steam recovery & conversion thermal energy and end of life equipment replacement, R&D towards green products Energy: Reduced emissions from energy installations, (ex oil and natural gas E&P

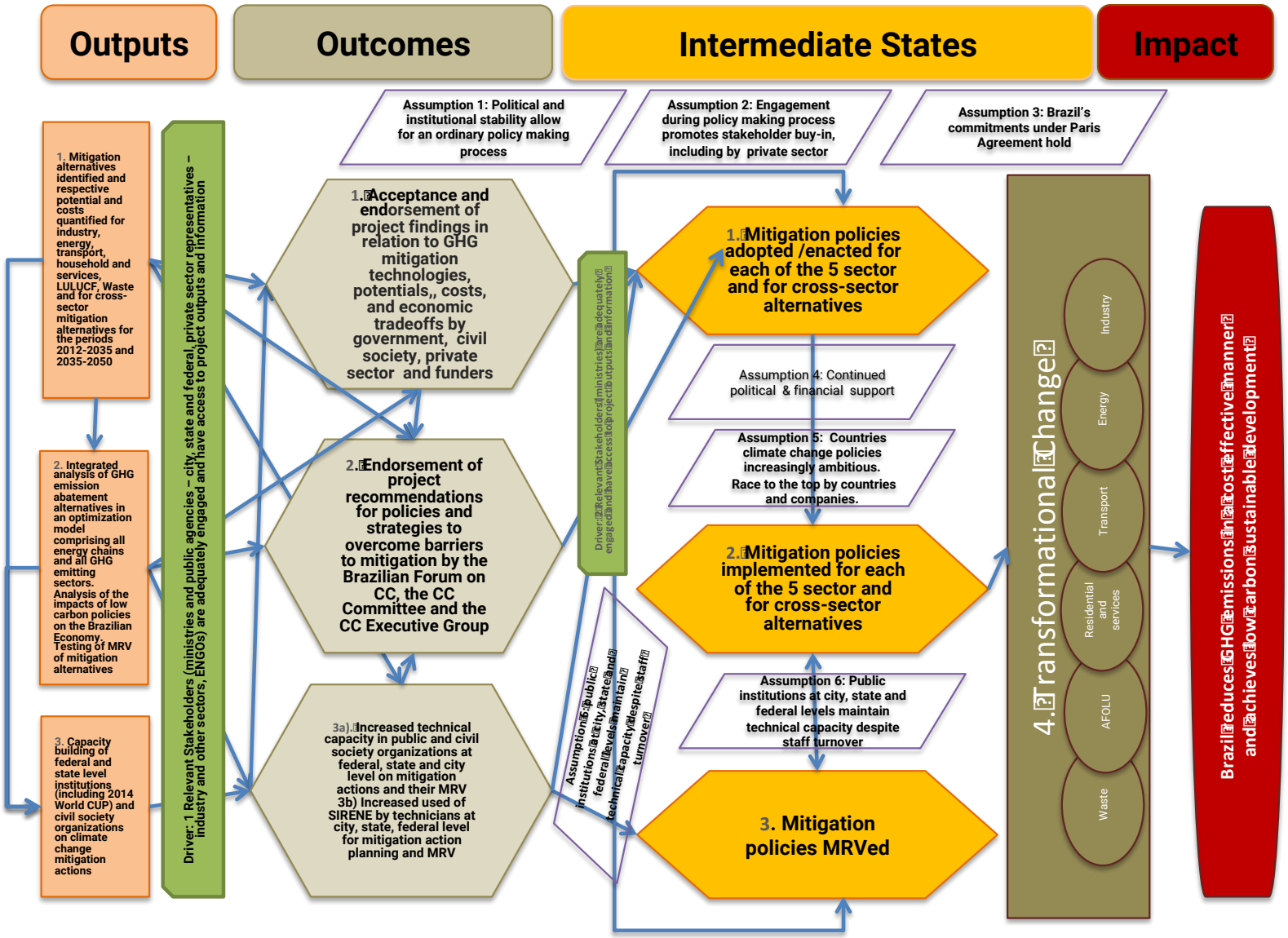
[42] Transformational change can be defined as "a structural change that alters the interplay of institutional, cultural, technological, economic and ecological dimensions of a given system. It will unlock new development paths, including social practices and worldviews (www.giz.de/expertise/downloads/giz2014-en-climate-finance-shifting-paradigms.pdf)

OUTCOMES				
Components and results:	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
				installations & oil refineries) through measures such as fugitive emissions and flare burning controls; renewable energy competitive and widely available including increased use biomass and bagasse; long term energy planning decision have not locked the country in high carbon intensity technologies, increased energy efficiency at production, distribution and consumption levels. Transport: modal shifts have occurred to more collective/public transport, change of freight to rail & waterways, new technologies and energy efficiency / renewable energy sources in transit systems, Residential and services: increased energy efficiency/ self-sufficiency based on renewable sources; increased use measures such as climate control efficiencies, photovoltaic panels, improved efficiency domestic cooking/LPG stoves AFOLU: increased deforestation through measures including validation of the Rural Environmental Registry, enforcement actions and Payment for Environmental Services, expanded commercial forest planting expansion/recovery degraded pastures for cattle raising. Waste: Reduced emissions through increased use of MSW bio-digestion for energy, landfill biogas for electricity and use of landfill biogas for energy generation

OUTCOMES				
Components and results:	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
				by flare. Cross Sector: increased carbon pipeline network and carbon capture particularly in project identified sectors (for example ethanol distillation)
Assumption: external conditions necessary for project results to lead to next-level results, over which the project has no control e.g. turn-over of government officials, global financial situation, technological advances.	Not defined	Two assumptions between intermediate states 1 and 2 and one assumption between intermediate states 2 and 3 have been proposed in the reconstructed Theory of Change.	Assumption 4: Continued political and financial support.	Political support refers to high-level political leadership in relation to a low carbon development. Financial support means that both national and international, public and private sources of financing channels funds towards the implementation of GHG mitigation policies.
			Assumption 5: Countries' climate change policies are increasingly ambitious and there is a race to the top by countries and companies.	The Paris Agreement and/or other pressures continue to drive all countries and Brazilian stakeholders and companies into adopting ever more stringent and ambitious GHG emissions reduction policies.
			Assumption 6: public institutions at city, state and federal level maintain technical capacity despite turnover.	See above.
Impact: long term changes in environmental benefits and human living conditions e.g. reduced human-caused global warming, conserved biodiversity,	Not defined	A project impact has been proposed in the reconstructed Theory of Change.	Brazil reduces GHG emissions in a cost-effective manner and achieves low carbon sustainable development	Brazil emissions become consistent not only with its contribution to the global goal enshrined in the Paris Agreement as well as sectoral reduction potentials outlined in the project

OUTCOMES				
Components and results:	**Component in the ProDoc**	**Changes from ProDoc to ToC at Evaluation**	**Component in the ToC at Evaluation**	**Comments**
improved water quality;				

Figure 4 – Theory of Change at Evaluation



60. In the context of this Theory of Change it is also important to highlight the fact that **two Impact Pathways** have been identified: Impact Pathway One: Policy Development and Impact Pathway Two: Strengthened Capacity

Impact Pathway 1: Policy Development – from Outputs 1 & 2 to Project Impact.

61. **Outputs 1 & 2** are similar in nature as they reflect the scientific and technical analysis performed in the scope of the project and are materialized in a set of comprehensive reports. Both outputs have a similar contribution to Outcomes 1 and 2, provided that (Driver 1) the relevant stakeholders (ministries and public agencies – city, state and federal, private sector representatives – industry and other sectors, NGOs…) have been adequately engaged during project implementation and that they have access to project outputs and information[43].

62. **Outcomes 1 and 2 directly contribute to Intermediate State 1** – Mitigation policies adopted /enacted for each of the five sectors and for cross-sector alternatives. In this step of the pathways, Driver 2 (Relevant Stakeholders – Ministries – are adequately engaged and have access to project outputs and information) and Assumptions 1 (political and institutional stability allow for an ordinary policy making process to take place) and Two (engagement during policy making process promotes stakeholders buy-in, in particular from private sector - industry) are required.

63. **Intermediate State 1 is directly linked with Intermediate State 2**(Mitigation policies implemented for each of the 5 sectors and for cross-sector alternatives). Assumptions 4 (Continued political support and national economic/financial situation allow for increased climate financing) and 5 (The Paris Agreement is effective; countries' policies are increasingly ambitious and there is a race to the top by both countries and companies), need to be met in order for policies to transition from adoption to implementation.

64. **Intermediate State 3** (Mitigation Polices Monitored, Reported and Verified), follows directly Intermediate State 2 and is dependent on Assumption 6 (Public institutions at city, state and federal levels maintain technical capacity despite staff turnover). Intermediate State Three provides feedback into Intermediate States 1 and 2. Intermediate State 2 **delivers Intermediate State 4 (**Transformational Change in GHG emitting sectors), provided that Assumption 3 (Brazil's commitments under the Paris Agreement hold) is in place and, thus, project impact is achieved.

Impact Pathway 2: Strengthened Capacity

65. **Output 3, based on inputs from Outputs 1 and 2 (plus additional information) delivers Outcome 3a**): Increased technical capacity in public and civil society organizations at federal, state and city level on mitigation actions and their MRV and Three b) Increased used of SIRENE by technicians at city, state, federal level for mitigation action planning and

[43] While the communication plan of the project outputs is not clear – as far as the evaluation team is aware, it may be limited to a public event and their publication in a website. The provision of access to project information and data seems to be granted through a dedicated online database.

MRV). Required between Output 3 and Outcome 3, Driver 1 (Relevant stakeholders - ministries and public agencies at the city, state, federal levels as well as private sector representatives – industry and other sectors, Environmental NGOs…- have been adequately engaged during project implementation and that they have access to project outputs and information".

66. Outcome 3, which profits from Outputs 1, 2 and 3, contributes to Outcomes 1 and 2, as technical capacity enhances acceptance and, consequently, endorsement. In this context, outcome three also contributes directly to Intermediate State 1, provided Driver 2: Relevant stakeholders are adequately engaged and have access to project outputs and information is present and Assumption 6 public institutions at city, state and federal level maintain technical capacity despite turnover holds.

67. **Outcome 3 contributes directly to Intermediate State 3**, taking into account Assumption 6. Intermediate State 3 provides input to Intermediate State 1 and 2 and from Intermediate State 2, Intermediate State 4 and Impact are reached.

68. Impact Pathways 1 and 2 interact at several points:
    - Outputs 1 and 2 (Impact Pathway 1) are inputs to Output 3 (Impact Pathway 2)
    - Outcome 3 (Impact Pathway 2) contributes to Outcomes 1 and 2 (Impact Pathway 1)
    - Outputs 1 and 2 (Impact Pathway 1) contribute to Outcome 3 (Impact Pathway 2)
    - Intermediate States 1, 2, 3 and 4 are common to both pathways.

5. Evaluation Findings

5.1. Strategic Relevance

69. The project is fully aligned with UN Environment's Mandate, Medium Term Strategy and Thematic Priorities and with its capacity building and South-South cooperation policies; with regional, sub-regional and national priorities; with donor and funding agencies priorities and is complimentary with other relevant initiatives identified by the evaluation team. Therefore, its strategic relevance is rated *Highly Satisfactory* according to the UN Environment Evaluation Office Criterion Ratings Matrix.

70. The project is extremely relevant for national priorities as it supports the country's efforts to define and implement the nationally determined contribution (NDC) under the Paris Agreement. There are several important synergies and complementarities between the project and other projects, such as the MAPS/IES-Brazil and the World Bank's Partnership for Market Readiness. The project has used information from the National GHG Inventory and is producing information, which may be relevant for future editions. Finally, one of the projects last activities aimed at sharing project results and methodologies with Portuguese-speaking developing countries, thus fulfilling the requirement for South-South Cooperation

5.1.1. UN Environment's Mandate, MTS and Thematic Priorities, POW

71. The project's design and implementation were aligned with UN Environment's mandate to establish standards for environmental policy and the Medium-Term Strategy (MTS) for 2010 to 2013 and 2014-2017. This project aligns with the thematic priority on climate change, particularly the objective to "strengthen the ability of countries to integrate climate change responses into national development process" (UNEP MTS 2010-13). With respect to the 2014-2017 MTS, the project was again aligned with the objectives in the climate thematic priority in terms of "strengthening the ability of the county to work towards low emissions pathways for sustainable development and human well-being" as well as working for moving Brazil towards "low emissions growth" (UN MTS, 2014-17). The Programme of Work for 2012-13 (POW), when the project was launched, supports science policy linkages and regional office work on climate change mitigation and adaptation which is clearly aligned with the strategy of this project (UNEP POW, 2012-2013). The project is also aligned with subsequent Programmes of Work (adopted during project implementation) on areas such as moving forward on climate change in terms of low emissions development and planning to reduce emissions from deforestation. Project-supported long and short -term capacity and skills on climate change mitigation also align with the Bali Strategic Plan for Technology Support and Capacity Building in Developing Countries. The project also addresses goals of having countries identify their own needs in capacity and technology based on their own environmental priorities.

5.1.2. Donor Priorities

72. This project clearly is aligned with the area of mitigation within the GEF 5 priority strategy framework (2010-4). Within this area, the strategy highlights an emphasis on "priority sectors, technologies, and activities identified by the countries themselves" (GEF-5). The strategy also places an emphasis on building technical and institutional capacity at national level, as well as a sectoral focus on areas including buildings, industry and transport. The project works on the sectors the GEF strategy prioritized creating a favorable policy and regulatory environment for renewable energy and promoted LULUCF activities aimed at "reducing forest emissions and promoting forest conservation, afforestation and reforestation, and sustainable forest management". The project thus seemed to be in alignment at the time of its formation with these general objectives with respect to the GEF donor agency.

73. While the project generally aligned well with donor and national priorities, the evaluation team did not find evidence of a gender analysis or gender-responsive results framework, in accordance with the GEF Gender Equality and Mainstreaming Policy (2011) requiring that all new projects conduct a gender analysis and be aligned with a gender responsive results-based framework (GEF, 2015).

5.1.3. Relevance to Regional, Sub-regional and National Priorities

74. While covering an ambitious economy wide GHG mitigation analysis across seven sectors, the project was also extremely relevant to national priorities which aim at fully delivering the GHG emissions reduction target included in the Nationally Determined Contribution submitted under the Paris Agreement.

75. The project builds upon current climate change policies (the Sectoral Plans – Planos Setoriais of the National Policy on Climate Change (PNMC)) and contributes to the definition and implementation of the nationally determined contributions under the Paris Agreement. The project builds upon the National Plan and national climate change policy (Law No 12. 187/2009 adopted in 2009) furthering Brazil's intention to design sectoral plans on mitigation. This plan, in Article 12 articulated the intention of the country to pursue voluntary actions for the mitigation of greenhouse gas (GHG) emissions and intention to reduce emissions by 36.1%-38.9% by 2020. Analysis references ways the project works with targets presented in policies and plans including the Sector Plan for Mitigation and Adaptation to Climate Change for the Consolidation of a Low Carbon Economy Economy (ABC Plan) (MMA, 2008) (1990), National Plan for Logistics and Transport (PNLT), National Water Resources Plan (PNRH), Ten Year Energy Plan 2024, National Plan for Basic Sanitation (Plansab), National Solid Waste Policy (PNRS), Growth Acceleration Program (PAC) among others (MMA, 2006, 2010, MT, 2012, MC, 2013, MP, 2017).

76. Numerous interviews with various government agencies and other stakeholders point to the project's relevance and alignment with national goals and priorities. One Ministry indicated that the "project was a success in giving us a range of products that provide more subsidies to the Government to formulate the implementation strategy of the NDC, which are our national goals. So, the project brings this wealth of information, brings benefits, provides information to the government in formulating the NDC's." The various reports and

analysis referred to built on a wide range of national subsector policies and plans (the Sectoral Plans).

77. Several states (such as Paraiba, Rio de Janeiro and São Paulo) have targets to reduce GHG emissions while others articulate intentions to stabilize or reduce GHG emissions and provide for creation of mitigation plans that will establish GHG emissions reductions goals. At the city level, São Paulo had climate change policies in place well before the project and other cities such as Belo Horizonte, in Minas Gerais, Feira de Santana, in Bahia, Recife, in Pernambuco and Rio de Janeiro, in Rio de Janeiro have seen legislative action on the topic in the period between 2011 and 2014. The four cities of Belo Horizonte, Recife, Rio de Janeiro and São Paulo have clear deadlines and targets for reducing GHG emissions. The project has contributed to building the capacity of state and city staff, at the same time as it makes available to policy makers a set of technologies and/or policy recommendations that can be used in state/city level climate change policy (for example, waste management technologies and public policies required to remove any barriers).

5.1.4. Project Complementarity or Duplication

78. The project has important complementarities/ similarities with a number of projects – MAPS/IES Brazil, PMR and GHG Inventory. No duplication of effort has been identified between the initiatives. The project results will be used by the PMR project and the project received input from the GHG inventory and will feed its results back to it.

79. The Mitigation Action Plans and Scenarios (MAPS)/IES Brazil process that emerged from a collaborative project amongst developing countries helps establish the evidence base for "long-term transition to economies that are both carbon efficient and climate resilient." Although both MAPS and this project h followed collaborative processes, this project was "more targeted at informing the government", while the MAPS project was described by some as more "stakeholder driven, involving more work with NGO's and trade unions" (Fourth Technical Committee, 2014). Based on interviews, there is some evidence of informal and limited exchange between the projects, as well as some competition and occasional confusion in civil society about project differences. Feedback indicates the two projects could have been more complementary if design and implementation structures and timing of both projects allowed this project to provide inputs to the MAPS country process in Brazil (IES-Brazil). The IES initiative was similar to the GHG project because it involved different sectors of Brazilian society working with experts to identify distinct developmental trajectories that align social, economic and environmental goals with scenarios for 2020-2030 and 2030-50. It also identified mitigation policies that address economic and social impacts. Some stakeholders indicated that the main difference between the two projects was in terms of the emphasis and approach. Due to a later than anticipated start, the IES project produced modeling tools that this project envisaged doing but later revised the workplan accordingly.

80. Another project mentioned in interviews with synergies was the World Bank Initiative, Partnership for Market Readiness (started 2015), aimed at the preparation and implementation of climate change mitigation policies—including carbon-pricing instruments to scale up GHG mitigation. As a result of the collaboration between MCTI, the project team and the Brazilian Ministry of Finance, this project explores options for various types of carbon pricing schemes in order to select suitable instruments for implementation

and to build national MRV capacity. The Partnership for Market Readiness uses the same background data from the project.

81. Interviews highlighted alignment with the national Brazilian Greenhouse Gas Inventory. Interviews affirmed that the project used the same emissions factors in the base year to the Brazilian Greenhouse Gas Inventory. Any differences were explained and justified in detail by the project reports, a reliable reference for future inventories in Brazil (based on an assessment of sample reports' technical quality and perceived utility).

5.1.5. South-South Cooperation

82. As a topic of the project steering committee meeting attended, examples of South-South cooperation included a project- sponsored workshop, MRV of GHG Emissions in the Countries of the CPLP, held in October 2017 in Brasilia to share draft reports of project results with representatives of Angola, Cape Verde, Guinea Bissau, Equatorial Guinea and Sao Tome. Later project extensions also facilitated opportunities for additional types of South-South cooperation. The Project Steering Committee discussed the fact it would be important to profit from the opportunity of Brazil taking over the Presidency of the Community of Portuguese Language speaking countries in the last year of the project.

83. In sum, the project rates *Highly Satisfactory* on Strategic Relevance, based on its alignment with UN Environment's mandate, Brazilian national climate change policy and targets, city level policy and synergies with other projects as well as contribution to South-South cooperation.

Rating of Strategic Relevance: Highly Satisfactory

5.2. **Quality of Project Design:**

84. The Project's Design is *Satisfactory* according to the UN Environment Evaluation Office Criterion Ratings Matrix. This is consistent with the assessment performed in the scope of the inception report. The specific criteria were scored with Strategic Relevance, Governance and Replication/Catalytic Effects with the highest ratings and Context with the lowest ratings. After weighting, the rating was as follows (from highest to lowest score): Replication and Catalytic Effects; Intended Results and Causality; Strategic Relevance, Logical Framework and Monitoring; Partnerships; Governance and Supervision Arrangements; Financial Planning/Budgeting; Learning, Communication and Outreach; Nature of External Context; Project Preparation; Efficiency; and Risk Identification and Social Safeguards.

85. The project is fully owned and driven by the country both at design and at implementation, with all the official channels and procedures properly established (the Steering Committee is in place where the Brazilian Government – through the Brazilian Cooperation Agency, oversees project implementation and ensures it's aligned with national priorities and interests). This had a clear positive effect in achieving outputs, as all involved in the project recognized its importance to the country.

86. During this phase of the evaluation, namely through the interviews, the following additional issues were explored: the appropriateness / justification for the integration of the FIFA Soccer World Cup Host Cities in the project; the ambitious inclusion of the sectors of industry, energy, transportation, residential and services, Agriculture, Forestry and Other Land Use (AFOLU)[44], waste management and other cross-sector alternatives; the revision of indicators to ensure they're SMART and the time (or lack thereof) to disseminate results.

87. The integration and emphasis on the 2014 FIFA World Cup host cities was because this issue was high on the public agenda in the period when the project was conceptualized and was therefore key to align project with national interests and priorities at the time. However, delays in getting the project off the ground led over time to some questioning the relevance of this component because the World Cup process was ending when much of the project was still to be implemented.

88. The project had such a wide scope (seven sectors, plus cross-sectoral alternatives) because the deep inter-relatedness of the sectors needed to be considered to have a clear sense of the economic impact of mitigation options. (An example given was that ethanol use relates to agriculture, transportation and industry). The movement towards integrated analysis and the need to think about the economy as a whole was viewed as an important and cutting-edge aspect of the project.

89. Related to project goals and indicators, there was discussion about the fact that these have had to be revised during project implementation to be more specific, measurable, realistic and timebound (SMART). Given the fact that many of the public policies emerging from project recommendations will only be implemented through integration into changes in policy which will happen over the course of the next one to six years, project indicators had to be reformulated in order to fit within the time limits of the project. While there was an attempt to scale down the project, the change in language of the project indicators which took place through the project revision in 2016, to place emphasis in the objective on number of policy instruments "proposed", may have been realistic in terms of lessening demands for the project to take on full responsibility for the political process, however it is important to recognize that the challenges of moving instruments through the policy adoption process still remain. Some challenges with the original formulation and wording of the projects outcomes should have been flagged at the design stage. These challenges included cumbersome wording and phrasing which needed to be improved to reflect the differentiation between outputs than outcomes, based on the definitions for these concepts by UN Environment (output as a service and product delivered; outcome as a change in stakeholder capacity resulting from an output (see Table 4)

90. It was also discussed that the time allocated to disseminate the final products of the project was potentially not adequate taking into account the amount of highly relevant and complex information produced. The intense engagement with stakeholders, namely public stakeholders, throughout project implementation, compensates for this.

[44] This sector was previously referred to as Land use, land-use change and forest (LULUCF)

91. Less attention to human rights and gender equity has been attributed to a variety of factors including: a) the fact that this was reported to be less of an emphasis in the period when the project was designed; b) the perception of need for emphasis of the project to deal with the economy "as a whole"; c) the fact that more of the groups working on these issues are focused on adaptation versus mitigation; and d) the original assessments that did not flag this as an issue. In Brazil, issues related to, in particular, agriculture, forestry and energy (namely dams), may have important impacts on indigenous communities, and although at least two groups representing these interests were present in the Brazil Forum where project presentations occurred, and technical teams at the universities conducting analysis include this representation, there were reports in the interviews that the project did no "special consultation" with indigenous group leadership or groups focused on gender.

Rating of Quality of Project Design: Satisfactory

5.3. Nature of External Context

92. The nature of the external context is rated as *favorable* to the project. The research and policy focus of the project did not make it particularly vulnerable to climate or extreme weather events; therefore, they had zero impact on the project. Despite challenging political and economic contexts – with a successful presidential impeachment process taking place at the same time as a deep economic and financial crisis - these did not have a significant negative impact on the project implementation, although the uncertainty may affect sustainability (See Section 5.7). It is expected that the policy making process in Brazil will now enter a slow phase, in anticipation of the 2018 presidential elections, which may lead to delays in the use of project outputs in the adoption of new GHG mitigation policies. The climate change institutional set up may also change after the elections, but it is not expected to change its inter-ministerial nature.

93. The project implementation phase spanned one Presidential election in Brazil in 2014 and later early termination of the president's term (due to impeachment) and replacement by the vice-president. During the early phases of the project preparation, Presidential elections and reorganization of MCTI led to delays in CEO endorsement from April 2010 to February 2012. In 2014 the Presidential incumbent was returned to power. There were reports that the political situation in Brazil was very unstable during the Presidential impeachment process (up to May 2016) and that, at times, the changes in various Ministries impacted attendance at Technical Consultative Committee meetings.

94. In accordance with interviews, reported tensions between MCTIC and the Ministry of Environment had some affect on aspects of project contributions to the Paris Climate Change agreement negotiations. Project contributions were made known to negotiators.

95. Some interviews mentioned a shift in the public mood, which will influence the policy agenda towards more concrete issues related to the economy and political corruption versus potentially more diffuse issues such as in climate change.

96. Throughout the life of the project, challenges with the overall Brazilian economic landscape also had some impacts on the project, both positive and negative. There were some

positive implications of the economic crises in Brazil that started in 2015 and continued through 2017 that resulted in a devaluation of Real (Brazilian currency). This created a budget surplus in national currency, which, in turn, was used to fund additional activities (including the participation of experts from Portuguese speaking African countries in the final seminars - south-south cooperation - and an online database with project information, an important driver to ensure the pathway to project impact). On the other hand, the economic crises experienced by the country also resulted in the need to revise some of the economic modeling activities, thus impacting the timeliness of the delivery, but contributing to the quality and relevance of the output.

97. The nature of the External Context on the Project is *Favorable* according to the UN Environment Evaluation Office Criterion Ratings Matrix since there is evidence that only two out of five possible impact areas (politics and economic conditions) had some influence on the project.

Rating of Nature of External Context: Favorable

5.4. Effectiveness

98. The evaluation assessed effectiveness across three dimensions: delivery of outputs, achievement of direct outcomes and likelihood of impact. Ratings are based on an assessment of the delivery of outputs, achievement of outcomes and likelihood of impact based on the Theory of Change at Evaluation (see. Table 4 and Table 5 and Figure 4). The evaluation team based its technical assessments on a sample of reports and executive summaries made available (see Table 6 and Table 7 for a list of publications produced and an identification of those made available to the team in a timely manner) and perceptions of utility by interviewees across all the sectors the project worked in. The final reports were available only after the evaluation was completed.

99. Effectiveness was rated *Moderately Satisfactory* based on a weighted aggregation of ratings for delivery of outputs, achievement of direct outcomes and likelihood of impact according to the UN Environment Evaluation Office's evaluation criteria ratings matrix.

100. The delivery of outputs was rated *Highly Satisfactory* as all targeted outputs were delivered, perceived to be of high utility and quality as well as having involved output users, particularly relevant government institutions, in their preparation. Additional outputs have been produced, namely the project's direct input to Brazil's Intended Nationally Determined Contribution.

101. The Achievement of Direct Outcomes was rated *Moderately Satisfactory* as the three key outcomes, assumptions and drivers discussed below feeding into the intermediate states were partially achieved, and assumptions partially hold.

102. The Likelihood of Impact was rated as *Moderately Satisfactory* based on partial attainment of key direct outcomes relevant to intermediate states, no intermediate states having been achieved and assumptions holding.

5.4.1. Achievement of Outputs

103. The achievement of the outputs was rated *Highly Satisfactory*, as all targeted outputs were delivered by the end of the project, with high levels of ownership by intended users. Despite some substantial delays in the finalization of some outputs, the overall quality of the reports was not affected and their draft versions were made available to inform related outputs/activities. In accordance with the interviews, stakeholders generally regard the outputs of the project as being of high quality, although there were a few limited instances where conclusions were not fully supported. Interviewees often praised the reputation and qualifications of consultants as another important factor linked to output quality. Stakeholders also praised highly the effectiveness of the capacity building initiatives, in particular at federal level.

104. The project included **three outputs**[45]:

- **Output 1**. Mitigation alternatives identified and respective potential and costs quantified for industry, energy, transport, residential and services, LULUCF, Waste and for cross-sector mitigation alternatives for the periods 2012-2035 and 2035-2050;

- **Output 2:** Integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification (MRV) of proposed mitigation alternatives;

- **Output 3**. Capacity building of federal and state level institutions (including 2014 World CUP) and civil society organizations on climate change mitigation actions

105. For Output 1, 21 publications were produced[46]. The end of project target of seven reports integrated and completed was achieved. For Output Two, two publications were produced[47]. For output three, 37 training events were held in Brasília, six regional training cycles concerning specifically to were held in 6 cities from 6 states. In addition, in 2014, seminars regarding GHG inventory seminars took place in twelve host cities.

106. Table 6 identifies the evidence –publications - that were publically available as of February 6, 2018 for Outputs 1 and 2. Table 8 identifies the topics and the materials available for the trainings – Output 3. Table 5 also includes reference to the executive summaries for some of the reports that were made available to the evaluation team slightly ahead of the publications being made available online.

[45] Note that these outputs were referred to as outcomes in the ProDoc.
[46] Of which, 16 were available, on February, 7 2018, at http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/opcoes_mitigacao/Opcoes_de_Mitigacao_de_Emissoes_de_Gases_de_Efeito_Estufa_GEE_em_SetoresChave_do_Brasil.html.
[47] Appendix F includes a list of all reports and publications for Output one and Output two.

107. The evidence regarding the achievement of outputs is based on a range of factors including positive feedback during the interviews, the analysis of the nine executive summaries made available during the evaluation and evidence related to the training events[48]. The list of publications for Outputs 2 and 1 made available at the MCTIC website[49] during the very latest moments of the evaluation, were also taken into account (and balanced with the other types of feedback). There is also evidence of 1014 people trained on across different levels (federal, state and city) and the implementation of a communication plan that includes a functional website to host the various reports. Since the reports were shared in full only at the end of the project, it limited the potential for full dissemination and media outreach. Barring the communications aspect of Output 3, the delivery of the majority of targeted outputs was achieved.

108. The selection of reports and executive summaries made available are substantive, with detailed sectoral discussions. Expert technical review of the reports and publications revealed clearly referenced data sources, activities and emissions, methods of GHG accounting consistent with the National GHG Inventory, and provide both methodological consistency and transparency. They are generally considered a major contribution to future studies, serving as an extensive database and methodological reference. Study limitations are presented in a direct and clear way. In comparison to previous sectoral mitigation plans[50], scientific and technical advances are clear. The reports and publications present a vast compilation of economic data that outweighs previous estimates of marginal cost of carbon abatement by sector.

109. The professionalism, skills, knowledge and work ethics of the project technical coordinator are praised by all interviewees who were asked about it. The technical coordinator played a key role in the production of the outputs and in achieving the outcomes. The importance of this role, which technically manages the project deliveries, was also praised in the steering committee by the UNEP manager as "essential for the success of the project" resulting in decisions to have a technical coordinator provided in all new projects. Generally speaking, positive assessment also extended to the remaining project team, including national coordinator(s) and consultants with high praise for both skills and experience. Although targeted for completion by October 2017, they were disseminated in full by project end. The final project public event took place in Brasilia on January 24th 2018.

[48] Additional material related to the training events were published at the MCTI website too late for its thorough review in the scope of the evaluation. Such material can be found at http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/opcoes_mitigacao/paginas/construcao_cenarios_baixo_carbono.html. The website was visited on February 7 2018.

[49] http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/opcoes_mitigacao/Opcoes_de_Mitigacao_de_Emissoes_de_Gases_de_Efeito_Estufa_GEE_em_SetoresChave_do_Brasil.html. The website was last visited on February, 7 2018

[50] Sectoral Mitigation and Adaptation Plans available at http://www.mma.gov.br/clima/politica-nacional-sobre-mudanca-do-clima/planos-setoriais-de-mitigacao-e-adaptacao

5.4.1.1. Output 1: Mitigation alternatives identified and respective potential and costs quantified for industry, energy, transport, household and services, LULUCF, waste and cross-sector mitigation alternatives for the periods 2012-2035 and 2035-2050

110. The ProDoc foresaw that for each sector (including eleven sub-sectors for industry), five independent reports (outputs) would be produced[51]:

- Sector Description and definition of Best Available Technology
- Definition of a baseline for GHG emissions
- Economic Assessment
- Innovation Analysis
- Identification of policy instruments to promote GHG abatement in the sector.

111. Interviews revealed that these five to six reports per sector, were aggregated into a single publication (see Output 1 Table 5), eventually publically disseminated at the end of January 2018 (through the website and the public event that took place in Brasilia, on January 24). The analysis of the publications available for the sectors shows that each one follows the same basic structure defined in the bullets above, with slight variations. [52].

112. The Outputs 1.1 to 1.7 are related to assessment of GHG emission reduction potential and estimation of abatement costs for each of the sectors of industry, energy, transport, household and services sector, land use, land use change and forestry, waste management and cross sector alternatives.

113. The research reports produced for these outputs were first disseminated in the form of draft reports, shared with relevant sectoral stakeholders and the overarching Technical Consultative Committee. These 102 sectoral reports as indicated above were eventually consolidated into the 21 sectoral publications and one executive summary. Stakeholder engagement, in particular public institutions (ministries and other public agencies), contributing significantly to production and acceptance. All relevant interviewees (from public institutions) mentioned the Technical Consultative Committee as a very important innovative good practice. With respect to non-public stakeholders, there is much positive evidence of their engagement, including in providing specific comments to draft versions of the outputs. However, there is also some suggestion of complaints that the level of engagement could have been improved, or that engagement should have started earlier in the process. Some complaints were also heard in relation to feedback on inputs provided not being given in a timely manner and in terms of the timing and tight control over access to and release of final reports. While non-public stakeholder engagement positively affected the outputs, there are also suggestions that the impact could have been greater, were the engagement performed differently.

[51] Some sectors had some specific additional reports, i.e. a report on the discount rate for the residential and services sector and the Identification of mitigation potential and evaluation of mitigation alternatives fesibility in LULUCF in Brazil.

[52] See Appendix F for a list of reports and respective publications.

114. Some hurdles along the way, mainly related to administrative matters (such as delays in hiring the technical consultants for the industry sector and delays in fulfilling payment commitments due the change of the financial systems at UN Environment), led to some delays in the preparation of the reports that substantiate the outputs. Some interviewees noted that the pressure to make up for some of the time lost may have resulted in the stakeholder consultation processes being given less time than would have been ideal.

115. The target was to have studies and reports fully complete early in the project, since these helped provide the foundation for the second project component where they were used as inputs. By June 2016 all activities related to analyses for identification of mitigation options and their respective potentials and costs were concluded in a highly satisfactory manner, with final reports under final steps of revision before publication (PIR, 2016).

116. Table 6 presents a description of the evidence, the highlights and the ratings of output one[53].

[53] The reports the iron, non-iron metals, paper and pulp, chemicals industrial sectors (output 1.1) and the biofules and renewable electricity generation (output 1.2) are not available yet and are therefore not included in Table 6.

Table 6 - Evidence, Highlights and Rating of Output 1

Output	Evidence (Publications)	Made available during the evaluation	Highlights	Lead	Rating
Output 1: Mitigation alternatives identified and respective potential and costs quantified for industry, energy, transport, household and services, LULUCF, waste and cross-sector mitigation alternatives for the periods 2012-2035 and 2035-2050	Executive Summary of Sectorial Modeling and Cross-Cutting Options for Mitigation of GHG Emissions	Yes	-	-	Highly Satisfactory
Output 1.1: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the industrial sector.	Executive Summary Sectoral Modeling of Low Carbon Options for The Industrial Sector	Yes	Some controversy with key industry representatives. Disagreements emerged, about factors used in baselines and abatement cost curves which was reported to be due to the "closed" nature of the sector, and lack of consultant access to data because of concerns about competition, some concerns input responsiveness. Final count: 55 reports include 5 per each of industrial 11 subsectors (food and beverages, ceramics, cement, chemicals, textiles, steel and iron, pulp and paper, non-ferrous metals, mining, feroalloys, other industries). Merged to 11 publications.	This part of the work was under the direction of the National Institute of Technology (INT), MCTIC where consulting contracts were signed with individual researchers. (PIR, 2016; Technical Committee, 2014).	Moderately satisfactory due to not all of the 11 subsectors reports being available
	Sectorial Modeling of Low Carbon Options for the Food and Beverage Sector	No			
	Sectorial Modeling of Low Carbon Options for the Textile Sector	Yes			
	Sectorial Modeling of Low Carbon Options for the Cement Sector	No			
	Sector Modeling of Low Carbon Options for the Pig Iron and Steel Sector	No			
	Sector Modeling of Low Carbon Options for the Ceramic Sector	No			
	Sector Modeling of Low Carbon Options for the Mining and Pelletizing Sector	No			

Output	Evidence (Publications)	Made available during the evaluation	Highlights	Lead	Rating
	Sector Modeling of Low Carbon Options for the Other Industries Sector	Yes			
Output 1.2: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the energy sector. Energy sector, as analysed in this Project, refers to the activities that produce and transform energy, as defined in the Brazilian National Energy Balance.	Sectorial Modelling of Low Carbon Options for the Oil and Natural Gas Sector	Yes	Final count of 20 sector reports and 4 publications that include four subsectors (biofuels, oil and gas, renewable sources of electricity, thermoelectric) In 2016 some reports reference 24 reports. These cover the sector description and definition of BAT, definition of a baseline for energy consumption and GHG emissions, identification of the sector discount rate and economic assessment, which were complete and rated highly satisfactory. The innovation analysis and identification of policy instruments resulted in 58 public policy instruments recommended, albeit with delays.	This work was led by COPPETEC Foundation (COPPE/UFRJ (Technical Committee, 2014).	Rated Satisfactory, as the reports on renewable energy sources and on biofuels are not available
	Executive Summary Sectoral Modelling of Low Carbon Options for The Oil and Natural Gas Sector	Yes			
	Sector Modelling of Low Carbon Options for the Thermoelectric and Thermonuclear Industries	No			
Output 1.3: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the transport sector.	Sector Modeling of Low Carbon Options for the Transport Sector	Yes	This includes detailed sectoral description with an overview of road, rail, air and waterway transport. The definition of the baseline for energy consumption and GHG emissions due in Feb of 2015 were also complete and highly satisfactory with the	This work was coordinated by faculty from DEE/UFF (Technical Committee,	Highly satisfactory as the readily available report is perceived of high quality

Output	Evidence (Publications)	Made available during the evaluation	Highlights	Lead	Rating
			report discussing the methodology for energy demand and GHG emissions. The innovation analysis slated for fall 2015, was fully complete and highly satisfactory by June 2016. This analysis included review of various innovative technologies with costs either developed or in development. Finally, the identification of policy instruments to promote GHG abatement targeted for Dec 2015, was completed by June 2016 with 51 policy instruments developed. Final count 5 reports merges to 1 publication.	2014).	
	Executive Summary Sectoral Modelling of Low Carbon Options for The Oil and Natural Gas Sector	Yes			
Output 1.4: Assessment of the potential for GHG emission reduction and estimation of abatement costs for the household and services sectors (energy consumption in buildings).	Sector Modelling of Low Carbon Options for the Buildings Sector	Yes	This output, due in 2014 and finalized by 2016, dealt with a combined set of issues related primarily to buildings, including residential, commercial, services, and those in the public sector. The work conducted for this output include analysis of factors such as the number of households in Brazil, type of technologies used, patterns of consumption, characterization of how energy was consumed in	The partner institution was the COPPE/UFRJ (Technical Committee, 2014).	
	Executive Summary Sectoral Modelling of Low Carbon Options for The Buildings Sector	Yes			

Output	Evidence (Publications)	Made available during the evaluation	Highlights	Lead	Rating
			the residential and services buildings and through what types of energy with future scenarios based on expectations of income and mobility up to 2050. Consultants described characterizing the sector as it is today and developing forecasts to 2050 in terms of demand for cooking, lighting, air conditioning. Models analyzed best technology choices at minimum cost for various income levels based on data inputs. Final count: 6 reports and one publication.		
Output 1.5: Assessment of mitigation alternatives and estimation of abatement costs for land use, land use change and forestry (LULUCF).	Sector Modeling of Low Carbon Options for Agriculture, Forestry and Other Soil Uses (AFOLU)	Yes	The analysis covered discussion of agriculture, livestock, animal husbandry, and planted forests. The five activities for this sector the description of methodologies for estimating GHG emissions, analysis of land use for food and energy purposes, definition of a baseline for GHG emissions, identification of mitigation potential and evaluation of alternatives feasibility and identification of policy instruments were all fully completed by June 2015. This sector, most important for Brazil's mitigation policy, as it	This component was under the direction of faculty from CSR/UFMG (1st Technical Committee, 2014).	Highly Satisfactory due to the highly comprehensive scope and received generally positive feedback on quality.
	Executive Summary: Sectoral Modelling of Low Carbon Options for Agriculture, Forestry and Other Land Use (AFOLU)	Yes			

Output	Evidence (Publications)	Made available during the evaluation	Highlights	Lead	Rating
			includes emissions from deforestation, one of Brazil's biggest challenges resulted in 38 policy instruments. The analysis discusses the challenges of reconciling conflicting interests and needs with respect to demands for conservation and development and demand for the highest levels of agricultural production. The policy analysis involved dividing the country into five land categories corresponding to various policy instrument types with analysis organized around examination of strategies including low cost monitoring of recorded properties, payments for environmental services to reduce deforestation and command and control policies. Final count: 5 reports merge to 1 publication.		
Output 1.6: Assessment of mitigation alternatives and estimation of abatement costs for the Waste Management Sector.	Sector Modelling of Low Carbon Options for the Waste Management Sector	Yes	The report explores three scenarios and strategies for mitigation potential such as increased use of municipal solid waste biodigestion for biomethane production, use of landfill biogas for biomethane production, and use of landfill biogas for energy generation. A range of specific barriers are	The partner institution managing this output was COPPE/UFRJ, (1st Technical Committee, 2014	Highly Satisfactory due to the highly comprehensive scope and positive perceived quality.
	Executive Summary: Sectoral Modelling of Low Carbon Options for The Waste Management Sector	Yes			

Output	Evidence (Publications)	Made available during the evaluation	Highlights	Lead	Rating
			identified and policy recommendations such as non-licensing of landfills that do not have methane production schemes, the creation of a national center to support municipalities in the low carbon management of solid waste and effluents; and the implementation of training activities for biogas energy generation. Final count: 6 reports merge to one publication.		
Output 1.7: Assessment of GHG emission reduction potential and estimation of abatement costs for cross-sector mitigation alternatives.	Transversal Options for Greenhouse Gas Emission Mitigation - Carbon Capture, Transport and Storage	Yes	The analysis addresses a variety of policy issues including the high level of uncertainty about the acceptance and availability of the carbon capture systems options in the near future that include technological, economic, regulatory, and socio-political issues and made a series of specific policy recommendations. A report on smart grids was also published and made available on a timely manner to the evaluation team. Final count: 5 reports merge to 2 publications.	The work was under the direction of of COPPE/UFRJ (First Technical Committee, 2014)	Highly Satisfactory due to the highly comprehensive scope and positive perceived quality.
	Executive Summary Cross-Sectoral Options for Mitigating Greenhouse Gas Emissions: Carbon Capture, Transportation and Storage	Yes			
	Cross-Cutting Options for Greenhouse Gas Emissions Mitigation - Smart Grids	Yes			
	Executive Summary Cross-Sectoral Options For Mitigating Greenhouse Gas Emissions: Carbon Capture, Transportation And Storage	Yes			

5.4.1.2. Output 2: Conducted integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification (MRV) of proposed mitigation alternatives

117. This output was a critical part of the project originally designed to comprise three important building blocks and is rated highly satisfactory, as all activities have been performed and the final report published, thus meeting end of project target of having studies and reports integrated and completed taking into account the timelines of the successive project revisions. This output included the process of integrated analysis of mitigation alternatives, evaluation of impacts on the Brazilian economy and finally, as per the interviews, activities focused on the issues related to testing, domestic measurement, reporting and verification of the mitigation alternatives. The activities for this component were characterized as dependent on the sectoral analysis and technical reports produced in Output 1 of the project. Delays in Output 1 resulted in delays in Output 2.

