PUBLIC

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

BARBADOS

DEPLOYMENT OF CLEANER FUELS AND RENEWABLE ENERGIES IN BARBADOS

(BA-L1012)

PROJECT PROFILE

The project team consisting of prepared this document: Christiaan Gischler (INE/ENE) Team Leader; Adriana Valencia (INE/ENE) Co-Team Leader, Martin Duhart (INO/SMC); Shohei Tada (INE/ENE), Joel Hernández (INE/ENE), Camila González (INE/ENE), Carlos Sucre (INE/ENE); Leanne Rapson (CCB/CBA), Denise Salabie (FMP/CBA), María Padilla (FMP/CBA); Camilo Gómez (CCB/CBA);Stephanie Suber (INE/ENE), Betina Hennig (LEG/SGO); Raúl Muñóz (VPS/ESG) and Rochelle Franklin (CCB/CBA), under the supervision of Ariel Yépez (INE/ENE) and Juan Carlos de la Hoz (CCB/CBA).

PROJECT PROFILE

I. BASIC DATA

Project name:	Deployment of Cleaner Fuels and Renewable Energies in Barbados	
Project number:	BA-L1012	
Project team:	Christiaan Gischler (INE/ENE) Team Leader; Adriana Valencia (INE/ENE) Co-Team Leader, Martin Duhart (INO/SMC); Shohei Tada (INE/ENE), Joel Hernández (INE/ENE), Camila González (INE/ENE), Carlos Sucre (INE/ENE); Leanne Rapson (CCB/CBA), Denise Salabie (FMP/CBA), María Padilla (FMP/CBA); Camilo Gómez (CCB/CBA); Stephanie Suber (INE/ENE), Betina Hennig (LEG/SGO); Raúl Muñóz (VPS/ESG) and Rochelle Franklin (CCB/CBA), under the supervision of Ariel Yépez (INE/ENE) and Juan Carlos de la Hoz (CCB/CBA).	
Borrower:	Government of Barbados (GOB)	
Executing agency:	National Petroleum Corporation (NPC)[1]	
Financing plan:	IDB:	US$ 24 million
	Total:	US$ 24 million
	Parallel financing[2] :	US$ 24 million
Safeguards:	Policies triggered:	B.13
	Classification:	B

II. GENERAL JUSTIFICATION AND OBJECTIVES

A. Justification

2.1 Barbados is a net importer of energy. Imported oil products accounted for 93% of total primary energy supply in 2011[3], 3.5% was locally produced natural gas (NG), and the remainder local biomass and waste[4]. Although a small oil and gas producer, Barbados lacks refining capacity and its oil and NG production falls short by 91% and 44% respectively with respect to local demand. Moreover, oil and gas production has been in decline[5] during the past decade.

2.2 Barbados has not yet fully developed its renewable energy (RE) endowment making the country dependent on costly imported liquid fossil fuels for power generation. Oil dependency affects the cost of living of citizens, who pay one of the highest electricity tariffs in the region, and imposes fiscal constraints. According to the Barbados Statistical Services, the country spent US$427 million in fuel retained imports in 2014 accounting for 9% of the gross domestic product (GDP). The cost-benefit analysis of the project will assess the benefits of this operation including on the country's fiscal situation.

[1] Following a directive from the Cabinet of Ministers, NPC and BNOCL are in the process of amalgamating into one entity.

[2] Efforts are underway to leverage parallel financing resources in the amount of US$24 million from IDB's co-financing partners.

[3] 9,500 barrels of oil equivalent per day (kboepd).

[4] IDB Energy Dossier – Barbados, Infrastructure and Environment Department/Energy Division, August 2015.

[5] Barbados will start offshore exploration for oil and gas. If exploration is successful, production from offshore fields would only come online at a much later stage (8-10 years).

2.3 Domestic NG sales were 1.4 million cubic feet per day (mmcfpd) in 2015. However local production fails to meet current residential, commercial and industrial demand estimated at 2-3 mmcfpd. The NG deficit poses a challenge to satisfy current and future NG consumption, a situation which is exacerbated during peak tourism seasons[6].

2.4 The Energy and Telecommunications Division (ETD) within the Office of the Prime Minister and the Minister of Energy monitor the activities of Barbados National Oil Company Limited (BNOCL), responsible for the production of crude oil and NG, and National Petroleum Corporation (NPC), in charge of the distribution of NG to residential, commercial, and industrial customers. Both institutions have been collaborating over the years on strategies to optimize energy use throughout Barbados. They have also been working on the legal and institutional arrangement for their amalgamation into a single legal entity. The amalgamation is expected to result in the reduction of operational costs, increased market penetration and quality of service, products and services diversification, and skills and capacity development. This project is a priority for NPC and BNOCL as well as for the Government of Barbados, which requested IDB assistance through the ETD.

2.5 Power generation in Barbados depends highly on heavy fuel oil (HFO) which accounts for 54% of fossil fuel use in the country. HFO powers almost all of the electric utility's generation capacity. Barbados Light and Power (BL&P)[7], a private entity and the sole utility in Barbados, has an installed capacity of 239.1 MW and over 920 GWh of generation capacity. Although its electricity sector is one of the most efficient in the Caribbean, Barbados's reliance on imported oil products leads to high and volatile electricity cost that affects all sectors in the economy.

2.6 The IDB developed a regional Liquefied Natural Gas (LNG) study to assess LNG options in the Caribbean. It shows promising results for Barbados and indicates that replacing HFO with NG for power generation may generate cost savings between 15-30% even at currently low oil prices. A potential of 120 MW (almost half of total installed capacity) could be converted to use NG, resulting in an increased demand of this fuel of approximately 18 mmcfpd and reduced power generation costs.

2.7 The government's priorities in the energy sector, according to the National Sustainable Energy Policy (NSEP)[8], are to reduce electricity prices, increase energy security, increase the use of cleaner fuels and reduce negative environmental impacts. As a result, and as mentioned in the Barbados Medium-Term Growth and Development Strategy (2013-2020), Barbados is seeking to promote energy efficiency (EE) and RE, and ensure a reliable source of NG. The government has introduced targets for RE to contribute 65% of total peak electrical demand by 2030 and a 22% reduction in electricity consumption by that date compared to a business as usual (BAU) scenario in 2029[9].

2.8 Through the projects BA-L1022 (Policy Based Loans to promote RE and EE), BA-L1020 (Energy Smart Fund for the private sector) and BA-L1025 (Public Sector Smart Energy Project), Barbados has adopted new regulation and legislation to

[6] During tourist season (November 2014 to April 2015), BNOCL could not meet local demand. Shortages affect all users but especially the tourism sector which is a key driver of growth, employment and main foreign exchange earning sector in Barbados.

[7] BL&P is owned by EMERA Caribbean Inc.

[8] The government is in the process of finalizing the Draft NSEP and expects its approval in 2017.

[9] Barbados Intended Nationally Determined Contribution Report communicated to the United Nations Framework Convention on Climate Change (UNFCCC) on October 28, 2015.

promote and deploy RE and EE, developed financial instruments to support Small and Medium Enterprises adoption of RE and EE and encourage the public sector to green its buildings and street lights. The Sustainable Energy Framework for Barbados (SEFB), developed with IDB support, explores ways in which the country can achieve the diversification of the electricity matrix replacing oil products with RE sources and NG, particularly solar power for peak loads and NG as a base load source.

