

**CARIBBEAN DEVELOPMENT BANK**

**TWO HUNDRED AND EIGHTY-SIXTH MEETING OF THE BOARD OF DIRECTORS**

**TO BE HELD IN TRINIDAD AND TOBAGO**

**JUNE 3, 2019**

**PAPER BD 51/19**

**SEVENTH POWER PROJECT (CAYE CAULKER SUBMARINE)**

**BELIZE**

**(President's Recommendation No. 975)**

The attached Appraisal Report appraises a project for the installation of a submarine cable from the island of Ambergris Caye to the island of Caye Caulker located on the North East Coast of Belize City. The project will enable Belize Electricity Limited (BEL) to provide a cleaner, more secure, and reliable electricity service to the island, which is currently supplied from Diesel Generators. The project is accorded high priority by both BEL and the Government of Belize (GOBZ) as Caye Caulker is not currently connected to the national grid, its demand is increasing significantly and there are significant potential social and environmental benefits to be had from replacing its current source of electricity supply.

2. On the basis of the Report, I recommend a loan to BEL, under the guarantee of GOBZ, of an amount not exceeding the equivalent of six million eight hundred and forty thousand United States dollars (USD6.840 mn) from the Ordinary Capital Resources of the Caribbean Development Bank (CDB) comprising:

- (i) an amount not exceeding the equivalent of three million one hundred and seventeen thousand United States dollars (USD3.117 mn) allocated from resources provided by the European Investment Bank (EIB) under the EIB Climate Action Line of Credit II; and
- (ii) an amount not exceeding the equivalent of three million seven hundred and twenty-three thousand United States dollars (USD3.723 mn) allocated from CDB's Equity and Market Resources,

on the terms and conditions set out and referred to in Chapter 7 of the attached Report.

3. Funds are available within CDB's existing resources and/or borrowing programme for the relevant disbursement period.



**CARIBBEAN DEVELOPMENT BANK**

**APPRAISAL REPORT**

**SEVENTH POWER PROJECT (CAYE CAULKER SUBMARINE CABLE)  
BELIZE**

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Considered at the Two Hundred and Eighty-Sixth Meeting of the Board of Directors on June 3, 2019

**(BD 51/19)  
AR 19/2 BE**

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**JUNE 2019**

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## **CURRENCY EQUIVALENT**

Dollars (\$) throughout refer to Belizean Dollars (BZD) unless otherwise stated.

USD1.00 = BZD2.00

BZD1.00 = USD0.50

## **ABBREVIATIONS**

ARP	-	Annual Review Proceedings
BEL	-	Belize Electricity Limited
BMCs	-	Borrowing Member Countries
BFFD	-	Belize Forest and Fisheries Department
BOD	-	Board of Directors
BTIA	-	Belize Tourism Industry Association
BTL	-	Belize Telemedia Limited
BZD	-	Belize Dollar
CBR	-	Correspondent Banking Relationships
CCVA	-	Climate Change Vulnerability Assessment
CCTGA	-	Caye Caulker Tourism Guide Association
CDB	-	Caribbean Development Bank
CFE	-	Comision Federal de Electricidad
CLO	-	Community Liaison Officer
COP	-	Cost of Power
CRVA	-	Climate Risk Vulnerability Assessment
CSA	-	Cross Sectional Area
DA	-	Designated Account
DG	-	Distributed Generation
DOE	-	Department of Environment
DSCR	-	Debt Service Coverage Ratio
E&M	-	Equity and Market
EIB	-	European Investment Bank
EMC	-	Environmental Monitoring Consultant
EMF	-	Electromagnetic Fields
EMP	-	Environmental Monitoring Plan
EPC	-	Engineering, Procurement and Construction
ER	-	Electromagnetic Radiation
ERR	-	Economic Rate of Return
ESIA	-	Environmental and Social Impact Assessment
ESM	-	Environmental and Social Monitoring
ESMP	-	Environmental and Social Management Plan
EU	-	European Union
FRR	-	Financial Rate of Return
FTRP	-	Full Tariff Review Proceeding
FY	-	Fiscal Year
GDP	-	Gross Domestic Product
GOBZ	-	Government of Belize
GRM	-	Grievance Redress Mechanism
GST	-	General Sales Tax

GWH	-	Gigawatt Hours
HDD	-	Horizontal Directional Drilling
IWG	-	Interagency Working Groups
IPP	-	Independent Power Producers
IT	-	Information Technology
km	-	kilometres
m	-	metres
mm	-	millimetres
mn	-	million
MPAs	-	Marine Protected Areas
M&E	-	Monitoring and Evaluation
MW	-	Megawatts
NEAC	-	National Environmental and Appraisal Committee
OCR	-	Ordinary Capital Resources
OHL	-	Overhead Line
OLAF	-	European Anti-Fraud Office
ORM	-	Office of Risk Management
p.a.	-	per annum
PAP	-	Project-affected Persons
PAS	-	Performance Assessment System
PC	-	Project Coordinator
PCC	-	People's Coalition Committee
PUC	-	Public Utilities Commission
RE	-	Renewable Energy
REPEG	-	Request for Proposals - Energy Generation
SAIDI	-	System Average Interruption Duration Index
SAIFI	-	System Average Interruption Frequency Index
SCC	-	Social Cost of Carbon
SEP	-	Stakeholder Engagement Plan
SIB	-	Statistical Institute of Belize
SSB	-	Social Security Board
TOR	-	Terms of Reference
US	-	United States
USD	-	United States Dollar

### **MEASURES AND EQUIVALENTS**

1 hectare (ha)	=	2.47 acres
1 kilometre (km)	=	0.621 mile (mi)
1 square kilometre (km <sup>2</sup> )	=	0.386 square mile (mi <sup>2</sup> )
1 metre (m)	=	3.281 feet (ft)
1 millimetre (mm)	=	0.039 inch (in)
1 square metre (m <sup>2</sup> )	=	10.756 square feet (ft <sup>2</sup> )

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**COUNTRY DATA: BELIZE**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017<sup>P</sup></b>	<b>2018<sup>P</sup></b>
GDP per capita (USD)	3,753	3,782	3,664	3,622	3,616
GDP at constant market prices (USD million)	1,346.8	1,393.0	1,384.8	1,404.7	1,439.3
<b>Sectoral Distribution of Constant GDP (%)</b>					
Agriculture, Forestry and Fishing	16.7	14.4	11.0	11.7	11.8
Mining and Quarrying	0.5	0.4	0.5	0.4	0.3
Manufacturing	8.9	7.4	6.8	6.6	6.4
Electricity and Water	5.8	5.9	6.2	6.2	6.1
Construction and Quarrying	3.0	3.5	3.8	3.6	3.6
Transport and Communication	11.9	12.2	12.2	11.8	11.7
Hotels and Restaurants	4.8	4.5	4.5	4.5	4.6
Wholesale and Retail Trade	18.7	19.7	23.0	23.7	23.3
Finance, Insurance, Real Estate, etc.	18.9	20.7	20.5	19.7	19.9
Government	10.9	11.9	12.2	12.3	12.6
Other Services	6.2	6.2	6.2	6.0	6.0
Less Imputed Service Charge	6.3	6.8	6.8	6.8	6.4
GDP at constant 2000 prices (\$ million)	2,693.6	2,786.0	2,769.6	2,809.5	2,878.7
GDP (annual % change)	3.7	3.4	-0.6	1.4	2.5
<b>MONEY AND PRICES</b>					
Money Supply (M2, annual % change)	7.9	7.5	2.7	(0.4)	1.5
Credit to the Private Sector (annual % change)	4.7	3.1	1.6	0.3	2.6
Inflation (period average) (%)	1.2	(0.9)	0.7	1.1	0.9
<b>PUBLIC FINANCES (% of GDP)</b>					
Overall Surplus (Deficit)	-4.7	-7.8	-3.3	-3.0	-0.9
Gross Public Debt	77.6	80.8	87.3	95.0	93.1
<b>BALANCE OF PAYMENTS (% of GDP)</b>					
Total Exports	63.6	58.8	53.0	55.8	54.8
Total Imports	67.4	67.1	60.7	58.3	57.9
Current Account Balance	(7.6)	(9.8)	(8.4)	(7.0)	(7.5)
Capital and Financial Account	6.0	2.9	4.8	3.7	2.6
Overall Balance	4.8	-2.8	-3.3	-3.5	-4.1
<b>AVERAGE EXCHANGE RATE</b>					
Belize dollars to 1 USD	2.00	2.00	2.00	2.00	2.00
Sources: Statistical Institute of Belize, International Monetary Fund's World Economic Outlook (October 2017) and Central Bank of Belize.					
Notes: Data for 2017 and 2018 are provisional.					



**COUNTRY DATA: BELIZE**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018<sup>p</sup></b>
<b>POPULATION</b>					
Population ('000)	358.9	368.3	378.0	387.9	398.0
Population (annual % change)	2.6	2.6	2.6	2.6	2.6
<b>EDUCATION</b>					
Net School Enrolment Ratio					
Primary	96.3	96.1	96.0	96.1	n.a.
Secondary	69.3	69.5	72.2	70.5	n.a.
Pupil-Teacher Ratio					
Primary	22.4	20.4	20.5	19.6	n.a.
Secondary	17.6	16.3	18.4	16.6	n.a.
<b>LABOUR FORCE</b>					
Unemployment Rate (%)					
Male	6.3	6.5	5.6	4.8	5.6
Female	19.9	10.7	12.4	15.6	14.9
<b>HEALTH</b>					
Life Expectancy at Birth (years)					
Male	67.4	67.6	67.7	67.9	n.a.
Female	73.0	73.2	73.4	73.6	n.a.
Mortality Rate, Infant (per 1,000 live births)	14.0	13.4	12.8	12.2	n.a.
Human Development Index	0.706	0.709	0.709	0.708	n.a.
Sources: Statistical Institute of Belize, International Monetary Fund's World Economic Outlook (October 2017), Central Bank of Belize, UN Development Reports, and World Development Indicators.					
Notes: Data for 2018 are provisional.					

