



Strengthening the Energy Sector

(GY-L1067/4698/BL-GY)

Project Completion Report (PCR)

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INDEX

Electronic Links.....	ii
Optional Electronic Links.....	ii
Acronyms and Abbreviations.....	ii
BASIC PROJECT INFORMATION.....	iii
i. INTRODUCTION.....	1
II. CORE CRITERIA. PROJECT PERFORMANCE.....	2
ii.1 Relevance.....	2
a. Alignment with country development needs.....	2
b. Strategic Alignment.....	5
c. Relevance of Design.....	6
ii.2 Effectiveness.....	11
a. Statement of project development objectives.....	11
b. Results achieved.....	11
c. Counterfactual Analysis.....	18
d. Unanticipated outcomes.....	19
ii.3 Sustainability.....	20
a. General Sustainability Aspects.....	20
b. Environmental and social safeguards performance.....	22
III. NON-CORE CRITERIA.....	22
iii.1 Bank Performance.....	22
iii.2 Borrower Performance.....	23
IV. FINDINGS AND RECOMMENDATIONS.....	23
iv.1 Dimensions 1 to 5.....	23
Table 1. Results Matrix - Outputs.....	25

Electronic Links

1. [Development Effectiveness Matrix \(DEM\) Summary](#)
2. [Final version of the Progress Monitoring Report \(PMR\)](#)
3. [PCR Checklist](#)

Changes to the Matrix¹

Optional Electronic Links

1. [Exit Workshop Minutes](#)
2. [National Vision for the Diversification of the Electricity Matrix](#)
3. [GPL's use of the National Grid Code](#)
4. [Generation System Expansion Plan: Scenarios Report](#)
5. [Department of Energy: Annual Report 2019](#)

Acronyms and Abbreviations

CDC	Civil Defence Commission
DBIS	Demerara-Berbice Interconnected System
DE	Department of Energy
EPA	Environmental Protection Agency
GDP	Gross Domestic Product
GEA	Guyana Energy Agency
GOG	Co-operative Republic of Guyana
GPL	Guyana Power & Light
GSDS	Green State Development Strategy
IDB	Inter-American Development Bank
IPP	Independent Power Producer
IRPP	Independent Renewable Power Producer
MOF	Ministry of Finance
MoPI	Ministry of Public Infrastructure
MoTP	Ministry of the Presidency
NG	Natural Gas
O&G	Oil and Gas
PBL	Policy Based Loan
PMR	Project Monitoring Report
PSA	Production Sharing Agreement
RE	Renewable Energy
TC	Technical Co-operation

¹ There were no changes made to the Results Matrix during the period of implementation.

BASIC PROJECT INFORMATION

^GY-L1067 Strengthening the Energy Sector

Country Beneficiary Guyana	Lending Instrument Policy-Based Loan	Borrower GY-GY - COOPERATIVE REPUBLIC OF GUYANA	Loan(s) 4698/BL-GY	Sector Energy	Sub-Sector Energy Institutional Strengthening And Capacity Building
Date of Board Approval Dec 06, 2018	Date of Eligibility for First Disbursement Dec 18, 2018	Date of Closure (CO) Dec 24, 2019	Loan Amount - Original 11,640,000.00	Loan Amount - Current 11,640,000,000.00	Pari Passu
Total Project Cost Not Available	Months In Execution from Approval 12	Months In Execution from First Disbursement 12	Original Date of Final Disbursement Dec 10, 2020	Actual Date of Final Disbursement Dec 10, 2020	Cumulative Extension(Months)

^Ratings of project Performance in PMRs



Has This Project Received Funds from another
Project?

☐ Yes ☒ No

Has This Project Sent Funds to Another Project?

☐ Yes ☒ No

Development Effectiveness Classification

No	PMR Date	PMR Stage	Classification	Actual Disbursements
1	May 15, 2019	Second period Jan-Dec 2018	Satisfactory	

Bank Staff



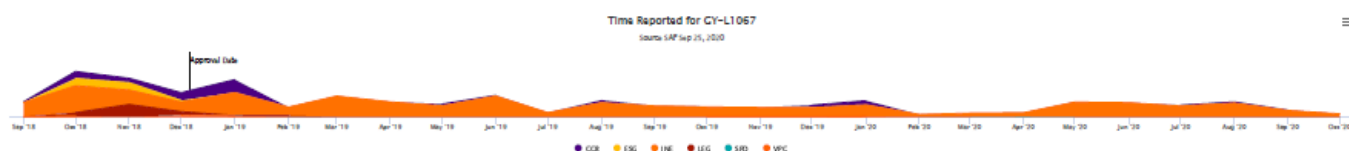
Positions	At PCR Dec 24, 2019	At Approval Dec 06, 2018
Vice-President VPS	Rodriguez-Ortiz,Ana	
Vice-President VPC	Rosa, Alexandre	Rosa, Alexandre
Country Manager	Turner-Jones,Therese (CCB/CCB)	Turner-Jones,Therese (CCB/CCB)
Sector Manager	Aguerre,Jose Agustin (INE/INE)	Aguerre,Jose Agustin (INE/INE)
Division Chief	Yepez-Garcia,Rigoberto Ariel (INE/ENE)	Yepez-Garcia,Rigoberto Ariel (INE/ENE)
Country Rep	Makonnen,Sophie (CCB/CGY)	Makonnen,Sophie (CCB/CGY)
Project Team Leader	Sologuren Blanco,Jaime (ENE/CGY)	Sologuren Blanco,Jaime (ENE/CGY)
PCR Team Leader		

Staff Time and Cost



Stage Project Cycle	# of Staff Weeks	USD (including Travel and Consultant Costs)
Preparation	21.70	48,502.49
Supervision	40.55	149,779.89
Total	62.25	198,282.38

Time



i. INTRODUCTION

Guyana is rich in natural resources with five main commodities: bauxite, gold, rice, sugar, and timber representing 84% of total exports in 2018.² Although Guyana's macroeconomic indicators have remained stable in the past five years with an average growth rate of 3.5% per year, its GDP per capita of US\$5,000 remains below the average in Latin America and the Caribbean of US\$9,000.³ From 2015 to 2019, total expenditure as a share of Gross Domestic Product (GDP) averaged 33.5%, while revenue as a share of GDP averaged 29.9%. This has contributed to recurrent fiscal deficits averaging 3.6% of GDP during this period. Historically, Guyana has been dependent on imported petroleum products to satisfy the bulk of its energy needs, with the power sector being the country's largest energy user (36%); followed by the transport sector (35%); agriculture, fishing and mining (21%); the residential sector (4%); and industry/manufacturing (3%). Over the period 2015 to 2019 on average petroleum imports represented 22% of the total merchandise imports (IMF-WEO, 04/2020).

Premised on the significant offshore oil discovery in the Stabroek Block in 2015,⁴ the country is now poised to become a critical Oil and Gas (O&G) supplier, with recoverable resources now estimated to be more than 8 billion Barrels of Oil Equivalent (boe).⁵ This would place Guyana among the 20 largest O&G reserve holders in the world⁶ with expectations of considerable increase in resource-related government revenues. Commercial production of oil commenced in December 2019 at the Liza 1 field with a projected output of 120,000 barrels per day (bpd) at peak production, with the block projected to reach 750,000 bpd by 2026.⁷ The updated projections taking into account the context of low oil prices in 2020 indicate that oil exports from the Liza 1 well will be approximately US\$1.3 billion in 2020, equivalent to 19% of the current GDP (IMF-WEO 04/2020).

The O&G sector is operating under a basic regulatory framework, designed to regulate the import and distribution of fossil fuels.^{8,9} Challenges that persist – in the context of the broader resource base – include a comprehensive policy, appropriate legal and regulatory framework, how operators acquire and manage licenses, defined fiscal regimes, environmental management, conduct of public officials active in the sector, information disclosure and others. As Guyana seeks to maximize the benefits of its O&G industry while simultaneously continuing a green development pathway, the overall Energy Sector framework needs to undergo significant transformation.

With regards to the electricity sector, the main public utility, Guyana Power and Light Inc. (GPL) has faced an annual average demand growth rate of 4.3% in recent years, which is expected to further increase as a consequence of the O&G driven economic growth. The current installed capacity of the main grid, the Demerara-Berbice Interconnected System (DBIS), is 172.2 Megawatts (MW), of which 135.9 MW are considered effective and operative. The peak

² Article IV International Monetary Fund (IMF) 2019.

³ World Economic Outlook, 10/2019.

⁴ The Stabroek block comprises 26,800 square kilometers. Esso Exploration and Production Guyana Limited is the operator and holds a 45% interest; Hess Guyana Exploration Ltd. holds a 30% interest; and CNOOC Petroleum Guyana Limited 25% interest.

⁵ Exxon Mobil, 2018.

⁶ U.S. Energy Information Administration (2018).

⁷ Article IV, IMF, 2018 p-4. The recent political context as well as the CoVID19 pandemic has contributed to a 6-12 month delay in the original objective of 750,000 bpd by 2025.

⁸ Historically, Guyana has been dependent on import of fossil fuels. In 2017, these imports represented 24% of the country's total imports. Guyana. Imports/Exports. OEC.

