Sustainable Energy Program For Guyana

NO. GRT/FM-13897- GY

GEF ID: 4520

IDB PROJECT ID: GY- G1004

Mid-Term Evaluation

Final Report

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October 22nd, 2018

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List of Abbreviations

ADF	Amerindian Development Fund
AOP	Annual Operations Plan
EU	European Union
EDF	European Development Fund
GEA	Guyana Energy Agency
GEF	Global Environmental Facility
GoG	Government of Guyana
GPL	Guyana Power and Light Inc.
GRIF	Guyana REDD+ Investment Fund
GSDS	Green State Development Strategy
GUYSUCO	Guyana Sugar Corporation
HECI	Hinterland Electrification Company Inc.
HEP	Hinterland Electrification Program
IDB	Inter-American Development Bank
IRENA	International Renewable Energy Agency
LCDS	Low Carbon Development Strategy
MIF	Multilateral Investment Fund
MoAA	Ministry of Amerindian Affairs
MoIPA	Ministry of Indigenous People's Affairs
MoPI	Ministry of Public Infrastructure
PERT	Program Evaluation Review Technique
PIU	Project Implementation Unit
PM	Project Management
PSC	Program Steering Committee
PUUP	Power Utility Upgrade Program
REDD+	**R**educing Emissions from Deforestation and forest Degradation
RET	Renewable Energy Technology
SAR	Semi-Annual Progress Report
SEPA[1]	Electronic Procurement Execution System
TOR	Terms of Reference
UAE	United Arab Emirates
UNDP	United Nations Development Program

[1] Spanish acronym

Basic Information

PROJECT TITLE:	Sustainable Energy Program for Guyana
COUNTRY:	Co-operative Republic of Guyana
GEF PROJECT ID:	4520
GEF AGENCY:	IDB
GEF AGENCY ID:	GY-G1004
OPERATION NUMBER:	GRT/FM-13897-GY
FORM OF FINANCING:	GEF Grant and, Soft Loans/Grants from Co-financing Partners
EXECUTING AGENCY:	Ministry of Public Infrastructure
GEF FOCAL AREA:	Climate Change

DATE OF BOARD APPROVAL:	July 12, 2013
DATE OF CONTRACT EFFECTIVENESS:	December 11, 2013
DATE OF ELIGIBILITY FOR FIRST DISBURSEMENT:	June 9, 2014

FINANCING AMOUNTS

GEF GRANT:	US$ 5,000,000.00
CO-FINANCING:	US$24.875,000.00
TOTAL PROGRAM COST:	US$29,875,000.00

PROJECT DURATION:	72 Months
MONTHS IN EXECUTION	
FROM APPROVAL:	57
FROM CONTRACT EFFECTIVENESS:	51

DISBURSEMENT PERIODS

ORIGINAL DATE OF FINAL BISBURSEMENT:	December 11, 2019
CURRENT DATE OF FINAL BISBURSEMENT:	December 11, 2019
CUMULATIVE EXTENSIONS (MONTHS):	None
SPECIAL EXTENSIONS (MONTHS):	None

DISBURSEMENTS

DISBURSEMENTS TO DATE[2] (GEF GRANT):	US$1,405,391.30

[2] LMS as of June 30, 2018

Executive Summary

Background, Objectives and Approach

The Sustainable Energy Program for Guyana was designed in response to priorities of the Government of Guyana's (GoG), in relation to the Low-Carbon Development Strategy (LCDS) to promote the development and use of renewable energy in the country. One of the main pillars of the LCDS is the sustainable development of the Hinterland with energy access among its main priorities. The Program is expected to address issues related to the efficiency and sustainability of energy supply nationally, reducing barriers to the introduction of Renewable Energy Technologies (RETs) and, reducing dependence on imported fossil fuels. It is expected to generate positive environmental benefits in the form of avoided GHG emissions (CO2) from the national energy sector in Guyana, estimated at a total of **0.67 Mtons CO2eq**[3]. This objective is consistent with priorities of the GoG, GEF and IDB with respect to the mitigation of global Greenhouse Gas (GHG) emissions, and in line with GEF-5 Strategy Document for Climate Change Mitigation[4]. (The Tracking Tool for Climate Change Mitigation Projects – For Mid-Term Evaluation – is attached in Annex I).

The Program, financed with a Grant of US$5.0 million from the GEF Trust Fund and Co-financing in the amount of US$24.875 million from various sources, was approved on December 11, 2013, with a 72 months disbursement period. The executing agency is the Ministry of Public Infrastructure (MoPI), with the Hinterland Electrification Company Inc. (HECI) as the Program Implementation Unit (PIU).

The goal of the Program is to reduce identified barriers to the deployment of RETs in Guyana and demonstrate the viability of delivering electricity to isolated communities and to the grid system, in a sustainable and cost-effective manner. The general objective is to improve the institutional capacities of the Guyana Power and Light Inc. (GPL) and the Ministry of Public Infrastructure, through staff training and the promotion of the use of Renewable Energy Technologies (RETs) in urban and hinterland areas.

The Program has three components, as follows:

- **Component I: Strengthening of the policy and institutional framework to implement Renewable Energy Technologies in Guyana.** The specific objective of this component is to develop a National Renewable Energy (RE) Strategy, as an action plan to promote the implementation of RETs under the Low-Carbon Development Strategy, including the revision of existing regulatory framework;
- **Component II: Strengthening of the Power Utility capabilities to improve electricity supply and promote the use of RETs.** The specific objective of Component II is to develop the technical capacity and expertise of professionals from GP&L and representatives from Hinterland communities, for planning, installing, operating and maintaining RE projects.
- **Component III: Contribute to sector sustainability with the implementation of cost-effective RETs for on-grid and off-grid electricity generation.** The specific objective of Component III is to implement RE pilot projects and demonstrate the technical, social, economic, financial and environmental sustainability of selected on-grid and off-grid RETs, through the implementation of pilot investments, such as wind energy, solar-PV and small hydropower projects.

[3] Request for CEO Endorsement, Section B.2, (page 15)

[4] https://www.thegef.org/sites/default/files/documents/GEF-5_FOCAL_AREA_STRATEGIES.pdf

Evaluation Objectives

The objectives of the Mid-Term Evaluation were to carry out a critical assessment of progress and achievement of results under the Program to date; to identify lessons learned and propose concrete actions to ensure the achievement of the targets established in the Results Framework of the Program.

Methodology: The Consultant worked in close collaboration with the Project Manager and officials of the IDB in gathering information for the evaluation of the Program. The review of Program documents and associated reports, collection of relevant data, consultation with key stakeholders and site visits, formed part of the methodology, with the Results Framework used as the basis for assessing progress. The evaluation focused on progress in the achievement of the Program's outputs and outcomes to date, the execution mechanism, lessons learned, as well as issues related to the risks and sustainability of the Program.

Key Conclusions

Achievement of Program Development Objectives: The evaluation concludes that implementation of the Sustainable Energy Program for Guyana has been *"Marginally Satisfactory,"* to date. Moderate progress was made towards the achievement of the development objective of the Program which aims to reduce identified barriers to the deployment of RETs in Guyana and demonstrate the viability of delivering electricity to isolated communities and the grid, in a sustainable and cost-effective manner. Significant progress has been made with respect to the installation of 116 grid-tied solar-PV systems, with a total installed capacity of 1.975 MW (approximately 10 times the end of project target), as well as many other off-grid systems. These results confirm the technical viability of grid-connected solar-PV systems and, highlight the leveraging effect of the Program, with the GoG moving ahead rapidly with the expansion of the solar-PV program. Significant challenges remain however, as the RE strategy and policy framework to regulate the interconnection of systems, are still to be developed and implemented. Business and operation models, critical to the sustainability of rural electrification schemes, are still to be developed also.

Coupled to the above, there have been delays and setbacks in the installation of a 330 kW hydropower plant; the collection of wind data, necessary to inform decisions on the installation of a 300 kW wind-turbine generator; the installation of solar-PV systems in ten (10) hinterland communities; and, capacity building programs for GPL personnel and residents of hinterland communities. Completion of these activities are necessary to ensure the achievement of the development objectives of the Program.

Moreover, given the limited time remaining for the implementation of the Program (fifteen months), it is clear that remaining activities will not be completed within this timeframe and that an extension of at least 12 months to the disbursement period would be required.

Effectiveness of Program Implementation: Effectiveness in Program implementation is rated as *"Unsatisfactory,"* based on the analysis of the Institutional, Technical, Administrative, Program Planning and other factors highlighted in the report (Section III.C, paragraphs 3.3 to 3.27). Improvements in Program implementation arrangements will be needed during the remaining period of execution (and possible extended period) if the Program is to achieve its development objectives. In particular, issues related to the activation of the Program Steering Committee, appointment of a full-time Project Manager, (or upgraded role of the proposed Project Assistant), as well as other staff assigned to the PIU will need to be addressed.

Programmatic-Approach: There was a genuine misunderstanding about the need to monitor and establish a common database to capture information on the overall Program and not just information related to the GEF-financed activities. As a result, Program-related data is stored by different agencies (HECI, GEA, MoPI, GPL,

Guysuco), that are/were involved in different aspects of Program. Consequently, delays are usually experienced in retrieving data (if complete) on the overall Program. Additionally, the financial management system that was established, captures information on GEF related activities only and there is no tracking of information from other co-financing sources. The Annual Financial Statements and Audit Reports reflect this situation also.

Efficiency of Program Implementation: With disbursement under the Program at only 28% to date, when it should have been about 86%, the efficiency of program implementation is rated as "*Unsatisfactory."* The cancellation of funds from two previously committed co-financing sources, delays in the selection of the communities to benefit from the demonstration RE projects, would have significantly impacted the rate of execution of the Program. Many of these activities fall under Components II and III where 89% of the Program funds are allocated.

Recommendations

Program Execution

Recommendation 1: *Program Oversight* **-** It is recommended that efforts be made to reactivate the Program Steering Committee (PSC), to provide strategic oversight and guidance on Program execution. The role of the PSC has become even more crucial, in light of the changing situation in the sector, vis-à-vis, developments in the oil and gas sector and the preparation of the Green State Development Strategy (GSDS). The need for a well-functioning PSC to address strategic and policy issues and, encourage increased levels of coordination among stakeholders cannot be over emphasized. Moreover, given the current emphasis on the development of the GSDS, it is recommended that a senior representative from the Ministry of the Presidency, be included in the PSC or, coordination meetings organized on a regular basis, to ensure adequate coordination and sharing of information.

Recommendation 2*: Project Manager* – It is recommended that a full-time Project Manager be appointed to focus solely on the implementation of the Program, as required in the Program Operation Manual. The Project Manager would be accountable to the CEO of the Hinterland Electrification Company Inc. (who has much wider responsibilities for the management of the company and execution of its business plan) and, be fully responsible for the minute implementation details and delivery of outputs needed to achieve the development objectives of the Program.

Recommendation 3: *Execution and Disbursement Period* **-** Given the current status of implementation of the Program, (with only 28% of funds disbursed after about 86% of the time have elapsed), it is recommended that a 12 to 18-month extension be granted to the period of execution and disbursement of the Program, Such extension should be approved, based on a revised Program Execution Plan that seeks to maximize benefits of the time and resources remaining under the Program.

Program Effectiveness and Efficiency

Recommendation 4: *Stakeholders engagement and coordination* **-** To improve stakeholder engagement and coordination, it is recommended that a formal stakeholder analysis be conducted to determine the potential impact of each stakeholder on the Program. The analysis should: identify all stakeholders; determine their level of authority and influence on the Program; determine individual requirements, interest and expectations, in order to identify ways to effectively manage the impacts. A formal Communication Management Plan should also be prepared, that details how stakeholders will be communicated with.

Recommendation 5: *Capacity Building* - Capacity building programs should be increased by organizing more training events and other relevant practical learning sessions, particularly in the area of procurement, monitoring and evaluation, results-based management and other similar programs. Representatives from key stakeholder

institutions should be included in some of these sessions, so that common issues can be addressed and, capacity developed at multiple levels at the same time.

Recommendation 6: *Monitoring and Evaluation* - It is recommended that the M&E Plan be extended to include data from all project-level activities and the reporting format be modified to capture, in a common database, information (outputs and outcomes) on the overall Program. This, no doubt, would help to strengthen the programmatic-approach, aimed at promoting the integration of projects, and increasing opportunities for greater coordination and collaboration.

Program Sustainability

Recommendation 7: *Co-financing resources to replace the MIF (GY-M1022) and EU Funds* - Critical to the success and sustainability of the Program is the development of business models for the medium to long-term financing, operation, maintenance and overall sustainability of RE systems developed under the Program. It is recommended that funds be sought for the development of the business models and associated training of residents in hinterland communities, as previously envisaged under the MIF TC. Experiences gained, and lessons learned from earlier attempts under the Hinterland Electrification Program and the Amerindian Development Fund, should serve as useful starting points in the development of the business models.

Recommendation 8: *Mid-Term Evaluation Workshop and Learning Event* - To help chart the way forward and also to prepare an updated Program Execution Plan, it is recommended that a Mid-Term Evaluation Workshop/Learning Event be organized, to consider the results and findings of this Report, look at the lessons learned and agree on new results-based approach towards the achievement of the development objectives of the Program. Such an event, involving key stakeholders, would help to achieve their full buy-in and participation, while at the same time, reinforcing GoG's commitment to a Programmatic-Approach in further developing and increasing the impact of the Sustainable Energy Program for Guyana.

I Introduction

1.1 The Government of Guyana (GoG), through the Ministry of Public Infrastructure (MoPI)[5] has retained the services of an independent consultant to conduct a Mid-Term Evaluation of the Sustainable Energy Program for Guyana (GRT/FM-13897-GY). The Program is financed with a Grant from the Global Environmental Facility (GEF), the Government of Guyana (GoG) and other co-financing Partners, with the IDB as the GEF Agency. It was approved on December 11, 2013 and has a 72-month disbursement period.

A. Objective of the Mid-Term Evaluation

1.2 The objectives of the Mid-Term Evaluation were to carry out a critical assessment of progress and achievement of results under the Program to date; to identify lessons learned and propose concrete actions to ensure the achievement of the established targets in the Results Framework of the Program.