## PROJECT SUMMARY

<b>Financial Terms and Conditions</b>					
<b>Borrower</b>	Belize Electricity Limited (BEL)				
<b>Implementing Agency</b>	Belize Electricity Limited (BEL)				
<b>Disbursement Period</b>	September 30, 2019 to July 31, 2022				
<b>Fund</b>	<b>Fund Source</b>	<b>Amount (000's)</b>	<b>Amortisation Period (years)</b>	<b>Grace Period (years)</b>	<b>Interest Rate (%)</b>
OCR-USD	EIB CALC Resources	3,117	12	2	3.02
OCR-USD	Equity and Market Resources	3,723	12	2	4.80
Loan Total:		6,840			
Counterpart Total:		1,825			
Total Project Cost		8,665			

**Office of Risk Management (ORM) Commentary:**

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.

**Project Summary**

**Project Outcome and Description:**

The expected outcome of the Project is reduced GHG emissions and improved reliability of the supply of electricity to Caye Caulker, with increased capability to meet projected increase in peak demand.

The proposed project consists of the following components:

- (a) Project Preparation assistance
- (b) Land
- (c) Infrastructure Works
- (d) Engineering and construction-related services
- (e) Project Management

Exceptions to CDB Policies — No exceptions to CDB policies are in place for this Project.

### **Gender Marker Summary**

<b>Analysis</b>	<b>Design</b>	<b>Implementation</b>	<b>Monitoring &amp; Evaluation</b>	<b>Score</b>	<b>Code</b>
1.0	0.0	0.0	0.5	1.5	Marginally Mainstreamed (MM)

Marginally Mainstreamed: The Project has limited potential to contribute to gender equality.

## **1. STRATEGIC CONTEXT AND RATIONALE**

### **REQUEST**

1.1 By letter dated September 14, 2018, BEL, a public company limited by shares and majority-owned by GOBZ, requested financing from CDB for capital works aimed at expanding its electricity supply capability, improving system reliability, and reducing electricity supply cost to residents of Caye Caulker, through the installation of a submarine cable from the island of Ambergris Caye to the island of Caye Caulker located northeast of Belize City. The project is the first phase of a broader Project being designed to upgrade the power infrastructure of three main load centers (Placentia, San Pedro, and Caye Caulker) to meet their future electricity demand as well as improve their system reliability. Caye Caulker has been prioritised as it is not currently connected to the main grid, its demand is increasing significantly and there are significant potential social and environmental benefits to be had from replacing its current source of electricity supply. The Project is of high priority for both GOBZ and BEL, and represents the sixth capital power project financed by CDB in Belize. Details of previous CDB interventions in the Power Sector in Belize is provided at Appendix 1.3.1.

### **MACROECONOMIC CONTEXT**

1.2 Annual economic growth averaged just 2% between 2008 and 2018. Traditional sectors like agriculture and fishing (including aquaculture) performed less well than in previous years, either due to extreme weather events or disease. Tourism has become the most important industry, contributing about 21% of GDP and 28% of employment, and it continues to support growth. In the year to September 2018, the Hotels and Restaurant sector grew by 14.0%. Unemployment in 2018 was 9.4%, while the rate of underemployment was 14.1%. Both unemployment and underemployment were much higher for females than for males.

1.3 Tourism activity on Caye Caulker continues to grow. The number of hotel rooms has increased by 40% since 2011, compared to 15% nationally, and hotel occupancy has risen. This power project will support further sustainable development on the island. It is consistent with Belize's Growth and Sustainable Development Strategy, which identifies interventions for achieving critical success factors, while aiming to have public investments financed on the most concessional terms available.

1.4 Public fiscal space has become more limited in the last three years. In March 2017, GOBZ restructured its commercial debt in order to meet its expenditure commitments. A condition of the restructuring was that GOBZ tighten its fiscal stance to meet annual primary surplus targets of 2% of GDP from fiscal year 2018-19. Consequently, fiscal measures in the 2017 and 2018 Budgets led to higher tax revenues and to lower expenditure as a share of GDP. While debt continued to rise in 2017, this was mainly due to funding the one-off final compensation payment following renationalisation of Belize Telemedia Limited (BTL). Debt fell to 93% of GDP in 2018, and GOBZ reports that it met the 2% primary surplus target.

1.5 With GDP expected to grow by 2% per year in the medium term, total debt should fall below 90% of GDP, even with planned new borrowing. However, this could be impacted by any negative growth shocks, such as from extreme weather events. Further fiscal measures may be necessary to lower debt and to free up expenditure for additional capital investment. In addition, reforms such as easing access to finance and modernising procedures for starting a business, would boost economic growth and government revenues. Further details are at Appendix 1.1.1.

## **SOCIAL CONTEXT**

1.6 **Demographics and Poverty:** Caye Caulker is a small island off the coast of Belize with a land area of about 1.8 square kilometres (km<sup>2</sup>). It is known internationally as “La Isla Cariniosa” due to the friendliness of its residents, its infrastructural simplicity and its relaxing atmosphere. It is Belize’s most distinguished tourist destination. The island has a population of 1,763 comprising 888 females and 875 males living in 555 households [Statistical Institute of Belize (SIB, 2010)]. Most residents reside in the south of the island. Mestizos are the main ethnic group on the island which include Maya, Creole, Garifuna and East Indian. The average household size of 3.2 is one of the smallest in Belize and is below the national average of 4.1. Although Caye Caulker is categorised in SIB’s Quintile 3 Wealth Rank, a Community Needs Assessment conducted by Belize Social Investment Fund in 2018, confirmed a high level of inequality and the existence of poverty in households represented in the lower quintiles.

1.7 **Tourism:** The tourism high season in Belize coincides with the dry season – December to April. In recent times, the island has become a popular tourism destination for both short and long-stay visitors reflecting strong pull factors associated with *inter alia*, competitively-priced hotel and tourism accommodation and overall value-for-money experiences. Similarly to San Pedro, tourism is a significant contributor to the economy, predicated on scuba diving, snorkelling and eco-tourism activities. The industry also provides the main livelihood source on the island. Approximately 65 tour guides/operators reside on the Caye. Most of them rely entirely on the tourism industry for their livelihood but a few maintain their traditional fishing activities in order to supplement their income, as necessary.

1.8 Subsidiary services, including food and beverage, transportation, and gift shops are on the increase to complement the growing tourism industry. Statistics show that the number of hotel rooms more than doubled between the decade of 1989 and 1999 and increased from 580 to 851 between 2007 and 2016 (Belize Tourist Board, 2016). The Caye Caulker Village Council highlighted the steadily increasing number of residents, tourists and workers on the island and estimated an average daily population of up to 5,000 during peak season. Tourism-related activities are driving the expansion of residential developments in the Caye to accommodate those employed in the sector. In this regard, settlement patterns on the island continue to be influenced by rapid urbanisation, following the rise of Caye Caulker as the number one overnight tourism destination in Belize. The expansion of tourism investments, including increased hotel room stock has enhanced livelihood opportunities for the local population but concomitantly, placed additional pressure on BEL to provide a reliable supply of electricity to service current and future projected energy demand.

1.9 **Key Stakeholders:** Caye Caulker holds Village status and is managed by a Council. The Council has a female chairperson and comprises seven (four females and three males) representatives. The island has a history of good governance with active participation of several conservation groups and tourism

agencies in the island's development. These include Belize Tourism Industry Association – Caye Caulker Chapter (BTIA), Belize Tourism Board, People's Coalition Committee (PCC), Forest and Marine Reserve of Caye Caulker, Caye Caulker Tour Guide Association (CCTGA), and Belize Forest and Fisheries Department (BFFD), among others. The BFFD's efforts are concentrated on environmental activism. The BTIA and the CCTGA are focused on sustainable and eco-friendly development of the tourism industry while PCC advocates for safer neighbourhoods and champions social development, wide stakeholder participation and inclusive growth. See Appendix 1.2.1. for the Macro Social Context.

## **SECTOR ISSUES**

**1.10 Expansion and reliability of the National Grid:** BEL is the primary distributor of electricity in Belize, serving approximately 94,450 customers with a peak power demand of approximately 107 megawatts (MW) per annum. The majority of power is purchased from Independent Power Producers and the Mexican grid. As of 2017, approximately 96% of the population had access to electricity, with 150 new communities and farms constituting 3,800 new customers being connected during the period 2014-2017, following a combination of donor-funded projects (by the European Union and CDB) and BEL's streamlining of its Customer Access Policy to help subsidise the connection of residential customers. Reliability of the geographically dispersed power grid has been a major area of concern and major achievement for BEL over the last 10 years. Reliability of BEL's power system is tracked by two indices, both show significant and continued improvement. First, the System Average Interruption Duration Index (SAIDI), which represents the average interruption duration on the system per customer served per year, calculated as the sum of customer interruption durations divided by the total number of customers. The second index is the System Average Interruption Frequency Index (SAIFI) that measures the average number of interruptions experienced by a customer (calculated by dividing the total number of customer interruptions by the total number of customers). The major causes of unplanned electricity outages have been equipment failure on the distribution system and at the substations, while vegetation is the main cause of outage on the transmission system. BEL has significantly reduced the level of SAIDI and SAIFI over the past 10 years by aggressively increasing its maintenance programme, including vegetation management, and undertaking major infrastructure and design upgrades to provide redundancy under the Sixth Power Project being financed by CDB. The year-on-year figures for SAIDI and SAIFI reliability indices are at Table 1.1, and shows continuous improvements over the past several years. BEL plans to continue its efforts to bring these indices down, through investments in upgrading its transmission and distribution (T&D) network.

**TABLE 1.1: BEL RELIABILITY INDICES**

Item	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
SAIDI (hours)	45.8	39.1	24.4	22.8	20.7	19.88	16.14	19.33	13.12	12.01
SAIFI (number)	47.9	37.6	22.6	17.6	13.85	15.36	12.04	13.2	11.55	9.93

**1.11** While BEL's national electricity grid connects all major municipalities (load centers), it does not connect to the 1,216 BEL customers on Caye Caulker. Instead, the island is supplied by four diesel generators, of which three are containerised mobile units, providing a total of 4.1MW of installed capacity. This supply is also highly unreliable when compared to the supply provided by the existing submarine cable

to Ambergris Caye. Significantly, the cause of both the high SAIDI and extremely high SAIFI is the generation plant rather than the local distribution network, as shown in the table below.

