Terminal Evaluation of the
UNDP-GEF Project "Market Transformation for Energy Efficiency in Buildings"

(Project BRA/09/G31; PIMS 3665; GEF ID 2941)

Terminal Evaluation Report
(final)

Prepared for:
UNDP CO Brasilia
Brazil

05 September 2018

Remi Rijs

Project Key Data

PROJECT AND TERMINAL EVALUATION DATA	
GEF Project ID	2941
Project Name	Market Transformation for Energy Efficiency in Buildings
Country	Brazil
Implementing Agency / Agencies	UNDP and IDB
Focal Area	Climate Change
GEF Strategy / Operational Program	GEF-4 CC-SP1 (EE Buildings)
Date of Work Program approval	June 2007
Date of CEO Endorsement	29 July 2009
Date of project start / effectiveness	March 2010
Date of project completion (activities)	31 December 2017
Name of Evaluator	Remi Rijs
Date of Terminal Evaluation completion	05 September 2018 (final report submission)

PROJECT FINANCIAL DATA – PROJECT PREPARATION PDF/PPG GRANTS (IN US$)		
Particulars	**At approval**	**At PDF/PPG completion**
GEF PDF/PPG grants for project preparation	250,000	250,000
Co-financing for project preparation	75,000	75,000

PROJECT FINANCIAL DATA – GEF PROJECT FUNDING (IN US$)		
Particulars	**At CEO Endorsement**	**At Project completion**
GEF project grant	13,500,000	13,500,000 *)
Co-financing	122,774,000	39,600,000
Total	**136,274,000**	**43,100,000**

*) An estimated USD 8.5-9M of the USD 10M GEF funds put into the EEGM have not been disbursed.

Executive Summary

This report describes the findings of the Terminal Evaluation of the project "Market Transformation for Energy Efficiency in Buildings" (BRA/09/G31, GEF ID 2941)) as carried out under Contract No. BRA10-35961 for the UNDP Country Office in Brasilia, Brazil. The Implementing Partner was the Ministry of Environment of the Federal Government of Brazil (MMA). The Project aimed to promote synergies between the UNFCCC and the Montreal Protocol to replace existing CFC-based chillers and promote EE investments in public and private buildings. After a Substantive Revision in 2015, the chiller components were transferred to a separate Project (BRA/12/G77) which did not involve GEF funding. The GEF grant for BRA/09/G31 was USD 13.5M with estimated co-financing of USD 122.7M.

An innovative element was the introduction of the Energy Efficiency Guarantee Mechanism (EEGM), enabling Energy Service Companies (ESCOs) to implement and finance EE projects. The expected environmental benefits included electricity consumption savings in commercial and public buildings with an associated direct reduction of global greenhouse gas (GHG) emissions. The budget of the UNDP Project BRA/09/G31 amounted to USD 3,305,000 and consisted of Technical Assistance (TA) activities, while the EEGM (USD 10,195,000) was administered directly by IDB. After a restructuring of the Bank in 2016, operational management of the EEGM was done by IDB Invest. The Project duration was 7 years.

The Project design was overly optimistic. Notwithstanding, the Project satisfactorily implemented three outcomes: (1) capacity building; (2) public building programme; (3) chiller demonstration. The EEGM (4) was successfully put into operation but did not generate significant market demand. After taking stock of the situation (May 2018), IDB Invest indicated not to continue the EEGM. As of 31 December 2017, BRA/09/G31 had spent approx. 92% of GEF resources (USD 3.05M) while the EEGM had consumed little more than 10% of the budget (USD 1M). As such, about 68% of the total GEF resources remain unused.

The Project triggered investment in EE and RE technologies in buildings worth USD 28.4M, energy savings of 441,443 MWh and direct GHG emission reductions of the order of 260 kton CO2. The results fall short of the target but are nevertheless significant. Cost-effectiveness is 11.3 USD/tCO2 based on the GEF funds actually spent; or USD 34 USD/tCO2 if referred to the total GEF budget. The EEGM leveraged about USD 17.5M at a cost of slightly more than USD 1M. This is 2-3 times better than typical cofinancing ratios for GEF CCM. Six building projects received support from the EEGM through a Partial Credit Guarantee (PCG); other investments under the Project concern one (1) commercial building and four (4) public buildings.

Significant efforts were directed to the national Financial Institutions (FIs). As of February 2018, contacts were made with 36 FIs, four (4) of which approved the EEGM legal documents and two (2) actually used it. The poor acceptance by FIs combined with the high share of ESCOs that could not close project finance, suggests that ESCOs still face great difficulties to access debt capital. No FI made changes in corporate strategies, staffing or internal procedures to anticipate on a growing EE market. This may be an indication of the inertia within the financial sector (and the likely existence of more profitable investments than EE).

Training and capacity development (Outcome 1) was quite successful. The activities were expanded to include certification of energy professionals on measuring and evaluation methodologies pursuant to the rules of ANEEL´s PEE programme and the Efficiency Valuation Organization (EVO) International Performance Measurement and Verification Protocol (IPMVP), for which 59 people were certified. The Project also adapted EE tools and methodologies to the Brazilian context and integrated these into some national EE policy and programmes.

Alternatives to Energy Performance Contracting (EPC) for the public sector (Outcome 2) were assessed and prepared including public-private partnerships (PPPs), differentiated contracting regime (RDC), and enhancement of the ANEEL PEE. The PBE Edifica Building Labelling programme was supported by the introduction of energy audits and benchmarking methodologies. The Project was successful in building alliances with sector stakeholders and contributed to enforcement of EE measures in public buildings (resolutions MPDG IN 02/2014 and TCU 1056/2017). The retrofitting of the ANEEL headquarter building

in Brasilia, which was implemented under a performance contract with local energy company CEB, may serve to demonstrate the progress made.

Notably, a dialogue between the Government, UNDP and IDB did not develop. The Evaluator questions whether the liability as a GEF Agency fully rests with IDB Invest. There may be a blank spot here that can only be clarified by the IDB Group and the GEF. Without certainty about the status of IDB Invest as the GEF Implementing Agency, the Evaluator is unable to assess its role as such.

The Project leaves open a series of fundamental and conceptual questions that relate to the original problem statement. An analysis of market drivers points into the direction that the EEGM is not the game changer for developing the EE market in Brazil as assumed at Project design. It is unlikely that the complex institutional and legal set-up for the EEGM would be the configuration-of-choice.

Since 2001, a body of expertise with EE financing has built up globally but it seems that the Project was implemented in the margin of this. The question whether a guarantee mechanism for ESCOs can play a role in Brazil, how relevant it is and for whom, is left unanswered. This is very disappointing for a GEF project of this size and duration, and which had raised high expectations when it was designed. It is therefore recommended to UNDP, IDB and the Government to initiate a dialogue on the Project content, its key results and exit strategy as soon as possible.

The Project achieved a substantial degree of problem ownership that should not get lost. The Evaluator would recommend MMA and UNDP to engage with MME on this point and evaluate the options. The legacy of the 3E Project can be used to start an information clearinghouse (repository) on EE in Brazil. One option is to integrate a RE/EE information service into the ANEEL PEE program and operate it from the resources available under this program. A successful information clearinghouse is a valuable asset for speeding up project pipeline development and increasing quality of proposals.

A summary of the Project Evaluation is given in the next table.

SUMMARY PROJECT EVALUATION RATINGS			
1. MONITORING AND EVALUATION	RATING	2. IA & EA EXECUTION	RATING
Overall quality of M&E	MS	Overall quality of IA/IP Execution	S
M&E Plan implementation	S	IA execution - UNDP	S
M&E design at project start-up	MS	IA execution – IDB	UA
		IP execution – MMA	S
3. ASSESSMENT OF OUTCOMES	RATING	4. SUSTAINABILITY	RATING
Overall Project Outcomes	MS	Overall likelihood of sustainability	ML
Relevance	MS	Financial resources	ML
Effectiveness	MS	Socio-economic	L
Efficiency	S	Political	ML
		Environmental	L

Non-mandatory aspects that were rated are:

PROJECT OVERALL SUSTAINABILITY	
CRITERIA	RATING
Project documentation and reporting	S
Coordination between stakeholders	S

The TE rates the Project as a whole as: Moderately Satisfactory (MS).

Acronyms and abbreviations

	(English)	*(Portuguese)*
ABC	Brazilian Cooperation Agency	Agência Brasileira de Cooperacão
ABESCO	Association of Brazilian Energy Service Companies	Associação Brasileira das Empresas de Serviços de Conservação de Energia
ABRAS	Brazilian Association of Supermarkets	Associação Brasileira de Supermercados
ABRAVA	Brazilian Association for HVAC-R	Associação Brasileira de Refrigeração, Ar Condicionado, Ventilação e Aquecimento
ANEEL	Brazilian Electricity Regulatory Agency	Agência Nacional de Energia Elétrica
APR	Annual Project Report	
AWP	Annual Work Plan	
BNDES	National Bank for Economic and Social Development	Banco Nacional do Desenvolvimento
BTOR	Back To Office Report	
CB	Capacity Building	
CBCS	Brazilian Sustainable Building Council	Conselho Brasileiro de Construcão Sustentável
CC	Climate Change	
CCM	Climate Change Mitigation	
CDR	Combined Delivery Reports	
CEBDS	Brazilian Business Council for Sustainable Development	
CEO	Chief Executive Officer (GEF)	
CEO ER	CEO Endorsement Request (GEF)	
CFC	Chlorofluorocarbon	
CGU	Controladoria-Geral da União	
CPAP	Country Programme Action Plan (UNDP)	
CPD	Country Programme Document (UNDP)	
CO	Country Office (UNDP)	
CO_2	Carbon dioxide	
EA	Executing Agency	
EDIFICA	EE program for buildings	Programa de Eficiência Energética em Edificações
EE	Energy Efficiency	
EEGM	Energy Efficiency Guarantee Mechanism	
EMDS	Encounter of the Municipalities with Sustainable Development	
EPC	Energy Performance Contracts	
EPE	Energy Planning Company	Empresa de Pesquisa Energética
ESAF	Superior School of Finance Administration	Escola de Administração Fazendária
ESCO	Energy Service Company	Empresa de Serviço de Conservação de Energia
EVO	Efficiency Valuation Organization	
FEBRABAN	Bank Federation of Brazil	Federação Brasileira de Bancos
FI	Financial Institution	
FSP	Full-Size Project (GEF)	
FY	Fiscal Year	
GBC	Green Building Council Brazil	
GDP	Gross Domestic Product	
GEF	Global Environment Facility	
GEFSEC	GEF Secretariat	
GEF	EO GEF Evaluation Office	
HQ	Head Quarter	
HVAC	Heating, Ventilation, and Air Conditioning	
IA	Implementing Agency (GEF)	
IBAMA	Brazilian Institute of the Environment and Renewable Natural Resources (MMA)	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis

ICMBio	Chico Mendes Institute for Biodiversity Conservation (MMA)	Instituto Chico Mendes de Conservação da Biodiversidade
IDB	Inter-American Development Bank	
INMETRO	National Institute of Metrology, Normalization and Industrial Quality (MDIC)	Instituto Nacional de Metrologia, Qualidade e Tecnologia
IPMVP	International Performance Measurement and Verification Protocol	
IR	Inception Report	
IW	Inception Workshop	
LAC	Latin America and the Caribbean	
LFA	Logical Framework Analysis	
MCTI(C)	Ministry of Science, Technology, Innovation (and Communication)	Ministério da Ciência, Tecnologia, Inovações e Comunicações
MDIC	Ministry of Development, Industry and Commerce	
MEC	Ministry of Education	Ministério da Educação
MF	Ministry of Finance	
MLF	Multilateral FUND (MP)	
MMA	Ministry of Environment	Ministério do Meio Ambiente
MME	Ministry of Mines and Energy	Ministério de Minas e Energia
MPDG	Ministry of Planning, Budget, and Management	Ministério do Planejamento, Desenvolvimento e Gestão
MRE	Ministry of Foreign Affairs	Ministério das Relações Exteriores
MWh	Megawatthour	
MP	Montreal Protocol	
MTon	Megaton	
MTR	Mid-Term Review	
M&E	Monitoring and Evaluation	
NEX	National Execution Modality	
NI	Normative Instruction (MPOG)	
NIM	National Implementation Modality	
NPC	National Project Coordinator	
NPD	National Project Director	
NPSC	National Project Steering Committee	
OFP	Operational Focal Point (GEF)	
OP	Operational Programme (GEF)	
CGCO	Ozone Layer Protection Management Unit (MMA)	
PB	Project Board	
PBE	Brazilian Labeling Program (Edifica)	
PBI	Public Building Initiative	
PDF	Preparatory Development Facility (GEF)	
PES	Sustainable Esplanada Project	Programa Esplanada Sustentável
PIF	Project Identification Form (GEF)	
PIMS	Project Information Management System (UNDP/GEF)	
PIR	Project Implementation Report (GEF)	
PMC	Project Management Cost	
PMU	Project Management Unit	
PPGM	Partial Performance Guarantee Mechanism	
PPP	Public-Private Partnerships	
PROCEL	Electricity Conservation Program	Programa Nacional de Conservação de Energia Elétrica
ProDoc	Project Document	
PROESCO	EE Project Support Programme (BNDES)	Programa de Apoio a Projetos de Eficiência Energética
PROPEE	Energy Efficiency Program Procedures (ANEEL)	
PSC	Project Steering Committee	
RCU	Regional Coordinating Unit (UNDP/GEF)	

RDC	Differentiated Contracting Regime	Regime Diferenciado de Contratações Públicas
Rede 3E	Network of Energy Efficiency in Buildings	
RF	Results Framework	
RFP	Request for Proposals	
RTA	Regional Technical Advisor	
R&D	Research and Development	
Sinduscon	Union of the Civil Construction Industry	Sindicato da Indústria da Construção Civil
SLTI	Logistics and Information Technology Secretariat (MPOG)	
SMART	Specific, Measurable, Achievable, Relevant, Time-bound	
SMCQ	Secretariat of Climate Change and Environmental Quality (MMA)	Secretaria de Mudanças Climáticas e Qualidade Ambiental
SMCF	Secretariat of Climate Change and Forestry (MMA)	Secretaria de Mudança do Clima e Florestas
SOF	Federal Budget Secretariat (MPOG)	
SR	Substantive Revision	
RF	Results Framework	
STAP	Scientific and Technical Advisory Panel (GEF)	
TA	Technical Advisor	
TA	Technical Assistance	
TAC	Technical Advisory Committee	
TCU	Federal Court of Auditors	Tribunal de Contas da União
TE	Terminal Evaluation	
TOR	Terms of Reference	
TPR	Tripartite Review	
UNDP	United Nations Development Programme	
UNESCO	United Nations Educational, Scientific and Cultural Organization	
UNFCCC	United Nations Framework Convention for Climate Change	
UPFEL	Federal University of Pelotas	Universidade Federal de Pelotas
USD	United States Dollar	
WP	Work Program	

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1 Introduction

This report describes the findings of the independent Terminal Evaluation of the UNDP-IDB/GEF Full-Size project "Market Transformation for Energy Efficiency in Buildings" as carried out under Contract No. BRA10-35961 for the UNDP Country Office in Brasilia, Brazil. The Implementing Partner (Executing Agency) was the Ministry of Environment of the Federal Government of Brazil (MMA). The Project was designed to influence, transform and develop the market for energy-efficient (EE) building operations in Brazil. The Project was jointly implemented by the GEF Agencies UNDP and IDB.[1]

The Project aimed to promote synergies between the UNFCCC and the Montreal Protocol to replace existing CFC-based chillers and as such, leverage the funding made available to Brazil by the Multilateral Fund (MLF). An innovative element of the Project was the creation of a financial instrument, the Energy Efficiency Guarantee Mechanism (EEGM), enabling Energy Service Companies (ESCOs) to implement and finance EE projects. The expected environmental benefits of realized investment projects included electricity consumption savings in commercial and public buildings to the order of 4,000,000 MWh over 20 years with associated direct greenhouse gas (GHG) emission reductions of 2 Mton $CO2_{eq}$ and indirect emission reductions of 16 Mton $CO2_{eq}$.

The budget for the BRA/09/G31 project "Market Transformation for Energy Efficiency in Buildings" ascends to USD 13,500,000 (GEF grant) and total co-finance resources of USD 122,774,000 as follows: private investors and lenders (USD 105,217,250 in-cash), UNDP-Multi-Lateral Fund (USD 1,000,000 in-cash), MMA (USD 414,000 in-kind); and a USD 15,000,000 balance-sheet commitment from the Inter-American Development Bank (IDB) to support the EEGM foreseen under the Project. In accordance with the CEO Endorsement Request, "the EEGM is a USD 25 million guarantee facility, under which the IDB will provide its AAA-rated balance sheet to act as Guarantor of Record."[2]

In 2012, MLF activities started under a separate project document, the "Chiller Project" (BRA/12/G77). The corresponding activities in outcome 3 were later removed from the GEF project document by the Substantive Revision (2015), which became now fully focused on energy efficiency as the "3E Project" (BRA/09/G31). The projects were executed by two different units under MMA. The Substantive Revision implemented the findings of the Mid-Term Evaluation (MTR) of BRA/09/G31[3]. The Terminal Evaluation of BRA/12/G77 was completed in November 2017[4]; the chiller component is therefore not evaluated under the present assignment but the findings of BRA/12/G77 Terminal Evaluation are included for reference.

The budget covered by the UNDP Project Document BRA/09/G31 amounts to USD 3,305,000 and is exclusively focused on Technical Assistance (TA) activities. The budget corresponding to the EEGM (USD 10,195,000) is administered directly by IDB. The following table clarifies the division of original Project, endorsed by GEF CEO in 2010, into three subprojects.

GEF ID 2941 Market Transformation for Energy Efficiency in Buildings – Division into sub-projects						
Project Name			Implementation		Budget	
Sub-project	Project No.	GEF Outcome[5]	GEF Agency	Executing Partner	GEF Budget	Co-finance
"3E Project"	BRA/09/G31	1, 2	UNDP	MMA/SMCQ/DPMC[6]	3,305,000	121,774,000
"EEGM"	none	4	IDB; IDB Invest	Atla Consulting	10,195,000	
" Chiller Project"	BRA/12/G77	3	UNDP	MMA/SMCQ/CGCO	0	1,000,000
				Total Budget	13,500,000	122,774,000

[1] The CEO Endorsement Request was submitted by UNDP and IDB jointly. A Project Co-Implementation Agreement concerning this Project was signed between IDB and UNDP in April 2008.
[2] CEO ER, p.18.
[3] Mid-Term Evaluation Report BRA/09/G31 "Market Transformation for Energy Efficiency in Brazil", Alfredo Caprile, June 2014.
[4] Terminal Evaluation Project BRA/12/G77, Integrated Management for the Chillers Sector, Mary Dayse Kinzo, November 2017.
[5] As per GEF CEO's letter communicating project endorsement, dated July 29, 2009. File: 7-29-09 ID2941-Brazil -Council letter.pdf.
[6] In 2018, Secretaria de Mudanças Climáticas e Qualidade Ambiental (SMCQ) was reorganized into the Secretaria de Mudança do Clima e Florestas (SMCF).

The Terminal Evaluation was carried out by a single consultant ("the Evaluator") in the period between December 4, 2017 and September 5, 2018, including a mission to Brazil from December 11-15, 2017. By December 31, 2017, all project activities - except the Terminal Evaluation - had been completed and 92% of the GEF project funds disbursed or committed[7].

The TE process was hampered by a number of factors that led to substantial delay in the delivery of the TE report: (1) The Project Advisor (at UNDP) was no longer under contract and by consequence could not collaborate as intensively with the mission as expected; (2) The mission partly coincided with the Final Seminar of the 3E project. This offered the Evaluator the opportunity to meet most key stakeholders in Brasilia; the backside was that insufficient time was available to review the project documentation and neither the Project Coordinator (at MMA) nor Project Technical Advisor could make time available; (3) The Project matter and scope proved more complex than anticipated; and (4) Doubts occurred about the scope of the assignment which could not be clarified in the mission's inception plan, specifically related to the fact that two GEF Agencies are involved (UNDP and IDB) and the "3E Project" and "EEGM" had different closure dates (31 December 2017, respectively 18 May 2018). A joint Evaluation plan, as per the GEF TE Guidelines, was not in place and a dialogue about the matter developed between UNDP and IDB in the first months of 2018. Meanwhile, most information voids that remained after the mission were eventually filled in by the stakeholders and the Consultant during the following months.