118. **Output 2.1** Testing MRV and integrated analysis of GHG emission abatement alternatives in an integrated optimization model comprising energy chains and all GHG emitting sectors analyzed for Brazil is considered highly satisfactory despite some limitations on evidence relating to domestic MRV, which is deemed of low relative value compared to the remaining activities under this output.

119. This output involved five activities including model development and description, evaluation of sector specific low carbon policies, testing of domestic MRV, construction of integrated scenarios and sensitivity analysis for the integrated low carbon scenarios for estimated learning curves. Albeit with delays, by 2015 the first two rounds of integrated modeling were conducted in MESSAGE and two reports on integrated analysis of GHG emission abatement alternatives in an optimization model comprising all energy chains complete. The evaluation of sector specific low carbon policies, construction of integrated scenarios and sensitivity analysis for integration of low carbon scenario for estimated learning curves were also fully complete and determined to be highly satisfactory by June 2017.

120. Field interviews and technical consultative committee minutes affirm that the project not only utilized but enhanced the MESSAGE (Model for Energy Supply Strategy Alternatives and their General Environmental Impacts) model, originally developed from work in Austria in the 1970's and cited as stemming from the International Institute for Applied Systems Analysis (IIASA) and the International Atomic Energy Agency (IAEA) (First Technical Committee, 2014). The model both formulates and evaluates alternative energy supply strategies which links with various constraints outlined (Hainoun, Aldin, Almoustafa, 2010). The model works with all of the energy consumption and supply sectors involved in the project including agriculture, buildings (residential, commercial and service), energy, industry, waste management and transport. The individuals

involved in the project received training in this modeling system before the project, and although this model had previously been applied in Brazil, it helped to improve mitigation management, such that it was characterized in interviews, as being "as good or possibly better", than any integrated national model found anywhere in the world. There were 17 reports produced related to the energy system and LULUCF sector of which four were not merged into a final publication. The other 13 reports were incorporated into the two publications on integrated economic modelling and mitigation paths to reach the Paris Agreements.

121. With respect to the testing of domestic MRV (activity c. of Output 2.1), the original idea was to carry out a domestic "MRV test", but the conceptualization of this item is addressed in first meeting of the Steering Committee in 2014 with note of the fact the original concept of the MRV test was remodeled due to its political nature. The intention to address the issue in the Technical Coordinating Committee is mentioned and there are reports of adding a line for a consultant to create terms of reference for a company to measure, report, and verify (MRV) "all ongoing mitigation studies". In an April 2015 technical committee meeting there are reports of new agreements stemming from bilateral Ministry consultations with the scope of work of the consultant on MRV to cover international experiences; survey of national initiatives, (including the modular system of monitoring and follow up on reduction of greenhouse gas emissions) with mention of further bilateral meetings to develop the terms of reference. By 2016 in a technical committee, the hired consultant reports the work as covering identification of possible sources of funding to MRV, systems of existing country MRV, possible MRV activities in light of the NDC.

122. Our interviews confirmed that a consultant surveyed the state of the art of systems and activities of MRV on GHG emissions in the international sphere, as well as the state of the art of Brazil on activities of MRV on GHG emissions, and formulated a proposal for possible MRV systems in light of the INDC implementation. The 2017 PIR report confirms delivery of a proposal on possible MRV in light of the NDC with a highly satisfactory rating. This produced five reports on MRV analysis however they were merged into a final publication and no report to serve as evidence of this activity was made available to the evaluation team. There does not however seem to be a clear target naming these specific report titles as one of the report deliverables in the log frame, thus this did not lead to a downgrading of the rating.

123. Output **2.2** Analysis of the impacts of low carbon policies on the Brazilian economy is rated highly satisfactory. Stakeholders state that no other developing county has an economic model with this level of rigour (1st Technical Committee, 2014 and, in interviews, that integration is at the "heart" of the project's purpose and value.

124. This output originally involved seven activities including development and description of the model, projection with macroeconomic and sector aggregated variables, revision of a macroeconomic and sector scenario, analysis of the impacts of low carbon policies on the competitiveness of the Brazilian economy, analysis of intangible impacts of low carbon policies on selected economic sectors, analysis of innovation costs and financing sources and finally analysis of the difference of economic impact in the analysis of impacts of low carbon policies on competitiveness of the economy with distinct cap criteria. By June 2016, four activities for this component of the project were

not completed, of which two had not yet been started. These included analysis of innovation costs and financing sources and analysis of the difference of economic impacts in activity above with distinct cap assignment criteria. The targets of these activities were originally March and July of 2016, but because these activities were all interdependent the expected completion date was moved to May 2017. These activities received ratings of moderately unsatisfactory in 2016, however by June 2017 all were completed with a highly satisfactory rating (PIR, 2017). By June 2016, the fourth activity, analysis of the impacts of low carbon policies on the competitiveness of Brazilian economy was only partially complete, moving up from a moderately satisfactory rating but by June 2017 this was both highly satisfactory and fully complete. Thus, by June 2017 all seven components of this part of the project were finalized, with highly satisfactory ratings.

125. The project utilized macroeconomic and sectoral models, EFES (Economic Forecasting Equilibrium System) and DSGE (Dynamic stochastic general equilibrium). The first originally based on a theoretical structure deriving from a MONASH model originally developed for the Australian economy, provides an integrated information system for specification of macroeconomic, sectoral, regional and analysis of national projections (Market Readiness Proposal, 2014; GEF, PNUMA, MCTI "Mitigation Options Presentation"). DSGE was used to analyze trajectories for the Brazilian economy, incorporating likely interactions and disturbances. EFES is a model under development since 2001, used for analysis of public policies to predict response of economic actors to various types of policy changes. The project's scenario of demand of energy to the different sectors, using inputs from the macroeconomic and sectoral models, was followed by rounds of interaction between the models. Thus, this project achieved energy-economy integrated modeling of mitigation options through six rounds of integrated analysis of GHG emission abatement alternatives with a report on impacts of low carbon policies on the Brazilian economy and its competitiveness concluded. In addition, technical workshops with sector representatives took place in the first semester of 2016 to improve and validate assumptions of specialists (PIR 2017).

126. This phase of work produced 16 reports and two publications. The publications "Integrated Modeling and Economic Impacts of Low Carbon Sectorial Options" and the "Mitigation trajectories and public policies to meet the Brazilian Paris Agreement Targets" published in the website[54] are evidence for this output and were made available to the evaluation team and within the project, thus meeting end of project targets[55].

127. Table 7 presents a description of the evidence, the highlights and the ratings of output 2.

[54] http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/opcoes_mitigacao/Opcoes_de_Mitigacao_de_Emissoes_de_Gases_de_Efeito_Estufa_GEE_em_SetoresChave_do_Brasil.html.

[55] Please refer to Appendix F for a list of the reports and publications for output two.

Table 7 - Evidence, Highlights and Rating of Output 2

Output	Evidence (Publications)	Made available during the evaluation?	Highlights	Lead	Rating
2.1 Testing MRV and integrated analysis of GHG emission abatement alternatives in an optimization model comprising all energy chains and all GHG emitting sectors analysed for Brazil	Integrated modeling and economic impacts of low-carbon sectoral options Mitigation paths and public policy instruments to achieve the Brazilian targets in the Paris agreement	No	MRV Analysis --5 reports--topics change later in project--issues include international MRV survey, MRV funding, system congruence, MRV system proposals[56] Energy Systems and LULUCF— 16 reports 4 unpublished Include simulation MSB8000 models as National Energy Plan scenarios, consistency analysis Message model and prep, 3 sensitivity scenarios transport/AFOLU and report on low carbon scenarios energy	COPPE/UFRJ COPPE/UFRJ CSR/UFMG	MS -The first part of these output reports on MRV were not in the final list of project publications and was not made available to the evaluation although a consultant product is reported to have been made made available to the project (2017 PIR). The two publications listed for 2.2 include elements from here—these reports rated HS/see below
2.2 Analysis of the impacts of low carbon	Integrated modeling and economic impacts of low-	Yes	Economic Impact Analysis Conducting macroeconomic and	17 authors	Rating: HS Studies generate useful lists and

[56] These reports were not included in any publication and were not made available to the team

Output	Evidence (Publications)	Made available during the evaluation?	Highlights	Lead	Rating
policies on the Brazilian economy	carbon sectoral options Mitigation paths and public policy instruments to achieve the Brazilian targets in the Paris agreement Executive Summary: Incorporated in the publications above		sector scenarios; analysis of impacts low carbon scenarios on the economy, analysis of impacts including GDP, employment and income, household projections—16 reports feed into two publications Report on policy is a synopsis of methods to meet NDC targets given scenarios. Contains useful, summary lists of policy targets, cost effectiveness rankings and instruments to overcome barriers	including faculty from UFRJ etc FIPE/USP—consultant	analysis of measures that inform policy choices; Also interesting discussions note that some of the EFES model not differentiating family representation by income

Training topic	Highlights	Date	Materials
Construction of low carbon scenarios	Training on the analysis of GHG mitigation measures in the construction of long-term scenarios. The sectors covered include: Industry, Energy, Transport, Residential and Services, AFOLU and waste	May 2015	1 presentation and one video class per sector
Construction of integrated energy-economy scenarios	Training on the strategies for integration of the energy and modelling technics applied in the project	October 2015	1 presentation and one video class
Impacts and opportunities for a low carbon economy – MESSAGE	Training on scenario concepts, modelling and presentation of the tool used in the project (MESSAGE Brazil and MSB8000)	June 2016	1 presentation and one video class
Impacts and opportunities for a low carbon economy – Economic modelling (CGE)	Training on the economic modelling strategy used to generate economic variables, sectoral results and to project the effects of implementation of a low carbon economy.	June 2016	1 presentation and one video class
Integrating economic and energy modelling – General equilibrium	Training on the strategies for integration of the energy and modelling technics applied in the project	April 2015	1 presentation and one video class
Integrating economic and energy modelling – MESSAGE	Training on the strategies for integration of the energy and modelling technics applied in the project	April 2015	1 presentation and one video class
Modelling a low carbon economy	Training on the theoretical and practical aspects that underlie the methodologies used to analyse problems of the “real economy”	March 2105	1 presentation and one video class
Modelling abatement costs and curves of technology uptake	Training on methodologies for the analysis of the marginal cost of abatement and technology uptake used in the project. The sectors covered include: Industry, Energy, Transport, Residential and Services, AFOLU and waste	October, 2015	1 presentation and one video class per sector
Potential for and costs of GHG emissions reductions in key sectors of the Brazilian economy	Training on the potential for and costs of sectoral GHG emissions abatements, barriers to implementation of low carbon measures and public policy instruments to overcome the identified barriers. The sectors covered include: Industry, Energy, Transport, Residential and Services, AFOLU and waste	June 2016.	1 presentation and one video class per sector
Proposal of public policy instruments for the transition to a low carbon economy	Training on barriers and co-benefits to the adoption of low carbon sectoral activities. The sectors covered include: Industry, Energy, Transport, Residential and Services, AFOLU and waste	April 2016	1 presentation and one video class per sector
Low carbon	Training on the identification of the key abatement	March	1 presentation

technologies applicable to key sectors in Brazil	measures (BAT – Best available technologies) for GHG emissions reduction. The sectors covered include Industry, Energy, Transport, Residential and Services and waste	2015	and one video class per sector

5.4.1.3. Output 3: Capacity building for federal, state and 2014 FIFA World Cup host cities government institutions, as well as civil society organizations, for implementation of mitigation actions for GHG emissions in key economic sectors

5.4.1.4. Output 3 was rated *Highly Satisfactory*, as there is extensive evidence and generally positive feedback in relation to the training events and respective capacity building effects.

128. All in all, over 1000 people participated in the training events promoted by the project. The meetings of the Technical Consultative Committee were mentioned by several interviewees as of great importance to build capacity at government level. The project team efforts at that level were highly commended. The evaluation team seconds such comments. This output includes also a communication/dissemination strategy, which is rated moderately unsatisfactory given the lack of a clear communication plan from project outset and the dissemination of project outputs close to or after project termination.

129. **Output 3.1:** Targeted training of federal and state level institutions as well as 2014 FIFA World Cup host cities and civil society organizations on climate change mitigation activities is considered highly satisfactory as there is extensive evidence of the training initiatives and respective training materials and most stakeholders, in particular at public level, have declared the project greatly contributed to building capacity throughout the different ministries.

130. This output focused on a range of training activities that took place throughout the project aimed at preparation and enhanced understanding of mitigation among a range of stakeholders throughout Brazil. This ambitious effort at "capacity building" continued through many project phases. This phase of the project included four activities including developing training and information materials, development of workshops for technical personnel, targeted training for technical personnel of federal, state and 2014 FIFA World Cup host cities institutions and finally a dissemination strategy targeted at stakeholders representing the different sectors and communities. The Technical Consultative Committee deliberations affirm desire for attention to broad dissemination of publications derived from trainings during the early project phases (7th Consultative

Committee, 2014). As a response key training materials and video-lessons are available on-line[57]. Table 8 describes the topics covered in training events held in Brasilia.

Table 8 - Key topics covered in training events

131. The following training events have been reported:

- **12 two-day capacity building workshops at twelve 2014 FIFA World Cup host cities**: Held late 2013/ 2014 (Brasilia, Natal, Curitiba, Cuiabá, Recife, Salvador, Fortaleza, São Paulo, Porto Alegre, Belo Horizonte, Manaus and Rio de Janeiro). Conducted in collaboration with Ministry of Environment. 319 participants lowest attendance Curitiba, highest Brasilia.

- **Six training cycles Brasilia**, with 37 training events, covering all sectors and integrated modelling activities, took place from March, 2015 to June, 2016, reaching 659 participants w 381 from 23 federal institutions and the rest from state and municipal government and civil society.

- **Six regional training cycles**, on project results, the GHG inventory and industry, energy, LULUCF, residential and services, and transport sectors (20 training events) took place in Brasília (Central), São Paulo (Southeast), Rio de Janeiro (Southeast) Curitiba (South), Manaus (North) and Salvador (Northeast), reaching 355 participants of which 122 were technical personnel from cities (22), state (80) and federal (60) government.

132. A variety of stakeholders, both inside and outside of government who attended project sectoral trainings and events expressed satisfaction with events, indicating that they were pleased with both content and structure. One comment from a federal stakeholder was that “these were interesting because it involved the private sector. It is always important when you have a theme that is technically complex and involves things like modeling, etc. that you have a level playing field so that people understand the language of what you're doing, and the limitations, and I think that the qualifications were good for that, for people to understand a little of the methodology.” Events for the private sector (particularly industry in 2015 and 2017), were generally praised, with a few suggestions for making some events a bit shorter and more targeted, given the diverse array of interests.

133. In accordance with interviews, the regional trainings (6 cycles in 6 cities – one for each region of Brazil + Brasilia) focused on issues including MRV and the use of the SIRENE system, which is the platform of the national inventory of greenhouse gases. The project exceeded its target of technicians from at least 20 states trained with 21 states represented. Participant survey evidence uncovered both training benefits and limitations (benefits include: evidence of fairly widespread National Inventory database access; low database difficulty; with relatively high representation of women and engineers. However, limitations include: challenges in the numbers and distribution of

[57] http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/opcoes_mitigacao/Opcoes_de_Mitigacao_de_Emissoes_de_Gases_de_Efeito_Estufa_GEE_em_SetoresChave_do_Brasil.html as visited on February, 7th.

those trained not actually dealing with mitigation or using it for monitoring or mitigation actions, and increased needs for databases to be regionally sensitive, cover more sectors, and for greater attention to alignment between federal and regional policies) this mixed feedback demonstrates the need for additional follow-up and new strategies (see recommendations).

134. Given the largely technical nature of the discussions and the references by public stakeholders of their contributions to building capacity, the meetings of the Project Technical Consultative Committee were also included in this output. This body, composed of representatives from 14 Brazilian ministries, was created and began to meet in May 2014. Many stakeholders noted the value of this initiative in helping to facilitate interagency coordination and to increase communication among various agencies, enhancing a sense of project ownership and buy-in and strengthening positive directions for the project.

135. Another part of this output was the dissemination strategy (3.1 d) for targeted stakeholders representing different sectors and communities. In 2014, for this aspect of the project it was reported that folders with project information were manufactured and distributed in relevant events related to the project objective. The technical coordinator participated in a range of events with this purpose, including attending COP 20 in Peru in December 2014 and COP 21 in Paris December 2015, as well as at two other conferences in 2014 and 2015. All aspects of these activities were rated as Satisfactory. Project dissemination also took place at events including the Adaptation Futures 2014 and 37th International Association for Energy Economics (IAEE) International Conference.

136. A communication plan for the project was developed only later in the project with strengths including the identification of two goals (increased access to the electronic site and a 70% increase in the number of articles, releases, reports and other communication) and assumptions and indicators. However, this communication plan appeared to come late in the project, with relatively few specifics or use of creative strategies tailored towards needs of diverse audiences. The plan also identifies three levels: media of MCTI; targeted media and mass distribution. Target audiences were also identified to include civil society, environmental groups, multinational organizations, employer's unions and sectoral organizations. Assessment of progress on this plan found that the consultant selection process was challenging for the project team, with a high turnover of communication consultants and some dissatisfaction with their recommended strategies. This led to the need for adaptive management and possibly impacted some aspects of report dissemination and media outreach. This evaluation found the project did generate positive, if somewhat limited, coverage of events on various websites and through news. There is evidence of some use of MTI media and websites for dissemination of project results, with videos for example produced of various trainings. Positive news includes the fact that project reports have been published on MCTI's website with 36 out of 54 trainings being available on YouTube. The final dissemination meeting and the list of invited guests[58], indicates that there were

[58] Fig 2 shows planned guests, although it was not possible to verify which of these guests actually attended.

efforts to disseminate to civil society, environmental organizations, multinational, employers unions and sectoral organizations. The project extension for a few months seems to have been aimed at enhancing dissemination. The fact that the release of the final report was moved to the very end of the project, may have also been a bit problematic because this indicates that there was relatively little time for extensive additional communication and dissemination. The team notes that the project suffered from the lack of a clear communication strategy and plan from the outset, which was partially due to difficulties with the communication consultants. In particular, the evaluation team feels that the dissemination of final results may not have been as wide as desired, due to the stated problems with the planning process, and the fact that this takes place in the last days of the project. These challenges are tied to both lessons learned and evaluation recommendations (Recommendation 1).

137. As per the above, overall the Project's delivery of Outputs is " Highly Satisfactory" according to the UN Environment Evaluation Office Criterion Ratings Matrix.

Rating of Achievement of Outputs: Highly Satisfactory

5.4.2. Achievement of Direct Outcomes

138. The project was evaluated against the following direct outcomes, assumptions and drivers in the reconstructed Theory of Change at Evaluation and rated moderately satisfactory.

139. The three direct outcomes are:
- **1:** Acceptance and endorsement of project findings in relation to GHG mitigation technologies, potentials, costs, and economic trade-offs by government, civil society, private sector and funders
- **2:** Endorsement of project recommendations for policies and strategies to overcome barriers to mitigation by the Brazilian Forum on CC, the CC Committee and the CC Executive Group
- **3:** a) Increased technical capacity in public and civil society organizations at federal, state and city level on mitigation actions and their MRV and 3 b) Increased used of SIRENE by technicians at city, state, federal level for mitigation action planning and MRV

140. A *driver for transition between outputs and outcomes* is required: Relevant stakeholders (ministries and public agencies – city, state and federal, private sector representatives – industry and other sectors, ENGOs) are adequately engaged and have access to project outputs and information

141. And *four assumptions* need to hold:
- Political and institutional stability allow for an ordinary policy making process
- Engagement during the policy making process promotes buy in, including private sector
- Brazil's commitments under the Paris Agreement hold

- Public institutions at city, state and federal level maintain technical capacity despite turnover.

142. While the driver (related to adequate stakeholder engagement) is in place, there is a wide degree of uncertainty in relation to whether the assumption (related to political and institutional stability) will hold, namely in such a fashion as to ensuring a timely adoption of the mitigation policies. There is no evidence that the remaining three assumptions do not hold.

Outcome 1. Acceptance and endorsement of project findings in relation to GHG mitigation technologies, potentials, costs, and economic tradeoffs by government, civil society, private sector and funders

143. This outcome was partially achieved based on available evidence of acceptance by government via the Technical Consultative Committee and in other direct and indirect, formal and informal mechanisms, creating a wealth of solid technical information not there before. Interviews also showed high levels of acceptance by civil society, including many key actors in the private sector (despite the controversy in some sectors around approaches and results) and funders (such as Banco do Brazil and BNDES). The project created Technical Consultative Committee participants, which include the array of government ministries discussed previously is supportive of findings, with extensive efforts to ensure their inputs over a long period of time, although no formal endorsement "vote" could be verified.

144. It is also clear that more work in this area still needs to be done given that project final report release and dissemination occurred at the end of the project (Note also that evaluation interviews also took place in the period just before full public release of final reports). It is clear that the amount of knowledge generated (in and through the outputs) and the engagement of stakeholders tends to point towards assurance that this outcome will be achieved. At the same time it should be recognized that that some of the options proposed by the project, in particular for the industrial sector, may not be fully aligned with some industry association expectations, although this will be more fully verified by the industrial sector in the coming months after the project closure, when the extent of incorporation of industry suggestions can be checked. This is the primary sector where the more substantive disagreement between the project results and the non-governmental stakeholders was uncovered. In relation to the other sectors, no relevant discrepancy between project proposals and stakeholder expectations has been identified, and some government agencies suggest that project findings will need to be mediated as part of a range of factors influencing agency considerations. Specific project policy recommendations also have implications for an array of actors given their complex nature. Project consultants also point to challenges related to full understanding of ideas and implications surrounding economic tradeoffs related to mitigation policies, indicating their perception of the need to continue outreach on these issues. Thus, while tremendous progress is acknowledged, additional efforts are needed to maintain the current trajectory of various actors acceptance of project implications and findings.

Outcome 2. Endorsement of project recommendations for policies and strategies to overcome barriers to mitigation by the Brazilian Forum on CC, the CC Committee (ICGCC) and the CC Executive Group (Gex):

145. This outcome was partially achieved because the Brazilian Forum for Climate Change (representing all relevant sectoral stakeholders) used project outputs in the discussions towards the implementation strategy of Brazil's Nationally Determined Contribution. The results of this discussion will be forwarded to the President of Brazil. However, evidence suggests that the Climate Change Committee and the Climate Change Executive Group have not, at the time of this report, yet endorsed the project recommendations.

146. Evidence suggests also that the project has clearly made ongoing efforts throughout the years to proactively engage with the three bodies mentioned above, through sharing project documents and personal attendance. With regard to the Executive Group on Climate Change there were no meetings of this body for two years between 2015 and spring 2017. There is evidence however discussion of this fact in the project steering committee and efforts to ensure that technical inputs were presented during that period at the Inter-ministerial Commission on Global Climate Change (CIMGC), the entity under the Office of the President comprised of 17 federal bodies that was responsible for the National Climate Change Plan. Policy proposals generated by the project have been embedded in MCTIC's contribution to development of the national strategy for implementation of the NDC of Brazil.

147. As mentioned, there is a degree of uncertainty as to what the policy making process will be in Brazil in light of upcoming Presidential elections in 2018, with possibilities for revisions in the existing institutional set up, including the role of the Climate Change Committee and its Executive Group. Nonetheless, in accordance with interviews, all participating sector ministries represented in the Climate Change Committee recognize the value and relevance of the project and its outputs, thus creating some positive assurance that the project recommendations will be endorsed by the CC Committee, at least as a basis for the decision-making process. Discussion at the inter-ministerial level is not yet decided at the time of this evaluation report. In summary, the uncertainty around political and institutional stability has had a negative impact on this rating, while the use of project findings by the Brazilian Forum on Climate Change had a positive one. At the time of this report development, the Forum is the primary official process where climate change policy is being discussed. Evidence suggests that the project is actively contributing to a consensus process on climate change policy in Brazil albeit more strongly at the ministerial, rather than interministerial level of Climate Change committee. The assumption "political and institutional stability allow for an ordinary policy making process" holding is fundamental for the achievement of this outcome.

Outcome 3 a) Increased technical capacity demonstrated in public and civil society organizations at federal, state and city level on mitigation actions and their MRV and 3b) Increased used of SIRENE by technicians at city, state, federal level for mitigation action planning and MRV

148. The project has partially achieved this outcome. In particular, the interviews evidence effective capacity building on socio-economic scenarios, modeling tools and methodologies, technology identification and evaluation at the federal, state and local levels (thus, mostly in relation to outcome 3a)). Interviews highlight the unprecedented amount of scientific knowledge generated at the universities participating in the project, which will endure for a long time. In relation to outcome 3b), while the relevant activities were conducted, a survey performed by the project team demonstrated that some of the training participants did not actually work on mitigation planning and that only few (less

than 4) actually used the SIRENE platform with a view to collecting information to plan mitigation measures.

149. In relation to the driver[59] - relevant stakeholders (ministries and public agencies – city, state and federal; private sector representatives – industry and other sectors; ENGOs) are adequately engaged and have access to project outputs and information – there are some examples where the project is promoting access and use of the information it generated:
    - The MoU between the Ministry of Finance and MCTI for access to information and future technical cooperation, where the Ministry of Finance aims at using project information in its World Bank Sponsored Partnership for Market Readiness Project
    - The user friendly, publicly accessible data base with all project data
    - The public availability of the project reports, assuming the promised full-release of the final reports by project end date (Outputs 1 and 2)
    - The preparation of a document specifically to serve as an input to the discussions at the Brazilian Forum on Climate Change, where all relevant stakeholders (public and private) have a seat.

150. It should be noted, in relation to this driver, that there is little evidence of specific efforts to identify and engage under-represented groups or to address gender issues.

151. With regard to the assumption "political and institutional stability allow for an ordinary policy making process[60]," several stakeholders, pointed out that Brazil is going through a particular political situation, which brings uncertainty in relation to the policy making process and, as a consequence to the success of project outcomes. Such circumstances include:

    - Change of president during project implementation (impeachment), with consequent change in leadership at ministerial level and in the level of priority attached to climate change

    - Institutional setting potentially being reviewed (namely in relation to the functioning of the CC Committee and/or the roles and responsibilities of the different ministries) within the tenure of current president, but without clear indications whether it will happen and if so, what changes might take place

    - The Presidential elections that are to take place in late 2018, halting decision- making process (in particular in relation to major political files, such as CC) about a year before (ministers usually actually resign about six months before the elections so that they can be fully devoted to campaign), and with at least a six-month period between elections and all cabinets taking office and being up and running.

[59] To be noted that this driver has been defined for the transition between all outputs and all outcomes.

[60] This assumption is particularly relevant for the achievement of outcome two as well as outcome one, but less relevant for outcome three.

152. At present, stakeholders could not indicate clearly or with any level of certainty what will be the process for the elaboration and approval for the Strategy for the Implementation of the NDC. Additionally, at the UNFCCC COP-23 (November 2017), Brazil announced its willingness to host the meeting in 2019. It is customary to expect from a role of leadership from the COP hosts. This may have a positive impact on Brazil's readiness to implement the Paris Agreement, but may also hamper the "ordinary policy making process" due to the political pressure to deliver at certain dates, irrespective of preparedness to do so.

153. The Project's Achievement of Direct Outcomes is thus rated *Moderately Satisfactory* according to the UN Environment Evaluation Office Criterion Ratings Matrix. The three outcomes were partially achieved in terms of achievement and the driver[61] seems to be in place. There is higher uncertainty as to whether the assumption holds[62], particularly for a timely achievement of the outcomes one and two.

Rating of Achievement Direct Outcomes: Moderately Satisfactory

5.4.3. Likelihood of Impact

154. The project was rated *Moderately Likely* in terms of the likelihood to achieve impact because there is a widespread sense of country driven-ness and ownership and the Paris Agreement will likely hold, positively influencing likelihood of impact. However, the fact that none of the intermediate states has been fully achieved yet has a negative effect on the rating. For intermediate states and impact, given their medium and long-term nature, it is harder to assess whether, and to what extent, assumptions hold.

155. The project impact is: Brazil reduces GHG emissions in a cost- effective manner and achieves low carbon sustainable development, and the project's four intermediate states are:
- *Intermediate State One*. Mitigation policies adopted /enacted for each of the five sectors and for cross-sector alternatives
- *Intermediate State Two*. Mitigation policies implemented for each of the sectors - energy; transport; residential and services; AFOLU, waste - and for cross-sector alternatives
- *Intermediate State Three*. Mitigation policies MRVed
- *Intermediate State Four*: Transformational change in all sectors

156. The following assumptions need to hold in order for the intermediate states and the impact to be achieved:

[61] Relevant stakeholders (ministries and public agencies- city, state and federal level, private sector representatives – industry, energy, transport, residential and services, LULUCF, waste - and NGOs are adequately engaged and have access to project outputs and information.

[62] Political and institutional stability allow for an ordinary policy makig process.

- *Assumption 1* - Political and institutional stability allow for an ordinary policy making process needs to hold
- *Assumption 4:* Continued political and financial support.
- *Assumption 5*: Countries' climate change policies are increasingly ambitious and there is a race to the top by countries and companies.
- *Assumption 6*: Public institutions at city, state and federal level maintain technical capacity despite turnover.

157. The following drivers need to be in place: *Driver 2* - Relevant Stakeholders (ministries) are adequately engaged and have access to project outputs and information

Intermediate State 1 - Mitigation policies adopted /enacted for each of the five sectors and for cross-sector alternatives

158. The transition to Intermediate State 1 - Mitigation policies adopted /enacted for each of the five sectors and for cross-sector alternatives, needs to happen in the very short term (at the latest by 2020, as the NDC refers to the period 2021-2030).

159. For this to happen, *Assumption 2* - Political and institutional stability allow for an ordinary policy making process needs to hold. In accordance with some interviews, the current institutional and political situation (with Presidential election in 2018 and the CC institutional setting up for review) may delay such transition to mid-2019, which may, however, still be on time. The recent announcement that the 2019 UNFCCC COP25 can be hosted by Brazil may support this process, as the country may want to show leadership by demonstrating readiness to implement its NDC.

160. *Driver 2* - Relevant Stakeholders (ministries) are adequately engaged and have access to project outputs and information, absolutely holds at this stage (for the transition between the three outcomes and Intermediate State 1 - Mitigation policies adopted /enacted for each of the sectors and for cross-sector alternatives), thus guaranteeing that each Ministry will be using project results in any decision-making process (Interviews with Finance, Transport, Environment, Cities, Forum…). Evidence for this is, the active engagement of the ministries in the Technical Consultative Committee; the MoU signed between MCTIC and the Finance Ministry on the use of the project information in the World Bank sponsored initiative Partnership for Market Readiness; and the development of a user friendly, online database with project data.

161. In this context, while the Climate Change Committee has not yet endorsed the project outputs, nor is it currently discussing the NDC implementation strategy, given that Driver 2 is in place, it is highly likely that the Assumption 1 holds because of the intensive engagement of the ministries during the project implementation. Civil society, including the private sector are engaged and, there is no evidence otherwise, will continue to be engaged in the discussions through the Brazilian Forum on Climate Change. Congressional and Senate leaders are also members of the Forum, thus ensuring the adequate engagement of the legislature in the process.

Intermediate State 2 - Mitigation policies implemented for each of the five sectors and for cross-sector alternatives

162. *Intermediate State 2* - Mitigation policies implemented for each of the five sectors and for cross-sector alternatives is a result of Intermediate State 1 - Mitigation policies adopted /enacted for each of the five sectors and for cross-sector alternatives - and not a direct result of any of the outcomes (this means that all outcomes contribute directly to intermediate state 1 and through intermediate state one to intermediate state 2; intermediate state 2 will not take place if intermediate state one does not materialize).

163. Two assumptions need to hold for policies to transition from an adopted to implemented status: *Assumption 4*: continued political and financial support and *Assumption 5:* Countries' climate change policies are increasingly ambitious, driving a "race to the top" by both countries and companies. Regarding Assumption 4, interviews revealed that Brazil is experiencing challenges in attracting international capital to finance mitigation action because of high capital costs. The financing of climate change mitigation policy is, therefore, mostly from domestic sources. During the financial crisis, there was some evidence that green investment suffered a smaller contraction than other types of investments, which may indicate investor confidence in climate/environmentally friendly technologies. Political support may of course fluctuate, but there is no reason to believe that Brazil will completely move away from the international leadership role it has held since the 80's of the 20th century. The offer to host the UNFCCC COP in 2019 is another sign of Brazil's commitment. With regards to Assumption 5, the operative assumption is that the Paris Agreement is fully implemented and that countries will reach carbon neutrality by the second half of the century.

164. *Assumption 2* – Engagement during policy making processes promotes stakeholder buy-in, including of the private sector - is a prerequisite to all intermediate states, but in particular to Intermediate State 2 - Mitigation policies implemented for each of the five sectors and for cross-sector alternatives. In accordance with the interviews, the Brazilian Forum on Climate Change is the official stakeholder engagement platform. The Forum is currently preparing its recommendation to the President of Brazil on the Strategy for the Implementation of the NDC and all relevant stakeholders are part of the Forum. It is unclear what additional stakeholder engagement will take place in the final decision-making process (namely at the level of the Climate Change Committee). One interviewee mentioned that the Forum was the primary official communication channel between civil society and the decision- making process. As such, it is likely that this assumption will hold.

Intermediate State 3 - Mitigation Policies Measured, Reported and Verified

165. *Intermediate State 3* - Mitigation Policies Measured, Reported and Verified is effective after *Intermediate State 3* - Mitigation policies implemented for each of the five sectors and for cross-sector alternatives if Assumption *6*: Public institutions at city, state and federal levels maintain technical capacity despite staff turnover holds.

166. The likelihood of *Assumption 6*: Public institutions at city, state and federal levels maintain technical capacity despite staff turnover holding is increasingly higher as the country develops. In spite of concerns about the problem in some interviews, at the Federal level there is no definitive *evidence* that turnover hampers institutional capacity (several interviewees held their post for several years, some for more than 10 years).

The change of project director at MCTI, without it affecting project implementation, may also serve as an indication that there are procedures in place to ensure capacity is not lost. However, three situations brought to the team's attention during the interviews counter the positive assessment above:

- In one key ministry, the project focal point left its post, leaving no one able to actually discuss it with the team.
- A large simultaneous transfer of staff from MCTI to Ministry for the Environment, reportedly reduced MCTI's capacity to, for example, produce Brazil's GHG Emissions Inventory
- A warning that this issue warrants consideration because of observations that staff tend to want to move from Brasilia

167. These situations show that despite some good prospects it is not absolutely guaranteed that *Assumption 6* fully holds at the federal level.

168. At state and city levels, the situation is rather different, with great discrepancies in terms of capacity from State to State. Larger states like Rio de Janeiro and São Paulo, as well as larger cities, such as Rio de Janeiro, São Paulo, Recife and Curitiba (among others) seem to have greater capacity and seemed to have participated actively in the project activities. Other states and cities, despite previous (and potentially ongoing) efforts from the Federal Government to engage them and to build capacity (through a working group coordinated by the Ministry for the Environment), may pose bigger challenges due to both staff retention and actual absolute lack of resources.

169. Nonetheless, despite the undeniable importance of the sub-national institutions, Federal level institutions will play a more important role on the three intermediate states identified then the sub-national ones.

Intermediate States 4 - Transformational Change and Impact - Brazil reduces GHG emissions in a cost effective manner and achieves low carbon sustainable development

170. The Intermediate *States 4* - Transformational Change[63] and the Impact - Brazil reduces GHG emissions in a cost-effective manner and achieves low carbon sustainable development may be completely dependent on *Assumption 3* - Brazil's commitments towards climate change reduction and GHG mitigation objectives including those under the Paris Agreement hold. There are two dimensions to this assumption:
    - Firstly, the Paris Agreement is in force: while this is the case currently and all countries have signed it and are on course to ratifying it, the USA's announcement that it may withdraw from the Agreement in 2020 unless further negotiations related to the implementation rules address US national interests, brings a cloud of uncertainty into this first dimension;
    - Secondly, Brazil increases the ambition of its post-2030 NDCs, towards reaching carbon neutrality by the second half of the century. While Brazil has historically shown leadership in the international arena regarding climate change (recently restated by

[63] Please refer to Table 4 for illustrative examples of what transformation change can entail for each sector.

the offering to host COP-25), it is highly unlikely that any country, including Brazil, will undergo the transition to a carbon neutral economy without both a global framework which drives all other countries in the same direction and some degree of sustained political commitment and movement towards climate change reduction objectives at the national level.

171. Overall, despite some uncertainty associated mostly to the how and when the intermediate states will be achieved, there is a reasonable expectation that some impact will be achieved, due both to domestic and international circumstances. Therefore, the Likelihood of Achievement of Project's Impacts is Moderately Satisfactory according to the UN Environment Evaluation Office Criterion Ratings Matrix.

Rating of Likelihood of Impact: Moderately Likely

5.4.4. Financial Management

172. The project was approved in 2013 with a total planned budget of $16,172,400. The project budget included GEF cash of $4,180,000 (25.9%), co-finance MCTI cash of $1,078,000 (6.7%), and co-finance MCTI in kind of $10,812,000 (66.9%) and co-finance UNEP in kind of $102,400 (0.6%)

173. The project spent 92.4%($3 865,131) of the GEF budget, as well as USD $14,455,564 received in kind from MCTI and UN Environment (see provisional 2017 expenditures table below).

Table 9 - Yearly Project Expenditures

Year	Actual Expenditures	% of Total GEF budget
2013	178,342.99	4.2
2014	909,700.56	21.7
2015	399,491.35	9.5
2016	1,461,765.51	34.9
2017	915,829.61**	21.9
Total	3,865,130.02*	92.4

*PIR amended to exclude unliquidated obligations

Table 10 - Provisional 2017 expenditures[64]

Budget Class	Provisional actual expenditure
Staff Personnel (project personnel and consultants)	229,055
Travel	32,598
Subcontracts	618,697
Equipment	10,464
Miscellaneous	25,016
Provisional 2017 Expenditures Total	915,830

Co-Financing

Table 11 – Summary of project co-financing

Co-financing Source	Amount (USD)	
	Planned	Actual
MCTI Cash	1,078,000	-
MCTI In-kind	10,812,000	14,353,164
UN Environment In-kind	102,400	102,400
Total Co-financing	**11,992,600**	**14,455,564**

174. The table above illustrates that total planned cofinancing was $11,992,600 growing to an actual cofinancing figure of $14, 455,564 by project end.

Cash Versus In-Kind

175. The only planned cash co-financing was $1, 078,000 from MCTIC. There was no additional cash cofinancing by the project end since MCTIC indicates that all of their cofinancing was in-kind. Planned in-kind support to the project included $10, 812,000 from the Government of Brazil through MCTI and $102,000 from UN Environment. The UN Environment in kind support remained the same between planned and actual support. The original planned MCTIC share of the project was $11,890,000 or 73.5% while the actual share rose slightly to 14,353,164 or 77%. The table below (confirmed by UN Environment) shows the report of in-kind contributions.

[64] Please note the 2017 expenditures are as per UMOJA records. The Executing Agency (UN Environment Brazil office) will map these expenditures when preparing the 2017 expenditure report in the required format (IMIS based)

Table 12 - Co-financing table

Co financing	UN Environment own		Government		Other*		Total		Total
(Type/Source)	Financing								Disbursed
	(US$1,000)		(US$1,000)		(US$1,000)		(US$1,000)		(US$1,000)
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	
Grants									
Loans									
Credits									
Equity investments									
In-kind support	102,400	102,400	10,812,000	14,353,164			10,914,400	14,455,564	14,455,564
Cash			1,078,000				1,078,000		
Totals	**102,400**	**102,400**	**11,890,000**	**14,353,164**			**11,992,400**	**14,455,564**	**14,455,564**

(Areas of over and under expenditure are discussed under efficiency criterion as they relate to cost and timeliness aspects)

176. The Project's Financial Management is rated as Satisfactory according to the UN Environment Evaluation Office Criterion Ratings Matrix. The project's financial management is rated based on the combination of ratings for completeness of financial information and communication between the project team and financial management officials. A breakdown of ratings for these aspects is provided in the table below. Both completeness of financial information and quality of project communication were rated satisfactory.

Table 13 - Financial Management

Financial management components	Rating	Evidence/ Comments
Questions relating to financial management across the life of the project		
Compliance with financial requirements and procedures of UN Environment and all funding partners (including procurement rules, financial reporting and audit reports etc)	S	Yes.
Timeliness of project financial reports and audits	MS	Because the project is internal project reports are due every six months but only completed yearly because of the transition to UMOJA.
Quality of project financial reports and audits	S	Reports generally adequate although 2017 data is provisional with not the same level of detail as other years.
Contact/communication between the PM/TM & FMO	HS	Communication strengthened during process of UMOJA transition

Financial management components		Rating	Evidence/ Comments
PM/TM & FMO responsiveness to addressing and resolving financial issues		HS	Team seems to have worked hard to address challenging issues related to project finance during project life
Questions relating to financial information provided during the evaluation:			
Provision of key documents to the evaluator (based on the provision of A-F below)		HS:HU	S
A.	An up-to-date 'Co-financing and Project Cost's table	Yes	Up to date tables provided (see above)
B.	A summary report on the project's annual financial expenditures during the life of the project.	Yes	Expenditures provided but full summary report completed after project closure—all available annual reports sent
C.	Financial documents from Mid-Term Evaluation/Review (where appropriate)	N/A	No mid-term evaluation
D.	All relevant project legal agreements (e.g. SSFA, PCA, ICA) – where appropriate	YES	16 legal documents including agreements with institutions including FIPE, FUNDEP, UFF-FEC, COPPETEC provided
E.	Associated financial reports for legal agreements (where applicable)	Yes	Amendments to documents above provided
F.	Copies of any completed audits	N/A—Yes--Board audit shared.	Determination no project specific audit needed to be funded by project because the Board of Auditors annual audit covers all projects executed by UN Env. If any project specific audit observation results then GEF is notified. No special audit observations were made for this project.
Demonstrated knowledge by the PM/TM & FMO of partner financial expenditure		S	Seems to be good communication but financial challenges because of systems permeate life of the project
PM/TM & FMO responsiveness to financial requests during the evaluation process		S	Requests and questions generally responded to in a timely fashion
Overall rating		S	

Completeness of financial information:

177. The financial management team and UN Brazil provided requested documents including:
- A Budget at Project Design document that includes source GEF and Co-financing (GEF, Govt and UNEP)
- Project budget by funding source (Table 3), up to date co-financing tables and a report of planned and actual co-financing for 2014;
- A signed 2010 PIF Clearance and PPG Approval letter from GEF to UNEP, and another signed 2012 PPG Extension request letter

- Signed reports for each of the project years showing Reconciliation between the GEF Activity-Based Budget and UNEP Budget reports for each of the project years except 2017 that includes the total budget by budget line, disbursed funds with project expenditures.
- Amendments for 2015 and 2016 expenditure reports were also received to reflect correct figures based on approved changes.
- Offline unsigned spread sheets/Budget Control reports were provided for 2014 and 2015 and 2016
- Signed Sub-allotment/Allotment/authorization reports (with budget lines) were provided from 2013,14,15;
- Project Expenditure sheets by line item by year rather than semi-annual for all project years through 2016, (2016 report titled, computerized signatures not penned-- and includes full year only), and for 2017 only provisional data was provided
- Project spend by component information was not maintained as UN Environment did not seem to require this of the project although there is a usual practice of providing budget by component.
- With respect to proof of delivery of in-kind contributions a signed co finance report dated July 2016 was provided.
- Proof of transfer of funds to implementing partners included email offer from UN Environment Nairobi to send it. However logistics posed problems due to need to transfer of 40 related documents, thus a certification note from UN Environment was received.
- Project revision and extension documents were provided including budget changes by line.
- Partner legal agreements and related amendments were provided including 16 documents with institutions including FIPE, FUNDEP, UFF-FEC and COPPETEC and related amendments provided.