**TABLE 1.2: CAYE CAULKER RELIABILITY INDICES**

	Caye Caulker Distribution	Caye Caulker Generation	Caye Caulker Total	Maskall – Ambergris Link
SAIDI	4.62	12.96	17.58	14.56
SAIFI	1.23	20.41	21.65	6.35

1.12 **Regulatory pressure to address Cost of Power (COP):** The use of diesel generators means Caye Caulker has a high cost of power and is BEL’s most expensive supply source. This has led to regulatory pressure to reduce this cost from the independent regulator, the Public Utilities Commission (PUC). The PUC undertakes a quadrennial review of the tariff through the Full Tariff Review Proceeding (FTRP) and the subsequent Annual Review Proceedings (ARP) that fall within FTRP period. The current FTRP runs July 2016-June 2020 and the most recent ARP instructs BEL to address the COP on Caye Caulker because PUC estimates this would provide approximately \$3mn/year savings across all BEL ratepayers. BEL has until June 2019 to show it is addressing the issue.

1.13 **Caye Caulker Load Growth and Diesel Generation Challenge:** Compounding the issue for BEL is that Caye Caulker’s electrical load is forecast to grow significantly and therefore requires access to more generation capacity. Energy consumption is forecast to grow at a rate of between 2.7% and 4.1% yearly. This will double both consumption and peak load by 2037 (see Appendix 4.1.2 Load Growth). This means BEL will need to consider additional generation capacity over the next 20 years. However, the existing diesel generation produces a number of negative environmental impacts on the local and global environment. The location of the existing BEL power station on Caye Caulker is in the heart of the South Caulker tourism zone. This means that noise and air pollution from the generators directly affects the area. This also has a global impact as diesel generation has a high rate of 0.8 tonnes of carbon dioxide equivalent emission per kWh produced. This is particularly evident when compared to the 0.28 CO<sub>2</sub>e/kWh rate on the national grid. This low rate is possible because BEL has a large amount of renewable generation on its national grid. As at December 2017, BEL’s energy sources comprised 58% from domestic renewable sources, 37% imported power from Mexico, and 5% from non-renewable sources.

1.14 **Climate Risk:** Belize is exposed to tropical storms and hurricanes. Caye Caulker, as a low-lying island off its western coast, is particularly exposed. In 2016 Hurricane Earl, a category 1 hurricane, caused a distribution outage across the Caye Caulker overhead line (OHL) network for over 30 hours. Feasibility analysis undertaken as part of the Sixth Power Project indicates the historical rate of disruption from hurricanes is once every 4.5 years. Submarine cables are more resilient to storm surge and high-winds than OHL networks. Given the latest Intergovernmental Panel on Climate Change findings regarding the likelihood for the increase in frequency and severity of hurricanes over the next 50 years, it is important that the resiliency of the infrastructure, particularly overland, is taken into account.

## **COUNTRY SECTOR STRATEGY**

1.15 Belize’s National Energy Policy Framework 2012-2033, and the Strategic Plan 2012-2017, both produced by the Ministry of Energy, Science & Technology and Public Utilities, have been the two primary policy documents mapping out GOBZ’s approach to energy security, renewable energy transition and



electricity access. These are set to be replaced by the new Belize Consolidated Project Plan. This new plan aims to create an open marketplace for renewable and sustainable energy and is being developed by GOBZ with assistance from the Clinton Climate Initiative and the Rocky Mountain Institute and Carbon War Room. Under the United Nations Framework Convention on Climate Change, GOBZ aims to increase the share of Renewable Energy (RE) in the electricity mix to 85% by 2027 and reduce its carbon dioxide emissions by 62% over the same period. It proposes to do this through a number RE and energy efficient initiatives, as well as increasing access to modern energy services across Belize. The proposed Project will support GOBZ's efforts to transition to a lower carbon intensity economy, and contribute to climate change mitigation.

## **LINKAGE OF PROJECT TO CDB'S COUNTRY AND SECTOR STRATEGY AND POVERTY GOALS**

1.16 The Project is consistent with CDB's country strategy of supporting inclusive social and economic development by increasing competitiveness and productivity through implementing measures to support energy efficiency.

1.17 The promotion of all forms of sustainable energy in BMCs has been an area of increased focus of CDB since the approval of the Bank's Climate Resilience Strategy in 2012 and CDB's Energy Sector Policy and Strategy in 2015, both of which highlighted initiatives in adaptation and mitigation to combat the impacts of climate change and promote better energy security and the adoption of RE.

1.18 This project is consistent with the following of CDB's strategic objectives:

- Supporting Inclusive and Sustainable Growth and Development

1.19 This project is consistent with the following of CDB's corporate priorities:

- Promote Environmental Sustainability (Climate Change Resilience, Environmental Management and DRM)
- Strengthen/Modernise Social and Economic Infrastructure

1.20 This project is expected to contribute to the following Sustainable Development Goals:

- SDG 7. Affordable and clean energy
- SDG 8. Decent work and economic growth
- SDG 10. Reduced inequalities
- SDG 11. Sustainable cities and communities

1.21 This Project is consistent with the following of CDB's Sector and Thematic Policies:

- Environmental and Social Review Procedures
- Energy Sector Policy and Strategy
- Climate Resilience Strategy

## **RATIONALE**

1.22 Within the BEL power system, Caye Caulker is the only load-centre isolated from the rest of the grid. Currently, that load-centre is supplied using on-site local diesel generation, consisting of four high speed units of which three are mobile. The peak loading at the load-centre is about 1.64 MW and is projected to increase to 4 MW over the next 20 years, fueled by growth in tourism and private developments.

The proposed installation of submarine cable is critical to accommodate this future load growth in demand thereby encouraging further economic investment and growth on Caye Caulker as well as improving service provided to the local community.

1.23 Expert analysis of the current loading at Caye Caulker confirmed that it is optimal and economic to connect the load-centre to the grid. Besides the obvious pollution issues from exhaust from combustion engines, the transportation of diesel fuel from the mainland to Caye Caulker through a busy water way and within proximity to sensitive and protected ecosystems presents a potential pollution hazard. In addition, with the location of the current power station within an area renowned for eco-tourism, the decommissioning and removal of the existing diesel generator will provide added benefits to the local community in the form of reduced emittance of air pollutants as well as a reduction in noise pollution and will therefore improve ambient environmental conditions in Caye Caulker. Further, replacement of diesel generation with electricity from the grid will automatically result in the introduction of approximately 50% renewable supply on the island, resulting in displacement of 730,000 gallons per annum of imported diesel fuel and a reduction of approximately 4,000 tons of carbon dioxide emissions per annum.

1.24 The cost of supplying power to Caye Caulker through diesel generation is significantly higher than the rest of the national grid. The average cost of power on Caye Caulker is USD0.26 per/Kwh compared to USD0.11 per Kwh for power supplied from the national grid. Caye Caulker is effectively subsidised by the rest of Belize, given that the tariffs are the same across all jurisdictions in the country. For this reason, PUC, the national utilities regulator, at the last full tariff review made grid connection of Caye Caulker mandatory under the approved tariff regime. Non-compliance with this PUC requirement could result in imposition of a fine of USD3.0 mn on BEL, which could dampen the ability of the company to undertake critical investments for improving the reliability and efficiency of its network. The grid interconnection to Caye Caulker will use the same supply received by the rest of Belize connected to the BEL transmission grid resulting in significant cost savings for the Company

## **2. PROJECT DESCRIPTION**

### **PROJECT OUTCOME**

2.1 The expected outcome of the Project is reduced GHG emissions and improved reliability of the supply of electricity to Caye Caulker, with increased capability to meet projected increase in peak demand.

### **PROJECT COMPONENTS**

2.2 The Project consists of the following components (further details of which are presented in Appendix 2.1): The Results Monitoring Plan is located at Appendix 2.2.

1. Project Preparation: Submarine cable feasibility study.
2. Land Acquisition: Purchase of land to site the cable landing, reclosers, distribution lines as well as temporary relocation diesel generators during construction of the sub-station at the existing generation plant location.
3. Infrastructure Works: (a) design and build of 10.4 km of a 46 kV submarine connection, inclusive of associated infrastructure required to interconnect Caye Caulker to Ambergris Caye; (b) environmental rehabilitation and preparation of the proposed substation site (the current location of the diesel power station on Caye Caulker); and (c) the decommissioning and removal of the diesel engines on Caye Caulker.
4. Engineering and construction-related services: This will include independent certification of works and supervision of the implementation of environmental impact mitigation and public safety measures in accordance with the Environmental and Social Management Plan (ESMP). This component will also include a Climate Risk Vulnerability Assessment (CRVA) to identify and evaluate the potential effects of climate change on the project area, and recommend resilience measures to address the identified risks and vulnerabilities and minimise adverse impacts.
5. Project Management: Project Management services will be provided by BEL's Project Management Unit (PMU), and will consist of the following staff: Project Coordinator (PC); a Project Engineer (PE); a Environmental Safeguards Supervisor (ESS); and a Community Liaison Officer (CLO).

### **RESULTS FRAMEWORK**

<b>Project Impact</b>
Improved social and economic development of Caye Caulker through the provision of a reliable and efficient electricity supply

<b>Outcome</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Target</b>	<b>Data Sources, Reporting Mechanisms and Report Frequency</b>
1 The expected outcome of the Project is reduced GHG emissions and improved reliability of the supply of electricity to Caye Caulker, with increased capability to meet projected increase in peak demand.	1.1 Reduced System Average Interruption Duration Index (SAIDI) (#)	12.96; 1/1/2019	12; 12/31/2021	BEL Records
	1.2 Sufficient capacity to meet increased projected demand (MW)	1.88; 12/13/2018	2.55; 12/31/2020	BEL Reports
	1.3 Reduced Carbon Emissions (Tonnes)	8000; 1/1/2019	4000; 12/31/2020	BEL Reports
	1.4 Reduced System Average Interruptions Frequency Index (SAIFI) (#)	20.41; 1/1/2019	6.35; 12/31/2021	BEL Records

**Assumptions for achieving outcomes**

No major economic decline experienced.

