



# Project Completion Report

## PCR

### LO-1103/SF-GY

**Project Name:** Unserved Areas Electrification Program

**Country:** Guyana

**Sector/Subsector:** Energy/Rural Electrification

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**Project Number:** GY00065

**Loan Number:** LO-1103/SF-GY

**CRG Date:**

**Final Approval Date of PCR:** June 1<sup>st</sup> 2011

**PCR Team:** Alejandro Melandri, Project Team Leader (INE/ENE); Jesus Tejeda, Alternative Project Team Leader (CCB/CGY); Clevern Liddell, CCB/CGY and Luis Hernando Rodriguez, Consultant.

## **Acronyms and Abbreviations**

<b>AC Power</b>	America and Caribbean Power, Ltd
<b>CIS</b>	Consumer Information System
<b>CEI</b>	Chief Electrical Inspector
<b>EID</b>	Electrical Inspection Department
<b>EIRR</b>	Economic Internal Rate of Return
<b>EPA</b>	Environmental Protection Agency
<b>ESRA</b>	Electricity Sector Reform Act 1999
<b>GEA</b>	Guyana Energy Agency
<b>GEC</b>	Guyana Electricity Corporation
<b>GEI</b>	Government Electrical Inspectorate
<b>GEF</b>	Global Environmental Fund
<b>GFC</b>	Guyana Forestry Commission
<b>GNBS</b>	Guyana National Bureau of Standards
<b>GOG</b>	Government of Guyana
<b>GPL</b>	Guyana Power and Light, Inc
<b>GRIF</b>	Guyana REDD+Investment Fund
<b>HIPC</b>	Heavily Indebted Poor Countries
<b>kW</b>	Kilowatt
<b>kWh</b>	Kilowatt-hour
<b>LCDS</b>	Low Carbon Development Strategy
<b>MDRI</b>	Multilateral Debt Relief Initiative
<b>MW</b>	Megawatts
<b>MWh</b>	Megawatt-hour
<b>NPV</b>	Net Present Value
<b>OPM</b>	Office of the Prime Minister
<b>PCR</b>	Project Completion Report
<b>PEU</b>	Project Executing Unit
<b>PIU</b>	Project Implementation Unit
<b>PPA</b>	Power Planning and Associates, Ltd.
<b>PPF</b>	Project Preparation Facility
<b>PRGF</b>	Poverty Reduction and Growth Facility
<b>PTI</b>	Poverty Targeted Investment
<b>PUC</b>	Public Utilities Commission
<b>SIMAP</b>	Social Impact Amelioration Program
<b>UAEP</b>	Unserved Areas Electrification Program

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## I. BASIC INFORMATION

BASIC DATA (AMOUNTS IN US\$)	
<b>PROJECT NO:</b> GY0065	<b>TITLE:</b> Unserved Areas Electrification Program
<b>Borrower:</b> The Cooperative Republic of Guyana	<b>Date of Board Approval:</b> 05 Jun 2002
<b>Executing Agency (EA):</b> Office of the Prime Minister (OPM)	<b>Date of Loan Contract Effectiveness:</b> 03 Sep 2002
	<b>Date of Eligibility for First Disbursement:</b> 20 Oct 2004
<b>Loan:</b> 1103/SF-GY	<b>Months in Execution</b>
<b>Sector:</b> Energy-Rural Electrification	* from Approval: 102
	* from Contract Effectiveness: 99
<b>Lending Instrument:</b> Investment/Specific Investment Operation	<b>Disbursement Periods</b>
	<b>Original Date of Final Disbursement:</b> 03 Mar 2008
	<b>Current Date of Final Disbursement:</b> 10 Dec 2010
	<b>Cumulative Extension (Months):</b> 33
	<b>Special Extensions (Months):</b> 9
	<b>Loan Amount(s)</b>
	* Original Amount: 34,400,000
	* Current Amount: 21,208,869
	* Original Cancelled Amount: 6,066,500
	* Current Cancelled Amount: 6,191,131
	* Cancellation Date: 12 Jun 2007
	* Pari Passu (if applicable): 65.46%
<b>Poverty Targeted Investment (PTI):</b> Yes	<b>Disbursements</b>
<b>Social Equity (SEQ):</b> Yes	* Amount to date: 100 (%)
<b>Environmental Classification:</b> B	
	<b>Total Project Cost (Original Estimate):</b> 34,400,000
	<b>Redirectioning</b>
	Has this Project?
	Received funds from another Project [ ]
	Sent funds to another Project [ ]
	N/A [X]
	<b>On Alert Status</b>
	Is project currently designated "on alert" by PAIS: No
	If yes then why is the project on alert (DO , IP Ratings and/or relevant PAIS indicators): N/A
	Comments on relevance of "on alert" status for this project (if applicable): N/A

Summary Performance Classifications				
DO	<input type="checkbox"/> Highly Probable (HP)	<input checked="" type="checkbox"/> Probable (P)	<input type="checkbox"/> Low Probability (LP)	<input type="checkbox"/> Improbable (I)
IP	<input type="checkbox"/> Highly Satisfactory (HS)	<input checked="" type="checkbox"/> Satisfactory (S)	<input type="checkbox"/> Unsatisfactory (US)	<input type="checkbox"/> Very Unsatisfactory (VU)
SU	<input type="checkbox"/> Highly Probable (HP)	<input checked="" type="checkbox"/> Probable (P)	<input type="checkbox"/> Low Probability (LP)	<input type="checkbox"/> Improbable (I)

## II. THE PROJECT

### A. Project Context

**Background 1980s:** The lack of reliable electricity supply in Guyana manifested in the numerous, long-lasting blackouts was a severe burden to households, even becoming a major factor in emigration. Along with the high unit cost of electricity diminishes the quality of life of citizens; this burden also placed a binding constraint on accelerating growth in the commercial and industrial sectors.

Beginning in 1988, the country embarked on an Economic Recovery Program (ERP) to stabilize and liberalize the economy and to give the *private sector* a wider role. Following this reform agenda, the Government of Guyana (GOG) proceeded to privatize its main public electricity supplier the *Guyana Electricity Corporation (GEC)*, with support from the IDB under the Electricity Sector Program (LO-986/OC-GY). By October 1, 1999, the GEC was privatized and converted into a new company, the *Guyana Power & Light Inc. (GPL)* – a joint venture owned 50% by the GOG and 50% by AC-Power, the private investor fully responsible for the company's operation and management. Subsequently, this program closed on December 18, 2000 with GPL meeting most of its performance targets included in its license, except for the reduction of electricity losses.

**Political/Social Framework:** The 2001 presidential elections saw national consensus on a number of important issues facing the country. Guyana's priorities were addressed in the fully participatory Poverty Reduction Strategy Paper (PRSP) which set particular targets aimed at reducing the proportion of the population living under the poverty line. To achieve these targets, Government's strategy included among others, creation of broad-based job-generation, and *intervention in special areas to redress regional disparities in economic and social conditions*. Even so, the strategy still faced significant constraints in fundamental sectors. In relation to the electricity sector, although the privatization agreement placed a commitment on GPL to make investments in system rehabilitation and expansion, including *electrification of unserved areas*, the amount of resources (US\$5 million) allocated by the company, for the electrification of new areas was insufficient to meet the demand.