178. With respect to the quality of project reporting both the staff and Brazil and financial manager in Nairobi affirmed the project had a high degree of transparency and coordination with staff in Nairobi and Brazil all being able to go in and access the same system so there were reported to be “no surprises” throughout the life of the project, although the major financial reporting is formally once a year.

179. The primary aspects of incompleteness in reporting were related primarily to data for 2017, for which only provisional data was available at the time of this evaluation. The project financial report will be completed by early April 2018, after this report was submitted. The data submitted for 2017 also appeared to be missing the line for training and evaluation but we were informed that the current UN UMOJA system unlike the previous IMIS system does not have a line for meetings, education and training so this data will have to be manually mapped to the IMIS budget lines by UN Brazil when they prepare the 2017 project financial report. Final project financial project reports will only be available after payments are made in the second half of 2018, later than required for this evaluation report. The detailed project budget by budget line for secured funds and the project expenditure sheets were signed.

180. In 2014, the project’s Financial Management Officer (FMO), determined that it was not necessary to allocate additional project funds for auditing, in accordance with what was

stipulated in the original budget because the project is subject to the yearly UN Environment audit conducted by the UN Board of Auditors. These funds were distributed to other budget lines. As noted above, if the annual Board audit identifies project specific issues GEF and donor are notified. Following these audits no observations resulted for this project.

Communication between FMO and project

181. Interviews with UN Environment Financial staff indicated that communication was good with the project team and UNEP Brazil and that the transfer of the financial system actually enhanced cooperation and communication. Communication and coordination was also enhanced by a number of trips that took place back and forth between Nairobi and Brazil during this period of transition. The transition did result in project delays, particularly around the second project outcome. Both staff in Nairobi and Brazil confirmed the utility of offline spread sheets in helping deal with this transition because there was still important data available. The new financial system, according to interviews, will result in templates that will enable output-based budgeting and reporting which was not previously available under the old system.

182. Challenges in the transition between financial systems seem to have resulted in closer collaboration. The substantial delays to the transfer by the UN of the financial system to the Enterprise Resource Planning System were reported to not be unique to this project since the transition was UN system wide. The UN Environment office in Nairobi had much more capacity, access and knowledge of the new system and played a large role in helping staff in Brazil understand and sort out all budget transition issues. There were reports of many problems that occurred during this period of transition, although the process led to intense collaboration between the financial teams because it obliged them to work together closely, including travel to Brazil, to sort out all of financial issues. It was further noted that the financial officer in Brazil had a great deal of experience which was apparently instrumental in moving successfully through this period. Adaptive measures taken by both staff throughout this process helped deal with challenges encountered.

Challenges with Partners affecting Financial Management

183. The project's legal agreements verify relationships with institutions including FUNDEP (for outputs related to public policy in LULUCF, two sensitivity analysis and macroeconomic scenarios (1.5), COPPETEC for outputs involving waste management scenarios and policy instruments related to construction (1.6, 1.2,1.4,1.7 and 2.1.) and FIPE for outputs involving the models and scenarios on sectoral growth and economic impacts (2.2). Towards the beginning of the project the unwillingness of a potential institutional partner to accept the rules had an impact on project and financial management. Interviews confirm interagency and partner challenges around finalizing contracts, buying tickets, data sharing and intellectual property rights with implications for finances. In this first year fund adjustments were also made because equipment purchases and travel could be organized directly by agreements with research institutions.

184. Likewise, the change of the UN Environment Accounting system also impacted the project's relationship with partners, because, on the one hand, it required additional efforts

from the management team (including at UN Environment Brazil) to prepare informal accounting and budget controlling tools, namely through the use of spreadsheets. Due to constraints in payments resulting from this situation, some consultants and institutional partners halted work until the payments were made midway in the project.

185. In summary, project financial management is rated as *Satisfactory* because with respect to the completeness of financial information the necessary financial items required in the UN Environment Criteria Matrix were adequate to date. In the area of communication between financial and project management staff, the project was deemed *satisfactory* because of the evidence that the project manager and FMO had strong awareness of the projects financial status, regular contact, evidence of proactive strategies to resolve financial issues and the fact that narrative and financial reports were reviewed.

Rating of Financial Management: Satisfactory

5.5. **Efficiency: Timeliness and cost-effectiveness**

186. The efficiency of the project was rated *Moderately Satisfactory*. Delays in project implementation had a negative impact on the rating, while adaptive management, time saving measures and use of existing institutions, agreements, partnerships and data sources had a positive impact. It meets the UN Environment Evaluation Office moderately satisfactory rating as the project sequenced activities efficiently and did not receive more than a year- long no cost extension as well as justified other revisions to the formally approved framework.

187. Delays in project implementation were mainly due to three factors:

- Transition to UMOJA system that led to delays in payment and, consequently, in implementation
- Need to re-run models to take into account new data accruing from the economic and financial crisis the country suffered during project implementation
- Process for reviewing, formatting and editing the reports (outputs) that required greater effort and time than originally foreseen.

188. However, the implementation of time-saving measures and the use of pre-existing institutions, agreements, partnerships, data sources allowed for a moderately cost-effective implementation of the project.

189. The inception phase of the project was long because the project was originally envisioned to start in December 2012 but the Internal Cooperation Agreement was not signed until April 5 2013.

190. In the first year of the project from 2013 to 2014 there were some initial problems in the workflow because of issues related to project management, although some of these issues seem to have begun to be cleared up by 2014, when the risk of the workflow was changed to a medium rating. The project began its technical work after professionals had been hired; around one year and four months after the initial date of its creation document. There were also some initial problems in terms of the issues related to UN Environment

administration delays. A revised work plan was sent to the Steering Committee, which was approved by 2015. This moved the projected project completion to fall 2016.

191. By the following year in 2015, the project was moving forward, essentially "on track" with outputs being delivered and the project ratings moving to highly satisfactory. The activities in Output 3 that involved the integrated analysis were ahead of schedule, due to a recommendation of the Project Technical Consultative Committee. For the third Output, training activities were being successfully developed and were expected to surpass targets set out in the project document. However, although some delays in technical activities were reported to have been overcome, the project implementation period was extended until November 30, 2016, so that all actions and goals established in the ProDoc could be met. The workflow risk rating had moved to medium.

192. Some factors affecting performance related to efficiency include the fact that during this early stage the project had to deal with the implications of hiring individual consultants for the industrial sector as opposed to hiring a research institution which would coordinate all consultants. This resulted in the need to shift around costs from budget lines. This situation came about because the potential institutional partner foreseen for the industrial sector was unique among partners, in terms of not being willing to accept the UN Environment rules (regarding overheads). The project team managed this situation reasonably, without any impacts in overall project cost. Capacity to overcome this early project hurdle was demonstrated through adaptive supervision and management. Nonetheless, it seems evident that the solution required additional efforts from the team, in particular from the project coordinator.

193. By 2016, transition to the UMOJA system was causing severe delays in payments and other administrative processes. Consequently, the work plan execution was delayed, relations with partner institutions such as the foundations was undermined with fears that the project conclusion was threatened. That year, the project was again reporting major challenges in the work plan primarily impacting the completion of Output 3, with work flow risk level ratings moving to high. This was tied to a range of administrative problems including processing contracts, agreements, procurements, payments, travel as well as HR issues. It was further identified that these kinds of delays were requiring amendments to existing agreements with partner institutions, which was a risk factor, since legal analysis within UN Environment also took longer than expected. Several partners stopped activities due to problems with payments, which further exacerbated work plan problems. Further challenges to project implementation were due to changes in the country's political and economic/financial situation. This required adjustment in the socio-economic scenarios.

194. The delays caused by the transition to UMOJA and the need to revise the scenarios to reflect new economic situation led to the request for an extension of the project for one year.

195. By June 2017, all aspects of the project were complete except for dissemination, reported to be 95%. That year there was another no cost project extension granted, that took place in the fall of 2017 and that pushed back project completion from November 2017 to Jan 31 2018. This was to allow for the final issues of completion of graphics and other aspects of the layout of final reports.

196. Interviews also uncovered feelings of some stakeholders, that issues of timing and pressures for the project to move forward rapidly occasionally impacted interaction with project consultants because there was either not enough time for stakeholder consultation concerning study premises or results or consultants seemed too driven to meet deadlines. In addition, some complaints centered on concerns about consultants airing problems about payments and delays in public meetings, in a setting perceived as inappropriate by some. Interviews confirm that delays in dissemination were causing problems for some stakeholders.

Time Saving Measures

197. With respect to measures being put in place to maximize results within the secured timeframe and budget there is evidence of the introduction and use of spreadsheets updated weekly to help control project activities in 2015. Project management software was identified to help with activity tracking and work started on procurement at that time. Interviews confirmed that off- line spreadsheets were seen as critical in terms of helping with the project issues related to the transition to UMOJA in 2016.

Cost Effectiveness

Table 14 - Summary of Expenditures during project life

Budget Class	Estimated at design	Estimates of total Expenditures through 2017	Difference from design	Ratio
Staff Personnel (project personnel and consultants)	453,600	989292	535692	2.18
Travel	24,000	201,760	177,760	8.40
Subcontracts	1768,688	2,301,684	532996	1.30
Equipment	72,285,	26266	-46019	0.36
Education and Training	1,181,427	163526	1,017,901	0.14
Miscellaneous	680000	182603	-497397	0.27
Provision Expenditures Total	4180,000	3,865,131	-314869	.92

198. Table 14 shows expenditures utilizing the available information (note that information for 2017 is provisional and will need amendments after 2017 data is made final) comparing the final project expenditures with the original planned expenditures. (A more detailed table of full expenditures up to the end of 2016 is available in Appendix F: Summary of project expenditures) As we can see from the table above, the main areas where expenditures were above those planned were primarily the areas of travel, personnel and subcontracts, with four areas where spending was below the original planned estimates including equipment, miscellaneous and education and training.

199. Explanations were sought for some of these variations from available project documents including revisions and oversight meetings. In terms of over-expenditure, travel stands out as the highest cost above those originally planned. Examination of project expenditure reports shows that the amounts for travel increased substantially as early as 2015, when they were almost three times the planned original amount. An approved revision in 2015 increased funding for the travel line to increase support for staff participation in various meetings including those dealing with sector representatives and Technical Consultative Committee. With respect to personnel and consultants, it is interesting to note decisions to increase payments for staff (project officer/assistant). The issue of increasing funding and variability in these lines was reviewed through Steering Committee minutes which addressed changes and the issue of the budget not being originally aligned with cost tables for general services contracts. Over time assistants had different types of contracts resulting in some variable costs. Additional funds were also added for items including the MRV and communications consultants in the early phase of the project.

200. With respect to the areas of under-expenditure, we note first of all the changes with respect to evaluation, and the decision made for no mid-term evaluation (discussed further in the section on M & E). With respect to lower expenditures on reporting, there is evidence of issues including final report dissemination being primarily inline with a smaller printed circulation of the final report, and movement of funds for aspects of publications and communications distributed to other budget lines such as agreements. With respect to the issue of equipment maintenance, there was movement of several of these items to institutional agreement lines in 2014. It should also be noted that the issue of the purchase of equipment seemed to be a somewhat controversial issue in early oversight discussions around whether these should be part of in-kind support. Many of these issues are discussed in various steering committee meetings.

201. Table 9 shows trends in project expenditures of the project over time. We can see the expenditures in the initial year 2013 were the lowest at only 4.2% of the available funds of $4,180,000, explained by the fact that the project did not run the full year. The highest year of expenditure was 2016 accounting for 34.9% which may be explained by the fact that this is when project activities were in full gear. Both 2014 and 2017 accounted for approximately 21% of the budget. While our figures show $4.865,130 including expenditures and obligations as of December 2017 $US 4152275 is reported.

202. With regard to other external confirmation and discussion about the adequacy of resources for the project, the project staff, involved financial actors and consultants interviewed, confirmed that finances were adequate to meet projects objectives. In fact, some consultants indicated that they were very pleased that funding levels allowed them to do all of the work desired and that they “would not have wanted more”. It was further confirmed that some of the adequacy of financing was due to variation of the currency exchange rates which allowed sufficient resources to expand the project’s scope over time. By spring 2017 the project was reporting a surplus budget of approximately 30 000 USD that was uncommitted and that would be used for trips, with 12 000 USD to be used for additional payments for consultants, and issues related to the release of final reports (Revision, 2017). The additional flexibility in funding that emerged later in the project was reported to have led to the ability of the project to add components such as enhanced

regional dissemination and training activities focused on mitigation, elaboration of a sensitivity analyses, as well as tools for consolidation of project results including one for visualization and one database with all quantitative information.

203. In 2014, the project was proceeding within budget, although some changes were made to deal with meeting the reality of paying the project's team until 2016, considering the project was slated for 36 months and its commencement date was only 4th May 2013 (instead of 12th January 2012) and redistributing resources allocated to the agreements involving sector and integrated studies and between budget lines according to the needs identified in the Substantial Review Document, (pp7-11). Some budgetary issues emerged (previously mentioned) related to funds for equipment for UNEP and a research partner, although recorded information about resolution of the issues was not found. We see the issue of UN Environment financial management transitions emerging in 2015 and 16 with project impacts continuing into 2017, first related to (Enterprise Resource Planning – ERP) and UMOJA with problems including that system employing different budget lines than the originally allocated on PRODOC for agreements and need for back-up systems of financial reporting. In 2015 proposed adjustments to the budget were discussed in the Steering Committee because of a combination of factors including currency depreciation, the fact that payments scheduled for 2015 had to be moved to be paid in 2016, as well as other interesting decisions such as the cancellation of the position of a political advisor, payment of the MRV consultant moved to 2016 as well as the decision to cancel the mid-term evaluation. An expanded set of activities was proposed leading to the need for a substantive review.

204. In 2016 the budget review reflected financial needs of each project component while the issue of the exchange rate change mentioned above was beginning to have some positive implications for the project budget. The issues of education and training are provisional because of issues with 2017 reporting on that line. Our evaluation and review of previous years' data raised some questions about why training funds for 2015 and 2016 appeared to be lower when training was more robust for those years. It was indicated that training consultants were hired individually so expenses were executed under personnel rather than the training line. In addition, travel expenses for training were under the line for travel for official business with various services such as catering under the workshop group meeting lines. While the project was generally executed in line with the budget, whenever there were deviations reported there involved extensive discussion between the financial officer in Nairobi and the staff in Brazil, resulting in formal approval.

Building on, and use of, pre-existing institutions, agreements, partnerships, data sources

205. There were a variety of points in the project where there is evidence of the project building on and making use of pre-existing partnerships, arrangements, data sources and synergies. These include first of all with respect the early work of the project for Component 3 around the World Cup training, this seemed to have built on some work going on related to the World Cup to deal with the assessment of the environmental impact, by the Ministry of Environment and other actors. This was helpful at the early project stages when the project was getting off the ground.

206. In 2015, it was clear that the project was experiencing problems with lack of involvement of the states in relation to the methodologies used in greenhouse gas (GHG) inventories.

This issue was partially remedied by inviting representatives of state environmental agencies to participate in training sessions in Brasilia. However, MCTIC also worked to strengthen collaboration with representatives of the member states of the Working Group in GHG Inventory.

207. The discussions of the Technical Committee include many instances of adaptation and collaboration with respect to various types of data. There is also mention of international tools and sources including the World Bank Mactool tools, EPPA Model of MIT and DECC calculator from the Government of the United Kingdom being studied for replication. Various Ministries also reported providing background information for project formulation. In addition the initiative for South-South cooperation that emerges towards the end of the project in terms of allocation of a workshop, is a result of the influence and contacts of the members in the steering committee and partnerships among Portuguese speaking countries In addition it was noted that in 2017, Brazil would take over the Presidency of the community of Portuguese Language countries-CPLP and the push for greater demand for the Brazil increase cooperation with such countries (Third Steering Committee, 2016).

208. The Project's Efficiency is "Moderately Satisfactory" on the basis of their performance on the timeliness and cost effectiveness dimensions according to the UN Environment Evaluation Office Criterion Ratings Matrix

Rating of Efficiency: Moderately Satisfactory

5.6. **Monitoring and Reporting**

209. Monitoring and reporting was rated *Satisfactory*, satisfying the Evaluation Office of UN Environment criteria for three areas including monitoring design and budgeting rated moderately satisfactory, monitoring of project implementation rated satisfactory and project reporting rated satisfactory The proposed robust monitoring system and the effective work of the Steering Committee and Technical Committee had a positive impact on the rating, with a few instances of lack of transparency, clarify or consistency in reporting had a negative impact.

Monitoring Design and Budgeting

210. The project was launched with many aspects of a solid monitoring plan that followed most standard monitoring and evaluation procedures. The plan outlined strategies including data collection methods, data collection frequency, a results framework with indicators, deliverables and benchmarks in the log frame, and targets for each outcome. The project document clearly designates roles and responsibilities for monitoring, evaluation and reporting from the outset of the project. The project includes an adequate budget by monitoring activity specifically for the midterm and final evaluation.

211. While the original monitoring strategy for the project called for a mid-term evaluation, this strategy was reconsidered by a UN Environment evaluation team following the projects highly satisfactory ratings in the PIR running from July to June 2014-15. The mid-term evaluation was determined to be too close to the final Terminal Evaluation and became the subject of a query with the UN Environment evaluation team in Nairobi who were formally reported to see no problems with this decision in presentations at the steering committee.

This resulted in a recommendation for the evaluation to be replaced by a more formal review of indicators by the project team, MCTI and UN Environment.

.

212. The review conducted of the indicators was based on SMART criteria (specific, measurable, attainable, realistic and timely). The joint review of indicators and targets by members of the project team and UN Environment, followed an orientation from the UN Environment Evaluation Office at headquarters in Nairobi. This process led to several alterations regarding indicators for achievement of project objectives approved during the 2015 Steering Committee changing language (Table 15). At this time there was alteration of indicators, baselines and targets with reference to Output 3, because several indicators had targets which went beyond the project duration and did not meet the criteria of being SMART. The rationale for these changes was that at the time of the project document being written it was "not yet mature enough to properly define such indicators, targets and baseline". It should also be noted however, that these changes did not reflect challenges identified in this evaluation related to the fact that some project outcomes should have been rephrased discussed in our section on the Theory of Change. In addition to changes outlined in Table 15 It is also interesting to note that all monitoring documents such as PIR reports for Outcome 3 after 2016 go from five indicators to four with a drop of the reference to an indicator about "number of 2014 FIFA World Cup host cities with monitoring teams regarding mitigation actions" with the accompanying target of "at least eight technical cooperation agreements between MCTI and 2014 FIFA World Cup host cities for establishment of monitoring teams." There is also reference to problems with the language about the cooperation agreements in the PIR reports for that year and the fact that these issues needed to be addressed in the review of indicators but this change is hard to formally track in the project revision documents.

213. There is reference to efforts to ensure that stakeholders understand their monitoring roles and responsibilities, although there is no clear reference to incorporation of gender and marginalized groups in the monitoring strategy.

Table 15 - Changes in objectives and indicators

Project Element	Original	Changed
Objective	Nº of policy instruments proposed by the Project as a result of the studies carried out and agreed to by relevant Ministries	At least one policy instrument proposed for each sector (industry, energy, transport, household and services, LULUCF, waste management and cross-sector
	Percentage increase in resources allocated by the Government to finance mitigation options proposed by the project	Percentage of increase of resources allocated by Government to finance mitigation options proposed by the Project
Output 3 Capacity building for federal, state and 2014 FIFA World Cup host cities, government institutions, as well as	Indicator: Number of Brazilian states with monitoring teams/units regarding mitigation actions Baseline: The states are not yet making use of the National	Indicator: Number of Brazilian states with technicians (of state and/or municipal institutions) trained to formulate and implement public policy instruments for mitigation of GHG emissions.

Project Element	Original	Changed
civil society organizations, for implementation of mitigation actions for GHG emissions in key economic sectors	Inventory methodologies. Original Target: At least 20 technical cooperation agreements between MCTI and states signed to establish monitoring teams / units regarding mitigation actions.	Baseline: The states have different levels of training, among their technical staff, with regard to the implementation of mitigation actions. Target: At least 20 Brazilian states with technicians (of state or municipal institutions) trained to formulate and implement public policy instruments for mitigation of GHG emissions
	Indicator: Number of Brazilian states applying the National Inventory methodologies for the different sectors and using the National Inventory databank Baseline: Rio municipality has presented its inventory in 2011 and is developing its monitoring system; Sao Paulo municipality is elaborating its inventory; Belo Horizonte municipality has presented its inventory in 2009. Porto Alegre (RS), Recife (PE), Brasilia (DF), Cuiabá (MT), Curitiba (PR), Fortaleza (CE), Manaus (AM), Natal (RN) and Salvador (BA) do not yet have specific legislation or a monitoring system Target: No of Brazilian states with technicians using the databank of the National Inventory as a tool for the implementation and monitoring of mitigation actions.	Indicator: Number of Brazilian states with technicians using the databank of the National Inventory as a tool for the implementation and monitoring of mitigation actions. Baseline: No change Target At least 20 Brazilian states with technicians using the databank of the National Inventory as a tool for the implementation and monitoring of mitigation actions

214. The project budget included funds for the mid-term and terminal evaluation, although only a terminal evaluation was done. The funds allocated for evaluation were considered adequate. Monitoring design and budgeting is rated moderately satisfactory.

Monitoring Implementation

215. With respect to monitoring financial expenditure, problems related to the transition to UMOJA provide evidence of a number of adaptive measures put in place to help with project reporting particularly in the reporting period between 2016 and 2017. These include the development and use of a spreadsheet to monitor and track the spend on project activities. A series of meetings between MCTIC and UN Environment and the finance staff in Nairobi helped with the process of reviewing project implementation and reporting. This included finance staff from Nairobi coming to Brazil or the Project Steering Committee in

October 2017. While there was new project management technology, the project officer had difficulties not only with the software, but in terms of challenges with UN Environment deadlines and procedures which was linked with the introduction of UMOJA as the operational system. Both the project officer and assistant travelled to Nairobi in the Spring of 2017 to deal in a more hands on way with the UMOJA transition. The new financial system, according to interviews, will result in templates that will further enable output based budgeting and reporting.

216. The project produced and provided to the evaluation Project Implementation Review reports (PIR) for the project years of 2014, 2015 and 2016 and 2017. Each of these reports were detailed and clearly written, including appropriate elements such as narratives of previous year projects, project status by component, summaries of changes experienced over the reporting periods. There is also evidence of these reports being used effectively to identify project issues and having these challenges discussed and addressed in various contexts such as the Steering Committee meeting, along with the adaptive measures that were taken to deal with identified issues and problems. For example, two PIRs pointed out the need to redefine the baseline and the project's logical framework indicators. This was part of the decision made to move forward on revisions. These reviews also helped to identify problems with lack of involvement of the states in relation to the methodologies used in greenhouse gas (GHG) inventories which was dealt with by inviting representatives of state environmental agencies to participate in training sessions in Brasilia. In addition, in response to problems highlighted in the PIRs, MCTI began collaborating with the representatives of the member states of the Working Group on Inventory.

217. While many of the PIR's were generally well organized and detailed, there are instances of some vague language on the reporting related to outputs, such as Output 3 in 2015 when the language notes only that "several events were undertaken" with no specificity. There are also a few gaps in the documents on some specific issues (such as the relationship of the project to higher level bodies such as the Climate Change Executive Group (GEX) and the invitation of state authorities), namely in terms of the follow up to recommendations. Some of these issues are mentioned, sometimes moving from year to year and then disappearing from the narrative without clarity about issue resolution. In some cases, issues are also addressed in the Steering Committee with clear strategies identified to deal with the various issues highlighted in the PIRs (2nd Steering Committee, 2015). In other cases, while the PIR's are generally quite detailed and useful, it is unclear and hard to track how some of the issues such as events and trainings were accounted for (which may relate to issues of titling and labelling for the complex array of activities organized by the project).

218. Data for monitoring project implementation was usually available and provided to the evaluation team upon request. The lack of availability of data to measure indicator number 4 of Output 3 was corrected in 2017 with completion of a survey.

219. We have discussed above the fact that baseline and most importantly the selection of indicators was revisited during the second project revision. Discussions about baselines used in the data analysis recur in many of the meetings of the technical committee.

220. The Steering Committee served the intended function both to receive regular yearly reports on project progress and to make a variety of recommendations about the project over time. The original plan for the Steering Committee was for it to include MCTIC, UN

Environment and other key institutions. This body became quite small by the end of the project perhaps because of the formulation of the Technical Consultative Committee. The Steering Committee made recommendations for project extensions, reviewed details of budgets, discussed problematic issues such as the relationship with the states. The body also influenced changes such as having existing baselines updated after the 2015 committee meeting.

221. With respect to expenditures for M & E, the decision to make changes to the mid-term evaluation was cited as one of the reasons for the budget revision reported in 2015 although this line continues to roll over as unspent funds in expenditure budget reports through the end of 2016 (the last date for which line item expenditure with this subitem reports were available).

222. Monitoring implementation is rated satisfactory.

Project Reporting

223. With respect to reporting, the progress reports made available for the project were well organized and detailed, including reports of specific meetings and attendees. Full reports were only made available for the early project years 2013 and 2014. For the years 2015 and 2016, only signed signature pages for half yearly reports were provided as evidence that these reports were completed in spite of additional requests to view more complete reports for other years (please note that this request was not in the original list of documents to be reviewed noted in the inception report but was made because these reports were later found to be useful in understanding more of the flow of the project).

224. Interviews mentioned the efficiency of particular personnel involved in the early part of the project who were quite organized about project reporting. All of the PIRs were available for the project (see discussion above) and they are generally complete with a few small flaws.

225. Steering Committee minutes were developed and made available for the project through each of the project years. Steering committee minutes were generally well organized including elements such as participants and observers, updates on project status, review of issues, revisions, and presentations. There were also summaries of comments. There are a few instances where more explanation is needed in ratings of various categories of project risks. Another issue is that the detailed discussion of issues such as budgeting is more limited in 2016 and 2017 compared to the first meetings of the committee. For the minutes in 2017, it is indicated that a budget presentation is made at the meetings but this is not included in the minutes.

226. Extensive numbers of over 18 Technical Consultative Committee minutes were also available and provided to the evaluation throughout the project and these provide an interesting supplement to the reports listed above in terms of discussion of the project flow. These minutes provide detailed discussions between the government agencies about many aspects of the project. There is also evidence of examples where suggestions made in the steering committee and technical consultative committee were used to make project adaptations and improvements. For example, the existing baseline was updated after discussions with the steering committee.

227. Final financial closure documents are not submitted until 6 to 12 months after technical completion for financial closure and receipt of final reports (final expenditure, final co-finance reports, final report, final inventory report and transfer of inventory request). The reports submitted were yearly expenditure reports instead of half yearly reports.

228. Many formal project documents, (for example versions of the Pro Doc, revisions, extensions etc.) were found challenging because of inconsistent document dating on titling pages (which would be useful since signature and dates were sometimes missing in various versions of documents sent). Improved titling on documents could help distinguish concepts including extensions and revisions for example.

229. The technical completion of the project was the 31 January 2018. A final report was not reviewed because of the timing of the data gathered for this evaluation and final project closure.

230. The Project's Reporting is rated "Satisfactory" according to the UN Environment Evaluation Office Criterion Ratings Matrix.

Rating of Monitoring and Reporting: Satisfactory

5.7. **Sustainability**

231. The sustainability of the project was rated *Moderately Satisfactory*. In terms of socio-political sustainability, the project is rated moderately satisfactory as it presents a high degree of dependency on socio-political factors, although there is strong ownership, interest and commitment among government and other stakeholders. In relation to institutional sustainability, the project was also rated moderately satisfactory, because sustainability of project outcomes has high dependency and sensitivity to institutional support, which has the potential to be problematic in spite of a robust mechanism that is in place to sustain/support the institutionalization of direct outcomes and the fact that capacity of relevant individuals has been enhanced, and they are likely to stay in their position. Regarding financial sustainability, the project is rated moderately satisfactory as it is highly dependent on future funding but interviews show willingness and openness of funders to make financing available to mitigation action[65].

232. The high level of engagement and commitment with the project from both public and private institutions, the climate leadership role of Brazil as a whole and of selected sectors of the economy, such as the cement sector, and the relative resilience of green investments during the recent crisis and the increasing portfolio of green investment by key players in the country have a positive impact on the rating.

[65] Since it cannot be expected that any specific percentage of the required funds for a long term transformational change of the country can be secured at Project end. In this context, the team felt that the impressions gathered in the interviews with the financial stakeholders were Strong enough to rate the mitigation at 75-99%.

5.7.1. Socio-Political and Institutional Sustainability

233. The project has a *moderately satisfactory* dependency on socio-political factors. This is the result of the intersection between a high dependency and circumstances that mitigate this dependency up to 99%, namely, there is a high level of ownership, interest and commitment among government and among other stakeholders. There is only a small possibility that this sense of ownership will vanish with future government changes. Brazil's historic leadership on the fight against climate change denotes the existence of mechanisms imbedded in the national political system that make climate change mitigation a priority across governments and through societal changes.

Table 16 –Dependency on socio-political factors and mitigation: MS

Dependency	*High*	HU	HU	U	MU	**MS**	S
	Moderate	*HU*	U	MU	MS	S	HS
	Low	*U*	MU	MS	S	HS	HS
	None						HS
		None	*0-24%*	*25-49%*	*50-74%*	*75-99%*	*100%*
	Mitigation						

234. With regards to sensitivity to institutional factors, the project rates *moderately satisfactory*, as it is highly sensitive/ dependent on such institutional factors but the country has in place mechanisms to mitigate that sensitivity up to 99%. In particular, the country has in place a robust mechanism to sustain/support the institutionalization of direct outcomes – despite the uncertainties regarding the specific institutional set up and when the process will take place and be concluded, Brazil has started the discussions on an implementation strategy of the NDC (in the Brazilian Forum on Climate Change – see discussion on achievement of direct outcomes and of intermediate states / impact above, in particular on Assumption 1). This process will result in the institutionalization / adoption of policies and measures based on the project outputs. In addition, the capacity of relevant individuals has been enhanced, and they are likely to stay in their position at federal, state and city levels (see discussion of likelihood of achievement of Intermediate State 3 above). The following paragraphs present further details.

Table 17 – Sensitivity to institutional factors and mitigation: MS

Dependency	*High*	HU	HU	U	MU	**MS**	**S**
	Moderate	*HU*	U	MU	MS	S	HS
	Low	*U*	MU	MS	S	HS	HS
	None						HS
		None	*0-24%*	*25-49%*	*50-74%*	*75-99%*	*100%*
	Mitigation						

235. As noted previously, there seemed to be a variety of expressions of a high level of ownership of project results, by a number of government Ministries in the project which has been supported through the working relationships and close engagement through Technical Consultative Committee. Some ministries suggested adopted/changed policies on the basis of project inputs (such as transport). Project reports were also used by the World Bank financed PMR project and the Brazil GHG Inventory database aligns closely with that of the project. While the project considered socio-political sustainability, it is unclear how fully it was addressed by strengthening ties to civil society or how the capacity building outcome would be sustained at the state and city levels, beyond the federal level.

236. MCTIC signed a technical cooperation agreement with the Ministry of Finance for the use of the project database in the World Bank-sponsored Partnership for Market Readiness project on carbon pricing. Many ministries affirmed that the project is providing important inputs for guidance on direction for future actions. The Ministry of Development, Industry and Foreign Trade indicated that they have been enthusiastic in discussions with the project team about work on future initiatives using the project information and future collaboration on their databank to continue to build on project results. The information from this project is also feeding into coordination that started in 2017 on elaboration of a proposal for technology needs assessment in the area of mitigation. The Ministry of Transport has utilized information from the project in development of its Environmental Guidelines, with suggestions it will influence sectoral plans. The plans for the database of low carbon technologies by the Ministry of Industry and Commerce, combined with their interest in the integration with project findings, bodes well as another instrument to ensure sustainability. As we previously discussed, there were other ministries where involvement in the process was more limited, so future efforts for outreach and engagement to explore intersections and follow up on linkages and recommendations is warranted.

237. Interviews picked up some concerns circulating among stakeholders about the possibility that the ministry in charge of NDC's implementation, the Ministry of Environment (MMA), may change as a result of politics, although policy proposals from the project have been incorporated and forwarded as part of MCTIC' contribution. As a result of these concerns about coordination, some expressed uncertainty about the impact the project reports will have in shaping climate policy, while also acknowledging that the study will be important.

238. From a civil society perspective, it can also be acknowledged that there is a high level of stated interest in mitigation relevant technologies and policies. In fact, for some sectors (such as cement), Brazilian industry is a leader as far as energy efficiency is concerned, which is a sign that there is action at society level aligned with the project outcomes and intermediate states. In addition, the private industrial sector was described as both heterogeneous and broad, with increased mobilization and responsiveness in some versus other segments. Other parts of society may pose greater challenges, namely in relation to agriculture and livestock, as these sectors are often mentioned as one important driver for deforestation (in addition to direct emissions, such as those resulting from enteric fermentation in cattle). Although policy think tanks in this area have been involved, much more extensive, targeted outreach is needed with other actors for this sector in the months and years to come (see project recommendations).

239. Specifically, in relation to the sustainability of capacity development efforts, it has been discussed elsewhere that the situation varies greatly in Brazil from stakeholder to stakeholder. Generally speaking, it can be said that the prospects at federal level are high, despite the concerns stated in some interviews in relation to staff turnover. The skills and qualification of civil servants at federal level is sophisticated. National level civil society organizations (such as industry associations or environmental NGOs) are also considered to be highly technically prepared to engage and contribute to climate change mitigation policy.

240. At state and city levels, as also discussed elsewhere in this report, the situation is quite different varying from state to state, city to city and organization to organization. At these levels, it may be considered that the existing capacity is not adequate for an effective and efficient climate change mitigation policy management, including MRV (even though it is considered that the Federal level plays a more important role than the other levels). There are some clear exceptions to this statement in larger cities and states, such as Rio de Janeiro and São Paulo. In addition, the participant survey of the impact of trainings as mentioned previously, shows that although there may be adequate access to the SIRENE systems, the level of use of these systems is not high. There is clearly a need to break down data by state and region and disaggregate data further by sector (see Recommendations 6,4,1 and Lesson 8).

241. In sum the team believes that the mechanisms in place are sufficient to mitigate the high dependency and sensitivity to socio-political and institutional factors, in particular taking into account the great level of ownership, the likelihood of institutionalization of the outputs and the level of capacity built at all levels, in particular at the federal level.

Financial Sustainability

242. The project rates *moderately satisfactory* in relation to financial sustainability, due to a high level of dependency on financial factors. Given the nature of the project, the evaluation team feels that the Evaluation Office of UN Environment criteria for financial sustainability cannot be directly applicable to a Project of this nature, as it cannot be expected that any specific percentage of required funds for a long-term transformational change of the country can be secured at Project end. In this context, the team felt that the impressions gathered in the interviews with the financial stakeholders were strong enough to rate the mitigation at 75-99%.

Table 18 - Dependency on financial factors and mitigation: MS

Dependency	*High*	HU	HU	U	MU	**MS**	S
	Moderate	*HU*	U	MU	MS	S	HS
	Low	*U*	MU	MS	S	HS	HS
	None						HS
		None	*0-24%*	*25-49%*	*50-74%*	*75-99%*	*100%*
	Mitigation						

243. The availability of climate change financing is a potential key bottleneck for climate change mitigation. The financial and economic crisis Brazil endured during the project implementation period is referred to as an illustration of a worst-case scenario, where the country is faced with a shortage of capital available for investment and where its conditions to attract foreign investment are at the worst. While the project helps to refine understanding of the necessity for substantial increase in funding to meet identified national and project goals, increases in resource allocation have been due to factors beyond the project (the project reports an average increase of 23% of resource allocation for emission mitigation actions for the duration of the project despite limited federal spending).

244. It is interesting to note that in spite of such a period of economic depression, and the political landscape moving away from emphasis on climate change, there were positive views in interviews that the reduction in investments in the green economy were not as steep as in the other sectors, which means that these types of investments are more resilient to degraded economic situations that other types.

245. The cost of capital is high in Brazil, even when sourced from special vehicles such as the Green Climate Fund. It seems from interviews that Brazil's climate change mitigation policy is funded mostly through domestic sources. There is some good news in the sense that Brazil's financial institutions (while financing carbon intensive technologies and initiatives) seemed to report being prepared and ready, and have been financing low GHG emitting technologies. One of the financial institutions interviewed estimates that about 40% of its portfolio can be classified as financing the Green Economy. There are also recent positive reports about issues such as consolidation of the green bond market. It is also positive that attention to climate funding has increased, with various factors such as the Brazil Forum focused on monitoring patterns of funding for climate change. These efforts will shed further light on the state of financing patterns and trends.

246. These issues however will clearly need ongoing attention since there are other more troubling indicators on the horizon. For example, international cooperation has played a role in financing mitigation policy in Brazil. The most important example is the Amazon Fund (USD 1 Billion), funded with donations from Norway and Germany. However, we see some indications of problems in recent years including announced threats to contributions (Speranza, Romeiro, Feder, 2017). The Fundo Clima (Climate Fund) is a national fund funded through domestic capital only (500 million Reals), aimed at financing climate change mitigation in the economy. There are also reports of cuts to budgets of major Ministries (up to 50%) such as the Environment Ministry which raise issues with respect to the Government's ability to monitor deforestation adequately (Climate Action, 2017).

247. In sum, despite the high levels of dependency of financial factors, the outlook collected through interviews of the financing stakeholders, allow to assess the mitigation to be as high as 75-99%.

248. The Project's Socio-Political, Institutional and Financial Sustainability is *Moderately Satisfactory* according to the UN Environment Evaluation Office Criterion Ratings Matrix

Rating Sustainability: Moderately Satisfactory

6. Conclusions, Lessons Learned and Recommendations

6.1. Conclusions

249. The project "Mitigation Options of Greenhouse Gas (GHG) Emissions in Key Sectors in Brazil" aimed to help the Brazilian Government strengthen technical capacity to support the implementation of actions to mitigate greenhouse gas emissions in seven key sectors of the economy. These economic sectors include industry, energy, transport, residential and services, Land Use, Land Use Change and Forestry -LULUCF (now AFOLU), waste management and other intersectoral alternatives. The project began in 2013 with final closure almost five years later at the end of January 2018. The project was a significant effort to enhance the Brazilian government's ability to be proactive in confronting threats of climate change, providing greater clarity for decisionmakers about the best way forward based on consideration of tradeoffs between mitigation potential and economic costs. The project thus provides a useful roadmap to inform both government and citizens concerned about the dual objectives of environmental sustainability and economic growth. The project was able to meet key objectives related to generating public policy instruments, with some evidence put forward by the project (that clearly needs additional analysis through other sources) of increasing resource allocation for emission mitigation actions over the period of the duration of the project. The full evaluation of the balance between project strengths and weaknesses, led to giving this project an overall rating of Satisfactory.

250. The project was certainly highly relevant to many overarching policies and objectives that exist at the level of national level of government in Brazil, in terms of the main project donors' objectives on climate change and policies at the regional and local level. The project worked with a broad range of sectoral policies, building upon, and in many cases moving forward from these platforms, as part of the framework of analysis.

251. The project also used an interesting variety of dynamic strategies as part of the project outputs that successfully combined both theoretical and action-oriented strategies to work towards the intended goals. The project combined the analytic power of integrated analysis and modelling forecasts and report generation, with strategies designed to help explain, inform and train a wide range of actors at federal, state and city levels as essential elements of the projects core. The project was lauded as one of the first of its kind, going beyond previous studies in estimating GHG reduction and creating forecasts related to emission reduction technologies and policies that are, for the first time, more fully in line with Brazilian reality. The project successfully unleashed energies of respected teams from Brazilian universities, praised by a wide range of stakeholders for both their competence and knowledge. The technical breadth of the effort to identify and rationalize such a broad scope of GHG mitigation technologies, policies and socio-economic impacts was applauded, even in cases where differences of opinion occurred about project findings The comment was made for example, that there is no mitigation study anywhere in the world quite as comprehensive or as rigorous as the one produced with the support of this project.

252. While these strengths are well-evidenced and should be applauded, the project also has some limitations, particularly that the wealth of intellectual energy stemming from this ambitious effort does not necessarily meet the more generalized needs of citizen and policymakers who are some of the key intended users of the information generated. One recommendation (see Recommendation 2) is for even more consolidation into a single much shorter, visually attractive "brochure like" document that quickly walks the reader through the complete project trajectory with key takeaways a reader or policymaker should understand that explains and ties together the various project components.

253. The project overcame a variety of obstacles to achieve a wide range of high-quality outputs: momentum was hampered during delays in startup; there were some negative impacts from elections; contracts and partner negotiations involving a large array of involved actors required administrative juggling; a period of early staff turnover contributed to delays and disruptions were experienced from a number of factors including the systemwide overhaul of UN financial systems. Thus, the project is considered moderately satisfactory with respect to efficiency. In spite of these issues, recognition should be given to the range of ways in which adaptive management was used to help track finances and hands-on approaches to communication between UN Environment in Nairobi and Brazil and project managers were adopted to help navigate these difficult phases.