2.9 The government is exploring options to diversify its energy portfolio including importing NG in the form of LNG to meet local demand in the residential, commercial and industrial sectors. BNOCL has already installed an LNG regasification facility at the Woodbourne Terminal (Micro LNG Regasification Facility) with capacity to handle iso-containers[10] to supply a NG demand of around 0.5 mmcfpd. However, there is a need to expand its capacity in order to satisfy total demand of 2-3 mmcfpd and avoid costly NG shortages.

2.10 In addition to meeting current demand the government is planning steps that could eventually enable the use of NG for power generation. BL&P has already shown interest in using NG in some of their facilities. To this end NPC is planning the process of establishing a Public-Private Partnership (PPP) to import LNG for power generation. In order to support this process, the IDB will collaborate with its private sector arm, the Inter-American Investment Corporation (IIC)[11].

2.11 LNG facilities vary from a regasification capacity of less than 15 mmcfpd (micro) to nearly 5.5 bcfpd (very large scale). The transport mechanism depends on the volume of LNG considered. Iso-containers transported in regular vessels are appropriate for volumes lower than 15 mmcfpd, small LNG vessels are recommended for volumes between 15 and 100 mmcfpd, and regular LNG vessels for larger volumes (see Table 1) In order to meet Barbados' demand and proposed storage capacity of 0.067 mmcf, the appropriate solution according to international best practices is a Micro LNG Plant using iso-containers. If in the future Barbados starts importing LNG to supply power generation needs, the use of a Small LNG Vessel and a Very Small (VS) LNG Regasification Facility could be justified.

Table 1: LNG Transportation and Regasification Capacity

	Micro	Very Small (VS)	Small	Medium	Large
Regasification capacity (NG)	< 15 mmcfpd	15 -100 mmcfpd	100-500 mmcfpd	0.5-1.0 bcfpd	>1.0 bcfpd
Storage capacity (LNG)	< 1 mmcf	1 – 2.0 mmcf	2 – 10 mmcf	10 – 50 mmcf	>50 mmcf
Transport mechanism	Iso-container	Iso-Container/ Small LNG Vessel	LNG Vessel	LNG Vessel	LNG Vessel

Source: International Group of Liquefied Natural Gas Importers, The LNG Industry 2014 http://www.giignl.org/

2.12 Main barriers to NG development are: (i) high capital costs for NG infrastructure; (ii) low oil prices; and (iii) the lack of economies of scale due to the relative small size of the NG market in Barbados.

2.13 The project is aligned with IDB's Update to the Institutional Strategy 2016-2019 as it contributes to the cross-cutting issues of: (i) gender equality and diversity, by promoting women's participation in management and technical roles; (ii) climate change and

[10] 40 foot container that can hold up to 10,000 gallons of LNG and can be transported by truck, regular vessel or rail.
[11] This operation will be double-booked between IDB Energy Division and the IIC.

environmental sustainability, by reducing carbon emissions; and (iii) institutional capacity, by strengthening NPC's capacity to engage in a partnership with the private sector. It also contributes to addressing development challenges such as: (i) reducing social exclusion and inequality, by reducing electricity costs and improving energy services reliability; (ii) improving productivity and innovation, by reducing energy costs for commercial and industrial customers and implementing cutting edge renewable energy technologies combine with NG; and (iii) enhancing economic and regional integration, by establishing a NG regional supply chain. The project is in line with the Infrastructure Strategy (GN-2710-5), the Public Utilities Policy (GN-2716-6), and the Barbados Country Strategy 2015-2018 (GN-2812).

B. Objectives and Expected Results

2.14 The objective of this project is to support Barbados' energy security, by reducing its dependency on liquid fossil fuels and promoting the use of cleaner fuels and smart energy solutions.

2.15 **Component 1. Institutional strengthening and capacity building (US$4.5 million)-** will finance consultancy services under **Sub-component 1.1 – NPC and BNOCL amalgamation**: to support the amalgamation of NPC and BNOCL and improve the performance of the new entity, including: (i) improving corporate governance, legal and regulatory functions; (ii) developing quality management systems, certification and training; (iii) improving information technology, operational audits and project management; and under **Sub-component 1.2 – PPP for Very Small (VS) LNG Regasification Facility**: to facilitate the establishment of a PPP to import LNG for power generation including (iv) supporting the procurement and negotiation process to select a private sector partner and enter into a PPP to build and operate the VS LNG Regasification Facility[12]; (v) supporting the procurement and negotiation process to secure at least 18 mmcfpd supply of LNG using a PPP scheme; and (vi) capacity building for structuring and managing the PPP contract[13].

2.16 **Component 2. NG Infrastructure (US$36.5 million) -** will finance activities to upgrade existing NG infrastructure under **Sub-component 2.1 – NG Infrastructure upgrade**: (i) develop a geographic information system (GIS) of NPC's network; (ii) update the Supervisory Control and Data Acquisition (SCADA) of NG processing and distribution; (iii) meter replacement/upgrade plan and automated meter infrastructure; (iv) modernization of on-road NG distribution fleet; and (v) replacement, realignment and installation of NG pipelines for transmission and distribution and upgrade of distribution stations; and to develop new infrastructure under **Sub-component 2.2 – Expansion of Micro LNG Regasification Facility at Woodbourne**, including: (i) LNG unloading facility for iso-container reception (up to 2 mmcfpd); (ii) cryogenic LNG storage tank and related equipment; (iii) emergency equipment; and (iv) gas buffering system.

2.17 **Component 3. Smart Energy Solutions – (US$7 million)** will finance solutions to increase EE and the use of RE in NPC-BNOCL facilities including: (i) installation of PV (300 kW) and smart systems in NPC-BNOCL facilities; (ii) conversion of compressors from NG to solar PV plus plant retrofits; (iii) installation of a 850kW wind turbine and (iv) installation of EE and/or RE equipment in buildings.

[12] The IIC will provide support by overseeing consultancy services under this sub-component.

[13] Efforts will be made to collaborate and identify synergies with the Caribbean Development Bank's Regional PPP Support Mechanism.

2.18 **Expected Results.** The expected results are: (i) optimized operations of NPC/ newly-created-entity; (ii) successful procurement process to enter into partnership with a private entity to build and operate the VS LNG Regasification Facility; (iii) long term LNG supply (at least 18 mmcfpd) secured using a PPP mechanism; (iv) 15-30% reduction in power generation cost, equivalent to savings US$20-30 millions/per year[14]; (v) upgraded NG networks; (vi) expansion of the Micro LNG Regasification Facility; (vii) increased RE capacity for the use of NPC/newly-created-entity; and (viii) carbon emission reductions of 1.45 million tonnes of CO_2 over 20 years.

III. TECHNICAL ISSUES AND SECTOR KNOWLEDGE

3.1 NPC would be the Executing Agency (EA) of the Project. NPC has no prior experience with IDB loan operations and policies. Annex IV describes completed work and proposed sector work needed to prepare the project.

3.2 Retroactive Financing will be considered up to a maximum of 20% of the total loan amount in accordance with IDB policies.

3.3 Risks for this operation are: (i) change in supply and demand of NG; (ii) operational risks associated with NG logistics and supply chain; (iii) global price of NG; (iv) limited experience of the EA using IDB policies; (v) lack of regulatory framework for PPPs and limited experience in structuring PPPs in Barbados in general and NPC in particular; and (vii) delays in the NPC/BNOCL amalgamation[15].

