

Technical Cooperation (TC) Abstract

I. Basic Project Data

▪ Country/Region:	Caribbean Region
▪ TC Name:	Natural Gas in the Caribbean – Feasibility Studies
▪ TC Number:	RG-T2243
▪ Team Leader/Members:	Alejandro Melandri (INE/ENE), Team Leader; Soo Hyun Lee (INE/ENE); Laura Rojas (INE/ENE); Malaika Culverwell (INE/ENE); Javier Jiménez (LEG/SGO); under the supervision of Leandro Alves, Chief (INE/ENE).
▪ Indicate if: Operational Support, Client Support, or Research & Dissemination.	Research and Dissemination
▪ If Operational Support TC, give number and name of Operation Supported by the TC:	n/a
▪ Reference to Request: (IDB docs #)	n/a
▪ Date of TC Abstract:	November 21, 2012
▪ Beneficiary (countries or entities which are the recipient of the technical assistance):	The Caribbean countries, specifically Barbados, Bahamas, Guyana, Suriname and Trinidad and Tobago, as well as other identified potential gas markets in the Caribbean region.
▪ Executing Agency:	Inter-American Development Bank (IDB)
▪ IDB Funding Requested:	US\$1,000,000
▪ Local counterpart funding, if any:	n/a
▪ Disbursement period (which includes execution period):	12 months
▪ Required start date:	January, 2013
▪ Types of consultants (firm or individual consultants):	Firm and Individual Consultants
▪ Prepared by Unit:	The Energy Division (INE/ENE)
▪ Unit of Disbursement Responsibility:	INE/ENE
▪ Included in Country Strategy (y/n);	n/a
▪ TC included in CPD (y/n):	
▪ GCI-9 Sector Priority:	Small and Vulnerable Countries; Support regional cooperation and integration

II. Objective and Justification

The objective of the Natural Gas in the Caribbean – Feasibility Studies (Program) is to analyze the overall feasibility of establishing a commercial supply chain for Natural Gas (NG) in the Caribbean region considering in particular the potential role or regional suppliers such as Trinidad and Tobago (T&T) and regional small economies as off-takers. The Program will include technical, economic, financial and commercial aspects, with particular focus on the resulting costs of investments and of the end cost of the delivered gas.

Justification: The Caribbean generation matrix is highly dependent on imported oil-based fuels, with 75% of its electricity generation mix from imported oil-based sources. In 2008, the cost of oil was 8% of the Caribbean Gross Domestic Product (GDP). This oil dependency affects Caribbean economies because of the high level as well as the volatility in oil prices. At the macroeconomic level, economies can be affected with potential inflationary effects and a fiscal deficit. In addition, households are also indirectly affected because they have to allocate a higher share of their income in meeting their electricity demand.

Many of the Caribbean countries are oil-importers, except for T&T, a major exporter of Liquefied Natural Gas (LNG), and in which the electricity generation is principally based on NG. Other countries in or close to the Caribbean region are also potential suppliers of NG. Recently, the correlation between NG prices and oil prices has decreased given new discoveries of NG reserves in North America.¹ This decoupling between NG and oil prices reduces the vulnerability to oil price changes, when using NG as a major source for power generation. Introducing NG into the Caribbean market space would not only reduce the Caribbean Region's unsustainable dependency on imported oil-based fuels for power generation, and enhance regional integration, but also would contribute to reduce CO² emissions, and transform the energy matrix of the Caribbean countries.

The Program is aligned with the IDB's institutional priorities as outlined in the report on the Ninth General Capital Increase in Resources for the IDB (GCI-9) (AB-2764) as it contributes to the objective of fostering sustainable growth through regional integration and mitigating sources of climate change. Furthermore, the Program contributes to the goals of: (i) supporting development in small and vulnerable countries; and (ii) support climate change initiatives, renewable energy and the environment, which includes the need to increase the knowledge base, strengthen frameworks and build capacity. In addition, the Program is in line with the Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy (GN-2609-1).

Description of Activities and Outputs

Component I: Assessment of Potential Natural Gas Market in the Caribbean. Component I will include the following activities: (i) to identify the T&T NG reserves and resources and summarize its historical development for exports to USA and other countries, both proven and potential natural gas reserves, as well as production and export statistics, including the historical development of large scale LNG exports (infrastructure, ports, volumes, prices, and quality); (ii) to identify the USA NG production and proven and potential NG reserves, its production and export statistics, as well as the historical and projected development of production facilities and USA's potential availability to supply NG to the Caribbean region; (iii) to identify infrastructure and technologies based on Compressed NG (CNG) and LNG potentially suitable to implement medium and small scale shipments and trade in the Caribbean region (infrastructure, ports facilities, volumes, prices, and quality); (iv) to identify additional potential markets in the Caribbean region for shipped NG, estimate their size and other relevant parameter required to evaluate the feasibility of their progressive incorporation to the commercial supply chain between T&T and Surinam (SU); and (v) to analyze the principal target markets and evaluate these markets as off-takers under different scenarios of demand for NG including at least: (a) importing NG to satisfy 50% of projected power generation by country; (b) to supply 80% of projected power generation; and (c) same as in (b) plus an additional demand related to potential energy intensive developments. Scenarios (a) and (b) could be temporary until scenario (c) is fully operational. The expected output of Component I will be a report with the assessment of potential of natural gas reserves and target markets in the Caribbean Region.