Planned Tourism Investments on Caye Caulker materialise.

<b>Output</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Target</b>	<b>Data Sources, Reporting Mechanisms and Report Frequency</b>
1 Generation Station Decommissioned	1.1 Station Decommissioned (Yes/No)	no; 12/13/2018	yes; 12/31/2020	BEL Reports
2 Construction of Submarine Cable	2.1 Supply lines installed or upgraded (Km)	0; 12/13/2018	10.4; 6/30/2021	Consultant's Monthly Reports and PCR

**Assumptions for achieving outputs**

1. No major natural disasters occur.

2. Adherence to design specifications.
3. All necessary approvals/permit received
4. Stake holder support maintained

## **LESSONS LEARNT**

<b>Description</b>	<b>Project Response</b>
<p>The Fourth Power Project with BEL included a component to interconnect the mainland grid to Ambergris Caye via a Submarine cable. The lesson learnt from this project was that the design, construction and installation of submarine cables is a specialised activity with a high-level of coordination required between each stage. A design-build approach was used for that component of the Project and proved very effective in reducing supervision costs and implementation risks.</p>	<p>This Project will use the same approach and BEL has in-house capacity to manage these type of contracts.</p>

### **3. FINANCING PLAN**

#### **FINANCING STRUCTURE AND COSTS**

3.1 The Project is estimated to cost USD8.665 mn and will be financed with resources from CDB and BEL. Estimates were developed by independent consultants procured under a CDB-financed feasibility study, based on equipment and material costs for similar projects in other jurisdictions. The cost estimates were reviewed by BEL and were found to be consistent with their experience in the local market. The cost estimates and corresponding contingencies were also reviewed by CDB staff and were found to be acceptable.

3.2 A summary of the Project Cost and Financing Plan is presented at Table 3.1 below and a detailed Project, Cost, Phasing and Financing Plan is provided at Appendix 3.1.

3.3 The Loan will be made to BEL and will be secured by a guarantee from GOBZ in form and substance acceptable to CDB. The Project will be financed by:

- a loan to BEL from CDB's OCR of an amount not exceeding the equivalent of USD6.840 mn (the Loan), representing 79% of the project costs and comprising:
  - an amount not exceeding the equivalent of USD3.117 mn allocated from resources provided by EIB to CDB under the Climate Action Line of Credit II (CALC II) (the EIB-CALC II Tranche); and
  - an amount not exceeding the equivalent of USD3.723 mn allocated from CDB's Equity and Market (E&M) resources (the Equity and Market Tranche);
- counterpart funding of not less than \$3.650 mn (USD1.825 mn), which represents 21% of the project costs and will be applied towards the financing of project preparation, land acquisition, infrastructure works, institutional strengthening, project management and interest during construction.

3.4 The EIB-CALC II and E&M Tranches will both be repayable over a period of 14 years, inclusive of a 2-year grace period. The EIB-CALC II Tranche will attract an interest rate subsidy that is currently estimated at 1.78%, thus yielding an indicative variable interest rate of 3.02% p.a. However, the interest rate of the E&M Tranche is currently 4.8% per annum (p.a.) (variable). A commitment charge of 1% p.a. on the undisbursed balance of the Loan is payable from the 60<sup>th</sup> day after the date of the Loan Agreement.

**TABLE 3.1: SUMMARY OF PROJECT COSTS AND FINANCING**

Components	TOTALS						
	OCR-USD		Total	COUNTERPART		Total	
	EIB CALC Resources	Equity and Market Resources		BEL	Executing Agency Counterpart Forecast		
1. Project Preparation	} 2,500,000	} 2,997,507	} 5,497,507	} 1,277,150	} -	} 6,774,657	
2. Land							-
3. Infrastructure Works							-
4. Engineering and Construction-related Services							-
5. Project Management							-
<b>Base Cost</b>	<b>2,500,000</b>	<b>2,997,507</b>	<b>5,497,507</b>	<b>1,277,150</b>	-	<b>6,774,657</b>	
6. Physical Contingency	500,000	587,001	1,087,001	146,500	-	1,233,501	
7. Price Contingency	85,879	101,941	187,820	28,679	-	216,499	
<b>Total Project Cost</b>	<b>3,085,879</b>	<b>3,686,449</b>	<b>6,772,328</b>	<b>1,452,329</b>	-	<b>8,224,657</b>	
8. Interest During Implementation	-	-	-	372,671	-	372,671	
9. Commitment Fees	31,121	36,551	67,672	-	-	67,672	
<b>Total Financing</b>	<b>3,117,000</b>	<b>3,723,000</b>	<b>6,840,000</b>	<b>1,825,000</b>	-	<b>8,665,000</b>	
<b>Percentage Financing</b>	<b>36%</b>	<b>43%</b>	<b>79%</b>	<b>21%</b>	<b>0%</b>	<b>100%</b>	

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.

## **4. PROJECT VIABILITY**

### **TECHNICAL ANALYSIS**

4.1 The feasibility study determined that the proposed Submarine Cable connecting Caye Caulker to the mainland grid through Ambergris Caye is the most technically feasible, efficient and least cost option for improving the quality and reliability of the electricity supply to the island. The distance between the takeoff and landing points of the cable is only 10 km, and the surrounding waters are relatively shallow which will reduce technical challenges compared to direct interconnection with the mainland of Belize. In addition, the displacement of existing diesel generation will yield a reduction of approximately 50% in the cost of power supplied to Caye Caulker as well as emissions reductions of approximately 46% (see Appendix 4.1.1).

4.2 **Analysis of Proposed Routes:** Expert multi-criteria-analysis determined “Route 5” as the preferred route option for the submarine cable. A detailed evaluation of the shortlisted routes is provided at Appendix 4.1.2 and the route map for "Route "5" is shown at Appendix 4.1.3. The analysis took into account: the load flow, power supply, bathymetry and passage through conservation areas. While all five potential routes have the same take-off point on Ambergris Caye, they differ in either the location of the cable-landing site on Caye Caulker and/or on the extent of work required to upgrade the network on Caye Caulker. The main advantage of the selected route is that it avoids passage through the forest reserve on Caye Caulker and removes the need for land acquisition to site the new substation as the existing location of the generation plant will be utilised. Other land requirements for the Project are minimal, approximately 160 sq. meters at three uninhabited locations on Caye Caulker and Ambergris Caye. The acquisition process is expected to be completed between July and September 2019.

4.3 **Cable Design Specifications:** The submarine cable will have a cross sectional area (CSA) of at least 95 mm<sup>2</sup>, with a large capacity of approximately 15 MVA, operating at 34.5kV; and include a 48 strand optical fibre. These specifications cater not only for load growth on Caye Caulker, detailed at Appendix 4.1.4, but also give BEL the ability to interconnect other islands, as shown in Appendix 4.1.5. Based on this cable size the study recommends a burial depth of at least one meter, which satisfies both IEC60287 and IEC60853 standards. These standards define the electrical ratings of the cable and the recommended burial depth to ensure that heat or electromagnetic waves produced during the operation of the cable do not pass into the environment.

4.4 **Underground Lines for Substation Connection:** The analysis also recommends underground line installation for connecting the cable landing to the substation because it is the more cost-effective option, when comparing whole-life costs over 40 years. This underground line will provide a more climate resilient connection to storm-surge and hurricane winds when compared to an overhead line. It also offers minimal maintenance and material requirements after installation.

4.5 **Engineering, Procurement and Construction (EPC) or Turnkey Approach:** The recommended procurement arrangement for the construction of the cable is to use an EPC/Turnkey contract approach. This is a commonly used approach for the implementation of submarine cables and has been justified in this instance due to the specialist nature of the works and the fact that cable design and the



installation method influence each other heavily. Having a single contractor who will construct the whole project to performance specifications significantly reduces the risk of coordination delays between each of these components. An EPC/Turnkey approach also reduces the administration burden on BEL when compared to undertaking separate contracts for the procurement and management of cable fabrication, cable laying vessel procurement, installation and commissioning.

## **INSTITUTIONAL ASSESSMENT**

4.6 BEL's Board of Directors consists of 12 members: 4, including the Chairman, are appointed by GOBZ and 3 each by the Social Security Board (SSB) and Fortis Cayman Inc. A further two members are selected by the shareholder-appointed board members to provide whatever additional skills sets they deem necessary to effectively deliver on their mandate. The expertise and experience at the board level covers a wide cross section of competences required for effective oversight of the institution, including electrical utility management, finance, law and engineering. The work of the Board is supported by the Audit and Risk Committee, and from time to time temporary Executive and Special Committees, appointed for special purposes as required. BEL has an established corporate governance framework, as well as core systems of processes and procedures in accordance with which all employee decisions and actions must be carried out. These include policies on conflicts of interest, a code of ethics and business conduct that stipulates the expected conduct and behavior of employees and contractors, a whistle blower policy and a grievance redress mechanism CDB is satisfied that the current governance arrangements at the company are adequate to safeguard the interest of all stakeholders.

4.7 The company has a staff complement of 324 employees consisting of 106 management staff, 200 non-management staff, 12 contract staff and 6 apprentices. These are deployed across 5 functional areas. Details are provided in the organisational chart at Appendix 4.2.1 The customer to employee ratio, which measures labour efficiency of the utility, has remained fairly stable over the past 5 years averaging 291:1 and is well above what obtains at other regional utilities.