IV. ENVIRONMENTAL SAFEGUARDS AND FIDUCIARY SCREENING

4.1 The potential impacts of the program are anticipated to be low to medium and the team proposes an environmental classification of “B”, under OP-703, defined as operations that are likely to cause mostly local and short-term negative environmental and associated social impacts and for which effective mitigation measures are readily available. The Environmental and Social Strategy (ESS) involves the preparation of an Environmental Impact Assessment and an Environmental and Social Management Plan (ESMP) (see Annex III-ESS for details). During the Due Diligence Phase, parties affected by the project will be consulted according to IDB Policies and in compliance with OP-102 the EIA and its ESMP will be disclosed by the EA and on IDB’s website. See Safeguard Annex.

V. RESOURCES AND TIMETABLE

5.1 It is foreseen that the Proposal for Operation Development Due Date (PODDD) for this operation will be, August 19, 2016. Consideration of this operation for approval by the IDB Board of Executive Directors is expected by October 26, 2016. A comprehensive timeline as well as the resources required are presented in more detail in Annex V.

[14] This operation would increase public debt by around 2% of GDP; however, energy savings estimated at US$20-30 million per year account for approximately 1% of GDP per year.

[15] Should the amalgamation of NPC and BNOCL be delayed, the structuring of the PPP can go ahead with NPC as the participating entity.

CONFIDENTIAL

[1] The information contained in this Annex is confidential and will not be disclosed. This is in accordance with the "Deliberative Information" exception referred to in paragraph 4.1 (g) of the Access to Information Policy (GN-1831-28) at the Inter-American Development Bank.

Safeguard Policy Filter Report

Operation Information

Operation		
BA-L1012 Deployment of the Use of Cleaner Fuels and Renewable Energies in Barbados		
Environmental and Social Impact Category	High Risk Rating	
B	High Risk	
Country	Executing Agency	
BARBADOS	{Not Set}	
Organizational Unit	IDB Sector/Subsector	
Energy	Undefined	
Team Leader	ESG Lead Specialist	
CHRISTIAAN GISCHLER BLANCO	{Not Set}	
Type of Operation	Original IDB Amount	% Disbursed
Loan Operation	$0	0.000 %
Assessment Date	Author	
23 May 2016	raulmu ESG Lead Specialist	
Operation Cycle Stage	Completion Date	
ERM (Estimated)	2 Jun 2016	
QRR (Estimated)	1 Jul 2016	
Board Approval (Estimated)	{Not Set}	
Safeguard Performance Rating		
{Not Set}		
Rationale		
{Not Set}		

Safeguard Policy Items Identified

B.1 Bank Policies (Access to Information Policy– OP-102)

The Bank will make the relevant project documents available to the public.

B.1 Bank Policies (Disaster Risk Management Policy– OP-704)

The operation is in a geographical area exposed to natural hazards (Type 1 Disaster Risk Scenario). Climate change may increase the frequency and/or intensity of some hazards.

B.1 Bank Policies (Disaster Risk Management Policy– OP-704)

The sector of the operation is vulnerable to natural hazards. Climate change may increase the frequency and/or intensity of some hazards.

B.10. Hazardous Materials

The operation has the potential to impact the environment and occupational health and safety due to the production, procurement, use, and/or disposal of hazardous material, including organic and inorganic toxic substances, pesticides and persistent organic pollutants (POPs).

B.11. Pollution Prevention and Abatement

The operation has the potential to pollute the environment (e.g. air, soil, water, greenhouse gases).

B.15. Co-financing Operations

The operation or any of its components is being co-financed.

B.17. Procurement

Suitable safeguard provisions for the procurement of goods and services in Bank financed operation will be incorporated into project-specific loan agreements, operating regulations and bidding documents, as appropriate, to ensure environmentally responsible procurement.

B.2 Country Laws and Regulations

The operation is in compliance with laws and regulations of the country regarding specific women's rights, the environment, gender and indigenous peoples (including national obligations established under ratified multilateral environmental agreements).

B.3 Screening and Classification

The operation (including associated facilities) is screened and classified according to its potential environmental impacts.

B.4 Other Risk Factors

The operation may be of high risk due to controversial environmental and associated social issues or liabilities.

B.4 Other Risk Factors

There are other environmental and social sustainability issues that the project team considers to represent a risk for this operation. (e.g. wood sourced from Amazon rainforest).

B.5 Environmental Assessment Requirements

An environmental assessment is required.

B.6 Consultations

Consultations with affected parties will be performed equitably and inclusively with the views of all stakeholders taken into account, including in particular: (a) equal participation by women and men, (b) socio-culturally appropriate participation of indigenous peoples and (c) mechanisms for equitable participation by vulnerable groups.

B.7 Supervision and Compliance

The Bank will monitor the executing agency/borrower's compliance with all safeguard requirements stipulated in the loan agreement and project operating or credit regulations.

Potential Safeguard Policy Items

B.1 Bank Policies (Resettlement Policy– OP-710)

The operation has the potential to disrupt the livelihoods of people living in the project area of influence (not limited to involuntary displacement, see also Resettlement Policy)

B.4 Other Risk Factors

The borrower/executing agency exhibits weak institutional capacity for managing environmental and social issues.

B.9 Natural Habitats and Cultural Sites

The operation will result in the degradation or conversion of Natural Habitat or Critical Natural Habitat in the project area of influence.

Recommended Actions

Operation has triggered 1 or more Policy Directives; please refer to appropriate Directive(s). Complete Project Classification Tool. Submit Safeguard Policy Filter Report, PP (or equivalent) and Safeguard Screening Form to ESR.

Additional Comments

[No additional comments]

Safeguard Screening Form

Operation Information

Operation		
BA-L1012 Deployment of the Use of Cleaner Fuels and Renewable Energies in Barbados		
Environmental and Social Impact Category	High Risk Rating	
B	High Risk	
Country	Executing Agency	
BARBADOS	{Not Set}	
Organizational Unit	IDB Sector/Subsector	
Energy	Undefined	
Team Leader	ESG Lead Specialist	
CHRISTIAAN GISCHLER BLANCO	{Not Set}	
Type of Operation	Original IDB Amount	% Disbursed
Loan Operation	$0	0.000 %
Assessment Date	Author	
23 May 2016	raulmu ESG Lead Specialist	
Operation Cycle Stage	Completion Date	
ERM (Estimated)	2 Jun 2016	
QRR (Estimated)	1 Jul 2016	
Board Approval (Estimated)	{Not Set}	
Safeguard Performance Rating		
{Not Set}		
Rationale		
{Not Set}		

Operation Classification Summary

Overriden Rating	Overriden Justification
Comments	

Conditions / Recommendations

Category "B" operations require an environmental analysis (see Environment Policy Guideline: Directive B.5 for Environmental Analysis requirements)

The Project Team must send to ESR the PP (or equivalent) containing the Environmental and Social Strategy (the requirements for an ESS are described in the Environment Policy Guideline: Directive B.3) as well as the Safeguard Policy Filter and Safeguard Screening Form Reports. These operations will normally require an environmental and/or social impact analysis, according to, and focusing on, the specific issues identified in the screening process, and an environmental and social management plan (ESMP). However, these operations should also establish safeguard, or monitoring requirements to address environmental and other risks (social, disaster, cultural, health and safety etc.) where necessary.

Summary of Impacts / Risks and Potential Solutions

Generation of solid waste is moderate in volume, does not include hazardous materials and follows standards recognized by multilateral development banks.

Solid Waste Management: The borrower should monitor and report on waste reduction, management and disposal and may also need to develop a Waste Management Plan (which could be included in the ESMP). Effort should be placed on reducing and re-cycling solid wastes. Specifically (if applicable) in the case that national legislations have no provisions for the disposal and destruction of hazardous materials, the applicable procedures established within the Rotterdam Convention, the Stockholm Convention, the Basel Convention, the WHO List on Banned Pesticides, and the Pollution Prevention and Abatement Handbook (PPAH), should be taken into consideration.