**The UAEP:** Taking this situation into consideration and the impending needs of the electricity sector likely undermining GOG's priorities in its PRSP; the GOG negotiated support for this critical sector by engaging the IDB to approve the **Unserved Areas Electrification Program (UAEP)**, LO-1103/SF-GY. This program was originally aimed at providing *new connections* to in excess of 40,000 new customers in seven of the country's ten administrative regions. The original Loan Contract signed on September 3, 2002, at a

total cost of US\$34.4 million, included the execution of three components coordinated by the Office of the Prime Minister (OPM) and co-executed by GPL. The Bank agreed to provide US\$27.4 million from its available Fund for Special Operations (FSO), including US\$0.25 million Project Preparation Facility (GY-0067) and local counterpart resources totaled US\$7.0 million, funded by GPL.

**GPL reverts to state ownership:** In May 2003, soon after signing into effect of the UAEP, GPL reverted to full state ownership given the withdrawal of AC-Power. There were a number of factors responsible for this reversion which included financial troubles caused by poor collections, increased self-generators, rising oil prices and the company's inability to control electricity losses which had increased to an unsustainable level of 44% that year. This occurrence posed significant difficulty to the management and operation of the recently signed Loan Agreement. In the face of these difficulties, the GOG requested the IDB's technical assistance to analyze the sector issues and developments, and to assess alternatives to help the Government identify potential courses of actions for the adequate development of the sector.

**Restructuring:** Consequently, an Analysis Mission was carried out by the Bank during April 14-17, 2003 and highlighted the need to restructure the priorities of the UAEP to include a particular focus on the high level of losses. Upon agreement with the GOG, the Loan was restructured by redesigning two out of three original components: i) Component 1 - Investment Component, and ii) Component III - Institutional Strengthening & Capacity Building Component. The GOG signed the **Amendatory Contract** on August 23, 2004 retaining the original contract sum of US\$34.4 million.

**Executing Agency:** After signing the Amendment Contract, the project execution structure remained as originally envisaged with the OPM being the overarching Executing Agency (EA) and GPL being co-executor for implementing the larger investment component. A high-level working Project Steering Committee comprising of the Prime Minister as Chairman and representatives from the relevant ministries was required to provide guidance on strategic and policy issues in relation to the UAEP. A Principal Project Coordinator, the Secretary to this Committee, was tasked with the responsibility of overseeing successful implementation of all project components with coordination and support from the Project Implementation Unit (PIU) at GPL. The Project Coordinator, a professional with experience in the electricity sector and public administration issues, was already appointed and serving as the Electricity Regulatory Advisor to the OPM.

**Guyana's debt Cancellation and new changes in the UAEP:** In March 2007, the IDB announced the *IADB-07 Initiative* which provided debt relief beyond the Heavily Indebted Poor Countries (HIPC) in Latin America and the Caribbean. Guyana was among the five

countries to benefit from a total debt write-off of US\$467 million. Accordingly, US\$6,189,500 of Bank-financing under the UAEP was cancelled as confirmed by an IDB Administration Mission in May 2007. The total value of the loan, now US\$28,210,499 million including US\$21.2 million from the IDB, created a new prioritization in the use of the resources and affected various Loan categories, mainly Grid Connections, Contingencies and the Re-Privatization Advisory Service, *see [Table 2](#) for revised loan values.*

## **B. Project Description**

### *i. Development Objective(s)*

The UAEP's main development objective was "to improve the quality of life and increase economic activity of the target population, i.e. previously unserved low-income areas." To achieve this goal, the following project objectives were designed to support the overarching socio-economic development and poverty alleviation strategy of Guyana: i) provide the financial resources required for accelerated electricity sector development; ii) extension of electricity service to the unserved consumers; and iii) strengthening of the legal, regulatory, and institutional framework of the energy sector. Although this Program was reformulated, these project objectives remained unchanged.

### *ii. Components*

The Program provided financing to execute the following three components: (i) **Investment Component**, (ii) **Hinterland Project Preparation Component**, and (iii) **Institutional Strengthening and Capacity-Building Component**.

The **Investment Component** was expected to provide financing, for feasible and sustainable investments in GPL's distribution system in the context of its Development & Expansion Program (D&E). It included the following three sub-components: i) *Grid Connections*; ii) *Loss Reduction* and; iii) *Project Management and Other Support*.

The *Grid Connections* sub-component, was designed to expand GPL's distribution lines of 13.8-kV for a total of 200-km, to provide electricity service to 30,000 housing lots in the vicinity of Georgetown and other coastal areas. Additionally, this sub-component would finance staffing for the Project Implementation Unit (PIU) at GPL which included mainly a construction manager, a construction supervisor, and a procurement and accounting officer.

The *Loss Reduction* sub-component, was included as part of the Investment Component of the Loan, to finance i) an assessment and feasibility study of non-technical losses; and ii) the implementation of a non-technical loss reduction investment program. It was envisaged that least-cost solutions be applied; and that sub-projects were selected based on proper

economic-financial analysis including consumers' ability and willingness to pay, and the sub-projects' Economic Internal Rate of Return (EIRR).

The *Project Management and Other Support* sub-component, was created to finance: i) the hiring of Consultants to support GPL in the negotiation of the power purchase agreements with other Independent Power Producers (IPP), trying to ensure that these agreements were economically viable and did not affect the sustainability of the utility; ii) the institutional and technical advisory services to assist GPL in overcoming its loss reduction challenges and; iii) financial and operational audits.

The **Hinterland Project Preparation Component**, planned to establish the technical, institutional and socio-environmental guidelines to lay down a sustainable, institutional and operational framework for the electrification of isolated and remote areas, where the extension of the existing network was not feasible. For this purpose, the program was focused on financing: i) studies of options and requirements for serving isolated areas with electricity; ii) selection of at least four demonstration projects in selected areas and according to their feasibility, the replication of successful projects at a later stage; iii) consultations with the local population and other relevant stakeholders on priority projects and; iv) external supervision of the environmental and social aspects of the component, especially of the demonstration projects. No counterpart contributions were directly allocated to this component.

The **Institutional Strengthening and Capacity-building Component** was established to finance: i) the project management activities at the Office of the Prime Minister (OPM) including the creation of a mechanism to monitor and evaluate the implementation of grid extension, the loss reduction sub-components, the hinterland demonstration projects, the strengthening of the Public Utility Commission (PUC), the Environmental Protection Agency (EPA) and the Electrical Inspection Department (EID), also known as the Government Electrical Inspectorate (GEI); ii) the training required for UAEP's successful implementation of the program; and iii) the legal, regulatory and institutional reforms to support the viability of UAEP.

### **C. QUALITY-AT-ENTRY REVIEW (IF APPLICABLE)**

A Quality-at-entry review was not applicable to this Program since it was developed prior to 2003, the year that quality-at-entry review exercises commenced.