4.8 A new Chief Executive Officer was appointed effective April 1, 2019. He has a long history with BEL, having been previously employed there as an engineer as well as having served on BEL's Board of Directors. Prior to this appointment, he was the Chairman of the Central Bank of Belize. He is supported by a cadre of skilled and experienced executives overseeing the daily operations of the company and ensuring the effective implementation of agreed upon strategy. The company continues to make tangible investments to ensure staff remain well equipped to execute their job functions. In 2017, the company supported over 940 man-days training for staff in various technical and non-technical areas. CDB staff is satisfied that the quality of BEL's human resource pool is adequate to ensure the continued successful operation of the company.

4.9 BEL finalised its new strategic direction in July 2018. The new strategic direction outlines a roadmap for a gradual and smooth transition to an energy services company that can meet the current and future demands of the market for electricity and other energy-related services. Four strategic imperatives frame the strategy: Increase shareholder value; improve customer & brand loyalty; improve productivity and risk management; and improve employee engagement. In line with the new strategic direction, the company commenced an organisation review exercise in December 2018, aimed at strengthening its organisational structure, in line with its new strategic direction. BEL has an efficient and up-to-date

information technology platform that includes a fully integrated enterprise resource planning system and customer information and billing system with functionalities that provide, inter alia, customer relationship management, customer service order management, customer billing and credit control. The company's information technology needs are adequately and efficiently served by its existing systems. Nevertheless, it seeks to further strengthen the security around its Information Technology Infrastructure and proposes to undertake a review and audit of its IT systems. CDB staff view both the organisational review and IT audit as essential to enhancement of BEL's capacity to deliver efficient services to its customers and to support its future development programs.

4.10 Along with the provision of electricity, BEL is a key partner in national development. The company has a Corporate Social Responsibility Programme with outreach activities that are developmental in focus and, as necessary, address issues related to poverty reduction, crime prevention and education. The company's Connecting Homes, Improving Lives, initiative connected 417 Belizean families who otherwise would not have been able to afford the cost of connecting to BEL's grid. BEL also subsidises the electricity bills of qualified senior citizens under its Golden Citizen Program.

### **FINANCIAL ANALYSIS**

4-11 – 4.20

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.

### **ECONOMIC ANALYSIS**

4.21 The assumptions underpinning the economic analysis are provided at Appendix 4.4.1. The analysis assumes that the main quantifiable benefits of the Project are those directly related to the decommissioning of the diesel power station and its replacement with power supply from the grid which is 50% renewable. This will result in annual displacement of approximately 730,000 gallons of fossil fuels used in electricity generation and reduction in GHG emissions of 5,000 tons per annum. In addition, significant benefits are also likely to accrue to the island from an expansion in supply capacity of the Caye Caulker load center to meet projected growth in demand to 2037. A major constraint to development on the North side of the Caye has been the inadequacy of infrastructure, including power supply. Environmental and dredging permits have been approved for four major tourism developments on the North side of Caye Caulker, and removal of this impediment will likely encourage implementation of these projects and thereby generate increased economic development for the area. Benefits associated with this potential increase in demand were not quantified in this analysis.

4.22 The adverse environmental and social impacts from using fossil fuels in electricity generation are well documented. With the location of the current power station within an area renowned for eco-tourism, the decommissioning and removal of the existing diesel generator will provide added benefits to the local community in the form of reduced emittance of air pollutants as well as a reduction in noise pollution and therefore improve ambient environmental conditions of Caye Caulker.

4.23 **Incremental Economic Rate of Return (ERR):** The incremental ERR is estimated at 26%, significantly above the benchmark rate of 12% and suggest significant economic benefits will accrue from a cleaner, more reliable and efficient source of electricity supply to Caye Caulker. The ERR of 26% is a conservative estimate of the potential economic impact of the Project, given that benefits associated with reduced pollution and risks to sensitive ecosystems and waterways essential to the livelihood of residents have not been quantified. Detailed computations of the ERR are provided at Appendix 4.4.2.

4.24 **Sensitivity Analysis:** A sensitivity analysis was carried out to test the robustness of the ERR. The results are shown in Table 4.3 and confirm that, even in a worse-case scenario of a simultaneous increase in Project costs and reduction in costs of fuel imports, the Project will be highly beneficial to the economy of Belize.

**TABLE 4.3: SENSITIVITY ANALYSIS**

<b>Scenario</b>	<b>ERR (%)</b>	<b>Switching Value</b>
Base	26	-
Fuel Price - 20% lower	21	>75%
Project cost plus 20% higher	22	>90%
20% reduction in fuel price and 20% increase in Project Cost	17	-

4.25 Switching values computed using the same parameters confirmed that ERR is robust. The price of diesel fuel, which was used to value the economic savings associated with displaced fuel imports, would have to fall by more than 75% for ERR to fall below the cut-off rate of 12%. The probability of such a major reduction in fuel prices in the near term is unlikely, given current trends in crude oil prices and overall increase in global demand.

### **MACROECONOMIC IMPACT**

4.26 The Project is likely to have a net positive macroeconomic impact on Belize. In the short term, employment will be provided through construction activity and the spillover effects. More significantly there will be longer-term benefits. The Project will allow increased energy supply on Caye Caulker, which will boost the tourism product and facilitate additional growth there. The rising room occupancy since 2011 has happened in spite of a higher than average increase in the average room rate. This, along with the greater hotel room stock, suggests that larger numbers of tourists are attracted to Caye Caulker, and therefore there is scope for additional growth.

4.27 Compared to continuing with the status quo, there will be a reduction in imports of diesel. Depending on prevailing prices, over which Belize has no control, this will benefit Belize's balance of payments position and protect its foreign exchange reserves.

### **SOCIAL AND GENDER IMPACT ASSESSMENT**

4.28 Stakeholder consultations confirmed significant buy-in for the Project during the conduct of the Environmental and Social Impact Assessment (ESIA). The ESIA indicated there is limited potential for adverse social impacts and those that have been identified can be readily mitigated.

4.29 During installation of the cable there is likely to be a variety of impacts on communities. The presence of vessels associated with the cable installation will restrict the movements and activities of fisherfolk and fishing vessels. Ongoing works may lead to disruption and/or closure of navigation routes between San Pedro and Caye Caulker in order to mitigate the risk of collision with other vessels. This impact will be mitigated by strategically undertaking construction in stages, so that diversions can be properly managed and the transport link between Caye Caulker

and San Pedro can be accessed. In addition, disruption of livelihood fishing activities during the lobster harvesting season which spans the period mid-June to mid-February, will be minimised through active stakeholder monitoring during implementation.

4.30 Construction works will require the installation of the cable and associated infrastructure using specialist plant and equipment. For the safety of the community, the installation process will temporarily restrict access to certain areas which will be clearly marked and monitored during construction. These temporary restrictions may have direct impacts on the availability of recreational and commercial activities such as water sports and diving tours. A Stakeholder Engagement Plan (SEP), inclusive of a transparent, four-step, gender-responsive and culturally- appropriate GRM scaled to the risks and adverse impacts of the Project will be developed to effectively facilitate resolution of concerns and complaints of project-affected people (PAP). The GRM will be at no cost and without retribution to PAPs in addressing social and environmental issues during implementation. The GRM will: (i) record, categorise and prioritise the grievances; (ii) settle the grievances in consultation with complainant(s) and other stakeholders; (iii) inform the aggrieved parties about the solutions; and (iv) forward the unresolved cases to higher authorities. In addition, CDB's Complaints Mechanism with six whistleblowing channels will also be available to PAPs on CDB's website at [projectscomplaints@caribank.org](mailto:projectscomplaints@caribank.org).

4.31 The SEP will be supported by a CLO whose Terms of Reference (TOR) are presented at Appendix 4.5.1. It will be a condition precedent to disbursement in respect of the infrastructure works that BEL engage the services of a CLO with qualifications and experience acceptable to CDB.

4.32 Land will need to be acquired in Caye Caulker to site the cable landing, reclosers, distribution lines and generators during construction of the sub-station. BEL is at an advanced stage in the negotiations process with the respective landowners using established country systems. This process is expected to be concluded by August 31, 2019. It will be a condition precedent to first disbursement of the loan that the lands required for the Project shall have been vested in BEL free of encumbrances, covenants, conditions and stipulations or, alternatively, arrangements acceptable to the Bank have been made for the entry by BEL into possession of such lands for the purposes of the Project.

4.33 Island coverage with connections to the main electrical grid will enhance the reliability and electrical supply for the increased future load demand expected and very importantly, reduce the cost of electricity supply to diverse users in Caye Caulker. Male and female-headed households, and small business owners/operators, many of whom are women, are expected to benefit from reduced electricity cost. The cost savings will positively impact such operations by contributing to profitability. According to CDB's Gender Marker Analysis (Appendix 4.6) the Project is marginally gender mainstreamed, with limited potential to contribute to gender equality.

**GENDER MARKER SCORE**

<b>Analysis</b>	<b>Design</b>	<b>Implementation</b>	<b>Monitoring &amp; Evaluation</b>	<b>Score</b>	<b>Code</b>
1.0	0.0	0.0	0.5	1.5	Marginally Mainstreamed (MM)

**ENVIRONMENTAL ASSESSMENT**

4.34 The Project is categorised as “A” based on CDB’s Environmental and Social Review Procedures as the works will be undertaken within two overlapping nationally declared marine protected areas (MPAs) - Hol Chan Marine Reserve, and Caye Caulker Marine and Forest Reserve, which are characterised by shallow waters and a relatively active navigation channel. The MPAs comprise sensitive ecosystems/habitats; commercially important fisheries; and the endangered Antillean manatee species. A full ESIA was prepared by independent consultants, in compliance with GOBZ’s Schedule 1 Environmental Impact Assessment Regulations under which an ESIA is mandatory. (ESIA summary Appendix 4.7.1). As a condition precedent to first disbursement, BEL is required to submit to CDB, evidence of receipt of the Department of Environment’s (DOE) Certificate of Compliance prior to infrastructure works.

4.35 Cable laying works are restricted to a narrow strip of seabed approximately 5–8 m wide on the sea floor in the inner reef zone, and to a depth of 5m. No further disturbance of the area is anticipated within the system’s 25 year design life unless a cable fault develops. Civil works to bury transmission cable on Caye Caulker (landing site to new sub-station) will cause temporary disruption on Caye Caulker.