254. With respect one of the central evaluation questions related to the climate change policy process, we found that Brazil is complex, influenced by different public actors and government ministries, sometimes with overlapping and conflicting roles. The Ministry for the Environment has an important policy coordination function, with additional oversight of forestry policy which makes up the greatest share of the country's GHG emissions. The Ministry for Science, Technology, Innovation and Communications, the central actor in this project, has traditionally been crucial in coordinating Brazil's participation in the Kyoto Protocol's Clean Development Mechanism, Brazil's GHG inventories, national communications and biennial update reports to the UNFCCC. The Climate Change Commission is coordinated by MCTIC, who defines rules and approves projects. Other actors include the Ministry of External Relations influential as coordinator the countries position in UNFCCC negotiations. Other relevant ministries are represented at the Inter-Ministerial Climate Change Committee, where climate change policy is formally discussed and approved. We also need to recognize that state and city level institutions play an important, but more limited, role with occasional inconsistencies with federal approaches, in spite of efforts to overcome these issues. [66]

255. In the face of this complex array of competing institutions, one of the interesting strengths of the project, which relates to another of the main evaluation questions, was clearly the ability to successfully engage a wide range of public stakeholders, in particular representatives of relevant ministries through the Technical Consultative Committee, an innovation from this project that we have previously identified as helping to fill an expressed need for increased government coordination around climate change. This committee, not originally foreseen in the project plan (though some of its functions were

[66] Addressing the following strategic question: What is the GHG mitigation policy change process in Brazil? Who are the key stakeholders, including civil society, to take forward project outputs/ outcomes at the state and federal levels respectively?

designated for the Steering Committee), demonstrated high levels of dedication to the project, meeting regularly throughout implementation, thus providing a forum for intense exchange between the project team, consultants and ministries. This process was praised by involved stakeholders and highlighted as good practice, contributing to building capacity, as well as understanding and ownership of project results. We assert that this structure has potential to provide a base for future efforts towards sustainability.

256. Several ministries from various sectors confirm that project results will be used in future work to help in inter-ministerial decision making and strategies for implementation of the Nationally Determined Contribution under the Paris Agreement[67]. The Finance Ministry signed an MoU with MCTIC to ensure future cooperation regarding the use of project data and information. In Brazil, the Government has full powers to adopt and enact climate change policy, even though Congress also adopts laws with impacts on climate change mitigation with some evidence of project outreach to Parliament[68].

257. Despite regional outreach events undertaken by the project, which allowed stakeholders from across the country to engage, the project's ability to build capacity at state and city levels was more limited, at least in comparison to its influence at the federal level. At the same time, the project put forward great efforts to work with these various levels, at times in cooperation with the Ministry of Environment, for example in the early phases of the project through the FIFA World Cup initiative, and through structured efforts at training. Effective engagement with the states was also an area with some challenges. While additional steps are needed to have the desired impact, the effort towards broad engagement should be appreciated.

258. Regarding civil society, Brazil is one of the few countries in the world to have a formal engagement mechanism: the Brazilian Forum on Climate Change. The Forum, composed of both public and private organizations, including ministries, industry associations and environmental NGOs, members interact in specific thematic chambers (such as the industry chamber). The discussions among members in the chambers result in recommendations adopted by the plenary and forwarded to the President of the Republic. We found that non-public stakeholders, including many private sector entities, demonstrated increasing interest in project activities over the life of the project, although to a somewhat lesser extent than those in the public sector, in the sense that their involvement came primarily through several project sponsored events as well as through the Brazilian Forum on Climate Change. While this was an important stakeholder mechanism, some of the effectiveness of this body was impacted because it was inoperative for a large part of the project implementation period. Nonetheless, after the Forum restarted operations in early 2017, the project was given attention and provided important inputs into the Forum's discussion on a strategy to implement Brazil's NDC. There is also evidence that the project is influencing the recommendation for implementation of the NDC to be forwarded to the Office of the President. The project also

[67] Addressing the following strategic question: To what extent has the project built individual and institutional capacity to support implementation of mitigation actions (Brazilian NAMAs aimed at reducing GHG emissions from 36.1 to 38.9 % by 2020 at local level)?

68 Addressing the following strategic question: How did the project identify and work with the relevant stakeholders to catalyze use of project outputs and outcomes in the GHG mitigation policy change process in Brazil?

stimulated new levels of analysis, debate and controversy because of concerted efforts to engage with the industrial sector, which significantly increased attention, including stimulating this sector to hire a consultant, to help with responses to Brazil's mitigation options over the long term[69]. Although this relationship was at times difficult, the efforts to hold several workshops with this sector are also quite positive, indicating that the project was working hard to deal with these critical players in the private sector.

259. These relationships sometimes led to concerns about consistency of feedback and problems surrounding tight controls over access to, and the release of, public documents that was a point of contention for various stakeholders both in and outside of government. Many aspects of communication could have been improved. These tensions may have stemmed from challenges with communication consultants as well as from practices aimed to provide some control given the sensitive nature of information tied to this effort. Thus, there are key lessons to learn about strategies to sustain stakeholder buy-in from some of these challenges. Another project challenge included engagement with marginalized groups and attention to gender focus and analysis, although research teams demonstrated some degree of diversity.[70]

260. The climate of political instability that Brazil faces influenced project implementation, but also increases uncertainty concerning sustainability and the formal policy process for climate change mitigation in terms of structure, deadlines and political will. While, the inter-ministerial committee is still formally the body where decisions will be made, several stakeholders mentioned that the current president is considering restructuring the process (no further details on this have been made known). Despite a lack of clarity about future direction, many members of the current arrangement will continue to be engaged, and most expressed investment in the project, therefore it is unlikely that change will entirely threaten forward movement on outcomes. Evidence was presented, of specific project inputs for the process of elaborating Brazil's Nationally Determined Contribution to the Paris Agreement. Additionally, as noted previously, the contributions of MCTIC, and work with the Brazil Forum has influenced the Brazil Forum's articulation of recommendations to be forwarded to the President on the strategy for implementation of the NDC[71].

261. This project has somewhat limited capacity to fully ensure the fulfilment of outcomes, in particular in relation to endorsement of project results by the institutional set up responsible for decision-making. Some of this relates to structural challenges, because the project implementation period terminates immediately after the completion of outputs and final dissemination of final reports. Dissemination and follow up require time, with the need to now focus attention on the specifics of policy instruments and proposals. While the project included an ambitious range of outreach activities it is clear that now more targeted work is still needed for the full benefits of this project to be realized. It is hoped that

[69] Addressing the following strategic question: How did the project identify and work with the relevant stakeholders to catalyze use of project outputs and outcomes in the GHG mitigation policy change process in Brazil?

[70] Addressing the following strategic question: How were the project reports disseminated? For example, how did Ministry/ Parliamentary committees take forward policy proposals- which sectors / why/ why not? Potential for scale up/ sustainability?

[71] Addressing the following strategic question: How has inter-ministerial collaboration supported sustainability and likelihood of impact of this project? (explore sharing information, capacity and any other issues)

ownership of the project results by key ministries (mostly due to the intense engagement efforts through the TCC) will maximize potential for this outcome to be achieved, increase project influence on strategies for implementation of the NDC's and forward movement through intermediate states to long-term impact[72]

262. Table 19 below presents a summary of the assessments against the defined criteria and the respective ratings attributed by the evaluation team.

Table 19 - Summary of Evaluation Assessment and ratings

Criterion	Summary Assessment	Rating
Strategic Relevance		HS
Alignment to MTS and Pow	Alignment with climate thematic priority MTS 2010-13/2014-17 POW-	HS
Alignment to UN Environment/GEF/Donor Strategic Priorities	Clear alignment to UN Environment MTS/GEF/Donor strategic priorities	HS
Relevance to Regional, Sub-regional and National Environmental Priorities	Project highly relevant to national, regional and sub-regional priorities although relationship to the states remained an ongoing project challenge	HS
Complementarity with existing interventions	The project demonstrated strong complementarity with many important interventions although there was also some evidence of overlap/duplication	S
Quality of Project Design	Strong project design but aspects of design structure and emphasis remained challenging throughout the life of the project	S
Nature of External Context	Project generally moved forward successfully, but some aspects of politics (both internal and external) and political transitions, and the financial crises in the country influenced movement forward at various times.	F
Effectiveness		MS
Achievement of Outputs	Outputs including reports, modelling and training were developed and considered of high quality by most. However, at the time of the field interviews for this assessment, the final reports still needed dissemination to maximize intended use.	HS
Achievement of direct Outcomes	Important strides and developments in achievement of direct outcomes, including acceptance of project findings, endorsement of project recommendations for policies and strategies and Increased technical capacity including assumptions and drivers however additional steps still	MS

[72] Addressing the following strategic question: How were the project reports disseminated? For example, how did Ministry/ Parliamentary committees take forward policy proposals- which sectors / why/ why not? Potential for scale up/ sustainability?

Criterion	Summary Assessment	Rating
	needed for full achievement	
Likelihood of impact	The achieved direct outcomes include the most important to attain intermediate states; assumptions for the change to intermediate states hold; drivers to support transition to intermediate states are in place.	ML
Financial Management		S
Completeness of project financial information	Some aspects of project financial information available	S
Communication between finance and project management staff	The problems with UMOJA increased communication and coordination between finance and project management	S
Compliance with UN Environment standards and procedures	Project determined to be in compliance with UN Environment standards and procedures	S
Efficiency	The project had four revisions against the original results framework; some periods of moving forward but problems with delays at various points had effects on stakeholders	MS
Monitoring and Reporting		S
Monitoring design and budgeting	Many aspects of monitoring design and budgeting are good but systems need later review and revision to be SMART; Some outcomes not improved in spite of revisions.	MS
Monitoring implementation	Approved process for change in mid-term review, generally good evidence of detailed monitoring of project implementation and sharing with a few gaps, extensive data shared with evaluators; also some aggregated data by gender conducted	S
Project reporting	Substantial documentation of project progress and good communication	S
Sustainability		MS
Socio-political sustainability	Brazil historically a leader on climate change issues, but different governments have different priorities.	MS
Financial sustainability	Financial crisis hitting the country during project implementation shows that, despite interesting prospects, financial constraints may jeopardize project intermediate states and impact.	MS
Institutional sustainability	The institutional set up for policy decision making in Brazil is currently uncertain. Nonetheless, there is a good track record of institutional capacity at federal level, in some of the key states and in key civil society stakeholders.	MS
Overall Project Rating		S

6.2. **Findings, Lesson Learned and Recommendations**

263. Table 20 includes a set of recommendations emerging from the project terminal evaluation.

Table 20 - Recommendations

Recommendations	
Context	A strategy for targeted follow up on the recommendations emerging from project is needed to ensure movement forward on specific project policy and action recommendations. Reference: Achievement of Direct Outcomes and Likelihood of Impact
Recommendation 1	As part of an exit strategy, the MCTIC team is advised to hold a follow-up meeting with all key relevant ministriesto discuss and handover these recommendations, including focusing on the Action Plan proposal included in recommendation 2 above, and any support needed for a smooth transition
Responsible Party	MCTIC
Time Frame	Within two months
Recommendation 2	Create a more specific process map of specific titles in key Ministries, federal and state agencies and legislative bodies of those who a) need to have understanding of project findings and recommendations over time b) those with actual control over GHG mitigation policy development, implementation and monitoring. Consult with agency hiring/training staff about ways to integrate/disseminate info into staff trainings/orientations or around new strategies through tools like online or telephone consultations. Also consult with sample experts in diverse disciplines at universities (policy, environment, business etc.) about creative methods to ensure project history/ dissemination. Get feedback from key target audiences (through interview, survey or focus group) to improve access to, use and understanding of info on MCTIC website. Feed findings into the action plan in Recommendation 3.
Responsible Party	MCTIC
Time Frame	Within one year
Recommendation 3	A project follow- up Key Sector GHG Mitigation Action Plan should be developed. The Plan should identify specific key target actors and type of follow up/ information and/or additional training needed to enhance both project understanding and movement forward on policy objectives and mitigation actions. Attention should be paid to short simple messages, and required next steps, targeted actors and time frames for action. Dissemination should be targeted using tools that involve easy access (ex teleconference, PowerPoint

Recommendations	
	Presentation) with sensitivity to needs of diverse audiences. A process of this type would also benefit from a shorter single report/document that consolidates, ties together and summarizes key highlights of what a reader needs to understand from all of the project components and policy recommendations.
Responsible Party	MCTIC
Time Frame	Two- year duration including phases of development and implementation.
Recommendation 4	The Technical Consultative Committee should continue to meet (timing and frequency to be negotiated) and be charged with monitoring Action Plan development and implementation. A separate working group composed of key project actors and members of civil society from the Brazil Forum on Climate Change, key policy area think-tanks, and appropriate representatives from sectors (including groups dealing with marginalized groups and women) should be consulted. The Brazil Forum also should create a schedule for updates. Reference: Paragraphs 189-196
Responsible Party	MCTIC, Brazil Forum, Technical Consultative Committee
Time Frame	Two- year duration. Formulation of working group within four months.
Recommendation 5	A meeting or meeting series should focus on moving forward research needs that follow from this project. The process should also involve a roundtable (or telephone conference outreach) with relevant think tanks for key sectors to discuss additional data access needs/utilization related to the information generated from the project. This process should also address any relevant issues related to interagency or external coordination on database use/ development. The process should consider research linkages to address needs of women, indigenous and marginalized groups and ways to further capitalize upon capacity built in the university teams involved in the project. This should also include consideration of the strategy to improve the National GHG Inventory information for mitigation purposes including further disaggregation by state and region for areas beyond agriculture and LULUCF. These steps should lead to a follow up research/data plan that identifies actors and resources. The plan should identify ways to promote and build on increased research capacity with consideration of issues of gender, race, and indigenous groups.
Responsible Party	MCTIC, Project Consultants, Rede Clima
Time Frame	Within one year
Context	The relationship to gender and marginalized groups was highlighted as one deficit in the current project. Thus, proactive strategies to engage with these groups will increase project understanding and

Recommendations	
	enhance future planning. Issues related to gender and vulnerable groups concerns mitigation policy as much as it does adaptation policy. Reference: Stakeholders
Recommendation 6	To overcome challenges of possible "elite capture" and "gender blindness" special efforts for outreach related to gender and marginalized groups can occur through a targeted seminars and creation of a resource guide to map and connect relevant resources and groups by city, state and region. This process can start with a small strategy session to bring together a few relevant groups and experts to discuss planning an appropriate initiative and methods to target group leaders and ways to build on themes relevant to bridging output of the existing project with interests and needs of target groups. A series such as "Listening Circles: Linking Climate Mitigation and Adaptation" could be a possible title. This should be organized in consultation with a diverse group of players both in and outside of government helping to play a leadership role. Specific methods and strategies for working with women and pro-poor groups can be found in the report Gender and Mitigation (Wollenberg, 2016) and methods in the work of the Huairou Commission and Groots International. Tools such as cultural domain analysis and local-to-local dialogues are example of strategic methods and attention should also be paid to diversity of language for some indigenous groups. Increased efforts towards these target groups can also help with enhancing a spirit of interest mobilization and commitment to action on project findings.
Responsible Party	MCTIC and target groups in Brazil Forum (IES, IPAM etc.)
Time Frame	Within one year
Recommendation 7	For MCTIC events and trainings, create formal systems or templates for more consistent labelling of cycles, events and trainings. Create flexible templates for training (and possibly even event) participant surveys which include questions or rating of participant satisfaction and room for open ended participant suggestions and recommendations. Review policies related to training surveys to create more uniform databases. At a minimum utilize suggestion boxes to allow room for participant feedback and recommendations.
	MCTIC
	Within one year

Table **21** presents a summary of key findings, lessons learned and recommendations.

Table 21 – Findings and Lessons Learned

Lessons Learned	
Context	The project involved mitigation issues related to key sectors of the Brazilian economy including industry, energy, transportation, residential and services, agriculture, forestry and land use, waste management and cross sector alternatives. Special efforts were made to engage with stakeholders in the key sectors however important lessons emerged about effective engagement, particularly in the early stages. The industrial sector relationship was particularly challenging because of issues related to access to data. Some industry representatives suggested that the process of involvement and mobilization of the sector was slow. Reference: Output 1: Mitigation alternatives identified and respective potential and costs quantified for industry, energy, transport, household and services, LULUCF, waste and cross-sector mitigation alternatives for the periods 2012-2035 and 2035-2050
Lessons Learned 1	Processes of this type should start with development of a stakeholder Engagement Plan. The plan should be shared and negotiated from the outset, allowing for input from key stakeholders. The plan should ensure that planned initiatives are tailored to specificities of its target audience and include negotiations on issues related to timing, venue, length and agenda. It should also plan for diverse needs of project managers and consultants. These plans should also include separate strategies to ensure that the correct people from government agencies are engaged, as well as ensure mechanisms for outreach to underrepresented and marginalized stake holders and groups involved with gender.
Lessons Learned 2	Industry spokespeople suggested that the process of engagement with the industrial sector outreach should always begin with initial contact in letter request form to associations with early negotiations to lay the groundwork for future project data needs and requests
Lessons Learned 3	In order to influence drivers as much as possible, projects of this type should invest strongly in buy in/ promotion mechanisms, because industry and private sector stakeholders are often busy, and to avoid problems of too many demands on stakeholders. Methods for meetings need to expedite both logistics and time required. Attention should be paid to a range of processes to ensure appropriate planning of travel arrangements for outside participants, design of short sessions rather than day long meetings and increased use of technology such as group skype or teleconferencing. Greater attention should also be given to increased mapping and project coordination in the climate change arena, particularly as it relates to involved stakeholders, outreach and communication.
Context	The Technical Consultative Committee was an excellent means to support interagency communication, consultation and capacity building. While agency communication and coordination were clear,

Lessons Learned	
	communication with external stakeholders was less so. Some key stakeholders felt engaged in some stages but not in others, others were left wondering about when they would receive feedback or whether they would be required to contribute again. Other important lessons related to project operations came from the voices of key stakeholders dealing with a variety of the projects ongoing challenges. Reference: Stakeholders and Output 1: Mitigation alternatives identified and respective potential and costs quantified for industry, energy, transport, household and services, LULUCF, waste and cross-sector mitigation alternatives for the periods 2012-2035 and 2035-2050
Lessons Learned 4	In any future, a Technical Consultative Committee for agencies should be combined with development of the dual structure of a project specific Citizens Advisory Committee or Sectoral Working Groups involving outside civil society including think tanks, academia and private sector groups and organizations which should be established to build ongoing project understanding and buy in over time and to ensure a consistent pace of consultation throughout the project. This will help mitigate issues experienced in this project of key bodies related to civil society such as the Brazil Forum on Climate Change being non-operational for a significant number of years due to factors outside of the control of the project.
Lessons Learned 5	More regular consistent communication with stakeholders is required. Tools such as regular project newsletters provide channels for communication about timetables, publications and revisions status and help keep the spirit of stakeholder engagement more positive. Back up strategies such as outlets for online/remote consultation with UNEnv/MCTIC preidentified communication experts may be useful for projects where issues emerge with contracted communication consultants.
Lessons Learned 6	Future mitigation modelling projects using models run by several institutions needs to pay attention to early planning for linkages between models to ensure improved feedback loops.
Lessons Learned 7	Future projects need to build on the lessons related to strengthening financial management and project monitoring and reporting. This includes a) always utilizing redundant financial back up systems such as off line spread sheets which were essential in the financial system crises experienced by this project; b) improving project report number and dating systems to ensure greater ease of document review; and c) holding meetings between project staff in Nairobi and field UN staff early in the project to establish processes and systems for ongoing communication and consultation. Project oversight should ensure opportunities for GEF to interact with management through occasional key event attendance or videoconference consultation to enhance more direct communication outside of project reports.
Lessons Learned 8	For the events and trainings, systems for clearer labelling of cycles,

Lessons Learned	
	events and trainings were sometimes unclear. For the technical training on the GHG inventory there is need to address better tailoring of training for those dealing with mitigation and more careful guidance related to those in roles related to monitoring or mitigation actions; increased needs for databases to be more regionally sensitive, to cover more sectors, and for greater alignment between federal and regional policies. The training participant surveys also do not have a question or rating of participant satisfaction, or open- ended participant suggestions and recommendations. In addition, the participant surveys did not seem to be proforma for all events to create a more uniform database.
Lesson Learned 9	The Project Technical Coordinator role, which technically manages the project deliveries, has been found to be essential for the success of the project.

7. Appendices

7.1. **Appendix A: List of Documents Consulted**

Amigos Da Terra, Amazonia Brasilia. (2016, Dec 7) Manaus terminates lecture cycle of mitigation options of the MCTIC project and UNEP. Retrieved from http://amazonia.org.br/2016/12/manaus-encerra-ciclo-de-palestra-do-projeto-opcoes-de-mitigacao-do-mctic-e-do-pnuma/

Arsenault C. (2015 Feb 10) Brazil climate plan backfires, doubling steel emissions. *Environment*. Retrieved fromhttps://www.reuters.com/article/us-climatechange-latam-carbon/brazil-climate-change-plan-backfires-doubling-steel-emissions-idUSKBN0LE1YM20150210

Asiah (n.d.) Integrated energy and economic modelling. Training PowerPoint Presentation

Attendance Lists: Towards a low carbon economy: Options for the reduction of sectoral emissions April 6. 2016: Curitiba; May 11, 2016; Brasilia March 5, 2016; Manaus Dec 6, 2016; Rio May 31, 2016; Salvador Oct 4, 2016

Barbi, F, da Costa, F.L (2016). *Governing climate change risks: Subnational climate policies in Brazil*. Centre for Environmental Studies and Research, University of Campinas, São Paulo, Brazil. doi: 10. 20944/preprints201607.0006.v1

Barbieri A. F., Domingues E., Queiroz, B.L, Ruiz R.M., Rigotti I.J., Carvalho A.M., Resende M.F. (2010) Climate change and population migration in Brazil's Northeast: scenarios for 2025-2050. *Population and Environment* 31: 344-370.

Barbour M. (May 6, 2010). [Letter to Maryann Fuller]. Global Environmental Facility Archive.

Beckel, L, et al (2012) *Using Marginal Abatement Cost Curves to Realize the Economic Appraisal of Climate Smart Agriculture Policy Options*. FAO. Retrieved from-http://www.fao.org/docs/up/easypol/906/ex-act_macc_116en.pdf

Borba B. (April 2, 2015) *Low-carbon technologies applicable to key sectors in Brazil* Transport sector)

Borba B. (n.d.) *Modelling of abatement costs and technological learning curves* (Transportation sector)

Borba B. (2015 June 5). *Construction of low carbon scenarios* (transportation sector).

Borba B. (2016 June 1) *Efficiency potential and costs of EGF emissions to key sectors of the Brazilian economy* - Transport

Brown A.M (2016) Difference between theory of change and logic models. Retrieved from https://www.annmurraybrown.com/single-post/2016/03/20/Theory-of-Change-vsThe-Logic-Model-Never-Be-Confused-Again

Carlos C. C; Martial B; Stoecio M. F. Maial; C E Pellegrino C. Ciniro CI; Brigitte J FII; Leidivan et. Al. (2010) Greenhouse gas mitigation options in Brazil for land-use change, livestock and agriculture *Sci. agric.* 67 (1) doi.org/10.1590/S0103-90162010000100015

Centre for Earth System Science, National Institute for Space Research. (2015) MCTIC presents low-carbon technologies for country reduce greenhouse gas emissions. Retrieved from http://www.ccst.inpe.br/mctic-apresenta-tecnologias-de-baixo-carbono-para-pais-reduzir-emissoes-de-gases/

Clark H., Anderson A. (2004) *Theories of change and logic models: Telling them Apart*. Retrieved from https://www.theoryofchange.org/wp-content/uploads/toco_library/pdf/TOCs_and_Logic_Models_forAEA.pdf

Climate Action Tracker (2017 6th November) Brazil. Retrieved from http://climateactiontracker.org/

Clippings List (2013-2016) GHG Mitigation options in key sectors in Brazil

Davis, J Potential and cost of cutting for key sectors of the Brazilian Economy in the 2012-2050 period Agriculture, Forest and other uses of soil 03/06 / 2016

Davis. L J. (n.d.) Modelling of abatement curves and technological learning curves for LULUCF (n.d.)

Dubreux, C. (2014, Dec 3) Greenhouse gases: what mitigation options are available? *Bridges*, 10(9) Retrieved from http://www.ictsd.org/bridges-news/pontes/news/gases-de-efeito-estufa-que-op%C3%A7%C3%B5es-de-mitiga%C3%A7%C3%A3o-est%C3%A3o-%C3%A0-disposi%C3%A7%C3%A3o

EcoDebate (2014, Nov 14) Brazil reduces Greenhouse Gas Emissions. Retrieved from https://www.ecodebate.com.br/2014/11/14/brasil-reduz-emissoes-de-gases-de-efeito-estufa/

Edmunds, D., J. Sasser, Wollenberg E. (2013) *A gender strategy for pro-Poor climate change mitigation*, Working Paper No 36. CGIAR Research Program on Climate Change, Agriculture and Food Security. Copenhagen, Denmark. Retrieved from www. Ccags.cgair.org

Escobar H., (2015 Sept 28) Brazil's Climate targets draw lukewarm reviews. *Science Magazine*. doi10.1126/science.aaad4637 . Retrieved from http://www.sciencemag.org/news/2015/09/brazil-s-climate-targets-draw-lukewarm-reviews

Fara W. R. (2015, May 7) *Integrating energy modeling and economic modeling*

Fearnside. P. (2017 Jan 29) Brazil's hydroelectric plans threaten its Paris commitments. *The Globalist*. Retrieved from http://Amazonwatch.org

Filho B.S. (2016 Aug 25) Land use policy scenarios in Brazil. Presentation. UFMG.

Filho J.B., Moraes G. I (2014) Climate Change. Agriculture and economic effects on different regions in Brazil. *Environment Development Economics* 20 :37-56.

Frisch M.(2013) Modeling climate policies: A critical look at integrated assessment models. *Philosophy and Technology* 26:117-137.

GEF 5 Programming Document. GEF/R./5/31/GRP.1 May 12 2010.

GEF Dec 8 2015. Climate Change and Women Impacts Compounded by Gender Inequality. Retrieved from https://www.thegef.org/news/climate-change-and-women-impacts-compounded-gender-inequality

GEF 5 Programming Document. GEF/R./5/31/GRP.1 May 12 2010 Emissions-key-sectors-brazi

il M. (2013, May 31). Mitigation Options project of Greenhouse Gases (GHG) in key Sectors of Brazil . {Blog post]Retrieved from http://3gestaoambiental-unisantos.blogspot.com.br/2013/05/projeto-opcoes-de-mitigacao-de-gases-de.html

Gebara M.F., Thaualt. (2013, Dec.) *GHG Mitigation in Brazil's Land Use Sector: An Introduction to the Current National Policy Landscape*. WRI, GV, Instituto Centro De Vida.Working Paper.

Retrieved from http://www.wri.org/www.wri.org/publication/ghg-mitigation-brazil-land-use-sector

Global Environment Facility. *Mitigation Options of Greenhouse Gas (GHG) Emissions in Key Sectors in Brazil*. Retrieved from https://www.thegef.org/project/mitigation-options-greenhouse-gas-ghg- GEF Dec 8 2015. Climate Change and Women Impacts Compounded by Gender Inequality. Retrieved from https://www.thegef.org/news/climate-change-and-women-impacts-compounded-gender-inequality

.Global Environmental Facility. Request for Project Preparation Grant. (May 5, 2010) Greenhouse Gas Emissions in Key Sectors.

Global Environmental Facility Trust Fund. Project Identification Form (PIF) (2009). Project Mitigation Option of Greenhouse Gas Emissions in Key Sectors

Gouvello, C D. (2010.) *Brazil Low-carbon country case study*. World Bank, Washington, DC. Retrieved from https://openknowledge.worldbank.org/handle/10986/19286 License: CC BY 3.0 IGO.

Government of Brazil. (2008 Dec.) National Plan on Climate Change. Interministerial Committee on Climate Change. Decree No 6263, Nov 21. 2007

Guerra J.B., Dutra L, Schwiden N.B., Andrade (2015) Future scenarios and trends in energy generation in Brazil: Supply and demand and mitigation forecasts. *Journal of Cleaner Production*. 103:197-210

Hainoun A., Aldin M.S., Almostafa (2010) *Energy Policy* 38 (4) 1701-1714.

Half Yearly Expenditure Statement. (2016) Mitigation Options for GHG Emissions in Key Sectors

Hughes, N. (2013). Towards improving the relevance of scenarios for public policy questions: A proposed methodological framework for policy relevant low carbon scenarios. *Technological Forecasting and Social Change*, 80(4), 687.

Hughes N. & Strachan N., (2010). Methodological review of UK and international low carbon scenarios. *Energy Policy* 38 pp. 6056–6065

International Institute for Applied Systems Analysis (2013). A modeling framework for medium-to long-term energy system planning, energy policy analysis, and scenario development. Retrieved from http://www.iiasa.ac.at/web/home/research/modelsData/MESSAGE/MESSAGE.en.html

Ishii, N. (September 13, 2012) Letter to Council Member. Global Environmental Facility.

Julian D.A. (2005) Enhancing quality of practice through theory- of- change based evaluation. *Community Psychology* 25 (3/4):159-168.

Kemfault C. (2002) An integrated assessment model of economy energy climate: The model Wiagem *Integrated Assessment* 3 (4): 281-298.

Kossoy, A. Oppermann, K.; Platonova-Oquab, A.; Suphachalasai, S.; Höhne, N.; Klein, N.; Gilbert, A.; Lam, L.; Toop, G.; Wu, Q.; Hagemann, M.; Casanova-Allende, C.; Li, L.; Borkent, B. Warnecke, C.; Wong, L. 2014. *State and trends of carbon pricing 2014*. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/18415 License: CC BY 3.0 IGO.

Larssa O. (n.d.) Modeling of Costs of Downturn and Curves of Technological Learning Consultant.

Lima, M.D.Vecchio de, Machado, C. Lopes,C., Alves, J Batista, & Fortunato, R A. (2016). Public governance to tackle climate change in Curitiba and the surrounding area. Mercator (Fortaleza), 15(4), 47-63. https://dx.doi.org/10.4215/rm2016.1504.0004

Lucena A. F. (n.d.) *Modeling of abatement costs and technological learning curves* (building sector)

Lucena A. F. (n.d) *Construction of low carbon scenarios (building sector*).

Ludena C., Netto (2011) *Brazil: mitigation and adaptation to climate change*. Inter-American Development Bank. Climate Change and Sustainability Division.

McKinsey (2009). *Pathways to a low carbon economy in Brazil*. McKinsey & Company.

MCTI launches Annual Estimates of greenhouse gas emissions in Brazil. Retrieved from https://www.brasil.gov.br/ciencia-e-tecnologia/2014/11/mcti-lanca-estimativas-anuais-de-emissoes-de-gases-de-efeito-estufa-no-brasil

Merry F., Filho S.G. (2017, July) Will intensification of beef production deliver conservation outcomes in Brazilian Amazon. UFMG. Presentation.

Miguez J.D., Olivera A.S. (n.d.) Towards achieving the objective of the United Nations Framework Convention on Climate Change. Ministry of Environment. Presentation

Ministry of Science, Technology, Innovation and Communications, UN Environment Programme. (2017) *Cross-cutting options for mitigation of greenhouse gas emissions carbon capture, transportation and storage*. Brasilia.

Ministry of Science Technology, Innovation and Communications. Survey. (n.d.) Use of the national registry of emissions.

Ministry of Science, Technology, Innovation and Communications, UNEP, GEF (2017) *Executive Summary Cross-Sectoral Options For Mitigating Greenhouse Gas Emissions: Carbon Capture, Transportation And Storage.* Draft report.

Ministry of Science Technology, Innovation and Communications, UNEP, GEF(2017) *Executive Summary Sectoral Modelling of Low Carbon Options for The Buildings Sector*. Draft report.

Ministry of Science Technology Innovation and Communications, UNEP, GEF(2017) *Executive Summary Sectoral Modelling of Low Carbon Options for The Oil and Natural Gas Sector.* Draft report

Ministry of Science Technology, Innovation and Commuications (2017) *Executive Summary Sectoral Modeling of Low Carbon Options for the Transport Sector.* Draft Report.

Ministry of Science, Technology and Communications (2017) *Executive Summary Sectoral Modelling of Low Carbon Options for The Oil and Natural Gas Sector*. Draft report.

Ministry of Science, Technology, Innovation and Communications, UN Environment Programme, GEF (2017) *Mitigation paths and public policy instruments to achieve the Brazilian targets in the Paris agreement*" Brasilia.

Ministry of Science Technology and Innovation. MCTIC presents options to reduce greenhouse gas emissions in key sectors of the economy. Retrieved from http://www.mcti.gov.br/noticia/asset-publisher/epbVOpr6elSO/content/mctic-apresnta-opcoes-para-reduzir-emissao-de-gases-de-efeito-estufa-em-setores-cave-da-economia

Ministry of Science Technology and Innovation. MCTI launches 2nd Edition of the Annual Estimates of greenhouse gas emissions in Brazil and presents mitigation project in key sectors of the country. Retrieved from http://www.mcti.gov.br/noticia/-/asset_publisher/epbV0pr6eIS0/content/mcti-lanca-2%C2%AA-edicao-das-estimativas-anuais-de-emissoes-de-gases-de-efeito-estufa-no-brasil-e-apresenta-projeto-sobre-mitigacao-em-setores-chave-do-pa

Ministry of Science Technology and Innovation. (2016, 11 May). Towards a Low Carbon Economy: Sector reduction emissions Options. Lecture Series, San Paulo.

Ministry of Science, Technology, Innovation and Communications, UN Environment Programme, GEF. (2017) *Integrated Modelling and impacts of Low Carbon Sectoral Options*. Brasilia.

Ministry of Science Technology, and Innovation, UN Environment, GEF (2017) *Modeling Sectoral Options of Low Carbon Emissions for the Transport Sector.*

Ministry of Science, Technology and Communications, UN Environment, GEF (2017) *Options for Mitigation of Emissions of Greenhouse Gas Emissions in Key Sectors Other Industries.* Brasilia.

Ministry of Science and Technology Technology Innovation and Communications, United Nations Environment Programme. (2017) *Sector modeling of low carbon options for agriculture, forests and other soil uses (Afolu)*. Brasilia.

Ministry of Science Technology and Innovation, UNEP, GEF (2017*) Sectoral modeling of low carbon options for the building sector*. Brasilia.

Ministry of Science Technology and Communications, Un Environment, GEF (2017) *Sector Modelling of Low Carbon Options for the Waste Management Secto*r. Brasilia

Mininisty of Science Technology and Communications, UN Environment, GEF (2017) *Sectorial Modelling of Low Carbon Options for the Oil and Natural Gas Sector*. Brasilia.

Ministry of Science, Technology and Communications, UN Environment GEF (2017) *Sectoral Modeling of Low Carbon Options for the Other Industries Secto*r. Brasilia.

Ministry of Science Technology and Communications, UN Environment, GEF (2017) *Sectoral Modeling of Low Carbon Options for the Textile Sector. Brasilia.*

Ministry of Science Technology Innovation and Communications. (2016 6 Dec) *Towards a Low Carbon Economy: Sector reduction emissions Options*. (Lecture Series, Manaus

Ministry of Science Technology Communications and Innovation, Un Env. (2016, 31 May) Towards a Low Carbon Economy: Sector reduction emissions Options (2016, 31 May) Lecture Series, Centro

Ministry Of Science, Technology, Innovation and Communications-MCTI, Secretariat Of Policies And Research and Development Programs-Seped, General Coordination Of The Climate – Cgcl, (2017) Mitigation options of greenhouse gas emissions in key sectors in Brazil GFL-4C79-2722 UNEP Program 13/Simplified Review.

Ministry of Science, Technology, Innovation and Communications. (2016 Oct 4) *Towards a Low Carbon Economy: Sector reduction emissions Options*. Lecture Series, Salvador

Ministry of Science, Technology, Innovation and Communications. (2016) *Towards a Low Carbon Economy: Sector reduction emissions Options*.Lecture Series, Salvador

UN Environment. Climate change Retrieved from http://web.unep.org/mudan%C3%A7a-do-clima

Ministry of Science, Technology and Innovation. Official Letter n 2012-CGMC-SEPED. Feb 29, 2012. Correa to Fuller.

Mitigation Options of Greenhouse Gas Emissions in Key Sectors in Brazil, Presentation GEF, PNUMA,

Ministry of Finance (2014) Market readiness proposal under the Partnership for Market Readiness Program. Brazil. Brasilia.

Ministry of Science and Technology. (2016) Mitigation options for greenhouse gas emissions in key sectors. Report of Planned and Actual Co-Finance by Budget Line.

Mitigation Options for Greenhouse Gas Emissions in Key Sectors (jan-Dec 2016) Half Yearly Expenditure Statement and Unliquidated Obligations.

Minutes and Agenda of the First Technical Consultative Committee Committee

Minutes of the Second Technical Consultative Committee

Minutes of the Third Technical Consultative Committee

Minutes and Agenda of the Fourth Technical Consultative Committee

Minutes of the Third Technical Consultative Committee.

Minutes and Agenda of the Fifth Technical Consultative Committee

Minutes and Agenda of the Sixth Technical Consultative Committee.

Minutes and Agenda of the Seventh Technical Consultative Committee

Minutes of the Eigth Technical Consultative Committee.

Minutes and Agenda of the Ninth Technical Consultative Committee

Minutes and Agenda of the Tenth Technical Consultative Committee.

Minutes of the Eleventh Technical Consultative Committee

Minutes and Agenda of the Twelfth Technical Consultative Committee

Minutes and Agenda of the Thirteenth Technical Consultative Committee

Minutes and Agenda of the Fourteenth Technical Consultative Committee

Minutes and Agenda of the Fifteenth Technical Consultative Committee.

Minutes and Agenda of the Sixteenth Technical Consultative Committee

Minutes and Agenda of the Seventeenth Technical Consultative Committee

Minutes of the Eighteenth Technical Consultative Committee

Minutes of the Nineteenth Technical Consultative Committee

Minutes of the First Steering Committee. (2014) Brasilia.

Minutes of the Second Steering Committee. (2015) Brasilia.

Minutes of the Third Steering Committee. (2016) Brasilia.

Minutes of the Fourth Steering Committee (2017) Brasilia

Motta, R.S., Hargrave J., Luedemann F., Gutierrez M.B. (2011) Climate change in Brazil: Economic, social and regulatory aspects. IPEA.

Natural Resources Defense Council, Climate Observatory. (2017, Nov) *The Road from Paris: Brazil's Progress Towards Its Climate Pledge*. Issue Brief. ID 17-11-F.

Neto. M. G. Communications Plan. GHG Mitigation Options in Key Sectors in Brazil.

Nogueira L. (2015 May 5) Construction of Low Carbon Scenarios for the Industrial Sector

Nogueira L. (Mar 3, 2015) Applicable carbon technologies for key Brazilian suppliers (consultants))

liveira, LG (n.d.) Potentials and Costs of GHG Emissions Abatement for Key Sectors of the Brazilian Economy - Waste Management Sector, Consultant

Oliveira, LG (n.d.) Applicable carbon technologies to key Brazilian suppliers (waste management sector)

Oliveira, LG (n.d.) Modeling of abatement curves and technological learning curves for the Waste Management sector

Oliveira, LG (2015 May 5) Construction of low carbon scenarios applicable to key sectors in Brazil (waste management sector)

Partnership for Market Readiness (nd). Workshop. *Mitigation Options of Greenhouse Gas Emissions in Key Sectors in Brazil*, Presentation GEF, PNUMA, MCTI

Program of Studies and Actions for the Semiarid (Sept 28, 2016) MCTIC opens registration for lectures on greenhouse gas emissions in the Northeast. Retrieved from http://peasa.paqtc.org.br/v2/index.php?option=com_content&view=article&id=1345:mctic-abre-inscricoes-para-ciclo-de-palestras-sobre-emissao-de-gases-na-regiao-nordeste&catid=34:noticias-2011&Itemid=54

Raupp M.A. 2013, June. {Letter to B. Borgas].

Reilly J., Palsev.S., Strzepek K., Selei N.E., Cai Y., Nam Mk.K., Monier E., Dutkeiwicz S., Scott J., Webster M., Solov A. (2002) Valuing climate impacts in integrated assessment models: The MIT IGSM. *Climate Change* 117:561-573.

Rochedo P. (n.d.) Construction of Low Carbon Scenarios (Energy) (n.d.).

Rochedo P. (n.d.) Integrating energy modeling and economic modeling (MESSAGE).

Rochedo P. (3, 02, 20) Low-carbon technologies applicable to key sectors in Brazil (energy sector) Consultant:

Rochedo P. (n.d.) Modeling of abatement costs and technological learning curves for the energy sector Consultant:

Romeiro, V. Biderman, R. (2015 Sept 30.) *A closer look at Brazil's new climate plan*. World Resources Institute. Retrieved from http://www.wri.org.)

Salles C. (2013, Oct 18) World Cup 2014 will have management of greenhouse gas emissions. Jus Brazil. Retrieved from http://www.jusbrasil.com.br/busca?q=Op%C3%A7%C3%B5es+de+Mitiga%C3%A7%C3%A3o+de+Gases+de+Efeito+Estufa&c

Sasser, J., Wollenberg E. (2013) *A gender strategy for pro-poor climate change mitigation*, Working Paper No 36. CGIAR Research Program on Climate Change, Agriculture and Food Security. Copenhagen, Denmark. Retrieved from www. Ccags.cgair.org

Scientific and Technical Advisory Panel. (May 5, 2010) Scientific and Technical Advisory Planning Screening of PIF.

Schmidt, Dubeux B. (2014) Greenhouse gases: that mitigation options are available? *Bridges,* 10(3). Retrieved from http://www.ictsd.org/bridges-news/pontes/news/gases-de-efeito-estufa-que-op%C3%A7%C3%B5es-de-mitiga%C3%A7%C3%A3o-est%C3%A3o-%C3%A0-disposi%C3%A7%C3%A3o

Sectoral Workshops cycle of mitigation of greenhouse gas emissions in key sectors of Brazil. Retrieved from http://proclima.cetesb.sp.gov.br/ciclo-de-workshops-setoriais-das-opcoes-de-mitigacao-de-emissoes-de-gases-de-efeito-estufa-em-setores-chave-do-brasil/

Sectoral Workshops cycle of mitigation of greenhouse gas emissions in key Sectors of Brazil. Retrived fromhttps://ambientedomeio.com/2016/09/16/ciclo-de-workshops-setoriais-das-opcoes-de-mitigacao-de-emissoes-de-gases-de-efeito-estufa-em-setores-chave-do-brasil/

Shayegh S. (2014) Learning in integrated optimization models of climate change and economy. Georgia Institute of Technology. Dissertation.

Speranza J., Romeiro V., Feder F. (2017) *Will Brazil meet its climate targets*. World Resources Institute. Retrieved from http://www.wri.org/blog/2017/07/will-brazil-meet-its-climate-targets

State Program of Climate Change State of Sao Paulo. (n.d.) Cycle of Sectoral Workshops of Options for Mitigation of Greenhouse Gas Emissions in Key Sectors of Brazil. Retrieved from http://proclima.cetesb.sp.gov.br/ciclo-de-workshops-setoriais-das-opcoes-de-mitigacao-de-emissoes-de-gases-de-efeito-estufa-em-setores-chave-do-brasil/

Stokstad E. (2017 May 3) In controversial move, Brazil may outsource Amazon deforestation monitoring *Science Magazine*.

Thompson V.E. (2014) *Sophisticated interdependence in climate policy: federalism in the United States, Brazil and Germany*. Anthem Press. United Nations Environment Program/UNEP Brazil Office. Amendment No 1 to Internal Cooperation Agreement (ICA) Between United Nations Environment Programme and UNEP Brazil Office/RSO-ROLAC/DTIE, Feb 26,2015, UNEP March 2, 2015. Thompson V.E. (2014) *Sophisticated Interdependance in climate policy. Federalism in the United States, Brasil and Germany*. Anthem: London.