The specific objectives are as follows:

- To evaluate the achievement of the project's outputs and outcome in relation to the expected and planned output indicators, identifying the real contribution towards the realization of the Program objectives.

- To evaluate the degree of progress and achievements in Program implementation, both qualitatively and quantitatively and document relevant lessons learned to date.

- Evaluate the sustainability of the Program and its components, in institutional and financial terms, as well as the degree of adoption by its users/beneficiaries.

1.3 In accordance with Annex, Paragraph 5.03 of the Non-Reimbursable Financing Agreement, the mid-term evaluation was expected to be carried out by an independent consultant, three (3) years after first disbursement under the program (i.e. June 2017).

B. Evaluation Scope

1.4 The scope of the assignment included the following activities:

a) Project Execution Analysis:

i) To evaluate progress (physical and financial) in the execution of the Program to date, and the delivery of expected outputs, in order to identify the strengths and weaknesses of the processes associated with the execution.

ii) To evaluate the degree of collaboration and complementarity of the project with the partners and local actors, among others, highlighting the commitments that they have made.

iii) To evaluate the degree of collaboration and complementarity with other projects and initiatives in the local and/or international spheres, in order to identify possible alliances and joint investments with other institutions, and to add value to the Program.

[5] At the time of signing the Agreement, the Executing Agency was the Office of the Prime Minister (OPM). This was however changed to the Ministry of Public Infrastructure (MoPI), through the signing of an Amendatory Agreement dated March 6, 2017.

iv) Detection of deviations from project design, and propose adjustments required in the technical, financial, economic and institutional framework for the implementation of the project.

v) Propose the necessary actions to efficiently reach the planned outputs, including adjustments in the follow-up indicators for each component and measures to improve monitoring.

b) Evaluation of Results

vi) Determine the progress in the fulfillment of the expected outputs and their linkage with the indicators of the expected results for the project.

vii) Identify the lessons learned, conclusions and key recommendations, based on the analysis of the preceding sub-paragraphs.

viii) Perform an analysis of the fulfillment of the assumptions of the project.

ix) Carry out an analysis of the sustainability of the investments and the effectiveness in project development, as well as positive value-added.

x) Analyze and propose an update of the risks identified in the project and update the Risk Management Matrix.

c) Design questionnaire and conduct interviews and consultation with Stakeholders

xi) Develop questionnaires and conduct interviews of stakeholders identified in the TOR, in order to obtain their opinions and perceptions on the performance of the Program.

C. Evaluation Methodology

1.5 The evaluation methodology consisted of four elements:

Document Review: Review of Program documentation and reports such as Semi-Annual Progress Reports, Annual Operating Plans, Project Monitoring Reports, consultant reports and other documents listed in Appendix III

Stakeholder Interviews: Semi-structured interviews of key stakeholders (Appendix IV) who are/were involved in the preparation and/or implementation of the Program.

Data Analysis: Analysis of data provided by the PIU and IDB on the key output and outcome indicators of the project.

Site Visits: Visits to Project sites, to verify completion of works.

II Overview of the Program

A. Context and Background

2,1 Guyana, with an area of 216,000 sq. Km and a population of about 778,000 people, is one of the least densely populated countries of the world. More than 90 percent of the population is concentrated in areas around Georgetown, the capital, and along the narrow coastal plain, while the hinterland areas remain sparsely populated. The country is largely dependent on imported fossil fuels for its energy supply and most of the electricity generation capacity is thermal-based, using heavy fuel oil or diesel.

2.2 The Guyana Power and Light Inc. (GPL) is the principal public supplier of electricity with an installed generating capacity of 171.5 MW, producing about 489 GWh of electrical energy annually[6]. The areas covered by GPL's services are mainly along the coast, while private companies generate and distribute electricity in the mining town of Linden and other parts of the Hinterland. With electricity tariffs ranging from $0.28 to $0.32/KWh, the cost of electricity in Guyana is among the highest in the region. Access to electricity in the Hinterland is still limited due to distance from major load centers and limited infrastructure development. Over 80% of the Amerindian population in hinterland areas lack access to electricity.

2.3 The Sustainable Energy Program for Guyana was designed in response to priorities of the Government of Guyana's (GoG), in relation to the Low-Carbon Development Strategy (LCDS), to promote the development and use of renewable energy in the country. One of the main pillars of the LCDS is the sustainable development of the Hinterland with energy access among its main priorities. The Program is expected to address issues related to the efficiency and sustainability of energy supply nationally, reducing barriers to the introduction of Renewable Energy Technologies (RETs) and, reducing dependence on imported fossil fuels. It is expected to generate positive environmental benefits in the form of avoided GHG emissions (CO2) from the national energy sector in Guyana, estimated at a total of **0.67 Mtons CO2eq**[7]. This objective is consistent with priorities of the GoG, GEF and IDB with respect to the mitigation of global Greenhouse Gas (GHG) emissions, and in line with GEF-5 Strategy Document for Climate Change Mitigation[8].

2.4 The Program follows on the heels of two earlier projects financed by the IDB - the Power Sector Support Program, which, among other findings, identified the additional steps to be taken with regards to the introduction and expansion of the use of RETs in Guyana. The other project was the Un-served Areas Electrification Project which provided support in addressing the efficiency-related issues of GPL, as well as increasing access to electricity to previously un-served areas in the hinterland and some coastal areas of Guyana.

2.5 The Program is being implemented at a time of changing outlook in the energy sector and the economy of Guyana, with the recent discovery of oil and gas in 2015, and the ongoing plans for production which is expected to commence by the middle of 2020. More recently (March 2017), the Framework for the Green State Development Strategy (GSDS) was launched by the GoG. As quoted, it is expected to "guide Guyana's economic and socio-cultural development over the next fifteen years." The central themes for the energy sector, as established in the framework are: (i) Achieving a transition to 100% renewable energy in power sector; (ii) Achieving affordable, reliable and clean energy services for all; (iii) Ensuring security and quality of energy for business growth; and (iv) Increasing energy efficiency.

[6] Investment Grant Proposal, Paragraph 1.3

[7] Request for CEO Endorsement, Section B.2, (page 15)

[8] https://www.thegef.org/sites/default/files/documents/GEF-5_FOCAL_AREA_STRATEGIES.pdf

B. Program Goals, Objectives and Components

2.6 The goal of the Program is to reduce identified barriers to the deployment of RETs in Guyana and demonstrate the viability of delivering electricity to isolated communities and to the grid system in a sustainable and cost-effective manner. By reducing fossil fuels consumption, the Program would contribute to the mitigation of global greenhouse gas emission through the avoidance of greenhouse gas emission by the national power sector in Guyana.

2.7 The general objective of the Program is to improve the institutional capacities of the Guyana Power and Light Inc. (GPL), and the Ministry of Public Infrastructure (MoPI)), through the training of staff and promotion of the use of Renewable Energy Technologies (RETs) in urban areas and the Hinterland. The aim is to: (i) implement sustainable business models for Operation and Maintenance (O&M) of Renewable Energy (RE) projects; (ii) increase energy access in Guyana; (iii) reduce the long-term operational costs of on-grid and off-grid electricity service; and (iv) contribute to sector sustainability and reduction of Greenhouse Gases (GhGs) emissions.

The Program has three components as follows:

2.8 **Component I: Strengthening of the policy and institutional framework to implement Renewable Energy Technologies (RETs) in Guyana**.

The specific objective of this Component is to develop a National RE Strategy as an action plan, to promote the implementation of RETs under the Low-Carbon Development Strategy, including the revision of existing regulatory framework. The strategy will promote the introduction of RETs to deliver electricity to the grid areas and the Hinterland, under public, private and community-based business modalities.

Component I is expected to serve as an action plan, in order to improve the present regulatory framework and facilitate the development of Components II and III. The expected outcome and outputs are as outlined in Table 1 below.

Table 1: Outcome and Outputs for Component I:

Component I: Strengthening of the policy and institutional framework to implement Renewable Energy Technologies (RETs) in Guyana.	
Expected Outcome: ***The policy framework and institutional capacities to implement RETs in Guyana have been strengthened.***	**Outcome indicators:** Policy, regulatory and institutional framework adopted and enforced.
Expected Outputs	**Output indicators.**
1.1 National RE strategy developed and approved. 1.2 Legal and technical revision of electricity regulatory framework developed. 1.3 Energy sector agencies are trained to implement RE systems and coordinate their roles. **1.4** Public Awareness campaign developed.	1.1 A National RE strategy is developed and approved. 1.2 Number of Legal and technical revisions of electricity regulatory framework developed. 1.3 Number of training activities conducted for energy sector agencies on the implementation of RE systems and coordination of their roles. 1.4 Number of Public Awareness campaigns developed and conducted.

2.9 **Component II**: **Strengthening of the Power Utility capabilities to improve electricity supply and promote the use of RETs.**

The specific objective of Component II is to develop the technical capacity and expertise of professionals from GP&L and representatives from Hinterland communities for the planning, design, installation, operation and maintenance of RE projects. Component II will be funded with the Program's resources, to create the necessary technical expertise in GP&L and contribute to its financial recovery and operational improvement, vis-à-vis the LCDS. The expected outcomes and outputs are as outlined in Table 2 below.

Table 2: Outcomes and Outputs for Component II

Component II: **Strengthening of the Power Utility capabilities to improve electricity supply and promote the use of RETs.**	
Expected Outcome: ***The Power Utility's capabilities to increase the share of RETs have been strengthened.*** i. Increase in technical and managerial skills for implementing RETs by GPL ii. Increase in local capacities to implement and operate RETs for rural electrification.	**Outcome Indicators:** i. Level of investment to implement a Corporate Development Program. ii. Number of RET-related training activities conducted and number of persons trained.
Expected Outputs:	**Output Indicators**
2.1 Wind measuring stations installed. 2.2 RE potential assessment developed. 2.3 Pre-feasibility study of RE projects for rural electrification developed. 2.4 The Power Utility has received support to improve its technical and managerial skills for implementing RETs under the LCDS and for infrastructure development. 2.5 Sustainable business models for on-grid RETs implemented. 2.6 Sustainable business models for rural electrification RETs implemented. 2.7 Representatives from Hinterland communities are trained in the operation and management of RET systems. 2.8 The potential of bioenergy as part of a low-carbon development strategy has been assessed. **2.9** Installation of a demonstration plant for bioenergy production.	2.1 Number of wind measuring stations installed. 2.2 Number of RE potential assessments developed. 2.3 Number of pre-feasibility studies of RE projects for rural electrification completed. 2.4 A Corporate Development Plan Implemented. 2.5 A sustainable business model for on-grid RETs implemented. 2.6 Number of sustainable business models for rural electrification RETs implemented. 2.7 Number of training activities implemented for Representatives from Hinterland communities on the operation and management of RET systems. 2.8 An assessment of the potential of bioenergy as part of a low-carbon development strategy has been developed. 2.9 A demonstration plant for bioenergy production has been installed.

2.10 **Component III**: **Contribute to sector sustainability with the implementation of cost-effective RETs for on-grid and off-grid electricity generation.**

The specific objective of Component III is to implement RE pilot projects and demonstrate the technical, social, economic, financial and environmental sustainability of selected on-grid and off-grid RETs, through the implementation of pilot investments, such as wind energy, solar-PV and small hydropower projects. In addition, these pilot investments will provide the evidence that would give grounds to proposals for amendments to the institutional and regulatory framework. At the end of the program, it is expected that viable pilot projects on the coastal zone will be interconnect to the grid on a commercial basis and provide electricity at competitive prices. With respect to rural electrification, the Program will prepare and test sustainable business models for ownership, operation and maintenance and, address the current technical, institutional and capacity barriers. The expected outcomes and outputs are as outlined in Table 3 below.

Table 3: Outcomes and Outputs of Component III

Component III: C**ontribute to sector sustainability with the implementation of cost-effective RETs for on-grid and off-grid electricity generation.**	
Expected Outcome: ***Rural electrification and on-grid RET pilots have been implemented and are sustainably operated***.	**Outcome Indicators:**
i. Rural communities have access to RE supply.	i. Number of rural end-users supplied with sustainable electricity service from installed RETs.
ii. Increase in rural energy supply from RE sources.	ii. Amount of energy produced annually by RET-based systems installed in rural areas.
iii. Increase in energy supply from RE sources injected to the national grid.	iii. Amount of energy produced annually by installed on-grid wind turbines.
iv. Technical, social and financial sustainability of on-grid RETs demonstrated.	iv. Number of on-grid RE projects evaluated.
v. Technical, social and financial sustainability of rural RETs demonstrated.	v. Number of rural RE projects evaluated.
Expected Outputs:	**Output Indicators**
3.1 Solar-PV projects installed for rural electrification.	3.1 Number of kW of solar-PV projects installed for rural electrification.
3.2 Rural hydro power projects installed.	3.2 Number of kW of rural hydro power projects installed.
3.3 On-grid RET (wind power) installed.	3.3 Number of kW of on-grid RET (wind power) installed.
3.4 On-grid solar-PV projects installed.	3.4 Number of kW of on-grid PV projects installed.

C. Program Cost and Financing Structure

2.11 The total cost of the Program is estimated to be up to US$29.875 million and is being financed with a Grant of US$5.0 million from the GEF Trust Fund and Co-financing in the amount of US$24.875 million from various co-financing sources. A summary of the Program cost and the funding structure is shown in the following tables.

Table 4: Total cost of the Program and Financing Plan

Component	Total Financing (US$)		
	GEF (Trust Fund)	Co-Financing	Total
Component I	210,000	650,000	860,000
Component II	140,000	11,925,000	12.065,000
Component III.	4,430,000	11,800,000	16,230,000
Components Sub-total	***4,780,000***	***24,375,000***	***29,155,000***
Administration, monitoring, and auditing	220,000	500,000	720,000
TOTAL PROGRAM	**5,000,000**	**24,875,000**	**29,875,000**

The Co-financing for the Program, by source and amount, is shown in Table 5 below.