Likely to have minor to moderate emission or discharges that would negatively affect ambient environmental conditions.

Management of Ambient Environmental Conditions: The borrower should be required to prepare an action plan (and include it in the ESMP) that indicates how risks and impacts to ambient environmental conditions can be managed and mitigated consistent with relevant national and/or international standards. The borrower should (a) consider a number of factors, including the finite assimilative capacity of the environment, existing and future land use, existing ambient conditions, the project's proximity to ecologically sensitive or protected areas, and the potential for cumulative impacts with uncertain and irreversible consequences; and (b) promote strategies that avoid or, where avoidance is not feasible, minimize or reduce the release of pollutants, including strategies that contribute to the improvement of ambient conditions when the project has the potential to constitute a significant source of emissions in an already degraded area. The plan should be subject to review by qualified independent experts. Depending on the financial product, this information should be referenced in appropriate legal documentation (covenants, conditions of disbursement, etc.).

Project construction activities are likely to lead to localized and temporary impacts (such as dust, noise, traffic etc) that will affect local communities and workers but these are minor to moderate in nature.

Construction: The borrower should demonstrate how the construction impacts will be mitigated. Appropriate management plans and procedures should be incorporated into the ESMP. Review of implementation as well as reporting on the plan should be part of the legal documentation (covenants, conditions of disbursement, etc).

Safety issues associated with structural elements of the project (e.g. dams, public buildings etc), or road transport activities (heavy vehicle movement, transport of hazardous materials, etc.) exist which could result in moderate health and safety risks to local communities.

Address Community Health Risks: The borrower should be required to provide a plan for managing risks which could be part of the ESMP; (including details of grievances and any independent audits undertaken during the year). Compliance with the plan should be monitored and reported. Requirements for independent audits should be considered if there are questions over borrower commitment or potential outstanding community concerns.

The negative impacts from production, procurement and disposal of hazardous materials (excluding POPs unacceptable under the Stockholm Convention or toxic pesticides) are minor and will comply with relevant national legislation, IDB requirements on hazardous material and all applicable International Standards.

Monitor hazardous materials use: The borrower should document risks relating to use of hazardous materials and prepare a hazardous material management plan that indicates how hazardous materials will be managed (and community risks mitigated). This plan could be part of the ESMP.

The project will or may require involuntary resettlement and/or economic displacement of a minor to moderate nature (i.e. it is a direct impact of the project) and does not affect indigenous peoples or other vulnerable land based groups.

Develop Resettlement Plan (RP): The borrower should be required to develop a simple RP that could be part of the ESMP and demonstrates the following attributes: (a) successful engagement with affected parties via a process of Community Participation; (b) mechanisms for delivery of compensation in a timely and efficient fashion; (c) budgeting and internal capacity (within borrower's organization) to monitor and manage resettlement activities as necessary over the course of the project; and (d) if needed, a grievance mechanism for resettled people. Depending on the financial product, the RP should be referenced in legal documentation (covenants, conditions of disbursement, project completion tests etc.), require regular (bi-annual or annual) reporting and independent review of implementation.

Transport of hazardous materials (e.g. fuel) with minor to moderate potential to cause impacts on community health and safety.

Hazardous Materials Management: The borrower should be required develop a hazardous materials management plan; details of grievances and any independent health and safety audits undertaken during the year should also be provided. Compliance with the plan should be monitored and reported. Depending on the financial product, this information should be referenced in appropriate legal documentation (covenants, conditions of disbursement etc). Consider requirements for independent audits if there are concerns about commitment of borrower or potential outstanding community concerns.

Disaster Risk Summary

Disaster Risk Level

Low

Disaster / Recommendations

No specific disaster risk management measures are required.

Disaster Summary

Details

The project is classified as low disaster risk because the occurrence of the hazard event does not impact in the achievement of project outcomes.

Actions

Operation has triggered 1 or more Policy Directives; please refer to appropriate Directive(s). Complete Project Classification Tool. Submit Safeguard Policy Filter Report, PP (or equivalent) and Safeguard Screening Form to ESR.

BARBADOS
LNG STORAGE FACILITY
(BA-L1012)

ENVIRONMENTAL AND SOCIAL STRATEGY

I. SUMMARY

Country	Barbados	
Project team:	Christiaan Gischler (INE/ENE) Team Leader; Adriana Valencia (INE/ENE) Co-Team Leader, Martin Duhart (INO/SMC); Shohei Tada (INE/ENE); Joel Hernández (INE/ENE), Camila González (INE/ENE), Carlos Sucre (INE/ENE); Leanne Raphson (CCB/CBA), Denise Salabie (FMP/CBA), María Padilla (FMP/CBA); Stephanie Suber (INE/ENE), Betina Hennig (LEG/SGO), Liza Lutz (LEG/SGO); Raúl Muñóz (VPS/ESG) and Rochelle Franklin (CCB/CBA), under the supervision of Ariel Yépez (INE/ENE) and Juan Carlos de la Hoz (CCB/CBA).	
Borrower:	Government of Barbados	
Executing agency:	National Petroleum Corporation (NPC)[1]	
Financing plan:	IDB:	US$ 24 million
	Total:	US$ 24 million
	Parallel financing[2]:	US$ 24 million
Safeguards:	Policies triggered: B.13 Classification: B	

II. PROJECT DESCRIPTION

2.1 Barbados is a net importer of fossil fuels; this drives high and volatile electricity prices creates fiscal constraints for the Government of Barbados (GOB). According to the Barbados Statistical Services, the country spent US$427 million in fuel retained imports at the end of 2014 which it represents the 9% of the gross domestic product (GDP).[3] Therefore, the GOB has set as its priorities in the energy sector to reduce electricity prices, increase energy security, and reduce negative environmental impacts. The two most important public institutions in the oil and gas sector are the Barbados National Oil Company Limited (BNOCL) and the National Petroleum Corporation (NPC).

2.2 The GOB is exploring options to diversify its current energy portfolio and within those options importing natural gas (NG) in the form of Liquefied Natural Gas (LNG) [4] to meet local NG demand in the residential, commercial and industrial sectors and eventually, at a later stage, for power generation and transport purposes. To that end, GOB is taking actions in the short term which include the installation by BNOCL of an LNG unloading

[1] The Cabinet of Barbados has given a directive that the entities NPC and BNOCL should amalgamate into one entity, which this process is in progress.
[2] Efforts are underway to leverage parallel financing resources in the amount of US$24 million from IDB's co-financing partners.
[3] Source: http://data.centralbank.org.bb/ForeignTrade.aspx
[4] The IDB developed a study to analyze the feasibility of establishing a competitive commercial supply chain for Natural Gas in the Caribbean region. The study concludes that for seven of the eight IDB-borrowing countries that import fossil fuels, including Barbados, the introduction of natural gas for electricity generation would reduce the cost of electricity generation under a variety of market scenarios, by between 17% and 40%.

and regasification facility at the Woodbourne Terminal (Micro LNG Regasification Facility) with capacity to handle iso-containers to supply a NG demand of around 0.5 mmcfpd. However, capacity at this facility needs to be expanded if Barbados is to satisfy total local demand of 3 mmcfpd.