Quality-At-Entry-Review			
<input type="checkbox"/> Highly Satisfactory (HS)-1	<input type="checkbox"/> Fully Satisfactory (S)-2	<input type="checkbox"/> Less than Satisfactory (LS)-3	<input type="checkbox"/> Unsatisfactory (US)-4



### III. RESULTS

#### A. Outcomes

ACHIEVEMENT OF DEVELOPMENT OBJECTIVES (DO)							
Development Objective(s) (Purpose)					Key Outcome Indicators		
1. Improved quality of life and increased economic activity for target population.							
<u>Classification: P</u>							
1.1 All new consumers use electricity instead of kerosene or other means of lighting 6 months after they have been served.							
Unit (%)							
Baseline		Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(23 Aug 2004)	ND	100	(26 Feb 2010)	100%	(30 Nov 2010)	
1.2 Newly connected areas achieve 90% of national average for ownership of electrical appliances by 2015.							
Unit (%)							
Baseline		Intermediate		End of Project		Outcome (Level of achievement %)	
52.5	(31 Mar 2008)	ND	90	(31 Dec 2015)	52.5	(31 Mar 2008)	
1.3 60% of the newly connected schools in coastal areas have information technology by 2010, 80% by 2012.							
Unit (%).							
Baseline		Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(23 Aug 2004)	ND	60	(31 Dec 2010)	100	(30 Dec 2010)	
1.4 Community centers in the hinterland have access to electricity and computers by 2009.							
Unit (No.)							
Baseline		Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(05 Jun 2002)	ND	02	(26 Feb 2010)	100	(30 Nov 2010)	
<u>Reformulation</u> [X] N/A							
PPMR Retrofitting. The PPMR was not retrofitted. [X] N/A							
Summary Development Objective(s) Classification (DO):							
[ ] Highly Probable (HP)		[X ] Probable (P)		[ ] Low Probability (LP)		[ ] Improbable (I)	

**Briefly justify DO classification, based on degree to which planned targets were met, explaining the differences between planned and achieved outcomes as well as any other relevant factors. Include references to evidence that can support these results.**

**1.1** As of December 2010, all new consumers (over 40, 000 Guyanese) have been utilizing electricity for lighting purposes. Average monthly consumption of newly connected households

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is 91.86-kWh<sup>1</sup>. In the hinterland, the installation of solar panels (PV) in targeted communities has eliminated the use of kerosene lamps or bottle lamps, popularly called “flambeau”<sup>2</sup>.

**1.2** Most of the newly served customers would have acquired at least half of the national average for appliance ownership in Guyana<sup>3</sup>.

**1.3** 100% of all newly connected **primary** schools in the coastal areas have access to electricity and are equipped with at least one computer or radio. Newly connected **secondary** schools have both electricity and are equipped with information technology<sup>4</sup>.

**1.4** All four (4) community centers among the twenty villages electrified with solar power had access to electricity and at least one computer thereby surpassing the development target requiring only two (2) community centers to access electricity<sup>5</sup>.

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**Country Strategy. Given the results described above, briefly discuss how the project contributed to the Bank’s strategy in the country.**

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At the time of approval, this project was expected to contribute to the Bank’s 2003-2007 Country Strategy objectives of: i) accelerating socio-economic development, under conditions of macroeconomic stability and led by the **private** sector; and ii) alleviation of poverty through delivery of improved infrastructure services in **housing, water supply, health and education**, which are critical to economic and social empowerment. The UAEP provided access to electricity to unserved low-income consumers especially along Guyana’s coast. Today, many Guyanese, in mainly new housing schemes, in over forty-four (44) areas in Guyana are accessing energy for lighting, powering basic essential appliances and venturing into business opportunities. These results are consistent with the Bank’s strategy and supported the GOG’s sector and economy reform agenda under its Poverty Reduction Strategy. This Program also provided fundamental support to other Bank initiatives, particularly the accelerated housing program, Low Income Housing I. Access to the complementary amenities of housing and electricity helped to enhance the delivery of services to many Guyanese.

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<sup>1</sup> Presentation during Exit Workshop by Operational Director, GPL Mr. Elwyn Marshall

<sup>2</sup> Final Report, Evaluation of Solar Electricity Demonstration Projects Implemented in Four Hinterland Villages 2010, Dr. Mark Bynoe, p. 32.

<sup>3</sup> Information provided by Monitoring & Evaluation Report 2008.

N.B. - The indicators for the DO objectives were selected during the development of the logical framework, assuming that it would be possible to obtain the information through the Bureau of Statistics, the Ministry of Amerindians Affairs, the Ministry of Local Government or surveys. There is no official data available in these institutions for this indicator.

<sup>4</sup> Information provided by the Ministry of Education, Statistics Department, 2011.

<sup>5</sup> Information provided by the Office of the Prime Minister, 2011.

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The Program overlapped into the new Country Strategy 2008-2012, where strategic infrastructure was considered one of the main pillars for economic development; and where energy supply continued to play a fundamental role. The UAEP continued to contribute to the main objective of the Bank's Strategy with Guyana by enabling the country to maintain efforts to reduce electricity losses and improve the reliability and quality of supply to households.

### ***B. Externalities***

**Negative:** The consistent increase in the number of illegal connections in newly served coastal areas had delayed the supply of energy by the Utility to the expanded network and discouraged the connection of new customers willing to pay for the service.

**Positive:** Positive impacts were observed as a result of the extended electrification to hinterland areas. Households now accessing lighting for the first time, allowed students have more time for reading and homework. Women and men could devote more time to social meetings and to their handicraft work, which offered the opportunity to secure higher individual incomes. Capacity building also emerged from community participation in the electrification of hinterland areas. Additionally, the three main electrical firms awarded with electrification contracts increased their knowledge of construction codes and practices, demand side management and familiarity with international procurement practices. Electrical technicians from the Government Technical Institute also benefitted from hands-on training in solar electrical installations due to short-term contracts with the largest solar electricity service provider, Farfan & Mendes Ltd.

## C. Outputs

IMPLEMENTATION PROGRESS (IP)							
1. Component I: INVESTMENT COMPONENT							
Total cost of Component 1: 20,443,233.62 Counterpart: 6,661,880 IDB: 13,781,353.62				IDB Disbursement: 100% <u>Classification:</u> S			
Key Output Indicators							
3.1 Installation of 30,000 new connections by Guyana Power and Light Inc. (GPL): 6,000 in 2005; 6,000 in 2006; 8,000 in 2007; 8,000 in 2008; and 2,000 in 2009 Unit: No.							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(23 Aug 2004)	0.0 6,000 14,000 20,000 28,000 30,000 30,000	(23 Aug 2004) (31 Dec 2005) (31 Dec 2006) (31 Dec 2007) (31 Dec 2008) (31 Dec 2009) (31 Dec 2010)	45,910	(30 Nov 2010)	100	(30 Nov 2010)
3.2 Loss Reduction Strategy approved by GPL's Board by May 2005. Unit: No.							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(23 Aug 2004)	1	(30 May 2005)	1	(30 Nov 2010)	100	(07 Aug 2006)
3.3 GPL to achieve reduction in the net commercial and technical losses in its system of 28% by the end of 2006 and 20% by the end of the project Unit: %							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
40	(07 Aug 2006)	28	(30 Dec 2006)	20	(30 Nov 2010)	38	(30 Jun 2010)
3.4 At least one additional Independent Power Producer supplies power to the national grid by December 2009. Unit: No.							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
1	(23 Aug 2004)	ND	ND	1	(30 Nov 2010)	100	(31 Dec 2008)
3.5 GPL achieve Net System Average Interruption Frequency Index (SAIFI) as follows Unit: No.							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
138	(31 Dec 2003)	120 100	(31 Dec 2005) (31 Dec 2006)	55	(31 Dec 2010)	N/A	(31 Dec 2010)

		80	(31 Dec 2007)				
<b>3.6 GPL achieve Net Customer Average Interruption Frequency Index (CAIFI) as follows</b>							
<b>Unit: No.</b>							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
298	(31 Dec 2003)	200 160 140	(31 Dec 2005) (31 Dec 2006) (31 Dec 2007)	96	(31 Dec 2010)	60	(31 Dec 2010)
<b>3.6 GPL achieve average availability</b>							
<b>Unit: days.</b>							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
85	(31 Dec 2005)	ND	ND	85	(30 Nov 2010)	N/A	(31 Dec 2010)

### **Briefly explain differences between planned and actual outputs (if applicable)**

**Electrification of unserved areas:** Although grid expansion works were aimed at providing electricity connections for only 30,000 houselots, the UAEP facilitated connections to over 40,000 houselots across seven out of ten regions in Guyana. Notwithstanding, a significant number of these connections were not being activated or legally accessed by the populace (approximately 59%). This scenario could be attributed to the following: i) some new housing developments lacked adequate basic amenities (paved roads and water) to immediately attract property owners thus contributing to low occupancy rates; ii) the inability or unwillingness of residents to finance their customer contribution; iii) the relatively high cost of electricity deterred resident's willingness to pay and helped develop a culture of theft in some areas; iv) the inability of residents to provide proof of legal occupancy (a mandatory requirement) due to the slow-paced, tedious procedures at the Ministry of Housing.