Table 5: Co-financing By Sources and Amounts

Sources of Co-financing	Name of Co-Financing	Type of Co-Financing	Amount Confirmed at CEO Endorsement (US$)
GEF Agency	IDB GY-L1038	Soft Loan	9,000,000
GEF Agency	IDB GY-T1096	Grant	600,000
GEF Agency	IDB GY-T1041	Grant	925.000
GEF Agency	IDB GY-M1022	Grant	1,500,000
National Government	GoG/GRIF	Grant	3,300,000
National Government	GoG (in-Cash)	Grant	5,300,000
National Government	GoG (in-kind)	In-Kind	1,250,000
Other Multilateral Agency	EU Energy and Water	Grant	3,000,000
Total Co-financing			**24,875,000**

III FINDINGS AND ANALYSIS

A. Achievement of Program Outputs and Outcomes

a) Program Results Framework

3.1 This section (Section III. A), provides a quantitative assessment of Program performance to date. Results reported in the Semi-Annual Progress Reports and Annual Operating Plans for the Program are compared to the output and outcome indicators in the Results Matrix, as presented in Tables 6 to 9 below. Comments are provided as necessary, to explain differences between the actual and targeted results.

It should be noted that the original Results Framework, prepared during the formulation of the Program, (Appendix II), does not include an Outcome Indicator to show the increase in energy supply injected into the grid from solar-PV energy sources. To ensure that this information is captured, an Outcome Indicator - *Increase in energy supply injected into the grid from solar-PV systems* - is included in the updated Results Matrix that was prepared during the mid-term evaluation.

3.2 Sections III. B and C. provide a qualitative in-depth assessment of implementation progress and achievement of Program Development Objectives, as well as the Effectiveness and Efficiency of Program Implementation.

Rating Criteria: Based on the assessment in different areas, ratings were assigned as follows:

i) Highly Satisfactory (HS): Effective performance and successful achievement of Program targets.
ii) Satisfactory (S): Moderate performance and/or achievement of Program targets.
iii) Marginally Satisfactory (MS): Moderate shortcomings in performance and/or achievement of targets.
iv) Unsatisfactory (US): Significant shortcomings in performance and/or achievement of Program targets.

Table 6: Achievement of Program Output Targets - Component 1: Strengthening Policy and Institutional Framework to implement RETs in GY

Output Indicators *(Units of measure)*	Base -line	Targets	2014	2015	2016	2017	2018	2019	EOP Target	Achieve-ment (to date)	Comments
1.1 National RE strategy developed and approved. *(No.)*	0	Planned				1			1	**0**	Development of the National RE strategy is slated for completion in 2019.[9] To date, a draft **National Energy Policy for Guyan**a (financed under a separate TC) and an **Energy Transition Roadmap (**financed under this Program), were prepared in 2016 and 2017 respectively. The road map identifies a list of actions to be taken by GOG and other key stakeholders to move towards the aspirational goal of 100% RE in the power sector in Guyana by 2025. This is in keeping one of the central themes outlined in the recently prepared Framework for Guyana's Green State Development Strategy[10].
		Actual				0					
		Revised						1			
1.2 Legal and technical revision of electricity regulatory framework developed. *(No.)*	0	Planned					1		1	**0**	This output will not be achieved within the current disbursement period of the Program, since it has to await the completion of a study, "Quantitative Analysis for Grid Integration of Distributive RE Sources" (still to be started), as well as the preparation of the National Energy Policy of Guyana, which is projected to be completed by the end of 2019.
		Actual					0				
		Revised						1			
1.3 Energy sector agencies are trained to implement RE systems and coordinate their roles. *(No.)*	0	Planned		1		1		1	3	**0**	Activities related to this Output have not been programmed to date.
		Actual		0	0	0	0				
		Revised						1			
1.4 Public Awareness campaign developed. *(No,)*	2	Planned		1	1	1	1		6	**4**	A Public Awareness strategy was developed in 2016 and two campaigns were implemented that year. A consultant was recently hired to evaluate the previous strategy and to launch two further campaigns that were scheduled to start in August 2018.
		Actual		0	2	0	2				
		Revised									

[9] As currently envisaged by the PIU, work on the drafting of the **National RE Strategy** will be guided by the **National Energy Policy** which is expected to be finalized by the end of 2019, as well as the **Power Generation System Expansion Plan,** prepared by GPL in 2016 and updated in 2018.

[10] https://motp.gov.gy/index.php/notices/policies/2016-framework-for-guyana-green-state-development-strategy

Table 7: Achievement of Program Output Targets - Component II: Strengthening of the Power Utility capabilities to improve electricity supply and promote the use of RETs

Output Indicators (Unit of measure)	Base -line	Targets	2014	2015	2016	2017	2018	2019	EOP Target	Achieve-ment (to date)	Comments
2.1 Wind measuring stations installed.	2	Planned		1	1	2			6	**0**	Four wind measuring stations are scheduled for installation by the end of 2018.
		Actual		**0**	**0**	**0**					
		Revised					4				
2.2 RE potential assessment Developed.	1	Planned			1		1		3	**0**	Not achievable due to cancelation of MIF TC (GY-M1022). New source of funds to be sought.
		Actual			**0**		**0**				
		Revised									
2.3 Pre-feasibility study of RE projects for rural electrification developed.	0	Planned			1	1	1		3	**0**	Not achievable due to cancelation of MIF TC (GY-M1022). New source of funds to be sought.
		Actual			0	0	0				
		Revised									
2.4 The Power Utility has received support to improve its technical and managerial skills for implementing RETs under the LCDS and for infrastructure development. *(A Corporate Development Plan implemented).*	0	Planned						1	1	**Pending**	Annex A, paragraph 2.04 of the Financing Agreement indicates that resources under Component II will be used to fund activities to create the necessary expertise in GPL. The PIU should therefore initiate discussion with GPL to ensure that this is done. (**Note**: The *Corporate Development Plan* currently being implemented by GPL does not include capacity building for the implementation of RETs, as previously envisaged).
		Actual									
		Revised									
2.5 Sustainable business models for on-grid RETs implemented.	0	Planned						1	1	**Pending**	Delayed due to cancelation of MIF TC (GY-M1022). New source of funds to be sought.
		Actual									
		Revised									

Output Indicators (Unit of measure)	Base -line	Targets	2014	2015	2016	2017	2018	2019	EOP Target	Achieve-ment (to date)	Comments
2.6 Sustainable business models for rural electrification RETs Implemented.	0	Planned				1	1		2	**0**	Delayed due to the cancelation of the MIF TC. Will be developed and implemented during the installation of the 4 solar PV mini-grids in 2019.
		Actual				**0**	**0**				
		Revised						**2**			
2.7 Representatives from Hinterland communities have been trained in the operation and management of RET systems (Number of training implemented).	2	Planned			2	1	2	1	8	**1**	Training commenced in 2016 with resources from the Basic Needs Trust Fund. A total of 146 residents from 16 communities were trained (*SAR 2, 2017).* Additional training to be provided during the installation of the solar-PV systems in the 10 communities in 2019. O&M training will also be provided during installation of mini-hydro power plant at Kato.
		Actual			**0**	**0**	**0**				
		Revised			1			6			
2.8 The potential of bioenergy as part of a low-carbon development strategy has been assessed.	0	Planned		1					1	**1**	Completed under IDB TC – Expanding Bioenergy Opportunities in Guyana. IDB GY -T1041 and IDB GY- T1064. Details on the outcome of the project not available.
		Actual			**1**						
		Revised									
2.9 Installation of a demonstration plant for bioenergy production.	0	Planned			1				1	**1**	Completed under IDB TC – Expanding Bioenergy Opportunities in Guyana. IDB GY -T1041 and IDB GY- T1064. Details on the outcome of the project not available.
		Actual			**1**						
		Revised									

Table 8: Achievement of Program Output Targets - Component II1: Contribute to sector sustainability with the implementation of cost-effective RETs for on-grid and off-grid electricity generation

Output Indicators (Unit of measure)	Base-line	Targets	2014	2015	2016	2017	2018	2019	EOP Target	Achieve-ment (to date)	Comments
3.1 Solar-PV projects installed for rural electrification.	141 (KW)	Planned		570		200	200	142	1,253	**453.2**	A total of 453.2 KW installed to date under GoG financed projects in the following areas[11]. Additionally, following the recent submission of Bids for the installation of solar-PV systems in 10 rural communities, it is anticipated that contacts will soon be awarded, and systems installed by end on 2019, adding another 199 KW.
		Actual	**35**	**390**	**9.2**	**19**	0				
		Revised						199			
3.2 Rural hydro power projects installed.	0 (KW)	Planned			330			2,000	2,300	**0**	The EOP target of 2,300 KW will not be achieved. Possible only 150KW. The project originally anticipated the rehabilitation of the Tumatumari (2,000Kw), and development of Kato (300KW) SHP plants. However, Tumatumari, has since been removed from under the project, while the capacity of Kato has been reduced to 150KW. Following the annulment of the bidding process for the construction of the Kato SHP, a new bidding process is currently in progress, with possible award of contract by Dec 2018. Construction is likely to be completed by 2020, within the proposed one-year extension to the period for disbursement of the Program.
		Actual									
		Revised									
3.3 On-grid RET (wind power) installed.	0 (KW)	Planned						300	300	**0**	The original target for the installation of a 300 Kw wind-powered turbine-generator will not be achieved, due principally to delays in the procurement and installation of wind measuring instruments and the collection of wind data, as well as the cancellation of the EU co-financing.
		Actual									

[11] (i) Hinterland Communities: 390Kw (6,000 systems at 65Kw each) in 2015; (ii) Forth Island and St. Cuthbert's Mission: 9.2 Kw in 2016; (iii) Schools and Health Clinics in the Hinterland: 19KW in 2017. (Associated documents to be reviewed and validated)

Output Indicators (Unit of measure)	Base-line	Targets	2014	2015	2016	2017	2018	2019	EOP Target	Achieve-ment (to date)	Comments
		Revised									GOG however, is currently negotiating a PPA with a private sector company for the development of a 10 to 14 MW wind farm at Hope Beach on the East Coast of Demerara (emphasizing its commitment to this Program and the expansion of the use of RETs).
3.4 On-grid PV projects installed.	18.46 (KW)	Planned			40	60	60	20	198.46	**1,975.6**	Seven (7) on-grid solar PV systems installed to date under the Program and 109 systems installed by GEA under the GoG Public Sector Investment Program. These systems are tied to the grid (which proves the technical viability), with net-metering arrangements in place to monitor the energy used, against that which is generated[12]. However, in in the absence of an enabling policy and regulatory framework, net energy produced, if any, is exported free to the grid.
		Actual			**16**	**1,959.6[13]**					
		Revised									

Table 9: Achievement of Program Outcome Targets

No	Outcomes /Indicators	Baseline	Targets	Achievements to Date		Name of Project	Location	Funding Source	Means of Verification
				This Project	Other Projects				
1.	Rural communities have access to RE supply. *Indicator: Number of rural end-users supplied with sustainable electricity service from installed RETs*	6,900 persons	27,500 persons	0	24,000 persons (i.e. 6,000 households at an ave. 4 persons per household..	GoG Hinterland Electrification Program	Hinterland communities in Regions 6, 5, 3, 2, 1, 7, 8 and 9.	Government of Guyana	Project records at HECI

[12] Sample printouts attached in Appendix VI

[13] 179.6 KW installed with resources from the GEF, plus 1,780 KW installed by GEA under the GoG Public Sector Investment Program

No	Outcomes /Indicators	Baseline	Targets	Achievements to Date		Name of Project	Location	Funding Source	Means of Verification
				This Project	Other Projects				
2.	Increase in rural energy supply from RE sources. *Indicator: Amount of annual energy production by installed rural RETs*	198 MWh/yr	12,222 MWh/yr	0	762[14] MWh/yr	GoG Hinterland Electrification Program	Hinterland communities in Regions 6, 5, 3, 2, 1, 7, 8 and 9.	Government of Guyana	Project records at HECI
3 (a)	Increase in energy supply from RE sources injected into the national grid. *Indicator: Amount of annual energy production by installed on-grid wind turbine.*	(Wind) 0	(Wind) 789 MWh/yr	0	0				
3 (b)	Increase in energy supply from RE sources injected into the national grid[15]. *Indicator: Amount of annual energy production by installed on-grid solar-PV.*	(Solar-PV) Not established	(Solar-PV) Target not established	325.76[16] MWh/yr	2,923[17] MWh/yr	i. Sustainable Energy Program for Guyana ii. GoG Public Sector Investment Program (2,923Kw)	Seven (7) Government Buildings in Region 4, principally	i. GEF/IDB ii GoG/PSIP	i. HECI Records ii. GEA Project Records
4.	Technical, social and financial sustainability of on-grid RETs demonstrated. *Indicator: Number of on-grid RE projects evaluated.*	0	1	0	0				
5.	Technical, social and financial sustainability of rural RETs demonstrated. *Indicator: Number of rural RE projects evaluated*	0.	2	0	0				

[14] Produced by the 453.2 KW of solar-PV systems installed under the GoG/HECI rural electrification **(Output Indicator 3.1)**

[15] This Outcome Indicator was not in the original Results Matrix but was added to report on the outcome of the on-grid solar-PV systems installed under the Program.

[16] Produced by the 179.6 KW of on-grid solar-PV system installed under the Program **(Output Indicator 3.4).**

[17] Produced by the 1.78 MW of on-grid solar-PV system installed by GEA under the GoG Public Sector Investment Program **(Included in Output Indicator 3.4 also).**

No	Outcomes /Indicators	Baseline	Targets	Achievements to Date		Name of Project	Location	Funding Source	Means of Verification
				This Project	Other Projects				
6.	Increase of technical and managerial skills for implementing RETs by GP&L *Indicator: level of investment to implement a Corporate Development Program*	0	US$20 M	0	TBD				
7.	Increase of local capacities to implement and operate RETs for rural electrification. *Indicator: number of training*	2	7	0	Awaiting info. from HECI				

B. Achievement of Program Development Objectives

3.3 The extent to which the Outputs and Outcomes, as highlighted in Section 3.1, have contributed to the achievement of the development objectives of the Program, is assessed in this section of the report.