UN Environment Program (Jan 13, 2015) First Sub Allotment GFL 4C79.United Nations Environment Program. Governing Council of the UN Environment Program. UN Environment Program of Work 2013-UNEP/GCSS.XII/9/Add.1 Biennial Programme and Work and Budget 2012- 2013

United Nations Environment Program (2015) Half Yearly Progress Report Mitigation Options. Signature page.

United Nations Environment Program (2016) Half Yearly Progress Report. Mitigation Options. Signature page.

UN Environment Program. Governing Council Programme of Work and Budget 2014-2015 UNEP/GC.27/10

UN Environment Program. Internal Cooperation Agreement (ICA) to the Full -size project Mitigation Options of Greenhouse Gas Emissions in Key Sectors in Brazil. GFL-5070-2722-IC79

UN Environment Program. (UNEP) Medium Term Strategy 2010-2013.

UN Environment Program (UNEP) Medium Term Strategy 2014-2017.

UN Environment Program (UNEP) Memorandum (2013) Mitigation Options for GHG in Key Sectors in Brazil. Authorization for Expenditure.

UN Environment Program (UNEP) Memorandum (2015) Mitigation Options for GHG in Key Sectors in Brazil. Authorization for Expenditure.

UN Environment. (2013 Dec 26) Mitigation Options for Greenhouse Gas Emissions in Key Sectors). UN Environment Brazil Authorization.

UN Environment (2015, 13 Jan. 2015) Mitigation Options for Greenhouse Gas (GHG) Emissions in Key Sectors. UN Environment Brazil Authorization.

UN Environment Programme (2015, 11 March) Mitigation options for greenhouse gas emissions in key sectors. UN Environment Brazil Authorization.

UN Environment GEF. PIR (2014) Mitigation options of greenhouse gas emissions in key sectors in Brazil.

UN Environment GEF. PIR FY (2015). Mitigation options of greenhouse gas emissions in key sectors in Brazil

UN Environment GEF. PIR (2016) Mitigation options of greenhouse gas emissions in key sectors in Brazil.

UN Environment GEF. PIR FY (2017). Mitigation options of greenhouse gas emissions in key sectors in Brazil

United Nations Environment Program. Project Document. Mitigation options of greenhouse gas emissions in key sectors in Brazil.

United Nations Environment Program, Ministry of Science Technology and Innovation (2014) Mitigation options of greenhouse gas emissions in key sectors in Brazil GFL-4C79-2722 UNEP Program 13/Substantial Review A.

United Nations Environment Program, Ministry of Science Technology and Innovation (2014) Mitigation options of greenhouse gas emissions in key sectors in Brazil GFL-4c79-2722 UNEP Program 13/Substantial Review B

UN Environment Program. Mitigation Options of Greenhouse Gas (GHG) Emissions in Key Sectors in Brazil. Retrieved from http://drustage.unep.org/energy/projects/mitigation-options-greenhouse-gas-ghg-emissions-key-sectors-brazil.

United Nations Environment Program, Ministry of Science Technology and Innovation (2016-2017) Review of Project Term of Validity. Brasilia.

UN Environment Program (May 6, 2013) Sub Allotment GFL/5070-2722-4C79. Advice No-2013-01.

UN Environment Program (Mar 11, 2015)2nd Sub Allotment GFL 4C79.

Un Environment. Status of allotment report FY 2013. Technical Cooperation Trust Fund for UN Environment's Implementation of the Activities Funded by the GEF Mitigation Options of Greenhouse Gas (GHG) Emissions in Key Sectors in Brazil

UN Environment Program. Use of Theory of Change in Project Evaluations. Retrieved from http://wedocs.unep.org/bitstream/handle/20.500.11822/7116/14.%20Use%20of%20Theory%20of%20Change%20in%20Project%20Evaluation%2026.10.17.pdf?sequence=4&isAllowed=y

United Nations Environment Program (Dec 2013-2014). Yearly Progress Report. Mitigation Options

United Nations Environment Program. (July- Dec 2014) Yearly Progress Report. July-Dec 2014. Mitigation Options

UN Environment Program. Theory of Change. Retrieved from https://www.unenvironment.org/about-un-environment/evaluation/our-evaluation-approach/theory-change

Varum, C.A., Melo, C., 2010. Directions in scenario planning literature-A review of the past decades. *Futures* (42)4, 355-369. doi: 10.1016/j. futures. 2009.11.021

Velaso, C. (Dec 5, 2016). Naturatins accompanies presentation of the National registration system of GHG Emissions in Manaus. Government of Tocatins. Retrieved from http://naturatins.to.gov.br/noticia/2016/12/5/naturatins-acompanha-apresentacao-do-sistema-de-registro-nacional-de-emissoes-gee-em-manaus/#sthash. v5FtQ8jP. dpuf

Verdelio. A. (2014, Nov. 13) Greenhouse gas emissions in Brazil fall more than 40% in seven years. Agencia Brasil. Retrieved from http://www.ebc.com.br/noticias/brasil/2014/11/emissoes-de-gases-de-efeito-estufa-caem-mais-de-40-em-sete-anos.

Weslem, Rodrigues Faria Impacts and opportunities for a low carbon economy - Economic modeling (CGE), 06/02/2016.

Wing S. (n.d.) *Computable General Equilibrium Models and their use in economy wide policy analysis*. Center for Energy and Environmental Studies and Joint Program on the Science and Policy of Global Change Massachusetts Institute of Technology.

World Bank, (2010). *Low carbon study for the Brazil-* http://www.esmap.org/sites/esmap.org/files/Relatorio_Principal_integra_Portugu es.pdf

World Bank, Ecofys and Vivid Economics. (2017*). State and trends of carbon pricing*. Washington, DC. Doi: 10.1596/978-1-4648-1218-7 License: Creative Commons Attribution CC BY 3.0 IGO

7.2. **Appendix B: Stakeholder Ratings as per the inception report**

Stakeholder Analysis

Who	Why			
	Interest	Influence	Expertise	Affected
Public Sector				
Ministry of Environment	A/B	A/B	A/B	A/A
Ministry of Mines and Energy	A/A	A/A	A/A	A/A
Ministry of Finance	A-/A	A-/A	B+/A	A/A
Ministry of Transport	B+/A	B/B	B+/A	B+/A
Ministry of Development, Industry and External Commerce	A-/A	A-/B	A- /A	A-/A
Ministry of Agriculture, Livestock & Food Supply	A/B	A/B	A /A	A/A
Ministry of Rural Development	C/C	C/C	C /C	C/C
EMBRAPA Brazilian Agricultural Research Corporation	A/C	A/C	A/A	A/A
Ministry of Cities	B/A	B/A	B/A	B+/A
Ministry of Planning, Budget and Management	B/A	B/A	B/A	B+/A
Secretariat of Strategic Affairs	ABOLISHED			
Executive Office of the President	B/A	A/A	B/A	B/A
Ministry of Health[73]	-	-	-	-
Ministry of External Relations	A/A	A-/A	B/A	A-/A

[73] The Ministry of Health is included in the Prodoc stakeholder matrix. However, in all the interviews performed in this inception phase, interviewees mentioned that Ministry of Health is irrelevant in mitigation policy and that it has had absolutely no involvement in the Project. Therefore, it is not rated.

Who	Why			
State Secretariats of Environment (all Brazilian states)	C/A	B/A	B/A	B/A
State Secretariats of Science and Technology (all Brazilian states)	C/A	B/B	C/B	C/A
Civil Society				
Brazilian Association of NGOs (ABONG)[74]	B/A	B/A	C/A	C/A
CNI-Brazilian National Confederation of Industry	A/A	B+/A	B+/A	A/A
Brazilian Society for the Progress of Science (SBPC)	C/C	C/C	C/B	C/C
National Confederation of Rural Workers (CONTAG)	C/C	C/C	C/C	C/B
Agriculture and Livestock Confederation (CNA)	A/A	A/A	A/A	A/A

Scale: A=High B=Medium C=Low

Apendix C: List of Individuals Consulted

#	Name	Organization	Type Interview
1	Luis Fermando Badanham	Ministry of Mines and Energy	In person
2	Ricardo Gorini	Company of Energy Planning	In person
3	Gustavo Silva	Ministry of Development, Industry Commerce	In person
4	Demetrio Filho	Ministry of Industry Development Commerce	In person
5	Marcos Cantarino	National Confederation of Industry	In Person
6	Steel Association (ThyssenKrupp)	Ingrid Pinho	Skype
7	Gonzalo Visedo	Cement Union	In Person
8	Cibele Franca	Ministry of Transportation	In person

[74] As per interviews performed during this inception phase, the Climate Observatory is actually a better-suited platform for engagement of NGO than ABONG. In accordance to such interviews, their ratings would be higher than ABONG's.

#	Name	Organization	Type Interview
9	Natalie Unterstell	Brazil Forum Climate Change	In person
10	Fernando Araldi	Ministry Cities	In person
11	Joseph Lima	Ministry of Environment	In person
12	Branco Americano	Observatorio do Clima	In person
13	Ricardo Vieira Arajo	MCTI	In person
14	Prof Roberto Schaeffer	COPEETEC	Skype
15	Marco Aurelio Pavariono	Former Ministry of Agriculture	In Person
16	Gustavo Luedmann	Institute of Economic Research and former Program Director	Skype
17	Edson Toledo	Ministry of Treasury	In Person
18	Rogerio Dias	Banco Do Brasil	In Person
19	Jose Migues	Ministry of Environment	In Person
20	Elvison Nunes Ramos	Ministry of Agriculture	In Person
21	BNDES-National Bank of Economic and Social Development	Marcos Macedo da Costa	In Person
22	Marcio Macedo da Costa	FINEP	In Person
23	Francine Vaurof	UN Environment Brazil	In Person/skype
24	Leena Darlington	UN Enviroment Nairobi/Finance	In person/Skype
25	Adrina Ramos	Social Environmental Institute	Skype
26	IPAM-Institute for Amazon Protection	Tiago Reis	Skype
27	Ruth Cuotto	UN Environment	Skype Final Report Consultation
Inception Phase			
27	MCTI	Regis Rathmann	Skype
28	UFRJ	Emilio La Rovere	Skype
29	Brazil Forum	Sergio Margulis	Skype
30	Former member Brasilian delegation member UNFCCC	Thiago Mendez	Skype

**Efforts also made to schedule/hold interviews with an additional six others but did not receive replies to requests for interviews. Another one individual had retired and there was no replacement at the institution who had been involved. There were also issues that arose around scheduling for an additional six. In some cases substitutions were made.

7.3. **Appendix D: Evaluation Matrix**

Evaluation criteria/sub-criteria	**Key guiding questions**	**Basis for Accomplishment**	**Data/information sources and collection procedures**
Relevance			
Strategic Relevance	To what extent were the projects objectives and implementation strategies consistent with UN Environments mandate and policies and strategies. This includes:		
See highlighted sections on strategic relevance in project interview questions	To what extent was there alignment with UN Environment Medium Term Strategy, Thematic Priorities and Programme of Work?	Evidence of alignment with UN MTS and POW	Project doc reviews on alignment, project reports including PIRs, desk review MTS/POW,
	To what extent was there alignment with regional, sub-regional and national environmental priorities?	Evidence the project was aligned with regional and sub regional and national plans and priorities, NAMAs	Desk reviews of Brazil national climate plan, NAMA's-- project management, stakeholder interview questions and state city rep questions on perceptions alignment -
	Target group and beneficiary needs		Questions of PM and Ministries and policy network stakeholders about project meeting needs, including state reps review of training participant satisfaction

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
			surveys,
		Evidence the project identified and responded to needs	Project documents; desk reviews inc GEF Strategy on Climate Change, Gender, Bali Strategy Plan; Project Manager
	To what extent was there alignment to donor priorities		
		Evidence that the Project's accomplishments are aligned with donor priorities	Stakeholder and PM interviews (question on project linkages, duplications), and reviews of literature on other projects docs like MAPS, Partnership for Market Readiness etc; consultant questions on linkages/duplication
	Duplication or complementarity other interventions		
		Evidence of duplication or complementarity	Interviews with Project Manager, Consultants, Steering Committee UN Task Mgr Project consultants—see questions on south/south

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
			cooperation evidence; Desk reviews of polices.
	Alignment UNEP Capacity Building and South South Cooperation policy	Evidence of capacity building and resources, technology, and knowledge exchanges practiced by relevant participants in the Project that may qualify as examples of South-South Cooperation.	Questions to PM and stakeholders about whether there is anything about design they would change

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Quality of Project Design	Rating from Assessment of Design	Evidence of alignment of ratings	Review of project documents, literature review Questions about the influence of these factors in interviews with Project team, consultants, UNEP Brazil, consultants
Nature of External Context	What is the rating of the projects external operating context	Evidence of prevalence of influence of climatic events, security, infrastructure, economic conditions, politics on project	

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
See External Context in Interview Guides			
Effectiveness			
Achievement of Project Outputs/Activities See questions on Effectiveness and Outputs/Outcomes	How successful has the Project been in producing its programmed results and in achieving its milestones per the Pro Doc? What were the reasons behind success or shortcomings?	Evidence of the level or degree of success of the project in achieving different outputs, taking into consideration their preparation, readiness, quality and quantity, quality of project management and supervision as well as usefulness and timeliness of the delivery of its outputs Involvement of stakeholders by sector in studies and project activities/ How were results disseminated and to whom?	Review of project documents, PIRs, revision reports; communication plans, Interviews project manager, UN Environment, consultants— questions about outputs status, stakeholder involvement, consultant probes, state/city rep questions Reviews and probes on outputs: -e.g. Outcome 1 outputs: reports assessment of the potential for GHG emission reduction and estimation of abatement costs for the specific sector --review activities sector descriptions, definition BAT, economic assessment, innovation analysis, ID policy instruments Outcome 2: testing MRV, integrated assessment modelling Outcome 3: --No training events and participants state technicians trained

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
			participant survey reviews
Achievement of Direct Outcomes	To what extent were the projects formal direct outcomes been achieved? What have been the key factors leading to or impacting the projects achievements? What was the relationship between UN Environment's intervention and the direct outcomes?	Assessment of the achievement of the Project direct outcomes as defined in the TOC Degree to which the Project met the relevant milestones and indicator targets set out in the Project's Logical Framework Matrix and monitoring plan; other relevant indicators as appropriate; feedback derived from the stakeholders; extent of lessons learned documentation; evidence Extent to which report fed into deliberations of Interministerial Commission on Climate Change, deliberations of Climate Forum, Ministry of Environment, international treaty deliberations	Project documents, Project manager interviews, PIR reports; interviews and web analysis of report influence including stakeholders interviews (such as of Brazil Climate Forum, Ministry of Environment etc.) about project impressions of project outcomes and factors influencing success --consultant responses on info for analysis --state city responses on use trainings and political support --interview questions Min Env and stakeholders and CC Forum on influence reports negotiations Interview with UN Env staff—questions about relationship with direct outcomes

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Likelihood of Impact			
See questions Likelihood of Impact	Did the project present a logical pathway of outputs to outcomes, then towards achieving the desired longer-term impact? To what extent has the project addressed the drivers and assumptions of the TOC (i.e. sufficient info for analysis, adequate stakeholder involvement, stakeholder engagement, stakeholders using trainings, political support for trainings, reduced resistance)? What is the likelihood the intervention may lead or contribute to unintended negative effects or risks identified in the project design? To what extent has there been engagement by stakeholders and representation of women/marginalizedd in civil society orgs interfacing w project?	Assessment of project results against the ToC, feedback on likely longer-term impacts Evidence project has addressed assumptions Evidence the project did not lead to negative effects/risks	Interviews project manager including questions on logframe, review TOC Interviews stakeholders/ministries on questions about project outputs, outcomes, impact Focus on questions on policy impact with PM, stakeholders, agencies, representatives at city/state level; Consultant interviews question on sufficient info for analysis -Questions to PM, stakeholders re engagement, Questions city/state about trainings follow-up Risks examined in stakeholder questions on policy, institutional & org, tech risks examined in agency questions; Interviews w Finance Min on carbon policy Questions on representation to stakeholders in terms of women/marginalized groups, questions PM and intent and degree of this issue in planning, gender specialist discussions

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
	What role did country ownership drivenness, communication and public awareness, project management play in the likeliness of impact? What impact has the project had on policy or legal and institutional systems?	Evidence Of consideration of diverse stakeholders representation and engagement	Questions about impact on policy perceptions agencies, stakeholders, questions policy network, city/state reps questions on impact, reviews of proposed legislation, policy, examination of proposed policy instruments in reports ,scans of reports, media or web documentation about policy impact of project, review of sample technical cooperation terms agreements re institutional systems
Financial Management			
See Financial Headings Interview Guide	What was the extent of completeness of financial information? Eg variance analysis – how budget varied from spend in each reporting period – indicates quality of project mgmt. -What was the actual spending across the life of the project of funds secured from all donors based on project outputs? -How does this compare with the approved project budget?	Evidence that financial and Audit reports were complete. Evidence that financial resource levels and cash flow management were adequate to support effective overall management, co-financing levels were delivered, and recruitment/procurement practice, use of financial resources and financial reporting followed proper standards Level of transparency and efficiency in the funds management attested to through Audit reports	Review of Project documents, project reports including PIRs, Reviews of requirements for financial reports; review of Audit reports and budget documents, interviews with project management staff, financial management officer, and UN Environment Task Manager, documents related to funders;

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
	-Were the identified financial resources adequate to achieve the objectives and strategies of the project?	Evidence financial resources were adequate by project component	Questions on financial adequacy to PM, consultants, steering committee; Financial officer discussions on each component and discussions about projections versus expenditures
	Did any financial management issues affect the timely delivery of the project or the quality of its performance will be highlighted		
	What was the level of communication between the financial and project management staff?	Evidence of financial mgt impact on project timetables and delivery	Reviews of PIRS on discussions about impact of transition to IMIS to UMOJA financial sytems on project
	What was the extent of compliance with UN financial management standards and procedures	Perceptions of communication by PM/financial officers	Questions to PM and financial officer about communication levels
	What was the level of expenditure across the life of the project of funds secured from donors and how does this compare with the approved budget?	Evidence of compliance	Reviews of UN financial standards; financial officer perceptions of compliance
	What was the level of communication between the		Approved budget review and question financial officer

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
	Task Manager and Fund Management Officer as it relates to effective delivery of the planned project and needs of a responsive, adaptive management approach?	Evidence of comparative expenditures	Questions task manager and financial officer about communication
	To what extent did the project adhere to proper financial management standards and policies?		
	-Were proper standards (clarity, transparency, timeliness, audit etc.) applied to financial planning, management and reporting?	Perceptions of communication	Interviews fund manager about standards
	What financial management issues impacted timely delivery or the quality of the project?		
	-Were funds used correctly (explain any over- or under-used expenditure)?		Questions about standards, review financial docs, PIR reports

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
			Review PIR reports, interview questions PM about impacts Interview questions financial mgr about project expenditure and budget alignment by component
Efficiency			
See Efficiency Headings Interview Guide	Was the project implemented as originally planned according to work plans and timeframes? Was the project implementation as cost-effective as originally planned (planned versus actual)? Were there any delays? If so why and how have these affected project execution, costs and effectiveness? What efforts	Comparison of delivery of project activities/results with timelines defined in the Project Document; Level of utilization and rate of delivery of Project budget (extent to which project funds have been converted into outcomes as per expectations in the project document).	Annual Project Implementation (PIR) Review Reports, other project M & E documents, Interviews with Project Managers and UN Environment Task Manager, Reviews of Project Document; Literature reviews; Interviews with stakeholders who have participated in project activities; Reviews UN Environment environmental footprint guidelines; Interviews with project management staff, Literature reviews

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
	were made to overcome these problems? Could these problems have been avoided through stronger project management? Did the project achieve and cost or time saving measures to bring it or its components to a successful conclusion? Did the project make use of/build upon pre-existing institutions, agreements and partnerships, data sources, synergies and complementarities with other initiatives, programs and projects etc. to increase project efficiency? What lessons can be learned about the Project regarding efficiency?		Reviews of PIR reports, PM questions PM questions, consultant questions about linkages
Monitoring and Reporting			
Monitoring Design and	To what extent did the project	Evidence of sound M & E plan including	Project documents, project reports

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Budgeting See Monitoring Headings Interview Guide	have a sound M& E plan and tools to monitor results and track progress towards achieving project objectives? Were there specific indicators in the log frame for each of the projects objectives and outcomes? Were these SMART--specific, measurable, attainable (realistic) and relevant to the objectives, and were the indicators time-bound? Were indicators disaggregated by gender or groups with low representation Were responsibilities for M& E activities clearly defined Why was there no mid-term evaluation—any impact of decision? Was the project monitoring system operational and did it facilitate timely tracking of results and progress towards projects objectives throughout the project implementation period.	SMART indicators identified and used, adequate baselines, M&E arrangements made, M&E budget allocated, timing and implementation of M& E activities, completion of M&E reports e.g. PIRS Follow up on initial findings of outputs being SMART but challenges with outcomes	including PIR, interviews project management team, UN Environment Task Manager Questions PM on why outcomes were defined essentially as outputs (various types of reports) Review of docs Questions PM/UNEP

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Monitoring of Project Implementation	How was information generated by the monitoring system during project implementation used to adapt and improve project execution, achievement of outcomes and ensure sustainability? Were funds allocated for monitoring used to support this activity?	Evidence of changes in project in response to monitoring reports and feedback	Question on impact of changes of no mid term evaluation Interviews project management staff, Review of project reports and steering committee meetings, project revisions, PIRs, interviews UN Environment staff
Project Reporting	To what extent have both UN Environment and donor reporting commitments have been fulfilled? Did reports adequately address specific relevant criteria including quality of project management and supervision and responsiveness to human rights and gender equity (e.g.		Review of PIRS, Project Tracking Tools and GEF tracking tool, CEO Endorsement template

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
	disaggregated indicators and data		
Sustainability			
What is the probability of direct outcomes being maintained and used after the close of the intervention? General	Does the Project have a clear exit and sustainability strategy Have the assumptions underpinning project sustainability been addressed during project implementation? Overall, what are the key constraints to sustainability of project results? What does the Project need to do to increase sustainability of its results? To what extent will continued funds be needed and what is the likelihood the Brazilian Government would commit	Evidence of written exit and sustainability strategy in ProDoc. Evidence that project management and agencies have addressed the conditions needed to enhance sustainability Which aspects need financial funding and is that likely to be in place the financial funding there to maintain aspects of the project?	Document reviews; Project management and financial management and agency stakeholder interviews Questions about what is needed for sustainability and whether these are in place Questions on timing of project reports dissemination/MRV training and timing needed for follow up processes

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Socio-Political Sustainability	funds to support future activities? Are there any social, legal or political factors that may influence, positively or negatively, the sustainability of project results and its progress towards impacts? If there are, what are these? Is the level of ownership by the main national, regional and international stakeholders sufficient to give confidence that the project results to be sustained and if so what is the evidence? Are individual capacity development efforts likely to be sustained? To what extent are project outcomes dependent on future funding for the benefits they	Evidence of social, legislative and political factors that may influence the sustainability of project results and its progress towards attaining the desired impact. Evidence of national govt. and other stakeholder awareness, interests, commitment and incentives to strengthen GHG mitigation actions, policies and alternatives Evidence of participant and institutional interest in sustaining individual capacity development related to GHG mitigation	Interview with Ministry reps Interviews stakeholders, policy network specialists Literature reviews, interviews policy and govt stakeholders

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
	bring to be sustained?	Assessment of project outcomes. Evidence of capacity	
	To what extent has budget line items for GHG reduction at the federal, sector or city level changed ? why		Questions to city or/state reps re training and sustainability
		Assessment of status of achievement of direct project outcomes and review of additional future steps	
	To what extent are institutional changes such as trainings, policy proposals, governance structures and processes, policies, sub-regional agreements, legal and accountability frameworks etc. robust enough to continue delivering the benefits associated with the project outcomes after project closure?	Evidence of follow-up funding from the Brazilian national budget; Evidence of funding from donors and private sector to continue project activities in the project area	Agency interviews, policy network interviews
			Project documents, agency interviews
Financial Sustainability	Does sustainability relate to the application of project outputs by the inter-ministerial committees and the Brazilian Forum for Climate Change?	Evidence of sufficient capacity and capability to sustain results built at	Project documents, interviews project staff etc. Finance Ministry interviews, funder interviews

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Institutional Sustainability	Does sustainability relate to the level and degree of project communication (who project shared reports with, when, how they ensured reports were used) and public awareness and country ownership and driven-ness.	institutional levels within the Brazilian government, including participating state and city government players. Evidence of policy implementation, Integration of project management considerations into national institutional systems and practices.	Agency interviews, state city interviews about events, trainings, impacts : Are the trained people still in the same depts.? Are GHG related reports being produced that demonstrate application of said training Is the information that the project produced featuring in national/ sectoral or city level plans? Has the project cost estimates featured into budgeting and planning for ghg reduction at the various levels? Agency interviews, review of agreements, policy network interviews, Interviews with Brazil Forum reps, PM and UNEP Brazil discussions, reviews of communication plans and timing,

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
			media scans
Factors Impacting Project Performance			
Quality of Project Design	Preparation and Readiness: To what extent were appropriate measures taken to either address weaknesses in the project design (duplication, ambitious/broad design, logframe challenges etc) or respond by changes between project approval, and and project mobilization To what extent did the project have effective supervision and management? -- level of performance of the MCTI as the executing agency --level of technical backstopping/ supervision	Evidence of approaches and adaptive management used in the implementation of the Project to ensure the attainment of Project results, including extent to which the -Project has responded to identified and emerging risks including delays due to IMIS/UMOJA transfer -inception mtg, work/procurement plan, steering committee formed, review partners, signing legal, financials, staff mobilization, stakeholder engagement, Evidence of effective leadership influencing: ----PM role in movement towards outcomes --includes evidence of satisfaction with performance of MCTI	Review of project documents including workplan, procurement plans), PIRS and project revisions, interview questions about changes in early phases for project managers, UN Brazil, review of steering committee minutes re establishment

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Quality of Management and Supervision	provided by UN Environment, -- level of effectiveness of project management with regard to: providing leadership towards achieving the outcomes? --What was the level of effectiveness of project management in terms of managing team structures? --what was the level of effectiveness of the project management in terms of maintaining productive partner relationships (including Steering Groups etc.)? --What was the level of effectiveness of Project management in terms of communication and collaboration with UN Environment colleagues? What types of risks did the project encounter? Did PM adapt? What was the nature and quality of engagement with stakeholder groups by the project team, the confirmation of partner capacity and development of partnership agreements	--evidence of satisfaction with supervision provided by UN Environment --evidence of leadership in achieving project outcomes --Evidence of role of PM in teams, influence on partner relationships and steering committee, influence over communication and collaboration, PM problem solving strategies, project adaptation	PM interviews, (perceptions of project leadership issues, challenges and examples of where leadership made a difference) UN Environment interviews, Steering committee interviews –questions on perception of project management and leadership Stakeholder, project manager interviews, Project document and or reports

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
			of capacity assessment
	What was the quality and effectiveness of all forms of communication and consultation with stakeholders throughout the project life?		Interviews consultants, project manager—see questions on risk, adaptive mgt
	What was the degree of support given to maximize collaboration and coherence between various stakeholders, including sharing plans, pooling resources and exchanging learning and expertise?		
	To what extent the project has applied the UN Common Understanding on the human rights based approach (HRBA) and the UN Declaration on the Rights of Indigenous People?	Evidence of communication/consultation with stakeholders at various project stages Evidence of support given to stakeholder collaboration and coordination	Project team interviews, stakeholder interviews, Agency interviews, in terms of questions about the relationship, role of stakeholders etc. Review of communication plans, interview steering committee, Stakeholder questions about communication; PM questions about stakeholder communication
	Within this human rights context to what extent the intervention adheres to UN Environment's Policy and Strategy for Gender Equality and the Environment?	Evidence of communication and consultation with stakeholders	
	Did the project undertake an adequate gender analysis at		

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Stakeholder Participation and Governance	design stage? Did the project implement the identified actions and/or applied adaptive management to ensure that Gender Equity and Human Rights are adequately taken into account? To what extent during project design, implementation and monitoring were: possible gender inequalities in access to and control over natural resources; specific vulnerabilities of women and children to environmental degradation or disasters; role of women in mitigating or adapting		Project manager, UN staff interviews, consultant interviews, steering committee interviews Review UN Gender strategy and prodoc; question PM about attn to

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
	to environmental changes and engaging in environmental protection and rehabilitation taken into consideration.		gender at design
		Evidence of attn to gender in design, stakeholder mapping, gender analysis in design	Review of Prodoc and docs on project prep.
	What was the level and degree of involvement of other official representatives whose cooperation is needed for change to be embedded in their respective institutions and offices?		Stakeholder interviews (ex Brazil Climate Forum), project manager interviews, consultant interviews see questions about gender outreach and inclusion
		Evidence of project application of HRBA and UN Declaration Rights Indigenous People,	
		Evidence of project adherence of UN Policy and Strategy for Gender Equality and the Environment	Review of project docs/HR, stakeholder participation lists, interviews with project staff, review key relevant language related to gender; examination of relevant UN frameworks human rights and gender and comparative approaches on projects. Interviews with gender climate experts
	What is the level of ownership generated by the project over outputs and outcomes and that is necessary for long term impact to be realized?		
		Evidence of project implementation of adaptive management to ensure Gender Equity and Human Rights were considered	Review of references to gender human rights in Project docs,design, question on gender role in implementation and participation in project activities

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Responsiveness to Human Rights and Gender Equity	What communication and learning management opportunities and what did the project facilitate at the federal sector and local levels? --What was the communication strategy— Who was involved, how has it worked, --What existing communication channels and networks were used at different levels? --Did these communication channels meet the differentiated needs of gender and marginalized groups? Were any feedback channels established Were knowledge sharing platforms established for the project? What is the likelihood of the sustainability of the communication channel?	Evidence of consideration of gender inequities	and events, evidence of gender equity in the payment scheme (question to finance) -questions re role marginalized groups/women represented in orgs project worked with—(see stakeholder interview questions) -- PM interviews, agency interviews, questions about engagement and impact on institutions, policy network interviews, interviews Brazil Forum, questions to state/city reps, agencies on institutional change; Probe/ list the specific ministries etc Review of project documents, project manager interviews, policy network and agency interviews and questions about long term/sustainability

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
			Review of project docs and communication plans, training products and attendance, satisfactions surveys, websites. Questions on communication and dissemination in interviews Project manager (also was the project designer), literature on gender analysis and UN Policy on Gender
		Evidence of influence of the project on other organizational/policy change processes	Policy network and stakeholder interviews questions on communication and dissemination—who,how and degree it worked -Review of project communication channels & plans such as websites etc.; gender expert questions

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Country Ownership and Drivenness		Evidence of involvement and buy in to outputs/outcomes Evidence of communication of learning and experience sharing between project partners and interested groups	Interviews with project staff on feedback, stakeholders, review of media, policy network interviews, interview Brazil Forum, review of communications including publications, reports, websites and examination of other networks representing interests related to gender and marginalized group

Evaluation criteria/sub-criteria	Key guiding questions	Basis for Accomplishment	Data/information sources and collection procedures
Communication and Public Awareness See Communication Questions in Guide		Evidence of public awareness activities influencing behavior of wider communities, civil society	

7.4. **Appendix E: Reports and Publication for Output 1 and 2**

Nº	Sector	Report	Publication	Executive summary	Database and software
Output 1: Mitigation alternatives identified and their respective potentials and costs quantified for the periods 2012-2035 and 2035-2050					
Output 1.1: Assessment of GHG emission reduction potential and estimation of abatement costs for the industrial sector				Executive summary: sectoral modeling and cross-cutting options for mitigation emissions of greenhouse gases	Software and database were produced with the information produced by the project
1	Food and beverages	Sector description and definition of the "Best Available Technology" (BAT)	Sector modelling of low carbon options for the food sector		
2		Definition of a baseline for energy consumption and GHG emissions from the food and beverages sector			
3		Identifying industrial sector's discount rate and economic assessment			
4		Innovation analysis			
5		Identification of policy instruments to promote GHG abatement in the food and beverages sector			
6	Ceramics	Sector description and definition of the "Best Available Technology" (BAT)	Sector		

Nº	Sector	Report	Publication	Executive summary	Database and software
7		Definition of a baseline for energy consumption and GHG emissions from the ceramics sector	modelling of low carbon options for the ceramics sector		
8		Identifying industrial sector's discount rate and economic assessment			
9		Innovation analysis			
10		Identification of policy instruments to promote GHG abatement in the ceramics sector			
11	Cement	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the cement sector		
12		Definition of a baseline for energy consumption and GHG emissions from the cement sector			
13		Identifying industrial sector's discount rate and economic assessment			
14		Innovation analysis			
15		Identification of policy instruments to promote GHG abatement in the cement sector			
16	Chemicals	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the chemical sector		
17		Definition of a baseline for energy consumption and GHG emissions from the chemicals sector			
18		Identifying industrial sector's discount rate and economic assessment			
19		Innovation analysis			
20		Identification of policy instruments to promote GHG abatement in the chemicals sector			
21	Ferroalloys	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the ferroalloy metallurgy		
22		Definition of a baseline for energy consumption and GHG emissions from the ferroalloys sector			
23		Identifying industrial sector's discount rate and economic assessment			

Nº	Sector	Report	Publication	Executive summary	Database and software
24		Innovation analysis	sector		
25		Identification of policy instruments to promote GHG abatement in the ferroalloys sector			
26	Mining	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the mining and pelletizing sector		
27		Definition of a baseline for energy consumption and GHG emissions from the mining sector			
28		Identifying industrial sector's discount rate and economic assessment			
29		Innovation analysis			
30		Identification of policy instruments to promote GHG abatement in the mining sector			
31	Non-ferrous metals	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the metallurgy sector of non-ferrous metals		
32		Definition of a baseline for energy consumption and GHG emissions from the non-ferrous metals sector			
33		Identifying industrial sector's discount rate and economic assessment			
34		Innovation analysis			
35		Identification of policy instruments to promote GHG abatement in the non-ferrous metals sector			
36	Other industries	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for other industries		
37		Definition of a baseline for energy consumption and GHG emissions from the other industries sector			
38		Identifying industrial sector's discount rate and economic assessment			
39		Innovation analysis			
40		Identification of policy instruments to promote GHG abatement in the other industries sector			

Nº	Sector	Report	Publication	Executive summary	Database and software
41	Pulp and paper	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the pulp and paper sector		
42		Definition of a baseline for energy consumption and GHG emissions from the pulp and paper sector			
43		Identifying industrial sector's discount rate and economic assessment			
44		Innovation analysis			
45		Identification of policy instruments to promote GHG abatement in the pulp and paper sector			
46	Steel & iron	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the pig iron and steel sector		
47		Definition of a baseline for energy consumption and GHG emissions from the steel sector			
48		Identifying industrial sector's discount rate and economic assessment			
49		Innovation analysis			
50		Identification of policy instruments to promote GHG abatement in the steel sector			
51	Textile	Sector description and definition of the "Best Available Technology" (BAT)	Sector modelling of low carbon options for the textile sector		
52		Definition of a baseline for energy consumption and GHG emissions from the textile sector			
53		Identifying industrial sector's discount rate and economic assessment			
54		Innovation analysis			
55		Identification of policy instruments to promote GHG abatement in the textile sector			
Output 1.2: Assessment of GHG emission reduction potential and estimation of abatement costs for the energy sector					
56	Biofuels	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling		

Nº	Sector	Report	Publication	Executive summary	Database and software
57		Definition of a baseline for energy consumption and GHG emissions from the biofuels sector	of low carbon options for the biofuel sector		
58		Identifying energy sector's discount rate and economic assessment			
59		Innovation analysis			
60		Identification of policy instruments to promote GHG abatement in the biofuels sector			
61	Oil & gas	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the oil and natural gas sector		
62		Definition of a baseline for energy consumption and GHG emissions from the oil and natural gas sector			
63		Identifying energy sector's discount rate and economic assessment			
64		Innovation analysis			
65		Identification of policy instruments to promote GHG abatement in the oil and natural gas sector			
66	Renewable sources of electricity generation	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the sector of renewable sources of electricity generation		
67		Definition of a baseline for energy consumption and GHG emissions from the renewable sources of electricity generation sector			
68		Identifying energy sector's discount rate and economic assessment			
69		Innovation analysis			
70		Identification of policy instruments to promote GHG abatement in the renewable sources of electricity generation sector			
71	Thermoelectric	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the thermoelectric		
72		Definition of a baseline for energy consumption and GHG emissions from the thermoelectric sector			

Nº	Sector	Report	Publication	Executive summary	Database and software
73		Identifying energy sector's discount rate and economic assessment	and thermonuclear sector		
74		Innovation analysis			
75		Identification of policy instruments to promote GHG abatement in the thermoelectric sector			
Output 1.3: Assessment of GHG emission reduction potential and estimation of abatement costs for the transport sector					
76	Transport	Sector description and definition of the "Best Available Technology" (BAT)	Sector modelling of low carbon options for the transport sector		
77		Definition of a baseline for energy consumption and GHG emissions from the transport sector			
78		Economic assessment			
79		Innovation analysis			
80		Identification of policy instruments to promote GHG abatement in the transport sector			
Output 1.4: Assessment of GHG emission reduction potential and estimation of abatement costs for the household and services sectors					
81	Household and services	Sector description and definition of the "Best Available Technology" (BAT)	Sector modeling of low carbon options for the building sector		
82		Definition of a baseline for energy consumption and GHG emissions			
83		Identifying service sector's discount rate			
84		Economic assessment			
85		Innovation analysis			
86		Identification of policy instruments to promote GHG abatement in the services sector			
Output 1.5: Assessment of mitigation alternatives and estimation of abatement costs for land use, land use change and forestry (LULUCF)					
87	LULUCF	Description of methodologies for estimating GHG emissions from LULUCF	Sector modeling		

Nº	Sector	Report	Publication	Executive summary	Database and software
88		Analysis of land use for food and energy purposes	of low carbon options for agriculture, forestry and other land uses (AFOLU)		
89		Definition of a baseline for GHG emissions from LULUCF			
90		Identification of mitigation potential and evaluation of mitigation alternatives feasibility in LULUCF in Brazil			
91		Identification of policy instruments to promote GHG abatement in LULUCF			
Output 1.6: Assessment of mitigation alternatives and estimation of abatement costs for the Waste Management Sector					
92	Waste management	Definition of BAT	Sector modeling of low carbon options for the waste management sector		
93		Definition of a baseline for the waste management sector			
94		Identifying energy sector's discount rate			
95		Economic assessment			
96		Innovation analysis			
97		Identification of policy instruments to promote GHG abatement			
Output 1.7: Assessment of GHG emission reduction potential and estimation of abatement costs for cross-sector mitigation alternatives					
98	Cross-sector mitigation alternatives	Carbon Capture and Storage (CCS) CO2 pipelines and hubs	Cross-cutting options for mitigation of greenhouse gas emissions: capture, transport and storage of carbon		
99		Smart grids			
100		Learning curves modeling and estimation			

Nº	Sector	Report	Publication	Executive summary	Database and software
101		Revision and estimate of potential and costs of cuts for measures	Cross-cutting options for mitigation of greenhouse gas emissions: networks smart grids		
102		Identification of policy instruments to promote GHG abatement in cross-sector mitigation options			
Output 2: Integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification (MRV) of proposed mitigation alternatives					
Output 2.1: Testing MRV and integrated analysis of GHG emission abatement alternatives in an optimization model comprising all energy chains and all GHG emitting sectors analyzed for Brazil					
1	MRV analysis	Survey of the state of the art systems and activities of MRV on GHG emissions in the international scope	Not published	Not published	Not published
2		Survey of the state of the art of Brazil on activities of MRV on GHG emissions			
3		Survey of potential sources of funds for MRV activities			
4		Verification of the congruence area between the systems of registration and/or GHG emissions monitoring currently existing in Brazil			
5		Proposal for possible MRV system in the light of Nationally Determined Contribution (NDC) of Brazil			
6	Energy	Simulation of the MSB8000 as a National Energy Plan 2050 Demand	Not published	Not	Not

Nº	Sector	Report	Publication	Executive summary	Database and software
	system and LULUCF sector	Scenario		published	published
7		Technical, economic and environmental feasibility study of Bio-CCS pilot project for the use of CO2 from the distillery of the Center-South of Brazil			
8		Preparation for the analysis of environmental co-benefits of integrated low carbon scenarios			
9		Co-benefits of concentrated solar plants			
10		Model development and description	1. Integrated modeling and economic impacts of low-carbon sectoral options 2. Mitigation paths and public policy instruments to achieve the Brazilian targets in the Paris agreement 1.	Integrated modeling and economic impacts of low carbon sector options "and" Mitigation paths and public policy instruments to achieve the Brazilian targets in the Paris agreement "	Software and database were produced with the information produced by the project
11		Consistency analysis of the MESSAGE optimization model			
12		MESSAGE preparation and structuring for insertion of low carbon activities			
13		Integrated scenarios for greenhouse gas emissions up to 2050 - Round 1 (Baseline and Low Carbon Scenarios)			
14		Assessment of mitigation options and estimation of abatement costs for transport sector - Sensitivity Scenario I			
15		Identification, revision and analysis of critical variables for sensitivity analysis in the integrated modeling of low carbon scenarios			
16		Sensitivity analysis to critical variables of the energy system			
17		Assessment of mitigation options and estimation of abatement costs for transport sector and waste management sectors - Sensitivity Scenario II			
18		Assessment of mitigation options and estimation of abatement costs for agriculture, forestry and other land uses (Afolu) - Sensitivity Scenario I			
19		Assessment of mitigation options and estimation of abatement costs for agriculture, forestry and other land uses (Afolu) - Sensitivity Scenario II			
20		Environmental co-benefits analysis of low carbon strategies			
21		Major barriers and public policies for the implementation of low carbon integrated scenarios			

Nº	Sector	Report	Publication	Executive summary	Database and software
22		Final report on integrated low carbon scenarios of the energy system			
Output 2.2: Analysis of the impacts of low carbon policies on the Brazilian economy					
23	Economic impact analysis	Development and description of the model			
24		Projections with macroeconomic and sector aggregated variables			
25		Revision of macroeconomic and sector scenario			
26		Second revision of macroeconomic and sector scenario - Scenario FIPE I			
27		Impacts of integrated scenarios of low-carbon on the Brazilian economy - Round 1 of the Scenario FIPE I			
28		Projection of consumption of households by income classes and regions of Brazil			
29		Projection of jobs by economic sectors			
30		Projections with macroeconomic and sector aggregated variables considering National Energy Plan			
31		Impacts of integrated scenarios of low-carbon on the Brazilian economy - Round 2 of the Scenario FIPE I			
32		Impacts of integrated scenarios of low-carbon on the Brazilian economy - Round 3 of the Scenario FIPE I			
33		Impacts of integrated scenarios of low-carbon on the Brazilian economy - Round 1 of the Scenario FIPE III			
34		Third revision of macroeconomic and sector scenario - Scenario FIPE III			
35		Impacts of integrated scenarios of low-carbon on the Brazilian economy - Round 2 of the Scenario FIPE III			
36		Adjustment of the EFES model to carry out sector sensitivity analyzes on the low carbon scenarios			
37		Impacts in terms of GDP, employment and income resulting from analyzes			

Nº	Sector	Report	Publication	Executive summary	Database and software
		of sectoral sensitivities			
38		Impacts on GDP, employment and income, resulting from the proposal of public policy instruments for the implementation of low carbon sectoral scenarios			
39		Final report of the impacts of integrated scenarios of low-carbon on the Brazilian economy			

7.5. **Appendix F: Summary of project expenditures**

This shows a more detailed summary of project expenditures up to the end of 2016. While we used provisional expenditures provided for 2017 the complete project expenditures for 2017 will be available after release of this evaluation.