1.1 Purpose and scope of the evaluation

The Terminal Evaluation for the Project is initiated by UNDP Brazil in line with UNDP Monitoring and Evaluation (M&E) Guidelines[8] in coordination with the UNDP/GEF Regional Coordinating Unit for Latin America and the Caribbean (RCU/LAC). The Terminal Evaluation is one of the instruments used by UNDP and GEF to evaluate the degree of success and effectiveness of an intervention. The purpose of a Terminal Evaluation is to evaluate the achievement of project results, to make specific recommendations to consolidate and enhance the results and benefits produced by the Project, and to draw lessons-learnt for further UNDP and GEF programming.

During the inception of the TE, it was observed that there was no agreement as yet between UNDP and IDB to implement the Guidelines concerning Terminal Evaluation of a GEF Project implemented by more than one GEF IA.[9,10] This circumstance is beyond control of the Consultant. Yet, it creates a problem for evaluating Implementing Agency role and performance, as the agencies can be rated individually or collectively. Endorsement from GEF CEO was requested by both agencies jointly, hence one assumes a

[7] Including estimated encumbrances of approx. USD 300,000 (9% of the project budget). Information source: UNDP Country Office, December 2017.

[8] Document: "Project-level Evaluation – Guidance for conducting Terminal Evaluations of UNDP-supported GEF-financed projects", UNDP Evaluation Office, 2012 (http://www.undp.org/evaluation).

[9] Ibidem, p.8. "Some GEF financed projects are carried out 'jointly', meaning that one GEF financed projects is carried out by more than one of the ten GEF implementing agencies. In these situations, GEF policy dictates that the project M&E plan should clearly set out the process by which these jointly-implemented projects get evaluated. The Plan should clarify responsibilities for review and approval procedures, and should be developed through consultations between the implementing agencies prior to, or then immediately after, launch of the project. A single GEF project should receive only one project terminal evaluation report, with one set of ratings. Joint evaluations can be expected to entail more extensive and time consuming ToR and report commenting procedures."

[10] The (unedited) Guidelines approved by the GEF IEO Director on 11th of April 2017 state the following (p.4). "For full-sized projects that are jointly implemented by two or more GEF Agencies, one terminal evaluation report should be prepared. The terminal evaluation report should be: (a) Unified. The terminal evaluation report will include the overall assessment of project performance and cover all project components. (b) Jointly owned. Unless otherwise agreed, the lead Agency implementing the project will lead the process for conducting the terminal evaluation. It should be undertaken with active participation and/or support from other GEF Agencies."

shared responsibility in alignment with the minimum fiduciary standards[11] and a combined focus on delivering on the GEF strategic objectives (basically GHG reductions, energy savings and mobilized investment under GEF-5 CCM). Yet, the split of the Project into one part (3E) with UNDP's counterpart (MMA) primarily focusing on public buildings and policy development and another part (EEGM) with IDB's counterpart (Atla Consulting) targeting the private market, was not supportive for developing a joint focus and combined strategy.

The TE engaged more closely with UNDP than with IDB. The Evaluator made an effort to reduce this asymmetry by sharing the Guidelines to clarify the purpose of a GEF Terminal Evaluation and seeking specific IDB Guidelines for TE of GEF Projects. The questions were raised why this GEF Project was assigned to IDB Invest and how it links to the Bank's ongoing work on the Project subject. [12] Detailed responses on this matter were not obtained from IDB however.

While institutional memory gaps inevitably occur with a project that spanned about 12 years (from 2006-2018 from design to closure), there seems to be a disconnect that hampers a broader reflection on the Project's merits and flaws, and whether an EEGM would work or not in Brazil. This circumstance certainly limits the ability of the present TE assignment to draw hard conclusions and extract lessons to feed into the global knowledge base and the GEF, the Agencies, and national stakeholders in Brazil in particular. The Consultant wishes that such a reflection process be started soonest.

1.2 Methodology of the Evaluation

The methodology for the Terminal Evaluation is given in the recent GEF guidelines for M&E[13], which are adhered to by the Evaluator to the extent possible. The current GEF guidelines highlight the need for a theory of change as a basis for evaluation of results. It is observed that "where an explicit theory of change is not provided in the project documents, the evaluators should develop it based on information provided (...) and through consultation with the project stakeholders (par. 10-11)". This situation applies to the 3E Project. The Evaluation will rate the Outcomes of the Project on three dimensions according to a six-point scale[14]:

a. Relevance: Were the project outcomes congruent with the GEF focal areas/operational program strategies, country priorities, and mandates of the Agencies? Was the project design appropriate for delivering the expected outcomes?
b. Effectiveness: The extent to which the Project's actual outcomes were commensurate with the expected outcomes.
c. Efficiency: Was the project cost-effective? How does the project cost/time versus output/outcomes equation compare to that of similar projects?

The framework for outcome achievement is the Project's Results Framework (RF, or "logframe"). Where measurement of outcome achievements is not realistic at the point of project completion, GEF observes that "the quality and level of outputs delivered may be used as a proxy to indicate outcome achievement".

[11] Minimum Fiduciary Standards for GEF Partner Agencies, GEF Policy GA/PL/02, Last Updated on June 27, 2014.

[12] As a reference may serve, for example, the recent publication "El modelo de negocio ESCO y los contratos de servicios energéticos por desempeño", by Arnaldo Vieira de Carvalho, Laura Natalia Rojas, IDB Washington D.C., 2017.

[13] Available at: http://www.gefieo.org/sites/default/files/ieo/evaluations/files/gef-guidelines-te-fsp-2017.pdf.

[14] According to the six-point scale: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U): Highly Unsatisfactory (HU); Unable to Assess (UA). The calculation of the overall outcomes rating of projects will consider all the three criteria, of which relevance and effectiveness are critical. The rating on relevance will determine whether the overall outcome rating will be in the unsatisfactory range (MU to HU = unsatisfactory range). If the relevance rating is in the unsatisfactory range then the overall outcome will be in the unsatisfactory range as well. However, where the relevance rating is in the satisfactory range (HS to MS), the overall outcome rating could, depending on its effectiveness and efficiency rating, be either in the satisfactory range or in the unsatisfactory range.

The Project was subject to a Substantive Revision (SR) which included a modification of indicators and a downgrading of targets. The Evaluator acknowledges that, according to GEF TE guidelines, the original targets as given in the CEO ER should be used as the basis for evaluation of project outcomes. However, the choice is made here to follow the SR indicators and targets for consistency with the PIRs and because, both SR and CEO ER would lead to the same conclusions.

Sustainability of the outcomes will be rated on a four-point scale[15] and consider the dimensions: (a) financial resources; (b) socio-political context; (c) political (institutional framework and governance); and (d) environmental factors. Where feasible, the Evaluation should report on progress to impact providing evidence and information sources, and assessing the role of the Project as well as other factors.

Other Project aspects that require a rating[16] include:

- M&E Design and Implementation. Was the M&E plan at CEO Endorsement practical and sufficient? Did it include baseline data and clear (SMART) indicators? Was the M&E system operated as per the M&E plan? Was the M&E plan revised in a timely manner? Was information on specified indicators and relevant GEF focal area tracking tools gathered in a systematic manner? Were resources for M&E sufficient? How was the information from the M&E system used during project implementation?
- Quality of GEF Agency Implementation (IA). The Evaluation will assess the extent to which the agency delivered on project preparation, appraisal, preparation of detailed proposal, approval and start-up, oversight, supervision, completion, and evaluation[17], focusing on elements that were controllable from the Agency's perspective. The Evaluation will assess how well risks were identified and managed by the GEF Agencies.
- Quality of Implementing Partner (IP). The Implementing Partner (also called Executing Agency) is involved in management and administration of Project day-to-day activities under the supervision of the GEF Agencies. It is responsible for the appropriate use of funds, and procurement and contracting of goods and services to the GEF Agency. The Evaluation will assess the extent to which the IP effectively discharged its role and responsibilities.

As transversal aspects of IA/IP evaluation are indicated: quality and realism in reporting, adequacy of management processes, and suitability of the chosen implementation modality. The Terminal Evaluation should further assess the following topics (no rating required): (a) need for follow-up, (b) materialization of co-financing; (c) compliance with environmental and social safeguards; (d) gender concerns; and (e) stakeholder engagement. The Evaluation should provide well-formulated lessons that are based on the project experience and applicable to the type of project at hand, to the GEF's overall portfolio, and/or to GEF systems and processes. Recommendations should be targeted and discuss the need for action, and a time frame for it.

Based on the Terms of Reference for the assignment (Annex A), the Evaluator has compiled a set of consolidated evaluation questions (Annex D).

1.3 Key issues addressed

Earlier GEF projects often suffered from design flaws, governance problems, unrealistic targets and poorly validated assumptions. Several of these issues also apply to the current Project. The general character of these problems has been analyzed and documented by the GEF Independent Evaluation Office (EIO)[18];

[15] As follows: Likely (L) –Moderately Likely (ML) – Moderately Unlikely (MU) – Unlikely (U). Unable to Assess (UA).

[16] According to the six-point scale HS-S-MS-MU-U-HU.

[17] In alignment with GEF/C.41/06/Rev.01 and GEF/C.39/9.

[18] Reviews for GEF-4 projects representative for Project GEF 2941 include: (1) "GEF Annual Performance Report 2012", Evaluation Report No. 83 (2013); (2) "OPS5 – Fifth Overall Performance Study of the GEF, Final Report: At the Crossroads for Higher Impact", Evaluation Report No. 86 (2014). Both reports are authored by the GEF Independent Evaluation Office, and available at www.gefieo.org.

therefore, this Terminal Evaluation aims to focus on specific issues and circumstances to generate useful conclusions and lessons. Since the Mid-Term Review and Substantive Revision extensively analyzed design and governance issues, this TE refers to the conclusions drawn rather than repeating the issues already known.

1.4 Structure of the evaluation

The evaluation report follows the general document structure as suggested for this purpose. Section 2 provides a description of the Project and the devised strategy in relation to its development context. Section 3 presents the findings of the Evaluation covering project design, implementation and results. The sections 4 and 5 summarize the conclusions, lessons learnt and recommendations.

2 The Project and its Development Context

2.1 Project start and duration

The Project idea goes back to 2005 when a PDF-B proposal was submitted by UNDP to the GEF. Work Programme entry for the Full-size Project (FSP) was achieved in June 2007. A lengthy review process started with UNDP seeking a co-implementation arrangement with the Inter-American Development Bank (IDB) to implement the envisaged financial instrument, the "Partial Performance Guarantee Mechanism – PPGM". IDB decided to carry out a due diligence procedure to assess the EEGM on its financial and legal implications and merits. As part of this process, UNDP and IDB commissioned an additional study into the EE and ESCO market in Brazil to update the proposal and fine-tune the PPGM; as a result of which, it was decided to create a more flexible mechanism, branded the "Energy Efficiency Guarantee Mechanism (EEGM)".

Although the project approach was challenged during review by the GEF Secretariat (GEFSEC)[19], the Project was eventually endorsed by the GEF CEO on July 29, 2009 (GEF ID 2941). Approval of the EEGM by the IDB Board was given on October 28, 2009. After translation of the project documentation into Portuguese and registry and approval by the Brazilian Government (ABC), the Project Document (Prodoc) BRA/09/G31 was signed by the Executing Agency (MMA/SMCQ) and by UNDP on March 1, 2010. It is noted that IDB is no signatory of this Prodoc. A separate project document between IDB and the Government of Brazil seems not to exist.[20] In view of the Evaluator, this situation may create a legal void.

A one-day inception workshop was held on March 5, 2010 with participation of MMA, MME, UNDP and IDB. Brief minutes (3 pages) of this event are available but not an Inception Report as intended in the Project Document.[21]

The Project was to be implemented under National Execution Modality (NEX/NIM) with an anticipated duration of 7 years (expected closure date: December 31, 2016). The project was drafted and endorsed under GEF-4 Climate Change Strategic Priority 1. Due to the complexity of the Project's subject and multi-agency implementation (UNDP and IDB), the time between Work Program (WP) entry (June 2007) and CEO Endorsement (July 2009) was longer than usual for a GEF Full-size Project.

The Mid-Term Review (MTR) in the first half of 2014 led to a Substantive Revision (SR) of the Project Document to implement adjustments to the project targets and the Project's institutional arrangements. The project activities addressing the substitution of CFC-based chiller systems were removed from

[19] See the issues raised in GEFSec review May 12, 2009.

[20] According to comments received from MMA (September 2018), ABC is not aware about a document signed between IDB and the Brazilian Government.

[21] UNDP Project Document, 1 March 2010, Par. 104-106.

BRA/09/G31 and transferred to the parallel initiative BRA/12/G77, which was already under execution with financial support from the MLF. The Substantive Revision document was eventually signed in May 2016 as the outcome of a participatory process with inputs from identified key stakeholders under leadership of the Ministry of Environment (MMA) of the Federal Government of Brazil and UNDP. The Substantive Revision extended the end date of the Project to December 31, 2017, bringing the formal project duration to a total of 7 years and 10 months.

2.2 Problems that the project seeks to address

The GEF CEO Endorsement Request states[22] that GEF support was requested *"to help removing finance, capacity, technology and policy barriers that currently stand in the way of the widespread adoption of energy-efficient measures and technologies in buildings in Brazil."* The identified main barriers were the following:

- Energy efficiency (EE) techniques remain poorly understood by building owners, operators and designers in the development and implementation of EE projects in buildings, particularly in the complex HVAC sector.
- Very few building owners/operators have implemented EE projects and they are reluctant to invest in projects with long payback periods.
- Accessing third-party financing and performance-based contracts through, for example, energy service companies (ESCOs) is complex for public buildings due to legal barriers, and a lack of knowledge and understanding by the various public sector stakeholders. And:
- Brazilian financial institutions lack access to performance risk mitigation options which would enhance their confidence in financing of EE initiatives.

The document further indicates that: *"The lack of access to specific project financing has been identified as the main barrier for the development of EE projects in Brazil, and for the development of a sustainable ESCO market in the country. Due to limited availability of credit, EE projects are generally financed internally by the client or by the ESCOs themselves."*

The original project idea was developed under GEF-4 and resulted in a completed PDF-B format[23], with the objective: "to complement the related activities funded by the Multilateral Fund for the Implementation of the Montreal Protocol, by focusing specifically on energy efficiency improvements aspects in building HVAC systems as a whole." This proposal responded to a request from the MLF to leverage funds allocated to Brazil's national Phase-out Plan (NPP) for CFC removal with GEF resources to enhance the impact on the chiller market. With the imminent start of the GEF-5 cycle, UNDP was asked to adjust the orientation of the project for submission under GEF-5. Due to the delay in approval of the GEF funds, the MLF resources came late to support phasing out of CFCs in Brazil (which was achieved by 2010) and therefore HCFCs were included in the chiller project (BRA/12/G77).

It was correctly acknowledged that a number of consultancy firms were active in the chiller market. These were identified as Energy Service Companies (ESCOs) but were actually subsidiaries of energy distribution companies such as AES Eletropaulo rather than independent businesses. This market was triggered by the PROCEL programme administered by Eletrobras under supervision of MME. ESCO experience in Brazil was quite limited and the Brazilian Association of ESCOs (ABESCO, created in 1997) was just taking off; with the exception of the utilities, most associates were small consultancy firms.

[22] GEF CEO Endorsement Request, July 29, 2009, p.4-5.
[23] GEF PDF-B Document, UNDP and Government of Brazil, "Market Transformation for Energy Efficient Buildings HVAC Appliances, building on CFC-free Chillers".

2.2.1 Challenges facing ESCOs and EEGM

The project idea is responsive to analysis by international experts from that period, which provide an independent perspective.[24] The challenges related to ESCOs and financing of EE projects in Brazil were already assessed in a study for the United Nations Environmental Programme (UNEP) several years before.[25] It highlights a series conditions for the development of a robust ESCO sector, as follows: *"(a) Building a growing "library" of variants of performance contract models adapted to Brazilian needs, with dissemination among service providers, consumers and financial agents; (b) Further adapting and disseminating procedures for verifying the results of projects and reporting formats; (c) Procedures for certifying professionals and firms providing EE services; and (d) Establish arbitration procedures for contractual disputes. Litigation is slow and basically kills the project."* All these measures were deemed important to build credibility over time. Performance contracting would need to become normally accepted, albeit not the only possible modality for energy services.

The main barrier in Brazil's banking sector was also highlighted, which is the traditional claim for collateral or guarantees by the banks on the borrower instead of a structured approach to risk. The UNEP report concludes: *"We believe that a Guarantee Mechanism is fundamental to really open commercial credit in Brazil. Moreover, the early stage projects that might receive investments guaranteed by such a mechanism would be instrumental to help develop broader financial products to attend the demand of the sector as a whole."* However, it was also recognized that substantial advocacy was needed to get the financial sector on board and actually break the current paradigm. A step-wise approach was devised as follows: (i) make banks aware of the potential returns of investments in EE by ESCOs, (ii) create and make available financial instruments (specifically a guarantee mechanism); and (iii) to implement a few pilot projects to demonstrate the investment potential of EE projects and generate confidence in the market. The GEF Project "Market Transformation for Energy Efficiency in Buildings" is aligned with this approach.

Alongside the Guarantee Mechanism, alternative instruments were identified in 2001, including aggregation of ESCO portfolios into a "SuperESCO", insurance policies, venture capitalists specialized in EE, etcetera. The UNEP study noted that a Guarantee Mechanism in Brazil would depend on government-backed capital, but that, in 2001, such a mechanism was not legally permitted. Concerning the design of a Guarantee Mechanism, a series of specific issues were identified to which the GEF project could provide the answers: (i) organization of the Guarantee Mechanism, parameters for dimensioning it and criteria for project selection and aggregation; (ii) the amount of credit to be covered by the guarantee; (iii) the tenor (time period) during which the guarantee is needed; (iv) need for (government) certification of projects; (v) establishment of an insurance policy for ESCOs; (vi) identification of the receiver of the guarantees (either the lending bank, the borrower, the investors, or a combination of these).

2.2.2 GEF Review

The final project design was moulded into the GEF-5 CCM framework, imposing a tight timeframe for establishing the EEGM and delivering on the GEF CCM key indicators. This implied that: (a) ESCO and financial sector response had to be assumed, rather than giving the advocacy process due time to develop and accepting their uncertain outcomes; (b) a substantial market response to invest in EE was assumed to deliver energy savings and GHG reductions relevant for the GEF; rather than a focus on nurturing the EEGM and its key stakeholders (ESCOs, local FIs and pilot projects).

[24] See for example: "An international survey of the energy service company (ESCO) industry", by Edward Vine, Lawrence Berkeley National Laboratory, Energy Policy 33, 691-704 (2005). Another publication worthwhile recalling is the World Bank/ESMAP report "Financing Energy Efficiency – Lessons from Brazil, China, India, and Beyond", by Robert P. Taylor e.a. (2008).

[25] Financing of Third Party Energy Efficiency Services in Brazil. Contribution to the Project: Developing Financial Intermediation Mechanisms for Energy Efficiency Projects in Brazil, China and India, report prepared for UNEP, by Alan Douglas Poole, by the Instituto Nacional de Eficiência Energética (INEE) and André Guimarães (A2R), Brazil, October 2001.

Meanwhile, it was known that BNDES's PROESCO did not meet market demands as hoped (leaving the Project without the most important credit supplier and institutional counterpart) and that Procurement Law 8.666/1993 imposed constraints to (private) project finance in public sector. [26] Inevitably, the GEF project would need to make additional efforts "on the fly" to circumvent these issues, if anyhow possible.