**Electricity loss reduction:** After the approval of the Loss Reduction Strategy in 2006, GPL pursued specific actions targeted at reducing commercial losses in the following four years of the program. These actions were successful in reducing commercial losses by 8% but the impact on overall losses was eroded by technical losses which had increased by 2.4% due to lack of investment in technical loss reduction actions and increased demand growth. The limited impact of these actions on the overall level of losses were attributed to personnel challenges as well as<sup>6</sup>: i) insufficient accurate and timely reporting to ensure that resources could be focused on those initiatives that provided the greatest benefit; ii) poor data maintenance, exception reporting and following up on exceptions; v) delays in the CIS (Customer Information System) procurement and implementation process; vii) high level of oil prices inhibited the purchase, and therefore the installation, of Itron meters for larger customers; viii) higher electricity prices may have had the

<sup>6</sup> Loss Reduction Investment Management - Final Report

effect of stimulating additional electricity theft; and x) continued increase in technical losses due to lack of investment and sustained demand growth.

**GUYSUCO, Independent Power Producer (IPP):** In 2008, the government-owned Guyana Sugar Corporation (GUYSUCO) commissioned its 10-MW HFO fired capacity at Skeldon to supply of power to the grid. However, the feeder link being used for this interconnection dispatches, at peak, only 6.8-MW of power to the grid.

**Quality of the service (SAIFI, SAIDI and CAIFI index):** Indicators SAIFI (System Average Interruption Frequency Index), SAIDI (System Average Interruption Duration) Index and CAIFI (Customer Average Interruption Frequency Index) were not being accurately recorded to provide reliable statistics on quality of service. GPL does not have a SCADA (Supervisory Control and Data Acquisition) system, a fault-disturbance or event recorder device which provides, in a more precise manner, the exact time of interruptions caused by a fault in the system. Under these conditions, GPL can hardly provide reliable information on the exact time or the duration of an interruption.

**Restructuring. Indicate if this component was restructured (date of approval by Manager). Briefly discuss the consequences of these changes.**

On August 26, 2004, this component was restructured resulting in: i) a decrease in the financing available to provide electricity to new houselots (connections); and ii) the addition of a new Loss Reduction sub-component. The reduction in financing to the Grid Connections sub-component resulted in a decreasing target households from 40,000 to 30,000.

IMPLEMENTATION PROGRESS (IP)							
2. Component II: HINTERLAND ELECTRIFICATION PROGRAM PREPARATION							
Total cost of Component I: US\$4,951,206.65 Counterpart: 0 IDB: US\$4,951,206.65				IDB Disbursement: 100 % <u>Classification:</u> S			
Key Output Indicators							
2.1 Evaluation of the options and requirements for hinterland electrification completed by March 2005. Unit: Evaluation completed							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(23 Aug 2004)	1	(23 Mar 2004)	1	(30 Nov 2010)	100	(30 Nov 2005)
2.2 Comprehensive strategy for Hinterland Electrification approved by Cabinet and made public by OPM by June 2005. Unit: Hinterland Electrification Strategy							

Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(23 Aug 2004)	1	(30 Jun 2005)	1	(30 Nov 2010)	100	(12 Jan 2007)
<b>2.3 Sustainable demonstration project completed, based on the above strategy.</b>							
<b>Unit:</b> No							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(23 Aug 2004)	1	(30 Dec 2006)	4	(30 Nov 2010)	100	(31 Dec 2008)

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**Briefly explain differences between planned and actual outputs (if applicable)**

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**Hinterland Electrification:** In 2005, this Component financed the completion of an Electricity Needs Assessment and Electrification Options study for hinterland communities in Guyana. Based on this analysis, the GOG proposed a strategy to explore the feasibility of proposed electrification options, where, at a later stage, those feasible options were expected to be replicated in other hinterland communities.

In keeping with this Strategy, **four** hinterland communities including their respective schools were initially provided with solar electricity. Additionally, training in basic panel maintenance, tools and protective gear were provided to each community. Meanwhile, studies were being conducted on the viability of wind sourced power through anemometer readings in other earmarked communities. At this stage, the planned outputs for this component had been achieved.

However, following the Strategy and with financing available, this Component also proceeded to fund i) the establishment of diesel powered mini-grid systems in **four** more hinterland communities; ii) the rehabilitation of existing distribution grids in **three** other hinterland communities; and, for the first time, iii) piloting the interconnection of a solar array into diesel powered mini-grid systems in **two** of the newly electrified communities. Network maintenance training was also provided to selected members in these communities, as well as training by the GEI for electricians on how to conduct electrical installations to meet the minimum safety requirements as specified in the new wiring standard, the NESC (National Electrical Safety Code). Further, based on the success of the initial solar electricity pilot programs, each home in an additional **eighteen (18)** hinterland communities received solar powered lighting for the first time. Overall, this Component contributed to improving the quality of life of approximately 15,000 residents (mainly of Amerindian descent) from communities in Guyana's poorest regions.

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**Restructuring. Indicate if this component was restructured (date of approval by Manager). Briefly discuss the consequences of these changes.**

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[X] N/A. This Component was not restructured.

IMPLEMENTATION PROGRESS (IP)							
3. Component III: INSTITUTIONAL STRENGTHENING AND CAPACITY BUILDING							
Total cost of Component I: US\$1,698,507.68 Counterpart: 0 IDB: US\$1,698,507.68					IDB Disbursement: 100 % <b><u>Classification: S</u></b>		
Key Output Indicators							
<b>1.1 Steering Committee at OPM functional and Project Executing Unit (PEU) at OPM and dedicated UAEP staff at GPL (PIU) operational by October 2004.</b> <b>Unit: PEU and PIU operational</b>							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(23 Aug 2004)	1	(26 Oct 2004)	1	(30 Nov 2010)	100	(30 Oct 2004)
<b>1.2 New Wiring Regulations and technical standards for the electricity sector brought into effect by December 2005.</b> <b>Unit: Wiring Regulation</b>							
Baseline		Annual/Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(23 Aug 2004)	1	(26 Oct 2004)	1	(30 Nov 2010)	100	(22 Nov 2007)
<b>1.4 Community centers in the hinterland have access to electricity and computers by 2009.</b> <b>Unit: No.</b>							
Baseline		Intermediate		End of Project		Outcome (Level of achievement %)	
0.0	(05 Jun 2002)	ND		04	(26 Feb 2010)	100	(30 Nov 2010)

#### **Briefly explain differences between planned and actual outputs (if applicable).**

**Steering Committee:** Although the Project Steering Committee (SC) was not active as planned, it was functional and effective. Issues that required intervention from the Prime Minister and government ministers were addressed as the need arose. The Prime Minister (PM) provided strategic directions and assisted in solving critical problems in the sector while members of SC (including the PM) met to review and revise critical laws and policies that emanated from studies financed under the UAEP. As a result, four new amendments to the electricity sector law had been enacted by the end of the Program.