4.36 The most adverse construction impacts will occur in the cable installation work zone. These include: (i) faunal species removal and habitat alteration; (ii) habitat disturbance (lobster and conch); (iii) mangrove habitat removal or destruction; (iv) reduction in species diversity and abundance within the cable’s footprint and (vi) increased sedimentation and turbidity. There will be temporary re-suspension of seabed sediments and disruption of longshore sediment transport with negligible impacts in the medium to the long term. Best Environmental Practices for submarine cable laying and installation have informed the draft performance specifications recommended in the ESIA for finalisation by the Contractor.

4.37 For continuity of service, the old diesel plant will be relocated while the new sub-station is constructed. Inadequate management of these activities, and movement of heavy equipment could result in marine pollution, soil contamination (from release of fuels, chemicals, and other hazardous materials); and adversely impact community and worker health and safety. A decommissioning plan has been developed to provide guidelines on site remediation and potential community health and safety impacts (Draft ESMP at Appendix 4.7.2). It will be a condition of the loan that BEL decommissions the old diesel power plant by December 31, 2021 or such later date as the Bank may agree.

4.38 Replacement of the existing diesel generator with the new sub-station will reduce air pollution, carbon emissions, noise and disturbance on Caye Caulker.

4.39 The construction contract will include the draft ESMP. The costs/budget for mitigation measures have been included in the project’s design and construction cost estimates. Initial feedback from DOE indicates that the Certificate of Compliance will include conditions for an E&S monitoring plan, to ensure compliance with the performance specifications of the ESMP. Any revisions to the ESMP including the monitoring plan will be led by the PMU’s PC and agreed to by DOE and CDB prior to implementation (see ESIA summary Appendix 4.7.1) The contractor will use the ESMP to prepare a detailed methodology for transmission cable installation and undertaking works at the landing sites for which site-specific

plans and drawings have been prepared.

4.40 The executing agency through the PMU will co-ordinate project monitoring and reporting (Appendix 4.7.3). The PMU team will include an Environmental Safeguard Supervisor to enhance its existing capacity. Routine reports will be submitted to CDB by the PC. CDB is satisfied that DOE has the appropriate organisational structure, experience with similar projects, and compliance staff competency for adequately managing E&S supervision.

#### **CLIMATE CHANGE VULNERABILITY ASSESSMENT (CCVA)**

4.41 Belize is vulnerable to multiple climate-related hazards, including hurricanes, floods, sea-level rise and storm surges. GOBZ has implemented initiatives for mainstreaming climate change into its national development processes and mechanisms. The country's Nationally Determined Contributions reflect a commitment to achieving the twin goals of strategically transitioning to low carbon development and strengthening climate resilience.

4.42 The government has also taken steps to increase the resilience of the energy sector. In 2016, GOBZ received a Technical Assistance Grant from the World Bank (WB) to implement the Energy Resilience and Climate Adaptation Project. The Project seeks to demonstrate solutions that enhance the resilience of the energy system to adverse weather and climate change impacts by pilot initiatives, infrastructure hardening, and analytical and planning efforts. WB financed project comprises two components, Long-Term Planning and Capacity Building for Adaptation; and Demonstration measures to enhance resilience of the energy sector. The outputs of this Project will, over the long term, help to strengthen the resilience of CDB supported investments in Belize.

4.43 The primary climate variables for the proposed project are: sea level rise, storm surges, intense rainfall and intense hurricanes. These parameters are likely to increase the exposure of the submarine cable landing sites and the substation to risk of coastal erosion and flooding from storm surges and intense hydro-meteorological events. The overhead distribution lines will also be at greater risk to damage from hurricanes. Some climate resilience measures have already been built into the project such as employing buried cable instead of overhead lines on Caye Caulker. The detailed engineering design work will be further refined in the site-specific plans and drawings based on the results of the CRVA (TOR for the CRVA at Appendix 4.8.1).

### **PAS GENERAL COMMENTARY**

4.44 The composite performance rating based on CDB's Performance Assessment System (PAS) has been estimated as highly satisfactory, which suggests that there is a good probability that the Project will achieve its objectives. The details of PAS are presented in the table below.

### **PAS TABLE**

<b>Criteria</b>	<b>Score</b>	<b>Justification</b>
Relevance	Highly Satisfactory	The availability of a secure and reliable electricity supply is vital to the continued development of Caye Caulker, one of the main tourist destinations in Belize. The Project supports GOBZ's developmental objectives by reducing the country's carbon footprint and reliance on imported fossil fuels for electricity generation. It is consistent with CDB's strategic objective of promoting broad-based economic growth and inclusive and sustainable social development as well as its Energy Sector Policy and Strategy and Climate Resilience Strategy.. It is therefore accorded high strategic relevance.
Effectiveness	Satisfactory	The Project is designed to allow BEL to improve power system reliability, efficiency, resilience and capability to service increased demand on Caye Caulker. The Project when completed is expected to achieve its stated objectives.
Efficiency	Highly Satisfactory	The ERR based on conservative estimates and quantifiable benefits is 26% and the selected option for routing the cable is least cost.
Sustainability	Satisfactory	The risk of the Project not realising its benefits is low. Submarine cables and underground transmission lines require negligible maintenance. To date BEL's maintenance programmes have been sound and deemed adequate for the small section of the network on Caye Caulker that require overhead lines, along with equipment. The financial projections show that BEL will be financially healthy going forward, subject to the assumptions made.
<b>Overall Score</b>	Highly Satisfactory	

## **5. RISK ASSESSMENT AND MITIGATION**

### **RISK JUSTIFICATION**

5.01 The major Project risks and proposed mitigation measures are summarised in the Table 5.1 below.

**TABLE 5.1: SUMMARY OF RISKS ASSESSMENT AND MITIGATION MEASURES**

<b>Risk Category</b>	<b>Risk Type</b>	<b>Description of Risk</b>	<b>Mitigation Measures</b>
Financial	Sustainability	<p>Impact on BEL's cash flow due to variability in COP and regulatory lag.</p> <p>Tariffs are set for a four year period based on projections of COP and other value added delivery services. Within that period, on an annual basis, COP is reviewed and BEL is required to submit information to PUC on COP by November of each year so that adjustments can be made, as necessary, by January of the following year. However, given the one year lag, cost recovery may not always be timely. In an increasing oil price environment, this situation can strain BEL's cash flows.</p>	<p>BEL has started to conduct quarterly COP projections. Such information is shared with PUC and will form the basis for a six-month tariff review in order to minimise the annual correction required.</p>
Developmental	Environmental	<p>Potential for significant negative impact on protected areas and pollution from decommissioning</p>	<p>(i) ESMP</p> <p>(ii) Outputs of CRVA included in design to increase resilience of infrastructure</p> <p>(iii) Environmental monitoring plan developed for project</p>
Developmental	Disaster Risk/Adverse Events	<p>Adverse weather conditions could delay Project implementation, especially</p>	<p>The major infrastructure works will be scheduled outside the hurricane</p>



<b>Risk Category</b>	<b>Risk Type</b>	<b>Description of Risk</b>	<b>Mitigation Measures</b>
		during trenching for the submarine cable and during the foundation works associated with the new substation construction.	season. In addition, the contractor will be required to demonstrate experience working in unfavourable marshlands which would be similar to ground conditions brought about by adverse weather.

## **6. IMPLEMENTATION AND PROJECT MANAGEMENT**

### **BORROWER**

6.1 The Borrower is BEL and the Guarantor is GOBZ. Details are provided in Appendix 6.4.1. BEL is majority-owned by GOBZ and the Belize SSB, which together control 63.8% shareholding in the Company. Fortis Inc. of Canada owns 33.3% and some 1,500 minority shareholders own the remaining 2.9% of the issued and outstanding shares of the company.

6.2 Regulatory oversight of the company is the responsibility of PUC. The Electricity Act, Chapter 221 and Statutory Instrument No. 145 of 2005, Electricity (Tariffs, Fees and Charges) By-laws 2005 of the Laws of Belize regulates and makes provision for electricity services in Belize and provides specific powers to PUC to enforce specific regulations with respect to tariffs, charges, and quality of service standards. The Company operates under an exclusive 10-year licence for the transmission and distribution of electricity, which expires in 2025. BEL has the option to renew the licence for a further period of 10 years. It will be a condition of the Loan that CDB shall be entitled to suspend, cancel or call in the Loan if BEL's operating licence terminates (whether through revocation, non-renewal, assignment or otherwise) before the Loan is repaid in full.

### **IMPLEMENTING AGENCY ANALYSIS**

6.3 BEL has substantial experience in implementation of electricity transmission and distribution Projects in Belize. The utility has successfully implemented four CDB funded capital projects, and is currently implementing the Sixth Power Project. Its PMU is very familiar with CDB processes, and has the requisite project management, monitoring and evaluation capacity to execute the Project successfully.

### **PROJECT MANAGEMENT**

6.4 Implementation of the Project will be the responsibility of the PMU within BEL. The unit is staffed by a team of three engineers (one of whom will be responsible for supporting the PC with the implementation, monitoring and reporting requirements of the project), three field supervisors/technicians, and one technical assistant, all with significant project experience in the construction of substations, sub-transmission, transmission and distribution line projects. Additionally, there are two contracted field supervisors supporting the unit. The PC, whose services will be paid for by BEL, will be assigned to the Project. As a condition precedent to first disbursement of the loan, BEL shall have assigned as PC, a person whose qualifications and experience are acceptable to CDB. No change shall be made to the appointment of PC without the prior approval, in writing, of CDB. The PC will be responsible for coordinating and monitoring all aspects of the Project, in accordance with the TOR at Appendix 6.5.1. The PMU will be further strengthened with the addition of an ESS and the CLO.