Table 10: Status of Achievement of Program Development Objectives and Goals

Program Goal and Objectives	Achievements/Comments
The aim[18] (goal) of the Program is to reduce identified barriers to the deployment of RETs in Guyana and demonstrate the viability of delivering electricity to isolated communities and to the grid system, in a sustainable and cost-effective manner.	**Limited progress to date in the achievement of this goal.** While the technical viability of delivering solar-generated power to the grid and to isolated hinterland communities has been demonstrated (with many systems installed to date), a business model is still to be developed to confirm the cost-effectiveness and sustainability of such systems. Additionally, work is still to be completed on the revision of the legal, technical and regulatory framework to guide the deployment of RETs.
The specific objective of the Program is to improve the institutional capacities of the Guyana Power and Light Inc. (GPL) and the Ministry of Public Infrastructure (MoPI) through staff training and the promotion of the use of RETs in urban and hinterland areas, with the aim to: i) Implement sustainable business models for the operation and maintenance of renewable energy (RE) projects. ii) Increase quality energy access in Guyana. iii) Reduce the long-term operational costs of on-grid and off-grid electricity services. iv) Contribute to sector sustainability and reduction of Greenhouse Gas (GhG) emissions.	Apart from GPL's in-house RE initiatives, a formal program, supported by the project is still to be developed, to strengthen GPL's capacity for the deployment of RETs. The MoPI, HECI and GEA, on the other hand, continue to build capacity through the implementation of various RE projects. i) No progress to date due to the cancellation of the MIF TC. New sources of funds to be identified to develop the business models for the 10 community-based solar-PV systems to be installed in 2019. ii) Some progress to date, with approximately 24,000 people benefiting from the GoG/HECI Hinterland Electrification Program. iii) No significant achievement to date under the Program. iv) Some progress to date. **Progress in the achievement of the development objectives of the Program, to date, is rated as *"Marginally Satisfactory."***
Program Components: **Component I**. Strengthening of the Policy and Institutional framework to implement RTEs in Guyana	Stakeholders are still in discussion regarding the revision of the policy, regulatory and institutional framework for the sector. A consultant should have been hired for this purpose at the end of 2017. This however, was delayed, pending the outcome of the stakeholder consultation. To date, a Draft National Energy Policy for Guyana (2016) was prepared, as well as a Generation Expansion Plan 2019-2035, that was prepared in 2017 and updated in July 2018. Additionally, an Energy Transition Roadmap was prepared in 2017 and should lead to the eventual preparation of a National Renewable Energy Strategy and, used in the negotiations for the release of GRIF co-financing resources. **Achievement under this component is rated *as "Marginally Satisfactory*."**

[18] Paragraph 1.20 of the Investment Grant Proposal.

Program Goal and Objectives	Achievements/Comments
Component II: Strengthening the Power Utility (GPL) capabilities to improve electricity supply and promote the use of RETs.	**Very little progress to date with the implementation of activities under this component**. • A program to strengthen GPL's capacity to implement RETs is still to be developed and included in the Corporate Development Plan of the Utility Company. • No progress in the development of the business models, the RE potential assessment and pre-feasibility studies, due to the cancellation of the MIF TC (GY-M1022). • Delays in the installation of wind measuring stations. • Limited progress in training in Hinterland communities. **Achievement under this component is rated *as "Unsatisfactory*."**
Component III. Contribute to sector sustainability with the implementation of cost-effective RETs for on-grid and off-grid electricity generation.	• Significant progress made with the installation of 116 grid-tied solar-PV systems with a total installed capacity of 1,975 MW (approximately 10 times the end of project target). • However, installation of the wind and hydropower schemes have been plagued by delays and other procurement related issues. **Achievement under this component is rated *as "Marginally Satisfactory*."**

C. Effectiveness of Program Implementation

a) Institutional Arrangements

3.4 In keeping with the Electricity Sector Reform Act 1999, the Ministry of Public Infrastructure is assigned responsibility for the overall administration of the power sector in Guyana, including policy formulation, as well as regulatory functions. Departments in the sector that comes under the Ministry are: Guyana Energy Agency (GEA), Guyana Power and Light Inc (GPL), Hinterland Electrification Company Inc. (HECI) and the Electrical Inspectorate.

3.5 As designed during Program preparation, the MoPI (previously the OPM), was identified to be the Executing Agency (EA), with the Hinterland Electrification Unit[19] (HEU) as the Project Implementation Unit (PIU). This was due to HEU's vast experience with the GOG-financed Rural Electrification Program, as well as the Un-served Areas Electrification Project (UAEP), financed previously by the IDB. In 2015 the HEU was incorporated as the Hinterland Electrification Company Inc. (HECI), the current PIU of the Program.

3.6 Oversight of the Program was expected to be provided at two levels: (i) at the strategic level and (ii) at the operational level. At the strategic level, a high-level Program Steering Committee (PCS) was to be established, comprising representatives from the MoPI (as the chairperson), the Ministry

[19] Following the completion of the UAEP in 2010, the PEU of the Project was renamed the HEU. It was retained within the OPM to provide technical and other support to hinterland projects that were implemented previously under the UAEP (2005-2010). The unit was also expected to develop and implement new projects based on government's development plan for the hinterland. In January 2015, the HEU was incorporated as the Hinterland Electrification Company Inc. (HECI).

of Finance, Ministry of Indigenous People's Affairs (previously the MoAA), GEA and GPL, and with the Project Manager of the PIU as Secretary to the Committee.

3.7 At the operational level, the PIU was to be responsible for the fulfillment of the technical, administrative, planning, supervisory and fiduciary tasks related to the execution of the Program. As a condition precedent to first disbursement, a Project Manager, Procurement Specialist, Financial Specialist, Electrical Engineer, and Social-Environmental Specialist were appointed by the EA to carry out the functions of the PIU.

3.8 At the strategic level, as it turned out, the high-level Program Steering Committee was established at the initiation of the Program[20] but based on reports, a meeting of the Committee was never convened. The reason for this lapse was not determined, however, as part of its portfolio monitoring efforts, Quarterly Portfolio Review Meetings, organized by the Ministry of Finance (and involving the MoPI, PIU, IDB and other stakeholders, as necessary) were conducted throughout the life of the Program.

3.9 At the operational level, the HEU was initially assigned responsibilities as the Program Implementation Unit (PIU) with staff appointed, as highlighted previously. In 2015 however, when the HEU was incorporated as the HECI, the Project Manager of the HEU became the Chief Executive Office of the new company (with broader responsibilities to manage the company and the promote its business plan), but at the same time, retained the position as Project Manager for the Program. The situation has remained the same since then but is not in keeping with the spirit and intent of the implementation arrangement for the Program, which requires staff to be in place on a full-time basis. A similar situation exists for other staff assigned to the PIU.

b) Technical

3.10 From a technical standpoint, the HECI has wide experience in the successful implementation of hinterland and coastal electrification projects and a proven track record of its capacity to implement activities envisaged under the Program. As the holding company for six (6) mini and micro grids that serve isolated communities in Guyana, HECI also has a pool of resources that it can potentially draw from, for the implementation of projects and programs. This experience however, seems limited to power generation using fossil fuels, as well as solar-PV systems.

3.11 With respect to hydropower development, the company does not have the in-house technical capacity and is dependent on the GEA for its support. As a result, the GEA has been playing a leading role in the planning, development and implementation of hydropower projects, such as Kato and Moco-Moco, as well as other micro and small hydropower projects. The Program continues to benefit from this arrangement which, at the same time, has provided the GEA with significant opportunities for learning and capacity building.

3.12 Additionally, with responsibility for preparing the National Energy Policy for Guyana, the GEA is playing a leading role as it pertains to the revision of legal and regulatory framework for the sector, the finalization of the National Energy Policy, as well as the preparation of the National Renewable Energy Strategy required under this Program.

3.13 Taken together, the Executing Agency (the MoPI), through the HECI and GEA have the technical capacity to implement activities under the Program. What was found lacking however, based on

[20] As required in Annex of the Financing Agreement, paragraph 5.02; and highlighted in paragraph 3.31 of the Program Operations Manual (POM).

interviews and discussions with key stakeholders in the sector, is the need for increased levels of coordination with stakeholder, given the multiplicity of initiatives ongoing in the sector at the moment.

c) Administrative

3.14 The administrative arrangements currently in place for the management of the Program is deficient. It is the view of this Consultant that following the incorporation of the HECI, a full-time manager for the Program should have been appointed, someone, preferably with project management experience, who is capable of performing the role as previously envisaged. This arrangement would have helped significantly, to keep Program activities in focus and on track and, contribute to the achievement of expected results. It would have also helped in scheduling the time of other project staff, given the potential conflicts that would have arisen in the performance of their duties.

3.15 With respect to procurement under the Program, familiarity with Bank's policies and procedures seems to have been a challenge and, would have been partly responsible for the protracted delays in Program execution. A review of the Updated Procurement Plans, included in Annex 3 of Semi-Annual Progress Reports, points to ongoing deferment of procurement-related activities. A complete analysis of procurement activities under the Program was not possible however, due to the absence of information from the online Electronic Procurement Execution System (SEPA) which is not being utilized, as required in the Fiduciary Agreement for the Program.

d) Financial Management

3.16 The financial management system that was established for the "Program," captures information on GEF related activities only, and account for Program resources totaling US$6.25 million (i.e. US$5.0 million "IDB/GEF Fund" + US$1.25 million "Local Counterpart."), as indicated in the Annex, Paragraph 3.01 of the Non-Reimbursable Financing Agreement. As such, financial reports prepared to date, account for these resources only, without reference to the "In-Cash" Co-financing contribution from the Government of Guyana, as well as Co-financing contribution from other sources, as indicated in the GEF document - Request for CEO Endorsement. Apparently, this document was only recently made available to the PIU. The Annual Financial Statements and Audit Reports reflect this discrepancy also. This is an issue that must be addressed in going forward.

e) Program Planning

3.17 In reviewing the implementation plans and status reports on the Program[21] it is noted that program planning seems to be activity-based, rather than results-based, and that information is presented in a way that focuses on an on-going series of activities. Consequently, 'actual results' are not compared to 'planned results' for the duration of the Program, making it difficult to get a full up-to-date picture, on the timeliness of Program execution.

3.18 As an example, the Microsoft Project Spreadsheets (Gantt Charts) included in Annex 5 of the Semi-Annual reports, provide details on activities for the forthcoming semester (and to the end of the Program), but does not include information on the length of time activities have been ongoing. Consequently, the process for the procurement and installation of the Wind Measuring Equipment which should have taken 206 days, between April 2015 and January 2016[22], is now shown for

[21] Contained in the Annual Operating Plans and Semi-Annual Reports

[22] Semi-Annual Progress Report II (July - December 2014)

delivery in 50 days between March and September 2018[23]. No indication is given of the overall duration for the completion of this activity which is in excess of 1,215 days.

3.19 Program planning and reporting should therefore be adjusted to one where 'results' are central to the planning and decision-making process and, reports provide the full picture of progress in Program implementation and achievement of results. This is an essential step in transitioning to a system/culture of managing for results.

3.20 Similarly, the 'Updated Procurement Plans' included in Annex 3 of Semi-Annual Reports do not provide a complete picture of procurement-related activities. A printout and analysis of the Electronic Procurement Execution System (SEPA) report would be useful in this regard.

f) Monitoring & Evaluation

3.21 As outlined in the Program Operations Manual, the MoPI through the HECI is responsible for monitoring progress and overall performance of the Program during its execution. Data is collected routinely and used for the preparation of SARs and AOPs and, updating the Results Matrix. However, while monitoring of activities related to the GEF financing is ongoing, it remains unclear as to the extent that information is captured at the Program-level. Consequently, information on the outcomes of all Program-related initiatives, (for example, the bioenergy project of the IDB; GOG HECI, GEA, and other co-financed initiatives) is not readily available.

3.22 Given the nature of the **"Program"**, it is essential that the M&E Plan be extended to include data for all projects under the Program and, the reporting format modified to capture, in a common database, the overall Program outputs and outcomes. This is the essence of a Programmatic-Approach and, if utilized, would help to improve coordination, inform planning and decision-making and overall effectiveness in Program execution.

g) Coordination with other Sectoral Institutions and Key Stakeholders

3.23 The sectorial institutions and key stakeholders within the scope of the Program are: The Ministry of Public Infrastructure (MoPI), the Hinterland Electrification Company Inc. (HECI), the Guyana Energy Agency (GEA), the Ministry of Indigenous People's Affairs (MoIPA), (previously Ministry of Amerindians Affairs), the Guyana Power & Light Inc (GPL) and the Ministry of the Presidency (MoP) (previously the Office of the President) - Project Management Office for the LCDS, and more recently, the Department of the Environment – related to the Green State Development Framework and Strategy.

3.24 **MoPI and HECI**: As mentioned in paragraphs 3.4 and 3.5 above, the Ministry of Public Infrastructure, the Executing Agency (EA) for the Program, is responsible for the administration of the power sector in Guyana and, through the Hinterland Electrification Company Inc (HECI), act as the Project Implementation Unit. The Ministry and the HECI continue to play leading roles in the promotion of RETs in Guyana and have been actively involved in implementing RE projects and seeking new co-financing partners, in order to expand the Program. In June 2018, the Ministry announced that several renewable energy projects, including solar-PV, wind and hydropower, totaling some 30 MW will be installed by 2020. Potential new sources of co-financing from the United Arab Emirates (UAE), the International Renewable Energy Agency (IREA), and the Government of China, as well as increased support by the IDB, are currently being considered.

[23] Semi-Annual Progress Report VII (July - December 2017)

3.25 **GEA**: During the evaluation it was determined that the level of coordination between the HECI and GEA is excellent. With responsibility for the preparation of the National Renewable Energy Strategy and revision of the legal and regulatory framework in the sector (under Component I), the GEA has taken a leading role in these areas, and also with the preparation of plans for the development of the hydro power sites under Component III of the Program. Regular coordination meetings between the EA and the GEA are held in this regard.

3.26 **MoIPA:** Based on an interview with officials from the Ministry of Indigenous Peoples Affairs it was determined that not enough is known about the Program and that increased levels of coordination and communication is needed, on matters related to the Program. This is particularly important, given the wide experience of the MoIPA in implementing projects related to the development of hinterland communities, including the development of business models that were tried and tested in the past.

3.27 **GPL**: With respect to GPL, a key beneficiary under the Program, the level of coordination on matters related to the Program is not as expected. Interviews conducted revealed that while officials at GPL are aware of the Program, they have little knowledge of the details, and the extent to which they are expected to benefit from the Program. Significant efforts are therefore needed, on the part of the Executing Agency (EA), to ensure that GPL, starting at the highest level, is brought fully onboard with the Program.