**New Wiring Regulations:** A collaborative effort between the international consulting firm, Foley Hoag, and several agencies from Guyana's electricity sector, GEA, GEI, PUC, etc, followed by public consultations led to the finalizing of the National Electrical Code (NEC) and the National Electrical Safety Code (NESC). NEC is applicable to all demand side electrical installations while NESC establishes the standard for installations and constructions carried out by electricity suppliers. In 2008, NESC was gazetted and officially adopted in the *Electricity Sector (Technical Standards) Regulation No. 6 of 2008* as the standard for all electricity suppliers' works. However, this law has not been fully applied since the GOG wishes to first complete a public sensitization process. Nonetheless, it should be highlighted that the GEI has been conducting its inspections in accordance with these new standards; all



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recent electrical installations have therefore been certified in keeping with the NEC.

Moreover, this Component also financed i) overseas training for PUC staff, ii) computer training for electrical inspectors at the GEI, and iii) training in the new wiring standard for over 100 persons, including electrical contractors, inspectors, lecturers, students and engineers. Financing was also utilized to purchase motor cycles, computers, printers, photocopiers, tools and testing equipment for the GEI to support their operations. The GNBS also benefitted from the purchase of meter testing equipment to help carry out their mandate.

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**Restructuring. Indicate if this component was restructured (date of approval by Manager). Briefly discuss the consequences of these changes.**

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Restructuring of this Component was approved on August 26, 2004 where total financing available to this Component increased by US\$494,000. Although this Component would now comprise five sub-components as opposed to the original eight sub-components, two additional activities were included based on the new focus of strengthening the sector to attract new private investors. Here, financing was made available to i) help the Government re-privatize GPL, and ii) the Project Preparation Facility (PPF) financing had been transferred from the Investment Component to this Component.

Summary Implementation Progress Classification:			
<input type="checkbox"/> Highly Satisfactory (HS)	<input checked="" type="checkbox"/> Satisfactory (S)	<input type="checkbox"/> Unsatisfactory(U)	<input type="checkbox"/> Very Unsatisfactory (VU)

## D. Project Costs

**Table 1 - Initial Project Costs, as per Annex A to original Loan Contract, September 2002.**

(in US\$ thousands)

INVESTMENT CATEGORY		BANK	LOCAL	TOTAL	%
<b>1. Investment Component</b>		<b>20,852</b>	<b>6,863</b>	<b>27,715</b>	<b>80.6</b>
1.1	Project Administration (GPL)	1,909	-	1,909	
1.2	Sub-Projects*	16,230	6,022	22,252	
1.3	Furniture	50	-	50	
1.4	Vehicles	50	-	50	
1.5	Computer equipment & software	-	75	75	
1.6	Financial and Operational Audits**	250	-	250	
1.7	Contingencies	2363	766	3,129	
<b>2. Hinterland Project Preparation</b>		<b>4,500</b>	<b>-</b>	<b>4,500</b>	<b>13.1</b>
2.1	Consultancies	200		200	
2.2	Engineering Studies	300		300	
2.3	Demonstration Projects	3,350		3,350	
2.4	Independent Supervision	63		63	
2.5	Contingencies	587		587	
<b>3. Institutional Strengthening and Capacity Building</b>		<b>1,500</b>	<b>-</b>	<b>1,500</b>	<b>4.4</b>
3.1	Project Management (OPM)	745		745	
3.2	Tech. Assistance PUC, EPA, EID	150		150	
3.3	Studies, Consultancies	30		30	
3.4	Monitoring and Evaluation	200		200	
3.5	Capacity Building at EID	200		200	
3.6	Legal and Regulatory Reforms	40		40	
3.7	Ancillary Expenditures	50		50	
3.8	Contingencies	85		85	
<b>4. Financial Costs</b>		<b>548</b>	<b>137</b>	<b>685</b>	<b>2.0</b>
4.1	Inspection and Supervision	274	-	274	
4.2	Interest	274	-	274	
4.3	Credit Fee	-	137	137	
<b>TOTAL</b>		<b>27,400</b>	<b>7,000</b>	<b>34,400</b>	<b>100.0</b>
<b>Percentages</b>		<b>79.7</b>	<b>20.3</b>	<b>100.0</b>	

\* includes US\$.025 million allocated through PPF-GY0067

\*\* Includes costs for financial audits for the other two components

**Table 2 - Changes in Project Costs 2004-2010**

Sub-Components (Category)		2004 (A)	2007 (B)	(C) [(B-A)÷A]	2010 (D)	(E) [D÷B]
		Planned (USD)	Approved (USD)	IADB-07 <sup>7</sup> effect (%)	Disbursed (USD)	% disbursed
<b>01.00.00</b>	<b>Grid Connections</b>	<b>12,300,000</b>	<b>8,070,698</b>	<b>-34%</b>	<b>7,354,162</b>	<b>91%</b>
01.00.01	Connections	11,375,000	7,145,698	-34%	7,124,901	100%
01.00.02	Project Administration	925,000	925,000	0%	229,261	25%
<b>02.00.00</b>	<b>Loss Reduction Assessment</b>	<b>6,348,000</b>	<b>6,329,948</b>	<b>0%</b>	<b>5,972,190</b>	<b>94%</b>
02.00.01	Loss Reduction	198,000	179,948	-9%	179,949	100%
02.00.02	Investment/ Management Services	6,150,000	6,150,000	0%	5,792,242	94%
<b>03.00.00</b>	<b>Project Management &amp; Other Costs</b>	<b>750,000</b>	<b>560,000</b>	<b>-25%</b>	<b>455,002</b>	<b>81%</b>
03.00.01	PPA Negotiation Support	100,000	100,000	0%	0	0%
03.00.02	Support for Loss Reduction	400,000	380,000	-5%	385,481	101%
03.00.03	Financial & Operational Audits	250,000	80,000	-68%	69,520	87%
<b>04.00.00</b>	<b>Hinterland Project Preparation</b>	<b>3,618,000</b>	<b>3,595,786</b>	<b>-1%</b>	<b>4,951,207</b>	<b>138%</b>
04.00.01	Strategy Assessment/Preparation	198,000	175,786	-11%	175,786	100%
04.00.02	Engineering/Other Studies	150,000	150,000	0%	1,089	1%
04.00.03	Demonstration Projects	3,200,000	3,200,000	0%	4,774,332	149%
04.00.04	Independent Supervision	70,000	70,000	0%	0	0%
<b>05.00.00</b>	<b>Institutional Strengthening &amp; Capacity Building</b>	<b>1,994,000</b>	<b>1,387,067</b>	<b>-30%</b>	<b>1,942,974</b>	<b>140%</b>
05.00.01	Project Management	694,000	694,000	0%	788,551	114%
05.00.02	Capacity Building (EID, PUC, EPA)	350,000	350,000	0%	822,266	235%
05.00.03	Program Monitoring/Evaluation	200,000	98,600	-51%	87,691	89%
05.00.04	Reprivitization Advisory Service	500,000	-	-100%	0	-
<b>85.00.00</b>	<b>Payoffs of PPF Loans</b>	<b>250,000</b>	<b>244,467</b>	<b>-2%</b>	<b>244,467</b>	<b>100%</b>
85.00.01	Payoff 1083/SF-GY	250,000	244,467	-2%	244,467	100%
<b>87.00.00</b>	<b>Financial Costs</b>	<b>685,000</b>	<b>562,000</b>	<b>-18%</b>	<b>533,335</b>	<b>95%</b>
<b>98.00.00</b>	<b>Contingencies</b>	<b>1,705,000</b>	<b>705,000</b>	<b>-59%</b>	<b>0</b>	<b>0%</b>
<b>TOTAL</b>		<b>27,400,000</b>	<b>21,210,499</b>	<b>-23%</b>	<b>21,208,869</b>	<b>99.99%</b>

<sup>7</sup> IADB Initiative = Debt Relief 2007.