⁹ Guyana is highly dependent on imported oil products for its overall energy supply. Imported fossil fuels account for about half of final energy consumption with the other half coming from combustible renewables and waste products.

demand in the DBIS in 2019, excluding self-generators, was 124.5 MW and this cannot be met with the desired level of reliability by the existing generating units. These generation assets utilize imported liquid fossil fuels, including Heavy Fuel Oil (HFO) and Light Fuel Oil (LFO).¹⁰ Thus, the volatility of oil prices over recent years has resulted in high generation costs that translate into average electricity tariffs of US\$0.24/kilowatt hour (kWh), which is among the highest rates in LAC.^{11,12} This situation presents a major challenge that also emphasizes the need for diversification of the electricity matrix to meet existing demand and expand coverage.

In 2018, the Government of the Cooperative Republic of Guyana (GoG) through the Ministry of Finance (MoF) requested IDB's assistance in the form of a Policy Based Loan (PBL)¹³ that would support the strengthening and sustainability of the overall Energy Sector by contributing to the development of the O&G sub-sector and the development of cleaner and cheaper energy sources for electricity generation. This PBL has the specific objectives of: (i) developing a management and planning framework for the O&G sector; and (ii) contributing towards the development of the policy framework to diversify the electricity generation matrix. The PBL is comprised of two tranches of US\$5.82 M each and was developed in alignment with the country's commitment to becoming a green economy by 2040 while considering the development of the O&G sector and Renewable Energy (RE) for electricity generation. The approval of the PBL – Strengthening the Energy Sector – was granted on **December 10, 2018** through Resolution DE-110/2018.

In accordance with the policies of the Bank, upon completion of the final disbursement of the program (second tranche of the PBL), a Program Completion Report (PCR) must be prepared. The current PCR seeks to document the lessons learned and evaluate the results of the mentioned specific objectives. The sources of information used for the preparation of the PCR include the means of verification as identified in the results matrix, related studies, reports, strategy documents of the sector and direct feedback from key stakeholders. The key stakeholder agencies that have participated include the Ministry of Finance (MoF), Ministry of Public Infrastructure (MoPI), Guyana Power and Light (GPL) and the Department of Energy (DE).

ii. CORE CRITERIA. PROJECT PERFORMANCE

ii.1 Relevance

a. Alignment with country development needs

All the activities of the Program and its commitments are aligned with the Guyana's Green State Development Strategy (GSDS) – Vision 2040. The GSDS is a national strategy and prioritizes the Energy Sector as one of the country's development pillars, emphasizing the desire to transition towards an almost 100% renewable resource base for the electricity generation matrix. The main objectives of the GSDS are to: (i) re-orient and diversify Guyana's economy; (ii) reduce reliance on traditional sectors; and (iii) open new sustainable income and investment opportunities to add higher value and growth. The GSDS therefore provides a roadmap for achieving the sustainable development goals and related targets and outlines a long-term vision for a prosperous and equitable future.

¹⁰ Generation based on HFO and LFO in 2017 was estimated to reach 93%.

¹¹ The latest rates published by the electric utility GPL present several categories of tariffs, starting at US\$0.23/kWh for the residential sector, going up to US\$0.35/kWh for the commercial sector.

¹² Tariffs in the region (US\$/kWh): Suriname (0.05), Trinidad and Tobago (0.06); Jamaica (0.24); Barbados (0.26); LAC average (0.18).

¹³ Loan number 4698/BL-GY.

The GSDS highlights the need of having a green matrix while also facing the challenges of becoming an O&G producer. Specifically, with Guyana emerging as a new O&G producer, there was an urgency in building capacity for governing the sector. In this regard, the need for the establishment of a high-level policy-making authority such as the Department of Energy to provide overall governance for the sector was identified in alignment with international best practices. Additionally, the PBL sought to support the development of a plan for the development of the sector and to provide adequate tools and protocols for effective management of existing and future Production Sharing Agreements (PSA) in order to maximize the expected benefits to the sector.

Guided by the GSDS, the GoG is also pursuing policies and strategies aimed at reducing the dependence on imported fossil fuels while transitioning towards a cleaner and diversified generation matrix. The PBL is therefore contributing to the main aspects of the country's development needs within the Energy Sector with the executed components.

Component I, referred to the Macroeconomic Stability of the country monitored to maintain the macroeconomic context and its consistency with the policy matrix verified by a valid Independent Assessment of Macroeconomic Conditions (IAMC).

Component II of the program focused on the development of a management and planning framework for the O&G sector that would contribute to improving the management and standard mechanisms to safeguard the adequate development and operationalization of this nascent sector. This component included the establishment and operation of the DE and provided support for designing actions to build the O&G institutional framework. To further support the DE, a roadmap to guide sector development, the DE's functions manual, and the depletion policy guidelines have been developed and these contributed to building a stronger policymaking environment for administrators and to streamline further interventions in the sector. Complementary work on assessing the readiness of existing petroleum legislations and regulations to adequately ensure optimal value capture and adherence to industry norms and best practices were done through a thorough legal review. The achievement of this measure underpins the critical work of drafting a model contract, an economic modeling toolkit and the PSA set of protocols for effective contract administration. This component and its outcomes represent a valuable input and a point of reference for all subsequent interventions for the IDB, government stakeholders and other development partners in the sector.

The creation of the DE, the roadmap to guide sector development, the DE functions manual, and the depletion policy guidelines have proven to be relevant as they contributed to building a stronger policymaking environment for administrators and for streamlining further interventions in the sector. The DE has become the focal government entity in charge of the oil and gas sector for coordination of other government agencies in the sector, a key partner for private operators and the development of various projects along the oil and gas value chain. Furthermore, the DE and has also been able to coordinate and execute other donors technical and financial support. Further, The DE has thus they have contributed to the evolution of activities within the sector, aimed at enhanced value capture, improve transparency and leveling of the proverbial playing field.

Component III was expected to contribute towards the development of the policy framework to diversify the electricity generation matrix (second specific objective). Policy measures considered in this component were aimed at strengthening the electricity sector towards the achievement of a sustainable generation matrix that would satisfy the growing demand and the use of domestic energy natural resources. Given the significant macroeconomic implications of the emerging oil

and gas sector as well as the country's goal of transitioning to predominantly renewable based generation while also having indigenous reserves of Natural Gas that could be used in electricity generation, the GoG embarked on the development of the Updated Expansion Study¹⁴. This study represented one of the main documents for the country to analyze and identify the guidelines for the development of the most adequate and cost effective power system infrastructure based on the most up to date sector information as well as the review of the existing regulatory framework for further development of RE and the diversification of the energy matrix of the GPL operated DBIS. This study proved to be relevant and core supporting planning document as is it regularly consulted by the various GoG stakeholders in the sector to guide sector policy and support the integral development of the electricity matrix of the DBIS and represents an important contribution to the country in identifying possible scenarios to achieve the GSDS.

Additionally, under this component, a Draft Policy Guideline was developed by the MoPI in accordance with the first-tranche conditions of the PBL. This document served to provide contextual information on the sector, inclusive of the legal and institutional framework, the existing sector policies, and the characteristics of electricity supply and demand in the DBIS. The main sector policies that formed the basis for the guideline document included the 2017 Draft National Energy Policy and the National Power Sector Policy, which were drafted in accordance with wider national development priorities. The objectives for diversification of the electricity matrix were also clearly outlined along with the specific policy guidelines as agreed by GoG. These guidelines were very relevant and useful for showing the way and vision of the diversification of the electricity matrix. They were grouped into eight categories that address: (i) a sustainable energy mix based on an Integrated Resource Plan; (ii) a favorable fiscal regime for goods and services associated with RE projects; (iii) appropriate studies and assessments to facilitates RE development; (iv) capacity building of government agencies and institutions; (v) private sector participation in RE projects; (vi) the flexibility of the generation system; (vii) improved grid operations; and (viii) energy efficiency.

The final Policy document was ultimately developed following the development needs of the country integrated in the GSDS and the Policy Guideline document. The main objective of the current Policy is therefore to provide the basis, and incentives to obtain, in the near future, an optimal generation matrix in the DBIS that can provide the reliable service with the required quality, using indigenous resources in a sustainable manner and reducing / eliminating the perverse effects of imported fuels¹⁵. The document sought to identify the key technical, economic, and regulatory issues that constrain the effective operation of the DBIS, both in current and future demand scenarios. In this regard, nine (9) Specific Policy Actions to address the identified challenges and to foster diversification of the matrix in the DBIS were established, and clear linkages between each policy action and identified issue were also presented. This was the first time that a specific policy was developed for the national interconnected system that attends to around 80% of the population.

Finally, the component included the development and adoption of the National Grid Code. The Grid Code is considered a key technical document which defines the parameters that need to be met to ensure safe, secure, and economic functioning of the electric system. It is therefore a critical element of the country's efforts to diversify the electricity matrix. GPL being the main public utility responsible for the operation of the DBIS, has been at the forefront of the Grid Code development. It is expected that the adopted code will provide the relevant guidelines for the

¹⁴ Update of the study on system expansion 2019-2035. The study was approved by GoG in November 2018 and submitted to IDB as part of the first tranche conditions.