3.28 **MoP**: As in the case of MoIPA and GPL, senior officials in the Ministry of the Presidency (the Project Management Office for the LCDS, and the Department of the Environment - related to the Green State Development Framework and Strategy) have expressed the need for increased level of information sharing and coordination on matters related to the Program.

D. Efficiency of Program Implementation

a) Execution and Disbursement of GEF Resources

3.29 Project implementation to date has been very slow. At 57 months into the 66 months execution period of the Program (i.e. 86% of the time), and a rated advance in Program implementation of about 20%, the Mid-Term Evaluation of the Program is only now being conducted (15 months after the scheduled date). Disbursement of GEF resources to date, stands at only US$1.40 million or 28% of the available amount as shown in Table 11 below.

Table 11: Disbursement of GEF Resources - Planned vs. Actual

Year	2014	2015	2016	2017	2018	2019	TOTAL
Projected Disbursement[24] (US$)	250,000	750,000	1,250,000	1,500,000	1,000,000	250,000	5,000,000
Projected Disbursement (%)	5%	15%	25%	30%	20%	5%	100%
Actual Disbursement (US$)	0.0	14,388	48,918	374,427	967,658[25]	-	1,405,391
Actual Disbursement (%)	0%	0.3%	0.97%	7.5%	19.3%	-	28.07%

[24] As per Disbursement Schedule – Table 2, Section 2.3 of the Investment Grant Proposal

[25] Based on Cumulative Disbursement in LMS as at July 3, 2018

3.30 The table presents a good picture of implementation progress to date. Issues related to the identification and definition of activities to be carried out under the Program, are reported to have been responsible for delays during the first two years of the Program.

3.31 Additionally, the cancellation of the MIF TC (GY-M1022), the failed bidding process for the construction of the Kato hydropower plant, as well as the delays in the selection of 10 communities to benefit from the installation of the solar-PV demonstration projects, are among the reasons for the slow implementation and disbursement under the Program. The impact of these delays on Program execution has been significant, since 89 % of the budget for the Program is allocated under Components III where most of these activities fall.

b) Budget and Cost Management

3.32 Issues of budget and cost management were raised recently as a result of the bidding experience related to the Kato hydropower development project. The single bid submitted was 91% above the Engineer's Estimate and, brings into question the original estimates for the development of hydropower projects. It is likely that these estimates might have been too low, in the first place, compounded by the issue of the escalation of costs with the passage of time. Also, the number of Hinterland communities to benefit from the installation of RETs under the Program has been reduced from 20[26] to 10, due principally to budget constraints.

c) Timeliness of Output Delivery

3.33 To evaluate the timeliness of delivery of Outputs, the estimated timelines and actual delivery of outputs were compared. The times were obtained from the Implementation Status and Gantt Charts included in Section 3 and Annex 5 of Semi-Annual Progress Reports, No: II to VIII. Table 12 below presents the results.

Table 12: Delivery of Outputs – Planned vs. Actual

Outputs	Commence Activities (Estimated)[27]	Complete Activities (Estimated)	Actual Completion
Component I: Strengthening the Policy and Institutional Framework for the Implementation of RET's in GY			
1.1 National RE strategy developed and approved	June 2017	(Dec. 2017)**	Pending
1.2 Legal and technical revision of electricity regulatory framework developed	Rescheduled to October 2018	TBD	Pending
1.3 Energy sector agencies are trained to implement RE systems and coordinate their roles.	June 2016	2019	Pending
1.4 Public Awareness campaign developed: Phase I: Phase II	 Apr. 2015 (Rescheduled to Sep. 2018)	 Feb. 2016 Rescheduled to Jan. 2019	 Aug. 2016 Not started
Component II: Strengthening the Power Utility Capabilities to Improve Electricity Supply and Promote RET's			
2.1 Wind measuring stations installed (Procure and install)	April 2015 (Rescheduled to Oct. 2018)**	Dec. 2016 (Rescheduled to Dec. 2018).	Not completed

[26] Investment Grant Proposal, paragraph 1.38.

[27] Based on **Semi-Annual Progress Report II (July-December 2014)** - Section 3: Implementation Status

Outputs	Commence Activities (Estimated)[27]	Complete Activities (Estimated)	Actual Completion
2.2 RE potential assessment developed	2016	Not scheduled	(Will not be completed)***
2.3 Pre-feasibility study of RE projects for rural electrification developed	2016	Not scheduled	(Will not be completed)***
2.4 The Power Utility has received support to improve its technical and managerial skills for implementing RETs under the LCDS and for infrastructure development *(A Corporate Development Plan implemented).*	Start time not scheduled	Completion to be scheduled for 2019	Pending
2.5 Sustainable business models for on-grid RETs implemented	Start time not scheduled	Completion was to be scheduled for 2019	(Will not be completed)***
2.6 Sustainable business models for rural electrification RETs implemented	Start time not scheduled	Completion to be scheduled for 2019	Pending
2.7: Representatives from Hinterland communities have become trained on the operation and management of RET systems (Number of training implemented).	2016	Completion to be scheduled for 2019	Pending
2.8 The potential of bioenergy as part of a low-carbon development strategy has been assessed	Completed	-*-	Completed under co-financed TC
2.9 Installation of a demonstration plant for bioenergy production	Completed	-*-	Completed under co-financed TC
Component III: Contribute to Sector Sustainability with the Implementation of Cost-Effective RET's on-grid and off-grid electricity generation			
3.1 Solar-PV projects installed for rural electrification	April 2015	Jan. 2016	May 2017
3.2 Rural hydro power projects installed: (i) Geo-Technical Studies only (Moco Moco) (ii) Kato Hodro Power Plant completed	 Mach 2018 March 2018	 July 16, 2018 May 2020	 Not started Not started
3.3 On-grid RET (wind power) installed. (Install instruments and collect data only)	Rescheduled to Sep. 2018	Sep. 2019	Not started
3.4 On-grid PV projects installed	April 2015	Jan 2016	Jan. 2017

Additional Notes:

** Based on **Semi-Annual Report Progress Report VII (July-December 2017)** – Table 3: Implementation Status

*** Outputs will not be achieved unless alternative sources to the MIF financing are secured

3.34 As noted in Table 12, many activities are still to be scheduled or are delayed. Some of them will not be completed within the current deadline for disbursement under the Program.

d) Use of GEF and Co-financing Resources and Complementarity with other Initiatives

3.35 GEF resources have been utilized, in keeping with the objectives and fiduciary requirements of the Program. However, as noted in paragraph 3.29 and Table 11, disbursements are significantly below projections. With respect to co-financing resources, Table 13 shows that of the US$24,875,000 confirmed at the approval of the Request for CEO Endorsement, only US$7,785,821.15 have materialized to date. An additional amount of US$139,000 in new co-financing resources was realized also, under a GoG/GIZ project for the construction of a 20KW demonstration hydropower project at Hosororo.

Several factors are responsible for the lower than expected achievement in co-financing to date, as explained in paragraphs 3.36 to 3.39 below.

Table 13: Co-financing Confirmed and Realized to date (US$)

Sources of Co-financing	Name of Co-Financing	Type of Co-Financing	Amount Confirmed at CEO Endorsement/ Approval (US$)	Actual Amount Materialized at Midterm (US$)	Comments
GEF Agency	IDB GY-L1038	Soft Loan	9,000,000	0	Preparation of this Operation was terminated. To be replaced by GY-L1066 (US$8.6 M) in November 2018.
GEF Agency	IDB GY-T1096	Grant	600,000	740,000	Implemented
GEF Agency	IDB GY-T1041	Grant	925.000	975,000	Implemented
GEF Agency	IDB GY-M1022	Grant	1,500,000	0	Amount cancelled
National Government	GoG/GRIF	Grant	3,300,000	0	Resources withheld by Government of Norway, pending agreement with GOG on the GRIF initiative.
National Government	GoG (in-Cash)	Grant	5,300,000	5,938,190[28]	Aided significantly by GoG/HECI and GoG/GEA Public Sector Investment Program.
National Government	GoG (in-kind)	In-Kind	1,250,000	132,631.15	
Other Multilateral Agency	EU Energy and Water	Grant	3,000,000	0	Amount cancelled.
Co-financing Approved/Realized			**24,875,000**	**7,785,821.15**	
New Complementary Co-Financing					
National Government	GoG/GIZ	Grant	0.0	139,000	Being used for construction of 20KW Hosororo demonstration hydropower plant.
Total Co-Financing Realized				**7,924,821.15**	

[28] Breakdown provided in Appendix IV, based in information provided by PIU.

3.36 **IDB: GY-M1022**: As mentioned earlier, the amount of US$1.5 million in co-financing was cancelled after the Executing Agency for the Grant (CARIBSAVE Partnership Inc.)[29] became insolvent. This resulted in the loss of US$1.33 million of in-cash financing from the MIF, and more than US$170,000 in-kind contribution from the Executing Agency itself. The impact of this loss was significant, as the financing was intended to focus on the development of business models for RE systems to be installed in hinterland communities, to ensure long-term sustainability.

3.37 **GoG/GRIF**: In the case of the GoG/GRIF co-financing arrangement, funds previously earmarked under the program were withheld by the Government of Norway pending submission by GoG of a Renewable Energy Transition Plan. This document, which has since been completed under this Program, was used recently in negotiations between the two governments. In July 2018 it was announced that tentative agreement was reached for the possible release of co-financing resources under the GRIF, for the construction of large-scale solar farms, gerarating as much as 100 MW of power.

3.38 **European Union**: In the case of the EU, resources previously committed under its Energy and Water Initiative were cancelled, following the annulment of the bidding process for the Kato Hydropower development. This action was necessary since the re-tendering and construction period would have fallen outside the budget cycle of the 11th EDF of the European Commission.

3.39 **IDB GY-L1038**: Preparation of this Operation was terminated. However, based on the IDB's ongoing commitment the Program, a new operation, GY-L1066 for the amount of US$8.6 million, is currently being prepared and is expected to be approved in November 2018.

3.40 To help offset the shortfall created by the cancellation of the MIF and EU co-financing amounts, and also to expand the scope of the Program, GoG with the support of the IDB is exploring new co-financing sources with possible support from the United Arab Emirates (UAE), the International Renewable Energy Agency (IRENA), China Grant Aid, and possible renewed commitment from the GRIF. The leveraging effect of the Program and the complementarity of these new initiatives would, no doubt, enhance the overall impact of the Program. An indicative list of possible new sources of co-financing is shown in Table 14 below. The amounts and final commitments are still to be confirmed.

Table 14: Potential New Partnership and Co-Financing Sources

	Agency	Comments
	United Arab Emirates	Hydropower development
	International Renewable Energy Agency	Solar PV farms for newly designated townships
	IDB: GY-L1066	Solar PV farms – Lethem, Bartica and Madia ($8.6 M)
	GoG/HECI	400 kW solar plant in Mabaruma
	GEA	25 kW hydropower plant in Mabaruma
	China Grant Aid	4 MW Solar-PV for West Coast Berbice
	GRIF	TBD

[29] A Barbados-based company

E. Assessment of Risks and Sustainability of the Program

3.41 A number of risks[30] that could potentially impact the successful implementation and sustainability of the program were identified during the Program preparation and, updated in the Annual and Semi-Annual Progress Reports. An assessment of the most significant risks is as follows:

3.42 **Public Management and Governance**: The risk of the withdrawal of GOGs commitment to the Program, or that its priorities would change, was rated as ***"Medium"*** during Program preparation. However, this classification has since been changed to ***"Low,"*** given the commitment expressed by the new government after its election in 2015. This commitment was further reinforced with the adoption of a Green State Development Framework, which, among other priorities, has set an aspirational goal of 100% renewable energy for the energy sector by 2025.

The risk related to "governance capabilities" and insufficient technical capacity to implement the Program remains as ***"Medium.***" In order to help mitigate this risk, further training is needed, particularly in the area of procurement policies & procedures, other IDB requirements, as well as current trends and developments in RETs. Updated training in the use of the Microsoft Project Software is also needed.

Additionally, while the partnership with the GEA in providing technical support for the hydropower development program has helped to mitigate some of the risks related to technical capacity, the expected partnership with the private sector, to draw on its expertise and know-how, did not materialize.

3.43 **Institutional viability**: The institutional risk identified is related to the ongoing commitment of the Ministry of Public Infrastructure and the HECI to the objectives of the Program. While there is no doubt about their commitment, there is need for this to be demonstrated in a tangible way, with the appropriate staffing arrangements being put in place, as required in the Program Operations Manual[31]. The assessment of this risk is rated as *"Medium."*

3.44 **Financing**: The cancellation of co-financing resources by the MIF has had a negative impact on the Program execution, since the development of business models, key to the sustainability of the Program, have not been completed to date. With potential new sources of parallel financing identified, however, it is anticipated that resources will be directed to the development of business models, based on models that were tested under the UNDP-implemented Amerindian Development Fund[32] (ADF), the HECI and other GoG-financed initiatives. Progress in these areas are necessary in order to enhance prospects for the sustainability of the Program. Additionally, new sources of co-financing would be needed to help mitigate the loss of the EU and other co-financing resources that have not materialized to date. The assessment of this risk is "*Medium."*

3.45 **Stakeholder Endorsement and Engagement**: The endorsement and commitment of key stakeholders to the overall goals of the Program remains ***High***, as determined during the stakeholder interviews. This rating is the same, as previously found during the preparation of the

[30] Paragraph 2.5 to 2.12 of Investment Grant Proposal and, Section B.4. of the Request for CEO Endorsement.

[31] Paragraph 3.3.3 of the POM

[32] The Amerindian Development Fund (ADF) was established to provide funding to support the socio-economic development of Amerindian communities and villages, through the implementation of their Community Development Plans (CDPs). https://moipa.gov.gy/amerindian-development-fund/

Program. However, based on feedback during the evaluation, stakeholder engagement is rated as ***Medium,*** given the absence of a mechanism for regular consultation and feedback.