The GEF Council members (USA and Switzerland), STAP and subsequent GEF Secretariat Reviews challenged the validity of the assumptions and the approach taken by the Project designers. The Evaluator shares these concerns. However, there was also a general consensus about the relevance of the Project for EE market development in Brazil and certain optimism about its chances of success and in July 2009, the Project was endorsed by the GEF CEO.

2.3 Goal and development objective of the Project

The goal of the Project is formulated as follows *"The goal of the project is to influence, transform, and develop the market for energy-efficient building operations in Brazil and move towards a less carbon-intensive and more sustainable energy consumption path in the country."* The development objective of the Project is: *"to foster EE investments in private and public buildings, by addressing the technical and financial barriers which persist despite past and present public and private sector programs/initiatives in this domain."*[27]

The Project would strive to remove the identified barriers through a comprehensive and integrated approach. Simultaneously, it was observed that: *"There is significant potential to achieve energy savings and reduce greenhouse gas emissions from the buildings market in Brazil, the program will encourage cross-convention synergies with the Montreal Protocol to include a chiller replacement component, thus contributing to the phase-out of CFCs."*

The Project was aligned with GEF Operational Programming 5 (OP5) *"Removal of Barriers to Energy Efficiency and Energy Conservation"* by removing barriers to the large-scale application, implementation, and dissemination of cost-effective, energy-efficient technologies and practices that will result in the reduction of greenhouse gas emissions in Brazil. Within this program, the Project supports the (GEF-4) Strategic Objective CC1: *"Promote energy-efficient buildings and appliances"*. Specifically, the Project pursued: (i) reinforcing the capacity of market actors in EE building activities; (ii) increasing market activities related to EE projects development and implementation in the buildings sector; (iii) designing an innovative energy efficiency guarantee mechanism (EEGM), (iv) increasing the number of EE appliances; and (v) monitoring the results of project's activities.

GEF support would help to develop 'state of the art' capacity in buildings EE, develop a mechanism for the implementation of EE projects in public sector buildings, implement an innovative financial mechanism to create the conditions for the implementation of a sustainable buildings EE market, disseminate information on buildings EE potential and benefits and create best practice information on the adoption of EE in the Brazilian markets.[28]

2.4 Expected results and indicators

The Project was structured along four[29] (4) components pursuing the following outcomes:

(1) Enhanced EE investments through Capacity Building (CB) in private and public sector buildings;

[26] GEF CEO Endorsement Request, p.24-29.
[27] Project Document, par.34-35, p. 12.
[28] Project Document, p.12.
[29] Note that the UNDP project document includes two more components: (5) Monitoring & Evaluation; and (6) Support for Project Management. For the purpose of the Terminal Evaluation, these are treated separately from the "core" project design and outcome definitions, as M&E and IA/EA quality will be assessed as such.

(2) Access to EE services and commercial financing for public sector buildings enhanced with a Public Building Initiative (PBI);
(3) Interest enhanced in the replacement of energy-inefficient CFC-using chillers; and
(4) Energy Efficiency Guarantee Mechanism (EEGM) made available to stimulate EE investment through ESCOs.

The expectations of the GEF and the Montreal Protocol (MP) are summarized in the ProDoc, par.75, "success will be assessed against the following set of key indicators":

- Reduction in GHG emissions resulting from the improvement of electricity consumption in both public and private building facilities;
- Gradual elimination of substances that deplete the ozone layer, as supported by the MLF.

Each of these outcomes has associated outputs, indicators and targets as described in the original Results Framework (RF); some modifications were made in the Substantive Revision. The Evaluation will use a consolidated set of indicators consistent with the Project Implementation Reviews (PIRs) 2016 and 2017. A few original indicators are maintained to include some quantifiable results under Outcome 4 although no specific target was set. Also, indicator 14 "the EEGM is operational" was split into two. The consolidated Results Framework is presented in the next table.

As early as the Inception Workshop (May 2010), a weakness in the Project design was already identified, i.e. "the need to collect baseline information and to review the feasibility of the targets"[30]. The Mid-Term Review (MTR) highlights two more issues: "the overestimated size of the ESCO market and number of CFC chillers in Brazil"; and the fact that "PROESCO financing has not been as active on the ground as assumed". The MTR concludes that *"the Project strategy and design continue to be relevant and EE is still a high priority in Brazil. However, some of the targets and indicators are considered as too ambitious in light of the current state of the EE market in Brazil and need to be revised accordingly."*

The Implementing Partners proposed to define realistic targets for the Results Framework but were reportedly instructed by UNDP GEF not to alter the outcomes of the Project in accordance with GEF policy.

[30] BRA/09/G31 Inception Report, p.2.

PROJECT BRA/09/G31 – CONSOLIDATED SET OF INDICATORS USED FOR TERMINAL EVALUATION			
SRF Level	Indicator[31]	Original Target (CEO ER)	Revised Target (SR)
Objective: To foster EE investments in private and public buildings in Brazil	Increase in investment in EE in public and private building sectors due to the Project (1)	USD93 million	USD93 million
	Direct and indirect GHG emission reductions attributable to the Project	Direct CO2 emission reduction: 2 Mt $CO2_{eq}$; Post-project and indirect CO2 emission reductions: 16 Mt $CO2_{eq}$	Direct CO2 emission reduction: 485,100 $tCO2_{eq}$; Post-project and indirect CO2 emission reductions: 2,910,600 $tCO2_{eq}$
	Number of Financial Institutions (FIs) offering energy saving guarantee services through EEGM or other sources (3)	At least 10 FIs	At least 10 FIs
	Number of new, implemented energy efficiency (EE) projects using the EEGM or other similar mechanisms due to the Project (4)	At least 250 projects implemented	At least 35 projects approved under the EEGM and provided with guarantees
Outcome 1: Enhanced EE investments through capacity building in EE in private & public buildings	EE offer fully functional for private building sector (5)	(no quantitative target)	EE building market capacity building in progress
		(no quantitative target)	Efficiency improvement in Brazil reinforced
	Number of stakeholders (building managers, entrepreneurs, equipment providers, ESCOs) advised or trained (6)	1400 ESCOs, Equipment providers, Building owner/managers association, Engineers associations, Technical Education institutions and Universities strengthened	1400 ESCOs, Equipment providers, Building owner/managers association, Engineers associations, Technical Education institutions and Universities strengthened
	Number of people from public and private building sectors trained (7)	Up to 5,000	up to 5,000
	Number of stakeholders reached with project publications (7)	At least 2,000	at least 2,000
	Number of unique visitors to Project´s web site (7)	At least 1,000 per month in 6 months after website launch	at least 1,000 per month in 6 months after website launch
Outcome 2: Access to EE services and commercial financing for public sector buildings enhanced with the support and strengthening of existing public initiatives	Public building EE tender process PBI Program for Public Building operational by end of project	Model for PBI designed and promoted	(same)
	Instruments to calculate or mechanisms to mitigate greenhouse effects in buildings developed (8)	(not foreseen)	PoA design document (PDD) and project activity component design document (CPA) developed
		(not foreseen)	Benchmark of energy consumption in public buildings established
	Number of ESCOs and public managers provided with technical assistance by the Project (9)	At least 30 ESCOs provided with technical assistance, and 400 persons trained	At least 3 ESCOs and 20 public managers technically assisted
	Number of bidding processes for EE in public buildings facilitated by the Project (9)	At least 15 RFP per year based on the Public Building Initiative (PBI) concept (on average)	At least 10 Requests for Proposals (RFP) due to the project
	Number of public buildings labelled according to PBE/Edifica (10)	(not foreseen)	Five (5) public buildings labelled according to PBE – Edifica
		(not foreseen)	Models of procurement notices, contracts and legal study developed

[31] The numbers in parenthesis correspond to the related indicator in the Project Implementation Review (PIR) 2017.

PROJECT BRA/09/G31 – CONSOLIDATED SET OF INDICATORS USED FOR TERMINAL EVALUATION			
SRF Level	Indicator[31]	Original Target (CEO ER)	Revised Target (SR)
Outcome 4: EEGM made available to stimulate EE investment through ESCOs	The EEGM is operational (14)	(no target specified)	(no target specified)
		At least 250 projects approved under the EEGM and provided with guarantees	At least 35 projects approved under the EEGM and provided with guarantees
	Number of ESCOs using portfolio guarantees such as the EEGM for public and private EE projects (15)	(no target specified)	(no target specified)
	Number of financial institutions which have defined target segments for EE financing and made relevant changes in internal procedures	At least 5 FIs	(same)
	Number of ESCOs, FIs and other stakeholders trained or informed about the EEGM	(no target specified)	(no target specified)

2.4.1 Chiller Project BRA/12/G77

For completeness, the components of the Chiller project "Demonstration Project for the Integrated Management of the Chillers Sector (BRA/12/G77)" are presented hereunder. For a detailed review reference is made to the Terminal Evaluation of this project finalized in November 2017. According to the Prodoc (signed April 2013), the objective is "To stimulate the interest, in an integrated way, for improvement of energy efficiency (EE) in buildings, demonstrating the potential of energy efficiency in replacing CFC- and HCFC-based coolers." The main components are indicated in the following table.

BRA/12/G77 – PROJECT COMPONENTS		
	PROJECT DOCUMENT BRA/12/G77	SUBSTANTIVE REVISION BRA/12/G77
1	National inventory of liquid chillers with CFCs and HCFCs carried out	
2	Technical and informative materials to promote and disseminate the outcomes obtained by replacing CFC and HCFC liquid chillers, produced and distributed;	
3	Workshops, capacity-building and training for specialized professionals and professionals interested in replacing CFC and HCFC liquid chillers	
4	Case study to demonstrate EE potential and the economic and environmental benefits obtained by replacing CFC liquid chillers in public building	
5	Technical assistance for the development of projects to replace liquid chillers with CFCs and HCFCs to increase EE	(eliminated)
6	(none)	Retro-commissioning processes of air conditioning systems with CFC and HCFC liquid chillers performed

2.5 National development context and baseline

The Project Document points out the enormous energy savings potential of the Brazilian Economy, estimated at a value of over USD 4.5 billion per year, which underlines the relevance of the Project. A trend towards cost-based energy pricing makes EE measures increasingly cost-effective.[32] The following baseline elements and initiatives are highlighted in the Prodoc:

- Law 9991 (2000), which mandates electricity distribution companies to spend a minimum of 1% of their operational liquid income in public-benefit investments and R&D, including 0.5 % in energy efficiency programs. Investments are to be applied according to Agência Nacional de Energia Elétrica (ANEEL) regulations.
- The PROCEL program (Programa Nacional de Conservação de Energia Elétrica), created in 1985 under responsibility of former State utility Eletrobras under guidance of MME.
- The Brazilian Labeling Program (PBE), established in 1983 and managed by the National Institute of Metrology, Normalization and Industrial Quality (INMETRO). PROCEL has developed marketing activities to assist private stakeholders to abide to the PBE.
- The EDIFICA Program (Programa de Eficiência Energética em Edificações) was launched by the end of 2005 with its activities effectively starting in 2006. It is responsible for organizing actions and defining targets for improvement that would lead to: (i) establish minimal requirements to integrate the architecture of the buildings to the environment and to the natural resources; (ii) create EE indicators for buildings; (iii) certificate material and equipment, establish procedures for regulation/legislation; (iv) create mechanisms to provide financial resources and the removal of barriers to the implementation of projects and (v) promote educational and of social interest projects.
- Energy Service Companies (ESCOs). ESCO experience in Brazil is recent and limited. Most EE service providers are small to medium sized engineering consulting firms and few make a living

[32] Project Document, p.6-7.

focused predominantly on energy efficiency (EE) services. Most successful ESCOs are linked to utilities. The Association of Brazilian Energy Service Companies (ABESCO), founded in 1997, has more than 72 members, 58 of which are ESCOs.[33]

The Public Building Initiative (PBI) pursued by the Project was designed to eliminate specific barriers to the implementation of EE projects in public buildings and, from an operational perspective, was based on the promotion of Energy Performance Contracts (EPC) in the public sector in Brazil.[34] This proposition was based on discussions with national Government partners about the urgency to attract private investment capital for EE in public buildings. The legal implications of Law 8.666 for ESCO involvement and EPC and the proposed solution was simplified.

During the Project, advances were made under the baseline, including the Sustainable Esplanada Project (PES, 2012) targeting the Federal Government buildings along the Esplanada Monumental in Brasilia[35]. The PES is a joint initiative by MPOG, MMA, MME, and the General Secretariat of the Presidency of the Republic, which encourages federal public agencies and institutions to adopt a management model aimed at the rational use of natural resources, including energy. In 2014, the Ministry of Planning, Budget and Management (MPDG) published NI 02/2014 requiring A-level labeling (as issued by PBE/Edifica) for renovations and constructions of new federal public buildings above 500m^2. The partners concluded that the GEF Project should support baseline developments rather than trying to develop a PBI by itself.

2.5.1 Specific circumstances during project implementation

The Project implementation period was characterized by political and economic turmoil in Brazil. The Substantive Revision[36] observes that *"Project design is based on an economic context that preceded the international financial crisis (2007 and 2008) that affected the entire world as well as Brazil. For illustration purposes, the Project Document uses as reference for the country's GDP growth from 2000 to 2015 an average of 4.3% in the baseline scenario and 5.3% in the optimistic scenario. However, the trend has been below this expectation, considering the 0.1% GDP growth recorded in 2014, which influenced the pace of execution of EE projects in the country."*

The expected growth in ESCO number and activity, necessary to reach the Project targets, was unlikely to happen under the adverse market and business conditions that developed in the following years. The public sector also suffered severe budget cuts.

2.6 Beneficiaries and stakeholders

The term "beneficiary" as used in the Project Document and CEO ER refers to: (i) ESCOs and recipients of EEGM guarantees; (ii) building owners and investors in EE projects; (iii) Financial Institutions (FIs) that engage with IDB under the EEGM; and (iv) professionals and other persons targeted by training activities under the Project.[37] The perspective on beneficiaries in the project design is more focused on entities rather than individuals. While valid, UNDP and GEF projects typically relate the term beneficiary to human beings and their development status.

Since the EEGM was only relevant for ESCOs with capacity to attract loan capital, the mechanism implicitly excluded the small companies. In this sense, the EEGM addressed a financing barrier but not the barriers related to the ESCO supply side; a more differentiated scheme would have been required to this purpose. Promotion of the EEGM however took place giving all ESCOs and other stakeholders equal attention and

[33] Information as in Project Document (p.10), dated 2009.
[34] SR, section 3.2.3, p. 8-9
[35] A UNESCO World Heritage site.
[36] Substantive Revision 2015 section 1.2, p.2.
[37] As found by a word search in the CEO ER, Project Document, Substantive Revision, and Mid-term Evaluation.

advice. During Project implementation, gender, racial and geographic inclusiveness was promoted through the selection process of candidate individuals for training[38]. Another initiative of the Project worth mentioning is the didactic platform for universities (professors and students) which offers training at no cost and which was implemented in all regions of Brazil.

With the Substantive Revision being shaped, a core group of stakeholders involved was formally convoked by MMA to take seat in the Project's Technical Advisory Committee (TAC).[39] These are summarized in the following table. The TAC met four times per year. The attendance was good, as can be deduced from the participation analyzed in Annex H.

PROJECT TECHNICAL ADVISORY COMMITTEE (TAC) – REPRESENTED STAKEHOLDERS
Ministry of Mines and Energy / Energy Planning Secretariat
Ministry of Planning, Budget and Management (MPDG) / Sustainable Logistics and Information Technology Secretariat and Federal Budget Secretariat
Ministry of Finance / Superior School of Finance Administration (ESAF)
Ministry of Development, Industry and Commerce / Production Development Secretariat
Ministry of Environment / Secretariat for Institutional Coordination and Citizenship / A3P
Ministry of Environment / Secretariat for Climate Change and Environmental Quality (Department of Climate Change and Management of Ozone Layer Protection)
ELETROBRÁS / PROCEL
Brazilian Electricity Regulatory Agency (ANEEL)
National Bank for Economic and Social Development (BNDES)
ATLA Consulting

Engagement with the private sector typically took place at a lower level, as part of project activities such as events, workshops and training programmes. Communication channels between the Project team and sector organizations including ABESCO, ABRAS, ABRAVA, and FEBRABAN were open, however. There were Technical Cooperation Agreements with ABESCO, GBC, ANEEL, ESAF and Recife Municipality, as well as the Ceará Government and the Rio de Janeiro Municipality.

2.7 Project Management arrangement

The envisaged management arrangements can be summarized as follows[40]:

- National execution in accordance with standard UNDP national execution guidelines with MMA (through the Secretariat of Climate Change and Environmental Quality) as the leading executing agency in partnership with MME (this partnership did not materialize). Outcome 4 would be implemented by IDB given the peculiarities of the EEGM administration.[41]
- The financial execution of components 1, 2 and 3 lies with MMA. Component 3 is coordinated by the Ozone Layer Protection Management Unit and the first two by the Department of Climate Change. Both are part of the structure of the Secretariat of Climate Change and Environmental Quality.[42]
- Establishment of National Project Steering Committee (NPSC) to oversee the global implementation of the project during its entire execution. The NPSC would be composed of senior representatives from MMA, MME, Finance, and Public Planning, as well as national banks and

[38] Source: interview with ANIMA Consultancy, December 13, 2017.
[39] This is done through a Portária (ordinance), indicating the purpose and scope of the activities for which staff from other public administration entities are requested.
[40] CEO Endorsement Request July 29, 2009, p. 8.
[41] CEO Endorsement Request July 29, 2009, p. 8.
[42] Substantive Revision 2015 section 1.1, p.1

various private sector interests. The NPSC could not be established, notwithstanding advocacy by MMA and UNDP.

- A National Project Management Unit (PMU) to manage and supervise the Project, except Outcome 4 (EEGM). The PMU would have full-time staff members managed by a Project Coordinator who reports to the National Project Director (at the Environment Ministry) and the NPSC. The PMU consisted of MMA staff in public service, hence it was funded through co-finance resources. In 2012, UNDP contracted a Project Technical Advisor to complement Implementing Partner capacities, provide guidance and improve liaison between UNDP and MMA.
- Management of the EEGM by an experienced Administrator in Brazil. The role of the Administrator may also involve a coordinating entity or person which would outsource the relevant technical and financial expertise as and when needed. The Administrator would be selected by the IDB with involvement of UNDP and the NPSC through competitive bidding (...).[43] The role of the Administrator was assumed by Atla Consulting which initiated activities in 2012. [44]

Notwithstanding exhortations to this extent by the MTR, the NPSC could never be installed and was eventually replaced by a Technical Advisory Committee, which met at the following dates:

PROJECT TECHNICAL ADVISORY COMMITTEE (TAC) – MEETINGS	
2014	20 November
2015	24 March, 26 June, 1 September, 10 November
2016	2 March, 11 May, 24 August, 7 December
2017	24 April, 22 May, 24 August

The Government appointed a National Project Director (NPD) and National Project Coordinator (NPC) from within MMA. Reportedly[45] one tripartite meeting was held on 2 June 2015 concerning the restructuring of work plans and contracting of a consultancy to determine the Project baseline to support the Substantive Revision.[46] No earlier tripartite meetings or other oversight activities (by UNDP GEF or by the OFP or ABC) before that date were identified.[47]

There is no written evidence why the NPSC could not be established. The MTR refers to the "detachment of the MME from the Project" and "political difficulties associated with the setup of a NPSC" but does not provide a hint to the underlying reasons. A first reason can be that the public sector in Brazil must engage with the private sector through a firewall to prevent conflicts or interests, fraud and other abuses. The original NPSC composition did not respect this principle (which is reflected in the TAC). A second reason can be that without PROESCO and BNDES, the Project was no longer relevant to the Ministry. A third reason can be that, with the changes in project approach and partners and the weakened assumptions over time, the MME no longer believed in the Project.

[43] Project Document 2009, par. 63, p.21

[44] According to IDB, the Administrator was appointed by agreement of December 14, 2011, after a two-year selection process, which followed the internal procedures and criteria set by IDB. Email communication 20 February, 2018.

[45] Source: Audit FY-2016.

[46] Such consultancy was not implemented but the SR was developed internally (MMA comment 03 September 2018).