2.3 In addition to meeting current demand by expanding capacity of the Micro LNG Regasification Facility, the government is planning steps that could eventually enable the use of NG for power generation. Barbados Light & Power Company Limited (BL&P), the local utility, has already shown interest in using NG in some of their facilities. To this end NPC plans to begin the process of establishing a Public-Private Partnership (PPP) to import NG at a medium scale (approximately 18 mmcfpd of LNG), and to build and operate a Very Small (VS) LNG Regasification Facility[5].

2.4 The objective of this project is to support Barbados' energy security by enhancing the energy sector as well as promoting to the use of cleaner fuels and smart energy solutions. The project includes the following components: (i) institutional strengthening and capacity building; (ii) natural gas infrastructure upgrade; and (iii) implementation of Smart Energy Solutions which entail the increased use of RE for supplying NPC-BNOCL energy needs.

Component 1. Institutional strengthening and capacity building - will provide necessary technical assistance under:

Sub-component 1.1 – NPC and BNOCL amalgamation: to support the amalgamation of NPC and BNOCL and improve the performance of the new entity, including: (i) improving corporate governance, legal and regulatory functions; (ii) developing quality management systems, certification and training; (iii) improving information technology, operational audits and project management;

Sub-component 1.2 – PPP for Very Small (VS) LNG Regasification Facility: to facilitate the establishment of a PPP to import LNG for power generation including (iv) supporting the procurement and negotiation process to select a private sector partner and enter into a PPP to build and operate the Very Small (VS) LNG Regasification Facility[6]; (v) supporting the procurement and negotiation process to secure at least 18 mmcfpd supply of LNG using a PPP scheme; and (vi) capacity building for structuring and managing the PPP contract.

Component 2. NG Infrastructure - will finance activities to upgrade and develop NG infrastructure under:

Sub-component 2.1 – NG Infrastructure upgrade: (i) develop a geographic information system (GIS) of the current NPC network; (ii) update of the Supervisory Control and Data Acquisition (SCADA) of NG processing and distribution network; (iii) meter replacement/upgrade plan and automated meter infrastructure; (iv) modernization of on-road NG distribution fleet; and (v) replacement, realignment and installation of NG pipelines for transmission and distribution purposes and upgrade of distribution stations;

Sub-component 2.2 – Expansion of Micro LNG Regasification Facility at Woodbourne, including: (i) LNG unloading facility to iso-container reception to

[5] The required regasification facility would fall within the category of a Very Small facility according to the classification used by the International Group of Liquefied Natural Gas Importers.

[6] The Medium LNG Plant would be comprised of receiving facilities, a regasification plant and transmission pipelines.

import up to 2 mmcfpd; (ii) cryogenic LNG storage tank and its complement equipment; (iii) office building; (iv) emergency equipment; and (v) gas buffering system.

Component 3. Smart Energy Solutions – will finance smart energy solutions to increase EE and the use of RE in NPC-BNOCL facilities including: (i) installation of PV (300 kW) and smart systems in NPC-BNOCL facilities; (ii) conversion of compressors from NG fueling to solar PV plus plant retrofits; and (iii) installation of a 850kW wind turbine.

2.5 The activities financed by the project with potential for environmental and social impact are those financed under Sub-components 2.1 (NG Infrastructure upgrade) and 2.2 (Expansion of Micro LNG Regasification Facility at Woodbourne) and Component 3 (Smart Energy Solutions).

2.6 **Expansion of Micro LNG Regasification Facility at Woodbourne** (Sub-component 2.2): includes the construction for the expansion of the existing LNG reception terminal located in Woodbourne, St. Philip, with the corresponding installation of additional LNG storage. The Micro LNG Regasification Facility will handle from 7 to 10 iso-containers for which the entry point will be the Port of Bridgetown. The Environmental and Social Strategy (ESS) that follows describes the potential impacts, their management, and the likely Safeguards triggered for the above sub-components.

2.7 The project will not finance any activities related with the construction of the Very Small (VS) LNG Regasification Facility. However, Sub-component 1.2 includes support to facilitate the establishment of a PPP to eventually build and operate the Very Small (VS) LNG Regasification Facility as well as secure long term supply of LNG to meet local power generation demand for NG. The Very Small (VS) LNG Regasification Facility would include: a) receiving port facilities, b) regasification plant, c) transmission pipelines.

2.8 **Alternatives for Very Small (VS) LNG Regasification Facility**: While the project does not finance the construction of the Very Small (VS) LNG Regasification Facility, the alternatives being considered for its eventual construction are described herein. Option A, includes a facility at the Port of Bridgetown and Option B includes a facility at the Spring Garden site. In both cases, pipelines would have to be built to link the Very Small (VS) LNG Regasification Facility with the location of Barbados Light & Power Company Limited (BL&P) power generation plants: (i) The Spring Garden Power Station adjacent to the coast and adjacent to the Option B site location; (ii) The Garrison Hill Power Station located in Trents, St. Phillip; and (iii) The Seawell Power Station is located near the Grantley Adams International Airport about 12 kilometers south east of the capital Bridgetown.

Option A - Port of Bridgetown: The Port of Bridgetown is the preferred location for the terminal, regasification, and storage facility; the facility could be located on the north (Option A1) or south (Option A2) side of the basin (Figure 1). The NG would be carried through new pipelines from the Port of Bridgetown to BL&P's facilities in (i) Spring Garden and (ii) Trents. There won't be a need for building new port terminal infrastructure as the project would make use of the existing port facilities where space is available for a development such as this one.

Figure 1: Option A - Port of Bridgetown location

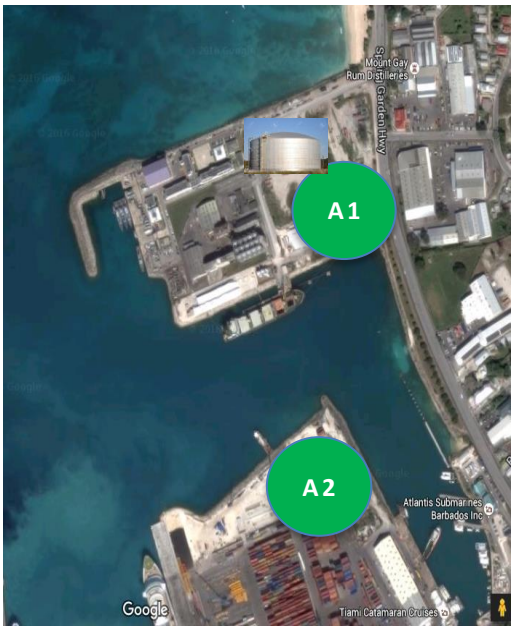
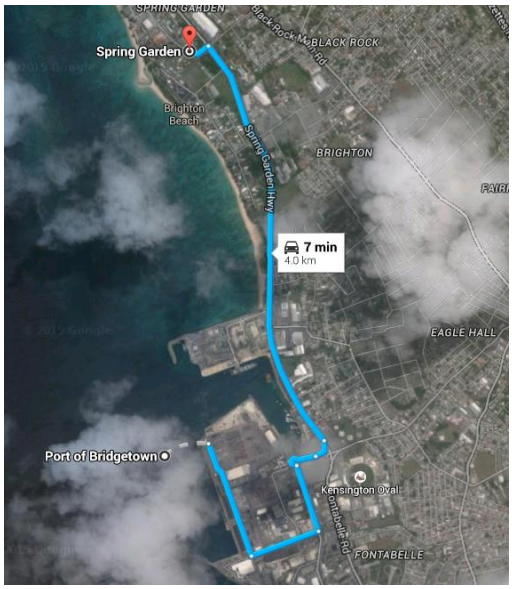


Figure 2: Option B - Spring Garden location



Option B - Spring Garden: In identifying Option B, BNOCL and NPC analyzed six possible sites for their suitability to house the LNG Medium Plant. The Spring Garden site is located four (4) kilometers from the Port of Bridgetown and is adjacent to the coast. The available location has operated previously as a Liquefied Petroleum Gas (LPG) storage terminal and is currently zoned for hydrocarbon storage. On completion, the site could have storage capacity for 450,000 gallons of LNG (or 37.2 million standard cubic feet of NG - mmscf). The terminal output will be in excess of 2 MMBTU per day of

NG into the existing NPC's NG system via a direct pipeline to the Belle Regulator Station at Belle, St. Michael.