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**Briefly explain any differences.**

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[Table 1](#) shows the original projects costs and categories for the Loan in 2002. Restructuring of the UAEP in 2004 changed the number of Components, sub-components and their allocations, as reflected in column A of [Table 2](#)., however, total Bank-financing remained the same. Reductions, reflected in column C, to the Investment sub-component categories and Institutional Strengthening categories show the effects of the IADB-07 debt relief initiative by 2007. These reductions, however, did not affect the achievement of the development objectives since GOG and SIMAP helped to expand the grid to accommodate the 30,000 connections. Also, by 2007, the Hinterland Assessment and Electrification Strategy were already completed, hence the percentage shown in the sub-component 04.00.01 reflects the transfer of the excess funds. Component 2 was not restructured. After debt relief, the Investment Component was reduced by 23% while the Institutional Strengthening Component and Other Costs Component were reduced by 30% and 47% respectively. Total Bank financing to the Program therefore shrunk by approximately 23% of original financing.

The final column in Table 1, column E, shows the percentage of the planned budget that was disbursed by the end of project execution in 2010. Most of the planned expenditure, i.e. 92%, for the Component 1 was disbursed to achieve the reported results by the end of the project. The low percentage of financial execution for sub-component categories 03.00.01 and 03.00.03 reflect the actual value of the contracts subscribed with the providers of these services. (*see Project Costs summarized by Component in [Table 3](#) and [Table 4](#)*).

Components 2 and 3 each utilized almost 40% more of their planned financing. It should be highlighted that the low percentages disbursed for sub-component categories 04.00.02 and 04.00.04 were as a result of the decision of OPM to suspend the recruitment of an Independent Hinterland Supervision consultancy and the no approval by the Cabinet for the hydropower feasibility studies and possible micro-hydro development. With the excess available funds resulting from the cancellations, the Program financed the additional hinterland electrification works: i) the installation of 1,200 more solar systems in 12 villages using 65-W systems instead of the 125-W systems, and dry cell instead of wet cell batteries; ii) the upgrade of existing electricity networks in Lethem, Moraikobai and St. Cuthbert's Mission; iii) the electrification of Mahdia in a similar way to Port Kaituma – constructing a network, a mini power station, and installing a 375-kVA and a 625-kVA generator and; iv) the installation of two 5kW solar PV grid-tie systems ( the first in Guyana) on the hospitals in Port Kaituma and Mahdia.

Increases in the amount of funds spent in sub-component categories 05.00.01 reflect the excess financing needed to cover the project administration expenses given the almost three years extension to the execution period of the Program. Also, the re-privatisation advisory service

financed by sub-component category 05.00.04 was no longer required given re-privatization strategy adopted by the GOG which encouraged the private participation without the need to privatize GPL in the short term. A small portion of [unutilized financing](#) was cancelled at the end of the program and is reflected in Table 3.

[Table 5](#) shows details of the Borrower's Contribution to the Loan Program which helped to achieve the results of the Program.

**Table 3 - Project Costs summarized by Component, 2002-2010**

COMPONENTS	Planned (USD)				Actual (USD)	% difference (2010/2007)
	2002	2004	IADB-07 Debt relief values	2007	2010	
<b>COMPONENT 1 - Investment Component<sup>8</sup></b>	20,852,000	19,398,000	(4,437,354)	14,960,646	13,781,354	92%
<b>COMPONENT 2 - Hinterland Projects</b>	4,500,000	3,618,000	(22,214)	3,595,786	4,951,207	138%
<b>COMPONENT 3 - Institutional Strengthening &amp; Capacity Building</b>	1,500,000	1,994,000	(606,933)	1,387,067	1,942,974	140%
<b>Other Costs</b>	548,000	2,390,000	(1,123,000)	1,267,000	533,335	42%
<b>TOTAL</b>	<b>27,400,000</b>	<b>27,400,000</b>	<b>(6,189,501)</b>	<b>21,210,499</b>	<b>21,208,869</b>	<b>99.99%</b>
<i>Unutilized financing - Cancellation</i>					(1,629.66)	0.01%

**Table 4 - Percentage differences in Project Costs by Component, 2004-2010**

COMPONENTS	Planned			Actual
	2002 Planned	2004 Restructuring effect	2007 Debt relief effect	2010 Disbursed
<b>COMPONENT 1 - Investment Component</b>	100%	-7%	-23%	92%
<b>COMPONENT 2 - Hinterland Projects</b>	100%	-20%	-1%	138%
<b>COMPONENT 3 - Institutional Strengthening &amp; Capacity Building</b>	100%	+32%	-30%	140%
<b>Other Costs</b>	100%	+336%	-47%	42%
<b>TOTAL</b>	<b>100%</b>	<b>0%</b>	<b>-23%</b>	<b>99.99%</b>

<sup>8</sup> Comprises of Sub-components 01.00.00, 02.00.00 and 03.00.00

**Table 5 - Project Costs, Borrower's Contributions**

Sub-Components (Category)		2002, 2004, 2007	2010	
		Planned (USD)	Actual (USD)	Disbursed (%)
<b>01.00.00</b>	<b>Grid Connections</b>	<b>4,600,000</b>	<b>6,050,705</b>	<b>32%</b>
01.00.01	Connections	4,125,000	4,598,202	11%
01.00.02	Project Administration	475,000	1,452,503	206%
<b>02.00.00</b>	<b>Loss Reduction Assessment</b>	<b>1,850,000</b>	<b>524,553</b>	<b>-72%</b>
02.00.01	Loss Reduction			
02.00.02	Investment/ Management Services	1,850,000	524,553	-72%
<b>03.00.00</b>	<b>Project Management &amp; Other Costs</b>	<b>150,000</b>	<b>86,622</b>	<b>-42%</b>
03.00.01	PPA Negotiation Support	150,000	86,622	-42%
03.00.02	Support for Loss Reduction	-	-	-
03.00.03	Financial & Operational Audits	-	-	-
<b>04.00.00</b>	<b>Hinterland Project Preparation</b>	<b>-</b>	<b>-</b>	<b>-</b>
04.00.01	Strategy Assessment/Preparation	-	-	-
04.00.02	Engineering/Other Studies	-	-	-
04.00.03	Demonstration Projects	-	-	-
04.00.04	Independent Supervision	-	-	-
<b>05.00.00</b>	<b>Institutional Strengthening &amp; Capacity Building</b>	<b>-</b>	<b>-</b>	<b>-</b>
05.00.01	Project Management	-	-	-
05.00.02	Capacity Building (EID, PUC, EPA)	-	-	-
05.00.03	Program Monitoring/Evaluation	-	-	-
05.00.04	Reprivitization Advisory Service	-	-	-
<b>85.00.00</b>	<b>Payoffs of PPF Loans</b>	<b>-</b>	<b>-</b>	<b>-</b>
85.00.01	Payoff 1083/SF-GY	-	-	-
<b>87.00.00</b>	<b>Financial Costs</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>98.00.00</b>	<b>Contingencies</b>	<b>400,000</b>	<b>973,725</b>	<b>143%</b>
	<b>TOTAL</b>	<b>7,000,000</b>	<b>7,635,605</b>	<b>9%</b>

#### **IV. PROJECT IMPLEMENTATION**

##### **A. ANALYSIS OF CRITICAL FACTORS**

**Shortages in the supply of Wallaba poles:** This phenomenon affected civil works activities under both Components 1 and 2 of the Program and translated into delays in the delivery of electricity service to earmarked areas. *Log tagging*, a monitoring tool implemented by the Guyana Forestry Commission (GFC) has helped the agency to better monitor the number of legal logs leaving the forest annually but has also restricted the amount of logs supplied by a pole supplier. Suppliers are permitted a specific number of log tags based on the size of their forest concessions. However, increasing demand for utility services (telephone and light) due to accelerated housing scheme developments had increased the demand for wallaba poles from the two main utilities in the country. With a small pool of large pole suppliers constantly bidding for contracts, this challenge brought significant delays to civil works activities. To remedy this situation, some poles suppliers resorted to either accumulate the required number of poles by purchasing from smaller suppliers or request an advance on their forest tags for the next year. In some instances, poles were supplied from the forest reservations of soon-to-be-electrified hinterland communities with permission from the village authorities.