[47] Source: Audit FY-2014, p.3

3 Findings of the Evaluation

3.1 Project scope and design

Poor design has repeatedly been invoked in the PIRs as the main problem affecting Project delivery; the same stance was taken by the MTR. In the view of the Evaluator, poor design is not so obvious and therefore requires a closer look. Project preparation was done by UNDP and IDB Headquarters. Communication was maintained with the GEF on milestones and to receive feedback on the EEGM and the arrangements between the Agencies. The Prodoc and RF are detailed and probably exceed the average quality of GEF projects from this period, although there are some inconsistencies. The proposed indicators are appropriate though not always "SMART". The objective-level targets are overly ambitious[48] but this is a known issue with GEF CC projects from those years. The questions raised by GEF reviewers were addressed.

Notwithstanding, a certain discomfort remains visible in the Review Sheet even just prior to technical clearance by GEFSEC. The main issues highlighted (actual relevance of ESCOs, performance of PROESCO, lack of detailed baseline, impediments for Energy Performance Contracting (EPC) under public procurement, EEGM exit strategy) actually touch the basis of the Project's rationale and intervention logic. Obviously, such fundamental points cannot be just resolved "on paper" so the responses and adjustments made were cosmetic rather than substantial. Hence at the moment of CEO Endorsement, there was a risk that the Project – specifically the EEGM - might actually "miss the point".

Several facts were not fully considered: (i) project finance is not (yet) common practice for EE in building in Brazil; (ii) energy efficiency criteria are not commonly decisive for investment in (retrofitting of) buildings; (iii) investment in Brazil is substantially driven by equity rather than debt capital; and (iv) rapid ESCO development depends on more factors than just the availability of credit for project finance. These factors are well aligned with the observations from the 2001 UNEP report.[49] The depicted road map presents a series of hurdles that could hardly be controlled by a Project, let alone in the proposed timeframe and committing such ambitious results. The Project incurred into a high risk by addressing a problem that was probably not the right one to start with (i.e. it aimed to install the guarantee mechanism prior to doing advocacy and developing demand and capacity).

The Evaluator perceived a bias towards a pre-conceived solution rather than a careful construction of a theory of change and a validation of the proposed solution. Warning signals such as the persistently low demand for PROESCO, and the constraints to effectively apply private (ESCO) financing to public buildings were not taken seriously. By 2011, Econoler (the main consultant involved in the project design) had developed a good understanding of the market constraints for the EEGM and acknowledged the unrealistic ambitions of the GEF Project.[50] It was understood by then that EPC and the EEGM had little chance of success without underlying Monitoring and Verification (M&V). It is not clear if this growing insight was picked up by the Project team in Brazil or was used by the GEF Agencies to steer the Project but the issues were eventually pushed forward by the Project.

With the benefit of hindsight and supported by a project study[51], one also wonders why no serious attempt was made during project design to ensure that a PCG which involves three parties could actually be legally shaped and made robust and credible. It is not the first time that a financial instrument proposed by international agencies proves to be incompliant with national legislation. For the EEGM, one issue is the number of contract parties (three, which goes against common business logic). The other issue is the

[48] Especially for the number of ESCO-driven EE projects to be triggered, and the resulting GHG reduction benefits.

[49] See footnote 25.

[50] IFC Energy Service Company Market Analysis, final report, revised, by Econoler, 23 June 2011 (p.101-103). Another relevant publication analyzing specific and systemic barriers is: "Market Assessment for Promoting Energy Efficiency and Renewable Energy Investment in Brazil through Local Financial Institutions", also by Econoler for IFC (contract No.7153884), October 2010.

[51] Relatório Análise EEGM - Mecanismo de Garantia para Eficiência Energética, by Melo Campos Advogados and Impact Lab, Contract Nº JOF-0003-30185/2017 (2017).

role of IDB, which is placed outside Brazilian Law. While IDB's AAA status might have been an asset to back up BNDES at some point in time, in the current set-up, the actual Guarantor has been the GEF with IDB acting as the appraisal window, rather than a tiered approach with a national project appraisal body and a FI securing back-up elsewhere to control exposure.

One would want to understand how the EEGM fits into broader set of experiences with guarantee mechanisms in the region.[52] Neither GEF back-up nor IDB's role as appraisal agency are sustainable and the present EEGM arrangement seems an anomaly in this respect. The joint workshop in Mexico City (2012), where the GEF Project was presented, could have served as a starting point to integrate the GEF Project into a more strategic approach to FIs in Brazil - preferably under guidance of the IDB - but apparently, this did not happen.[53] The GEF Project seems to have operated rather isolated from the extensive work on the subject that was building up globally, which was a missed opportunity for the Project team and the GEF Agencies. In this context, the elimination of foreseen international consultancies from the Project budget may have had its impact.

Market assessments from that time describe the failures of PROESCO in simplistic and subjective language, rather than making an effort to engage with local stakeholders and understand market response. In this respect, it must be noted that a considerable body of expertise has built up since. Worthwhile mentioning is the analysis done in 2014 by the Brazilian Business Council for Sustainable Development (CEBDS)[54] which notes that alongside the common barriers "it is necessary to achieve a better understanding of how agents of energy efficiency markets act". It analyzes investment criteria by market actors and why EE considerations are not prioritized.[55] While perception by customers is a key aspect of private entrepreneurship, the project designers seemed to assume that it was enough to have a good product. This is one of the key lessons that should be drawn from this Project.

The CEBRD report analyzes successful cases in 14 countries; it also mentions the start of the EEGM in 2013. The study assesses the complexity of financial and non-financial solutions for the Brazilian market, assessing a Guarantee Fund as high-impact and of high complexity. Therefore, as of 2006, the GEF Project designers might have started offering simpler solutions to the market and gradually work towards more sophisticated solutions. In this respect, the CEBRD report (2014) confirms the need for a road map and suggests that the EEGM was ahead of its time for the Brazilian market. This opens the question whether a guarantee mechanism can play a role in the future, how relevant it is and for whom, i.e. for which class of market actors and (building) projects. A survey among the received applications to the EEGM may provide some responses to these questions.[56]

3.2 Barrier analysis and vertical logic

The vertical logic expressed in the RF is reasonably well but unfortunately, a number of assumptions proved invalid. By consequence, the Project does not lead to a sufficient and necessary set of outcomes

[52] An interesting study which explores the role of national development banks in promoting guarantees for a number of sector was published by IDB in 2014: "Guarantees for Green Markets: Potential and Challenges" by Marco Aldana, Isabella Braly-Cartillier e.a., IDB-MG-282, 2014.

[53] Report Financial Instruments to Promote Energy Efficiency: The experience from Local Financial Institutions In Latin America and the Caribbean, Joint Workshop of the IDB, KfW and NAFIN, October 18 & 19, 2012, Mexico City.

[54] "Removing barriers to financing energy efficiency in Brazil – Financial and non-financial solutions for market agents", Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável (CEBDS), Rio de Janeiro/RJ, Brazil, December 2014. Note that CEBDS entered into a partnership with the GEF Project.

[55] Ibidem, p.17.

[56] A recent study in this field is: "Transformative Investments for Energy Efficiency and Renewable Energy (TI4E) – Mapping Brazil's industrial energy efficiency market, opportunities, challenges, and assistance requirements to determine how best to unlock the existing industrial efficiency potential." by GIZ for the Carbon Trust, September 2017.

for delivery of the project objectives. The definition of outcomes and outputs is not always respected.[57] The most striking deficiency concerns Output 4.2 ("At least 250 projects approved under the EEGM and provided with guarantees"). This is obviously not an output (i.e. a direct result of GEF funds and co-finance support). This result is only achieved on the assumption of a strong, positive ESCO market response to the EEGM, which in itself cannot be controlled by the Project, but may happen if Outcome 4 is delivered and relevant, and if external factors do not prevent the market from responding within the timeframe set. Output 4.2 should have been set at impact level (project objective) and not at output level and even then it was very ambitious (unrealistic).

In this context, the comment by GEFSEC[58] is retrieved, which objects that "no investment co-financing has been committed". In fact, the turnover of the EEGM is used as a proxy for "real" investment sums which in turn are a proxy for estimating energy savings and GHG reductions – all this applied to a heterogeneous group of project types, technologies, scales, and baseline uses. As of 2006, there was a strong focus on short-term results among GEF project designers; while for this project, a more long-term focus on the roadmap towards ESCO and EEGM development would probably have led to a better and more sustainable approach (see also section 2.2.2).

Summarizing, the Evaluator concludes that the Project design was done with due diligence but that Project rationale and strategy were insufficiently underpinned with baseline information and a proper barrier analysis, and that some critical assumptions were not validated. Moreover, the complexity of the proposed solutions and the vast scope of the market addressed probably escape the deterministic approach typically applied in GEF project design.

3.3 Project implementation

3.3.1 Management arrangements

The management and project execution arrangements for a nationally implemented (NIM) project as described in the Project Document, were not fully implemented. Brazilian Law establishes that the functions of NPD and NPC cannot be transferred to another party and must rest with MMA. Hence the NPC is national public servant and cannot be recruited from project funds as usual. Specific Terms of Reference for these functions were drafted in the Project Document[59]. Legislation further prohibits the deployment of an externally-funded PMU inside a Federal Government Ministry. Hence a Project is either implemented by Ministry staff itself with national resources (which requires priorities and capacities are in place); or it relies on externally-based individuals hired with GEF funds and supported by assigned UNDP CO staff.[60] In 2012, a Technical Advisor (TA) was contracted (based at UNDP and funded from the Project) to complement MMA competences and facilitate liaison between UNDP and the Government, reportedly after lengthy reviews of the Terms of Reference.[61]

There are a range of factors here that relate to the way how International Cooperation projects are handled within the Brazilian Federal Government. From the perspective of this Project - and probably the GEF portfolio in Brazil as a whole - there is certainly room for clarification of roles and functions, and for more expedite procedures linking UNDP, the Executing Agency, and the GEF Operational Focal Point. It is highlighted that the OFP in Brazil does not assume the functions as expected by GEF. From the perspective

[57] According to the OECD Development Assistance Committee, outcomes are "the likely or achieved short-term and medium-term effects of an intervention's outputs. Outputs are the products, capital goods and services which result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes."
[58] GEFSEC Review 12 May 2009, Box 20: "Except for the MLF, no co-financing is securized".
[59] Project Document July 29, 2009, p. 56-58.
[60] In this case, UNDP counts with one Programme Analyst, one Programme Assistant and one Coordinator.
[61] Communication with former TA, 11 Jan 2018.

of public administration in Brazil, there may be good grounds for the current *modus operandi*.[62] A more active role of the Government could have ensured more adequate coordination between the GEF Agencies. With respect to Project implementation, UNDP CO has learned from these experiences and has therefore moved to a *de facto* assisted NIM with a key role for the Technical Advisor.

The minutes of the Technical Advisory Committee (TAC), which started November 2014 demonstrate that the dynamics of Project management greatly improved; simultaneously, project expenditure took off. MMA/SMCQ presided the trimestral TAC sessions, which analyzed the appropriateness and scope of potential project activities, reviewed TORs for contracted services and consultancies, set the action plan for the next 3-month period and effectively followed up on this. The NPC, TA and UNDP staff took charge of day-to-day management while the TAC served as a platform ensuring broad consensus among key public stakeholders and fine-tuning of ideas of proposals. The authority of the Project (such as for approving AWPs) formally rested with MMA (NPD), not with the Committee.

This arrangement proved highly effective and may serve as an interesting example for other projects (best practice). Two factors should be highlighted in this context: (1) the profound understanding of the EE market context in Brazil by the Committee members, as evidenced in the minutes of the Committee sessions. Sequential reading of these minutes reveals a process of exploring the barriers to EE investment in public buildings, a progressive focus on key information barriers, procurement modalities and contract models and, at last, commissioning of a series of highly relevant products delivered during the last two project years; and (2) the issuance of an ordinance by MMA formally convoking a select group of public stakeholders to become part of the Project, under leadership of MMA. On this basis, participation in the Committee proved to be constant and relevant over time.

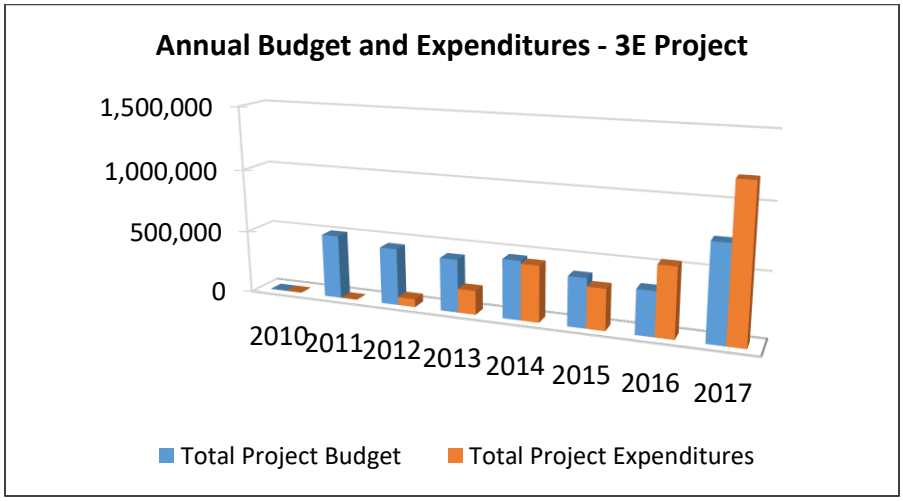
The EEGM (Outcome 4) was administered by Atla Consulting on behalf of IDB. The processes governing the involved IDB Project team and Atla are laid out in a document, updated in 2016.[63] Outstanding guarantees were monitored by the Portfolio Management Team at IDB Invest and new opportunities and periodic evaluations were discussed with the Project Team at IDB Invest. The Evaluator had no insight in evidence (meeting reports) to verify these processes and neither had the opportunity to meet the IDB Team. As a general appraisal, the management arrangement appears solid.

3.3.2 Financial Monitoring and Reporting

In the absence of a Steering Committee and annual tri-partite meetings, project management lacked the support to move forward. Records of strategic and operational management decisions are not available until 2013. A strategic focus towards annual results was absent and AWP targets were eventually moved to the next year. Until 2015, a cumulative lag between expenditures and budget planning was built up, as shown in the next figure for the "3E Project". Actual expenditure figures are taken from the consolidated Combined Delivery Reports (CDRs) over the period 2011-2017. After 2015, expenditures exceed the original budget. (See Annex G for more figures).

[62] An inquiry was made to the GEF OFP (by email on January 17, 2018) to further explain management of the GEF portfolio by the Government of Brazil (as it also involves the Brazilian Cooperation Agency – ABC) but no answer was obtained.

[63] Approval Procedure EEGM sub-projects, as updated February 29, 2016; provided by IDB Invest.



The Project assigned to MMA (BRA/09/G31 components 1 and 2) was audited three times by the Controladoria-Geral da União (CGU).[64] The audits covered the Project years 2011-2014; 2015-2016; and 2017, their scope being defined as follows: (a) relation between Project execution and work plans; (b) adequacy of internal control mechanisms finance, assets and administration; (c) conformity of expenditures with Prodoc and applicable standards and regulation, including documented justifications; and (d) implementation of previous audit recommendations; expenditures in audit year; location of assets and equipment not registered by the executing agency (MMA). The audits state that: (i) the CDRs are trustworthy and the cost items included supported by evidence and adequately documented; (ii) the internal control procedures were adequate.

The audits are positive with some minor comments and recommendations. In 2014, it was observed that only 21% of project resources had been spent. It was noted that an assessment of annual progress was not possible because the intermediate (annual) targets are not defined in the Prodoc, but as a general appraisal, the deployed activities arguably contribute to the defined outcomes. A recommendation was issued concerning the administrative processes, which should be strengthened. While progress has been made since, the Evaluator considers that there is still room for further improvement.[65]

By end 2016, cumulative disbursement of the MMA-executed outputs had increased to 47%. The 2016 audit raises this point to which the EA responded "that the pending contracts involve a large budget volume leading to full execution of remaining funds by end 2017". The audits observe a systematic under-expenditure per annum, which may point towards unrealistic planning, a sub-estimation of procurement processes, or, as the 2014 auditors suggest, "a problem in the definition of parameters".[66]

Based on a sample of activities, the 2016 audit further states that PIR 2016 is consistent and trustworthy and that procurement of goods and services was in conformity with applicable rules and in "abidance to the principals of legality, impersonality, morality, publicity, efficiency and objective appraisal". While progress towards the targets (for Outcome 1 and 2) is evident, the auditors consider it rather hard to establish a direct relation between these targets and the activities listed in the PIR and to assess their

[64] Under Service Order 201412173 (audit FY 2014), 201700296 (audit FY 2016) and 201702455 (audit FY 2017). The Project audits took place in the premises of SMCQ/MMA, from 05-10 February 2015, 13-17 February 2017, and 27 Nov-01 Dec 2017.

[65] As phrased by the 2015 audit: "Os processos são o registro do relato histórico dos procedimentos adotados dentro de determinada ação, disponível para consulta a posteriori, por quelquer cidadão." (Audit 2015, p.6)

[66] Audit FY 2014, p.4.

value in terms of reaching these targets. The Evaluator shares this observation, which is directly related to the lack of "SMART" indicators at outcome level.[67]

Concerning Outcome 4, IDB reported that the costs associated to the administration of the programme were higher than the aggregate fees generated by the guarantees issued (USD 4,602,284, see section 3.5.4.1) as shown in the following table.

OUTCOME 4 – EEGM ADMINISTRATION COSTS AND REVENUES	
ITEM	AMOUNT (USD)
Fees generated	406,966
Total Administration Costs	(1,488,722)
Gain (loss)	(1,081,756)

3.3.3 Monitoring and evaluation

UNDP has a range of instruments for project monitoring and evaluating progress and results, including the mandatory: (i) Project Inception Workshop and Report (IW/IR); (ii) Annual reporting (APR/PIR); (iii) Quarterly progress reports (QPR); (iv) Annual work plans (AWP); (v) Steering Committee meetings; (vi) Tripartite Reviews (TPR); and (vii) Mid-term and Terminal Evaluations (MTR/TE). These can be complemented with: (viii) field visits by UNDP (CO and RTA) to the project; and (ix) ad-hoc evaluations and expert missions. An M&E plan is supposed to be finalized at inception stage[68] and should include a time schedule of programmed M&E events.

The IW was a 1-day event and the IR is a brief 3-page document which falls short of the scope stipulated in the Prodoc[69]. A formal M&E plan was not produced.[70] For reference, the IR plus the (non-consolidated) agenda proposals by UNPD and IDB are attached (Annex J). As one can see, the IW did not conclude but rather initiated a process towards the establishment of the NPSC and NPC; neither did it prepare the first AWP. Follow-up actions were identified and assigned to the partners, but eventually the process took two years. As a lesson learnt, UNDP nowadays pays more attention to the inception process and considers it a key milestone in the project implementation cycle. Similarly, IDB usually requires a series of conditions prior to be in place before disbursement of project funds can start – these include having the full project team and administrative capacity in place. Another lesson drawn from this (and other) projects is, that having more than one ministry at the same project level (in this case MMA and MME) tends to be challenging.

A series of monitoring missions were conducted by the GEF Agencies involving UNDP CO, RTA[71], Project TA and IDB, as indicated in the following table[72]:

MONITORING MISSIONS TO THE PROJECT	
2011	23 September
2013	20 August; 17 December (by RTA)
2014	21-25 July (with IDB participation)
2015	25-26 August
2016	8-11 August; 29-31 August (with IDB participation)
2017	9-10 August

[67] Especially for Outcome 1, there is gap between the operational, activity-related quantitative output indicators, and the rather abstract result to "enable the EE offer". Proxy indicators could have been used, such as the number of partnerships closed, EE market activity, number of EE professionals, register of public bidding processes for EE/retrofitting, etc.

[68] This is the period in a project between Prodoc signature and the approval of the first Annual Work Plan.

[69] Prodoc, par. 98-101, p.31-32.

[70] Interview with former Project TA, 11 January 2018.