The NG would be carried through a new pipeline from Spring Garden to BL&P's facilities in Trents.

It is important to highlight that for option B, and in order to ensure the environmental feasibility for this alternative, the NG will be carried through new pipelines to be built from the Port of Bridgetown to Spring Gardens facilities and thus there will not be need to build new LNG receiving facilities that would require the construction of receiving bouy(s) located offshore but close to the shore nor for a cryogenic pipeline to bring the LNG to shore. By doing so, additional impacts on coastal and marine environment due to the project will be avoided since the LNG will be loaded at current facilities in Bridgetwon Port. This is also very important considering the touristic use of the shore close by the Spring Gardens site.

Site development: Development of either site will include the following activities/infrastructure, among others:

- **LNG Receiving Facility** (Option B only) - The receiving infrastructure will allow for the offloading of LNG from LNG vessels into storage tanks. The facilities will include an LNG transfer pump and LNG transfer lines. Depending on the size of the vessel, a certain minimum depth of water is required for the vessel's safe maneuvering. Thus, dredging might be required depending on the type of vessel and the distance from the shore where it will offload.
- **LNG Storage Tanks** - The LNG storage tank consists of a suitable cryogenic metal inner container (9% nickel steel) designed to contain NG vapors at 4.3 psig of pressure and it will be equipped with level devices, pressure/vacuum relieving devices, pressure make-up system, remote monitoring capability, overfill prevention interlocks, pressure and temperature indication, and LNG density profiling capability to detect stratification. The piping systems will be designed so that LNG can be re-circulated or loaded from both the top and bottom to help prevent stratification. Fire/leak detection and fire extinguishing equipment will be sited throughout the tank area to detect and mitigate leaks and fires. There will be no below-liquid-level tank penetrations.
- **LNG Impoundment Pit** - There will be a concrete open drainage ditch that will drain to a concrete impoundment pit, located to the south of the tanks. The pit will be designed to hold a 10 minute spill from one of the LNG lines at the top of the tank. The vaporizers that are on the east side will drain into the same impoundment pit.
- **LNG Pumps** - Electrically driven LNG send-out pumps will be installed in the LNG storage tank. These pumps operate fully submerged in LNG and are located within pump wells, allowing for easy pump removal, maintenance and installation. The pump wells also serve as the discharge piping from the pumps and are connected to the tank-top piping.
- **LNG Vaporizers** - Ambient air vaporizers will be used to vaporize the LNG. There will be three vaporizers located in the area shown on the plot plan, to the west of the LNG tanks. The vaporizers will be located to the east of the LNG tanks; two will operate during peak loads with one on standby to assure reliability.

- **Fire Protection** – Provisions will be made for firewater in accordance with the NFPA 59-A requirements. A firewater tank will be located at the north east corner of the plot and will be initially charged with potable water. The firewater system will loop around the LNG tank with a buried line a have required monitors and hydrants.

NG Pipelines: NG transmission lines, 8" in diameter, will be installed under the PPP scheme to supply this fuel to power plants located at the Bridgetown Airport (20 MW), Spring Garden (2x30 MW), and Trents (2x20 MW), for a total of up to 110 MW. The project does not include the power plant conversions.

2.9 **LNG Project Phases:** The project would be constructed in two phases. Phase I would include the expansion of the existing LNG of Woodbourne Terminal located in St. Philip which will handle from 7 to 10 iso-containers from the Port of Bridgetown as well as infrastructure repairs of existing NG pipelines. Phase II will be the supporting in the procurement process for a medium-scale supply of LNG under a PPP scheme which would include; a) receiving port facilities, b) regasification plant, c) transmission pipelines and d) long-term LNG supply contract and the construction of one new; here the Option A is the ideal location for the construction of this facility.

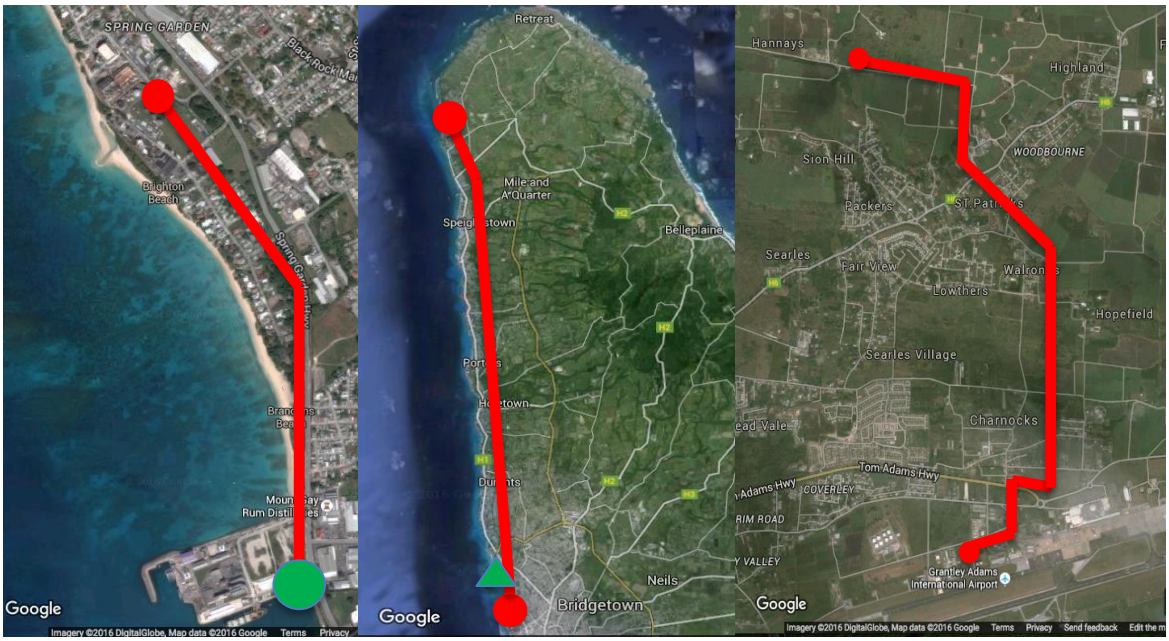


Figure 3: Pipeline routes (from left to right: to Springs Gardens, to Trent, and from Woodbourne to Airport.