¹⁵ Policy Document for Diversification of the Electricity Matrix in the DBIS.

continued diversification of the electricity matrix in the DBIS and allow for efficient and effective system and market operation. The Grid code is now an integral part of GPL's planning and operational activities and will become increasingly important as the utility prepares for the integration of several utility scale and customer owned RE projects over the medium term.

In this regard, the objectives as presented in the program are directly linked to the two main outcomes which sought to improve the management and planning framework of the nascent O&G sector and the planning framework for the diversification of the electricity matrix. The program demonstrated as being realistic and attainable based on the country's current green development agenda and the urgent need for development of the O&G sector. More so, the overall implementation of the project was successful as it achieved the majority of its project outcomes.

b. Strategic Alignment

The program has been aligned with the IDB Group Country Strategy with the Cooperative Republic of Guyana 2017-2021 (GN-2905) as it supports: (i) establishing a modern national strategy and planning framework; and (ii) strengthening public policies and the framework for managing natural resource revenues. As highlighted in the loan document, Guyana faces two key challenges: (i) to manage the new O&G sector sustainably; and (ii) to diversify the energy sources in electricity generation to reduce the dependency on imported fossil fuels, while introducing indigenous energy sources and developing the policy framework for development of the interconnected system. The PBL sought to contribute to the achievement of the country strategy objectives in the O&G and electricity sectors through the implementation of Components II and III, respectively.

The operation is consistent with the update to the Institutional Strategy 2010-2020 (AB-3008) and is aligned with the development challenge of Productivity and Innovation, by supporting the design and development of a robust management framework for the O&G sector and the development of RE. The program is also aligned with the cross-cutting themes of: (i) Institutional Capacity and Rule of Law, as the program has strengthened both planning and governance; and (ii) Climate Change and Environmental Sustainability, with the support to the DE and the development of renewables. In addition, the project has contributed to the Corporate Results Framework 2016-2019 (GN-2727-6) under the indicator of government agencies benefited by projects that strengthen technological and managerial tools through: (i) improving public service delivery with the creation of the DE; (ii) establishing contract models needed to manage transparent legal arrangements between the public and private sectors; and (iii) the diversification of the electricity generation matrix with alternative cleaner and indigenous energy sources (NG and RE).

The program is consistent with the Energy Sector Framework (GN-2830-3), under the thematic lines of sustainability, security and governance by driving policy reforms that promote: (i) sustainable development of the sector; and (ii) diversification of the energy mix using renewable and nonconventional energy sources. The operation is also consistent with the Climate Change Sector Framework (GN-2835-3) since the proposed energy policy reforms entail a reduction in greenhouse gas emissions. The program is also aligned with the priority areas of the IDB Infrastructure Strategy: Sustainable Infrastructure for Competitiveness and Inclusive Growth (GN-2710-5), with actions that promote the development of infrastructure for more reliable, efficient systems.

c. Relevance of Design

The PBL was developed primarily to address the existing policy gaps within the O&G and electricity sectors based on the country's current development agenda. The country is at a critical juncture where it must urgently establish robust governance systems to maximize the expected benefits from its recently discovered O&G resources while simultaneously adopting a sustainable development framework.

Through the GSDS, the GoG has outlined several policy recommendations inclusive of legal and institutional actions that seek to guide the country's transition to a green state. Some of the framework goals related to the Energy Sector are: (i) establish a sovereign wealth fund for the O&G sector prior to oil production and have a trade balance on imported fossil fuels and oil exports; (ii) implement building codes and net-metering of residential renewable power; and (iii) reduce dependence on fossil fuels for electricity generation. The program was therefore appropriately conceptualized to support GoG in developing an appropriate O&G governance framework through the implementation of Component II and contribute to the diversification of the electricity matrix through the implementation of Component III.

The macroeconomic stability is included in Component I with the objective of maintaining a macroeconomic context that is consistent with the objectives as defined in the Policy Matrix. An Independent Assessment of the Macro Economic Conditions (IAMC), for the country had been approved and valid at the time of approval and disbursements of the loan in accordance with the Bank's policies. The design does not include a specific development objective nor an output indicator for this Component.

Based on these components, the program has defined two specific objectives: (i) develop a management and planning framework for the O&G sector; and (ii) contribute towards the development of the policy framework to diversify the electricity generation matrix. Figure 1 shows the chain between outputs, outcomes, and specific objectives.

Specific objective 1. Develop a management and planning framework for the O&G sector:

The outcomes associated with this specific objective were: (i) sectoral plan to develop the O&G sector approved by the DE; (ii) PSA economic modelling toolkit tested by the DE; and (iii) cost accounting rules based on PSA contract management protocols implemented. These [outcomes](#) would be instrumental to the improved governance and planning capabilities of the Department of Energy as the sector policymaker.

The creation of the DE within the Ministry of the Presidency was achieved prior to execution of Tranche I, however, the achieved outcomes under component II have significantly improved the quality of decision-making and planning for the sector, that at one time, had more than 18 government ministries and agencies operating along the O&G decision chain.

The realization of the outcomes was supported by the key activities under tranche I, that also included: a roadmap to develop Guyana's O&G sector, PSA economic modeling toolkit, and model contract. Barring the creation of the DE and the roadmap, other activities focused on identifying legal and regulatory constraints that directly or indirectly inhibit effective organization and management of the sector. Tranche II outputs – DE functions manual, depletion policy, and PSA set of protocols for contract administration – represented a focused approach towards the ideal archetype for institutional organization of the sector, while strengthening sector oversight through the development of process trees and guidelines for contract management. The O&G industry is technologically complex and needs specific regulations and controls to ensure, among

other things, the safety of operations, the accuracy of measurements of volumes and qualities, and the protection of the environment. Furthermore, the development of a depletion policy guidelines will assist with the overall development of the O&G sector considering national development objectives and priorities.

The measures under Component II were all aimed at contributing to the improvement of the management and standard mechanisms to safeguard the adequate development and operationalization of the O&G sector. The policy commitments outlined are also based upon industry international experiences and are well-recognized as foundational blocks for the establishment of a properly functioning sector.

Specific objective 2. Contribute towards the development of the policy framework to diversify the electricity generation matrix: There were two outcomes associated with this objective including (i) improvement in the policy framework to diversify the electricity matrix; and (ii) improved planning framework for the diversification of the electricity matrix. The definition of the National Vision for Diversification of the Electricity Sector is indicative of an improved policy framework while the implementation of the National Grid Code combined with the development of scenarios for diversifications of the generation matrix were directly linked to the improvement of the planning framework. Thus, the first result is achieved with the development of first, a Policy Guideline (Tranche I) that later is presented as the Policy Document for the diversification of the DBIS (Tranche II) which sets concrete actions for advancing in the achievement of the [national diversification goals](#). The draft Policy Guidelines were thus developed with specific focus on utilizing diverse clean and renewable indigenous generation sources for electricity generation. This document was critical in setting out the main objectives for diversification of the electricity matrix and provided the specific considerations based on national and sector related priorities for the development of the final Policy document.

The 2018 Expansion Study also provided related policy and regulatory requirements for the diversification of the matrix and so, contributed towards the improvement of a policy framework towards diversification. The study, commissioned in response to the dynamic evolution of the Energy Sector, mainly attributable to the recent discovery of oil and gas resources and in line with the expected improvement in the country's macroeconomic outlook and future electricity demand forecast scenarios up to 2035, identifies scenarios for the optimal development of generation infrastructure in the DBIS. The study also evaluates critical complementary interventions including energy efficiency and distributed generation in the matrix diversification, contributing all in the development of a complete and comprehensive Policy Document. The Policy formulates nine "categories of intervention", each with defined policy actions, and clear linkages to the key issues to be addressed to successfully create a policy framework to diversify the DBIS electricity matrix.

With respect to the second outcome associated with this specific objective, the establishment of specific scenarios for the development of an optimal and cost effective generation expansion program in the DBIS presented in the Expansion Study, it was also important to create a supporting Grid Code to ensure successful implementation. The Draft National Grid Code served to define the technical conditions that all parties interconnected to the DBIS must meet, to ensure safe, secure, and economic operation of the main electric system. In this regard, the ultimate adoption of the grid code (Tranche II) is seen as critical for the systematic diversification of the electricity matrix, while maintaining stable, efficient, and reliable system operation. A fully adopted and functional grid code is expected to create the necessary conditions for the planning of a systematic integration of variable renewable energy and technologies, as envisioned in the GSDS and the Policy, and also an expansion plan ultimately contributed to an improved planning framework for the diversification of the generation matrix. It is important to note that the National Grid Code, which was developed under the direction of GPL, was also subjected to review of key

Energy Sector stakeholders including the GEA, MoPI and the Public Utilities Commission. The National Grid Code was officially approved by MoPI and adopted by GPL in December 2019.

Having approved the Policy for Diversification of the Electricity Matrix, the MoPI embarked upon the development of the National Vision for Diversification of the Electricity Sector. The document was officially submitted to the Bank in June 2020 serving as the outcome indicator associated with an improved policy framework for diversification of the electricity framework. With the formal adoption of the National Grid Code by GPL, the power utility has since verified that the [Code has been operationalized](#) and its various sub-codes are consulted on a regular basis for guiding technical, administrative and procedural actions in relation to network planning, interconnection, operations, technical parameters and metering. Additionally, the [Report presented by MoPI](#) to the Bank sets the scenarios utilizing a modern energy system modelling and simulation software package. The outcomes considered the logical next steps between the two tranches policy measures that further consolidate actions towards the diversification of the electricity matrix.