[71] Information retrieved from UNDP Administration, provided by Program Analyst UNDP/GEF in regional office Panama, 10 January 2018.

[72] Based on provided Back-to-Office Reports. The actual number of missions carried out may be larger.

Based on the limited records available, the Evaluator concludes that a reasonable effort was made by UNDP and IDB to follow-up on the project implementation process and progress.

In the first years, UNDP invested substantially in advocacy and articulation between stakeholders. No information is available whether IDB also contributed to this process but the Bank selected and contracted the EEGM Administrator Atla end 2011. When the TAC was installed, Atla Consultancy was invited as a member.

Progress monitoring was already a point of discussion before GEF endorsement, hence an end-of-project impact study was included in the indicative M&E Plan (estimated budget USD 60,000).[73] During the IW, the methodology and input parameters for evaluating the GHG reductions were questioned, as well as the need to establish a baseline and the feasibility of the project targets. The analysis and dissemination of lessons learnt was foreseen towards the end of the Project (USD 27,500). The Final Seminar (December 2017) provided a valuable platform for the exchange of experience but the Evaluator would welcome that these be systematized and made available to feed into future UNDP, IDB and GEF programming.

Adaptive management practices were applied by UNDP, notably by: (i) adjusting the Project's management structure and installing the TAC to circumvent the absence of a NPSC; and (ii) initiating the substantive revision of the Prodoc to address identified issues and incorporate the recommendations of the MTR. From the side of IDB, worth mentioning is the adjustment of the Partial Credit Guarantee in 2016 to address a larger range of EE projects under the EEGM.[74] Notwithstanding, the GEF funds put into the EEGM remained largely unused and the Agencies could have opted for more rigorous measures to apply the GEF funds to achieve global impact and make a contribution to the national development agenda.[75] From the latter perspective, adaptive management was insufficient to keep the project on track.

MONITORING AND EVALUATION	
CRITERIA	RATING
Monitoring and Evaluation	MS
Overall quality of M&E	MS
Application of adaptive management	MS
M&E Plan implementation	S
M&E design at project start-up	MS

3.3.4 Project documentation and reporting

The TE has found the reports produced by the Project and subcontractors of high quality and in correspondence with their Terms of Reference issued by UNDP and MMA. Atla Consulting produced a series of presentations for explaining and promoting the EEGM among market actors. Inputs from Atla and IDB were sent to UNDP to feed into the PIRs.

Project management reporting is reflected in Atlas and in a narrative form in the annual PIRs. Written evidence from the early project years (2010-2012) is scarce, which is primarily explained by the difficulties to establish the project management structure and the absence of a contracted Project Coordinator. Once

[73] CEO ER 2010, Table 9 Indicative M&E work plan and budget (p.35).

[74] IDB Approval Procedure EEGM sub-projects, as updated February 29, 2016.

[75] Without the intention of any benchmarking across projects and agencies, the Evaluator would like to recall the Krakow Energy Efficiency Project in Poland (GEF ID 786; World Bank P070246; GEF grant USD 11M), of which the Terminal Evaluation was posted 29 December 2014. The Project was designed to provide commercial banks partial coverage of risk exposures against loans made for EE projects in buildings throughout Poland. The Partial Guarantee Facility (USD 5.7M) was expected to leverage about US$ 39 million in debt financing for 390 EE projects but went unutilized and was eventually cancelled from the Project. This case is an example of adaptive management where the Agency intervened strongly based on a re-assessment of the market context during project execution.

the Project started operations and with the TA on board, reporting became expedite. As a suggestion, progress reporting per outcome in the PIRs could be more concise and in response to the indicators. To this extent, hands-on guidelines for implementing RBM could be issued or enforced since concise, standardized reporting saves time and facilitates tracking of progress over subsequent PIRs. With these comments in mind, the Evaluator rates reporting as Satisfactory (S).

3.3.4.1 Knowledge management

Knowledge Management (KM) was not an explicit aspect of project design under GEF 4 and GEF 5 but nowadays it is. MMA has created a web portal to make available products and presentations of the Project to a broader public.[76] Analysis and conclusions concerning EE market development and the achievements of the GEF project in particular are not made however. Analysis and the aggregation of results adds value to the KM process as it facilitates accessibility to information and interpretation of results by external stakeholders (cooperation agencies, other governments, professionals, among others)

The Evaluator emphasizes the Prodoc instructions to the IP to keep track of relevant project information from Project start. For some reason, effective KM tends to be problematic. One reason is probably that IPs in the first project years tend to focus on securing political support within the organization; and on fully understanding the project problem and context. Another reason can be a lack of experience and vision to know upfront which information and data should be systematized. The development of a template to this purpose during the inception phase may assist the IP (specifically the NPC) to structure the KM process. From a broader perspective, UNDP may consider including KM into a web-based application.

An alternative approach can be to hire a consultancy before MTR and TE to collect and systematize project information and extract lessons and knowledge. This option is foreseen already in the standard M&E plan. However, this approach is less robust in a context with frequent staff rotation. Current UNDP Guidelines require the NPC to be under contract until completion of the TE. In practice, this may be hard to enforce as consultants tend to look for a new job during the last year of a project. Therefore, the Evaluator highly recommends to implement an active KM system throughout the duration of a Project.

3.3.5 Coordination between stakeholders

Coordination with sector stakeholders was limited during project design. The key Government stakeholders took part in the Inception Workshop. During the first project year, coordination between MMA and MME did not result in the envisaged Project management structure. Coordination greatly improved once the TAC was established with participation of key Ministries and other public entities.

In later Project years, a number of partnerships was established or promoted. The Project successfully fostered engagement with stakeholders in peripheral states of Brazil. It organized events and seminars for Project dissemination and interaction with - and between- stakeholders. The Evaluator attended the final Seminar held in Brasilia (14-15 December 2017) which demonstrated a comprehensive view on the challenges and opportunities for EE in public and private buildings in Brazil. In summary, the Evaluator judges stakeholder coordination as Satisfactory (S).

3.3.6 Quality of IA and EA implementation

For evaluation of the IA's role and performance – rather than the Project itself – reference is made to the evaluation questions (Annex D, Table 4a-c).

[76] http://mma.gov.br/component/k2/item/10577-p-r-o-j-e-t-o-3e

3.3.6.1 UNDP implementation

The Evaluation observes a reasonable focus on the achievement of results although more holistically than on a year-by-year basis. Progress tracking is hampered by the lack of annual targets in the Prodoc. Since the Project started with great delay and the end targets were not realistic, the PIRs made a continuous effort to explain these circumstances. This situation was rather uncomfortable for UNDP and its partners.

UNDP made a considerable advocacy effort to support MMA to install the Project institutions but also ran into the (legal) limitations to install a full-fledged PMU within the Government. The TE lacks information for a proper assessment of UNDP staff capacity and resources and its relation to the use of the Agency Fee. As a general appraisal, projects executed under NIM still need substantial CO support in terms of advocacy, strategic guidance and operational support, which is not duly accounted for during project design. The CO therefore provided assistance that went beyond the scope of a typical NIM.

The appointment of the TA (2012) greatly improved liaison capacity and direct support to MMA and the Project. The position of a TA in a Project is a good practice worth consideration by GEF project designers. While UNDP interaction with the Government can often be portfolio-based, this does not work well if Government oversight is fragment or roles are not clear, in which case intensive engagement at project-level is needed, increasing transaction costs.

PIR reporting was acceptable, but the Evaluator would prefer more concise reporting in line with SMART indicators. With unrealistic targets to be met, the PIRs could not be exempt from candor. In this respect, the Evaluator would welcome sound realism, also from the GEF, to take stock of what can actually be achieved so that CO and the IP can focus on content rather than pleasing higher management levels and the donor. Unfortunately, documentation from the early project years seems somewhat scattered. Relevant factors include: (i) the initial lack of clarity on roles; (ii) the need for some UNDP support (assisted NIM), which was initially not acknowledged; and (iii) transition to a new management system within UNDP; among others.

Risk management was conform the procedures but the Evaluator would prefer a more active reflection on identified risks and include a validity check of underlying assumptions. Greater benefit could be taken from active risk monitoring for project monitoring and steering.

The TAC, in which UNDP CO took seat, showed a profound understanding of opportunities and issues and quickly developed a working agenda to develop project activities, TOR, contracted consultancies and partnerships. However, a strategic discussion between UNDP, IDB and the Government on the Project content, its key results and exit strategy did not take place. This is a serious omission which may jeopardize the sustainability of the Project's outcomes. Based on the above, the Evaluator rates the role of UNDP as GEF Implementing Agency as Satisfactory (S).

3.3.6.2 IDB implementation

In a tandem with Atla Consulting, IDB Invest provided adequate support to the EEGM and had a team for project appraisal and issuance and monitoring of the PCGs. The Evaluator had no access to information to judge internal staff capacity and resources but observes that financial reporting was adequate and shared with UNDP to feed into the PIRs. Annual progress monitoring does not show a focus to keep the GEF project on track towards attainment of the committed GHG reductions and investment. However, achieved GHG reductions and investment at end-of-project were duly reported.

No adaptive management has been applied to re-define project activities or budget to deliver on the key GEF indicators within the Project's timeframe. The value created by the GEF resources managed by IDB (US$ 10M) is poor and opportunities to diversify and test alternative financial and non-financial solutions were not explored. On the other hand, about USD 9M remain unused.

The exit strategy provided by IDB Invest[77] is essentially based on financial-operational considerations but does not provide answers to the initial questions how an EEGM should be shaped in Brazil, how relevant it is and for whom, and to whom the EEGM should be handed over. It rather confirms that the initial assumptions were incorrect and that the chosen set-up did not work; one does not need a 7-year project to ascertain this. The exit strategy does not pay tribute to the ongoing work by the IDB Group on the subject and the body of expertise built up since Project start. This reduced scope is not what one would expect from a GEF IA.

A strategic dialogue between the Government, UNDP and IDB did not develop. At the operational level, there was no need for IDB to engage with the Government since it engaged with EE market actors through Atla Consulting. However, the GEF project funds were assigned from Brazil's RAF-4 CC allocation, which enters through the Government, hence one would expect an institutional relation as well, possibly involving the IDB office in Brazil. The absence of the GEF OFP in the process should also be highlighted, which would normally ensure adequate engagement with the Agencies.

In this context, the restructuring of the Bank is recalled: *"After a realignment process that kicked off in 2013 and was officially sanctioned by the Bank's board of governors at its annual meeting two years later, in January 2016, the IDB Group officially consolidated all of its private sector investment activities into the Inter-American Investment Corp (IIC)"*.[78] The contact between the Evaluator and the Bank has been with IDB Invest, which operates under the IIC. The Evaluator directed a series of questions: (i) to understand how this Project was monitored as part of the Bank's GEF portfolio and other initiatives on EE financing and ESCOs; (ii) how the IDB process for a GEF TE is structured; and (iii) whether IDB Guidelines for such evaluation are in place. The questions were ignored or could not be answered.

The Evaluator considers it an omission that project partners are not duly informed how the restructuring would institutionally and operationally impact on the Project and on the collaboration modalities. As of June 2018, operational interaction exists with IDB Invest but institutionally, UNDP nor the Government seem to know the entry point to engage with the Bank concerning the Project. The Evaluator questions whether the liability as a GEF Agency (which is described and for which fiduciary standards exist) rests fully with IDB Invest. There may be a blank spot that can only be clarified by the IDB Group and the GEF.

Without certainty about the status of IDB Invest as the GEF Implementing Agency, the Evaluator is Unable to Assess (UA) its role as such.

3.3.6.3 MMA implementation

MMA acted as the lead Implementing Partner (Executing Agency) for the Project, delivering the NPD and NPC and supporting staff. During the first years, MMA could not establish the NPSC as MME decided not to take part in the Project. Once it was agreed to change the project structure and create the TAC, implementation became more expedite. The justification of the SR may serve to demonstrate the level of ownership and understanding of the Project context which had grown with MMA (see Annex F).

Constraints in public administration law impede a full-fledged NIM within the Government. Since the Project team consisted of public servants, their availability for the Project was not full-time and activities expected under NIM sometimes got compromised. No detailed records of time dedication by Government staff to the Project have been made available, hence a quantitative assessment of IP capacity cannot be made. Back-up from UNDP and the appointment of a Project Technical Advisor were needed to circumvent this problem, putting substantial management tasks in hands of UNDP (but not political choices, which rest with MMA). The tandem UNDP-MMA performed well but with higher transaction costs than supposed under a NIM.

[77] IDB Invest – Memorandum "Exit strategy for the Energy Efficiency Guarantee Mechanism (BR-XI018)", 24 May 2018.

[78] Source: https://www.devex.com/news/how-the-inter-american-development-bank-is-restructuring-its-private-sector-financing-88105

With respect to reporting, reference is made to the comments in section 3.3.6.1; it is likely that UNDP and the TA did the larger share of work. Concerning the focus on results, also see under UNDP.

From the engagement with MMA project staff and comments by UNDP CO, the Evaluator deduces that knowledge of GEF and UNDP procedures could have been stronger. This requires an investment in training which is only effective if staff remains in position for a longer period. Staff well-versed in reporting and monitoring will feel more confident to focus on key issues and becomes more expedite. Project products and other evidence submitted to the Evaluator were not structured along the vertical logic of the Project. Achievements on output indicators (such as number of people trained) were not always consolidated and tended to change during the TE, which made verification of results a tedious job. It is noted that, as per UNDP GEF TE Guidelines, aggregation of results is assumed to be completed prior to starting the TE.

The Evaluator further perceived rather low awareness of the NPC of the full mandate of an IP under NIM. In this respect, stronger political back-up from higher levels would have been welcomed to integrate project activities and anticipate on a clear exit strategy. Bearing in mind these limitations, the Evaluator believes that the project team did a good job on the ground and proved effective in engaging with a large number of stakeholders. Based on the above, the Evaluator rates the role of MMA as the Implementing Partner as Satisfactory (S).

3.3.6.4 IA and IP Rating

IA (UNDP AND IDB) AND IP (MMA) IMPLEMENTATION	
CRITERIA	RATING
Overall quality of IA/IP Execution	S
IA execution - UNDP	S
IA execution – IDB	UA
IP execution – MMA	S

3.4 Project results

In line with the Evaluation methodology, the project outcomes will be assessed and rated on the dimensions relevance, effectiveness, and efficiency. Relevance refers to the appropriateness of the Project to address a development problem in line with national priorities and GEF and UNDP objectives. Effectiveness considers the ability of the Project to reach the objectives set forth. Efficiency refers to the cost-effectiveness of the Project and the delivery of results in relation to its cost and the projected timeline.

Information on achieved results and impact was not fully consolidated by end 2017. The Evaluator has used the following sources as means of verification: (1) PIR 2017; (2) Reports by subcontractors of the Project; (3) Email communication from Atla Consulting (23 January 2018); (4) IDB Invest/Atla EEGM Project Presentation (16 February 2018; updated 19 June 2018); and (5) Spreadsheet by NPC (7 June 2018).

A detailed evaluation of achieved direct and indirect GHG emission reductions (from the EEGM and investment in public buildings) was not prepared prior to the TE and as far as the Evaluator can observe, input data to this purpose were not collected and centralized for consolidation. The Evaluator has had no insight in the feasibility studies underpinning the investments made. Neither did the Chiller Project (BRA/12/G77) track the GHG emission reductions that can be attributed to the retrofits.

3.4.1 Overall Project results

Relevance

As a general appraisal, the Project was clearly aligned with national and global environmental priorities as described in the CEO ER. Rising energy costs in Brazil, increased fiscal budget controls for public buildings,

a need for mobilizing investment capital to reduce the GHG footprint of the building sector, in a context of progressive global climate change, reconfirm the relevance of the Project's subject and scope. With positive developments in the financial market and increased awareness of ESCOs and building operators, the design of appropriate financing mechanisms also gained relevance.

Effectiveness

The achievement of the Project in terms of the objective-level targets mainly involves the leveraged investment, energy savings and associated GHG reductions (GEF-5 CCM indicators). No comprehensive data were made available to the Evaluator, hence an approximation was made based on the limited information and some educated guesses (see Annex J). The results are summarized in the next table. These figures provide a reasonable indication of the direct contribution of the project to the GEF CCM indicators.

PROJECT MARKET TRANSFORMATION FOR ENERGY EFFICIENCY IN BUILDINGS (GEF ID 2941) – ESTIMATED CONTRIBUTION TO GEF-5 CCM INDICATORS						
Building	Energy savings		GHG reductions[79]		Investment	
	(MWh/yr)	(MWh)	(t CO2/yr)	(t CO2)	(USD)	(RS)
DIRECT						
Chiller Birmann 21	696	6,960	409	4,904	(undisclosed)	
EEGM (6 buildings)	38,719	371,033	22,775	218,242	17,486,451	56,831,000
3 approved public buildings	4,227	42,266	2,486	24,861	1,200,462	3,901,500
ANEEL building	2,118	21,183	1,246	12.460	2,950,000	9,600,000
Total	45,760	441,443	26,916	259,657	21,641,000	70,332,000
INDIRECT (POST-PROJECT REPLICATION)[80]						
Public Building portfolio (17)	23,951	239,509	14,088	140,879	6,800,000	22,100,000

The figures are presented in the following table to allow for a comparison with the targets. As can be seen in the table, the Project underperformed with respect to leveraging of investment in EE under the Project (31%). It delivered about 54% of the direct emission reductions. In this context, the overambitious targets and the Project design centered on the EEGM, are recalled.

It is observed that these benefits were achieved in about half of the original 7-year Project duration under adverse market conditions. From this perspective, the achievement is significant although not as satisfactory as hoped. The indirect benefits fall short of the estimate (13% of the target), also because no replication of the EEGM is assumed. Given the large uncertainties in the parameters and the impossibility to quantify the impact that can be attributed to the Project, no attempt is made to further estimate post-project and indirect GHG emission reductions.

[79] The given GHG estimates have the sole purpose to enable a comparison with the targets defined in the GEF CEO Endorsement Request (2010). The reductions are based on estimates of electricity savings and production from installed RE/EE technologies in buildings. A GHG intensity factor of 0.5882 tCO2/MWh is used (IGES 2017), which is slightly higher than value used in the CEO ER (0.502 tCO2/MWh). For more information on the assumptions made, please refer to Annex J.

[80] The estimated replication is based on the assumption that investment will occur in all 20 audited buildings.

PROJECT OVERALL EFFECTIVENESS – OBJECTIVE LEVEL INDICATORS			
OBJECTIVE INDICATOR[81]	TARGET (SR)	ACHIEVED (AS OF 01 JULY 2018)	ACHIEVEMENT (%)
Increase in investment in EE in public and private building sectors due to the Project (1)	USD93 million	Direct: *USD 21.6M* *Post-project: USD 6.8M* *Total: USD 28.4M*	31%
Direct and indirect GHG emission reductions attributable to the Project	Direct: 485,100 tCO2; Post-project and indirect: 2,910,600 tCO2.	Direct: 260,000 tCO2 Post-project: 140,000 tCO2	54% 14%
Number of Financial Institutions (FIs) offering energy saving guarantee services through EEGM or other sources (3)	At least 10 FIs	4 FIs	40%
Number of new, implemented energy efficiency (EE) projects using the EEGM or other similar mechanisms due to the Project (4)	At least 35 projects approved under the EEGM and provided with guarantees	Size (6) projects provided with guarantees; total guarantee amount issued: USD 4,602,248	17%

Efficiency

The Evaluation has reviewed a sample of the services and goods procured under the Project. Since price levels vary from country to country, it is difficult to make comparisons with Projects in other countries. Reference (unit) prices are not available for tailored consultancies and services as requested under the Project. As a general appraisal, the Evaluator judges the value of the services and products received as acceptable or good in relation to their cost. The financial audits FY-2014 and FY-2016 arrived at similar conclusions.

As per 31 December 2017, the Project had disbursed or committed 92% of its GEF funds, according to the following Table.