Component II: Economic Analysis of Liquefied Natural Gas (LNG) and Compressed Natural Gas (CNG) Application. Component II will include, but not be limited, the analyses of the following aspects: (i) the global LNG market, taking into consideration the major producers and consumers, the marketplace production and consumption profile, current and projected prices, and projections for the future cost and production trends in the marketplace; (ii) the market for CNG and LNG in the Caribbean, taking into

¹ World Bank. Mitigating Vulnerability to High and Volatile Oil Prices. 2012.

account the use of LNG for electricity production and transportation; (iii) the electricity market in the Caribbean, including analysis of the marginal cost of production of electricity, a comparison of electricity generating cost using Heavy Fuel Oil (HFO) or diesel versus NG, while examining price sensitivities for the respective fuel sources; (iv) examine the economics of converting existing HFO or diesel plants from to NG, along with providing models for cost allocation between the public and private sector actors. The output of Component II will be a report with the economic analyses of liquefied and CNG applications.

Component III: Technical Analysis of Natural Gas (NG) Applications in the Caribbean.

Component III will include, but not be limited, to an analysis of the following: (i) to identify the preferred technology, by comparing between options (i.e., CNG or LNG for medium and small scale). This activity will include a summary of advantages and disadvantages of each option, with their corresponding prices estimates for NG delivered onshore to a grid or customer. The following activities will be developed for the identified preferred technology: (ii) to analyze of the complete commercial cycle, including on and off shore processes, transportation logistics and alternative distribution modes (as underground pipelines and virtual pipelines, if using LNG trailers), legal and financial aspects, such as applicable legislations, property of traded goods and facilities, taxes, insurance, trade practices, and required contract types; (iii) dimension the most efficient infrastructure solution, including ships, on shore facilities and storage; (iv) cost of the dimensioned infrastructure for trading natural gas from T&T to the Caribbean region, including on and off shore facilities; (v) operational costs along the whole commercial cycle; (vi) and a complete financial analysis, including feasibility assessment and determination of median and marginal cost of NG on shore in principal markets. The expected output of Component III will be a selected preferred technology for the Caribbean and a report with the technical analysis of this technology.

Component IV: Socio-environmental Impact and Risk Analysis. Component IV will conduct socio-environmental impact and risk analysis (including gender-gap analysis) of the issues associated with developing a NG facility in the Caribbean. The expected output of Component IV will be a report with the socio-environmental impact and risk analysis of the implementation of the preferred technology in the Caribbean.

Component V: Develop Technical Terms of Reference for developing the selected solution.

Component V will provide the terms of reference to select a firm to develop the selected solution for the Caribbean. The solution chosen will be the recommended technology option based upon results of the aforementioned studies.

The consultant(s) hired under the Program will propose a methodology to accomplish the objectives of the Program, including any additional topics to be included according to its experience. All Components will include the necessary activities to obtain and process input from relevant regional stakeholders and to disseminate results.

III. Budget

Table 1. Indicative Budget (in US\$)

Activity/Component	Description	IDB/Fund Funding	Counterpart Funding	Total Funding
Component I - Assessment of Potential Natural Gas Market in the Caribbean	Production of Potential Natural Gas Market report.	200,000	0	200,000
Component II: Economic Analysis of Liquefied and Compressed Natural Gas Application	Production of the economic analyses for both technologies.	300,000	0	300,000
Component III: Technical Analysis of Natural Gas Applications in the Caribbean	Identification of a preferred technology for the Caribbean Region and production of technical analysis for its application.	250,000	0	250,000
Component IV: Socio-environmental Impact and Risk Analysis	Identification of major risks and environmental impacts and design of mitigation measures.	100,000	0	100,000
Component V: Develop Technical Terms of Reference for constructing the selected solution	Production of terms of reference	50,000	0	50,000
Support to Program implementation, including Supervision and peer review	Consultant in charge of the supervision and peer review of the reports in Component I to V	100,000		100,000
Total		1,000,000		1,000,000

All of the activities will be performed by an international firm/consortium and/or individual consultants with experience in the Caribbean Energy Sector.

IV. Executing Agency and Execution Structure

Given its regional nature, the Program will be executed by the Energy Division of the IDB. Coordination with governmental entities will be essential in the collection of data and analysis of country-specific strategies.

V. Project Risks and Issues

There are not major risks in the implementation of the Program. Regarding the potential implementation of the identified solution, the major risk is that if in the future oil prices drop significantly, countries may lose momentum and abandon efforts to switch to NG. However, in the Caribbean Region, the oil dependence is considered a major barrier for the economic development; therefore Caribbean countries have strong incentives to hedge against volatile oil prices.

VI. Environmental and Social Classification

There are no envisioned environmental or social risks associated with this operation. We expect a C classification.

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