Overall, the analysis proved that the vertical logic of the program was adequate as it showed a clear connection between the outputs and the outcomes and specific objectives, thus, demonstrating the relevance of the operation to address the development challenges of the Energy Sector in Guyana. Furthermore, the analysis showed that the project development objectives and the original vertical logic were aligned with the country development needs and realities, as well as with the IDB's Country Strategy for Guyana at the time of approval, execution, and closure. Therefore, the PCR team considers a score of excellent for Relevance.

Figure 1. Vertical Logic of the Program

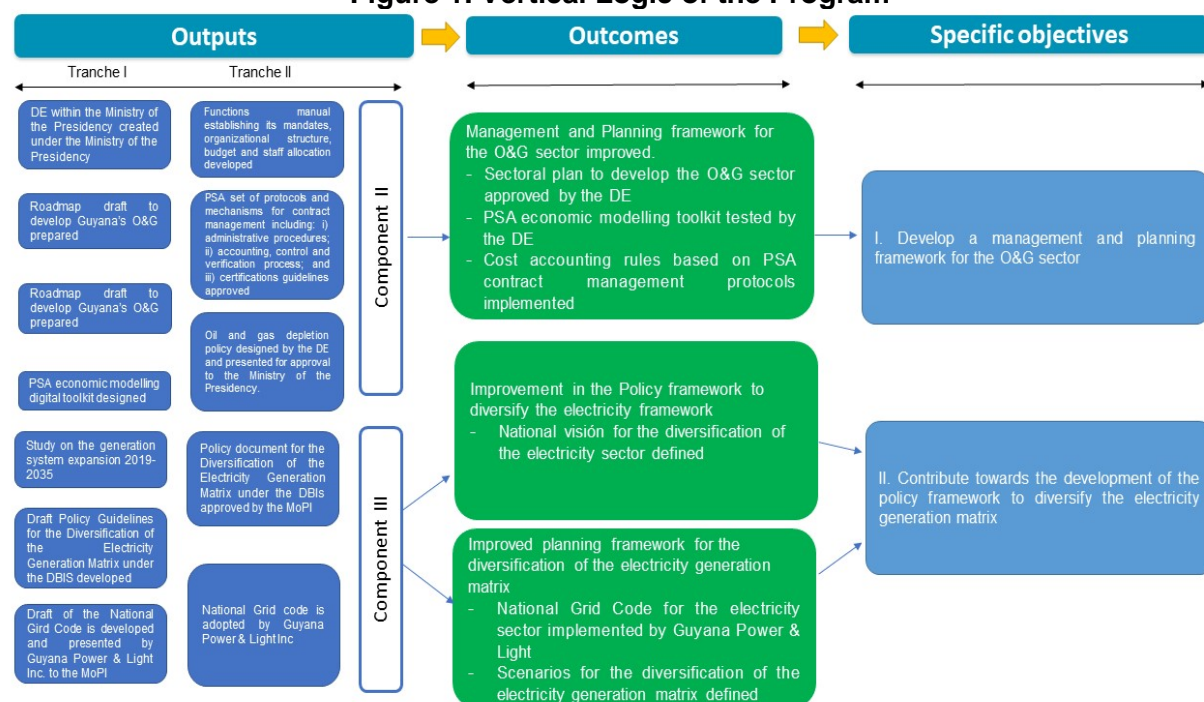


Table 1. Results Matrix - Outcomes

Indicators	At Approval			Startup Plan			At Project Completion (PCR)			Comments
	Unit of measure	Baseline	EOP 2020 (P)	Unit of measure	Baseline	EOP 2020 (P)	Unit of measure	Baseline	EOP 2020 (A)	
Specific Objective I. Develop a management and planning framework for the O&G sector										
Sectoral plan to develop the O&G sector approved by the DE.	Plan	0	1	Plan	0	1	Plan	0	0	On-going to be completed by end of 2020
PSA economic modelling toolkit tested by the DE	Report	0	1	Report	0	1	Report	0	1	Sent to the Bank (August 12, 2020) EZShare-949966928-1
Cost accounting rules based on PSA contract management protocols implemented.	Report	0	1	Report	0	1	Report	0	1	
Specific Objective 2. Contribute towards the development of the policy framework to diversify the electricity generation matrix										
National vision for the diversification of the electricity sector defined	Report	0	1	Report	0	1	Report	0	1	Sent to the Bank (10 th June 2020) EZShare - 1393711520-10
National Grid Code for the electricity sector implemented by Guyana Power & Light	Report	0	1	Report	0	1	Report	0	1	Sent to the Bank (11 th June 2020) EZShare – 1393711520-9
Scenarios for the diversification of the electricity generation matrix defined.	Scenario Report	0	3	Scenario Report	0	3	Scenario Report	0	3	Sent to the Bank (25 th June 2020) EZShare - 1393711520-8

ii.2 Effectiveness

a. Statement of project development objectives.

The general objective of the Program is to support the strengthening and sustainability of the Energy Sector in Guyana by contributing to the development of the Oil and Gas (O&G) sector and the development of cleaner energy sources for electricity generation.

The specific objectives are to:

- i. Development of a management and planning framework for the O&G sector.
- ii. Contribute towards the development of the policy framework to diversify the electricity generation matrix.

b. Results achieved

The program was implemented in accordance with the development objectives set forth in the loan proposal and followed the sequence of proposed activities that were identified under each component. The overall program is comprised of six result indicators. The achievement of these indicators is deemed successful and is presented in Table 2 and discussed in the following sections.

It should be noted that compliance with the PCR preparation deadlines did not make it possible to verify the achievement of all the results set for 2020 as one is still under development; therefore, the respective GoG stakeholders were asked to report the most recent progress of the indicators in order to verify progress towards meeting the results or check the anticipated achievement of the commitments agreed in the results matrix.

Table 2. Results Achieved Matrix

Specific Objectives/Indicator	Unit of Measure	Baseline value	Baseline year	Targets and Actual Achievement		% Achieved	Means of Verification
Specific objective 1: Development of a management and planning framework for the O&G sector							
Sectoral plan to develop the O&G sector approved by the DE	Plan	0	2017	P	1	50%	Sectoral plan presented by the DE and shared with the IDB. The ongoing development of the sectoral plan will be in line with the proposals found in the approved roadmap to develop O&G management framework. The plan will define key government entities responsible for managing the sector. It is expected to be finalized by end of 2020.
				P(a)	1		
				A	0		
PSA economic modelling toolkit tested by the DE.	Report	0	2017	P	1	100%	DE's annual report shared with the IDB
				P(a)	1		
				A	1		
Cost accounting rules based on PSA contract management	Report	0	2017	P	1	100%	DE's annual report shared with the IDB
				P(a)	1		
				A	1		

protocols implemented.							
Specific objective 2: Contribute towards the development of the policy framework to diversify the electricity generation matrix							
National vision for the diversification of the electricity sector defined.	Report	0	2017	P	1	100%	MoPI's report on the national objectives with the vision and objectives in line with the policy guidelines and policy for the diversification of the electricity generation matrix
				P(a)	1		
				A	1		
National Grid Code for the electricity sector implemented by Guyana Power & Light.	Report	0	2017	P	1	100%	GPL's report on the use of the National Grid Code covering the DBIS system
				P(a)	1		
				A	1		
Scenarios for the diversification of the electricity generation matrix defined.	Scenario Report	0	2017	P	3	100%	Scenarios report prepared and presented to the IDB by MoPI - The generation system expansion plan will provide different scenarios for the diversification of the electricity generation matrix considering several electricity demand growth-projections
				P(a)	3		
				A	3		

Specific Objectives/Indicator	Unit of Measure	Baseline value	Baseline year	Targets and Actual Achievement		% Achieved	Means of Verification
Component II. Establishment of a governance structure for the oil and gas sector							
DE within the Ministry of the Presidency created under the Ministry of the Presidency	Department	0	2017	P	1	100%	Official communication/letter from the Executing Agency attaching the Official Gazette (Extraordinary) of Guyana #120/2018 dated 10/02/2018 that established the creation of DE
				P(a)	1		
				A	1		
Roadmap draft to develop Guyana's O&G prepared	Draft Roadmap	0	2017	P	1	100%	Official communication/letter from the EA attaching the approval of the draft of the Roadmap by the DE and the copy of the referred roadmap
				P(a)	1		
				A	1		
A model contract for future PSA designed by the DE and presented to the Ministry of the Presidency	Model contract	0	2017	P	1	100%	Official Communication/Letter from the Executing Agency presenting the model contract for future PSA to the Ministry of the Presidency. The model contract must be included as an attachment to the official communication
				P(a)	1		
				A	1		
PSA economic modelling digital toolkit designed	Toolkit	0	2017	P	1	100%	Official communication/letter from the Executing Agency attaching the Stabroek PSA economic modelling digital toolkit with the ability to conduct scenario planning analysis
				P(a)	1		
				A	1		
Functions manual establishing its	Manual	0	2017	P	1	100%	Official communication/Letter from the Executing Agency