REMAINING GEF BUDGET PER 31 DECEMBER 2017		
BUDGET	(US$)	(%)
Total project funds (GE)	3,304,500.00	100%
Total expenditure as of 31/12/17	(2,741,629)	(83%)
Remainder	562,871	17.0%
Estimated encumbrance[82]	(300,000)	(9%)
Nett remainder	262,871	8.0%

The main changes in type of budget category are: (i) reduction in international consultants from US$ 281,250 to US$ 34,494; (ii) reduction in local consultants from US$ 1,250,000 to US$ 24,633; and (iii) increase of contractual services by companies from US$ 333,420 to US$ 1,883,378.

DIFFERENCE ACTUAL EXPENDITURES AND ORIGINAL BUDGET FOR MAIN ATLAS BUDGET LINES					
DISTRIBUTION PER BUDGET LINE (GEF)		PROJECT DOCUMENT (US$)		ACTUAL EXPENDITURE (US$)	
71200	International Consultants	281,250	8.5%	34,494	1.3%
71300	Local Consultants	1,250,000	37.8%	24,633	0.9%
71400	Contractual Services – Individuals	542,967	16.4%	346,849	12.7%
71600	Travel	607,267	18.4%	221,092	8.1%
72100	Contractual Services – Companies	333,420	10.1%	1,883,378	68.7%

[81] The numbers in parenthesis correspond to the related indicator in the Project Implementation Review (PIR) 2017.

[82] Estimation provided by UNDP CO, December 2017.

While total expenditures per Component closely match the original budget, there are significant changes in the allocation per budget line. A detailed comparison between the Project GEF budget and the actual expenditures, is provided in Annex G. One reason for the reduction in local consultants was the impossibility to integrated teams of public servants and external consultants. The original budget anticipated long-term consultancies under Outcome 1 (training, US$ 340,000) and Outcome 2 (advisor for the PBI, US$ 340,000 and US$ 240,000). For individual local consultancies, the contractual services line (71400) was used over individual contracts (71300).

International consultancies were limited to the MTR and TE but foreign know-how and best practices were incorporated through partnerships with an international orientation, such as Green Building Council, Brazilian Sustainable Building Council, ABESCO, ABRAVA, and others. The majority of the original individual consultancy services were embedded into the contracted services from specialized companies (72100), which make up 2/3 of the total expenditures.[83] As a final note, the baseline/end-of-project study mentioned in the original budget (US$ 82,967) was not implemented.

Project management costs (PMC) were budgeted at USD 490,000 (15% of total GEF budget). This is high for current GEF standards (5%). The actual PMC expenditures stayed within this budget. Travel costs were significantly lower than budgeted, also due to the shift in modality from individuals to contractual services (72100). Since expenditures between 2010-2014 were very low, the share of PMC was high during that period. In hindsight, the volume of TA activities delivered could probably have been executed in 4 years (instead of 7), thereby reducing PMC costs and increasing overall efficiency.

Currency exchange rate effects were moderate during the Project implementation project. The USD gained value compared to the BRL over the last project years, likely enough to offset inflation during the Project period and maintain the original purchase power of the GEF funds. It is observed that the EEGM used a cushion of 25% of the GEF funds to absorb the currency risk. It is clear that the total GEF project budget was dominated by the design of the EEGM. With demand lower than assumed, this Outcome became overbudgeted: probably an amount of US$ 3-4M would have been sufficient to cover exposure under the current EEGM operation period.

Cofinance

The following table summarizes the cofinance as committed at CEO ER and actually achieved.

Planned and actual co-financing committed to the Project (in million USD)								
Co-financing (type/source)	GEF Agenc(y)(ies)		Government		Other partners		Total	
	planned	actual	planned	actual	planned	actual	planned	actual
Grants	1.0[84]	1.0	-	-	-	-	1.0	1.0
Loans/concessions	15.0	15.0[85]	-	-	105.2	21.6[86]	120.2	36.6
In-kind support	-	-	0.4	2.0[87]	1.1	n/a[88]	1.5	2.0
Totals	16.0	16.0	0.4	2.0	106.3	21.6	122.7	39.6

The participation of public staff in the project deserves acknowledgement as a demonstration of Government commitment to the Project objectives and direct support to its implementation. This cofinance was not tracked during the Project. Work spent by MMA staff (5 people) on the Project amounts to approx. BRL 1.9 million (USD 560,000) over the period 2014-2017. The Evaluator assesses the in-kind

[83] CEO Endorsement Request, 29 July 2009, Annex C, p.41.
[84] MLF resources implemented by UNDP CO.
[85] IDB committed guarantee.
[86] Investment in 6 EE projects under EEGM.
[87] Not tracked. Estimated value of Government in-kind support (USD 2M).
[88] Not tracked.

support from MMA and other Government partners as very substantial and of high quality (adding to the implementation capacity and results of the Project). It may represent a value in the range of USD 2-3 million over the full project period.

3.5 Project results per outcome

3.5.1 Outcome 1: Enhanced EE investments through Capacity Building in EE in private and public sector buildings. (Budget: US$ 1,368,170 GEF; US$ 500,000 cofinance)

3.5.1.1 Description of activities and delivered outputs

The purpose of Outcome 1 was to develop capacity in Brazil for identification, formulation, implementation and management of EE projects in the buildings sector. [89] The RF indicators (see table section 3.5.1.3) essentially refer to individuals and institutions trained (6, 7) and people informed or made aware on EE (7). The identified target groups included buildings administrators, owners, technical staff, service providers (consultants and ESCOs), architects and engineers, and banks and other financial institutions, for a total of 5,000 trainees. Ample geographical coverage was foreseen through activities in at least 10 large cities. The Prodoc provided a detailed list of topics per target group.

In order to reach its objective to build market capacity (indicator 5), the implemented activities were broadened to include certification of energy professionals on measuring and evaluation methodologies pursuant to the rules of ANEEL´s PEE programme and the Efficiency Valuation Organization (EVO) International Performance Measurement and Verification Protocol (IPMVP). In total, the Project enhanced professional competences among approx. 1,000 individuals, including IPMVP certification (59) and creating capacities to apply methodologies under the ANEEL PEE, which is an asset for project pipeline development.

Energy professionals can only operate effectively in the market if they can draw upon proven and accepted tools and methodologies. At baseline, the use of such tools was limited to pioneers but they were not included in formal regulation or part of the Engineer's standards. The Project made a great contribution to filling this void by adapting tools and methodologies to the Brazilian context, create proficiency on their use among energy professionals, and integrate these into some national EE policy and programmes.

These outputs contribute to both Outcome 1 and Outcome 2 (indicator 9). More importantly, the activities made a substantial contribution towards a functional EE market in public and private buildings (Outcome 1) and also enabled direct interventions in public sector buildings (Outcome 2). This is a great achievement and can largely be ascribed to the analysis and orientation done by the Project's TAC.

The following tables provides a summary of the deliveries under Outcome 1, compiled by the Evaluator from the PIR 2017 and additional information provided by MMA[90].

Outcome 1 – EE Tools, Templates and Platforms developed with Project Support			
Type of capacity building	Activity	Web Reference	Contract
Tools	Two energy contracting simulators SICE and SIAD.	proben.ufpel.edu.br	Project arrangement with the Universidade Federal de Pelotas (UFPEL)
	Energy Performance tool for building operations.	n/a	Conselho Brasileiro de Construção Sustentável, BRA 10-33056/2015

[89] Project Document, p.12-14.
[90] Table provided by formed NPC MMA, 7 May 2018.

Templates	Energy audit format for use under the EEGM – minimum requirements according to ASHRAE.	n/a	Ação Engenharia
	Model for appraisal and classification of EE projects in buildings – minimum requirements according to ASHRAE.		
	Terms of Reference for EE retrofit in public buildings - based on MMA Building Bloco B.	n/a	Project team internal work
	Technical justification note for EE retrofit buildings.	n/a	Project team internal work
Platforms	The ProjetEEE platform.	projeteee.mma.gov.br	Project team internal work and service contract

Project publications were distributed to all professionals participating in the training courses and in the events attended by the project's technical team, including (i) Green Building 2016 and 2017, (ii) Habitat III Conference, and (iii) Encounter of the Municipalities with Sustainable Development – EMDS (2017). Initiatives worth mentioning include further the Final Seminar of the 3E Project with participation of the TAC and key project partners, and the First ProjetEEE Prize for Bioclimatic Architecture. A traveling exhibition of the technical videos produced by the project toured several governmental and sector organizations in the period, namely Agência Nacional de Águas, IBAMA, ICMBio, MCTI, MDIC, MEC, MME, MPOG, BNDES, Eletrobras and Sinduscon.

OUTCOME 1 – SUMMARY OF CAPACITY BUILDING ACTIVITIES DELIVERED					
TYPE OF CAPACITY BUILDING	SUPPORT CONTEXT	ACTIVITY	PARTNERS	CONTRACT	INDIVIDUALS ADDRESSED
Specific training	Energy labeling of buildings (PBE Edifica)	Training on energy labeling in support of the PROCEL - PBE Edifica labelling programme through 26 training event.	PROCEL	BRA10-34190/2016	823
	Energy performance contracting (EPC)	Capacity buildings about models to access the EEGM.	Universidade Caixa, ABESCO	BRA 10-25221/2013	35
		Training on the design of public-private partnerships of EE building projects under EPC.	Mailing list compiled from contacts and participants of project events.	BRA 10-35645/2017	50
		Training on the application of EPC contracts under the ANEEL PEE	ANEEL; candidates approached through mailing list compiled from contacts and participants of project events.	BRA 10 35229-35230/2017	25
	EE benchmarking	Training on installation and operation of energy meters for benchmarking data collection and analysis.	Managers of 20 selected public buildings.	BRA 10-33056/2015	33
		Training on the use of energy monitoring software for EE benchmarking and management	Managers of 20 selected public buildings.	BRA 10-33056/2015	38
Certification of professionals	EVO Training and Certification	Training and certification of professionals on Efficiency Valuation Organization (EVO) International Performance Measurement and Verification Protocol (IPMVP).	ANEEL and SENAI	BRA 10-34557/2-16	82
		Training and certification of professionals on ANEEL PEE methodology (São Paulo/SP, Brasília/DF, Rio de Janeiro/RJ, Porto Alegre/RS, Florianópolis/SC and Salvador/BA).			191
Support workshops and events by the Project team and partners	Awareness and general capacity building	Information and dissemination of intermediate results of 3E Project	Green Building Council	Implemented by Project team and partners	630
		Training of EE financing	Green Building Council		
	Support to public sector	EE retrofitting	A3P Forum and others		220
		Capacity building on energy benchmarking in public buildings and available public funding programs	CITENEL/SEENEL ww.citenel.gov.br		200
		Support to the PROPrograma de Bom Uso Energético- PROBEN	Universidade Federal de Pelotas- UFPEL		79

3.5.1.2 Relevance

The outputs delivered are certainly supportive for EE market development, as such, relevance of this outcome is rated Highly Satisfactory (HS).

3.5.1.3 Effectiveness

The following table assesses the achievement of the outputs delivered in relation to the indicators for Outcome 1 in the Project's SRF. Based on a review of the material provided (training material, websites) as well as interviews with stakeholders, quality and appropriateness of the activities is evaluated as very good. Although the original target of 5,000 professionals has not been reached, there has been overcompliance in other activities. The alignment with PBE/Edifica and the ANEEL EE program further contributed to the effectiveness of the capacity building. As such, the Evaluator assesses the effectiveness as Highly Satisfactory (HS).

OUTCOME 1: ENHANCED EE INVESTMENTS THROUGH CAPACITY BUILDING IN EE IN PRIVATE & PUBLIC BUILDINGS			
OUTCOME/OUTPUT INDICATOR[91]	TARGET (SR)	ACHIEVED (AS OF 31 DEC 2017)	ACHIEVEMENT (%)
EE offer fully functional for public and private building sector (5)	EE building market capacity building in progress	See text	Highly Satisfactory
Number of stakeholders (building managers, entrepreneurs, equipment providers, ESCOs) advised or trained (6)	1400 ESCOs, Equipment providers, Building owner/managers association, Engineers associations, Technical Education institutions and Universities strengthened	About 1,000 professionals trained on EE; 571 professionals trained on EVO/IPMVP and guidelines for ANEEL´s EE programme[92]; 96 participants (17%) were women.	100%
Number of people from public and private building sectors trained (7)	Up to 5,000	1,930 professionals from public and private sector	40%[93].
Number of stakeholders reached with project publications (7)	At least 2,000	More than 53,000 people reached through MMA publications and websites, and 8,600 views through UNDP	100% or better[94]
Number of unique visitors to Project´s web site (7)	At least 1,000 per month in 6 months after website launch	Project website with over 1,000 views per month;[95] In addition, the ProjetEEE platform was launched, which receives over 15,800 page views monthly.[96]	100% or better[97]

Since the outcome indicator (5) is not "SMART", the question arises to what extent the EE market is ready now and what challenges remain. Information to this extent was not systematized to feed into the TE. As a recommendation, the Evaluator would like to see a wrap-up exercise of the current status. The contributions to the final Project seminar (December 2017) may serve as a useful starting point.

In this context, it is noted that an explicit exit strategy for Outcome 1 is not in place. The Project has been able to bring professionals and institutional stakeholders together and has transferred new competences. Highly positive is the preoccupation of the stakeholders with the exit strategy of the training modules and

[91] The numbers in parenthesis correspond to the related indicator in the Project Implementation Review (PIR) 2017.

[92] Activity "Capacitacao em Medicao e Verificacao", Contract No. BRA10-34557/2016, by ANIMA Consulting, Niterói/RJ. 273 people successfully concluded the training and 60 of them became IPMVP certified.

[93] Additional relevant outputs include manuals and guidelines, hence in the medium-term the target may well be reached.

[94] A characterization of this public according to stakeholder group is not available.

[95] http://www.mma.gov.br/informma/item/10577-p-r-o-j-e-t-o-3e

[96] http://projeteee.mma.gov.br/

[97] The ProjetEEE platform is also used for educational purposes.

tools, including institutionalization within the Superior School of Financial Administration (ESAF), alliances with industry organizations (ABESCO, ABRAVA), banking sector (FEBRABAN). The situation created generates confidence that professional training in EE has achieved momentum and activities will be continued without a need for additional GEF support.

However, one would like the role of the Project to oversee and convoke the market to be continued. This function is not automatically assumed by MMA. The Evaluator would recommend MMA and UNDP to engage with MME on this point and evaluate the options. One suggestion is to continue the TAC as a kind of consultative organ for public programs (ANEEL PEE and others). The Project achieved a substantial degree of problem ownership that should not get lost.

3.5.1.4 Efficiency

The close interaction with baseline programmes and the establishment of partnerships also point into high efficiency. A question that can be raised is the distribution of the activities over the project time span, as most training was carried out in the period 2014-2017 instead of spread out over 7 years as originally proposed. Albeit somewhat of a rush towards the end (especially in 2017), there are good indications that timing was more favorable towards the end of the Project period (2015-2017) and the market more receptive for absorbing the delivered TA products.

Since it is unlikely that this progress would have been achieved without GEF support, incrementality of the latter seems assured. Based on these considerations, the Evaluator rates efficiency as: Satisfactory (S).

3.5.1.5 Outcome rating

OUTCOME 1: ENHANCED EE INVESTMENTS THROUGH CAPACITY BUILDING IN EE IN PRIVATE AND PUBLIC SECTOR BUILDINGS	
CRITERIA	RATING
Overall quality of project outcome	HS
Relevance	HS
Effectiveness	HS
Efficiency	S

3.5.2 Outcome 2: Access to EE services and commercial financing for public sector buildings enhanced with the support and strengthening of existing public initiatives. (Budget: US$ 1,183,330 GEF; US$ 160,000 cofinance)

3.5.2.1 Description of activities and delivered outputs

Outcome 2 was revised in the SR considering the observations made in the MTR[98]. The Project commissioned a study to assess the status of performance contracts in the private sector in Brazil (since these contracts were virtually non-existent in the public sector), which indicated that such contracts should be used with special caution if applied to the public sector. Alternative contract modalities for the public sector were to be considered as well, such as: Public-Private Partnerships (PPPs), Differentiated Contracting Regime (RDC), and submission of projects for calls for proposal from Energy Concessionaires, according to ANEEL's new Energy Efficiency Program Procedures (PROPEE). The Substantive Revision therefore re-frames the PBI as the set of Federal Government baseline activities and proposes to take benefit from the Project BRA/09/G31 to enhance these.

The RF indicators for outcome 2 (see table section 3.5.2.3) refer to the delivery of supportive instruments for benchmarking of public buildings (8), capacity building (9, overlapping with Outcome 1), calls for

[98] MTR, p.61

projects (9, 10) and preparation of a few demonstration pilots. Investment in two public buildings was realized during the Project, which is captured in the original indicators (the ANEEL headquarters and the MMA Bloco B building at the Esplanada Monumental, both in Brasilia). The investment proposals were channeled through the local electricity distribution company (CEB) under the ANEEL PEE program. Also, a study was concluded into the design of a public building program to access carbon funds under application of CDM methodologies.

The benchmarking component took benefit from baseline work in this area by the Conselho Brasileiro de Construção Sustentável (CBCS) which had launched its operational energy performance programme in 2013 coordinated by a Technical Committee. CBCS was contracted by the Project to execute energy audits in 20 public buildings to identify the share of different energy end-uses in total building consumption, and to assess building energy performance in terms of floor area and occupation.[99] The buildings were selected after a public call and represent a variety of buildings across Brazil as presented in the next table. This activity included the installation and monitoring of electricity metering systems in the buildings for a 12-month period.

OUTCOME 2: REGIONAL DISTRIBUTION OF BUILDINGS TARGETED BY EE BENCHMARK			
CITY	BUILDING NUMBER	CITY	BUILDING NUMBER
Itápolis	1	Catanduva	8
Morrinhos	2	Florianópolis	10, 18
São Paulo	3, 9	Penápolis	12
João Pessoa	4	Belém	13
Porto Alegre	7, 11	Recife	16
Limeira	5	Rio de Janeiro	19
Brasilia	6, 17, 20		

Five of these building received further technical assistance to participate in the ANEEL PEE programme; to these was added the MMA building. Proposals for three buildings have been approved so far, with a total investment sum of nearly BRL 4M.[100]

While the objectives to accompany a series of Requests for Proposals (RFPs) under a PBI (indicator 9) proved too ambitious, the Project established a partnership with ANEEL to accelerate project pipeline development. Through the Project, MMA was invited to take seat in the committee defining regulation of PBE Edifica (administered by PROCEL and INMETRO).

The Project was also invited to review the draft text for MPDG Instruction IN 02/2014 which imposed EE saving measures for public buildings. MMA also became part of the Technical Committee governing this instruction. The Project also fostered the participation of MMA in the technical committee that defines the EE indicators for the EE labeling of buildings[101] and the unit defining the destination of the PROCEL funds.[102]

Relevant is further resolution TCU 1056 (2017) by the Federal Court of Auditors which enforces verification of EE (and other resource-saving) measures by Federal government entities. The resolution requires building operators to monitor the EE performance which involves the actual utilization of energy benchmarking tools. TCU 1056 has the potential to induce a behavioral change in the Federal Government where there is no long-term tradition of resource efficiency and cost-saving.

[99] Relatório Técnica de Desenvolvimento de Benchmarks, CBCS – Conselho Brasileiro de Construcao Sustantavel and MMA, 2017.
[100] These buildings are, the MMA Bloco B, the SEFAZ building in Rio de Janeiro, and Banco de Brasil in Recife. The total project costs are estimated at BRL 3,901,500.
[101] Comitê Gestor de Indicadores de Eficiência Energética.
[102] GCCE (Grupo Coordenador de Conservação de Energia).

Worthwhile mentioning is finally the retrofitting of the ANEEL main building, which received technical assistance from the GIZ. The project involves retrofitting of the chiller system (BRL 3.5M) and lighting (BRL 1.3M). The commissioning of 510 kWp rooftop PV[103] (26 June 2018) is expected to cover 18-20% of total electricity use and will be implemented by the local electricity company CEB under a performance contract. This is one of the first demonstrations of EPC in the public sector, a result pushed forward by the GEF Project. CEB has developed and proposed the PV project for funding under the PEE^2 programme.