3.46 **Availability of RE Resources and Data**: The availability and reliability of existing data needed for the deployment of RETs in Guyana was identified as *"Medium"* risk during Program preparation. Delays in the installation of instruments for the collection of wind data highlight this risk and, has been a setback to the Program. Notwithstanding this, the PIU is continuing with its work of collection of data related to various projects under the Program. A common database, however, that captures data for the overall Program is still to be developed. This is an issue that must be addressed during the remaining period of execution of the Program. The classification of this risk remains at *"Medium,"* as before,

3.47 **Socio-economic risks and degree of adoption by users**: The lack of acceptance of RETs by rural communities was cited as a risk to the implementation, operation, maintenance and sustainability of the Program. To mitigate this risk, resources are included for the development of business models, with strong participation of the beneficiary communities. In this regard, experiences under the ADF, GOG, HECI and GEA programs have shown that, while the adoption of RETs by hinterland communities is not a major challenge, the issue of sustainability still remains. This risk is therefore rated as "*Medium*," since additional work is still needed in adapting and/or developing two or three new business models. This is key to the sustainability of the Program.

F. Quality of Outputs - Consultancy Services

3.48 The following reports were prepared by consultants, as at July 31, 2018:

i) Renewable Energy Technologies – Public Awareness Campaign Strategy Three-Year Plan (2016-2019)
ii) Preliminary Assessment of Sites for Wind Measurement (August 2016)
iii) Energy Transition Roadmap for Guyana (March 2017)
iv) Update of the Study for the Expansion of the Generation System (June 2018)

Comments on these reports are as follows:

3.49 Public Awareness Campaign: The Public Awareness Campaign Strategy is a well-prepared document that outlines a program to promote the benefits of Renewable Energy Technologies in urban and hinterland communities in Guyana. It sets out a three-phase countrywide communication plan aimed at: *(i) creating and increasing awareness; (ii) encouraging modifications of attitudes and behavior changes among urban, rural and Hinterland populations; and (iii) promoting the adoption of renewable energy technologies and the rational use of energy*. The strategy also called for continuous program of monitoring and evaluation, with a view of learning and making adjustments, as necessary, during the strategy period. The plan was to be implemented over a three-year period with annual reviews and updates, but after the first-year launch there was no follow up, due to difficulties in finding a suitable firm to continue implementation of the plan.

3.50 Preliminary Assessment of Sites for Wind Measurement (August 2016). The objective of the assessment was to identify four top-ranked sites for wind measurement with two additional sites as back-up. The assessment was in support of plans under the Program "*to collect high quality wind data from tall met-masts in order to create an accurate wind resource map for the coastal areas in Guyana*." Data collected will be used to inform decisions about the long-term development of grid-

connected, utility-scale wind projects along the coast of Guyana. The assessment done was found to be satisfactory and is now being used by the EA to inform decisions on other phases of the Program.

3.51 Energy Transition Roadmap for Guyana (March 2017)

With the evolving situation in the energy sector in Guyana, preparation of the Energy Transition Roadmap was seen as a necessary step, prior to the preparation of the National Renewable Energy Strategy, as required under the Program. The "Roadmap" identifies a path for achieving close to 100% renewable energy penetration in the electric sector, with natural gas suggested as the transitional energy source during the period 2017-2035. The report which was accepted by the GoG is currently being used in its negotiations with the Government of Norway for the release of funds, which have so far been held-up under the Guyana REDD+ Investment Fund (GRIF) initiative.

3.52 Update of the Study for the Expansion of the Generation System (June 2018)

The "Initial Study" on the Expansion of the Generation and Transmission System of the Demerara-Berbice Interconnected System (DBIS), financed by the GoG and IDB, was commissioned in 2014. The aim was to obtain guidelines for the development of the most appropriate electrical infrastructure for generation and transmission in Guyana. The Expansion Plan was updated in 2016 to take into consideration the use of imported Natural Gas. Following the discovery of oil and gas in Guyana, however, the Study was further updated in 2018 to identify options for the optimal development of generation infrastructure for the period 2019 to 2035, taking this new development into consideration.

Of direct importance to this Program, the Action Plan included in the Study identifies the development of a 6 MW (2x3 MW) solar powered plants in 2019, a 10.3 MW Wind Park in 2019; a 13.7 MW Biomass Plant by 2021 and a 165 MW mid-size hydro by 2027.

The comprehensive report is currently being reviewed by GoG and other stakeholders. It is expected to help inform the preparation of an updated National Energy Policy for Guyana, the National Renewable Energy Policy (required under this Program), as well as the development of appropriate institutional and regulatory framework.

IV. Conclusions, Lessons Learned and Recommendations

4.1 This conclusion summarizes the key findings of the Mid-Term Evaluation and rates the performance of the Program to date. The lessons learned and recommendations that follow are intended to help chart the way for improved performance of the Program by maximizing the use of time and resources remaining under the Program.

4.2 **Achievement of Program Development Objectives:** The evaluation concludes that implementation of the Sustainable Energy Program for Guyana has been *"Marginally Satisfactory,"* to date. Moderate progress made towards the achievement of the development objective of the Program which aims to reduce identified barriers to the deployment of RETs in Guyana and demonstrate the viability of delivering electricity to isolated communities and to the grid, in a sustainable and cost-effective manner. Significant progress have been made with respect to the installation of 116 grid-tied solar-PV systems with a total installed capacity of 1.975 MW (approximately 10 times the end of project target), as well as many other off-grid systems. These results confirm the technical viability of grid-connected solar-PV systems and, highlight the leveraging effect of the Program, with the GoG moving ahead rapidly the expansion of the solar-PV systems. Significant challenges remain however, as the RE strategy and policy framework to regulate the interconnection of systems, are still to be developed and implemented. Business and operation models, critical to the sustainability of rural electrification schemes, are still to be developed also.

4.3 Coupled to the above, there have been delays and setbacks in the installation of a 330 kW hydropower plant; the collection of wind data, necessary to inform decisions on the installation of a 300 kW wind-turbine generator; the installation of solar-PV systems in ten (10) hinterland communities; and, capacity building programs for GPL personnel and residents of hinterland communities. Completion of these activities are necessary to ensure the achievement of the development objectives of the Program.

4.4 Moreover, given the limited time remaining for the implementation of the Program (fifteen months), it is clear that remaining activities will not be completed within this timeframe and that an extension of at least 12 months to the disbursement period would be required.

4.5 **Effectiveness of Program Implementation:** Effectiveness in Program implementation is rated as *"Unsatisfactory,"* based on the analysis of the Institutional, Technical, Administrative, Program Planning and other factors highlighted in the report (Section III.C, paragraphs 3.3 to 3.27). Improvements in Program implementation arrangements will be needed during the remaining period of execution (and possible extended period) if the Program is to achieve its development objectives. In particular, issues related to the activation of the Program Steering Committee, appointment of a full-time Project Manager, (or upgraded role of the proposed Project Assistant), as well as other staff assigned to the PIU will need to be addressed.

4.6 **Programmatic-Approach**: There was a genuine misunderstanding about the need to monitor and establish a common database to capture information on the overall Program and not just information related to the GEF-financed activities. As a result, Program-related data is stored by different agencies (HECI, GEA, MoPI, GPL, Guysuco), that are involved in different aspects of the Program. Consequently, delays are usually experienced in retrieving data (if complete) on the overall Program. Additionally, the financial management system that was established, captures

information on GEF related activities only and there is no tracking of information from other co-financing sources. The Annual Financial Statements and Audit Reports reflect this situation also.

4.7 **Efficiency of Program Implementation:** With disbursement under the Program at only 28%, to date, when it should have been about 86%, the efficiency of program implementation is rated as "*Unsatisfactory."* The cancellation of funds from two previously committed co-financing sources, delays in the selection of the communities to benefit from the demonstration RE projects, would have significantly impacted the rate of execution of the Program. Many of these activities fall under Components II and III where 89% of the Program funds are allocated.

E. Lessons Learned

4.8 **Legal and Regulatory Framework:** Revision of the legal, technical and regulatory framework and, development of sector strategy takes time. This is particularly so in an environment where the conceptual basis and rationale for a Program is being considered, in light of new and emerging developments in the sector, in this case, the discovery of oil and gas in Guyana. As a result, additional studies were needed for the formulation of a broader strategy, than was anticipated at the time. Included in these were the preparation of an Energy Transition Roadmap for the country, a revision of the National Energy Policy, as well as the updating of the Generation Expansion Plan for GPL. Timely inputs from high-level stakeholders and policy makers are essential for the successful outcome of activities related to this component.

4.9 **Oversight and Implementation Arrangements:** A fully functioning PSC is needed to provide guidance and strategic oversight for the effective execution of the Program and, delivery of results. As highlighted during stakeholder consultations, the absence of a PCS would have contributed to the current state of affairs. This is an issue that should be addressed early.

4.10 **Stakeholder Commitment, Consultation and Coordination:** Co-financing arrangements and stakeholder commitment fall away quickly if the Program is not implemented on schedule. Significant improvement in Program execution will therefore be needed in the future, so as to maintain the commitment of partners and avoid the possible loss of Grant/Co-financing resources. Additionally, stakeholder consultation and coordination, at all levels, must be efficiently managed in order to reach consensus early and avoid delays in Program execution.

4.11 **Policy/Regulatory Framework and Private Sector Interest**: Appropriate policy and regulatory framework must be in place in order to attract significant private sector interest and investment in the sector. This is particularly evident, as highlighted in the poor responses to bidding processes and apparent lack of interest by investors with respect to the development of hydropower projects in Guyana. Given the perceived high risks of investing in RE-related projects, including small and medium-size hydropower plants in hinterland areas, attention must be given to addressing the policy and regulatory barriers in a timely manner.

4.12 **Bidding Process and Conditions:** The failed bidding process for the construction of the Kato hydropower project was a costly one for the Program, both in terms of time and the loss of co-financing resources. The experience in this case, points to the need for appropriate terms and conditions to be established that are conducive to attracting potential bidders. While the process was a significant learning experience for the agencies involved, the key lesson is that the preparation and submission of sound bankable proposals, requires giving potential bidders enough time to do their 'homework,' in order to submit competitive bids. The findings (lessons learned), highlighted in the Evaluation Report on the bidding process, should help inform future actions.

4.13 **Monitoring and Evaluation Systems for the Program:** While the PIU has done a good job in compiling data and reporting results of the GEF-financed activities, a more comprehensive monitoring and evaluation plan is needed, in order to capture data at the Program-level, so as to provide a complete picture of the financial and physical advances of the Program. This type of information, considered to be necessary by all stakeholders, was not readily available during the evaluation.

4.14 **Activity-based Approach and Managing for Results:** The apparent focus on activities rather than results, points to the need for increased training and strengthened institutional capacities, in order to transition from a system of "activity-based accounting to results-base accountability." While it is recognized that complex processes can be uncertain and are not totally controllable at the project level, the need for appropriate and timely responses are required, in order to achieve desired results. The promotion of a culture of accountability of all stakeholders, in managing for results is seen as a necessity.

4.15 **Procurement Policies and Procedures**: In-depth knowledge of the National Procurement & Tender Administration process and the IDB Procurement Policies & Procedures, is critical to the timely and efficient implementation of the Program. Greater understanding of the requirements of the dual system is needed and, increased support & training provided, in order to overcome this problem.

F. Recommendations

a) Program Execution

4.16 **Program Oversight.** In keeping with the implementation arrangements outlined in the Investment Grant Proposal therefore, it is recommended that efforts be made to reactivate the Program Steering Committee (PSC), to provide strategic oversight and guidance on Program execution. The role of the PSC has become even more crucial, in light of the changing situation in the sector, vis-à-vis, developments in the oil and gas sector and the preparation of the Green State Development Strategy (GSDS). The need for a well-functioning PSC to address strategy and policy issues and, encourage increased levels of coordination among stakeholders cannot be over emphasized. Moreover, given the current emphasis on the development of the GSDS, it is recommended that a senior representative from the Ministry of the Presidency, be included in the PSC or, coordination meetings organized on a regular basis, to ensure adequate coordination and sharing of information.

4.17 **Project Manager:** It is recommended that a full-time Project Manager be appointed to focus solely on the implementation of the Program, as required in the Program Operation Manual. The Project Manager would be accountable to the CEO of the Hinterland Electrification Company Inc. (who has much wider responsibilities for the management of the company and execution of its business plan) and, be fully responsible for the minute implementation details and delivery of outputs needed to achieve the development objectives of the Program.

4.18 **Financial Management System**: It is recommended that the financial management and accounting system be expanded to capture co-financing information on the overall Program and not just the GEF- related activities. Increased level of collaboration and coordination with the other agencies involved, would be necessary.

4.19 **Execution and Disbursement Period:** Given the current status of implementation of the Program, (with only 28% of funds disbursed after about 86% of the time have elapsed), it is recommended that a 12 to 18-month extension be granted to the period of execution and disbursement of the Program, Such extension should be approved, based on a revised Program Execution Plan that seeks to maximize benefits from the time and resources remaining under the Program.

b) Program Effectiveness and Efficiency

4.20 S**takeholders engagement and coordination**: To improve stakeholder engagement and coordination, it is recommended that a formal stakeholder analysis be conducted to determine the potential impact of each stakeholder on the Program. The analysis should: identify all stakeholders; determine their level of authority and influence; determine individual requirements, interest and expectations, in order to identify ways to effectively manage the impacts. A formal Communication Management Plan should also be prepared, that details how stakeholders will be communicated with.

4.21 **Capacity Building**: Capacity building programs should be increased by organizing more training events and other relevant practical learning sessions, particularly in the area of procurement, monitoring and evaluation, results-based management and other similar programs. Representatives from key stakeholder institutions should be included in some of these sessions, so that common issues can be addressed and, capacity developed at multiple levels at the same time.

4.22 **Results Matrix:** It is recommended that the Results Matrix be updated to include an Outcome Indicator that shows the increase in energy production from on-grid solar-PV systems. This is necessary in order to highlight achievements in this area, and also to provide information on the lifetime energy production from installed solar photovoltaic systems, as required in GEFs Tracking Tool for Climate Change Mitigation Projects.

4.23 **Monitoring and Evaluation**: It is recommended that the M&E Plan be extended to include data from all project-related activities and the reporting format be modified to capture, in a common database, information (outputs and outcomes) on the overall Program. This, no doubt, would help to strengthen the programmatic-approach, aimed at promoting the integration of projects, and increasing opportunities for greater coordination and collaboration.