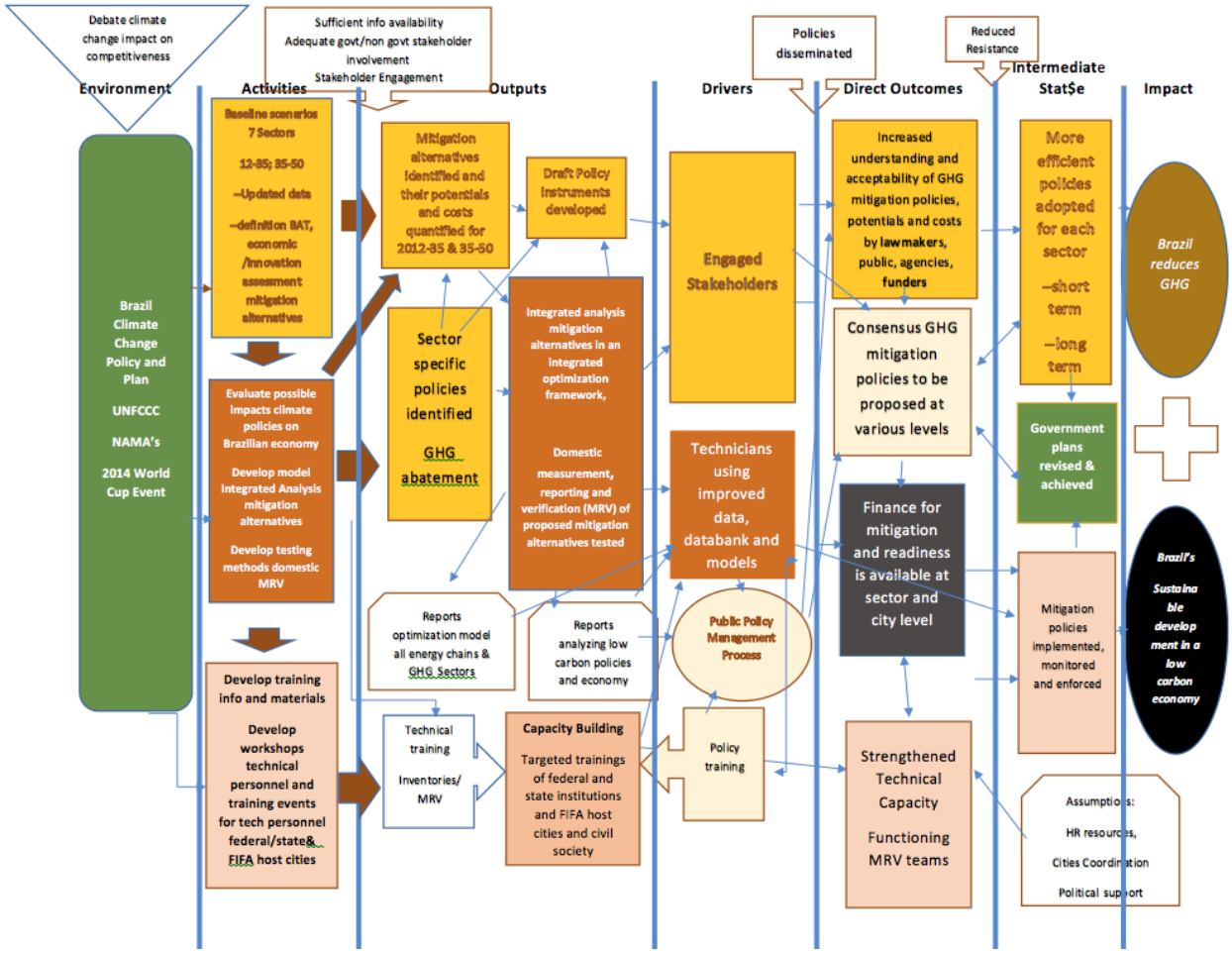
Budget Component	Estimated cost at design *	Actual cost as at December 2016**	Expenditure ratio (actual/planned)
Personnel			
Project Personnel	300,000	305,465	1.02
Consultants	153,600	454,772	2.96
Admin Support	0	0	
Travel	24,000	169,162	7.05
Personnel TOTAL	477,600	929,398	
Sub Contracts			
Development of applications	1,768,688	1,682,987	0.95
Subcontracts TOTAL	1,768,688	1,682,987	
Education and Training			
Group Training	369,903	122,309	0.33
Workshops/Group Meetings	751,524	37,941	0.05
Steering Committee	60,000	3,276	0.05
Education and Training TOTAL	1,181,427	163,526	
Equipment and Premises TOTAL			
Non Expendable Equipment	72,285	15,802	0.22
Equipment and Premises TOTAL	72,285	15,802	
Miscellaneous			
Operation and Equip Maintenance	155,000	376	0.00
Reporting	279,000	4,706	0.02
Sundry.	206,000	152,505	0.74

Budget Component	Estimated cost at design *	Actual cost as at December 2016**	Expenditure ratio (actual/planned)
Evaluation - MTR	20,000		0.00
Evaluation - TE	20,000		0.00
Miscellaneous - TOTAL	**680,000**	**157,587**	
PROJECT GRAND TOTAL	**4,180,000**	**2,949,300**	

* Please note 2 budget revisions were processed

**Full budget details for 2017 not available until 2018

7.6. **Appendix G: Theory of Change at Inception**



7.7. **Appendix H: Stakeholder comments to the draft evaluation report and responses**

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
#Stakeholder1				
1	***Front cover***	I don't believe the photo reflects the project correctly	For discussion on alternatives	We had to find a picture a picture which we could use without copyright issues and that could actually capture the project. This picture is from the environment ministry picture folder in their website and is of the Brazilian rainforest… which represents about 80% of Brazil's emissions… in that context, a forest related picture can best capture the topic of GHG emissions in Brazil, despite being only one in several sectors. Picture to remain unchanged.
2	***Project Identification Table***	Is this the PCA date or the first disbursement date?	Consultants to address	This is the "actual start date" reported in the project identification sheet in the 2014 PIR—the first disbursement date is listed below which is May 6 2013
3		Amount is different than the one above highlighted in yellow		Changed to align

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
4	**8**	Can we assess a project a moderately satisfactory just because the Paris agreement might not remain in force?	Important to clarify that multiple factors go into rating. One of which is the TOC at review- merely a reconstruction-extension of the log frame. (See TOC table 5 & 6 in report (page 31-8) As mentioned in the report sections on outcome and likelihood of impacts, the evaluators looked not only at the assumption: "Paris agreement in force" but took a holistic approach- see report page 47: "The Achievement of Direct Outcomes was rated Moderately Satisfactory as the three key reconstructed outcomes, assumptions and drivers discussed below feeding into the intermediate states were partially achieved, and assumptions partially hold." The three direct outcomes are: **1:** Acceptance and endorsement of project findings in relation to GHG mitigation technologies, potentials, costs, and economic tradeoffs by government, civil society, private sector and funders: Partially achieved **2:** Endorsement of project recommendations for policies and strategies to overcome barriers to mitigation by the Brazilian Forum on CC, the CC Committee and the CC Executive Group: Partially achieved **3:** a) Increased technical capacity in public and civil society organizations at federal, state and city level on mitigation actions and their MRV and 3 b) Increased used of SIRENE by technicians at	That is not the case as the overall Satisfactory score is based on assessing each element- strategic relevance, effectiveness, efficiency, sustainability, on specific criteria elaborated upon and shared in the EOU ratings matrix . The project's satisfactory evaluation reflects the evaluation of many different parameters based on desk reviews and of 30 interviews. The Paris Agreement remaining in force is only one assumption we included in the ToC at review. The evaluation team believes that if the Paris Agreement (or any replacement under the UN) is not in force, countries will most likely loose momentum for change, meaning that without a global binding framework, countries will not undergo a low carbon transition within the foreseeable future. However, we assume that it is highly likely that the PA or any replacement will be in force and that Brazil will remain highly engaged.

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
			city, state, federal level for mitigation action planning and MRV: Partially achieved A driver for transition between outputs and outcomes is required: Relevant stakeholders (ministries and public agencies – city, state and federal, private sector representatives – industry and other sectors, ENGOs) are adequately engaged and have access to project outputs and information And four assumptions need to hold: Political and institutional stability allow for an ordinary policy making process Engagement during the policy making process promotes buy in, including private sector Brazil's commitments under the Paris Agreement hold Public institutions at city, state and federal level maintain technical capacity despite turnover. While the driver (related to adequate stakeholder engagement) is in place, there is a wide degree of uncertainty in relation to whether the assumption (related to political and institutional stability) will hold, namely in such a fashion as to ensuring a timely adoption of the mitigation policies. There is no evidence that the remaining three assumptions do not hold. "The Likelihood of Impact was rated as Moderately Satisfactory based on partial attainment of key direct outcomes relevant to	No changes to the report will be made.

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
			intermediate states, (mitigation policies adopted) no intermediate states having been achieved and assumptions holding" The project was rated Moderately Likely in terms of the likelihood to achieve impact because there is a widespread sense of country driven-ness and ownership and the Paris Agreement will likely hold, positively influencing likelihood of impact. However, the fact that none of the intermediate states has been fully achieved yet has a negative effect on the rating. For intermediate states and impact, given their medium and long-term nature, it is harder to assess whether, and to what extent, assumptions hold. The project impact is: Brazil reduces GHG emissions in a cost- effective manner and achieves low carbon sustainable development, and the project's four intermediate states are: Intermediate State One. Mitigation policies adopted /enacted for each of the five sectors and for cross-sector alternatives Intermediate State Two. Mitigation policies implemented for each of the sectors - energy; transport; residential and services; AFOLU, waste - and for cross-sector alternatives Intermediate State Three. Mitigation policies MRVed Intermediate State Four: Transformational change in all sectors The following assumptions need to hold in order for the intermediate states and the impact to be	

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
			achieved: Assumption 1 - Political and institutional stability allow for an ordinary policy making process needs to hold Assumption 4: Continued political and financial support. Assumption 5: Countries' climate change policies are increasingly ambitious and there is a race to the top by countries and companies. Assumption 6: Public institutions at city, state and federal level maintain technical capacity despite turnover. The following drivers need to be in place: Driver 2 - Relevant Stakeholders (ministries) are adequately engaged and have access to project outputs and information Overall, despite some uncertainty associated mostly to the how and when the intermediate states will be achieved, there is a reasonable expectation that the impact will be achieved, due both to domestic and international circumstances. Therefore, the Likelihood of Achievement of Project's Impacts is Moderately likely according to the UN Environment Evaluation Office Criterion Ratings Matrix.	
5		I believe that impacts can only be assessed after some time of project completion, not at project completion…in my view, there is a	Agree that impact realization is much longer term – that's why EOU approach breaks it down to look at achievement of direct outcomes, assumptions and drivers in place to yield	The project evaluation regarding the ToC is based on a pathway from outputs to impacts, taking into account the causality between the different elements.

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
		strong likelihood that policies based on project results will be adopted and we have already one example with the ministry of finance…so I am not sure I agree with this rationale for the rating…	intermediate states and ultimately "likelihood of impact" See TOC table 5 & 6 in report (page 31-8)	While outputs are evaluated regarding their "delivery", the impact is evaluated regarding its "likelihood." Such nuances are reflected in the evaluation methodology. No changes to the report will be made.
6	***Exec summary 13***	I am not sure I agree with this rating and rationale. Can we provide more details of why sustainability is not rated as satisfactory?		EOU - Sustainability- has a three-fold dimension– institutional, socio-political and financial – weighted avg of the 3 factors (see report page 84) Socio-political: The evaluation will assess the extent to which social or political factors support the continuation and further development of project direct outcomes. It will consider the level of ownership, interest and commitment among government and other stakeholders to take the project achievements forwards. High dependency on socio- political factors- very relevant to the national strategy development. This did not meet the highly satisfactory

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
				criterion that requires moderate dependence on socio-political factors and 100% mitigation which this project did not have. Institutional factors – (MS) During the evaluation period, there was great uncertainty about the institutional set up. There is some sense of urgency in getting these policies on the ground and this uncertainty is a threat. Interviews picked up some concerns circulating among stakeholders about the possibility that the ministry in charge of NDC's implementation, the Ministry of Environment (MMA), may change as a result of politics, although policy proposals from the project have been incorporated and forwarded as part of MCTIC' contribution. MS : The project has high institutional dependency and some risks not mitigated 100%- therefore highly satisfactory impossible Financial sustainability: MS : the project is rated moderately satisfactory as it is highly dependant on future funding but interviews show willingness and openness of funders more so domestically than internationally. The transition to a low carbon economy- Banco de Brazil, Brazil

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
				Dev Bank pointed to interest by domestic organizations in green tech. Nonetheless financing the country's entire economy is a bottleneck in accessing international capital market. Prospects are good but dependency isn't 100% mitigated. A footnote was included in the report in order to clarify the approach to evaluating sustainability namely, by stressing that sustainability is related to factors external to and uncontrollable by the project.
7		We cannot be involved (UNEP) in any follow up of this project. Let's talk. This is for MCTIC to do.	Consultant to change	Changed to MCTIC
8	***Table 1***	Why?	Consultant clarified	• Recommendation from • Methods of direct GEF Interaction • Response: This was a recommendation that came from the interview held with Suggestion of former project administrator--see narrative from transcript below: • I: Do you have recommendations • R: "There should be more direct communication between GEF—there should be more direct contact with GEF rather than it all going through UN Environment. GEF should have more direct contact with implementing

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
				partners. This is important for the learning process. If you take people working on the ground…reports are filtered. reports can be submitted but you also need direct communication. • I: What would be the channel? R: There could be skype communication. I don't believe GEF has information that the system change posed such a big risk to the project
9	***19***	I am not sure we can state this ? if we had a PRC and this a UNEP project, we are always between the GEF understanding and the UNEP PRC requests. Please let's discuss how to convey this in a way that doesn't damage the project evaluation	Consultant to address	removed the paragraph since it is not really necessary here
10	***23***	The evaluation is not for the UNEP evaluation office but for the GEF and for the MCTIC…	Consultant to address	Made change of language to include GEF and MCTIC
11	***29***	I was not interviewed…this is a bit awkward…since I believe I had a thing to say that might have influence some of rating on likelihood of impact and		The project's satisfactory evaluation reflects the evaluation of many different parameters based on desk reviews and of 30 interviews. A skype call during this phase allowed for the stakeholder's views

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
		sustainability…which I tend to disagree and would like to discuss		to be taken on board and for concerns and issues to be clarified. List of those interviewed is changed to reflect input on review of final report
12	***40***	I am not sure I understand this? A project shouldn't be assessed against its original or changed through the project outcomes and outputs? We should use the results framework? Shouldn't we? I would like to call for a meeting with the Evaluation Office to further understand this way of evaluating which I am not familiar with. I have really pushed the project team to work towards the outcomes targets and I am not sure how a project can be judged against reviewed outcomes without indicators and targets known by the project teams during implementation….can we discuss??	See GEF – Theory of change. Para 11: 11. Some of the projects may already have an explicit theory of change. Where appropriate, after consultations with the project stakeholders, the evaluators may refine this theory of change. Where an explicit theory of change is not provided in the project documents, the evaluators should develop it based on information provided in the project documents and through consultations with the project stakeholders.	The Guidelines for GEF Agencies in Conducting Terminal Evaluation for Full-sized Projects are very clear: evaluators are to, where appropriate, in consultation with the stakeholders, refine an existing ToC or, when it does not exist, create one. The exact wording in the guidelines is as follows: 11. Some of the projects may already have an explicit theory of change. Where appropriate, after consultations with the project stakeholders, the evaluators may refine this theory of change. Where an explicit theory of change is not provided in the project documents, the evaluators should develop it based on information provided in the project documents and through consultations with the project stakeholders. In this context, we developed a theory of change during the inception phase, which was specifically discussed with stakeholders (including the project team

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
				and respective coordinator) in skype interviews before the inception report was delivered (therefore before the mission to Brasilia). During the interviews in Brasilia and Rio, once the state of preparedness of the reports (outputs in the ToC, outcomes in the ProDoc), was clear, with all stakeholders giving praise to the quality of the drafts made available so far, the discussions focused mostly on achievement of outcomes and impact of the project. The interviews validated the evaluation team's proposed path from output to impacts. It should be noted that the evaluation team was very loyal the concepts included in the ProDoc, by using the exact wording that was approved by GEF and UNEP. No changes to the report are required.

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
13	***49***	This is not correct. DTIE was the IA (not through the office in Brazil but with me as Task Manager and Leena and Faith ad IA FMOs) and the Brazil office provided execution support to MCTIC with -a project office - Francine - and a financial assistant Patricia. This is important since it is what is agreed in the Executive Programme. This needs fixing.	Consultant to address	Changed sentence to reflect comments
14	***51***	Francine, please check		This point was discussed in the interviews in terms of the role of Rede Clima etc in multiple interviews, consultations about the project graphic etc., --got rather ambiguous responses, rephrased the language indicating their role as proforma and sent this to UNEP Brazil to affirm, questioned this with them in the project graphic but did not get response about whether to make additional changes—resent the phrasing and description for a recheck and they said it was ok—this issue could not get additional clarification therefore and remains as referenced in report
15	***Figure 3***	This is not the correct structure during implementation, it is missing	Consultant to address	The figure is not supposed to show the members of the Steering Committee, but

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
		the ABC		rather that the steering committee has oversight in relation to project supervision, project officer and executing agency. A footnote has been included to clarify.
16	***56***	If this is the case, the project initial date is probably April/May 2013 and not March as mentioned before? Please kindly check the final date of the ICA.	Consultant to address	• P56 • The project was formally signed in February 2013 by the Ministry of Science, Technology and Innovation (MCTI) and the Brazilian Government, through the Brazilian Cooperation Agency of the Ministry of Foreign Affairs (ABC/MRE) and then in April 2013 by UN Environment • Comment: If this is the case, the project initial date is probably April/May 2013 and not March as mentioned before? Please kindly check the final date of the ICA • Response: Revised the dates and amended the texts to try to clarify more
17	***57***	I don't get this, which outputs were outcomes? This is a bit confusing…	Current log frame outcomes- studies by the project do not fit GEF definition of outcomes which look at how the project outputs were used.. therefore they had to be reconstructed. You also concur that outcomes read like outputs(See TOC table 5 & 6 in report(page 31-8)	In proposing a ToC and in the spirit of the guideline 11 transcribed above, the evaluation team felt it was important to propose a reclassification of the ProDoc outcomes and actually classify them as outputs in accordance with the GEF definitions. The GEF defines outputs as

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
				services and products delivered directly by the intervention e.g. guidance material, policy advice, a local pilot project. In this context, the ProDoc was the basis only for the outputs included in the ToC. The direct outcomes, the intermediate states and the impact, as well as the drivers and the assumptions were proposed by the evaluation team (in the scope of the mandate of guideline 11 transcribed above). These elements proposed by the evaluation team do not represent, however, something external, additional or unforeseen/unforeseeable to the project: they simply represent a mapping out of the project pathway from outputs (as described in the ProDoc, but wrongly classified as outputs) to impact. Since this issue is better explained later in the report and may be confusing for the reader this early in the text in the discussion of the Theory of Change and table this sentence is removed from the original placement in the report however.
18	***59***	I don't understand this.		See above. Also added another sentence about some of the historical background and theory behind the Theory of Change to

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
				methodology section with additional literature sources .
19	***Table 4***	The Paris Agreement is a positive driver but it only occurred long after project design. The project contributed to the Brazil NDC. Can we capture this positively somehow?	Has been addressed in report- see consultant comment	The project's input to the INDC and to the strategy to implement the NDC has been positively taken into consideration, namely in relation to the achievement of outcomes. Some slight changes made to table wording.
20		The project impact doesn't hold on the Assumption 3 that Brazil holds its commitments vis-à-vis Paris agreement. The Paris agreement is not so ambitious vis-à-vis Brazilian reality. It will be incumbent on MCTIC and Ministry of Energy, EPE, Ministries of Planning and Foreign Affairs to work together to incorporate the findings of this project in Brazil planning energy policies and finances allocated to this. Independently of the Paris Agreement. I believe….	To be discussed	Countries are supposed to submit more ambitious NDC/commitments every five years (in fact, at any time). In that sense, the assumption does capture the fact that Brazil can be more ambitious than the current NDC/commitment, as Brazil can increase the ambition of it's NDC under the Paris Agreement, as soon as it terminates the policy making process described in the reconstructed ToC. Some slight changes made to table wording.

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
21	***140***	Can we discuss this?		See answer to comment 17 above
22	**141**	Shouldn't we use the outcomes that the project has worked in the PIR with the indicators and targets??	Indeed the reconstructed theory of change used the PIR indicators and targets. GEF guidelines require reconstruction of theory of change especially as you agree "project outcomes looked like outputs"	See answer to comment 17 above
23	***143***	Don't agree with this one		See answer to comments 4 and 20 above.
24	***147***	But this is new outcome and target… We need to discuss, while I do agree that the project outcomes looked like outputs, this is what was approved by GEF and UNEP**.** Having said that I noticed that and we reviewed the project objective's target and indicator. Exactly to cater for this and to make it more realistic. I would like to discuss this.		See answer to comment 17 above.
25	***158: direct outcomes- MS rating***	Disagree	See explanation above	See answer to comment 17 above.
26		Let's discuss		See answer to comment 17 above.
27	**175:** Intermediate States 4 - Transformational	Let's discuss – not sure as I said, agree	See TOC table 5 & 6 in report (page 31-8)	See answer to comment 12 above.

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
	Change and Impact - Brazil reduces GHG emissions in a cost effective manner and achieves low carbon sustainable development			The intermediate states were proposed by the evaluation team after consultation with stakeholders.
28	***237***	Ok.. let's discuss, I tend to agree but I am not sure to understand the rationale for the rating. I believe this is not necessarily correct, since the group in MCTIC responsible for this is undertaking the national communications…so this can and I believe will be very sustainable…let's talk	See consultant comment	We do say that there are in place robust mechanisms to sustain the institutionalization of the outcomes. We acknowledge that Brazil has been able to sustain leadership on CC for a few decades now. That has been taken into account. However, some institutional instability has been highlighted by many interviewees and that also needs to be taken into account. Additionally, see answer to comment 6 above. No changes were made to the report.

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
29	***267***	Let's discuss. I have something to bring up here that might influence the rating.		The discussion in the skype call went to this paragraph to find out what was desired however respondent did not recall what was meant thus there were no changes were made to the report.
30	***Table 20 (Rec 1):*** As part of an exit strategy, the UN Environment team is advised to hold a **follow-up meeting** with MCTIC to discuss and handover these recommendations, including focusing on the Action Plan proposal included in recommendation 2 above, and any support needed for a smooth transition	Agree, let's discuss because I am not sure who will convene, but it is an interesting suggestion, but I would have preferred a recommendation to the Executing Agency – MCTIC to hold a meeting with all relevant ministries at a high level or GEX to do this…	Consultant to address	Changed to MCTIC
31	***Table 20 (Rec 2:***	Agree with the suggestion but it is	Consultant to address	Changed to MCTIC

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
	Create a more specific **process map** of specific titles in key Ministries, federal and state agencies and legislative bodies of those who a) need to have understanding of project findings and recommendations over time b) those with actual control over GHG mitigation policy development, implementation and monitoring. Consult with agency hiring/training staff about ways to integrate/disseminate info into staff trainings/orientations or around	for MCTIC not for us – we don't have any more staff of this and this is for the Executing Agency to do not for us, if this is not for MCTIC, I would decline/disagree with this.		

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
	new strategies through tools like online or telephone consultations. Also consult with sample experts in diverse disciplines at universities (policy, environment, business etc.) about creative methods to ensure project history/ dissemination. Get feedback from key target audiences (through interview, survey or focus group) to improve access to, use and understanding of info on MCTIC website. Feed findings into the action plan in			

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
	Recommendation 3.			
#Stakeholder 2				
		Agradecemos muito a oportunidade de participar / contribuir com este processo. Tive a oportunidade de ler o sumário e senti falta de relatar mais oportunidades e lições aprendidas neste projeto, a partir da interação com o setor industrial. A participação e engajamento do setor privado no projeto também não ficou muito evidenciado. Ficamos à disposição para aprofundar se necessário. [Highight in english: the report does not capture properly issues related to the engagement of the private sector and the lessons learned aso do not seem to reflect that.]		O relatório aborda exaustivamente a questão do engajamento de stakeholders, incluindo do setor privado. Aliás, a entrevista consigo foi fundamental nesse aspeto. O ponto 4.3.2 do relatório e os parágrafos 112 (secção 6.4.1.1), 145 (secção 6.4.2), 263 and 264 (secção 7.1), abordam especificamente essa questão. Note também que a recomendação 3 visa propor um engajamento continuado dos stakeholders na elaboração da política das mudanças climáticas no Brasil. Da mesma forma, as lições 1 a 5 do projeto dizem respeito ao engajamento de stakeholders (tendo em conta o que escutámos principalmente da indústria). Estamos à sua disposição.

	Paragraph / section (as in the commented report version)	Stakeholder comment	UN Environment Evaluation Office (EO) responses to the comments	Consultant responses/ actions
				[Highlight in English: the full report covers the issue mentioned extensively. A few of the instances where such discussion can be found in the report are identified]. The Lessons Learned 1, 2, 3, 4 and 5 all reflect comments and input from private sector respondants.
#Stakeholder3				
		O link para o projeto "Opções de mitigação...." mencionado no pé de página numero 2, não está funcionando [Highlight in English: the web link to the project site is not working]		The link has been updated to http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/brasil/Opcoes_de_Mitigacao_de_Emissoes_de_Gases_de_Efeito_Estufa_GEE_em_SetoresChave_do_Brasil.html

7.8. **Appendix I: Quality assessment of the evaluation report**

Evaluation Title:

GEF Project: Mitigation Options of GHG Emissions in Key Sectors in Brazil

All UN Environment evaluations are subject to a quality assessment by the Evaluation Office. This is an assessment of the quality of the evaluation product (i.e. evaluation report) and is dependent on more than just the consultant's efforts and skills. Nevertheless, the quality assessment is used as a tool for providing structured feedback to evaluation consultants, especially at draft report stage. This guidance is provided to support consistency in assessment across different Evaluation Managers and to make the assessment process as transparent as possible.

A number rating 1-6 is used for each criterion: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, Highly Unsatisfactory = 1. The overall quality of the evaluation report is calculated by taking the mean score of all rated quality criteria.

	UN Environment Evaluation Office Comments	Final Report Rating
Substantive Report Quality Criteria		
Quality of the Executive Summary: The Summary should be able to stand alone as an accurate summary of the main evaluation product. It should include a concise overview of the evaluation object; clear summary of the evaluation objectives and scope; overall evaluation rating of the project and key features of performance (strengths and weaknesses) against exceptional criteria (plus reference to where the evaluation ratings table can be found within the report); summary of the main findings of the exercise, including a synthesis of main conclusions (which include a summary response to key strategic evaluation questions), lessons learned and recommendations.	Final report: Final report now has a comprehensive executive summary while earlier drafts did not	6
I. Introduction A brief introduction should be given identifying, where possible and relevant, the following: institutional context of the project (sub-programme, Division, regions/countries where implemented) and coverage of the evaluation; date of PRC approval and project document signature); results frameworks to which it contributes (e.g. Expected Accomplishment in POW); project duration and start/end dates; number of project phases (where appropriate); implementing partners; total secured budget and whether the project has been evaluated in the past (e.g. mid-term, part of a synthesis evaluation, evaluated by another agency etc.) Consider the extent to which the introduction includes a concise statement of the purpose of the evaluation and the key intended audience for the findings?	Final report: Significantly improved over the zero and first drafts which were overly detailed	6
II. Evaluation Methods This section should include a description of how the *TOC at Evaluation*[75] was designed (who was involved etc.) and applied to the context of the project? A data collection section should include: a description of evaluation methods and information sources used, including the number and type of respondents; justification for methods used (e.g. qualitative/ quantitative; electronic/face-to-face); any selection criteria used to identify respondents, case studies or sites/countries visited; strategies used to increase stakeholder engagement and consultation; details of how data were verified (e.g. triangulation, review by stakeholders etc.).	Final report: Zero draft and first draft required a lot of restructuring of methods and table of reports reviewed All now addressed in final	6

[75] During the Inception Phase of the evaluation process a *TOC at Design* is created based on the information contained in the approved project documents (these may include either logical framework or a TOC or narrative descriptions). During the evaluation process this TOC is revised based on changes made during project intervention and becomes the *TOC at Evaluation*.

	UN Environment Evaluation Office Comments	Final Report Rating
The methods used to analyse data (e.g. scoring; coding; thematic analysis etc.) should be described. It should also address evaluation limitations such as: low or imbalanced response rates across different groups; gaps in documentation; extent to which findings can be either generalised to wider evaluation questions or constraints on aggregation/disaggregation; any potential or apparent biases; language barriers and ways they were overcome. Ethics and human rights issues should be highlighted including: how anonymity and confidentiality were protected and strategies used to include the views of marginalised or potentially disadvantaged groups and/or divergent views.		
III. The Project This section should include: *Context:* Overview of the main issue that the project is trying to address, its root causes and consequences on the environment and human well-being (i.e. synopsis of the problem and situational analyses). *Objectives and components*: Summary of the project's results hierarchy as stated in the ProDoc (or as officially revised) *Stakeholders:* Description of groups of targeted stakeholders organised according to relevant common characteristics *Project implementation structure and partners:* A description of the implementation structure with diagram and a list of key project partners *Changes in design during implementation:* Any key events that affected the project's scope or parameters should be described in brief in chronological order *Project financing:* Completed tables of: (a) budget at design and expenditure by components (b) planned and actual sources of funding/co-financing	Final report: The draft report now contains all the necessary sections whereas in the zero draft financials were not explicit and content had to be restructured to meet standards	6
IV. Theory of Change The TOC at Evaluation should be presented clearly in both diagrammatic and narrative forms. Clear articulation of each major causal pathway is expected, (starting from outputs to long term impact), including explanations of all drivers and assumptions as well as the expected roles of key actors. Where the project results as stated in the project design documents (or formal revisions of the project design) are not an accurate reflection of the project's intentions or do not follow OECD/DAC definitions of different results levels, project results may need to be re-phrased or reformulated. In such cases, a summary of the project's results hierarchy should be presented	Final report: Zero and draft reports needed a few rounds of changes from the original log frame to the theory of change at review.	6

	UN Environment Evaluation Office Comments	Final Report Rating
for: a) the results as stated in the approved/revised Prodoc logframe/TOC and b) as formulated in the TOC at Evaluation. *The two results hierarchies should be presented as a two column table to show clearly that, although wording and placement may have changed, the results 'goal posts' have not been 'moved'*.		
V. Key Findings Strategic relevance: This section should include an assessment of the project's relevance in relation to UN Environment's mandate and its alignment with UN Environment's policies and strategies at the time of project approval. An assessment of the complementarity of the project with other interventions addressing the needs of the same target groups should be included. Consider the extent to which all four elements have been addressed: Alignment to the UN Environment Medium Term Strategy (MTS) and Programme of Work (POW) Alignment to UN Environment/ Donor/GEF Strategic Priorities Relevance to Regional, Sub-regional and National Environmental Priorities Complementarity with Existing Interventions	Final report: Zero and initial draft reports contained very detailed sections that needed to be summarized alongwith some re-organization	6
B. Quality of Project Design To what extent are the strength and weaknesses of the project design effectively summarized?	Final report: The analysis accurately summarized the quality of design integrating inception report feedback.	6
C. Nature of the External Context For projects where this is appropriate, key external features of the project's implementing context that limited the project's performance (e.g. conflict, natural disaster, political upheaval), and how they affected performance, should be described.	Final report: After some back and forth from the zero and draft report, this section is now comprehensive	6
D. Effectiveness **(i) Outputs and Direct Outcomes:** How well does the report present a well-reasoned, complete and evidence-based assessment of the a) delivery of outputs, and b) achievement of direct outcomes? How convincing is the discussion of attribution and contribution, as well as the constraints to attributing effects to the intervention.	Final report: Zero and earlier subsequent drafts contained a lot of detail that had to be focused around the EOU criteria, along with overall summaries. Now addressed	6

	UN Environment Evaluation Office Comments	Final Report Rating
(ii) Likelihood of Impact: How well does the report present an integrated analysis, guided by the causal pathways represented by the TOC, of all evidence relating to likelihood of impact? How well are change processes explained and the roles of key actors, as well as drivers and assumptions, explicitly discussed?	Final report: Final report now articulates the change processes, drivers and assumptions much better than zero draft	6
6E. Financial Management This section should contain an integrated analysis of all dimensions evaluated under financial management and include a completed 'financial management' table. Consider how well the report addresses the following: *completeness* of financial information, including the actual project costs (total and per activity) and actual co-financing used *communication* between financial and project management staff	Final report: Zero and Draft reports lacked all the requisite financial information, now provided. It had a lot of detail which has now been summarized and better utilized to respond to the financial mgmt. sub criteria	5
F. Efficiency To what extent, and how well, does the report present a well-reasoned, complete and evidence-based assessment of efficiency under the primary categories of cost-effectiveness and timeliness including: Implications of delays and no cost extensions Time-saving measures put in place to maximise results within the secured budget and agreed project timeframe Discussion of making use of/building on pre-existing institutions, agreements and partnerships, data sources, synergies and complementarities with other initiatives, programmes and projects etc. The extent to which the management of the project minimised UN Environment's environmental footprint.	Final report: same as above	6
G. Monitoring and Reporting How well does the report assess: Monitoring design and budgeting (including SMART indicators, resources for MTE/R etc.) Monitoring of project implementation (including use of	Final report: Required back and forth to address criteria and reorganize detail	6

	UN Environment Evaluation Office Comments	Final Report Rating
monitoring data for adaptive management) Project reporting (e.g. PIMS and donor report)		
H. Sustainability How well does the evaluation identify and assess the key conditions or factors that are likely to undermine or contribute to the persistence of achieved direct outcomes including: Socio-political Sustainability Financial Sustainability Institutional Sustainability	Final report: Final report relies well on the EOU ratings criteria matrix. Significant improvement from the earlier drafts.	6
I. Factors Affecting Performance These factors are <u>not</u> discussed in stand-alone sections but are **integrated in criteria A-H as appropriate**. To what extent, and how well, does the evaluation report cover the following cross-cutting themes: Preparation and readiness Quality of project management and supervision[76] Stakeholder participation and co-operation Responsiveness to human rights and gender equity Country ownership and driven-ness Communication and public awareness	The information in the zero and initial drafts has since been re-organized and integrated into the various criteria it affected- along with relevant examples	6
VI. Conclusions and Recommendations **Quality of the conclusions:** The key strategic questions should be clearly and succinctly addressed within the conclusions section. It is expected that the conclusions will highlight the main strengths and weaknesses of the project, and connect them in a compelling story line. Conclusions, as well as lessons and recommendations, should be consistent with the evidence presented in the main body of the report.	Final report: The final report now contains a compelling and reflective conclusion section with lessons learned and recommendations which integrates stakeholder feedback.	6

[76] In some cases 'project management and supervision' will refer to the supervision and guidance provided by UN Environment to implementing partners and national governments while in others, specifically for GEF funded projects, it will refer to the project management performance of the executing agency and the technical backstopping provided by UN Environment.

	UN Environment Evaluation Office Comments	Final Report Rating
ii) Quality and utility of the lessons: Both positive and negative lessons are expected and duplication with recommendations should be avoided. Based on explicit evaluation findings, lessons should be rooted in real project experiences or derived from problems encountered and mistakes made that should be avoided in the future. Lessons must have the potential for wider application and use and should briefly describe the context from which they are derived and those contexts in which they may be useful.	Final report: Compared to zero draft which brainstormed a lot of good ideas, the main lessons and recommendations have been synthesized and prioritized in detail	6
iii) Quality and utility of the recommendations: To what extent are the recommendations proposals for specific action to be taken by identified people/position-holders to resolve concrete problems affecting the project or the sustainability of its results? They should be feasible to implement within the timeframe and resources available (including local capacities) and specific in terms of who would do what and when. Recommendations should represent a measurable performance target in order that the Evaluation Office can monitor and assess compliance with the recommendations.	Final report: as above	6
VII. Report Structure and Presentation Quality		
Structure and completeness of the report: To what extent does the report follow the Evaluation Office guidelines? Are all requested Annexes included and complete?	Final report: The final report demonstrates that the consultants have keenly followed guidelines and completed all annexes which were not in the zero or earlier drafts.	6
Quality of writing and formatting: Consider whether the report is well written (clear English language and grammar) with language that is adequate in quality and tone for an official document? Do visual aids, such as maps and graphs convey key information? Does the report follow Evaluation Office formatting guidelines?	Final report: Compared to the zero and earlier drafts, the draft report now summarize information and goes to the detail a	6

	UN Environment Evaluation Office Comments	Final Report Rating
	bit better. The formatting guidelines have been followed. There are places where the writing style can be made more uniform (As different team members have contributed to the report)	
OVERALL REPORT QUALITY RATING		5.9

At the end of the evaluation, compliance of the evaluation process against the agreed standard procedures is assessed, based on the table below. *All questions with negative compliance must be explained further in the table below.*

Evaluation Process Quality Criteria	**Compliance**	
	Yes	**No**
Independence:		
1. Were the Terms of Reference drafted and finalised by the Evaluation Office?	**y**	
2. Were possible conflicts of interest of proposed Evaluation Consultant(s) appraised and addressed in the final selection?		**n**
3. Was the final selection of the Evaluation Consultant(s) made by the Evaluation Office?	**y**	
4. Was the evaluator contracted directly by the Evaluation Office?	**y**	
5. Was the Evaluation Consultant given direct access to identified external stakeholders in order to adequately present and discuss the findings, as appropriate?	**y**	
6. Did the Evaluation Consultant raise any concerns about being unable to work freely and without interference or undue pressure from project staff or the Evaluation Office?		**n**
7. If Yes to Q6: Were these concerns resolved to the mutual satisfaction of both the Evaluation Consultant and the Evaluation Manager?		
Financial Management:		
8. Was the evaluation budget approved at project design available for the evaluation?	**y**	
9. Was the final evaluation budget agreed and approved by the Evaluation Office?	**y**	
10. Were the agreed evaluation funds readily available to support the payment of the evaluation contract throughout the payment process?	**y**	
Timeliness:		
11. If a Terminal Evaluation: Was the evaluation initiated within the period of six months before or after project operational completion? Or, if a Mid Term Evaluation: Was the evaluation initiated within a six month period prior to the project's mid-point?	**y**	

Evaluation Process Quality Criteria	Compliance	
12. Were all deadlines set in the Terms of Reference respected, as far as unforeseen circumstances allowed?	y	
13. Was the inception report delivered and reviewed/approved prior to commencing any travel?	y	
Project's engagement and support:		
14. Did the project team, Sub-Programme Coordinator and identified project stakeholders provide comments on the evaluation Terms of Reference?	y	
15. Did the project make available all required/requested documents?	y	
16. Did the project make all financial information (and audit reports if applicable) available in a timely manner and to an acceptable level of completeness?	y	
17. Was adequate support provided by the project to the evaluator(s) in planning and conducting evaluation missions?	y	
18. Was close communication between the Evaluation Consultant, Evaluation Office and project team maintained throughout the evaluation?	y	
19. Were evaluation findings, lessons and recommendations adequately discussed with the project team for ownership to be established?		
20. Did the project team, Sub-Programme Coordinator and any identified project stakeholders provide comments on the draft evaluation report?		
Quality assurance:		
21. Were the evaluation Terms of Reference, including the key evaluation questions, peer-reviewed?	y	
22. Was the TOC in the inception report peer-reviewed?	y	
23. Was the quality of the draft/cleared report checked by the Evaluation Manager and Peer Reviewer prior to dissemination to stakeholders for comments?	y	
24. Did the Evaluation Office complete an assessment of the quality of both the draft and final reports?	y	
Transparency:		
25. Was the draft evaluation report sent directly by the Evaluation Consultant to the Evaluation Office?	y	
26. Did the Evaluation Manager disseminate (or authorize dissemination) of the cleared draft report to the project team, Sub-Programme Coordinator and other key internal personnel (including the Reference Group where appropriate) to solicit formal comments?	y	
27. Did the Evaluation Manager disseminate (or authorize dissemination) appropriate drafts of the report to identified external stakeholders, including key partners and funders, to solicit formal comments?	y	
28. Were all stakeholder comments to the draft evaluation report sent directly to the Evaluation Office	y	
29. Did the Evaluation Consultant(s) respond to all factual corrections and comments?	y	
30. Did the Evaluation Office share all comments and Evaluation Consultant responses with all those who were invited to comment?	y	

Provide comments / explanations / mitigating circumstances below for any non-compliant process issues.