**Supply of sub-standard materials:** Some materials were not supplied as specified (sub-standard bulbs and cables) and failed within the first week of operation. The replacement of such materials by the supplier caused significant setbacks to the timely completion of projects.

**Delays in the delivery of equipment and accessories:** The projects in the hinterland were affected by significant delays in the procurement and delivery of equipment from overseas as well as delivery to the communities. For instance, one supplier provided equipment three months behind the original delivery schedule. Hinterland community electrifications were also delayed by unexpected bad weather conditions (unexpected long raining seasons during the execution of works) and the limited transportation infrastructure to move equipment and materials from Georgetown to communities in the interior.

**Delays in the procurement of the CIS system and the ITRON meters** given the highly specialized nature of these software and equipment and their novelty characteristics. These delays were in part due to time understanding the application of the Bank's procurement guidelines in securing these types of goods and services.

**Delays in the electrification and legal connections of unserved areas to the grid:**

Although GPL had purchased adequate goods and services to complete the network expansion, low consumer application for service and increased illegal connections that rapidly increased electricity losses in some areas, made GPL reluctant to power the majority of the transformers in these areas, hence delaying the completion of the expected expansion.

**Personnel Changes:** In 2008, a new Project Coordinator (PC) and Project Implementation Manager at OPM and GPL, respectively, took over the role of implementing remaining activities. Earlier in the Program, the services of the Chief Electrical Inspectorate at the GEI were terminated. Over the life of the project, the following challenges were also faced by GPL: i) long-term gaps in GPL's senior management team limited the degree of focus and increased the demands on the remaining personnel; ii) a substantial re-organization during the early part of the loss reduction program, which led to the establishment of the Loss Reduction Division, thereby significantly diverting management effort; iii) working arrangements changed between in-house staff and outsourced contractors for a short period and disrupted some activities, and iv) difficulty in the understanding and acceptance of the new billing technology (CIS) by GPL's employees.

**B. BORROWER/EXECUTING AGENCY PERFORMANCE**

The Executing Agency's performance was rated in the following areas:

Key areas	PERFORMANCE			
	HS*	S	U	UV
1. Participation and quality of its contributions during project design		S		
2. Organization for project execution (Executing/Coordinating Unit's staff, infrastructure, coordination, communication, etc.)		S		
3. Coordination and integration of the project executing/Coordinating Unit with the Executing Agency		S		
4. Establishing a monitoring and results framework (baseline data, systems, procedures, data analysis and reporting, etc.)		S		
5. Executing/Coordinating Unit's management and decision-making capacity		S		
6. Timeliness in the fulfillment of the Bank's policies, procedures and contractual clauses			U	
7. Financial management (securing counterpart resources, disbursements, quality and timeliness of AFS, etc.)		S		
8. Timeliness and efficiency for procurement of goods, works and consulting services			U	
9. Executing Agency top-level management's leadership, ownership and support to project execution		S		
10. Concrete actions to secure project sustainability		S		



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**Briefly explain the result.**

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The two areas received unsatisfactory ratings because: (i) data for the update of the monitoring results framework was not adequately maintained; and (ii) there were significant constant delays in the submission of documentation in compliance with contractual clause

Borrower/Executing Agency			
<input type="checkbox"/> Highly satisfactory (HS)	<input checked="" type="checkbox"/> <b>Satisfactory (S)</b>	<input type="checkbox"/> Unsatisfactory (U)	<input type="checkbox"/> Very unsatisfactory (VU)

### ***C. Bank Performance***

The Borrower's Evaluation classified as **probable** the achievement of the Development Objectives of the UAEP. It stated that, towards ensuring the sustainability of the hinterland electrification efforts, the Government of Guyana has recently agreed to establish within the Guyana Power & Light Inc., a Hinterland Electrification Unit to, inter alia, assist and supervise the use and maintenance of the photovoltaic systems installed and other systems to be installed in the hinterland communities.

Regarding their own performance during the Project Preparation and Execution, the Borrower rated as **highly satisfactory** their performance without adding comments to this classification. In reference to the Bank's performance during project preparation and project supervision, the Borrower considered as **highly satisfactory** the intervention of the Bank in these activities, also without comments, *see Borrower's Evaluation in Annex*.

## ***V. SUSTAINABILITY***

### ***A. Analysis of Critical Factors***

**The Investment Program:** UAEP's contribution in the reduction of commercial losses was successful because the Program encouraged an understanding of the issue of losses in the system and in the operations of the Utility as a whole. The learning process in electricity loss reduction was long but necessary. GPL's technical capacities also received additional support with the creation of the Loss Reduction Unit focused on streamlining actions to continue the downward trend in overall losses. These actions will help to improve GPL's financial viability and enhance the quality of service to its consumers. Further, Government's commitment in the sustainability of these actions is demonstrated in the approval of new investments to continue the reduction of commercial losses, as well as lowering technical losses in the low and medium voltage network.

**The Hinterland Electrification Program:** Proper functioning of the community fee system established to support maintenance activities is vital to the sustainability of these electrification programs. The maintenance activities, by trained personnel in villages, help to maximize the yield from solar systems thus improving the level of service to residents. Moreover, strong commitment and direct participation of the Government in the sustainable development of hinterland communities is highlighted by the LCDS (Low Carbon Development Strategy) initiative. Under the LCDS, the GRIF (Guyana + REDD Investment Fund) will finance projects & programs which include inter alia: i) investment in low carbon economic infrastructure, including renewable energy and information and communications technology; ii) investment in development and new economic opportunities for Amerindian communities; and iii) investment in institutional strengthening, among others initiatives. One of the first projects proposed by the Government for financing under the GRIF is the solar electrification program for Amerindian communities. This program could be built on the successful experience of the UAEP in the electrification of hinterland communities using 65-W, 125-W and 220-W photovoltaic panels.

**Capacity Building and loss reduction:** During the implementation of the UAEP, it was observed that continued actions toward strengthening local capacities is an essential part of Government's effort to promote the development of a sustainable energy sector in Guyana. The UAEP trained local people to work in the construction, operation and maintenance of local distribution grids while also promoting safe and proper electrical installation practices. Further, strengthening of the GEI will help to accelerate loss reduction efforts and support better demand side management. Dedicated local capacity to record and monitor electricity losses at GPL will also strengthen management of the losses issues. Continuing these actions

will contribute to smoother execution of future projects in the sector, like those financed under the LCDS and GEF's (Global Environment Facility) initiatives for the sustainable development of the interior and coastal areas. Here, the central role of the Capacity Building component should be considered in executing of these interventions.

## ***B. Potential Risks***

The main risks contemplated and associated with the sustainability of the results achieved are: i) Insufficient amount of financial resources to further implement the strategy to continue similar activities funded by the UAEP; ii) quality and quantity of GPL's personnel to implement loss reduction actions and monitor results; iii) enforcement by the GEI to implement the control of losses due to illegal connections and metering problems which is showing an upward trend in repeated offenders; iv) the natural risk associated with Presidential Elections in 2012 to the continuation of similar objectives.