4.24 **Procurement Management and Project Schedules**: It is recommended that the use of the on-line Electronic Procurement Execution System (SEPA) be implemented immediately, in order to enhance the efficiency and overall management of procurement-related activities under the Program. A printout of the SEPA should also be included in the Semi-Annual and Annual Reports, to allow for increased oversight at the management level.

Similarly, the usefulness of Gantt Charts included in Semi-Annual Reports should be enhanced by ensuring that, in addition to the schedule for individual activities, the precise start and end dates for the delivery of outputs are included.

c) Program Sustainability

4.25 **Co-financing resources to replace MIF and EU Funds:** Critical to the success and sustainability of the Program is the development of business models for the medium to long-term financing, operation, maintenance and overall sustainability of RE systems developed under the Program. It is recommended that funds be sought for the development of the business models and associated

training of residents in hinterland communities, as previously envisaged under the MIF TC. Experiences gained, and lessons learned from earlier attempts under the Hinterland Electrification Program and the Amerindian Development Fund, should serve as useful starting points in the development of the business models.

4.26 **Enhance collaboration with other partners:** Additionally**,** it is recommended that the GoG continue to seek opportunities to enhance collaborative co-financing arrangements with other development partners, taking advantage of the complementarities with other sustainable energy projects and initiatives, in order to expand Program goals and objectives.

4.27 **Mid-Term Evaluation Workshop and Learning Event**: To help chart the way forward and also to prepare an updated Program Execution Plan, it is recommended that a Mid-Term Evaluation Workshop/Learning Event be organized, to consider the results and findings of this Report, look at the lessons learned and agree on new results-based approach towards the achievement of the development objectives of the Program. Such an event, involving key stakeholders, would help to achieve their full buy-in and participation, while at the same time reinforcing GOG's commitment to a Programmatic-Approach in further developing and increasing the impact of the Sustainable Energy Program for Guyana.

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APPENDIX I

GUYANA

Consultancy: Mid-Term Evaluation of the Sustainable Energy Program
GRT/FM-13897-GY

TERMS OF REFERENCE

I. ACKGROUND

Most of Guyana's electricity generating capacity is thermal-based, using heavy-fuel oil or diesel. Guyana Power and Light Inc. (GP&L) is the main public supplier of electricity, with an installed nominal generating capacity of 181-MegaWatt (MW), producing approximately 750-GigaWatt-hour (GWh) annually. In spite of Guyana's relatively large size, the area covered by GP&L is approximately 500-km^2. Private companies generate and distribute electricity in the mining town area of Linden and other villages in the coastal areas and the Hinterlands, with an estimated installed capacity of 35-MW.

The cost of electricity in Guyana is among the highest in the region, with tariffs ranging from US$0.28/per kiloWatt-hour (kWh) to US$0.32/kWh. This high cost of electricity can be attributed to different factors including: (i) dependence on expensive heavy fossil-fuels for power generation; (ii) inadequate system operation; and (iii) a high level of technical and commercial losses in the distribution system.

The electrification of rural communities in the vicinity of Georgetown on the coast is being gradually increased by GP&L, however in the Hinterlands, infrastructure is still underdeveloped and access to electricity is limited due to distance from major load centers.

The institutional and regulatory framework of the sector requires strengthening, as adequate regulation for RE and the enforcement thereof are necessary for the diversification of the energy mix. Progress has been made under the Power Sector Support Program funded by the Inter-American Development Bank (IDB), to implement reforms in the electricity sector but some necessary steps still await full GOG commitment and approval with regard to non-conventional RE.

The general objective of the Sustainable Energy Program (GY-G1004) is to improve institutional capacities of the Public Utility and OPM (now MoPI), through the training of said institutions' staff and promotion of the use of nonconventional Renewable Energy Technologies (RET) in the urban areas and the Hinterlands with the aim to: (i) implement sustainable business models for Operation and Maintenance (O&M) of Renewable Energy (RE) projects; (ii) increase quality energy access in Guyana; (iii) reduce the long-term operational costs of on-grid and off-grid electricity service; and (iv) contribute to sector sustainability and reduction of Greenhouse Gas (GhG) emissions.

The Program is being implemented by the Government of Guyana (GoG) with financing from the Inter-American Development Bank-Global Environmental Facility (IDB-GEF) Fund and in-kind local counterpart resources. These resources are expected to leverage and complement other Bank endeavors and projects for the energy sector in Guyana, and also other projects recognized by GEF as sources of parallel financing. The executing agency is the Ministry of Public Infrastructure (MoPI) through the Hinterland Electrification Company.

The main components of the Program are: (i) strengthening of the policy and institutional framework to implement RETs in Guyana; (ii) strengthening of GP&L's capabilities to improve electricity supply and promote the use of RETs; (iii) contribute to sector sustainability with the implementation of cost-effective RETs for on-grid and off-grid electricity generation.

The purpose of these Terms of reference is to establish the general and specific scope of the consultancy to carry out the midterm evaluation of the project, following the contractual commitments signed by the executing agency with the IDB and the GEF.

II. OBJECTIVE

General objective

To carry out a critical evaluation of the performance obtained by the Sustainable Energy Program in Guyana, establishing the degree of fulfillment of its results and specific products, in order to identify lessons learned and proposed concrete actions that ensure the achievement of the established targets in the project's results framework.

The specific objectives of the consultancy are as follows:

- To evaluate the relation of the expected and planned outputs with the achievement of the project's outcome indicators, identifying the real contribution towards the realization of thr program objective.
- To evaluate the degree of progress and fulfillment achieved in the implementation of the project, both qualitatively and quantitatively and document relevant lessons learned to date.
- Evaluate the sustainability of the project and its components in institutional and financial terms as well as the degree of appropriation of its users/beneficiaries.

III. MAIN ACTIVITIES

3.1 In accordance with the abovementioned objectives of the consultancy, this section details the specific scope for each topic of analysis that will be undertaken.

Project execution analysis

- To evaluate the physical and financial[33] execution of the expected outputs of the project, in order to identify the strengths and weaknesses of the processes associated with the execution.
- To evaluate the degree of collaboration and complementarity of the project with the partners and local actors, among others, highlighting the commitments that they have made.
- To evaluate the degree of collaboration and complementarity with other projects and initiatives in the local and/or international spheres, in order to identify possible alliances and joint investments with other institutions for the scope of outputs, with value added.
- Detection of deviations from project design, and proposed adjustments required in the technical, financial, economic and institutional framework for the implementation of the project.
- Propose the necessary actions to efficiently reach the planned outputs, including adjustments in the follow-up indicators for each component and measures to improve monitoring.

Evaluation of results

- Determine the progress in the fulfillment of the expected outputs and their linkage with the indicators of the expected results for the project.

[33] Including the total amount of the Project as indicated in the Project annex (GEF/BID, project Counterpart and Co Finance).

- Identify the lessons learned, conclusions and key recommendations based on the analysis of the preceding subparagraphs.
- Perform an analysis of the fulfillment of the assumptions of the project.
- Carry out an analysis of the sustainability of the investments and the effectiveness in project development, as well as positive value added.
- Analyze and propose an update of the risks identified in the project and update the risk Management matrix.

Document Analysis

The consultant should consider, at least, the following documents in carrying out the assignment:

- Request for CEO Endorsement.
- The non-reimbursable financing agreement of the Global Environment Fund GRT/FM-13897-GY.
- The Individual Project implementation report (GEF PIR 2017) and bi-annual reports to the IDB.
- Operating Manual of the project.
- Agreements with the project partners.
- The current results framework matrix.
- The reports of the external audits made to the project.
- The technical and similar documents generated by consultants financed by the project.
- The documents generated through other technical cooperations or related studies, which have been used in the development of the project.
- Reports of technical inspection visits and aide de memoires of administrative missions.

Design and application of interviews and consultations

The consultant must develop and carry out an interview program to obtain opinions and perceptions of the following actors on the project's performance:

- Relevant people directly or indirectly linked to the project.
- Strategic local and international partners for the implementation of the components, and national and regional authorities related to the project.
- Local governments in the areas of influence of the project.
- Civil society actors and related non-governmental organizations.

In addition, the consultant should conduct interviews with the consulting firms and individual consultants responsible for the implementation of the project-specific studies and activities.

IV. REPORTS

The consultant must deliver the products listed below:

a) Methodology and work Plan.

b) *Diagnosis and analysis.* With the following contents: (i) achievements in institutional, technical, administrative and financial matters. (ii) Achievements in objectives and goals of the project. (iii) Achievements in the result matrix of indicators: input, process, outputs, outcomes and performance. (iv) Cost effectiveness (times and processes), coordination with sectoral institutions etc.

c) *Final Evaluation of the project:* with the following minimum contents: (i) achievements in the quality of the outputs received and delivered: consultancies and services. (ii) Analysis of the use of GEF resources, as well as co-financing. (iii) Lessons learned. (iv) Analysis and recommendations on a future approach to the actions to be undertaken by the project. (v) Conclusions and recommendations, (vi) sustainability.

The consultant must submit the preliminary reports electronically, and the final submission in three (3) printed copies:

- A methodology report and work Plan, 3 days after the start of the consultancy.
- A diagnostic report, 30 calendar days after the start of the consultancy.
- A final report within 15 calendar days after the diagnostic report.

The consultant shall respond in writing to the comments of the technical counterpart within a period of no more than 5 (five) calendar days and shall make the corresponding modifications prior to the submission of the final report.

The software tools for submitting reports, annexes and other documents must be agreed with the technical counterpart. All documents must be presented in English language and an executive summary of the final must also be presented.

V. SCHEDULE OF PAYMENT

5.1 The consultancy will be developed under a lump-sum basis according to the following structure of payments:

- First payment: 35% at approval of the first report on the methodology and work plan.
- Second payment: 65% at approval of the Final report of the consultancy.

VI. COORDINATION

6.1 The consultant will work in close collaboration with the Project Coordinator of the Sustainable Energy Program

VII. CHARACTERISTICS OF CONSULTANCY

7.1 **Type:** Individual International or National Consultant, Lump-sum.

7.2 **Duration of the assignments: A**pprox. 20 non-consecutive working days within a 2-month period.

7.3 **Place of work and mission:** The consultant will work from his/her office and will undertake max. 2 missions to Georgetown Guyana.

VIII. QUALIFICATIONS

Qualifications and Experience: University Professional with a degree in economics, natural resource management, engineering or related areas. Preferably with a master's degree. General professional experience of at least 10 years. Proficient in English. Specific experience in the execution of at least 2 similar projects. Experience in evaluating at least 3 projects/programs financed with funds from multilateral agencies and/or GEF. Monitoring working experience in the Latin American region and the Caribbean.

Appendix II

RESULTS FRAMEWORK
(Original)

Operation objective	The objective of the operation is to improve institutional capacities of GP&L and OPM, through the training of said institutions' staff and promotion of the use of RETs in the urban areas and the Hinterlands.

MATRIX OF IDICATORS

Output Indicators	Baseline (2011)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Target (Year 6)	Means of Verification
Component 1 – Strengthening of the policy and institutional framework to implement RETs in Guyana.									
National RE strategy developed and approved	0	0	0	0	1	0	0	1	Official publications by GOG
Legal and technical revision of electricity regulatory framework developed.	0	0	0	0	0	1	0	1	Legal and technical revision documents.
Energy sector agencies are trained to implement RE systems and coordinate their roles.	0	0	1	0	1	0	1	3	Project document report
Public Awareness campaign developed	2	0	1	1	1	1	0	6	Official publications by GOG
Component 2 – Strengthening of the Power Utility capabilities to improve electricity supply and promote the use of RETs.									
Wind measuring stations installed	2	0	1	1	2	0	0	6	Project document report
RE potential assessment developed	1	0	0	1	0	1	0	3	Project document report
Pre-feasibility study of RE projects for rural electrification developed	0	0	0	1	1	1	0	3	Pre-feasibility document

Output Indicators	Baseline (2011)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Target (Year 6)	Means of Verification
The Power Utility has received support to improve its technical and managerial skills for implementing RETs under the LCDS and for infrastructure development (*A Corporate Development Plan implemented*).	0	0	0	0	0	0	1	1	Project document report
Sustainable business models for on-grid RETs implemented	0	0	0	0	0	0	1	1	Project document report
Sustainable business models for rural electrification RETs implemented	0	0	0	0	1	1	0	2	Project document report
Representatives from Hinterland communities have become trained on the operation and management of RET systems (*Number of training implemented*).	2	0	0	2	1	2	1	8	Project document report
The potential of bioenergy as part of a low-carbon development strategy has been assessed	0	0	1	0	0	0	0	1	Project document report
Installation of a demonstration plant for bioenergy production	0	0	0	1	0	0	0	1	Project document report
Component 3 – Contribute to sector sustainability with the implementation of cost-effective RETs for on-grid and off-grid electricity generation.									
Solar-PV projects installed for rural electrification (kW)	141	0	570	0	200	200	142	1,253	Progress reports; Project Final Reports.
Rural hydro power projects installed (kW)	0	0	0	330	0	0	2,000	2,330	Progress reports; Project Final Reports.
On-grid RET (wind power) installed (kW)	0	0	0	0	0	0	300	300	Project Final Report.
On-grid PV projects installed (kW)	18.46	0	0	40	60	60	20	198.46	Progress reports; Project Final Reports.

Outcome / Indicators	Baseline (2011)	Target (Year 6)	Means of Verification	Comments
Rural communities have access to RE supply. Indicator: Number of rural end-users supplied with sustainable electricity service from installed RETs.	6,900 persons	27,500 persons	Final evaluation report	Based on average 40-W installed RET capacity per end-user
Increase in rural energy supply from RE sources. Indicator: Amount of annual energy production by installed rural RETs.	198 MWh/yr	12,222 MWh/yr	Metering reports by operating entity[1];	Based on installed capacity of 2,330-kW hydro and 1,253-kW solar PV.
Increase in energy supply from RE sources injected to the national grid. Indicator: Amount of annual energy production by installed on-grid wind turbine.	0	789 MWh/yr	Metering reports by operating entity[2]; sector statistics	Based on installed capacity of 300-kW on-grid wind turbine.
Technical, social and financial sustainability of on-grid RETs demonstrated . Indicator: Number of on-grid RE projects evaluated.	0	1	Projects final evaluation	At least one project constructed and connected to the grid assessed to evaluate technical, social and financial sustainability.
Technical, social and financial sustainability of rural RETs demonstrated. Indicator: Number of rural RE projects evaluated.	0	2	Business plans of operating entities; final evaluation	For individual PV systems and small hydro power.