Finally, a number of studies were executed by national consultancy firms as summarized in the following table. The Evaluator assesses the scope of this work as highly appropriate and the studies are of good quality. The Evaluator had the opportunity to interview most of the consultants during the mission, where they clarified the purpose of their work and their view on the market. One could appreciate their interest in the subject, moreover since it required multi-disciplinary work in a field that was partially new to them and innovative for Brazil. The consultants looked forward to see their technical-legal work being applied to real building projects in the near future, which was very encouraging to see.

Outcome 2: List of Executed Subcontracted Studies			
	Name of Study	Contractor	Contract
1	Estudo sobre o Estado da Arte dos mecanismos de contratação de serviços de eficiência energética em edificações no Brasil	Raymundo M. de Aragão Neto	BRA 2013-000577-00
2	Relatório Técnico de Desenvolvimento de Benchmarks	Conselho Brasileiro de Construçao Sustantável (CBCS)	BRA 10-33056/2015
3	Estudo de viabilidade técnica e econômica para o PoA de eficiência energética em edificações públicas no Brasil	Luis Filipe Kopp	BRAS 2017-000191
4	Estudo jurídico para possibilitar contratação e execução através de Parcerias Público-Privadas de projetos de eficiência energética em edifícios públicos com base no desempenho	by Madrona Advogados, São Paulo/SP	JOF-0004-30179/2017
5	Regime Diferenciado de Contratações para Clientes Públicos	Amaral Paes de Andrade Perez Figueiredo, Recife/PE	BRA10-35514/2017,
6	Modelagem de Contratualizacao de Projeto de Eficiencia Energetica para Predios Publicos	Consórcio Menezes e Niebuhr Advogados Associados (Florianópolis/SC) and AGES Consultoría e Projetos Ltda (São Paulo/SP)	BRA10-35229-35230/2017
7	Relatório Análise EEGM - Mecanismo de Garantia para Eficiência Energética[104]	Melo Campos Advogados and ImpactLab	JOF-0003-30185/2017

3.5.2.2 Relevance

Based on the products delivered through combined GEF and baseline efforts, it seems reasonable to assume that the Federal Government has now most of the tools in hands to start implementing EE in public buildings. It is noted that the direct target (10 RFPs at End-of-Project) has not yet been met. If political back-up is sustained and (public and private) capital is available, one would expect a swift offtake of EE investments in public building in the near future. A post-project impact study should be able to verify this. In this context, the key role of MPDG, the Central de Compras and the Tribunal de Contas for mainstreaming of EE into the Federal Government, is also highlighted.

Considering the positive reception of Project results by the Federal Government and the progress made in EE policy, the Evaluator rates this Outcome as Satisfactory (S).

[103] See: http://www.aneel.gov.br/

[104] This study relates to Outcome 4 but is included here for completeness.

3.5.2.3 Effectiveness

The following table reviews the outputs delivered in relation to the SR for Outcome 2. The pursued activities are not always well aligned with the defined outputs. However, the Project managed to implement a work package that is consistent and supportive for the Outcome objective (i.e. to enable a public building EE programme to take off). While one cannot consider such a programme to be fully operational as yet (see indicator 9), a number of the legal and conceptual barriers with respect to contracting modalities for EE in public buildings (including EPC) seem to be greatly reduced or removed altogether. Normative instruments (NI 02/2014) and enforcement (TUC 1056/2017) have been approved providing a stick for implementing energy management systems and EE investments in the sector.

On the other hand, pipeline development is still limited to opportunities in the vicinity of the key project partners (MMA, ANEEL) hence it is still early to speak about a developed public sector EE market. The Evaluator would recommend a post-project evaluation of market off-take, for example by assessing the portfolio of the ANEEL PEE project during the next years and recording investment sums and GHG emission reductions. In conclusion, the Evaluator rates the effectiveness of this outcome as Satisfactory (S).

OUTCOME 2: ACCESS TO EE SERVICES AND COMMERCIAL FINANCING FOR PUBLIC SECTOR BUILDINGS ENHANCED WITH THE SUPPORT AND STRENGTHENING OF EXISTING PUBLIC INITIATIVES			
OUTCOME/OUTPUT INDICATOR[105]	TARGET (SR)	ACHIEVED (AS OF 31 DEC 2017)	ACHIEVEMENT (%)
Public building EE tender process PBI Program for Public Building operational by end of project	Model for PBI designed and promoted	See narrative	Satisfactory
Instruments to calculate or mechanisms to mitigate greenhouse effects in buildings developed (8)	PoA design document (PDD) and project activity component design document (CPA) developed	Consultancy for CDM POA contracted and delivered	100%
	Benchmark of energy consumption in public buildings established	Benchmark study carried out	100%
Number of ESCOs and public managers provided with technical assistance by the Project (9)	At least 3 ESCOs and 20 public managers technically assisted	20 public buildings assisted under benchmarking activity; At least (1) ESCO targeting public buildings directly assisted.[106]	100% (buildings) 33% (ESCOs)
Number of bidding processes for EE in public buildings facilitated by the Project (9)	At least 10 Requests for Proposals (RFP) due to the project	No specific info in the PIR 2017	10%[107]
Number of public buildings labelled according to PBE/Edifica (10)	Five (5) public buildings labelled according to PBE – Edifica	No specific info in the PIR 2017	20%?
	Models of procurement notices, contracts and legal study developed	Three case studies: (1) Public-Private Partnerships (PPPs); (2) Differentiated Public Procurement Regime; (3) Legal implications of Procurement Law 8.666/1993 for ANEEL EE Program	100%

[105] The numbers in parenthesis correspond to the related indicator in the Project Implementation Review (PIR) 2017.
[106] A contribution was made to CEB to implement RE/EE systems in the ANEEL building under an EPC contract.
[107] Only MMA building demonstration pilot); likely more RFPs will materialize after project termination.

3.5.2.4 *Efficiency*

The change in approach to address EE in the public sector as outlined in the SR implied the mobilization of public sector baseline initiatives. This approach strengthened the incrementality principle for this outcome and thereby the efficiency of the allocated GEF resources. Although not tracked as co-finance, the value of the baseline support actually provided to this component is substantially larger than the US$ 160,000 estimated at Project design. The wide scope and quality of the delivered products indicate good value for money. The Evaluator therefore rates the efficiency as Highly Satisfactory.

3.5.2.5 *Outcome rating*

OUTCOME 2: ACCESS TO EE SERVICES AND COMMERCIAL FINANCING FOR PUBLIC SECTOR BUILDINGS ENHANCED WITH THE SUPPORT AND STRENGTHENING OF EXISTING PUBLIC INITIATIVES	
CRITERIA	RATING
Overall quality of project outcome	S
Relevance	S
Effectiveness	S
Efficiency	HS

3.5.3 Outcome 3: Interest enhanced in the replacement of energy-inefficient CFC-using chillers (Budget: US$ 0 GEF; US$ 1,000,000 cofinance)

For the assessment of Outcome 3, reference is made to the Terminal Evaluation of Project BRA/12/G77, the findings of which are presented hereunder:

OUTCOME 3: INTEREST ENHANCED IN THE REPLACEMENT OF ENERGY-INEFFICIENT CFC-USING CHILLERS		
CRITERIA	RATING	COMMENTS
Overall quality of project outcome	5 (S)	As assessed by TE of BRA/12/G77
Relevance	2 (R)	
Effectiveness	5 (S)	
Efficiency	5 (S)	

3.5.4 Outcome 4: Energy Efficiency Guarantee Mechanism (EEGM) made available to stimulate EE investment through ESCOs (Budget: US$ 10,195,000 GEF; US$ 120,217,250 cofinance)

3.5.4.1 *Description of activities and delivered outputs*

The purpose of Outcome 4 was to implement the EEGM in Brazil, promote it in the market and secure financing for investment in EE systems to reduce electricity consumption and achieve GHG emission reductions. The indicators are given in the RF (see section 3.5.4.3). Since substantial effort was dedicated to promotion and outreach, two indicators are presented which were not included in the PIRs.

The EEGM was a pilot to test whether a partial guarantee mechanism would also work in the Brazilian market.[108] This involved the assumptions that: (i) ESCOs are a relevant delivery mechanism for EE in Brazil; and (ii) debt financing is a critical barrier for ESCOs. The EEGM was opened on 24 May 2013 and ended 23 May 2018. Original maximum exposure to any single ESCO was up to USD 2,500,000 and IDB's exposure limit up to 50% of an EE project amount, at any time under PCG; these restrictions were later relaxed to USD 5,000,000 and 80%, respectively. At Project design, eligible Partial Credit Guarantees (PCGs) were in

[108] IDB Invest – Atla, EEGM Program Review, February 2018 (updated June 2018).

the range of USD 150,000-800,000; the upper limit was in 2016 extended to USD1,600,000. The maximum PCG tenor was 7 years.

The EEGM Administrator (Atla Consulting), with approval of the IDB EEGM team, defined target audiences to attract end-users and project companies as follows: (a) "class entities": with whom to maintain constant relationship to disseminate the concept of EEGM for EE and RE projects; and (b) "end users and specialized engineering companies", which could have the right profile to use the EEGM. Over 1,500 people from 900 companies were addressed and made aware on the potential of EE investments and the use of the EEGM.

In response, more than 100 guarantee letter consultations were directed to Atla Consulting during the 5 years of availability period of the EEGM component, representing a volume of potential EE and RE projects worth US$ 154 Million in investments. The actual volume of PCGs issued is much lower: 9 projects approved and 6 PCGs issued for an investment volume of USD 17.5M. IDB reports that the other projects in the pipeline decided not to use the EEGM, either because negotiations between ESCOs and FIs were interrupted (35%), because they decided to use another financial source (15%), or because they decided to use their own resources (10%).[109] For 40% of the cases, the reason was not clarified.

Significant efforts were also directed to the FIs that were to provide financing for the EE projects, and who would have to accept the guarantee as collateral. At launch in 2012, the EEGM was presented to a shortlisted group of 7 banks approved by the IDB integrity process: Banco Itaú, BIC Banco, Banco SOFISA, Banco Daycoval, Banco Pine, Banco Indusval & Partners, and Banco Industrial do Brasil. Later marketing and communication efforts also targeted ESCOs. As of February 2018, contacts and arrangements for meetings were made with 36 FIs; 8 of which presented comments about EEGM legal documents. Four (4) FIs approved the EEGM legal documents[110]: Desenvolve SP, Banco Indusval & Partners, AGERio and Santander. Only two (2) FIs formalized guarantees through the EEGM.

The issued PCG letters indicate an average PCG amount of USD 767,000 which is near to the original upper limit (USD 800,000) and typically encompasses climatization (HVAC) projects. The smallest PCG issued was about USD 256,000 for a commercial EE lighting project (slightly above the threshold amount of USD 150,000). Two ESCOs were involved but just one large ESCO (APS) made up for most of the EEGM activity. This is an ESCO with strong credit capacities and which engages in large projects. Building projects involving climatization tend to require PCGs above USD 750,000 with project sums over USD 2M as shown in the following table.

OUTCOME 4: EEGM – SUMMARY OF EE PROJECTS UNDER ISSUED PARTIAL CREDIT GUARANTEES (PCGS) [111]						
PCG DATE OF ISSUANCE	PROJECT	TECHNOLOGY	PROJECT COST (USD)	PCG AMOUNT (USD)	ENERGY SAVINGS (MWH/YR)	LIFETIME (YR)
24 May 2013	Pepsico	Lighting	440,684	256, 031	705	10
24 May 2013	Contax	Climatization & lighting	4,875,923	768,094	4,487	5
24 May 2013	Shopping Pátio Paulista	Climatization	5,258,493	768,094	4,317	10
17 Nov 2015	Shopping Praia de Belas	Climatization	4,160,348	1,326,762	1,383	5
30 April 2015	Lojas Renner	Generation, climatization, lighting	1,893,858	871,872	26,944	10
17 May 2018	Localiza Rent a Car	Distributed generation	857,142	611,428	880	25
		TOTAL	**17,486,451**	**4,602,248**	**38,719**	
			Lifetime Energy Savings (MWh)		**371,033**	

[109] IDB Invest (INO/NFP) Memorandum Exit strategy for the Energy Efficiency Guarantee Mechanism (BR-XI018), 24 May 2018.
[110] Importantly, the EEGM legal documentation could not be approved by BNDES.
[111] Source: IDB Invest – Atla, EEGM Program Review, February 2018 (updated June 2018).

The total commission fees generated were USD 406,966, slightly over 9% of the PCG sum. This was insufficient to cover the administration costs of the EEGM program (USD 1,488,722). There is one outstanding guarantee.

3.5.4.2 Relevance

The poor acceptance of the EEGM by national FIs, combined with the high share of ESCOs that could not close project finance, suggests that ESCOs still face great difficulties to access debt capital. It is unlikely that the current institutional and legal set-up would be the configuration-of-choice for a guarantee mechanism for EE in Brazil (as discussed in section 3.1). The EEGM presents an operational loss which might be mitigated by increasing PCG commissions. IDB concludes that transactional costs were high and that the program as it was designed is not financially sustainable – hence IDB will not continue the EEGM. However, information about price elasticity and competitiveness of the EEGM viz-a-viz other financing options has not been quantified. The gathered data set is too small to draw hard conclusions whether the EEGM can work in Brazil, under which conditions, and for which type of beneficiaries.

The EEGM was not tested under favorable market conditions. Timing was also premature in the absence of a substantial volume of ESCOs with the right profile to benefit from the facility. An analysis of market drivers points into the direction that the EEGM is not the game changer for developing the EE market in Brazil as assumed at Project design. Instead, other barriers including more flexible public procurement modalities and the lack of integrated retrofit solutions provided by the sector, have been identified as more relevant. These barriers were further explored and are partially addressed under Outcomes 1 and 2 (and 3).

In spite of very active promotion by Atla Consulting among building operators, ESCOs and installation companies, market demand for the guarantee mechanism so far has been much lower than expected. The EEGM did not trigger investment in EE in public buildings through ESCOs, as this delivery mechanism was not open under Brazilian Law (No. 8666). For private projects, the EEGM was accessed by two ESCOs to close finance for six (6) projects, involving two (2) FIs[112]. None of the FIs has made changes in corporate strategies, staffing or internal procedures to anticipate on a growing EE market; this may be interpreted as another indication of the inertia within the national financial sector (and the likely existence of more profitable investments than EE).

Concluding, the EEGM outcome was established but seems only marginally relevant. An extension of the EEGM pilot may be considered to collect more information and test this hypothesis; however, acceptance by FIs evolves very slowly (only 4 entities after 6 years of advocacy) while growth of the ESCO market is a critical assumption that is not fulfilled as yet. Probably, the EEGM would be more successful for larger investment projects served by ESCOs which strong lending capacity and with the ability to deliver integrated, complex projects with an EE component.

Therefore, the Evaluator rates the relevance of the EEGM proposed under this Project to trigger EE in buildings as Moderately Unsatisfactory (MU).

3.5.4.3 Effectiveness

Demand for the EEGM fell far behind the original projections, which clearly indicates that its role as a market agent is weaker than expected. Also, response from FIs was low. On the other hand, many project proposals were received, indicating a need for funding.

The effectiveness of the EEGM to induce a market transformation was marginal and its ability to trigger investment (and GHG reductions) lagged behind the expectations. However, a (small) portfolio of EE

[112] Five projects were executed by the ESCO APS Soluções em Energia S/A through BI&P - Banco Indusval & Partners. In 2018, a 1,092 kWp Distributed Power PV project was added, executed by Áxis Locadora de Equipamentos S/A through Áxis SPE.

building projects was implemented thanks to the EEGM. This is an important achievement compared to the baseline situation. The Evaluator therefore rates its effectiveness as Moderately Unsatisfactory (MU).

OUTCOME 4: EEGM MADE AVAILABLE TO STIMULATE EE INVESTMENT THROUGH ESCOS			
OUTCOME/OUTPUT INDICATOR[113]	TARGET (SR)	ACHIEVED (AS OF 31 DEC 2017)	ACHIEVEMENT (%)
The EEGM is operational (14)	(no target specified)	The EEGM is technically working	Achieved (100%) but marginally satisfactory[114]
	At least 35 projects approved under the EEGM and provided with guarantees	6 projects supported.	17%
Number of ESCOs using portfolio guarantees such as the EEGM for public and private EE projects (15)	(no target specified)	public buildings: one (1)[115]; private projects: two (2).	Partially
Number of financial institutions which have defined target segments for EE financing and made relevant changes in internal procedures	At least 5 FIs	Four (4) FIs[116] accepted the EEGM and two (2) formalized the PCG with an ESCO. No (0) FIs included EE in corporate strategies; No FIs have made specific recruitment for EE market yet or changed in internal procedures to appraise EE projects.	Partially
Number of ESCOs, FIs and other stakeholders trained or informed about the EEGM	(no target specified)	ESCOs: 1,585 people from 900 companies; FIs: 280 people from 36 FI's	100%[117]

3.5.4.4 Efficiency

Since the actual demand fell behind the projections at Project design stage, nearly 90% of the GEF grants allocated to the EEGM remained untouched. The Evaluator considers that with more active monitoring of the EEGM's exposure and liquidity, part of the remainder could have been re-allocated to other activities to support the Project objectives and accelerate the envisioned EE market transformation.[118]

Another perspective is to consider that USD 1 M operational budget translated into USD 17.5M leveraged capital for project investment. This achievement is 2-3 times better than the typical cofinancing ratios for GEF CCM projects, under the premise that the remainder (approx. USD 9M) will be released for reprogramming. As such, the Evaluator rates the efficiency of this outcome as: Moderately Satisfactory (MS).

[113] The numbers in parenthesis correspond to the related indicator in the Project Implementation Review (PIR) 2017.

[114] However, the Project did little effort to simplify the legal and institutional structure and bring the EEGM closer to the Brazilian market. The product was viewed from the Bank rather than from the perspective of local market actors.

[115] While not through the EEGM, an important achievement is the retrofitting of the ANEEL building in Brazil through electricity company CEB under performance contracting.

[116] AGERio, Banco Indusval & Partners, Banco Santander, and Desenvolve SP.

[117] Because: in alignment with achievements under Outcome 1.

[118] In this context, the earlier recommendation in the MTR (p.43) is recalled: "In order to maximize the effect of the EEGM in addressing market barriers will be important to review the relevance and acceptance of the EEGM in the market on a periodic basis and if necessary, the EEGM and its menu of guarantee products should be fine-tuned in light of the evolution of the market."

3.5.4.5 *Outcome rating*

OUTCOME 4: EEGM MADE AVAILABLE TO STIMULATE EE INVESTMENT THROUGH ESCOS	
CRITERIA	RATING
Overall quality of project outcome	MU
Relevance	MU
Effectiveness	MU
Efficiency	MS

3.6 Sustainability, Impact and Catalytic effects

3.6.1 Sustainability

PROJECT OVERALL SUSTAINABILITY		
CRITERIA	RATING	COMMENTS
Overall likelihood of sustainability	ML	
Financial resources	ML	The EEGM was not a decisive factor to achieve financial closure of EE projects. Public funding for EE is available under ANEEL PEE, but more funding is needed to cover the market.
Socio-economic	L	Economic revenues of EE are positive.
Political	ML	Political support is not guaranteed
Environmental	L	With Brazil's power sector leaning towards increased thermal generation, the impact of EE is even more relevant.

3.6.2 Impact and catalytic effects

RATING PROJECT IMPACT[119] & CATALYIC EFFECTS[120]		
CRITERIA	RATING[121]	OBSERVATIONS
Environmental status improvement	M	Minor, but verifiable reduction of GHG emissions due to EE investments.
Environmental stress reduction	N	Not measured but negligible.
Progress towards stress/status change	S	Positive contribution to regulatory and policy changes to foster EE technologies in buildings, thereby reducing GHG emissions compared to the baseline scenario.
Catalytic effects	(not to be rated)	Delivered EE and chiller demonstration projects are a showcase for replication in public and private sector in Brazil. Capacity Building, M&V certifiers, legal solutions to performance contracts in public sector, participation in public calls.