Process Criterion Number	**Evaluation Office Comments**

7.9. **Appendix J: Terms of Reference**

Terminal Evaluation of the UN Environment/Global Environment Facility project

"Mitigation Options of Greenhouse Gas (GHG) Emissions in Key Sectors in Brazil"

Section 1: PROJECT BACKGROUND AND OVERVIEW

Project General Information

Table 1. Project summary

Executing Agency:	**Ministry of Science, Technology and Innovation (MCTI)**		
Sub-programme:	Climate Change Mitigation Unit, Energy, Climate, and Technology Branch Economy Division	Expected Accomplishment(s):	Low emission growth: Energy efficiency is improved and the use of renewable energy is increased in partner countries to help reduce greenhouse gas emissions and other pollutants as part of their low emission development pathways;
UN Environment approval date:	April 5, 2013	Programme of Work Output(s):	
GEF project ID:	4254	Project type:	FSP
GEF Operational Programme #:		Focal Area(s):	Climate Change
GEF approval date:	October 16, 2012	GEF Strategic Priority:	Climate Change
Expected start date:		Actual start date:	May 22, 2013
Planned completion date:	30 November 2015	Actual completion date:	30 November 2017
Planned project budget at approval:	$16,172,400	Actual total expenditures reported in IMIS 7 Umoja as of 30 May 2017*:	US$ 4,066,315.56
GEF grant allocation:	$4,180,000	GEF grant expenditures reported as of [30.05.2017]:	US$ 4, 066,315.56[77]
Project Preparation Grant - GEF financing:	Budget- 47,273 Actual-	Project Preparation Grant - co-financing:	Nil

[77] This amount includes both actual and commitments. Actual amount 3,677,128.50 Commitments 389,187.06

Executing Agency:	**Ministry of Science, Technology and Innovation (MCTI)**			
	46,928.06			
Expected Medium-Size Project/Full-Size Project co-financing:	?	Secured Medium-Size Project/Full-Size Project co-financing:	$14,353,164.40[78] (upto June 2016)	
First disbursement:	26 Dec 2013 (1.13 M USD)	Date of financial closure:	30 Nov 2017	
No. of revisions:	3 revisions	Date of last revision:	18 Oct 2016	
No. of Steering Committee meetings:	3	Date of last/next Steering Committee meeting:	Last: Aug 31, 2016	Next: Oct 3, 2017
Mid-term Review/ Evaluation *(planned date):*	Didn't have one	Mid-term Review/ Evaluation (actual date):	Didn't have one	
Terminal Evaluation *(planned date):*	Aug 2017	Terminal Evaluation (actual date):		
Coverage - Country(ies):	Brazil	Coverage - Region(s):	Latin America	
Dates of previous project phases:	n/a	Status of future project phases:	n/a	

Project rationale

Brazil has adopted voluntary emission reduction targets, along with developing/ improving the corresponding institutional and policy framework. Aligned with the Brazilian National Plan and Policy on Climate Change, as well as the Climate Change GEF priority, this project expected to generate indirect global environmental benefits through the reduction of GHG emissions. The project aimed to enhance the Brazilian government' capacity to formulate and implement mitigation actions. The project comprised mainly research studies across various sectors[79],

[78] Source: actual total cumulative column- co finance report mitigation 2015 _jul-2016_ica format_signedMC

Pir (30 jun 2016), Verified by Faith Karuga – June 2017

- Industry= Chemical, cement, textile, paper and cellulose, food and beverage, ceramics, pig iron and steel, ferro-alloys, non-ferrous metals and mining – From Prodoc: Mining- Exclusive oil extraction, natural gas and coal, Non-metals- cement and ceramics, Ferrous and non-ferrous- sectors iron and steel, iron-alloys and non-ferrous metals chemicals, Foods and Beverages, Textiles, Pulp and Paper, Other industries-
- Transportation: Road, rail, waterway and air-road, pipeline (cargo and passenger)
- Households and Services: Buildings, Residential, Services, Commerce and Public Sector
- Service sectors: commerce (?), communications, financial institutions, public administration, rent, other services and SIUP less power generation.

and capacity building at federal and state levels, provided necessary inputs to implementing the NDCs. (Source- project design document-Prodoc and last progress report- PIR) The project reports detailed the emission reduction targets established by the National Policy on Climate Change (Federal Law No. 12,187 of December 29, 2009) and Decree n. 7.390, dated 9 December 2010. Effectively implementing the NAMAs will provide global benefits in terms of reducing GHG emissions. These benefits can be measured by the economic and market potential for mitigation which will be estimated for all emitting sectors in Brazil. The identification of mitigation options and their costs can also lead to more efficient policies, new legislations at federal and state levels. The project aspired to help change Brazil's policies on energy efficiency (and associated GHG emissions) by presenting its research results as policy proposals to appropriate fora for decision-making and policy design concerning climate change. Some of the research focused on previously unexamined topics in Brazil, such as integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation options, cost analysis of innovative mitigation policies and economic impact analysis of mitigation options.

The project design document (Prodoc) and last progress report (PIR) highlight that the project worked with key ministries to lobby for integration of GHG abatement policy proposals into laws, regulations and low carbon development to be budgeted in the respective ministerial budget items to ensure sustainability. It would be interesting to examine whether this has actually occurred across all sectors in which the project produced research studies and built capacity building for.

Linkage with GEF and Non GEF interventions: The project linked up with GEF and Non- GEF projects as relevant. The project provided baseline scenario development, cost abatement projections to the other GEF financed project, Third National Communication, which then updated the GHG emissions baseline to develop scenarios. Both projects are under the same MCTI division and unit- the Secretariat for Research and Development Policies and Programmes Division (SEPED) and General Coordination on Global Climate Change Unit.

As well, the project planned to provide inputs to non- GEF, World Bank-managed Partnership for Market Readiness (PMR), a grant financing fund to pilot market-based instruments for GHG emission reductions in Brazil. These inputs included: national and sectoral projections, identifying mitigation options and assessing national and sectoral abatement potentials.

Project objectives and components

- Land use, land use change and forestry (LULUCF). Agriculture, livestock, forests eg conversion of native forests into production areas – accounts for 80% of total GHG emissions in Brazil (2009)
- Waste Management Sector: Urban waste, effluents and agricultural residues
- Energy: Fossil fuels, natural gas, solar power, hydro power, Oil and gas extraction, production and refining, thermal power, alternative source of energy and biofuel
- Cross-sector mitigation alternatives. CCS and smart grid across above sectors. Carbon capture and CO2 storage report, smart grid technologies

Objective: The Project will support the Government of Brazil in its efforts to reduce GHG emissions and, at the same time, allow the country to grow sustainably. The Project´s objective is to assist the Government of Brazil to strengthen its technical capacity in supporting the implementation of its mitigation actions for greenhouse gas emissions in key economic sectors (industry, energy, transportation, household and services, LULUCF, waste management and other cross-sector alternatives).

Outcomes: To achieve the stated objective, the Project will implement the following three outcomes: (i) Mitigation alternatives identified and their respective potentials and costs quantified for the periods 2012-2035 and 2035-2050; (ii) integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification (MRV) of proposed mitigation alternatives; and (iii) Capacity building for federal, state and 2014 FIFA World Cup host cities government institutions, as well as civil society organizations, for implementation of mitigation actions for GHG emissions in key economic sectors.(from PIR)

Table 2: Summary of Project Outcomes and Outputs

Outcome	Outputs
Outcome 1: Mitigation alternatives identified and their respective potentials and costs quantified for the periods 2012-2035 and 2035-2050;	*Output 1.1:* Assessment of GHG emission reduction potential and estimation of abatement costs for the industrial sector. *Output 1.2:* Assessment of GHG emission reduction potential and estimation of abatement costs for the energy sector Output 1.3: *Assessment of GHG emission reduction potential and estimation of abatement costs for the transport sector* Output 1.4: *Assessment of GHG emission reduction potential and estimation of abatement costs for the household and services sectors* Output 1.5: *Assessment of mitigation alternatives and estimation of abatement costs for land use, land use change and forestry (LULUCF)* Output 1.6: *Assessment of mitigation alternatives and estimation of abatement costs for the Waste Management Sector* Output 1.7: *Assessment of GHG emission reduction potential and estimation of abatement costs for cross-sector mitigation alternatives*
Outcome 2: Integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification	Output 2.1: *Testing MRV and integrated analysis of GHG emission abatement alternatives in an optimization model comprising all energy chains and all GHG emitting sectors analyzed for Brazil* Output 2.2: *Analysis of the impacts of low carbon policies on the Brazilian economy*

(MRV) of proposed mitigation alternatives;	
Outcome 3: Capacity building for federal, state and 2014 FIFA World Cup host cities government institutions, as well as civil society organizations, for implementation of mitigation actions for GHG emissions in key economic sectors	Output 3.1: *Targeted training of federal and state level institutions, as well as 2014 FIFA World Cup host cities and civil society organizations on climate change mitigation actions* *Includes:* Development of training and information materials, Targeted training for technical of federal, state and 2014 FIFA World Cup host cities institutions, Development of workshops for technical personnel

Technical Coordinator and the partner institutions jointly developed Terms of Reference for the studies to deliver Outputs 1.1 to 1.7.

Executing Arrangements

The Project is being implemented by the Division of Technology, Industry and Economics (DTIE), of the United Nations Environment Programme, (UNEP). UNEP, through its Office in Brazil and in coordination with MCTI, Ministry of Science, Technology and Innovation , the national Executing Agency, provided support in the execution of the Project in accordance with the objectives, activities and GEF budget outlined in the project document.

Project Executing Agency: Ministry of Science, Technology and Innovation (MCTI)

MCTI is responsible for the implementation of the Project in accordance with the objectives and activities outlined in Section 4. MCTI works closely with UNEP and provide free access to all relevant information so as to allow the organization to fulfill its responsibilities to the GEF. MCTI responsibilities will include:

- Jointly selecting the staff for the Project Management Unit (PMU) with UNEP;
- Planning for and monitoring the technical aspects of the Project, and monitoring progress
- benchmarks and outputs;
- Actively participating in all relevant project activities where appropriate;
- Adopting, during the course of the Project, the information and results generated by the
- Project to ensure sustainability of the project outcomes;
- Play an active role in coordinating with other stakeholders throughout the Project;
- Preparation and submission of periodic progress reports, and regular consultations with
- beneficiaries and contractors;
- Maintaining a separate project account for the accountability of project funds;
- Ensuring advanced funds are used in accordance with agreed work plans and project budget;
- Preparing, authorizing and adjusting commitments and expenditures; ensuring timely
- disbursements, financial recording and reporting against budgets and work plans;
- Managing and maintaining budgets, including tracking commitments, expenditures and
- planned expenditures against budget and work plan; and,
- Maintaining productive, regular and professional communication with UNEP and other
- project stakeholders to ensure the smooth progress of project implementation.

Project Partner/ day – to day implementation- UNEP Brazil

The Project Management Unit (PMU) in UNEP Brazil is responsible for day-to-day management of the Project. The PMU will consist of appropriate professional and support staff and the staff of this team may be augmented through secondment of national staff to the Project. The PMU is staffed with the following professional and support staff to be funded with GEF resources:

(i) One Project Officer;

(ii) One Project Assistant

Project Steering Committee

10. A Project Steering Committee (PSC) will provide political and strategic guidance for the Project. The PSC will meet at least once a year and will be responsible for overseeing and approving annual work plans, budgets, and other strategic decisions. It will also provide technical guidance, analyze draft terms of reference, supervise and validate the outputs to be delivered. Membership of the PSC will include UNEP, MCTI and other key institutions that have a strategic or practical interest in the Project, e.g. INPE, Ministry of Environment, Ministry of Finance, Ministry of Mines and Energy, Ministry of Development, Industry and External Commerce, Ministry of Transport, Ministry of Agriculture and Livestock. Separate committees or working groups have been created by the executing agency to give advice on specific scientific and technical issues to the Project Steering Committee.

Implementation Issues

According to the last project implementation report (PIR ended June 30, 2016) and discussions with the project team, the main issue this project faced was payment delays to consultants and partners due to transition from IMIS to UMOJA system (2015) e.g. Modeling activities recommended by the TCC were delayed because of the temporary suspension of project activities caused by the delay in processing payments – from PIR: “the project, however, has been facing serious problems related to processing amendments, new contracts as well as payments of several products stipulated under agreements with partner institutions and individual consultancy contracts. The project officer and UNEP´s administrative officer have been in close contact with UNEP offices in Panama and Nairobi in order to carry out project operations, but most of the procedures are still not clear and the transition to the UMOJA system is causing severe delays in payments and other administrative processes. Consequently, the work plan execution is delayed, relations with partner institutions (foundations) are undermined”

Another issue mentioned in the same PIR was that Ministry of Science, Technology and Innovation (MCTI) the executing agency, has faced structural changes due to the present political context.

Project Cost and Financing

This was Full-sized GEF project with USD 4,180,000 from the GEF and USD 11,890,004 from co-financing by the Government of 11,890,004 and co financing of USD 102,400 in kind from UNEP. (source: Prodoc)Co financing reports are also provided for review.

Budget at Project Design - GEF and Co-Financing					**CO-FINANCING**	
	PY1	**PY2**	**PY3**	**Total GEF**		
Budget Source	**GEF**	**GEF**	**GEF**	**GEF**	**Government (cash/in-kind)**	**UNEP (in-kind)**
Project Outcome 1: Mitigation alternatives identified and their respective potentials and costs quantified for the periods 2012-2035 and 2035-2050;	1,084,321	585,411	0	1,699,732	4,380,922	0
Total Outcome 1	**1,084,321**	**585,411**	**0**	**1,699,732**	**4,380,922**	***0***
Project Outcome 2: Integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification (MRV) of proposed mitigation alternatives	0	405,255	822,510	1,227,765	4,380,922	0
Total Outcome 2	**0**	**405,255**	**822,510**	**1,227,765**	***4,380,922***	***0***
Project Outcome 3: Capacity building for federal, state and 2014 FIFA World Cup host cities government institutions, as well as civil society organizations, for implementation of mitigation actions for GHG emissions in key economic sectors					2,047,160	0
Total Outcome 3	**285,858**	**305,834**	**310,810**	**902,503**	**2,047,160**	***0***

Budget at Project Design - GEF and Co-Financing					**CO-FINANCING**	
Project Management	115,000	130,000	135,000	380,000	1,081,000	102,400
Total Project Management	**115,000**	**130,000**	**135,000**	**380,000**	**1,081,000**	**102,400**
PROJECT TOTAL	**1,485,179**	**1,426,500**	**1,268,320**	**4,180,000**	**11,890,004**	**102,400**

Section 2. OBJECTIVE AND SCOPE OF THE EVALUATION

Key Evaluation principles

Evaluation findings and judgments should be based on sound evidence and analysis, clearly documented in the evaluation report. Information will be triangulated (i.e. verified from different sources) as far as possible, and when verification is not possible, the single source will be mentioned (whilst anonymity is still protected). Analysis leading to evaluative judgments should always be clearly spelled out.

The "Why?" Question. As this is a terminal evaluation and a follow-up project is likely [or similar interventions are envisaged for the future], particular attention should be given to learning from the experience. Therefore, the "Why?" question should be at the front of the consultants' minds all through the evaluation exercise and is supported by the use of a theory of change approach. This means that the consultants need to go beyond the assessment of "what" the project performance was, and make a serious effort to provide a deeper understanding of "why" the performance was as it was. This should provide the basis for the lessons that can be drawn from the project.

Baselines and counterfactuals. In attempting to attribute any outcomes and impacts to the project intervention, the evaluators should consider the difference between what has happened with, and what would have happened without, the project. This implies that there should be consideration of the baseline conditions, trends and counterfactuals in relation to the intended project outcomes and impacts. It also means that there should be plausible evidence to attribute such outcomes and impacts to the actions of the project. Sometimes, adequate information on baseline conditions, trends or counterfactuals is lacking. In such cases this should be clearly highlighted by the evaluators, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgments about project performance.

Communicating evaluation results. A key aim of the evaluation is to encourage reflection and learning by UN Environment staff and key project stakeholders. The consultant should consider how reflection and learning can be promoted, both through the evaluation process and in the communication of evaluation findings and key lessons. Clear and concise writing is required on all evaluation deliverables. Draft and final versions of the main evaluation report will be shared with key stakeholders by the Evaluation Office. There may, however, be several intended

audiences, each with different interests and needs regarding the report. The Evaluation Manager will plan with the consultant(s) which audiences to target and the easiest and clearest way to communicate the key evaluation findings and lessons to them. This may include some or all of the following; a webinar, conference calls with relevant stakeholders, the preparation of an evaluation brief or interactive presentation.

Objective of the Evaluation

In line with the UN Environment Evaluation Policy80 and the UN Environment Programme Manual81, the Terminal Evaluation (TE) is undertaken at completion of the project to assess project performance (in terms of relevance, effectiveness and efficiency), and determine outcomes and impacts (actual and potential) stemming from the project, including their sustainability. The evaluation has two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote operational improvement, learning and knowledge sharing through results and lessons learned among UN Environment and other project partners. Therefore, the evaluation will identify lessons of operational relevance for future project formulation and implementation.

Key Strategic Questions

In addition to the evaluation criteria outlined in Section 10 below, the evaluation will address the strategic questions listed below. These are questions of interest to UN Environment and to which the project is believed to be able to make a substantive contribution:

- How were the project reports disseminated? For example, how did ministry/ parliamentary committees take forward policy proposals- which sectors / why/ why not? Potential for scale up/ sustainability?

- To what extent has project built individual and institutional capacity to support implementation of mitigation actions (Brazilian NAMAs aimed at reducing GHG emissions from 36.1 to 38.9 % by 2020 at local level)?

- What is the GHG mitigation policy change process in Brazil? Who are the key stakeholders, including civil society, to take forward project outputs/ outcomes at the state and federal levels respectively?

- How did the project identify and work with the relevant stakeholders to catalyse use of project outputs and outcomes in the GHG mitigation policy change process in Brazil?

[80] http://www.unep.org/eou/StandardsPolicyandPractices/UNEPEvaluationPolicy/tabid/3050/language/en-US/Default.aspx

[81] http://www.unep.org/QAS/Documents/UNEP_Programme_Manual_May_2013.pdf . *This manual is under revision.*

- How has inter-ministerial collaboration supported sustainability and likelihood of impact of this project? (explore sharing information, capacity and any other issues)

Evaluation Criteria

All evaluation criteria will be rated on a six-point scale. Sections A-I below, outline the scope of the criteria and a link to a table for recording the ratings is provided in Annex 1). A weightings table will be provided in excel format (link provided in Annex 1) to support the determination of an overall project rating. The set of evaluation criteria are grouped in nine categories: (A) Strategic Relevance; (B) Quality of Project Design; (C) Nature of External Context; (D) Effectiveness, which comprises assessments of the achievement of outputs, achievement of outcomes and likelihood of impact; (E) Financial Management; (F) Efficiency; (G) Monitoring and Reporting; (H) Sustainability; and (I) Factors Affecting Project Performance. The evaluation consultants can propose other evaluation criteria as deemed appropriate.

A. Strategic Relevance

22. The evaluation will assess, in line with the OECD/DAC definition of relevance, 'the extent to which the activity is suited to the priorities and policies of the target group, recipient and donor'. The evaluation will include an assessment of the project's relevance in relation to UN Environment's mandate and its alignment with UN Environment's policies and strategies at the time of project approval. Under strategic relevance an assessment of the complementarity of the project with other interventions addressing the needs of the same target groups will be made. This criterion comprises four elements:

Alignment to the UN Environment Medium Term Strategy82 (MTS) and Programme of Work (POW)

23. The evaluation should assess the project's alignment with the MTS and POW under which the project was approved and include reflections on the scale and scope of any contributions made to the planned results reflected in the relevant MTS and POW.

Alignment to UN Environment /GEF/Donor Strategic Priorities

24. Donor, including GEF, strategic priorities will vary across interventions. UN Environment strategic priorities include the Bali Strategic Plan for Technology Support and Capacity Building83 (BSP) and South-South Cooperation (S-SC). The BSP relates to the capacity of governments to: comply with international agreements and obligations at the national level; promote, facilitate and finance environmentally sound technologies and to strengthen frameworks for developing coherent international environmental policies. S-SC is regarded as the exchange of resources, technology and knowledge between developing countries. GEF priorities are specified in published programming priorities and focal area strategies.

[82] UN Environment's Medium Term Strategy (MTS) is a document that guides UN Environment's programme planning over a four-year period. It identifies UN Environment's thematic priorities, known as Sub-programmes (SP), and sets out the desired outcomes, known as Expected Accomplishments (EAs), of the Sub-programmes.

[83] http://www.unep.org/GC/GC23/documents/GC23-6-add-1.pdf

Relevance to Regional, Sub-regional and National Environmental Priorities

25. The evaluation will assess the extent to which the intervention is suited, or responding to, the stated environmental concerns and needs of the countries, sub-regions or regions where it is being implemented. Examples may include: national or sub-national development plans, poverty reduction strategies or Nationally Appropriate Mitigation Action (NAMA) plans or regional agreements etc.

Complementarity with Existing Interventions

26. An assessment will be made of how well the project, either at design stage or during the project mobilization, took account of ongoing and planned initiatives (under the same sub-programme, other UN Environment sub-programmes, or being implemented by other agencies) that address similar needs of the same target groups . The evaluation will consider if the project team, in collaboration with Regional Offices and Sub-Programme Coordinators, made efforts to ensure their own intervention was complementary to other interventions, optimized any synergies and avoided duplication of effort. Examples may include UNDAFs or One UN programming. Linkages with other interventions should be described and instances where UN Environment's comparative advantage has been particularly well applied should be highlighted.

27. Factors affecting this criterion may include: stakeholders' participation and cooperation; responsiveness to human rights and gender equity and country ownership and driven-ness.

Quality of Project Design

28. The quality of project design is assessed using an agreed template during the evaluation inception phase, ratings are attributed to identified criteria and an overall Project Design Quality rating is established. This overall Project Design Quality rating is entered in the final evaluation ratings table as item B. In the Main Evaluation Report a summary of the project's strengths and weaknesses at design stage is included.

29. Factors affecting this criterion may include (at the design stage): stakeholders participation and cooperation and responsiveness to human rights and gender equity, including the extent to which relevant actions are adequately budgeted for.

C. Nature of External Context

30. At evaluation inception stage a rating is established for the project's external operating context (considering the prevalence of conflict, natural disasters and political upheaval). This rating is entered in the final evaluation ratings table as item C. Where a project has been rated as facing either an Unfavourable or Highly Unfavourable external operating context, the overall rating for Effectiveness may be increased at the discretion of the Evaluation Consultant and Evaluation Manager together. A justification for such an increase must be given.

D. Effectiveness

31. The evaluation will assess effectiveness across three dimensions: achievement of outputs, achievement of direct outcomes and likelihood of impact.

i. Achievement of Outputs

32. The evaluation will assess the project's success in producing the programmed outputs (products and services delivered by the project itself) and achieving milestones as per the project design document (ProDoc). Any formal modifications/revisions made during project implementation will be considered part of the project design. Where the project outputs are inappropriately or inaccurately stated in the ProDoc, a table should, for transparency, be provided showing the original formulation and the amended version. The achievement of outputs will be assessed in terms of both quantity and quality, and the assessment will consider their usefulness and the timeliness of their delivery. The evaluation will briefly explain the reasons behind the success or shortcomings of the project in delivering its programmed outputs and meeting expected quality standards.

33. Factors affecting this criterion may include: preparation and readiness and quality of project management and supervision84.

ii. Achievement of Direct Outcomes

34. The achievement of direct outcomes is assessed as performance against the direct outcomes as defined in the reconstructed85 Theory of Change (TOC). These are the first-level outcomes expected to be achieved as an immediate result of project outputs. As in 1, above, a table can be used where substantive amendments to the formulation of direct outcomes as necessary. The evaluation should report evidence of attribution between UN Environment's intervention and the direct outcomes. In cases of normative work or where several actors are collaborating to achieve common outcomes, evidence of the nature and magnitude of UN Environment's contribution should be included.

35. Factors affecting this criterion may include: quality of project management and supervision; stakeholders' participation and cooperation; responsiveness to human rights and gender equity and communication and public awareness.

iii. Likelihood of Impact

[84] In some cases 'project management and supervision' will refer to the supervision and guidance provided by UN Environment to implementing partners and national governments while in others, specifically for GEF funded projects, it will refer to the project management performance of the executing agency and the technical backstopping provided by UN Environment.

[85] UN Environment staff are currently required to submit a Theory of Change with all submitted project designs. The level of 'reconstruction' needed during an evaluation will depend on the quality of this initial TOC, the time that has lapsed between project design and implementation (which may be related to securing and disbursing funds) and the level of any changes made to the project design. In the case of projects pre-dating 2013 the intervention logic is often represented in a logical framework and a TOC will need to be constructed in the inception stage of the evaluation.

36. Based on the articulation of longer term effects in the reconstructed TOC (i.e. from direct outcomes, via intermediate states, to impact), the evaluation will assess the likelihood of the intended, positive impacts becoming a reality. Project objectives or goals should be incorporated in the TOC, possibly as intermediate states or long term impacts. The Evaluation Office's approach to the use of TOC in project evaluations is outlined in a guidance note available on the EOU website, web.unep.org/evaluation and is supported by an excel-based flow chart called, Likelihood of Impact Assessment (see Annex 1). Essentially the approach follows a 'likelihood tree' from direct outcomes to impacts, taking account of whether the assumptions and drivers identified in the reconstructed TOC held. Any unintended positive effects should also be identified and their causal linkages to the intended impact described.

37. The evaluation will also consider the likelihood that the intervention may lead, or contribute to, unintended negative effects. Some of these potential negative effects may have been identified in the project design as risks or as part of the analysis of Environmental, Social and Economic Safeguards.86

38. The evaluation will consider the extent to which the project has played a catalytic role or has promoted scaling up and/or replication87 as part of its Theory of Change and as factors that are likely to contribute to longer term impact. Ultimately UN Environment and all its partners aim to bring about benefits to the environment and human well-being. Few projects are likely to have impact statements that reflect such long-term or broad-based changes. However, the evaluation will assess the likelihood of the project to make a substantive contribution to the high level changes represented by UN Environment's Expected Accomplishments, the Sustainable Development Goals88 and/or the high level results prioritised by the funding partner.

39. Factors affecting this criterion may include: quality of project management and supervision, including adaptive project management; stakeholders' participation and cooperation; responsiveness to human rights and gender equity; country ownership and driven-ness and communication and public awareness.

E. Financial Management

40. Financial management will be assessed under three broad themes: completeness of financial information, communication between financial and project management staff and compliance with relevant UN financial management standards and procedures. The evaluation will establish the actual spend across the life of the project of funds secured from all donors. This expenditure will be reported, where possible, at output level and will be compared with the approved budget. The evaluation will assess the level of communication between the Task Manager and the Fund Management Officer as it relates to the effective delivery of the planned

[86] Further information on Environmental, Social and Economic Safeguards (ESES) can be found at http://www.unep.org/about/eses/

[87] *Scaling up* refers to approaches being adopted on a much larger scale, but in a very similar context. Scaling up is often the longer term objective of pilot initiatives. *Replication* refers to approaches being repeated or lessons being explicitly applied in new/different contexts e.g. other geographic areas, different target group etc. Effective replication typically requires some form of revision or adaptation to the new context. It is possible to replicate at either the same or a different scale.

[88] A list of relevant SDGs is available on the EO website www.unep.org/evaluation

project and the needs of a responsive, adaptive management approach. The evaluation will verify the application of proper financial management standards and adherence to UN Environment's financial management policies. Any financial management issues that have affected the timely delivery of the project or the quality of its performance will be highlighted.

41. Factors affecting this criterion may include: preparation and readiness and quality of project management and supervision.

F. Efficiency

42. In keeping with the OECD/DAC definition of efficiency, the evaluation will assess the cost-effectiveness and timeliness of project execution. Focusing on the translation of inputs into outputs, cost-effectiveness is the extent to which an intervention has achieved, or is expected to achieve, its results at the lowest possible cost. Timeliness refers to whether planned activities were delivered according to expected timeframes as well as whether events were sequenced efficiently. The evaluation will also assess to what extent any project extension could have been avoided through stronger project management and identify any negative impacts caused by project delays or extensions. The evaluation will describe any cost or time-saving measures put in place to maximize results within the secured budget and agreed project timeframe and consider whether the project was implemented in the most efficient way compared to alternative interventions or approaches.

43. The evaluation will give special attention to efforts by the project teams to make use of/build upon pre-existing institutions, agreements and partnerships, data sources, synergies and complementarities with other initiatives, programs and projects etc. to increase project efficiency. The evaluation will also consider the extent to which the management of the project minimized UN Environment's environmental footprint.

44. Factors affecting this criterion may include: preparation and readiness (e.ge. timeliness); quality of project management and supervision and stakeholders participation and cooperation.

G. Monitoring and Reporting

45. The evaluation will assess monitoring and reporting across three sub-categories: monitoring design and budgeting, monitoring of project implementation and project reporting.

Monitoring Design and Budgeting

46. Each project should be supported by a sound monitoring plan that is designed to track progress against SMART[89] indicators towards the achievement of the projects outputs and direct outcomes, including at a level disaggregated by gender or groups with low representation. The evaluation will assess the quality of the design of the monitoring plan as well as the funds allocated for its implementation. The adequacy of resources for mid-term and terminal evaluation/review should be discussed if applicable.

[89] SMART refers to indicators that are specific, measurable, assignable, realistic and time-specific.

Monitoring of Project Implementation

47. The evaluation will assess whether the monitoring system was operational and facilitated the timely tracking of results and progress towards projects objectives throughout the project implementation period. It will also consider how information generated by the monitoring system during project implementation was used to adapt and improve project execution, achievement of outcomes and ensure sustainability. The evaluation should confirm that funds allocated for monitoring were used to support this activity.

Project Reporting

48. UN Environment has a centralised Project Information Management System (PIMS) in which project managers upload six-monthly status reports against agreed project milestones. This information will be provided to the Evaluation Consultant(s) by the Evaluation Manager. Projects funded by GEF have specific evaluation requirements with regard to verifying documentation and reporting (i.e. the Project Implementation Reviews, Tracking Tool and CEO Endorsement template90), which will be made available by the Task Manager. The evaluation will assess the extent to which both UN Environment and donor reporting commitments have been fulfilled.

49. Factors affecting this criterion may include: quality of project management and supervision and responsiveness to human rights and gender equity (e.g. disaggregated indicators and data).

H. Sustainability

50. Sustainability is understood as the probability of direct outcomes being maintained and developed after the close of the intervention. The evaluation will identify and assess the key conditions or factors that are likely to undermine or contribute to the persistence of achieved direct outcomes. Some factors of sustainability may be embedded in the project design and implementation approaches while others may be contextual circumstances or conditions that evolve over the life of the intervention. Where applicable an assessment of bio-physical factors that may affect the sustainability of direct outcomes may also be included. The evaluation should also assess whether lessons learnt were shared with other Lusophone countries to promote replication.

According to the project document, he Project's sustainability was to be based upon: (i) institutional and sectoral sustainability; in other words, the continuing ability of stakeholders and project participants to fulfill their role in the project and support the long-term development of the project; (ii) the strong existing legal and regulatory framework regarding climate change mitigation to support future initiatives and ensure the continuing involvement and support of public institutes and organizations.

[90] The Evaluation Consultant(s) should verify that the annual Project Implementation Reviews have been submitted, that the Tracking Tool is being kept up-to-date and that in the CEO Endorsement template Table A and Section E have been completed.

i. Socio-political Sustainability

51. The evaluation will assess the extent to which social or political factors support the continuation and further development of project direct outcomes. It will consider the level of ownership, interest and commitment among government and other stakeholders to take the project achievements forwards. In particular the evaluation will consider whether individual capacity development efforts are likely to be sustained.

ii. Financial Sustainability

52. Some direct outcomes, once achieved, do not require further financial inputs, e.g. the adoption of a revised policy. However, in order to derive a benefit from this outcome further management action may still be needed e.g. to undertake actions to enforce the policy. Other direct outcomes may be dependent on a continuous flow of action that needs to be resourced for them to be maintained, e.g. continuation of a new resource management approach. The evaluation will assess the extent to which project outcomes are dependent on future funding for the benefits they bring to be sustained. Secured future funding is only relevant to financial sustainability where the direct outcomes of a project have been extended into a future project phase. The question still remains as to whether the future project outcomes will be financially sustainable. The evaluation should ask whether there are budget line items in Government planning and budgetary documents related to the work the project implemented.

iii. Institutional Sustainability

53. The evaluation will assess the extent to which the sustainability of project outcomes is dependent on issues relating to institutional frameworks and governance. It will consider whether institutional achievements such as governance structures and processes, policies, sub-regional agreements, legal and accountability frameworks etc. are robust enough to continue delivering the benefits associated with the project outcomes after project closure.

54. Factors affecting this criterion may include: stakeholders participation and cooperation- such as the application of project outputs by the inter-ministerial committees and the Brazilian Forum for Climate Change, responsiveness to human rights and gender equity (e.g. where interventions are not inclusive, their sustainability may be undermined); communication and public awareness and country ownership and driven-ness.

I. Factors and Processes Affecting Project Performance

55. These factors are rated in the ratings table, but are discussed as cross-cutting themes as appropriate under the other evaluation criteria, above.

Preparation and Readiness

56. This criterion focuses on the inception or mobilisation stage of the project. The evaluation will assess whether appropriate measures were taken to either address weaknesses in the project design or respond to changes that took place between project approval, the securing of funds and project mobilisation. In particular the evaluation will consider the nature and quality of engagement with stakeholder groups by the project team, the confirmation of partner

capacity and development of partnership agreements as well as initial staffing and financing arrangements. (Project preparation is covered in the template for the assessment of Project Design Quality).

i. Quality of Project Implementation and Execution

57. Specifically for GEF funded projects, this factor refers separately to the performance of the executing agency and the technical backstopping and supervision provided by UN Environment, as the implementing agency.

58. The evaluation will assess the effectiveness of project management with regard to: providing leadership towards achieving the planned outcomes; managing team structures; maintaining productive partner relationships (including Steering Groups etc.); communication and collaboration with UN Environment colleagues; risk management; use of problem-solving; project adaptation and overall project execution. Evidence of adaptive project management should be highlighted.

ii. Stakeholder Participation and Cooperation

59. Here the term 'stakeholder' should be considered in a broad sense, encompassing all project partners, duty bearers with a role in delivering project outputs and target users of project outputs and any other collaborating agents external to UN Environment. The assessment will consider the quality and effectiveness of all forms of communication and consultation with stakeholders throughout the project life and the support given to maximise collaboration and coherence between various stakeholders, including sharing plans, pooling resources and exchanging learning and expertise. The inclusion and participation of all differentiated groups, including gender groups, should be considered.

iii. Responsiveness to Human Rights and Gender Equity

60. The evaluation will ascertain to what extent the project has applied the UN Common Understanding on the human rights based approach (HRBA) and the UN Declaration on the Rights of Indigenous People. Within this human rights context the evaluation will assess to what extent the intervention adheres to UN Environment's Policy and Strategy for Gender Equality and the Environment.

61. The report should present the extent to which the intervention, following an adequate gender analysis at design stage, has implemented the identified actions and/or applied adaptive management to ensure that Gender Equity and Human Rights are adequately taken into account. In particular, the evaluation will consider to what extent project design (section B), the implementation that underpins effectiveness (section D), and monitoring (section G) have taken into consideration: (i) possible gender inequalities in access to and the control over natural resources; (ii) specific vulnerabilities of women and children to environmental degradation or disasters; (iii) the role of women in mitigating or adapting to environmental changes and engaging in environmental protection and rehabilitation.

iv. Country Ownership and Driven-ness

62. The evaluation will assess the quality and degree of engagement of government / public sector agencies in the project. The evaluation will consider the involvement not only of those directly involved in project execution and those participating in technical or leadership groups, but also those official representatives whose cooperation is needed for change to be embedded in their respective institutions and offices. This factor is concerned with the level of ownership generated by the project over outputs and outcomes and that is necessary for long term impact to be realised. This ownership should adequately represent the needs and interests of all gender and marginalised groups.

v. Communication and Public Awareness

63. The evaluation will assess the effectiveness of: a) communication of learning and experience sharing between project partners and interested groups arising from the project during its life and b) public awareness activities that were undertaken during the implementation of the project to influence attitudes or shape behaviour among wider communities and civil society at large. The evaluation should consider whether existing communication channels and networks were used effectively, including meeting the differentiated needs of gender and marginalised groups, and whether any feedback channels were established. Where knowledge sharing platforms have been established under a project the evaluation will comment on the sustainability of the communication channel under either socio-political, institutional or financial sustainability, as appropriate.

Section 3. EVALUATION APPROACH, METHODS AND DELIVERABLES

64. The Terminal Evaluation will be an in-depth evaluation using a participatory approach whereby key stakeholders are kept informed and consulted throughout the evaluation process. Both quantitative and qualitative evaluation methods will be used as appropriate to determine project achievements against the expected outputs, outcomes and impacts. It is highly recommended that the consultant(s) maintains close communication with the project team and promotes information exchange throughout the evaluation implementation phase in order to increase their (and other stakeholder) ownership of the evaluation findings. Where applicable, the consultant(s) should provide a geo-referenced map that demarcates the area covered by the project and, where possible, provide geo-reference photographs of key intervention sites (e.g. sites of habitat rehabilitation and protection, pollution treatment infrastructure, etc.)

65. The findings of the evaluation will be based on the following:

A) desk review of documents in the annex referring to:

- Relevant background documentation, inter alia for example, UN Environment MTS and PoW documents, laws, regulations and projects related to the Brazilian government's mitigation plan
- Project design documents (including minutes of the project design review meeting at approval); Annual Work Plans and Budgets or equivalent, revisions to the project (Project Document Supplement), the updated logical framework and its budget; Stakeholder Analysis

- Project reports such as six-monthly progress and financial reports, progress reports from collaborating partners, meeting minutes, relevant correspondence and including the Project Implementation Reviews and Tracking Tool etc.;
- Notes from the Steering Group meetings.
- Other project-related material produced by the project staff or partners.
- Relevant material published on the project web-site.
- Documentation related to Project outputs:
- Draft final report of the project
- Evaluations/reviews of similar projects.

B) Interviews (individual or in group) with:

- UN Environment Task Manager (TM);
- Project management team;
- UN Environment Fund Management Officer (FMO);
- Sub-Programme Coordinator;
- Project partners, including Rede Clima
- Relevant resource persons.
- The list of those to be interviewed is in an annex

The inception report will describe if the evaluation will collect data from the desk-based review of documents in Portuguese and English as well as interviews with key stakeholders. Field visits to interview key stakeholders and partners in Brasilia, Sao Paolo and Rio will be required.

Evaluation Deliverables and Review Procedures

The evaluation team will prepare:

Inception Report: (see Annex 1 for links to all templates, tables and guidance notes) containing an assessment of project design quality, a draft reconstructed Theory of Change of the project, project stakeholder analysis, evaluation framework and a tentative evaluation schedule.

Preliminary Findings Note: typically in the form of a powerpoint presentation, the sharing of preliminary findings is intended to support the participation of the project team, act as a means to ensure all information sources have been accessed and provide an opportunity to verify emerging findings. In the case of highly strategic project/portfolio evaluations or evaluations with an Evaluation Reference Group, the preliminary findings may be presented as a word document for review and comment.

Draft and Final Evaluation Report: (see links in Annex 1) containing an executive summary that can act as a stand alone document; detailed analysis of the evaluation findings organised by evaluation criteria and supported with evidence; lessons learned and recommendations and an annotated ratings table.

Evaluation Bulletin: a 2-page summary of key evaluation findings for wider dissemination through the EOU website.

Review of the draft evaluation report. The evaluation team will submit a draft report to the Evaluation Manager and revise the draft in response to their comments and suggestions. Once a draft of adequate quality has been peer-reviewed and accepted, the Evaluation Manager will share the cleared draft report with the Project Manager, who will alert the Evaluation Manager in case the report contains any blatant factual errors. The Evaluation Manager will then forward revised draft report (corrected by the evaluation team where necessary) to other project stakeholders, for their review and comments. Stakeholders may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions as well as providing feedback on the proposed recommendations and lessons. Any comments or responses to draft reports will be sent to the Evaluation Manager for consolidation. The Evaluation Manager will provide all comments to the evaluation team for consideration in preparing the final report, along with guidance on areas of contradiction or issues requiring an institutional response.

Based on a careful review of the evidence collated by the evaluation consultants and the internal consistency of the report, the Evaluation Manager will provide an assessment of the ratings in the final evaluation report. Where there are differences of opinion between the evaluator and the Evaluation Manager on project ratings, both viewpoints will be clearly presented in the final report. The Evaluation Office ratings will be considered the final ratings for the project.

The Evaluation Manager will prepare a quality assessment of the first and final drafts of the main evaluation report, which acts as a tool for providing structured feedback to the evaluation consultants. The quality of the report will be assessed and rated against the criteria specified in template listed in Annex 1 and this assessment will be appended to the Final Evaluation Report.

At the end of the evaluation process, the Evaluation Office will prepare a Recommendations Implementation Plan in the format of a table, to be completed and updated at regular intervals by the Task Manager. The Evaluation Office will track compliance against this plan on a six monthly basis.

The Consultant Team

The evaluation team will consist of a Team Leader and two Supporting Consultants who will work under the overall responsibility of the Evaluation Office, represented by an Evaluation Manager and an Evaluation Assistant. The consultants will also consult with the UN Environment Project/Task Manager, Ruth Cuotto, Fund Management Officer, Leena Darlington, and the Climate Change Mitigtion Portfolio Manager, Geordie Colville of the Climate Change Mitigation Unit, Energy, Climate, and Technology Branch Economy Division. The consultants will liaise with the Evaluation Manager on any procedural and methodological matters related to the evaluation.

Specific Responsibilities for Team Leader:

The Lead is the primary liaison with UN Environment Evaluation manager and deliver top quality final documents which include the inception report, draft report, final report and two page bulletin. The two supporting consultants will provide their inputs into the specific deliverables of each report. (See detailed breakdown of responsibilities in the table below.

Specific Responsibilities for the Supporting Consultants:

Support Consultant 1 : Support 1 has an extensive background in evaluating the impact of climate change policy into impact as well as Portuguese language skills. S/he will be conducting the interviews in person and on the phone as well as supporting the team in the desk review providing a technical perspective on the reports produced, designing the theory of change, interview guides, drafting the inception, final report and two page bulletin.

Support Constant 2 : Support 2 is a Portuguese-speaking consultant based in Brazil with post-graduate training in policy/ environment/ climate change background. S/he will be assisting Support 1 with planning meetings and data collection, transcription and summaries of interviews as well as translations of the executive summary, conclusion and any other parts as necessary.

The consultants will liaise with the Evaluation Manager on any procedural and methodological matters related to the evaluation. It is, however, the consultants' individual responsibility to arrange for their visas and immunizations as well as to plan meetings with stakeholders, organize online surveys, obtain documentary evidence and any other logistical matters related to the assignment. The UN Environment Task Manager and project team will, where possible, provide logistical support (introductions, meetings etc.) allowing the consultants to conduct the evaluation as efficiently and independently as possible.

The three consultants will be hired for 6 months spread over the period July/ September 2017 to January/ February 2018. The team of consultants should have the following skills: an advanced university degree in environmental sciences, international development or other relevant political or social sciences area; a minimum of 10 -15 years of technical / evaluation experience, including of evaluating large national programmes and using a Theory of Change approach; a broad understanding of working with climate change/ GHG mitigation policy/ Energy and Economics; proficiency in Portuguese along with excellent writing skills in English; experience leading evaluations and, where possible, knowledge of the UN system, specifically of the work of UN Environment. Experience in managing partnerships, knowledge management and communication is desirable for all evaluation consultants.

The consultants will be responsible, in close consultation with the Evaluation Office of UN Environment, for overall management of the evaluation and timely delivery of its outputs, described above in Section 11 Evaluation Deliverables, above. They will make substantive and high quality contributions to the evaluation process and outputs. The consultant will ensure that all evaluation criteria and questions are adequately covered.

Details of Evaluation Consultants' Team Roles can be found on the Evaluation Office of UN Environment website: www.unep.org/evaluation.

Division of Labor: Lead, Support 1 and Support 2: What	Who
Overall – Lead=Primary liaison with unep evaluation manager and deliver top quality final documents	Lead
Inception Phase	
- conduct a preliminary desk review and introductory interviews with project staff;	ALL
- draft the reconstructed Theory of Change of the project;	Support 1 with inputs from Lead
- project design review;	Lead: with inputs from rest of team
- stakeholder analysis review;	Support 1: - with inputs from rest of team
- prepare the evaluation framework;	All
- develop the desk review and interview protocols;	Support 1: - with inputs from Lead
- plan the evaluation schedule;	Lead and Support 1 with input from Support 2
- prepare the inception report, including comments received from the Evaluation Office	ALL
- submit draft and final inception report;	Lead with inputs from all Supports
Data collection and analysis phase of the evaluation	
- field mission and desk based interviews to conduct in-depth interviews with key stakeholders of the project and observe project activities;	Support 1: - with inputs from rest of team
- data analysis;	Support 1: - with inputs from Support 2: (esp on reports) and Lead:
- present preliminary findings to solicit first comments from the Project team	Support 1: with inputs from rest of team
Reporting phase	
- prepare zero draft report and share with the Evaluation Office for comments	ALL - esp to critique project reports, Lead: to integrate pieces into cohesive whole report
- liaise with the Evaluation Office on comments received on the draft report and ensure that comments are taken into account during finalization of the main report; and	Lead with inputs from both supports
- prepare a Response to Comments annex for the main report, listing those comments not accepted by the consultant and indicating the reason for their rejection.	Lead: with inputs from rest of team

Division of Labor: Lead, Support 1 and Support 2: What	Who
- Prepare draft two pager –	Lead: with inputs from rest of Supports
- Integrate evaluation office comments into two pager	Lead: with inputs from Supports
Translate evaluation 2 pager, exec summary and conclusion into Portguese for ministry	Support 2
Managing relations of the evaluation team	
maintain a positive relationship with evaluation stakeholders, ensuring that the evaluation process is as participatory as possible but at the same time maintains its independence;	ALL
- communicate in a timely manner with the Evaluation Office on any issues requiring its attention and intervention.	All

Schedule of the evaluation

The table below presents the tentative schedule for the evaluation.