[1] Based in the Sustainable Business Models implemented through Component II.

[2] *Ibid.*

Increase of technical and managerial skills for implementing RETs by GP&L Indicator: level of investment to implement a Corporate Development Program.	0	US$20 million	Official document with investment approved	The implementation of a Comported Development Program to improve GP&L's capacities *vis-à-vis* the LCDS, has been analyzed by IDB and the GoG.
Increase of local capacities to implement and operate RETs for rural electrification Indicator: number of training	2	7	Projects final evaluation	Training in RETs will be carried out in Hinterland and in the coastal zone of Guyana

Impact Indicators	**Base (2011)**	**Target (Year 6)**	**Verification Means**	**Comments**
Percentage of the population with access to electricity increased.	85%	90%	Sector statistics	Based on Country Strategy 2012-2016
Investment in RETs mobilized.	0	US$19,950,000	Progress reports of Operation; purchase of RETs using parallel-financing.	Parallel-financing resources committed to the GEF at project approval must be monitored during project implementation.
Implementation of a Corporate Development Program for GP&L	0	1	Final evaluation report	Linked to Guyana's Country Strategy 2012-2018 indicator of "Utilities capabilities improved *vis-a vis* the LCDS"

APPENDIX III

List of Documents Reviewed

No.	Document Name	Author	Date
1.	Request For CEO Endorsement	Global Environment Facility (GEF)	Dec. 14, 2012
2.	Investment Grant Proposal – Sustainable Energy Program for Guyana. Global Environment Facility (GEF) - GY-G1004)	Inter-American Development Bank	April 3, 2013
3.	Sustainable Energy Program for Guyana – Non-Reimbursable Financing Agreement No. GRT/FM-13897-GY	Government of Guyana & Inter-American Development Bank	Dec. 11, 2013
4.	Letter of Agreement - Sustainable Business Models for Rural Business Models and Energy Access in Guyana – Non-Reimbursable Technical Cooperation No. ATN/ME-15211-GY	Multilateral Investment Fund and CARIBSAVE Partnership Inc.	Dec. 1, 2015
5.	Memorandum -	MIF	Dec. 13, 2017
6.	Project Implementation Report (3rd PIR) FY 2017	GEF - IDB	Dec. 2017
7.	PMR Operational Report	IDB	March 16, 2018
8.	LMS Executive Financial Summary for GTR/FM-13897-GY	IDB	July 3, 2018
9.	IDB Country Strategy with Guyana 2012-2016	IDB	2012
10.	Draft National Energy Policy for Guyana – Report 2 - Green Paper	Ronald Clark, PhD - Consultant	Feb. 2017
11.	Framework for the Guyana Green State Development Strategy and Financing Mechanism	UNDP Project Team	March 2017
12.	Energy Transition Roadmap for Guyana	Ronald Clark, PhD - Consultant	March 2017
13.	Update – Generation Expansion Study	Brugman SAS	June 2018
14.	Preliminary Assessment of Sites for Wind Measurement – Deliverable 2	Pramod Jain, Ph.D - Consultant	Aug. 31, 2016
15.	Public Awareness Campaign Strategy – Three-Year Plan 2016-2019	Y. Alexis Stephens - Consultant	May 2016
16.	Bidding Document and Evaluation Report for the Development of the 300 Kw Hydropower Plant at Kato	MoPI /HECI	Aug. 2017 & Jan 2018
17.	Final Report – HydroPower Feasibility Study on the Chiung River	GoG/UNDP/CARICOM	Dec. 2009
18.	Program Operations Manual	Consultant	May, 2014
19.	Semi-Annual Progress Reports II – VIII (2014 to 2018)	HEIC/PIU	Various
20.	Annual Operations Plan 2014-2017	HEIC/PIU	Various

No.	Document Name	Author	Date
21.	Revised Logical Framework	HEIC/PIU	
22.	Audited Financial Statements of the Program – 2016 and 2017	Audit Office of Guyana	April 2017 & 2018
23.	Training and Maintenance Manual – Solar Photovoltaic Systems	HECI	Undated

Appendix IV

Stakeholders Interviewed/Consulted

Stakeholder Institution	Name	Position
Hinterland Electrification Company Inc. (HECI)/Program Implementation Unit	Mr. Horace Williams	Chief Executive Officer/ Program Coordinator
	Ms. Annie Ramnarine	Program Accountant
	Mr. Kevin Vickery	Procurement Officer
	Patrick Chase	Engineer
	Mr. Dexter Price	Technician
Ministry of Public Infrastructure/	Ms. Morsha Johnson-Francis	Electricity Regulatory Advisor in the Ministry
	Ms. Keran Matai	Legal/Energy Advisor to the Minister
Guyana Energy Agency (GEA)	Dr. Mahender Sharma	Chief Execution Offices
Guyana Power and Light Inc.	Mr. Erwin Marshall	Deputy Chief Executive Officer - Technical
	Mr. Horace Woolford	Systems Planning Manager
	Mr. Donald Nurse	Project Coordinator – Power Utility Upgrade Program
Ministry of Indigenous People's Affairs	Mr. Alfred King	Permanent Secretary
	Ms. Sherie Samantha Fedee	Deputy Permanent Secretary
Ministry of the Presidency – Dept. of Environment	Mr. Marlon Bristol	Head, Project Management Office, Low Carbon Development Strategy
	Ms. Deirdre Shurland	Project Manager, Green State Development Strategy
	Ms. Sandra Britton	Renewable Energy Liaison Office, Green State Development Strategy
Inter-American Development Bank	Mr. Jaime	
Delegation of the European Union in Guyana	Ms. Layla El Khadraoui	International Cooperation Officer
Privat Sector Commission of Guyana	Mr. Desmond Sears	Chairman
	Mr. Devon Seeram	Economist

Appendix V

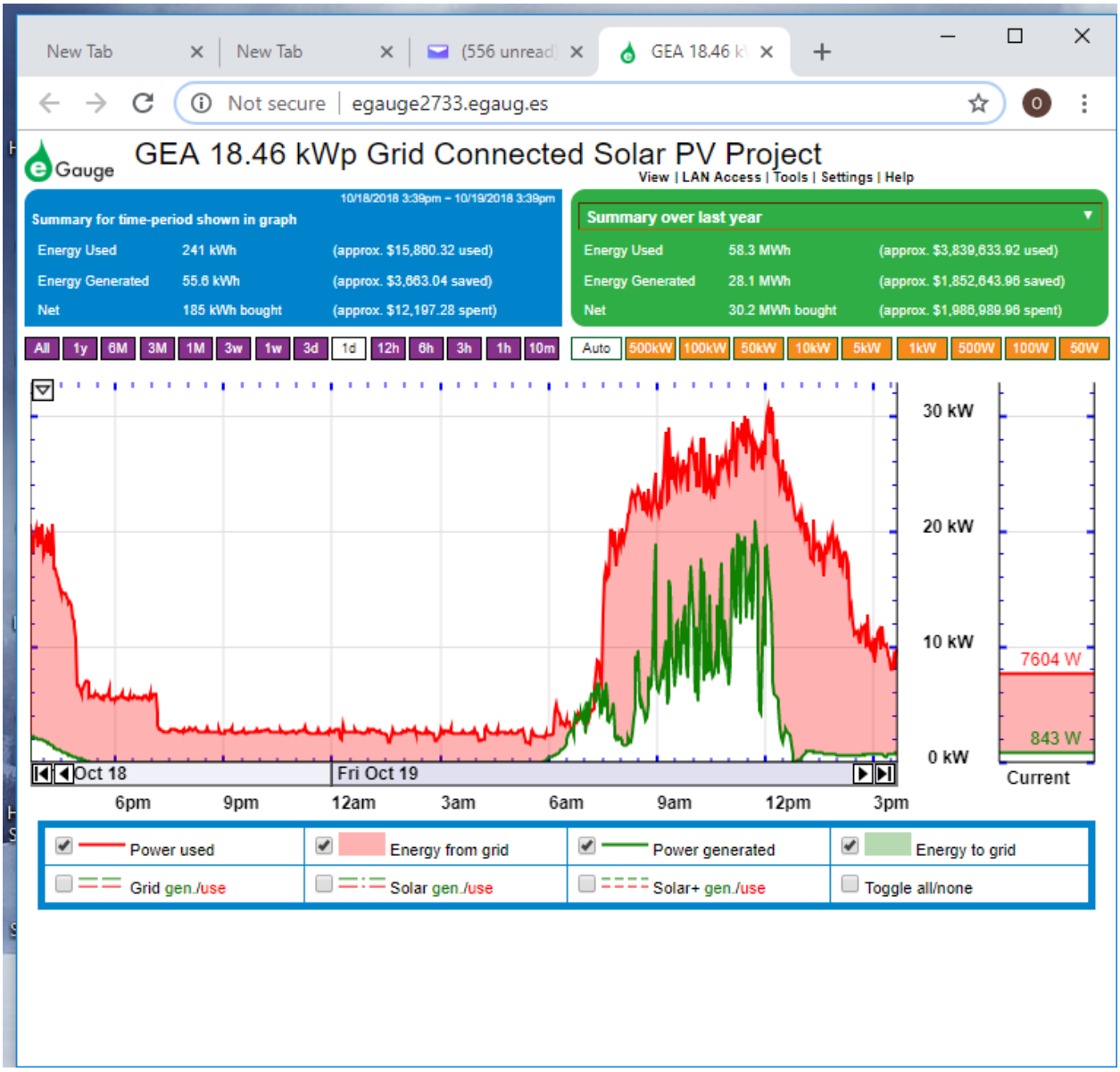
Mid-Term Evaluation of Sustainable Energy Program for Guyana
GRT/FM- 13897-GY

Government of Guyana (in-cash) Co-Financing Contribution to the Program for Solar-PV and Hydropower Systems (as of 10/04/2018)					
Description	**Funding Source**	**Installed Capacity (MW)**	**Energy Produced (MWh/yr.)**	**GoG In-Cash Contribution (US$)**	**Comments**
Grid-Tied Solar-PV system	GEF Program	0.178	325.76		Financed under the Program (Cost US$318,931.)
Off-Grid Solar-PV system (Hinterland)	GoG/HECI	0.459	762.00	2,157,862	
Off-Grid Solar-PV system (Hinterland)	GoG/HECI	0.400	0.0	1,102,697	400 KW Solar Farm. Currently under construction.
Grid-Tied Solar-PV system	GoG/GEA	1.780	2,923.00	2,677,631	
-	GoG/GRIF	-	-	-	No contribution to date.
TOTALS (systems installed to date)		**2.417[34]**	**4,010.76**	**5,938,190**	
Complementary Co- Financing (Hydropower)					
Hosororo Demonstration Hydropower Project.	GoG/GIZ	20KW	0	139,000	To be commissioned by end of 2018.

[34] Does not include the 400KW solar farm that is still to be commissioned.

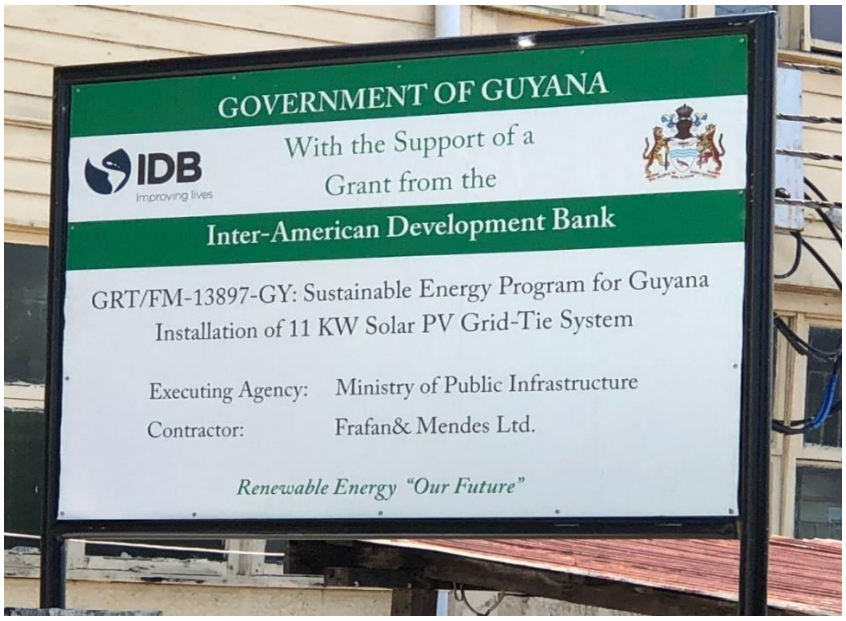
Appendix VI

Sample Printout from one of GEA's Grid-Connected Solar-PV System



Appendix VII

Project Photographs

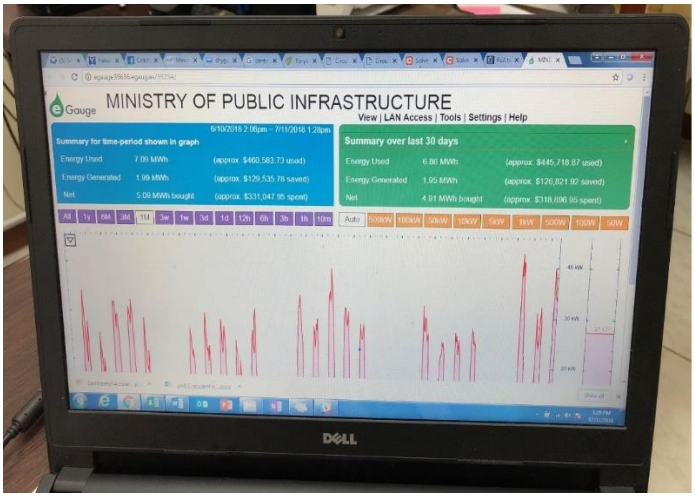


Project Signboard – Government Technical Institute

Solar Panels – Government Technical Institute

Solar Panels - Ministry of Public Infrastructure

Inverter Panels – Ministry of Public Infrastructure



Computer Monitor – Ministry of Public Infrastructure