mandates, organizational structure, budget, and staff allocation, developed				P(a)	1		attaching the resolution of the Ministry of the Presidency approving the DE's functions manual and the copy of the referred manual
				A	1		
PSA set of protocols and mechanisms for contract management including: (i) administrative procedures; (ii) accounting, control, and verification processes; and (iii) certifications guidelines, approved	Set of Protocols		2017	P	1	100%	Official communication/Letter from the Executing Agency attaching the resolution of approval of the DE and the PSA set of protocols and mechanisms for contract management
				P(a)	1		
				A	1		
Oil and gas depletion policy designed by the DE and presented for approval to the Ministry of the Presidency	Policy Document	0		P	1		Official communication/Letter from the Executing Agency attaching the oil and gas depletion policy presented to the Ministry of the Presidency for approval
				P(a)	1		
				A	1		
Component III. Policies for sustainable electricity generation							
Study on the generation system expansion 2019-2035, prepared	Study	0	2017	P	1	100%	Official communication from the Executing Agency attaching the study: "Update of the study on the system expansion of the Generation System 2019-2035"
				P(a)	1		
				A	1		
Draft Policy Guidelines for the Diversification of the Electricity Generation Matrix under the DBIS developed	Policy Framework	0	2017	P	1	100%	Official communication from the Executing Agency attaching the Draft Policy Guidelines document for the Diversification of the Electricity Generation Matrix under the DBIS
				P(a)	1		
				A	1		
Draft of the National Grid Code is developed and presented by Guyana Power & Light Inc. to the MoPI	Document	0	2017	P	1	100%	Official communication from the Executing Agency confirming the presentation of the draft National Code Grid to the MoPI for approval
				P(a)	1		
				A	1		
Policy document for the Diversification of the Electricity Generation Matrix under the DBIS is approved by the MoPI	Policy document	0	2017	P	1	100%	Official communication/Letter from the Executing Agency attaching the policy document including principles for the diversification of the electricity matrix and the national objectives of the electricity sector
				P(a)	1		
				A	1		
National Grid code is adopted by Guyana Power & Light Inc	Code	0	2017	P	1	100%	Official communication from the Executing Agency submitting the written approval of the MoPI approving the National Grid Code
				P(a)	1		
				A	1		

Where: P = Start-Up Plan; P (a) = Revised Annual Target; A = Actual.

Specific objective 1: Development of a management and planning framework for the O&G sector.

As described in the Relevance Section, this specific objective was associated with three (3) output indicators. The policy measures designed sought to develop a robust management framework for the nascent Oil & Gas sector that has eighteen government ministries and agencies with responsibilities along the value chain. The main expected [outcomes](#) of this component are: (i) Sectoral plan to develop the O&G sector approved by the DE, (ii) PSA economic modelling toolkit tested by the DE, and (iii) Cost accounting rules based on PSA contract management protocols implemented. The achievement of each of these outcomes is as follow:

i. Sectoral plan to develop the O&G sector approved by the DE

The ongoing development of the sectoral plan for O&G is supported by the roadmap that outlines the development of the institutional architecture and the critical sequence of administrative decisions that would lead to the successive creation and deployment of the key government institutions that will manage the country's energy resources.

The outcome has not been achieved as yet, however, the policy recommendations in the roadmap provided governance and institutional development experiences of other resource-rich countries, recognizing that the circumstances of each country are unique, as are industry and market circumstances at any point in time. The country experiences drew from those that developed an effective institutional architecture for the governance of their energy resources such as, Brazil, Colombia, and Norway and most recently, Mexico. These and other countries provide lessons and widely recognized best practices which can be considered as orientating experiences and benchmarks for Guyana.

The sectoral plan is under elaboration and will focus on the objective administration principles, that is, the plan will aim at the best possible resource development strategy for the benefit of the people of Guyana. Informed by the roadmap and other technical outputs of component II and III of the PBL, the sectoral plan for the Oil and Gas sector assumes a gradual approach towards the construction of the selected institutional and industrial model, recognizing the State's capabilities to sustainably administer resources, manage risks and opportunities along the O&G value chain and incorporate the national development strategies. The development and completion of the sectoral plan is expected by December 2020. Component II outputs have thus far contributed towards the design and completion of the Sectoral plan, include:

- *Model contract for future Production Sharing Agreements (PSA).* This policy measure created a draft model contract for adoption that can be used as a template by the Government of Guyana in its negotiations with oil exploration and production companies in the future in the very likely case that the government decides to open unexplored oil blocks for exploration and/or production. The model contract also serves as a benchmark or checklist of ideal contract conditions for the DE as it continues to develop and implement updates to existing petroleum legislations.
- *Development of the DE functions manual.* This policy measure proposed institutional design recommendations following the ratification of the mandate and the scope of the policy coordination function of the DE. An operational mandate was developed that considered the optimal institutional designs – 'Ministry' or 'Corporate Body' or 'Authority,' that best maximizes transparency, policy independence and good governance practices, given the country's institutional, legislative, and sociopolitical context. The subcomponents under this policy included a staffing manual and draft terms of references for key technical

positions, internal control systems and standard operating procedures, and a multi-year budget that considers the medium growth of responsibilities of the DE in the OG sector.

- Oil and Gas depletion policy guidelines - The support provided saw the development of the depletion policy framework for Guyana that includes the depletion and reserve guidelines and proposed government standards to be applied by the Government of Guyana. The depletion policy guidelines will guide the time path of production until final extraction and it inherently informs an optimal extraction rate that maximizes resource use, economic value, and national development policy outcomes. The policy guidelines provide a basis for policymakers to determine the kind of depletion policy Guyana may wish to pursue in terms of rate of extraction of exhaustible resources. The depletion policy defines several policy options for the trilemma faced by Guyana in trying to maximize: (i) resource recovery, (ii) ultimate effective economic value and (iii) domestic capital formation or foreign asset accumulation as desired under national development strategies such as the Green State Development Strategy (GSDS) and the Natural Resource Fund Bill. The policy recommendations and the set of guidelines identifies preferences for resource management that either favors value or reserves.

ii. PSA economic modelling toolkit

This policy measure designed a spreadsheet model of the production sharing agreement (PSA) of Guyana's Stabroek Block that can be used to simulate a range of scenarios based on changes in technical and economic inputs including the oil price. The PSA modeling toolkit estimates the Government's share from production from the Stabroek Block – specifically Liza Phase 1 – based on key inputs from the government PSA and ExxonMobil's project development plan for Liza Phase 1. The toolkit is also used to conduct scenario modeling that considers the effects of price changes, cost overruns and production disruptions. The model toolkit is robust enough to incorporate multiple projects under the Stabroek license area, as well as other projects under development in other oil blocks.

iii. Cost accounting rules based on PSA contract management protocols implemented.

Operationalizing cost accounting rules and other protocols for enabling the proper administration of the PSAs are essential as the activities of the existing contracts gather momentum and the demands for interaction between the contractors and the Government will increase exponentially. A key characteristic of the production-sharing agreements (PSAs) is the complexity of cost-control by the host government as the allocation of costs is subject to a high degree of judgement where disagreement between the parties are frequent. As the type and importance of decisions and authorizations are likely to grow in complexity and impact, implementing clear lines of responsibility and procedures is paramount.

To avoid pervasive conflict and other difficulties, cost accounting rules for the specific purpose of facilitating control should be agreed between the parties. If no reasonable agreement is possible, the adoption by law of cost allocation rules that is consistent with the provisions of the PSAs is always a powerful option. With the completion of the drafted PSA set of protocols for contract administration, the next phase which is the implementation of these rules is expected late 2020.

Given that two of the three outcomes have been achieved, and that the one not achieved is ongoing and is expected to be achieved by the end of the year, the PCR team considers that the specific objective has been partially achieved.

Specific objective 2: Contribute towards the development of the policy framework to diversify the electricity generation matrix.

The policy measures contemplated are aimed at improving the policy framework to diversify the electricity framework and improving the planning framework for the diversification of the electricity generation matrix. In this regard, the main expected outcomes of this component are: (i) a national vision for the diversification of the electricity sector; (ii) a national grid code for the electricity sector implemented by Guyana Power & Light; and (iii) definition of scenarios for the diversification of the electricity generation matrix. The achievement of each of these outcomes is:

i. National vision for the diversification of the electricity sector defined.

These actions supported the design of a national policy to address the strategic aim of electricity generation matrix diversification towards reducing dependence on imported fossil fuels. It gives due consideration to the potential use of indigenous NG resources combined with the development of RE as key elements of the diversification strategy. The two policy measures linked to the first tranche disbursement were: (i) completion of the generation system expansion study 2019-2035 and (ii) the elaboration of the draft Policy Guidelines for the Diversification of the Electricity Generation Matrix under the DBIS. The expansion study was completed in 2018 prior to commencement of the PBL, while the Draft Policy Guidelines was finalized by the MoPI in November 2018.

The draft policy guideline for the diversification of the electricity matrix in the DBIS provided an outline of the existing GoG policies that govern the energy and electricity sectors while also providing insight into the prevailing legislative and institutional framework, the energy supply and demand characteristics of the DBIS, the operational challenges of the DBIS and the clean generation options for system expansion. Premised on the policy objectives contained in the GSDS, the policy guideline document provides insight into the core policy areas identified for continued action and development.