Table 3. Tentative schedule for the evaluation

Milestone	**Deadline**
Inception Report	8 Sept 2017
Evaluation Mission: (Brasilia, Rio& Sao Paolo)	21 Sep- 10 Oct 2017
Telephone and in-person interviews, surveys etc.: 10 working days: Brasilia(most stakeholders are there) 2 working days: Rio 2 working days: Sao Paolo 2 working days: Attending steering committee meeting and project dissemination workshop	Before 21 Sept
Powerpoint/presentation on preliminary findings and recommendations	30 Oct 2017
Draft report to Evaluation Manager (and Peer Reviewer)	30 Nov 2017
Draft Report shared with UN Environment Project Manager and team (after integrating feedback)	21 Dec 2017

Draft Report shared with wider group of stakeholders	First week of January 2018
Final Report	2 weeks after feedback 20 Jan 2018
Final Report shared with all respondents	1-2 weeks after receiving final draft with summary of recommendations 20 Jan 2018

Contractual Arrangements

A team of three Evaluation Consultants will be selected and recruited by the Evaluation Office of UN Environment under an individual Special Service Agreement (SSA) on a "fees only" basis (see below). By signing the service contract with UN Environment/UNON, the consultants certify that they have not been associated with the design and implementation of the project in any way which may jeopardize their independence and impartiality towards project achievements and project partner performance. In addition, they will not have any future interests (within six months after completion of the contract) with the project's executing or implementing units. All consultants are required to sigh the Code of Conduct Agreement Form.

A lump sum fee will be paid on an installment basis, paid on acceptance by the Evaluation Office of expected key deliverables. The schedule of payments is as follows:

Schedule of Payment for the Consultants:

Deliverable	**Percentage Payment**
Approved Inception Report (as per annex document 7)	30%
Approved Draft Main Evaluation Report (as per annex document 13)	30%
Approved Final Main Evaluation Report	40%

Fees only contracts: Air tickets will be purchased by UN Environment and 75% of the Daily Subsistence Allowance for each authorized travel mission will be paid up front. Local in-country travel will only be reimbursed where agreed in advance with the Evaluation Office and on the production of acceptable receipts. Terminal expenses and residual DSA entitlements (25%) will be paid after mission completion.

The consultants may be provided with access to UN Environment's Programme Information Management System (PIMS) and if such access is granted, the consultants agree not to disclose information from that system to third parties beyond information required for, and included in, the evaluation report.

In case the consultants are not able to provide the deliverables in accordance with these guidelines, and in line with the expected quality standards by the UN Environment Evaluation Office, payment may be withheld at the discretion of the Director of the Evaluation Office until the consultants have improved the deliverables to meet UN Environment's quality standards.

If the consultant(s) fail to submit a satisfactory final product to UN Environment in a timely manner, i.e. before the end date of their contract, the Evaluation Office reserves the right to employ additional human

resources to finalize the report, and to reduce the consultants' fees by an amount equal to the additional costs borne by the Evaluation Office to bring the report up to standard.

Annex 1: Tools, Templates and Guidance Notes for use in the Evaluation

The tools, templates and guidance notes listed in the table below, and available on the Evaluation Office website (www.unep.org/evaluation), are intended to help Evaluation Managers and Evaluation Consultants to produce evaluation products that are consistent with each other and which can be compiled into a biennial Evaluation Synthesis Report. The biennial summary is used to provide an overview of progress to UN Environment and the UN Environmental Assembly. This suite of documents is also intended to make the evaluation process as transparent as possible so that all those involved in the process can participate on an informed basis. It is recognised that the evaluation needs of projects and portfolio vary and adjustments may be necessary so that the purpose of the evaluation process (broadly, accountability and lesson learning), can be met. Such adjustments should be decided between the Evaluation Manager and the Evaluation Consultant in order to produce evaluation reports that are both useful to project implementers and that produce credible findings.

Document	Name	URL link
1	Evaluation Process Guidelines for Consultants	Link
2	Evaluation Consultants Team Roles *(Team Leader and Supporting Consultant)*	Link
3	Evaluation Ratings Table	Link
4	Weighting of Ratings (excel)	Link
5	Evaluation Criteria *(summary of descriptions, as in these terms of reference)*	Link
6	Matrix Describing Ratings by Criteria	*(under development – search 'Working With Us' on website)*
7	Structure and Contents of the Inception Report	Link
8	Template for the Assessment of the Quality of Project Design	Link
9	Guidance on Stakeholder Analysis	Link
10	Use of Theory of Change in Project Evaluations	Link
11	Assessment of the Likelihood of Impact Decision Tree (Excel)	Link
12	Possible Evaluation Questions	Link

13	Structure and Contents of the Main Evaluation Report	Link
14	Cover Page, Prelims and Style Sheet for Main Evaluation Report	*(under development – search 'Working With Us' on website)*
15	Financial Tables	Link
16	Template for the Assessment of the Quality of the Evaluation Report	Link

Annex 2 : Evaluation Ratings Table

The review will provide individual ratings for the evaluation criteria described in the table below.

Most criteria will be rated on a six-point scale as follows: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU). Sustainability and Likelihood of Impact are rated from Highly Likely (HL) down to Highly Unlikely (HU) and Nature of External Context is rated from Highly Favourable (HF) to Highly Unfavourable (HU).

In the conclusions section of the review report, ratings will be presented together in a table, with a brief justification for each rating, cross-referenced to findings in the main body of the report.

Criterion (section ratings A-I are formed by aggregating the ratings of their respective sub-categories, unless otherwise marked)	Summary Assessment	Rating
A. Strategic Relevance		HS → HU
1. Alignment to MTS and POW		HS → HU
2. Alignment to UN Environment /GEF/Donor strategic priorities		HS → HU
3. Relevance to regional, sub-regional and national environmental priorities		HS → HU
4. Complementarity with existing interventions		HS → HU
B. Quality of Project Design		HS → HU
C. Nature of External Context		HF → HU
D. Effectiveness[91]		HS → HU
1. Achievement of outputs		HS → HU
2. Achievement of direct outcomes		HS → HU
3. Likelihood of impact		HL→ HU
E. Financial Management		HS → HU
1.Completeness of project financial information		HS → HU
2.Communication between finance and project management staff		HS → HU
3.Compliance with UN Environment standards and procedures		HS → HU
F. Efficiency		HS → HU
G. Monitoring and Reporting		HS → HU
1. Monitoring design and budgeting		HS → HU
2. Monitoring of project implementation		HS → HU

[91] Where a project is rated, through the assessment of Project Design Quality template during the evaluation inception stage, as facing either an Unfavourable or Highly Unfavourable external operating context, the overall rating for Effectiveness may be increased at the discretion of the Evaluation Consultant and Evaluation Manager together.

Criterion (section ratings A-I are formed by aggregating the ratings of their respective sub-categories, unless otherwise marked)	Summary Assessment	Rating
3.Project reporting		
H. Sustainability (the overall rating for Sustainability will be the lowest rating among the three sub-categories)		HL → HU
1. Socio-political sustainability		HL → HU
2. Financial sustainability		HL → HU
3. Institutional sustainability		HL → HU
I. Factors Affecting Performance[92]		HS → HU
1. Preparation and readiness		HS → HU
2. Quality of project management and supervision[93]		HS → HU
3. Stakeholders participation and cooperation		HS → HU
4. Responsiveness to human rights and gender equity		HS → HU
5. Country ownership and driven-ness		HS → HU
6. Communication and public awareness		HS → HU
Overall project rating		HS → HU

[92] While ratings are required for each of these factors individually, they should be discussed within the Main Evaluation Report as cross-cutting issues as they relate to other criteria. Note that catalytic role, replication and scaling up are expected to be discussed under effectiveness if they are a relevant part of the TOC.

[93] In some cases 'project management and supervision' will refer to the supervision and guidance provided by UN Environment to implementing partners and national governments while in others, specifically for GEF funded projects, it will refer to the project management performance of the executing agency and the technical backstopping provided by UN Environment, as the implementing agency.

Annex 3 : Guidance on the Structure and Contents of the Inception Report

Section	Notes	Data Sources	Recommended no. pages
1. Introduction (Note that the previous abbreviation of UNEP should now be written as UN Environment)	Summarise: Purpose and scope of the review (eg learning/accountability and the project boundaries the evaluation covers) Project problem statement and justification for the intervention. Institutional context of the project (MTS, POW, Division, umbrella etc) Target audience for the review findings.	TOR and ProDoc	1
2. Project outputs and outcomes	Confirm the formulation of planned project outputs and expected outcomes. The project should be assessed against its intended results, but these may need to be rephrased, re-aligned etc. Where the articulation of the project's results framework, including outputs, outcomes, long term impacts and objectives/goals, needs to be revised, a table should be provided showing the original version and the revisions proposed for use in the review.	ProDoc, Revision documents, consultation with TM/PM	1 /2
3. Review of project design	Complete the template for assessment of Project Design Quality, including ratings, and present as an annex (template available) Summarise the project design strengths and weaknesses within the body of the inception report.	Project document and revisions, MTE/MTR if any	1 page narrative and completed assessment of PDQ template
4. Stakeholder analysis[94]	Identify key stakeholder groups and provide an analysis of the levels of influence and interest each stakeholder group has over the	Project document Project	1

[94] Evaluation Office of UN Environment identifies stakeholders broadly as all those who are affected by, or who could affect (positively or negatively) the project's results. At a disaggregated level key groups should be identified, such as: implementing partners; government officials and duty bearers (eg national focal points, coordinators); civil society leaders (e.g. associations and networks) and beneficiaries (eg households, tradespeople, disadvantaged groups, members of civil society etc). UN Environment recognizes the nine major groups as defined in Agenda 21: Business and Industries, Children & Youth, Farmers, Indigenous People and their Communities, Local Authorities, NGO's, the Scientific & Technological Community, Women, Workers and Trade Unions.

	project outcomes. Give due attention to gender and under-represented/marginalised groups. (guidance note available)	preparation phase. TM/PM	
5. Theory of Change	Revise or reconstruct the Theory of Change based on project documentation. Present the TOC as a one-page diagram, where possible, and explain it with a narrative, including a discussion of the assumptions and drivers (guidance note and samples available) Identify any key literature/seminal texts that establish cause and effect relationships for this kind of intervention at higher results levels (eg benefits of introducing unleaded fuel)	Project document narrative, logical framework and budget tables. Other project related documents.	Diagram and up to 2 pages of narrative
6. Review methods	Describe all review methods (especially how sites/countries will be selected for field visits or case studies; how any surveys will be administered; how findings will be analysed etc) Summarise date sources/groups of respondents and method of data collection to be used with each (e.g skype, survey, site visit etc) Create a review framework that includes detailed review questions linked to data sources. Include any new questions raised by review of Project Design Quality and TOC analysis. Present this as a table/matrix in the annex (samples available) Design draft data collection tools and present in the annex (eg interview schedules, questionnaires etc)	Review of all project documents.	1 page narrative. The evaluation framework as a matrix and draft data collection tools as annexes.
7. Team roles and responsibilities	Describe the roles and responsibilities among the review team, where appropriate		½
8. Evaluation schedule	Provide a revised timeline for the overall review (dates of travel and key review milestones) Tentative programme for site/country visits	Discussion with TM/PM on logistics	½ (table)
9. Learning, communication and outreach	Describe the approach and methods that will be used to promote reflection and learning through the review process (eg opportunities	Discussions with the TM/PM and EM	½

	for feedback to stakeholders; translation needs etc)		
TOTAL NARRATIVE PAGES			8-12 pages, plus annexes
Annexes	A - Review Framework B - Draft data collection tools C - Completed assessment of the Project Design Quality D - List of documents and individuals to be consulted during the main evaluation phase E - List of individuals and documents consulted for the inception report		

Annex 4 : Guidance on the Structure and Contents of the Main Review Report

NOTE: Review consultants are kindly advised to refer the reader to paragraphs in different parts of the report instead of repeating material.

Preliminaries (Note that the previous abbreviation of UNEP should now be written as UN Environment)	*Title page* – Name and number of the reviewed project, type of review (mid-term or terminal), month/year review report completed, UN Environment logo. Include an appropriate cover page image. *Contents page* – including chapters, tables and annexes *Abbreviations table* – only use abbreviations for an item that occurs more than 5 times within the report. Introduce each abbreviation on first use and ensure it is in the table. Where an abbreviation has not been used recently in the text, provide its full version again. The Executive Summary should be written with no abbreviations. *Acknowledgements* – This is a maximum of two paragraphs. At the end of acknowledgements name the Project Manager and Fund Management Officer. *Short biography of the consultant(s)* – giving relevant detail of experience and qualifications that make the consultant a suitable candidate for having undertaken the work. (Max 1 paragraph) *Header/footer* – Name of reviewed project, type of review and month/year review report completed. Page numbers, header and footer do not appear on the title page
Project Identification Table	An updated version of the Project Identification Table.
Executive Summary (Kindly avoid all abbreviations in the Executive Summary)	The summary should be able to stand alone as an accurate summary of the main review product. It should include a concise overview of the review object; clear summary of the review objectives and scope; overall evaluation rating of the project and key features of performance (strengths and weaknesses) against exceptional criteria (plus reference to where the evaluation ratings table can be found within the report); summary of the main findings of the exercise, including a synthesis of main conclusions (which include a summary response to key strategic evaluation questions),and selected lessons learned and recommendations. (Max 4 pages)
I. Introduction	A brief introduction, identifying institutional context of the project (sub-programme, Division, regions/countries where implemented) and coverage of the review; date of Proposal Review Committee approval and project document signature); results frameworks to which it contributes (eg Expected Accomplishment in POW); project duration and start/end dates; number of project phases completed and anticipated (where appropriate); implementing partners; total secured budget and whether the project has been reviewed/evaluated in the past (eg mid-term, part of a synthesis evaluation, evaluated by another agency etc) Concise statement of the purpose of the review and the key intended audience for the findings. (Max 1 page)
II. Review Methods	This section is the foundation for the review's credibility, which underpins the validity of all its findings.

	The section should include a description of how the Theory of Change at Review was designed (who was involved etc) and applied to the context of the project. The data collection section should include: a description of review methods and information sources used, including the number and type of respondents; justification for methods used (eg qualitative/quantitative; electronic/face-to-face); any selection criteria used to identify respondents, case studies or sites/countries visited; strategies used to increase stakeholder engagement and consultation; details of how data were verified (eg triangulation, review by stakeholders etc). The methods used to analyse data (eg. scoring; coding; thematic analysis etc) should be described. It should also address limitations to the review such as: inadequate review budget to complete the TOR; low or imbalanced response rates across different groups; extent to which findings can be either generalised to wider review questions or constraints on aggregation/disaggregation; any potential or apparent biases; language barriers and ways they were overcome. Ethics and human rights issues should be highlighted including: how anonymity and confidentiality were protected and strategies used to include the views of marginalised or potentially disadvantaged groups and/or divergent views. (Max 3 pages)
III. The Project	
A. Context	Overview of the main issue that the project is trying to address, its root causes and consequences on the environment and human well-being (ie synopsis of the problem and situational analyses). Include any socio-economic, political, institutional or environmental contextual details relevant to the project's stated intentions. Can include a map of the intervention locations. The section should identify any specific external challenges faced by the project (eg conflict, natural disaster, political upheaval etc). (1 page)
B. Objectives and components	Summary of the project's results hierarchy as stated in the ProDoc (or as officially revised). A brief description of how the project structure delivers against the project's results framework (eg stated purpose of components; role of management components). (1 page)
C. Stakeholders[95]	Description of groups of targeted stakeholders organised according to relevant common characteristics such as: interest/influence; roles/responsibilities or contributions/benefits etc. Key change agents should be identified and due attention given to gender and under-represented/marginalised groups. (½ page)
D. Project implementation	A description of the implementation structure with diagram (implementing and executing agencies) and a list of key project partners, including their role in

[95] Evaluation Office of UN Environment identifies stakeholders broadly as all those who are affected by, or who could affect (positively or negatively) the project's results. At a disaggregated level key groups should be identified, such as: implementing partners; government officials and duty bearers (eg national focal points, coordinators); civil society leaders (e.g. associations and networks) and beneficiaries (eg households, tradespeople, disadvantaged groups, members of civil society etc). UN Environment recognizes the nine major groups as defined in Agenda 21: Business and Industries, Children & Youth, Farmers, Indigenous People and their Communities, Local Authorities, NGO's, the Scientific & Technological Community, Women, Workers and Trade Unions.

structure and partners	project delivery and performance (½ page narrative + table/diagram)
E. Changes in design during implementation	Any key events that affected the project's scope or parameters should be described in brief in chronological order, including: costed/no-cost extensions; formal revisions to the project's results; additional funding and when it was secured etc. (½ page)
F. Project financing	Completed tables of: (a) budget at design and expenditure by components (b) planned and actual sources of funding/co-financing should be provided.  Financial Tables
IV. Theory of Change	
Reconstructed Theory of Change of the project	A summary of the project's results hierarchy should be presented for: a) the results as stated in the approved/revised Prodoc logframe/TOC and b) as formulated in the *TOC at Review*[96]. This can be presented as a two column table. The TOC at Review should be presented clearly in both diagrammatic and narrative forms. Clear articulation of each major causal pathway (starting from outputs to long term impact), including explanations of all drivers and assumptions as well as the expected roles of key actors. The insights gained by preparing the TOC at Review should be identified (e.g. gaps or disconnects in the project's logic that were identified; added value or UN Environment comparative advantages that were highlighted; lessons in project design that became apparent etc) (3 pages + diagram)
IV. Review Findings	
Refer to the TOR for descriptions of the nature and scope of each criterion	This chapter is organized according to the evaluation criteria presented in the TORs and reflected in the evaluation ratings table. The Review Findings section provides a summative analysis of all triangulated data relevant to the parameters of the criteria. Review findings should be objective, relate to the review objectives/questions, be easily identifiable and clearly stated and supported by sufficient evidence. This is the main substantive section of the report and incorporates indicative evidence[97] as appropriate. "Factors Affecting Performance" should be discussed as appropriate in each of the evaluation criteria as cross-cutting issues (see section IV. I below). Ratings are provided at the end of the assessment of each evaluation criterion and the complete ratings table is included under the conclusions section (V. A) below.
A. Strategic Relevance	Integrated analysis of all dimensions evaluated under Strategic Relevance.
B. Quality of Project Design	Brief summary of the strength and weaknesses of the project design.

[96] During the Inception Phase of the review process a *TOC at Design* is created based on the information contained in the approved project documents (these may include either logical framework or a TOC or narrative descriptions). During the review process this TOC is revised based on changes made during project intervention and becomes the *TOC at Review*.

[97] This may include brief quotations, anecdotal experiences, project events or descriptive statistics from surveys etc. The anonymity of all respondents should be protected.

C. Nature of the External Context	Brief summary of any key external features of the project's implementing context that may have been reasonably expected to limit the project's performance (eg conflict, natural disaster, political upheaval)
D. Effectiveness: i. Achievement of outputs ii. Achievement of direct outcomes iii. Likelihood of impact	Integrated analysis, guided by the causal pathway represented by the TOC at Review, of all evidence relating to the delivery of results. Change processes explained and the roles of key actors, as well as drivers and assumptions, should be explicitly discussed.
E. Financial Management	Integrated analysis of all dimensions evaluated under financial management: *completeness* of financial information, including the actual project costs (total and per activity) and actual co-financing used; *communication* between financial and project management staff and *compliance* with relevant UN financial management standards and procedures. The completed 'financial management' table should be included in this section.
F. Efficiency	This section should contain a well-reasoned, complete and evidence-based assessment of efficiency under the primary categories of cost-effectiveness and timeliness including: Implications of delays and no cost extensions Time-saving measures put in place to maximise results within the secured budget and agreed project timeframe Discussion of making use of/building on pre-existing institutions, agreements and partnerships, data sources, synergies and complementarities with other initiatives, programmes and projects etc. The extent to which the management of the project minimised UN Environment's environmental footprint.
G. Monitoring and Reporting	Integrated analysis of all dimensions evaluated under Monitoring and Reporting, including: Monitoring design and budgeting (including SMART indicators, resources for Mid Term Evaluation/Review, plans for collection of disaggregated data etc.) Monitoring implementation (including use of monitoring data for adaptive management) Project reporting (e.g. PIMS and donor report; gender disaggregated data)
H. Sustainability	Discussion of the key conditions or factors that are likely to undermine or contribute to the persistence of achieved <u>direct outcomes</u> are identified and discussion, including: Socio-political Sustainability Financial Sustainability Institutional Sustainability (including issues of partnerships)
I. Factors Affecting	These factors are not discussed in stand-alone sections but are integrated in

Performance	criteria A-H as appropriate. A rating is given for each of these factors in the Evaluation Ratings Table.
V. Conclusions and Recommendations	
A. Conclusions	This section should summarize the main conclusions of the review following a logical sequence from cause to effect. The conclusions should highlight the main strengths and weaknesses of the project, preferably starting with the positive achievements and a short explanation of how these were achieved, and then moving to the less successful aspects of the project and explanations as to why they occurred. Answers to the key strategic evaluation questions should be provided. All conclusions should be supported with evidence that has been presented in the evaluation report and can be cross-referenced to the main text using paragraph numbering. The conclusions section should end with the overall assessment of the project, followed by the ratings table. The conclusions section should not be a repeat of the Executive Summary, but focuses on the main findings in a compelling story line that provides both evidence and explanations of the project's results and impact. (Max 2 pages)
B. Lessons Learned	Lessons learned should be anchored in the conclusions of the review, with cross-referencing to appropriate paragraphs in the evaluation report where possible. Lessons learned are rooted in real project experiences, i.e. based on good practices and successes which could be replicated in similar contexts. Alternatively they can be derived from problems encountered and mistakes made which should be avoided in the future. Lessons learned must have the potential for wider application and use and should briefly describe the context from which they are derived and those contexts in which they may be useful. Specific lessons on how human rights and gender equity issues have been successfully integrated into project delivery and/or how they could have could have been taken into consideration, should be highlighted.
C. Recommendations	As for the lessons learned, all recommendations should be anchored in the conclusions of the report, with paragraph cross-referencing where possible. Recommendations are proposals for specific actions to be taken by identified people/position-holders to resolve concrete problems affecting the project or the sustainability of its results. They should be feasible to implement within the timeframe and resources available (including local capacities), specific in terms of who would do what and when, and set a measurable performance target in order that the project team/Head of Branch/Unit can monitor and assess compliance with the recommendations. It is suggested that a SMART[98] recommendation is stated first and is followed by a summary of the finding which supports it. In some cases, it might be useful to propose options, and briefly analyse the pros and cons of each option. Specific recommendations on actions that could be taken within the available time and resources to ensure the delivery of results relevant to human rights and gender equity should be highlighted.

[98] SMART refers to indicators that are: Specific, Measurable, Achievable, Results-oriented and Time-bound

Annexes (The Project Design Qualify assessment is not needed in the final evaluation report as it is annexed in the inception report)	These may include additional material deemed relevant by the Reviewer(s) but must include: 1. Response to stakeholder comments received but not (fully) accepted by the reviewers, where appropriate. 2. Review TORs (without annexes). 3. Review itinerary, containing the names of locations visited and the names (or functions) and of people met/interviewed. (A list of names and contact details of all respondents should be given to the Project Manager for dissemination of the report to stakeholders, but contact details should not appear in the report, which may be publicly disclosed on the UN Environment Evaluation Office website). 4.Summary of co-finance information and a statement of project expenditure by activity 5. Review Bulletin: A short (2-page) and simple presentation of review findings and lessons to support the dissemination of learning to a wide range of audiences. 6. Any other communication and outreach tools used to disseminate results (e.g. power point presentations, charts, graphs, videos, case studies, etc.) 7. List of documents consulted 8. Brief CVs of the consultants 9. Quality Assessment of the Review Report will be added by the Project Manager as the final annex.

Annex 4 : List of Stakeholders to be Interviewed

Industry

- Ministry of Development, Industry, Commerce

Gustavo.Silva@mdic.gov.br

Demetrio.filho@mdic.gov.br

- National Confederation of Industry

marcos.cantarino@cni.org.br

- thyssenkrupp

ingrid.pinho@thyssenkrupp.com'

- Cement Union

gonzalo@snic.org.br

Energy

- Ministry of Mines and Energy

luis@mme.gov.br

- Company of Energy Planning

ricardo.gorini@epe.gov.br

- Petrobras

Angela Martins@petrobras.com.br

- Brazilian Association of Coal

zancan@carvaomineral.com.br

fernando.zancan@satc.edu.br

- Brazilian Association of Biofuel

diretoria@ubrabio.com.br

Transportation

- Ministry of Transportation

cibele.franca@transportes.com.br

- Brazilian Fórum of Climate Change

rzkvamos@gmail.com

- Transportation Engineering Program of the University of Rio de Janeiro

skr@pet.coppe.ufrj.br

- Brazilian Company of Planning and Logistics

juan.mikan@epl.gov.br

Services and Household

- Ministry of Cities

fernando.araldi@cidades.gov.br

- Construction Company

mdpereira@construcap.com.br

LULUCF

- Ministry of Agriculture

katia.marzall@agricultura.gov.br

- Ministry of Treasury

edson.toledo.neto@fazenda.gov.br

- Insitute of Economic Research

gustavo.luedemann@ipea.gov.br

- Centro Vida

paula.bernasconi@icv.org.br

- IPAM – Institute of Research of the Amazon

tiago.reis@ipam.org.br

- Instituto Brasileiro de árvores

fabio.marques@plantarcarbon.com.br

Waste

- Ministry of Cities

fernando.araldi@cidades.gov.br

- Ministry of Environment

josana.lima@mma.gov.br

Transversal

-

- Brazilian Forum of Climate Change

natalieunterstell@gmail.com

afsirkis@gmail.com

- WWF

Andre.nahur@wwf.org.br

- Ministry of Foreign Affairs

felipe.ferreira@itamaray.gov.br

- Climate Observatory

carlosrittl@observatoriodoclima.eco.br

- Instituto Clima e Sociedade

branca.americano@gmail.com

Executing Agency

Marcio Rojas Da Cruz mrojas@mctic.gov.br

Ricardo Vieira Araújo ricardo.araujo@mctic.gov.br

Antonio Marcos Mendonca antonio.mendonca@mctic.gov.br

People to be contacted for comments on draft report : Executing agency (above) Ruth Coutto, Leena Darlington and Faith Karugoa (FMO) Steering committtee members: Francine Varouf, Ruth Coutto, MCTIC and the agency of Brazilian cooperation (tania.jardim@abc.gov.br and alessandra.ambrosio@abc.gov.br)

Annex 5 : Project Reports

Outcome 1: Mitigation alternatives identified and their respective potentials and costs quantified for the periods 2012-2035 and 2035-2050	Completion date
Output 1.1: Assessment of GHG emission reduction potential and estimation of abatement costs for the industrial sector.	
Sector description and definition of the "Best Available Technology" (BAT)	October 2014
Definition of a baseline for energy consumption and GHG emissions from the industrial sector	February 2015
Identifying industrial sector's discount rate	July 2015
Economic assessment	July 2015
Innovation analysis	October 2015
Identification of policy instruments to promote GHG abatement in the industrial sector	December 2015
Output 1.2: Assessment of GHG emission reduction potential and estimation of abatement costs for the energy sector	
Sector description and definition of the "Best Available Technology" (BAT)	August 2014
Definition of a baseline for energy consumption and GHG emissions from the energy sector	December 2014
Identifying energy sector's discount rate	April 2015
Economic assessment	April 2015
Innovation analysis	October 2015
Identification of policy instruments to promote GHG abatement in the energy sector	December 2015
Output 1.3: *Assessment of GHG emission reduction potential and estimation of abatement costs for the transport sector*	
Sector description and definition of the "Best Available Technology" (BAT)	August 2014
Definition of a baseline for energy consumption and GHG emissions from the transport sector	December 2014
Economic assessment	April 2015

Innovation analysis	October 2015
Identification of policy instruments to promote GHG abatement in the transport sector	December 2015
Output 1.4: *Assessment of GHG emission reduction potential and estimation of abatement costs for the household and services sectors*	
Sector description and definition of the "Best Available Technology" (BAT)	August 2014
Definition of a baseline for energy consumption and GHG emissions	December 2014
Identifying service sector's discount rate	April 2015
Economic assessment	April 2015
Innovation analysis	October 2015
Identification of policy instruments to promote GHG abatement in the services sector	December 2015
Output 1.5: *Assessment of mitigation alternatives and estimation of abatement costs for land use, land use change and forestry (LULUCF)*	
Description of methodologies for estimating GHG emissions from LULUCF	October 2014
Analysis of land use for food and energy purposes	February 2015
Definition of a baseline for GHG emissions from LULUCF	March 2015
Identification of mitigation potential and evaluation of mitigation alternatives feasibility in LULUCF in Brazil	October 2015
Identification of policy instruments to promote GHG abatement in LULUCF	December 2015
Output 1.6: *Assessment of mitigation alternatives and estimation of abatement costs for the Waste Management Sector*	
Definition of BAT	August 2014
Definition of a baseline for the waste management sector	December 2014
Identifying energy sector's discount rate	May 2015
Economic assessment	May 2015
Innovation analysis	October 2015
Identification of policy instruments to promote GHG abatement	December 2015
Output 1.7: *Assessment of GHG emission reduction potential and estimation of abatement costs for cross-sector mitigation alternatives*	

Carbon Capture and Storage (CCS) CO2 pipelines and hubs	August 2014
Smart grids	December 2014
Learning curves modeling and estimation	April 2015
Revision and estimate of potential and costs of cuts for measures	October 2015
Identification of policy instruments to promote GHG abatement in cross-sector mitigation options	December 2015
Outcome 2: Integrated analysis of the different mitigation alternatives in an integrated optimization framework, considering the non-additivity of the different mitigation alternatives and other economic considerations; and an evaluation of the possible impacts of different climate policies on the Brazilian economy; testing domestic measurement, reporting and verification (MRV) of proposed mitigation alternatives	Completion date
Output 2.1: *Testing MRV and integrated analysis of GHG emission abatement alternatives in an optimization model comprising all energy chains and all GHG emitting sectors analyzed for Brazil*	
Model development and description	March 2015
Consistency analysis of the MESSAGE optimization model	July 2015
MESSAGE preparation and structuring for insertion of low carbon activities	August 2015
Integrated scenarios for greenhouse gas emissions up to 2050 – Round 1 (Baseline and Low Carbon Scenarios)	December 2015
Survey of the state of the art systems and activities of MRV on GHG emissions in the international scope	January 2016
Survey of the state of the art of Brazil on activities of MRV on GHG emissions	February 2016
Survey of potential sources of funds for MRV activities	March 2016
Verification of the congruence area between the systems of registration and/or GHG emissions monitoring currently existing in Brazil	March 2016
Proposal for possible MRV system in the light of Nationally Determined Contribution (NDC) of Brazil	April 2016
Simulation of the MSB8000 as a National Energy Plan 2050 Demand Scenario	August 2016
Technical, economic and environmental feasibility study of Bio-CCS pilot project for the use of CO2 from the distillery of the Center-South of Brazil	August 2016
Assessment of mitigation options and estimation of abatement costs for transport sector – Sensitivity Scenario I	September 2016
Identification, revision and analysis of critical variables for sensitivity analysis in the integrated modeling of low carbon scenarios	November 2016
Preparation for the analysis of environmental co-benefits of integrated low carbon scenarios	November 2016
Sensitivity analysis to critical variables of the energy system	November

	2016
Co-benefits of concentrated solar plants	November 2016
Assessment of mitigation options and estimation of abatement costs for transport sector and waste management sectors – Sensitivity Scenario II	November 2016
Assessment of mitigation options and estimation of abatement costs for agriculture, forestry and other land uses (Afolu) - Sensitivity Scenario I	November 2016
Assessment of mitigation options and estimation of abatement costs for agriculture, forestry and other land uses (Afolu) - Sensitivity Scenario II	February 2017
Environmental co-benefits analysis of low carbon strategies	February 2017
Major barriers and public policies for the implementation of low carbon integrated scenarios	February 2017
Final report on integrated low carbon scenarios of the energy system	February 2017
Output 2.2: *Analysis of the impacts of low carbon policies on the Brazilian economy*	
Development and description of the model	August 2014
Projections with macroeconomic and sector aggregated variables	August 2014
Revision of macroeconomic and sector scenario	November 2015
Second revision of macroeconomic and sector scenario – Scenario FIPE I	September 2015
Impacts of integrated scenarios of low-carbon on the Brazilian economy – Round 1 of the Scenario FIPE I	September 2015
Projection of consumption of households by income classes and regions of Brazil	September 2015
Projection of jobs by economic sectors	September 2015
Projections with macroeconomic and sector aggregated variables considering National Energy Plan	November 2015
Impacts of integrated scenarios of low-carbon on the Brazilian economy – Round 2 of the Scenario FIPE I	November 2015
Impacts of integrated scenarios of low-carbon on the Brazilian economy – Round 3 of the Scenario FIPE I	September 2016
Impacts of integrated scenarios of low-carbon on the Brazilian economy – Round 1 of the Scenario FIPE III	September 2016
Third revision of macroeconomic and sector scenario – Scenario FIPE III	September 2016
Impacts of integrated scenarios of low-carbon on the Brazilian economy – Round 2 of the Scenario FIPE III	November 2016

Adjustment of the EFES model to carry out sector sensitivity analyzes on the low carbon scenarios	November 2016
Impacts in terms of GDP, employment and income resulting from analyzes of sectoral sensitivities	November 2016
Impacts on GDP, employment and income, resulting from the proposal of public policy instruments for the implementation of low carbon sectoral scenarios	February 2017
Final report of the impacts of integrated scenarios of low-carbon on the Brazilian economy	February 2017
Outcome 3: Capacity building for federal, state and 2014 FIFA World Cup host cities government institutions, as well as civil society organizations, for implementation of mitigation actions for GHG emissions in key economic sectors	Completion date
Output 3.1: *Targeted training of federal and state level institutions, as well as 2014 FIFA World Cup host cities and civil society organizations on climate change mitigation actions*	
Development of training and information materials	
Low carbon technologies applicable to industry sector	February 2015
Low carbon technologies applicable to energy sector	February 2015
Low carbon technologies applicable to transport sector	February 2015
Low carbon technologies applicable to household and service sectors	February 2015
Low carbon technologies applicable to waste management sector	February 2015
Modeling of Low Carbon Economy	February 2015
Construction of low-carbon scenarios for the industrial sector	April 2015
Construction of low-carbon scenarios for the energy sector	April 2015
Construction of low-carbon scenarios for the transport sector	April 2015
Construction of low-carbon scenarios for the household and service sectors	April 2015
Construction of low-carbon scenarios for the waste management sector	April 2015
Integrating energy and economic modelling (CGE models)	April 2015
Integrating energy and economic modelling (MESSAGE model)	April 2015
Construction of low-carbon scenarios for the AFOLU sector	July 2015
Low carbon technologies applicable to industry sector – FIESP workshop	July 2015
Low carbon technologies applicable to energy sector – FIESP workshop	July 2015
Modeling of GHG emissions abatement costs and technological learning curves for the industry sector	September 2015
Modeling of GHG emissions abatement costs and technological learning curves for the energy sector	September 2015

Modeling of GHG emissions abatement costs and technological learning curves for the transport sector	September 2015
Modeling of GHG emissions abatement costs and technological learning curves for the household and service sectors	September 2015
Modeling of GHG emissions abatement costs and technological learning curves for the AFOLU sector	September 2015
Modeling of GHG emissions abatement costs and technological learning curves for the waste management sector	September 2015
Construction of economic and energy integrated scenarios (CGE models)	September 2015
Construction of economic and energy integrated scenarios (MESSAGE model)	September 2015
Proposal of public policies for the transition to a low carbon economy for the industry sector	March 2016
Proposal of public policies for the transition to a low carbon economy for the energy sector	March 2016
Proposal of public policies for the transition to a low carbon economy for the transport sector	March 2016
Proposal of public policies for the transition to a low carbon economy for the household and service sectors	March 2016
Proposal of public policies for the transition to a low carbon economy for the AFOLU sector	March 2016
Proposal of public policies for the transition to a low carbon economy for the waste management sector	March 2016
GHG emission reduction options for the AFOLU sector in the Midwest region	April 2016
GHG emission reduction options for the energy sector in the Midwest region	April 2016
GHG emission reduction options for the transport sector in the Midwest region	April 2016
GHG emission reduction options for the energy sector in the Southeast region	May 2016
GHG emission reduction options for the industry sector in the Southeast region	May 2016
GHG emission reduction options for the household and service sectors in the Southeast region	May 2016
GHG emission reduction options for the transport sector in the Southeast region	May 2016
Potentials and GHG emission mitigation costs for the industry sector	May 2016
Potentials and GHG emission mitigation costs for the energy sector	May 2016
Potentials and GHG emission mitigation costs for the transport sector	May 2016
Potentials and GHG emission mitigation costs for the household and service sectors	May 2016
Potentials and GHG emission mitigation costs for the AFOLU sector	May 2016
Potentials and GHG emission mitigation costs for the waste management sector	May 2016
Impacts and opportunities for a low carbon economy – CGE Economic Modeling	May 2016
Impacts and opportunities for a low carbon economy – MESSAGE Energy System Modeling	May 2016
GHG emission reduction options for the energy sector in the South region	June 2016
GHG emission reduction options for the industry sector in the South region	June 2016

GHG emission reduction options for the AFOLU sector in the South region	June 2016
GHG emission reduction options for the transport sector in the South region	June 2016
GHG emission reduction options for the energy sector in the Northeast region	October 2016
GHG emission reduction options for the transport sector in the Northeast region	October 2016
GHG emission reduction options for the AFOLU sector in the North region	November 2016
GHG emission reduction options for the energy sector in the North region	November 2016
GHG emission reduction options for the transport sector in the North region	November 2016
Contribution of MCTIC to the elaboration of the strategy of implementation of the Nationally Determined Contribution of Brazil to the Paris Agreement	January 2017
Mitigation paths and instruments of public policies to reach the Brazilian targets in the Paris Agreement	June 2017
Targeted training for technical of federal, state and 2014 FIFA World Cup host cities institutions	
Low carbon technologies applicable to industry sector	March 2015
Low carbon technologies applicable to energy sector	March 2015
Low carbon technologies applicable to transport sector	March 2015
Low carbon technologies applicable to household and service sectors	March 2015
Low carbon technologies applicable to waste management sector	March 2015
Modeling of Low Carbon Economy	March 2015
Construction of low-carbon scenarios for the industrial sector	May 2015
Construction of low-carbon scenarios for the energy sector	May 2015
Construction of low-carbon scenarios for the transport sector	May 2015
Construction of low-carbon scenarios for the household and service sectors	May 2015
GHG emission reduction options for the energy sector in the South region	June 2016
Integrating energy and economic modelling (CGE models)	May 2015
Integrating energy and economic modelling (MESSAGE model)	May 2015
Construction of low-carbon scenarios for the AFOLU sector	August 2015
Innovative low carbon technologies for the industrial sector	August 2015
Modeling of GHG emissions abatement costs and technological learning curves for the industry sector	October 2015
Modeling of GHG emissions abatement costs and technological learning curves for the energy sector	October 2015
Modeling of GHG emissions abatement costs and technological learning curves for the transport	October

sector	2015
Modeling of GHG emissions abatement costs and technological learning curves for the household and service sectors	October 2015
Modeling of GHG emissions abatement costs and technological learning curves for the AFOLU sector	October 2015
Modeling of GHG emissions abatement costs and technological learning curves for the waste management sector	October 2015
Construction of economic and energy integrated scenarios (CGE models)	October 2015
Construction of economic and energy integrated scenarios (MESSAGE model)	October 2015
Proposal of public policies for the transition to a low carbon economy for the industry sector	April 2016
Proposal of public policies for the transition to a low carbon economy for the energy sector	April 2016
Proposal of public policies for the transition to a low carbon economy for the transport sector	April 2016
Proposal of public policies for the transition to a low carbon economy for the household and service sectors	April 2016
Proposal of public policies for the transition to a low carbon economy for the AFOLU sector	April 2016
Proposal of public policies for the transition to a low carbon economy for the waste management sector	April 2016
GHG emission reduction options for the AFOLU sector in the Midwest region	May 2016
GHG emission reduction options for the energy sector in the Midwest region	May 2016
GHG emission reduction options for the transport sector in the Midwest region	May 2016
GHG emission reduction options for the energy sector in the Southeast region – São Paulo	May 2016
GHG emission reduction options for the industry sector in the Southeast region – São Paulo	May 2016
GHG emission reduction options for the household and service sectors in the Southeast region – São Paulo	May 2016
GHG emission reduction options for the transport sector in the Southeast region – São Paulo	May 2016
GHG emission reduction options for the energy sector in the Southeast region – Rio de Janeiro	May 2016
GHG emission reduction options for the industry sector in the Southeast region – Rio de Janeiro	May 2016
GHG emission reduction options for the household and service sectors in the Southeast region – Rio de Janeiro	May 2016
GHG emission reduction options for the transport sector in the Southeast region – Rio de Janeiro	May 2016
Potentials and GHG emission mitigation costs for the industry sector	June 2016
Potentials and GHG emission mitigation costs for the energy sector	June 2016
Potentials and GHG emission mitigation costs for the transport sector	June 2016
Potentials and GHG emission mitigation costs for the household and service sectors	June 2016
Potentials and GHG emission mitigation costs for the AFOLU sector	June 2016
Potentials and GHG emission mitigation costs for the waste management sector	June 2016

Impacts and opportunities for a low carbon economy – CGE Economic Modeling	June 2016
Impacts and opportunities for a low carbon economy – MESSAGE Energy System Modeling	June 2016
GHG emission reduction options for the energy sector in the South region	June 2016
GHG emission reduction options for the industry sector in the South region	June 2016
GHG emission reduction options for the AFOLU sector in the South region	June 2016
GHG emission reduction options for the transport sector in the South region	June 2016
GHG emission reduction options for the energy sector in the Northeast region	October 2016
GHG emission reduction options for the transport sector in the Northeast region	October 2016
GHG emission reduction options for the AFOLU sector in the North region	November 2016
GHG emission reduction options for the energy sector in the North region	November 2016
GHG emission reduction options for the transport sector in the North region	November 2016
Development of workshops for technical personnel	
Low carbon technologies applicable to industry sector – FIESP workshop	July 2015
Low carbon technologies applicable to energy sector – FIESP workshop	July 2015