6.5 Engineering consultants will be engaged by BEL to provide the services set out at Appendix 6.5.2. The cost of these services will be financed from CDB loan. It will be a condition precedent to first disbursement of the Works that BEL engages consultants whose qualifications and experience are

acceptable to CDB. The Project has made provision for an environmental safeguards supervisor in the PMU to coordinate implementation of the environmental components of the ESMP. Further details can be found at Appendix 6.5.2. CDB staff are satisfied that the proposed project management and administrative arrangements are adequate to effectively implement the Project on behalf of BEL. The Project Organisation Chart is provided in Appendix 6.6.1.

## **IMPLEMENTATION**

6.6 The Project will be implemented over a 15-month period, commencing December 2019, and ending March 2021. The Implementation Support Plan and the Project Implementation Schedule are set out in Appendix 6.7.1 and Appendix 6.7.2, respectively.

## **PARTICIPATION OF BENEFICIARIES AND STAKEHOLDERS**

6.7 The preparation and appraisal of this Project involved consultation with a wide range of stakeholders. Meetings were held with BEL, different categories of Government representatives including *inter alia*, the Ministries of Economic Development, and Human Development, Social Transformation and Poverty Alleviation, DOE, civil society and community representatives in Caye Caulker. These discussions provided opportunities for stakeholders' opinions and concerns to be expressed and to be considered in the design of the Project. Stakeholder participation will be strengthened during implementation. Project stakeholders will be invited to participate in the Project Launch Workshop and stakeholders' meetings that will be convened during implementation. Multi-modal strategies, including community meetings, and messaging via various social media platforms, will be used to keep stakeholders abreast of progress.

6.8 An SEP inclusive of a GRM was developed to support participation and to keep all affected or with a stake/interest in the intervention informed. SEP will provide opportunities for affected communities or parties to register project-related concerns and facilitate the timely resolution of any concerns that may be raised during project implementation. SEP will be supported by PC and updated as necessary. In addition, Project implementation will be supported by the CLO.

## **DISBURSEMENT**

6.9 Disbursement of the CDB Loan will be made in accordance with Disbursement Guidelines for CDB-Financed Projects (January 2019). It is expected that the first disbursement from the Loan will be made by September 30, 2019. The Loan is expected to be fully disbursed by July 31, 2022. The estimated Disbursement Schedule is provided at Appendix 6.8.

## **PROCUREMENT**

6.10 Procurement of works, goods and non-consultancy services will be in accordance with CDB's Guidelines for Procurement (January 2006), while the procurement of consultancy services shall be in accordance with CDB's Guidelines for the Selection and Engagement of Consultants by Recipients of CDB Financing (October 2011). However, where EIB CALC II resources are being used together with CDB's

E&M resources, then, in accordance with Paper BD 65/17, which was approved by CDB's Board of Directors in May 2017, procurement eligibility shall be extended to countries eligible for procurement under EIB-funded projects which are not CDB Member Countries. The value of the contracts with the aforementioned extended procurement eligibility is estimated to be USD3.723 mn.

6.11 In accordance with the provisions of the EIB CALC II Finance Contract, where contracts are financed under the EIB CALC II, procurement and contract award notices, above prevailing EU thresholds, shall be published in the Official Journal of the European Union and successful bidders for contracts will be required to submit the "Covenant of Integrity" in the form attached in the Annex to the Procurement Plan at Appendix 6.3. Also the proceeds of the Loan must not be used to finance any EIB Excluded Activities as set out in the Annex to Appendix 6.3.

### **MONITORING AND REPORTING**

6.12 It will be a condition of the Loan that PC shall furnish, or cause to be furnished, to CDB the reports listed in Appendix 6.9.1 to this report, in such form or forms as CDB may require, not later than the times specified therein for so doing.

## **7. TERMS AND CONDITIONS**

### 7.01 Terms and Conditions of the Loan

<b>No.</b>	<b>Subject</b>	<b>Terms and Conditions of the Loan</b>
<b>1.</b>	<b>Parties</b>	<p><u>Bank</u>: Caribbean Development Bank</p> <p><u>Borrower</u>: Belize Electricity Limited (BEL)</p> <p><u>Implementing Agency</u>: Project Management Unit (PMU), BEL</p> <p><u>Guarantor</u>: Government of Belize</p>
<b>2.</b>	<b>Amount of Loan</b>	<p>The Bank agrees to lend to the Borrower an amount not exceeding the equivalent of six million eight hundred and forty thousand United States dollars (USD6,840,000) (the Loan) comprising:</p> <p><u>Ordinary Capital Resources (OCR)</u>:</p> <p>Three million one hundred and seventeen thousand United States dollars (USD3,117,000) EIB CALC II Resources</p> <p>Three million seven hundred and twenty-three thousand United States dollars (USD3,723,000) Equity and Market Resources</p>
<b>3.</b>	<b>Purpose</b>	<p>The purpose for which the Loan is being made is to assist the Borrower in financing the project described in the <b>Project Description</b> (the Project).</p>
<b>4.</b>	<b>Repayment</b>	<p>The Borrower shall repay the amount withdrawn from the EIB CALC II Resources Loan Account in forty-eight (48) equal or approximately equal and consecutive quarterly instalments on each Due Date, commencing on the first Due Date after the expiry of two (2) years following the date of the Loan Agreement or on such later Due Date as the Bank may specify in writing.</p> <p>The Borrower shall repay the amount withdrawn from the Equity and Market Resources Loan Account in forty-eight (48) equal or approximately equal and consecutive quarterly instalments on each Due Date, commencing on the first Due Date after the expiry of two (2) years following the date of the Loan Agreement or on such later Due Date as the Bank may specify in writing.</p>

No.	Subject	Terms and Conditions of the Loan
5.	<b>Interest</b>	<p>The Borrower shall pay to the Bank interest at the rate of three decimal zero two percent (3.02%) per annum on the amount of the EIB CALC II Resources withdrawn and outstanding from time to time. Such interest shall be payable quarterly.</p> <p>The Borrower shall pay to the Bank interest at the rate of four decimal eight percent (4.8%) per annum on the amount of the Equity and Market Resources withdrawn and outstanding from time to time. Such interest shall be payable quarterly.</p> <p>The Bank may from time to time increase or decrease the rate of interest for the time being payable on any amount of the Loan which is being lent from the OCR to take effect on the day after the first Due Date after March 31, June 30, September 30 and/or December 31 in any year, or such other date or dates as the Bank may specify in writing from time to time.</p>
6.	<b>Commitment Charge</b>	<p>The Borrower shall pay to the Bank a commitment charge at the rate of one percent (1%) per annum on the amount of the OCR Loan unwithdrawn from time to time. Such charge shall accrue from the sixtieth (60th) day after the date of the Loan Agreement and shall be payable quarterly.</p>
7.	<b>Withdrawal and Application of Loan</b>	<p>Except as the Bank may otherwise agree, the amounts withdrawn from the Loan Account(s) shall be used to finance the components of the Project allocated for financing by the Bank as shown in the <b>Financing Plan</b> up to the respective limits specified therein.</p> <p>Except as the Bank may otherwise agree, withdrawals from the Loan Account(s) shall not exceed in the aggregate seventy-nine percent (79%) of the cost of the Project.</p> <p>The amounts withdrawn from the Loan Account(s) shall not be used to meet any part of the costs of the Project which consists of identifiable Taxes imposed under the laws of the Project Country.</p> <p>Except as the Bank may otherwise agree, disbursements from the Loan Account(s) shall be made rateably from the EIB CALC II Resources and the Equity and Market Resources in accordance with the respective amounts thereof.</p> <p>The Loan shall not be used to finance any <b>EIB Excluded Activities</b>.</p> <p>The Borrower shall comply with the Bank's <i>Disbursement Guidelines for CDB-Financed Projects (January 2019)</i>, which publication is in effect at the date hereof and which may be</p>

No.	Subject	Terms and Conditions of the Loan
		amended from time to time by the Bank.
8.	<b>Period of Disbursement</b>	<p>The Bank shall have received an application for first disbursement of the Loan by September 30, 2019 or such later date as may be specified in writing by the Bank.</p> <p>The Loan shall be disbursed up to July 31, 2022 or such later date as may be specified in writing by the Bank.</p>
9.	<b>Procurement</b>	<p>Except as provided below, procurement shall be in accordance with the following procedures or such other procedures as the Bank may from time to time specify in writing:</p> <p><i>CDB's Guidelines for Procurement (2006)</i></p> <p><i>CDB's Guidelines for the Selection and Engagement of Consultants by Recipients of CDB Financing (2011)</i></p> <p>In respect of the procurement of goods, works and/or services where EIB CALC II Resources are being used together with Equity and Market Resources, eligibility shall be extended to countries eligible for procurement under EIB-funded projects which are not member countries of the Bank.</p> <p>The Borrower shall comply with the procurement requirements set out in the <b>Procurement Plan</b>. Any revisions to the <b>Procurement Plan</b> shall require the Bank's prior approval in writing.</p>
10.	<b>Additional Condition(s) Precedent to First Disbursement</b>	<p>The Bank shall not be obliged to make the first disbursement of the Loan until the Borrower has furnished or cause to be furnished to the Bank, evidence acceptable to the Bank, that the following condition/s has/have been satisfied:</p> <p>PC has been assigned.</p> <p>The Borrower has furnished to the Bank a copy of the environmental compliance certificate for the Project issued by DOE.</p> <p>The Borrower has furnished or caused to be furnished to the Bank the Guarantee Agreement (as defined below).</p> <p>The lands required for the Infrastructure Works are vested in the Borrower free from all encumbrances and without covenants, stipulations or conditions which may adversely affect the Project,</p>