[119] UNDP-GEF TE Guide, p.52 suggests to assess the following domains: a) verifiable improvement in ecological status; and/or b) verifiable reductions in stress on ecological systems; c) through specified process indicators that progress is being made towards achievement of stress reduction and/or ecological improvement; d) regulatory and policy changes at regional, national and/or local levels.

[120] Ibidem, whether the Project has exhibited a) scaling up (to regional and national levels), b) replication (outside of the project), c) demonstration, and/or d) production of a public good (lowest level of catalytic effect, such as new technologies and approaches).

[121] Rating scale: Significant (S), Minimal (M), Negligible (N).

3.6.3 Partnerships

The Project established or promoted a substantial number of partnerships with, and between stakeholders. In alignment with the revised approach outlined in the SR, these partnerships build forth on, and complement, current baseline initiatives and are likely to be sustained after Project termination. The following partnerships can be highlighted, as presented in the next table:

PROJECT TECHNICAL ADVISORY COMMITTEE (TAC) – REPRESENTED STAKEHOLDERS		
PROCEL	Programa Nacional de Conservação de Energia Elétrica	National Energy Conservation Program PROCEL, implemented by Eletrobras. The following project initiatives were carried out in cooperation with PROCEL: consolidation of EE Labelling Program; design and implementation of ProjetEEE tool; benchmarking of energy consumption in public buildings; and capacity building activities. PROCEL was a partner in the TAC.
ESAF	Escola de Administração Fazendária	The Superior School of Finance Administration, ascribed to the Ministry of Finance. A technical cooperation agreement was made with ESAF to provide the infrastructure for implementing the capacity building activities in the public sector. ESAF was a partner in the TAC.
ABESCO	Associação Brasileira das Empresas de Serviços de Conservação de Energia	Brazilian Association of Energy Service Companies, which acted as the Project partner for implementing capacity building activities in the private sector.
ANEEL	Agência Nacional de Energia Elétrica	Brazilian Electricity Regulatory Agency. Project activities related to benchmarking and identification of alternatives for financing EE projects were carried out in cooperation with ANEEL, which was also a member of the TAC.
FEBRABAN	Federação Brasileira de Bancos	The National Bank Federation of Brazil was a channel to reach out to target groups and to disseminate information.
MPDG/SLTI	Ministério do Planejamento, Orçamento e Gestão / Secretaria de Logística e Tecnologia da Informação	The Logistics and Information Technology Secretariat coordinated the implementation of MPOG NI 02 (2014), It participated in the TAC.
MPDG/SOF	Ministério do Planejamento, Orçamento e Gestão / Secretaria de Orçamento Federal	The Federal Budget Secretariat of the Ministry of Planning, Budget and Management was in charge of coordinating the Sustainable Esplanada Project (PES). It participated in the TAC.
BNDES	Banco Nacional de Desenvolvimento	The National Development Bank (BNDES) was a partner to identify the strategy for the financial sector (acquisition and credit section); it was a member of the TAC.
CEBDS	Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável	Brazilian Business Council for Sustainable Development (CEBDS) was partner for implementing capacity building activities in the private sector.
GBC	Green Building Council Brazil	The GBC was partner for implementing capacity building activities in the private sector under a Technical Cooperation Agreement with MMA.
	The Municipality of Recife/PB	The Municipality of Recife signed a Technical Cooperation Agreement with MMA for implementing the case study on retrofit of hospitals under the Differentiated Procurement Regime.
Rede 3E	Rede de Eficiência Energética em Edificações	The University Laboratories Network of Energy Efficiency in Buildings was a key partner for capacity building and the evaluation of contents and technical proposals developed under the Project.

The Evaluator confirms the close collaboration with these partners, and other stakeholders, through interviews and events, and concludes that partnership building was Highly Satisfactory (HS).

3.7 Overall project rating

The next table summarizes the ratings of the Project outcomes in the domains relevance, effectiveness and efficiency. The partial ratings are used to generate a rating for the overall Project results.

Criteria	Rating				
	Outcome				Project
	1	2	3	4	
Overall quality of project / outcome	HS	S	S	MU	MS
Relevance	HS	S	S	MU	MS
Effectiveness	HS	S	S	MU	MS
Efficiency	S	HS	S	MS	S

A summary of the Project Evaluation is given in the next table.

Summary Project Evaluation Ratings			
1. Monitoring and Evaluation	Rating	2. IA & EA Execution	Rating
Overall quality of M&E	MS	Overall quality of IA/IP Execution	S
M&E Plan implementation	S	IA execution - UNDP	S
M&E design at project start-up	MS	IA execution – IDB	UA
		IP execution – MMA	S
3. Assessment of Outcomes	Rating	4. Sustainability	Rating
Overall Project Outcomes	MS	Overall likelihood of sustainability	ML
Relevance	MS	Financial resources	ML
Effectiveness	MS	Socio-economic	L
Efficiency	S	Political	ML
		Environmental	L

Non-mandatory aspects that were rated are:

Project Overall Sustainability	
Criteria	Rating
Project documentation and reporting	S
Coordination between stakeholders	S

The TE rates the Project as a whole as: Moderately Satisfactory (MS).

4 Conclusions

1. The Full-Size project “Market Transformation for Energy Efficiency in Buildings” in Brazil was approved by the GEF on July 29, 2009. The Project was jointly implemented by the United Nations Development Programme (UNDP) and the Inter-American Development Bank (IDB). The Implementing Partner was the Ministry of Environment of the Federal Government of Brazil (MMA). The Project aimed to promote synergies between the UNFCCC and the Montreal Protocol to replace existing CFC-based chillers and promote EE investments in public and private buildings. The chiller components (outcome 3) were implemented under a separate Project (BRA/12/G77), which did not involve GEF funding, and were removed from the BRA/09/G31 Prodoc by the Substantive Revision (SR) in 2015. The GEF grant for BRA/09/G31 was USD 13.5M with estimated co-financing of USD 122.7M.

2. An innovative element was the introduction of the Energy Efficiency Guarantee Mechanism (EEGM), enabling Energy Service Companies (ESCOs) to implement and finance EE projects. The expected environmental benefits included electricity consumption savings in commercial and public buildings with an associated direct reduction of global greenhouse gas (GHG) emissions. The budget of the UNDP Project BRA/09/G31 amounted to USD 3,305,000 and consisted of Technical Assistance (TA) activities, while the EEGM (USD 10,195,000) was administered directly by IDB. After a restructuring of the Bank in 2016, operational management of the EEGM was done by IDB Invest.

3. The Project design was overly optimistic, because some critical assumptions made were not validated and the targets were unrealistically ambitious. Notwithstanding, the Project satisfactorily achieved three outcomes: (1) capacity building; (2) public building programme; (3) chiller demonstration. The EEGM (4) was successfully put into operation but did not generate significant market demand. After taking stock of the situation (May 2018), IDB Invest indicated not to continue the EEGM. As of 31 December 2017, BRA/09/G31 had spent approx. 92% of GEF resources (USD 3.05M) while the EEGM had consumed little more than 10% of the budget (USD 1M). As such, about 68% of the total GEF resources remain unused.

4. The Project triggered investment in EE and RE technologies in buildings worth USD 28.4M, energy savings of 441,443 MWh and direct GHG emission reductions of the order of 260 kton CO2. The results fall short of the targets as revised in the SR but are nevertheless significant. Cost-effectiveness is 11.3 USD/tCO2 based on the GEF funds actually spent; or USD 34 USD/tCO2 if referred to the total GEF Project budget. The EEGM leveraged about USD 17.5M at a cost of slightly more than USD 1M. This is 2-3 times better than typical cofinancing ratios for GEF CCM. Six building projects received support from the EEGM through a Partial Credit Guarantee (PCG); other investments in EE under the Project concern one (1) commercial building (chiller and EE retrofit) and four (4) public buildings.

5. In spite of very active promotion by the EEGM Administrator in Brazil (Atla Consulting) market demand so far has been much lower than expected. The EEGM was accessed by two ESCOs to close finance for six (6) projects, involving two (2) FIs. Other projects in the pipeline (about 100) decided not to use the EEGM, either because negotiations between ESCOs and FIs were interrupted (35%) or because another financing source (15%) or own capital (10%) was used. For 40% of the cases, the reason was not clarified.

6. Significant efforts were directed to the FIs that were to provide financing for the EE projects. As of February 2018, contacts were made with 36 FIs, four (4) of which approved the EEGM legal documents and two (2) actually used it. The poor acceptance by national FIs, combined with the high share of ESCOs that could not close project finance, suggests that ESCOs still face great difficulties to access debt capital. No FI made changes in corporate strategies, staffing or internal procedures to anticipate on a growing EE market. This may be an indication of the inertia within the financial sector (and the likely existence of more profitable investments than EE).

7. An analysis of market drivers points into the direction that the EEGM is not the game changer for developing the EE market in Brazil as assumed at Project design. Instead, other barriers including more flexible public procurement modalities and the lack of integrated retrofit solutions provided by the ESCO sector have been identified as more relevant. These barriers were further explored and are partially addressed by the Project (Outcomes 1-3). The data set obtained however is too small to draw hard conclusions whether the EEGM can work in Brazil, under which conditions, and for which type of beneficiaries. It is unlikely that the complex institutional and legal set-up would be the configuration-of-choice.

8. Specific training and capacity development (Outcome 1) was quite successful. The activities were expanded to include certification of energy professionals on measuring and evaluation methodologies pursuant to the rules of ANEEL´s PEE programme and the Efficiency Valuation Organization (EVO) International Performance Measurement and Verification Protocol (IPMVP), for which 59 people were certified. The Project also adapted EE tools and methodologies to the Brazilian context and integrated these into some national EE policy and programmes.

9. The Substantive Revision re-framed the Public Building Initiative (PBI) to strengthen a set of Federal Government programmes. Since Energy Performance Contracting (EPC) was virtually non-existent in the public sector, alternative contract modalities for the public sector were assessed and prepared including public-private partnerships (PPPs), differentiated contracting regime (RDC), and enhancement of the ANEEL PEE. The PBE Edifica Building Labelling programme was supported by the introduction of energy audits and benchmarking methodologies. The Project was successful in building alliances with public sector stakeholders and professional organizations, and contributed to enforcement of EE measures in public buildings (MPDG Instruction IN 02/2014 and Federal Court of Auditors' resolution TCU 1056/2017). The retrofitting of the ANEEL headquarter building in Brasilia, which was implemented under a performance contract with local energy company CEB, may serve to demonstrate the progress made.

10. The Project design represents a series of flaws which are not uncommon for GEF projects from the GEF-4 cohort. Critical assumptions were not well validated, targets were overambitious, and a domino effect was created by using the estimated turnover of the EEGM as a proxy for investment, which in turn is a proxy for estimating energy savings and GHG reductions. The design of the EEGM was complex with PCGs involving three parties (ESCO, FI and IDB) with the latter placed outside Brazilian Law. Neither GEF back-up nor IDB's role as an appraisal agency are sustainable and the chosen arrangement was rejected by most FIs.

11. Due to institutional issues, expenditures were minimal over 2010-2012. After installing a Technical Advisory Committee (TAC) chaired by MMA in 2013, project implementation greatly improved. The Substantive Revision is one example of adaptive management by UNDP and MMA. A strategic view on the EEGM however seemed not to happen and no adaptive management was applied to deliver on the key GEF indicators within the Project's timeframe. Opportunities to diversify and test alternative financial and non-financial solutions were not explored in spite of progressing insight by 2014. By consequence, the GEF resources in the EEGM remained largely unused. These funds (about USD 9M) have an opportunity cost as they could have been applied to the benefit of GEF and national development objectives.

12. Notably, a dialogue between the Government, UNDP and IDB did not develop. As of June 2018, operational interaction exists with IDB Invest but institutionally, UNDP nor the Government seem to know the entry point to engage with the Bank concerning the Project. The Evaluator questions whether the liability as a GEF Agency fully rests with IDB Invest. It is noted that a project document signed between IDB and the Brazilian Government seems not to exist. There may be a blank spot here that can only be clarified by the IDB Group and the GEF. Without certainty about the status of IDB Invest as the GEF Implementing Agency, the Evaluator is unable to assess its role as such. The lack of discussion between UNDP, IDB and the Government on the Project content, its key results and exit strategy may jeopardize the sustainability of the Project's outcomes. A more active role of the GEF OFP in Brazil could have helped to avoid or mitigate the institutional issues.

13. Monitoring and evaluation (M&E) was not fully convincing. The Inception Workshop was a 1-day event that initiated the process towards the establishment of the NPSC and NPC rather than concluding it; neither did it prepare the AWP. A joint Evaluation plan, as per the GEF TE Guidelines, was not in place towards Project closure. Project results are made available by MMA through a web portal but analysis and conclusions concerning EE market development and the achievements of the GEF project were not ready at the time of the TE mission. In spite of good intentions from all parties, information was not centralized and not always consolidated making review a time-consuming job. Also the Evaluator had underestimated the complexity and extent of the Project.

14. The Project leaves open a series of fundamental and conceptual questions that relate to the original problem statement. GEF Review (2009) reflects the awareness that the Project - specifically the EEGM - might actually "miss the point" as several factors in Brazil were not fully considered. Already in 2001, a UNEP report outlined a road map for fostering the ESCO market in Brazil, acknowledging that substantial hurdles had to be taken before a guarantee instrument could be implemented. Since then, a body of

expertise with EE financing has built up globally but it seems that the Project was implemented in the margin of this; most notably, the EEGM seems not integrated into work in this field by the IDB Group, and the GEF Project is not actively used as a pilot from which to extract all possible information. Also, no reflection has taken place on alternative solutions to serve the market. The question whether a guarantee mechanism for ESCOs can play a role in Brazil, how relevant it is and for whom, is left unanswered. This is very disappointing for a GEF project of this size and duration, and which had raised high expectations when it was designed.

4.1 Lessons learnt

1. Although Project design was done with due diligence, there are limits to the work volume that can reasonably be done and managed during the Preparation Phase of a GEF CCM Project. The addressed development problem was complex, project beneficiaries heterogeneous and market drivers insufficiently characterized and understood. To this can be added complicating factors including the twinning of GEF and MLF, the multi-agency arrangement UNDP-IDB, and the sheer size of Brazil in all aspects. A lesson learnt should be to carefully assess a project idea on its merits and feasibility, and reduce the scope as appropriate.

2. The proposed solution to a development problem should always be scrutinized and validated. The project design was biased towards a specific solution (the EEGM) and alternative actions were not considered, notwithstanding existent analysis and road maps. While the market (FIs, including BNDES) largely refused the offered product (PCG), no effort was made to adapt the product to the market. A lesson learnt should be that market perception is leading, not theory. When an innovative solutions is introduced, one should ensure that the appropriate context is in place and uncontrolled factors eliminated to the extent possible.

3. Institutional arrangements should be analyzed, discussed and agreed with stakeholders and Implementing Partners during the project design phase. The analysis should include existing engagement mechanisms between Government partners at both political and technical levels. In spite of good intentions, proposed coordination processes may not be in place or not receive institutional back-up. For this Project, this applies to both the Steering Committee (NPSC) and the IDB-UNDP arrangement. A lesson learnt can be to avoid multi-stakeholder arrangements unless they have high added value and effective coordination mechanisms are in place. Otherwise, they present a significant implementation risk that may lead to delays and a loss of ownership.

4. National Implementation (NIM) is the preferred modality. In this case, the IP (MMA) provided national staff (public servants) to manage the Project, which by itself is positive. However in practice government staff is rarely 100% dedicated to a project, which undermines responsiveness and anchoring of specific competences within the Team. By consequence, day-to-day implementation, progress monitoring and knowledge management become compromised. This situation was addressed by UNDP by hiring the TA and expanding direct support services. As a lesson learnt, one can anticipate on this situation by securing adequate capacity in a Project through one or more long-term consultancies.

5. The Project cycle of GEF, UNDP and IDB is built around a series of milestones. In this Project, compliance with these milestones was poorly enforced. Two examples are: (1) GEF CEO endorsement in spite of serious concerns about the project objective and approach; and (2) the lack of progress prior and during the Inception Workshop, which did not manage to properly install the Project. As a result, the boundary conditions for successful project implementation were not in place and all problems were put on the shoulders of UNDP CO and MMA. Such situation should be prevented. Lessons have been drawn since and the Agencies nowadays pay more attention to timely and qualitatively meeting of milestones.

6. UNDP and GEF Evaluations for preparation and implementation of MTR and TE are detailed. Notwithstanding, practical circumstances often compromise the recommended preparation process. The

Evaluator underestimated the volume of work and background information, and the technical diversity and complexity of this Project. Preparation prior to the TE mission to Brazil was insufficient, input information was not always prepared and project staff no longer under contract. A lesson learnt is, that the TE Guidelines should be respected to the extent possible. Sufficient information should also be made available to the TE Consultant or TE Team to assess the scope of work and draft a realistic plan of activities. Preparation should therefore start sufficient time ahead of the actual TE work.

7. The Technical Advisory Committee (TAC) chaired by MMA proved a good alternative to the typical NIM configuration of a PSC and a National Project Director. The arrangement proved highly effective and may serve as an interesting example for other projects (best practice). The NPC, TA and UNDP staff took charge of day-to-day management while the TAC served as a platform ensuring broad consensus among key public stakeholders and fine-tuning of ideas of proposals. The authority of the Project (such as for approving AWPs) formally rested with MMA (NPD), not with the Committee. However, a genuine dialogue will only develop if participants are competent and committed and acknowledged as such by the Chair, which was the case in this Project.

5 Recommendations

1. The exit strategy for the EEGM provided by IDB Invest is essentially based on financial-operational considerations. It does not provide answers to the initial questions how an EEGM should be shaped in Brazil, how relevant it is and for whom, and to whom the EEGM should be handed over. It is recommended to UNDP, IDB and the Government to initiate a dialogue on the Project content, its key results and exit strategy as soon as possible.

2. The position and interests of Atla Consulting should be considered; although contracted as a service provider, Atla has acted as a financial agent in the market for a product that is no longer serviced by the supplier. This situation affects the perception and credibility of EEGM product and its agent by the market. Therefore, Atla should soonest receive from IDB all relevant information for making opportune business decisions.

3. The Project achieved a substantial degree of problem ownership that should not get lost. One would like the role of the Project to oversee and convoke the market to be continued. This function is not automatically assumed by MMA. The Evaluator would recommend MMA and UNDP to engage with MME on this point and evaluate the options. One suggestion is to continue the TAC as a kind of consultative organ for public programs (ANEEL PEE and others). Essentially, this recommendation concerns the identification of an exit strategy for Outcomes 1 and 2.

4. The question arises to what extent the EE market is ready now and what challenges remain. It is recommended to MMA and UNDP to carry out a wrap-up exercise to systematize the results and experiences obtained. The contributions to the final Project seminar (December 2017) may serve as a useful starting point. Ideally, a road map with key actions can be devised capitalizing on the expertise and know-how that exists under the partnerships established during the Project. This activity can be finalized in 2018.

5. While acknowledging the efforts made so far, it is recommended to MMA, UNDP and IDB to devise an explicit Knowledge Management system for the Project. With a large number of actors in the field, there is a need for concentration, validation and dissemination of information and expertise. Ideally, the legacy of the 3E Project can be used to start an information clearinghouse (repository) on EE in Brazil. This involves continuous management, resources, and a business model.

6. A specific recommendation to MMA and MME is to consider integration of an RE/EE information function into the ANEEL PEE program and operating it from the resources available under this program. A successful information clearinghouse offering validated data, best practices, technology factsheets,

calculation tools, etc., is a valuable asset for outreach to the market, thereby speeding up project pipeline development and increasing quality of proposals.

7. According to MMA, the applicable GEF and UNDP procedures and guidelines were not always clear, limiting the Implementing Partner's effectiveness and ability to make adjustments to the project strategy and targets. It is recommended to UNDP to periodically consolidate applicable guidelines, manuals, etc., to ensure that information is offered to the IP in a consistent manner. An annual workshop or webinar for project coordinators may be considered, possibly to be held in the months prior to PIR delivery and organized by the regional UNDP-GEF office.