The final Policy document for the Diversification of the Electricity matrix was completed in October 2019. Section 9 of the document outlines the specific actions to foster the diversification of the matrix. These actions are grouped into 9 categories including (i) planning for a sustainable energy generation mix; (ii) natural gas as a transitional fuel in the energy matrix; (iii) regulatory framework for renewable energy development and distributed generation; (iv) studies and assessments; (v) capacity building; (vi) private sector; (vii) improved grid operations; (viii) energy efficiency and DSM and (ix) regional integration. Each category of actions is also clearly linked to the key issues of the DBIS that they are expected to address. The final section of the Policy seeks to allocate responsibility to various stakeholder agencies within the Energy Sector.

The National Vision is confirmed with the [Report](#) submitted to the Bank by MoPI following the commitments made and expressed in the Results Matrix of the operation. This report confirms the different actions taken by the GoG and demonstrate different levels of advancement in various areas concerning RE development, distributed generation, studies, and others. This confirms the achievement of the PBL result.

ii. National Grid Code for the electricity sector implemented by Guyana Power & Light Inc.

In compliance with the Special Conditions Prior to the first tranche disbursement, the Ministry of Public Infrastructure in November 2018 formally through a letter to the MoF confirmed their receipt

of the draft National Grid Code from GPL. This draft document incorporated complementary or new technical, administrative, and/or procedural actions in the areas of planning, interconnection, operations, minimum technical requirements, and metering. The Grid Code applies to all parties interconnected to the GPL system¹⁶ and is comprised of five separate codes including: (i) a Planning Code; (ii) an Interconnection Code; (iii) an Operational Code; (iv) a Minimum Technical Requirement Code and (v) a Metering Code.

The National Grid Code was formally approved by the MOPI in December 2019. The official communication from the Executing Agency submitting the written approval of the MoPI was subsequently shared with the Bank as the official means of verification. The Grid Code will be reviewed periodically by a Grid Code Review Panel to, inter alia, discuss and develop the document and its implementation consider amendments that may be proposed by stakeholders or that may become necessary due to unforeseen circumstances and issue guidance in relation to the performance and interpretation of the Code. The Code is a live and useful policy document for the power utility company.

[The GPL report](#) indicated the full adoption of the Grid Code which will provide the relevant guidelines for the continued diversification of the electricity matrix in the DBIS and allow for an efficient and effective system and market operation therefore contributing to improved planning of such diversification. The Grid Code has been fully utilized by GPL from its inception. All five individual sub-codes are inter-related and together they present a structured approach to grid operations and management that is consistent with a world-class utility. The practical uses of the sub-codes are described in the Report – GPL’s use of the National Grid Code. The Code is therefore an integral part of GPL’s planning and operational activities and will become increasingly important as the utility prepares for the integration of several utility scale RE projects over the medium term. GPL has also indicated its intention to establish and maintain a Grid Code Review Panel, which will be charged with review and updating the Grid Code as the need arises.

iii. Scenarios for the diversification of the electricity generation matrix defined.

The 2018 Expansion Study Update followed on from previous versions completed in 2014 and 2016 and gave due consideration to the evolution of the electricity sector and the most recent policy decisions based on GoG’s GSDS and the availability of recently discovered indigenous O&G resources. The report focused on GPL’s power networks with emphasis on the power expansion of the DBIS while also providing in-depth revision and analysis of RE technologies and NG fired generation options. It includes 3 scenarios: (i) Business as Usual (BAU): this involved the identification of the optimal Business as Usual generation expansion during short, medium and long terms using reciprocating engines, fueled with HFO and LFO; (ii) Selection of the optimal technology for a gas fired generation expansion: this involved the identification of the optimal technology for a new gas fired generation expansion using around 30-50 mmcf/d of indigenous natural gas; and (iii) Selection of optimal long term generation expansion: this optimization considered BAU and renewable energy generation optimal expansion during short-term, optimal gas fired and renewable energy generation expansion during mid-term and options of only renewable energy expansions. The 2018 Update Study also included a preliminary socio-environmental impact and risk analysis of the issues associated with the candidate generation

¹⁶ Draft National Grid Code.

technologies and an analysis of the existing regulation in order to make regulatory policy recommendations that would facilitate RE generation technologies.¹⁷

Since 2015 when the first O&G discovery was announced, there have been several discoveries that indicate the availability of large reserves of natural gas, which could be utilized for power generation. This, coupled with the fast price reduction of renewables, especially solar, has led to the constant review and updating of generation expansion scenarios, with the aim of transitioning from a fossil fuel based matrix towards near 100% RE by 2040 following the country's NDC targets and GSDS Vision 2040 goals.

Economic and technical modeling tools are now used by GPL, introduced through the company's efforts, and with technical support from the IDB financed program GY-L1041. These interventions have facilitated the commencement of more advanced demand forecasting and technical modeling activities within GPL, which would have previously been done with the support of external consultants. Through the PBL, GPL and as indicated in the [MoPI/GPL report](#) is therefore better positioned technically to attend to constantly changing energy scenarios, linked to the diversification of the generation matrix in the DBIS.

All together demonstrate the achievement of the second specific objective providing the necessary first step actions that could contribute towards the development of the policy framework to diversify the electricity generation matrix. This means that the PBL has effectively contributed towards the development of the policy framework to diversify the electricity matrix.

c. Counterfactual Analysis

For Component II, significant progress has been made towards the creation of a cohesive management and planning framework for the Oil and Gas sector through the measures and outcomes set out in the PBL. The PBL was instrumental in rapidly responding to the challenges faced in developing Guyana's nascent indigenous capacities in the Oil and Gas sector utilizing a consultative approach with Government, local and international stakeholders, academia, and industry experts. The varied and specialized nature of the required activities in the Oil and Gas sector suggested that different types of institutions and actors are needed. Given the role of Government to design the public institutions that intervene in the various activities, and the types of private actors needed and allowed to operate, a single government institution or single type of private actor would be unable to conduct all the activities in the Oil and Gas decision and value chains, as the international experiences suggest. Comparatively, the institutional framework of Brazil and Colombia's oil sector underwent a key reform over the last two decades with the creation of the National Petroleum Agency (ANP), and the National Hydrocarbon Agency (ANH), respectively. Following the Norwegian model, both countries created an independent regulatory agency to administer oil-bearing lands and oversee hydrocarbon operations in the country that improved the oil sector's response to market signals¹⁸. The establishment of a designated O&G responsible entity like DE while developing its function manual as well as other operational measures supported by the PBL set the bases for the institutional framework as per the countries' context and reality as well as good international practices.

These interventions were predicated on areas on five broad types of government interventions according to their nature: policy-making and legal framework; public administration of resources,

¹⁷ As is the normal practice in planning the electricity sector, initial studies were done and are now being updated given changes in outlook due to COVID-19 and other events. New Integrated Resource and Resilience Plan (IRRP) to be developed by end of the year.

¹⁸ Balza & Espinasa, 2015; Manzano, Monaldi et al., 2008.

regulation, and operations and commercial. These areas required the deployment of substantial resources and a variety of expertise and capabilities. Given their magnitude and complexity, a good combination of public and private efforts made optimal development possible. Due to the extensive decision chains involved and limited sector organization at the time of oil discovery, the PBL offered a unique opportunity for the Government to consider an informed stepwise approach to sector development that employed lessons learnt from other oil producing economies. The PBL, thus, highlighted the importance of the relationship between the O&G sector planning and oversight and the national development strategies to realize sustainable outcomes.

Under Component III of the Program, a national vision and scenarios for the Diversification of the Electricity Sector have been defined, complemented by the adoption and implementation of a National Grid Code. These program outcomes were derived through the achievement of various outputs including the Expansion Study, the Policy Document for Diversification of the Matrix, and the National Grid Code. The achievement of PBL outputs, outcomes and objectives was premised on the collaborative process involving both GoG and the IDB. In this regard, the inputs provided by GoG stakeholders were instrumental for deriving the Final Policy document, and in the case of the National Grid Code, GPL provided the relevant leadership. Where the PBL was crucially important was for streamlining and advancing all the various prerequisite activities for the development of comprehensive final policy documents. For the development of the Policy for the Diversification of the Matrix, external support was provided leading to the production of a concise document that is consistent with international standards. This document was key for the formulation of the national vision for diversification of the matrix that was developed by MoPI.

Given the dynamic nature of the Energy Sector in recent years, and the competing priorities that must be managed by sector stakeholders on an ongoing basis, it is likely that the results achieved with the PBL would not have been possible without the additional technical support provided by the Bank with the TCs. The PBL provided the necessary impetus for leveraging important existing sector studies and knowledge to create the necessary policy framework that will serve as the foundation for achieving stated sector and national objectives. This was done in a well-coordinated fashion that benefitted from the inputs of all relevant stakeholders. In the final analysis, while the PBL is not solely responsible for the outlined achievements it is evident that given the capacity challenges faced by the local Energy Sector, if it had not materialized, it is unlikely that the policy framework would have been impacted to a similar extent within the same timeframe. With Guyana being a nascent oil producing country it was imperative to develop at this early stage - and in the shortest possible time, a policy and planning framework to diversify the electricity matrix to support the strengthening and sustainability of the energy sector. The alternative approach where there is an overreliance on fossil fuel resources for electricity generation has proven to be unsustainable over the long term due to the finite nature of such resources, price volatility and their environmental impact. This has been the experience of Trinidad and Tobago whose electricity sector is almost 100% fossil fuel based, with subsidized energy prices that now present a major challenge for RE uptake and energy efficiency promotion. In acknowledgment of the gaps within the existing energy policy framework, the Trinidad Government is now in the process of developing a national energy policy green paper that recognizes the importance of adopting diversified low-emission technologies and strategies for the promotion of sustainable development. These policy reforms have been driven by the recognition of the importance of RE development to provide greater diversity in that country's energy mix, which is also critical to long term energy security and sustainability of energy supply.

d. Unanticipated outcomes

No unanticipated outcome was observed.