III. INSTITUTIONAL AND REGULATORY CONTEXT

3.1 The legal framework for the energy sector in Barbados is well developed. The most important law that governs the NG sector is the Fair Trading Commission Act of 2002 (FTC Act), which established the FTC such as independent regulator in Barbados. The FTC Act makes the FTC responsible for regulating competition and consumer protection in the electricity, NG, telecom, and water sectors of Barbados. The FTC Act establishes that the FTC's mandates is: (i) to safeguard the interests of consumers; (ii) regulate utility services supplied by service providers; (iii) monitor and investigate the conduct of service providers and business enterprises; and (iv) promote and maintain effective competition in the economy of Barbados.[7]

3.2 Laws relevant to building and operating infrastructure in the energy sector, such as the infrastructure to import LNG include environmental and planning laws and labor, health, and safety laws. In this regard, the Town and Country Planning Act of 1985 dictates procedures for the granting of development permissions, the acquisition and disposal of land for planning purposes, and enforces and controls infrastructure development. The Act covers a significant part of the environmental protection provisions that must be taken into account for infrastructure development in Barbados. The Act empowers the Chief Town Planner to request an environmental impact assessment if a proposed infrastructure development project is likely to impact the environment of Barbados. On the side of labor and healthy, Labor Department Act of 1943 and the Safety and Health at Work Act of 2005 are the laws in charge to legislates matters regarding labor employment and consolidates legislation relating to the health, safety and welfare of workers, respectively.

3.3 The Project Executor, NPC, has drafted Terms of Reference (TOR) for the preparation of an Environmental Impact Assessment (EIA) for the LNG Storage Facility. The TOR have been shared with IDB for comment. The preparation of the EIA will be done according to local legislation, IDB's Environmental and Social Policies, and the World Bank Environmental, Health and Safety Guidelines. The study will include a Phase 1 Environmental Assessment of the Port site (Option A – Bridgetown Port) to determine the presence of any environmental liabilities. The TOR is currently with the Barbadian planning authorities for review and approval. The consulting firm, Environmental Resources Management (ERM) will be preparing the EIA in consortium with a local firm in early 2016. The EIA scope to be prepared will cover both the works to be carried out under the IADB loan (NG infrastructure upgrade network, upgrading of existing LNG facility at Woodbourne – Micro LNG Regasification Facility), and the smart energy solutions component) and the works to be developed under the potential PPP for which the loan will support in (i) the procurement and negotiation process to select a private sector partner and enter into a PPP to build and operate the Very Small (VS) LNG Regasification Facility; and (ii) the procurement and negotiation process to secure at least 18 mmcfpd supply of LNG using a PPP scheme. The EIA will be prepared in two consecutive tranches: (i) environmental and social assessment for the works to be covered by the IADB loan (Sub-component 2.1 – NG Infrastructure upgrade and Sub-component 2.2 – Expansion of Micro LNG Regasification Facility at Woodbourne) which will be used for loan preparation purposes; (ii) and the final EIA for the whole system (IADB loan and PPP scope – Very Small (VS) LNG Regasification Facility). The EIA will prepare considering IADB policies for both phases.

[7] Fair Trading Commission Act, Part II, Section 4.

3.4 On the basis of available information at this stage, the Project triggers the following directives of IDB's OP-703 Environmental and Safeguards Policy: B.2, Country Laws and Regulations; B.3, Screening and Classification; B.4, Other Risk Factors; B.5, Environmental Assessment Requirements; B.6., Consultations; B.7, Supervision and Compliance; B.10, Hazardous Materials; B.11, Pollution Prevention; and B.15, Co-Financing Operations. The OP-102, Disclosure of Information Policy also applies for this Project. It does not appear that the OP-765 on indigenous peoples will be triggered for this Project. Based on available information, the Project had been classified by the Bank as a Category B operation. Based on available documentation, it does not appear that the Bank's OP-710 on involuntary resettlement would be triggered, as the infrastructure repairs for NG pipelines will be constructed along existing utility rights-of-way; however, this will be assessed during the EIA and due diligence process. In this regard, during the loan preparation the EIA will also assess the future needs for physical and/or economic displacement of people associated with the new pipelines to be constructed under the PPP and , if needed, the consultancy firm responsible for the EIA will prepare a Resettlement Framework according to IDB Policies.

3.5 It is not anticipated that the Project will trigger OP-704, the Natural and Unexpected Disasters Policy; however, this will be assessed during the due diligence process.

3.6 At this stage it is not expected that the works under the IADB loan will imply any potential significant risks to coastal and marine critical natural habitats (CNH). In any case, during the DD phase, the EIA will assess whether the necessity for new dredging operations under the PPP execution will pose any risk to coastal and marine CNHs . In that case, the need for triggering the B.09 policy will have to be assessed and the EIA will have to include all the provisions needed in compliance with this policy.

IV. ENVIRONMENTAL AND SOCIAL SETTING

4.1 For Option A, the project would be located at the Port of Bridgetown, which is an active industrial facility. The proposed NG transmission line (8" in diameter) will be located within existing utility corridors/rights of way.

4.2 The Bridgetown Port is the major port of entry for approximately 90% of the goods used in the manufacturing and retail sectors in Barbados. A major part of its responsibility has been dedicated to supporting businesses in the import/export trade, a job that it carries out without any government subsidies, unlike the majority of Ports around the Caribbean. All cruise vessels berth at the Bridgetown Port and it is currently the home porting hub for 17 vessels conducting full and partial exchanges of passengers.

4.3 Currently, BNOCL imports LNG iso-containers via commercial vessels in order to deliver LNG to the Woodbourne regasification plan. No specific LNG container vessels are received in the port, however the Port of Bridgetown is the preferred location for the terminal, regasification, and storage facility; the facility could be located on the north (Option A1) or south (Option A2) side of the basin (see Figure 1).

4.4 The selected site for Option B is Spring Garden, located just outside the capital city Bridgetown. Land use between the port and the storage facility is a mixture of industrial, commercial and residential. The coastal area is heavily used by local Barbadians for

recreational activity. The coastal site and destination for the LNG is owned by the Rubis (West Indies) and is an active LPG storage terminal, which currently houses dated and decommissioned tanks that previously stored Bunker C, diesel and gasoline fuels (Figure 4). The site has been in industrial use since 1935.

Figure 4: Spring Garden Location of the proposed LNG receiving, storage and re-gasification facility

4.5 Expansion of the existing LNG facility in Woodbourne: This location is one of the areas for crude oil and NG production in Barbados and it is the main area of operation. Here, there is a temporary re-gasification facility which has the capacity to receive LNG iso-containers, it is located 4 km from the Bridgetown Port and is the first LNG facility of the country as shown in Figure 6. The purpose is the re-gasification of NG which is injected into NPC's existing distribution system. Up today, this facility can manage from 3 to 5 LNG iso-containers per week with a capacity up to 460 thousand cubic feet per day (mcfpd). The objective for this Option C is the upgrade of the existing uploading LNG facility in order to increase reception of LNG iso-containers from 7 to 10 having a total capacity of 1 mmcfpd.

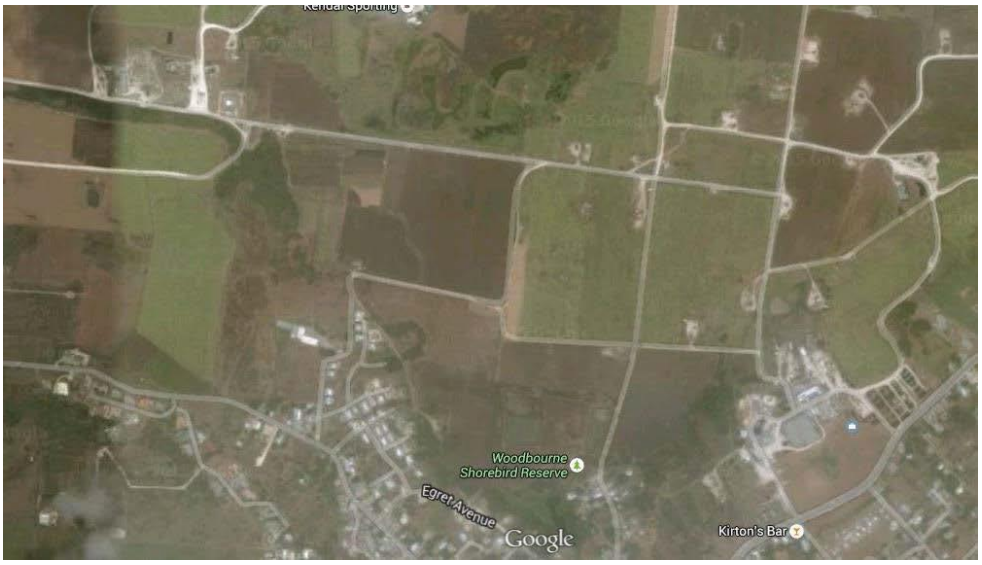


Figure 5: LNG temporary re-gasification facility in Woodbourne, St Philip

4.6 The TOR for the project development also include a detailed public consultation process, which will involve town planning authorities, neighboring communities, and other interested agencies, public bodies, and civil society representatives.