The former is secured with Government support through new investments in electrical infrastructure which should contribute to inhibit the growing effect of technical losses. The latter is reduced with the agreement of the LCDS between Guyana and Norway which will secure resources to operate the GRIF in the execution of similar initiatives funded by the UAEP. Also, the request by the Government to the GEF, to receive grant resources to exclusively promote the development of renewable energy and energy efficiency in Guyana; add value to the Government's commitment in the continuation of similar actions.

## ***C. Institutional Capacity***

The UAEP included a component for institutional strengthening that targeted some key institutions related to the energy sector such as: the OPM, GPL, GEI, PUC and others institutions like the Guyana Energy Agency (GEA) that received indirect support to finance shared activities (like energy conservation campaigns). This Program also financed the creation and operation of the Project Executing Unit at the OPM and the Project Implementation Unit at GPL with local skilled consultants. It also financed studies to support the Power Sector Reform Program which recommend specific actions to improve/amend the institutional, legal and regulatory framework affecting the sustained development of the energy sector. The sustainability of the mentioned reform is part of an ongoing agreement between the Government of Guyana and the IDB to implement the GY-L1014, the Power Sector Support Program.

Sustainability Classifications (SU):			
<input type="checkbox"/> Highly Probable (HP)	<input checked="" type="checkbox"/> Probable (P)	<input type="checkbox"/> Low Probability (LP)	<input type="checkbox"/> Improbable (I)

## **VI. MONITORING AND EVALUATION**

### **A. Information on Results**

**The overall evaluation of the DO resulted satisfactory:** The existing available information on the progress of the Development Objectives(s)/ Purpose Indicators were provided through the following main data sources: the 2008 Monitoring & Evaluation Report, GPL's Development & Expansion Plans, the Semi-Annual Progress Reports of the Program, the Mid-term and Final Evaluation Reports and reports from studies financed by the Program.

**Baseline data and indicators were affected by changes in the Program:** The DO baseline data was gathered through field surveys conducted by a consultant between January to March 2006. The survey included seventeen socio-economic variables for a sample size of 270-households from electrified areas and 266 from unserved areas. Due to the different changes/amendments to the structure of the Program, the methodology used in this survey was hardly adapted to monitor progress for some of the main indicators which led to reporting the information based on general surveys carried out by the PEU and the PIU.

**SAIDI, CAIFI and SAIFI:** While statistics on the CAIFI were not readily reported, the SAIDI and SAIFI indicators provided did not reflect the status of the quality of the electricity service at the end of the program. GPL current Operating Standards related to customer interruptions are monitored through the SAIFI and the SAIDI for twelve month periods. GPL does not have a SCADA system or a fault or event recorder devices that can provide, in a more precise way, the exact time of an interruption or restoration of the service followed by fault in the system. Presently, this information is gathered manually through unreliable information sources like telephone calls from interrupted customers, flickering of lights, the sound of opening of breakers in substations, among others, which do not provide information on the exact start of an interruption. Also, once a fault has been repaired, there are many factors that affect the accuracy of these indicator figures. For instance, the time interval between the suspension and the restoration of electricity service is calculated from records that are manually registered. The data on total number of customers affected by the interruption is estimated by the number of customers connected to each distribution feeder as recorded by the Sophia Control Center. However, faults could also occur some distance away from the substation in the low voltage side of the distribution transformer where the cut-out fuse is blown in the transformer rather than tripping the breaker at the substation. For this scenario, GPL does not have accurate information of the total number of customers connected to the low voltage side of the transformer. Due to this situation, it was difficult to report reliable numbers to monitor the real progress in the quality of the service through the SAIDI and SAIFI indicators.

## ***B. Future Monitoring and Ex-post Evaluation***

During the Loan Proposal stage, the Bank team consulted with GOG about an ex-post evaluation and the GOG decided not to carry out this evaluation. Mid-term and final evaluations were conducted in January 2007 and October 2010 respectively.

## VII. LESSONS LEARNED

The main lessons learned are grouped by Component and presented below:

Investment Component	Lessons Learned
<b>Delays in the preparation and execution of procurement processes.</b> Changes in the structure of the overall program at an early stage of execution and after year of execution resulted in a new learning process by the new structure and delay in the execution of implemented procedures.	Avoid major changes during the execution of a Program or encourage the hiring of skilled experienced consultants and the implementation of intensive and specific training programs in the new structure, where necessary.
<b>Difficulty in the understanding and acceptance of the new billing technology</b> by GPL's employees.	Major changes in information technology should be complemented by transitional training programs for personnel directly affected and will allow for more efficient and effective use of the adopted technology.
<b>Increases in meter tampering and meter bypass.</b> The risk of repeated offenders for meter tampering and meter bypass is presenting a new challenge in the control of non-technical losses: 45% in metering tampering and 40% in new interfaces during 2009.	The control of technical losses requires a very strong judicial system, in particular, to deal with those persons who break the law in a repetitive way.
Hinterland Component	Lessons learned
<b>Low performance in the timely execution of Hinterland projects:</b> the main challenges faced in the execution of hinterland projects were: i) lack of adequate infrastructure to access communities and supply goods and services in a timely manner; and ii) unexpected long bad weather conditions to perform works.	Rural electrification projects in isolated areas with scarce means of transportation and communication should consider these factors during the design of similar new initiatives.
<b>Wet cell batteries were more high maintenance and troublesome for hinterland residents to maintain.</b>	Gel type batteries are a marked improvement over the use of wet cell types, used in the initial demonstration areas. They eliminate all the safety hazards attributed to use of wet cell batteries; they do not need periodic watering, and it impossible to spill acid or emit corrosive fumes. With these benefits,

	gel batteries are justifiably higher cost than the wet cell battery.
<b>Sustainability of training programs:</b> more extensive training is needed in some cases for the sustainability of the schemes used in the electrification of hinterland areas, but training can result in the loss of opportunities for residents to engage in income generating activities retention of the persons within the villages who were trained to maintain the PV system.	The payment of a stipend to trainees, as an incentive to attend training, should be encouraged in hinterland communities. Women in hinterland communities are more stable residents and can become substitute maintenance providers.
<b>Shortage of Wallaba poles</b>	i. Community contracting can add value to hinterland projects while ensuring supply of some materials and improvements in completion times. ii. Consider alternative materials to use for utility poles.
<b>Institutional Capacity</b>	
<b>Availability and reliability of data.</b> The lack adequate information delayed the identification of effective actions in the reduction of losses and also the selection of cost-effective technologies for the electrification of hinterland.	Monitoring, collecting, and analysis of data should be a common practice in the energy sector. The use of information technology to improve the monitoring and reliability of data needs to be encouraged. The best decision in terms of cost and impact, relies on how well informed is the decision maker. Personnel should be identified/hired to provide these services and support decision makers.
<b>Low success in the removal of illegal connection:</b> raids for the removal of illegal connections are usually carried out at night when the Police Officers are not fully available and in certain areas require special Police Quad. GPL has limited authorities to effectively perform these activities.	Most of the field activities for the removal of illegal connections require the assistance and coordinated effort of the Guyana Electrical Inspectorate (GEI). Improvements to the staffing would help to provide more support to GEI in the execution of their mandate.

## ***ANNEXES***

- 1) [Glimpse of the UAEP](#) (Photos)
- 2) [Minutes from the Exit Workshop](#)
- 3) [Borrower's Evaluation](#)
- 4) [Summary of the Mid-Term and Final Evaluation Reports](#)