The PCR team considers a score of Excellent for Effectiveness.

ii.3 Sustainability

a. General Sustainability Aspects

With the O&G discoveries in Guyana, the country has now realized the importance of having both a dedicated hydrocarbons sector and an electricity sector. The development of Guyana's O&G sector presents unique environmental challenges throughout its value chain. However, the improved mapping of responsibilities in the management and planning framework streamlined in the DE Functions Manual, the model PSA, and set of protocols for contract administration¹⁹ has strengthened coordinated regulatory oversight with the Environmental Protection Agency (EPA) and Civil Defense Commission (CDC) on environmental issues associated with the hydrocarbon sector. This greatly raises the likelihood of positive environmental outcomes as result of coherent institutional organization, led by the DE. Due to the importance of the different outputs supported under the PBL for managing of the PSA, it is foreseen that will continue be in utilization by the DE.

The DE now fully operational as the designated O&G national entity coordinated now with EPA towards completing the country's National Oil Spill Response plan intended to be broad-based, focusing on mitigation of both onshore and offshore risks. Additionally, the multi-agency compliance framework and reporting guidelines in the PSA set of protocols and enshrined in the PSAs are important for the active monitoring of offshore drill activities and risk management since drilling activities in deep-water increases threats to the environment. Despite regulatory gaps, both in terms of human and technical capacities at different stages of the petroleum project lifecycle, active reporting of the nature drill activities and depth makes targeted monitoring possible. Besides the mentioned interagency coordination, and led by the IDB Country Office Guyana, a donors coordination group has been established in order to share the support being given by different development partners to the development of the nascent O&G sector and to avoid duplication of efforts. This is a space for partners to share the ongoing and future actions as well as to find complementarity in the support provided to the country.

Regarding the electricity sector as indicated above the major challenge is to transition away from imported fossil fuels towards a diversified generation matrix with close to 100% RE penetration, while ensuring access to reliable supply of electricity. The PBL has therefore contributed to the important first step of establishing an appropriate policy framework for RE technology penetration in the DBIS, while also supporting a robust planning framework that is guided by international standards and an appropriate National Grid code, that is fully enforced by GPL. Additionally, the PBL has contributed to building GPL's "in-house" technical capacity for planning and modeling of future system expansion scenarios.

The continuity of the long-term policy is verified with actions that the Government has already taken in relation to the categories presented in the Policy. The Program's sustainability is verified by the National Vision report presented by the MoPI where it is clearly reported the status of various actions, which were planned in the Policy, much of which IDB is supporting with Technical

¹⁹ All of them supported by TCs in execution: ATN/OC-16533-GY and ATN/OC-16532-GY, which have also included local capacity development in the realization of the outputs.

Co-operations and investment operations. The actions being undertaken directly correspond to the various categories of interventions as outlined in the Policy document for Diversification of the Electricity matrix and are further detailed in the report on the National Vision for the Diversification of the Electricity Sector. Some key actions being undertaken include, the commencement of work with CARICOM regarding the development of the Integrated Resource and Resilience Plan (IRRP). Complementary to this, GPL continues to undertake scenario-based expansion planning that builds upon the 2018 Expansion Study and considers updated sector information. These actions contribute directly to the improved planning for a sustainable energy mix as outlined in the policy document.

In furtherance of the Regulatory framework for renewable energy development and distributed generation in 2019, GPL, GEA and MoPI reviewed the GPL's license to consider and determine amendments towards creating additional opportunities for GPL to engage IPPs and non-IPPs for the purchase of excess generation capacity from RE sources within established interconnection parameters. This Order has been gazetted and represents a start to the incorporation of distributed generation. Stakeholders are now in the process of examining and drafting a Terms of Reference to review and update the legislative framework for the Electricity Sector. Various technical studies are also being pursued in support of identified projects including wind resource assessments under GY-G1004, utility scale solar PV interconnection studies and the exploration of e-mobility options, where GEA has already purchased a demonstrative electric vehicle.

As it relates to the use of Natural Gas as a Transitional Fuel in the Energy matrix, in 2018-2019, the IDB assisted GoG to develop studies for the optimal use of indigenous gas sources for power production. A Gas Working Group has also been convened and led by the Department of Energy, inclusive of GPL and MoPI regarding development of natural gas infrastructure and related industries.

Capacity building for GoG agencies is also an ongoing process supported by various international institutions including IDB, European Union (EU), Latin American Energy Organization (OLADE), German Agency for International Co-operation (GIZ) and the World Bank. In the case of GPL, under the IDB funded Power Utility Upgrade Program (GY-L1041), funding is being provided to develop the utility's operational efficiency through structured training programs related to SCADA, demand forecasting and a business intelligence system. GPL has also undertaken other key training programs in areas of system modeling and simulation utilizing PLEXOS and PSS@SINCAL software. Efforts to improve GPL's grid operations are also ongoing through the adoption of the national grid code and the implementation of distribution network rehabilitation works under the GY-L1041 and related loan from the Islamic Development Bank (ISDB-GUY1008). These works are intended to reduce GPL's overall technical and commercial losses, improve the quality of service and upgrade and secure meter installations.

Actions related to energy efficiency are also being implemented on an ongoing basis and are led by GEA, part of whose mandate is the dissemination and promotion of information relating to energy efficiency, conservation, and renewable energy. This is a budgeted item and remains part of its operational cycle. The Guyana National Bureau of Standards (GNBS) is also working collaboratively with the CARICOM Regional Organization for Standards and Quality (CROSQ) and other CARICOM countries to develop a standard that will address Minimum Energy Performance for Refrigerators, Air Conditioners and Lighting. Policy in relation to regional

integration continues to be guided by the CARICOM's Regional Energy Policy while studies in relations to the Arco Norte Project are ongoing.

Overall, this supports the vision and national objectives being implemented and set into action by the Ministry of Public Infrastructure and the various agencies under its' purview, including GPL that is beyond the PBL's support.

The National Grid Code is fully implemented by GPL, such that international practices contextualized to Guyana for system operation and planning are part of the company's internal procedures, thereby providing better and more reliable electricity to its customers. GPL has the task of building an energy diversification portfolio of projects and action plans based on global and local Energy Sector trends, defining a portfolio of prioritized barriers and opportunities that will be part of the expansion plans, considering development needs, new technological capacities, market competitiveness and social welfare that add value to the sector.

In general, the measures supported by the PBL and implemented for the O&G and Energy sectors will be satisfactorily sustained and contribute to the growth and development of these sectors.

b. Environmental and social safeguards performance

The environmental and social safeguard category for this operation is "B-13. Given that the operation is not generating any direct or significant environmental and social impacts, an environmental and social management report was not a requirement during project preparation, and this section of the report is "Not Applicable"²⁰."

The PCR team considers a classification of satisfactory as the results under both components showed continuous use and its application is seen to go beyond the PBL's duration.

iii. NON-CORE CRITERIA

iii.1 Bank Performance

The design and implementation of the Program was accompanied by monitoring and verification activities developed by the team. During preparation of the PBL and its implementation, it was observed that there was good coordination between the Bank's team and the Government counterparts for the achievement of the planned results. This was evidenced through the use of various TCs to support activities for the achievement of some of the outputs and consequently important technical support given from the Bank teams towards the realization of the outputs. The results matrix was carefully followed, the indicators of products, and expected results that made up the matrix were monitored and verified accordingly.

The monitoring activities were carried out also to facilitate compliance and following the implementation of the two tranches by the Government, the Bank carried out its supervision in compliance with the committed products included in the PBL policy matrices.

²⁰ According to the 2020 Principles and Guidelines for the completion of the PCR(Annex 1 of the OP-1696-5), In the case of policy-based loans, this section is only applicable to those PBLs that have developed an environmental and social management report during project preparation.

Overall, the Bank's performance is considered to be **Excellent**.

iii.2 Borrower Performance

The main agencies responsible for the fulfillment of the policy conditions, Ministry of Finance, Ministry of Public Infrastructure, Guyana Power and Light and the Department of Energy were active and integral in ensuring these conditions were met within the timelines.

Throughout the process of the design and execution of the operation, these Agencies showed high levels of commitment and involvement and their technical specialists and experts provided adequate support to the Bank in the development and review of the numerous documents of the operation.