V. KEY POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND RISKS

5.1 Potential environmental impacts and risks associated with the Facility during the construction phase are mainly site specific. Main construction impacts are: (i) soil contamination during dismantling and removal of decommissioned fuel storage tanks; (ii) discovery of existing soil contamination; (iii) fire and explosion hazard from hot works conducted in the vicinity of flammable fuel (LPG) storage; (iv) dust, noise, vehicle emissions and vibration pollution from the heavy equipment operating on site; (v) demolition refuse from the removal of the concrete base and land re-grading; (vi) Increased water usage for the production of cement and mortar during the construction of the concrete pads for the LNG storage bullets; impoundment pit; fire walls and process equipment; (vii) transportation disruption on the public highway during movement of major construction material and or equipment; (viii) occupational health and safety hazards for the workforce. The installation of natural gas pipelines may affect traffic and access to residences and businesses.

5.2 Once in operation, main impacts and risk associated with solar facilities are: (i) vehicle noise and emissions due to the fortnightly arrival of seven (7) mobile ISO LNG containers; (ii) LNG spill hazard on the route from the Bridgetown Port to the LNG Terminal, and spill risk during transfer from the mobile containers to the storage bullets; (iii) release of natural gas to the atmosphere from the pressure reduction mechanisms on the storage bullets, and release of other emissions (NOx and CO2) during regasification; (iv) increased noise pollution from the natural gas compressors supplying the underground network; (v) community health and safety hazards in the neighboring vicinity.

5.3 The due diligence will determine with more certainty the extent of anticipated impacts of the Project. It is expected that the Borrower will apply mitigation measures that correspond to best industry practices for LNG storage.

5.4 Potential impacts on coastal and marine environment due to potential dredging operations associated mainly with new port terminal upgrades activities and operations (i.e the need for maneuver of bigger vessels) will have to be assessed during the DD phase.

VI. ENVIRONMENTAL AND SOCIAL DUE DILIGENCE STRATEGY

6.1 Based on the requirements outlined in IDB's OP-703 Environmental and Safeguards Compliance Policy, the Team proposes that the LNG Storage project be classified as a Category B.

6.2 The Bank will perform an Environmental and Social Due Diligence ("ESDD") in order to confirm that all of the Project's relevant impacts and risks have been, or will be, properly and adequately evaluated, and mitigated.

6.3 The ESDD will specifically address the following aspects:

- Review the Project EIA and determine if additional physical, biological, and socio-economic baseline information is required;
- Investigate the potential impacts of the unloading and transportation process, and review whether additional information and mitigation plans are required: provide more details on its location;
- Assess potential adverse socio-economic impacts of construction and operation activities such as temporary, or permanent, noise, vehicular, or emissions impacts;
- Assess the potential impact of pipeline construction, including the potential for involuntary resettlement, as well as noise, air quality, traffic, and temporary access to businesses (IDB loan and PPP). If needed, a Resettlement Plan will be prepared as part of the EIA.
- Assess the adequacy and timely consultation and information dissemination process with affected parties of the current project;
- Assess the hazardous material management plan used by the Port of Bridgetown;
- Assess the adequacy of the Traffic Plan to ensure road safety is maintained despite the temporary increase in traffic, particularly heavy trucks and equipment through small communities;
- Assess the mitigation and management plans for the protection of coastal water quality;
- Assess potential impacts on coastal and marine environment and the applicability of the B.09 policy for the whole Project scope (IDB loan and PPP).;
- Assess the adequacy of the hazardous materials management plan with specific attention to spill management, handling, transportation, and disposal and tracking of hazardous wastes;
- Assess the adequacy of the health and safety procedures of the NPC;

- Review the Environmental and Social Management Plan (ESMP) to ensure the avoidance, minimization, and mitigation of any potential impacts;
- Determine if the Project has been developed and implemented in compliance with the environmental laws and regulations of Barbados;
- Assess the Project's compliance with IDB's Environmental and Safeguards Compliance Policy (OP-703) and the WB Environmental, Health and Safety Guidelines, and if needed develop an Action Plan in order to resolve any observed non-compliance.

6.4 An Environmental and Social Management Report (ESMR) will be prepared by the Project Team as part of the ESDD to analyze the management of the environmental and social aspects of the project.

INDEX FOR PROPOSED SECTOR WORK

Area	Study/Technical Support	Description of works	Dates	References and electronic links
Knowledge	Natural Gas in the Caribbean - Feasibility Studies; Revised Final Report; Vol I and Vol II, 30 June 2015, Castalia Strategic Advisors, Inc.	This study determine the feasibility of establishing a competitive commercial supply chain for natural gas in the Caribbean region. The first version of this study was completed and published in October 2014. The updated version, completed in June 2015, updates the studies costs estimates and overall conclusions based on recent changes in oil and natural gas prices and updated price projections. The study examines the feasibility of using natural gas to reduce energy prices and emissions in a variety of market scenarios.	2015	file:///C:/Users/ssuber/Downloads/Natural_Gas_in_the_Caribbean%E2%80%94Feasibility_Studies_Final_Report_(Volume_I).pdf
Knowledge	Study on ActionPlan to Import Natural Gas to Barbados; FINAL REPORT, 27 November 2014, Castalia Strategic Advisors, Inc.	This study lays out the process of the Government of Barbados should follow to pursue its objective of importing natural gas at a competitive price and sets the process that GOB should follow to prepare and competitively tender the project for importing NG.	2014	Not published.
Knowledge	Energy Sector in Barbados, Technical Note, IDB, July 22, 2014.	This study proposed the areas where the Bank could support the Boverbnment of Barbados in the implementation of different actions in the neergy sector. Implications as lehal and regulatory framework in electricity sector, support development of a Public-Private Partnership Framework and help secure a more sustainable supply of fossiel fuels are presented.	2014	http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=40303778
Knowledge	Caribbean Regional Energy Integration Assessment: Scenarios and Opportunities	This study analyzes options for Caribbean countries, especially small ones that have not been able to benefit from cheaper fuel costs and other advantages of larger-scale markets, toaddress their enrgy problems through integration in the energy sector.	2014	Not published.
Missions	Identification.	June 8 - 11, 2015.	2015	N/A
Missions	Analysis.	Estimated dates,February 2016.	2016	N/A
Missions	Negotiation.	Estimated dates, May 2016.	2016	N/A

CONFIDENTIAL

[1] The information contained in this Annex is confidential and will not be disclosed. This is in accordance with the "Deliberative Information" exception referred to in paragraph 4.1 (g) of the Access to Information Policy (GN-1831-28) at the Inter-American Development Bank.