Overall, the Borrower performance is considered to be Excellent.

iv. FINDINGS AND RECOMMENDATIONS

iv.1 Dimensions 1 to 5

Table 4
Findings and Recommendations

Findings	Recommendations
Dimension 1. Technical-sectorial dimension (Design)	
Finding #1. Project Maturity: The project was based on the ongoing support provided by the bank in policy related actions that were planned or ongoing at the time of approval. In this regard, the policy measures associated with the first tranche, were rapidly fulfilled by the end of the first year of the PBL.	Recommendation #1. Considering the type of PBL used, it is recommended that the fulfillment of first tranche policy measures are advanced prior to approval of the Program to increase the likelihood of achieving expected project outcomes and overall Program success. In this regard, the identification and availability of quality technical studies and other critical reference documents can contribute significantly to the efficient and timely execution of the Program.
Finding #2. Project Complexity: The project had clearly defined development objectives in a complex context where 3 coherent components and attainable outcome indicators targets. The PBL was able to address policy gaps in the Energy Sector with the ongoing technical cooperation while building on policy documents that were either completed or already in the process of being finalized. This supported and where included in the PBL policy matrix facilitating continuation and adoption of the policy measures by the GoG.	Recommendation #2. PBL Programs such as this with multi-tranche disbursement could be designed in a clear and concise manner and with specific targets based on the status of existing and policy measures being advanced in the sector especially when considering tight timelines. Realistic planning is proven very important for the achievement of the results.
Finding #3. Project Duration: The timeline earmarked for Program completion was sufficient to achieve the expected tangible outcomes under Component III, mainly due the state of readiness of the first tranche policy measures at the time of approval.	Recommendation #3. The allotted timeline should give due consideration to the state of readiness of tranche 1 policy measures during project design to ensure that the Program can effectively focus on the implementation of the final outcomes.

<p>Finding #4. Counterpart Readiness: The newly formed DE, at the time of the first tranche, was limited in technical capacity which increased the length of engagements with the Bank for component II. Streamlining project delivery and related issues, such as, comments and feedback required added time to project schedules and facilitation to ensure stakeholder buy-in and that concerns were addressed. The technical limitations of the DE were further compounded by greater capacity of other institutions in the governance framework. The need for inter-agency collaboration and feedback on outputs also increased the time for the approval/acceptance processes.</p>	<p>Recommendation #4. It is important that the time and resources required to review and comment on policy documents are provided to counterpart agencies, such as the DE, to ensure policy outcomes are achieved and also reflect the views of the agencies involved. For technical policy documents that require specialist knowledge on the part of the counterpart, baseline capacity assessments should be considered during the project design phase to determine likelihood of timely project delivery and realization of expected outcomes.</p>
Dimension 1. Technical-sectorial dimension (Monitoring & Evaluation)	
<p>Finding #1. Adequacy of Methodology: The chosen indicators have clearly set out the expected objectives of the projects. The policy matrix and the results matrix facilitated the efficient monitoring and evaluation of the progress and achievement of final outcomes. These instruments were complemented by regular follow-up interactions between IDB and GoG stakeholders. The agreed means of verification of achievements were also appropriately selected.</p>	<p>Recommendation # 1. Regular engagements with government stakeholders are needed to ensure adequate information sharing and opportunities to address any challenges or bottlenecks that could affect the achievement of program targets. Close coordination with the counterpart teams need to be planned and followed accordingly.</p>
<p>Finding #2. Rigorousness of the evaluation plan: The evaluation plan was concise and well suited to the scope of the PBL and the questions posed in this regard allowed stakeholders to assess the outcomes of the project.</p>	<p>Recommendation # 2. It is important to have a comprehensive quality review system involving both IDB and GoG stakeholders to ensure that policy documents address relevant issues in the sector and are in alignment with overarching policy guidelines and sector strategies.</p>
<p>Finding #3. Information sharing or availability: The relevant information and baseline data for development of the project and for the fulfillment of PBL conditions were readily available through collaborative arrangements between IDB and GoG.</p>	<p>Recommendation # 3. Notwithstanding the relatively small size of the local Energy Sector it is important to identify the relevant contact person (s) within stakeholder agencies who are responsible for information gathering and dissemination to facilitate efficient Program execution.</p>
Dimension 2. Organizational and managerial dimension (Project management capacity)	
<p>Finding # 1. Project Management Capacity: The project management team was comprised of professionals of the IDB with related expertise and experience in energy policy development, program design and program management.</p>	<p>Recommendation # 1: It is useful to effectively coordinate and leverage the relevant technical expertise and experience of project team members in order to produce quality outcomes that meet the project's development objectives.</p>
<p>Finding # 2. Matters related to meeting eligibility conditions for disbursement: The policy reforms linked to the first tranche disbursement were achieved in a timely manner mainly due to the state of readiness of the related studies and policy guidelines.</p>	<p>Recommendation # 2: Eligibility conditions should be established based on the state of readiness of reference documents and sector guidelines such that the efforts of the project team and the EA can be primarily focused on achieving the final outputs and outcomes of the program.</p>
<p>Finding # 3. Structure and/or location of Executing Agency: The Ministry of Finance (MoF) has the relevant experience in executing reform processes and provided the necessary support to sector authorities during the implementation of the PBL. Through the Project Cycle Management Division (PCMD) the MoF interacts with various sector agencies to ensure projects are completed successfully within the specified timeline.</p>	<p>Recommendation # 3. It is important that the identified EA is integrally involved in all aspects of project planning, design, and monitoring & evaluation to effectively coordinate government commitments and to ensure timely fulfilment of policy reforms.</p>
Dimension 2. Organizational and managerial dimension (Intra/inter coordination)	
<p>Finding #1 Roles and responsibilities among different actors responsible for implementation. Considering the complexity of the operation and the different government stakeholders involved, a successful coordination was required for the achievement of the results. As the EA, MoF was responsible for</p>	<p>Recommendation # 1. Robust intra/inter agency coordination arrangements are critical when implementing PBLs that include stakeholders from two distinct energy subsectors – in this instance electricity and Oil & Gas. The disaggregation of the project components following these sector dimensions</p>

the coordination of MoPI and DE program activities toward fulfillment of policy commitments and for the consolidation of reforms. Additionally, coordination arrangements were also successfully undertaken between MoPI and GPL as the public utility responsible for the management, operation, and ultimately the diversification of the electricity matrix operation of the DBIS. These implementation arrangements were adhered to and were effective in contributing to the overall satisfactory results of the Program.	facilitated easier monitoring and follow-up and achievement of intermediate and final outcomes.
Dimension 3: Public Processes/ Actors Dimension (Stakeholder Priorities)	
Finding #1. This operation provides broad policy support and has a clear commitment from Government for the sustainability of the policies agreed upon for this Program. The policy commitments as they relate to diversification of the electricity matrix and strengthening of O&G governance framework are expected to be supported by all political actors and are consistent with the development agenda that has been articulated by the Government.	Recommendation # 1. Further support should be provided to GoG to advance these policy reforms that will continue transforming the Energy Sector in accordance with Government's development priorities and the country needs.
Dimension 4: Fiduciary dimensions	
No findings. All fiduciary measures were implemented as allowed under this type of bank-product.	
Dimension 5: Risk management	
As part of the IDB supervision and risk management apparatus, it is advisable to assess program risk on an ongoing basis.	While no negative spill-offs were noted during execution. It is recommended that future operations seek to institutionalize a continuous risk assessment mechanism to ensure deviations are promptly corrected or anticipated at little to no cost or impact on the quality of desired outputs or outcomes.

Annex 1:

Table 1. Results Matrix - Outputs

Indicators	At approval			Startup plan			At project completion (PCR)		
	Unit of measure	Base line	EOP (P)	Unit of measure	Baseline	EOP (P)	Unit of measure	Base line	EOP (A)
DE within the Ministry of the Presidency created under the Ministry of the Presidency	Department	0	1	Department	0	1	Department	0	1
Roadmap draft to develop Guyana's O&G prepared	Draft Roadmap	0	1	Draft Roadmap	0	1	Draft Roadmap	0	1
A model contract for future PSA designed by the DE and presented to the Ministry of the Presidency	Model contract	0	1	Model contract	0	1	Model contract	0	1
PSA economic modelling digital toolkit designed	Toolkit	0	1	Toolkit	0	1	Toolkit	0	1
Functions manual establishing its mandates, organizational structure, budget, and staff allocation, developed	Manual	0	1	Manual	0	1	Manual	0	1
PSA set of protocols and mechanisms for contract management including: (i) administrative procedures; (ii) accounting, control, and verification processes; and (iii) certifications guidelines, approved	Set of Protocols	0	1	Set of Protocols	0	1	Set of Protocols	0	1
Oil and gas depletion policy designed by the DE and presented for approval to the Ministry of the Presidency	Policy Document	0	1	Policy Document	0	1	Policy Document	0	1
Study on the generation system expansion 2019-2035, prepared	Study	0	1	Study	0	1	Study	0	1

Draft Policy Guidelines for the Diversification of the Electricity Generation Matrix under the DBIS developed	Policy Framework	0	1	Policy Framework	0	1	Policy Framework	0	1
Draft of the National Grid Code is developed and presented by Guyana Power & Light Inc. to the MoPI	Document	0	1	Document	0	1	Document	0	1
Policy document for the Diversification of the Electricity Generation Matrix under the DBIS is approved by the MoPI	Policy document	0	1	Policy document	0	1	Policy Document	0	1
National Grid code is adopted by Guyana Power & Light Inc	Code	0	1	Code	0	1	Code	0	1