No.	Subject	Terms and Conditions of the Loan
		or alternatively the Borrower has made arrangements satisfactory to the Bank to enter into possession of or acquire the relevant rights over such lands for the purposes of the Project.
11.	<b>Condition(s) Precedent to Disbursement in respect of Infrastructure Works</b>	<p>The Bank shall not be obliged to disburse any amount in respect of Infrastructure Works until the Borrower has furnished or caused to be furnished to the Bank, evidence acceptable to the Bank, that the following condition/s has/have been satisfied:</p> <p>The Borrower has received all requisite statutory, planning, building and environmental permits, licenses and/or other approvals in respect of the Infrastructure Works.</p> <p>PE has been assigned.</p> <p>Engineering Supervision Consultant has been engaged.</p> <p>Environment Safeguards Supervisor has been engaged.</p> <p>CLO has been engaged.</p> <p>The Borrower has furnished to the Bank the CRVA, in form and substance acceptable to the Bank.</p>
12.	<b>Project Implementation/Execution</b>	<p>Except as the Bank may otherwise agree, the Borrower shall: (i) carry out the Project at all times with due diligence and efficiency, with management personnel whose qualifications and experience are acceptable to the Bank and in accordance with sound technical, environmental, administrative, financial and managerial standards and practices; and (ii) institute and maintain organisational, administrative, accounting and auditing arrangements for the Project, acceptable to the Bank.</p> <p>The Borrower shall carry out the Project at all times in accordance with the ESMP approved by DOE.</p>
13.	<b>Project Management</b>	<p>The Borrower shall, for the duration of the Project, assign as Project Coordinator (PC) a member of the staff of the PMU, whose qualifications and experience are acceptable to the Bank, who shall be responsible for coordinating and monitoring all aspects of the Project and carrying out the duties described in the <b>Terms of Reference - Project Coordinator</b>.</p> <p>The Borrower shall, for the duration of the Project, assign as Project Engineer (PE) a member of staff of the PMU, whose qualifications</p>



No.	Subject	Terms and Conditions of the Loan
		<p>and experience are acceptable to the Bank, who shall be responsible for carrying out the duties described in the <b>Terms of Reference –Project Engineer</b>.</p> <p>The qualifications and experience of any person(s) subsequently appointed to the position(s) referred to in this Section shall be acceptable to the Bank.</p>
14.	<b>Engagement of Consultant(s)</b>	<p>The Borrower shall, in accordance with the procurement procedures applicable to the Loan, select and engage consultant(s) to provide the following consulting services and shall, within a timeframe acceptable to the Bank, implement such of the recommendations arising out of the following consultancy/ies, as may be acceptable to the Bank:</p> <p><b>Engineering Supervision Consultant</b></p> <p>The Borrower shall utilise its own resources to select and engage consultant(s) to provide the following consulting services and shall, within a timeframe acceptable to the Bank, implement such recommendations arising out of the following consultancy/ies, as may be acceptable to the Bank:</p> <p><b>Environment Safeguards Supervisor</b></p> <p><b>Community Liaison Officer</b></p> <p><b>Climate Risk and Vulnerability Assessment (CRVA)</b></p> <p>The qualifications and experience of any person(s) subsequently engaged to provide the abovementioned consulting services shall be acceptable to the Bank</p>
15.	<b>Engagement of Contractors</b>	<p>The Borrower shall, in accordance with the procurement procedures applicable to the Loan, select and engage contractors to carry out the works to be financed by the Loan.</p>
16.	<b>Security</b>	<p>The Borrower shall furnish or cause to be furnished to the Bank, an agreement between the Guarantor and the Bank in form and substance acceptable to the Bank, guaranteeing the repayment of the Loan and the performance of the Borrower’s obligations under the Loan Agreement, on the Bank’s standard terms and conditions and on the terms and conditions set forth herein (Guarantee Agreement).</p>

No.	Subject	Terms and Conditions of the Loan
17.	<b>Maintenance of Infrastructure</b>	The Borrower shall keep the infrastructure financed from the Loan, or cause the same to be kept, in good repair and condition and shall provide the financial and other resources required to adequately maintain the infrastructure financed from the Loan.
18.	<b>Maintenance of Corporate Existence</b>	The Borrower shall maintain its corporate existence and, except with the prior approval of the Bank, shall not amend its Articles of Association and Memorandum of Association.
19.	<b>Operational Requirement(s)</b>	<p>The Borrower shall (i) keep its staff at a level consistent with financial prudence and technical and administrative competence; and (ii) conduct its business along strict commercial lines and in such a manner as to generate operating revenue sufficient to cover its operating expenses including depreciation, as well as debt service and other charges in respect of the Loan and all other loans and, to accumulate a reasonable surplus.</p> <p>Except as the Bank may otherwise agree, the Borrower shall not:</p> <p>(i) sell, lease, transfer or otherwise dispose of any of its assets which shall be required for the efficient carrying on of its business;</p> <p>(ii) make any loans to any of its directors or shareholders or to any other person (with the exception of the Borrower's staff) for any purpose whatsoever; and (iii) grant any credit (other than in the ordinary course of business) or give or negotiate any guarantee or indemnity to or for the benefit of the Borrower, or anyone else, or voluntarily assume any liability in respect of any obligation of anyone else.</p>
20.	<b>Financial Covenant(s)</b>	<p>The Borrower shall commencing with the financial year 2019, for the duration of the Loan, within one hundred and eighty (180) days after the end of each financial year, furnish to the Bank a copy of its financial statements together with the accompanying management letter issued by the Borrower's auditors, and shall implement, in accordance with a timetable acceptable to the Bank, such recommendations of the auditors as the Bank may require.</p> <p>The Borrower shall not incur any new debt (other than for the Project) unless a DSCR (defined as the operating surplus before deduction of depreciation, but after taxes, divided by total debt service in the same year) of at least 1.5 times is achieved.</p> <p>The Borrower shall maintain throughout the life of the Loan: (i) accounts receivable at a maximum level of thirty-five (35) days' sales; (ii) a DSCR of at least 1.5:1 and (iii) a return of at least four percent (4%) on average net fixed assets.</p>

No.	Subject	Terms and Conditions of the Loan
21.	<b>Insurance</b>	<p>The Borrower shall maintain a self-insurance plan for its transmission and distribution assets, or alternatively, shall obtain, from responsible insurers, and maintain, or make other provision satisfactory to the Bank for, insurance against such risks and in such amounts as shall be consistent with sound business practice and without limitation upon the foregoing, such insurance shall cover: (i) loss or damage by flood, fire, earthquake, hurricane, storm and tempest to its insurable assets; (ii) marine, transit and other hazards incident to the acquisition, transportation and delivery to the place of use or installation of goods financed out of the Loan; and (iii) loss or damage to goods financed out of the Loan at the place of installation up to commissioning; any indemnity thereunder to be made payable in a currency freely usable by the Borrower to replace or repair the property covered by such insurance, to the intent that the Bank's standard condition in this regard shall not apply to the Loan.</p>
22.	<b>EIB-CALC II Conditions</b>	<p>The Borrower shall: (a) maintain in force all rights of way or use and all permits necessary for the execution and operation of the Project and comply with all laws to which the Project is subject; (b) implement and operate the Project in compliance with the Bank's "Environmental and Social Review Procedures" published in December 2014; (c) obtain and maintain all requisite environmental permits, licenses and/or other approvals for the Project and comply at all times with the same; (d) as the case may be, in conformity with applicable environmental laws and regulations and international treaties and conventions, and upon the Bank's request, provide to the Bank evidence to verify its fulfilment of the obligation referred to in (c) above; and (e) promptly notify the Bank of any complaints received by the Borrower that relate to an adverse environmental or social impact on the Project (including any complaint relating to breach of the Bank's Environmental and Social Review Procedures applicable to the Project) and cooperate on any matter necessary to resolve such complaint.</p> <p>The Borrower undertakes: (a) not to engage in (and not to authorise or permit any person acting on its behalf to engage in), any Prohibited Conduct in connection with the Project, any tendering procedure, or any transaction contemplated by this Loan Agreement; (b) to take such action as the Bank shall request to investigate or terminate any alleged or suspected occurrence of any Prohibited Conduct; (c) to investigate or terminate and enable the Bank to access and collect information, investigate, sanction or terminate any alleged or suspected occurrence of any Prohibited Conduct in connection with the Project; (d) to promptly inform the Bank of any allegation, complaint,</p>

No.	Subject	Terms and Conditions of the Loan
		<p>information or investigation with regard to a Prohibited Conduct related to the Project; (e) to take immediate and appropriate measures in respect of (as applicable) the Borrower and/or any member of its management bodies and/or any person acting on its behalf, who has been convicted by a final and irrevocable court ruling of a Prohibited Conduct perpetrated in the course of the exercise of his/her professional duties or becomes a Sanctioned Person, in order to ensure that as applicable the Borrower and/or any member of its management bodies and/or person acting on its behalf is excluded from any activity in relation to any funds made available by the Bank under this Loan Agreement or in relation to the Project; (f) not to enter into a business relationship with any Sanctioned Person or make any funds available to or for the benefit of, directly or indirectly, any Sanctioned Person; and (g) to promptly inform the Bank of any measure taken by it pursuant to this Section.</p> <p>The Borrower represents that: (a) to the best of its knowledge, no funds invested in the Project by it are of illicit origin, including products of money laundering or linked to the financing of terrorism, and it will promptly inform the Bank if at any time it becomes aware of the illicit origin of any such funds; and (b) any information or document given to the Bank in connection with the Project is true and correct.</p> <p>The Borrower: (a) shall deliver to the Bank and/or EIB any such information or further document concerning customer due diligence matters of or for the Borrower, as the Bank and/or EIB may reasonably require within a reasonable time; and (b) acknowledges that the Bank or EIB may be obliged to communicate information relating to the Borrower, the Loan and the Project to any competent institution or body of the European Union in accordance with the relevant mandatory provisions of European Union law.</p> <p>The Borrower shall allow persons designated by the Bank or EIB, as well as persons designated by other institutions or bodies of the European Union when so required by the relevant mandatory provisions of European Union law: (a) to visit the sites, installations and works comprising the Project and to conduct such checks as they may wish for purposes connected with the EIB-Finance Contract and the financing of the Project; (b) to interview representatives of the Borrower and not obstruct contacts with any other person involved in or affected by the Project; (c) to review the Borrower's books and records in relation to the execution of the Project and to be able to take copies of related documents to the extent permitted by the law; and (d) to facilitate investigations by the Bank, EIB and by the other</p>

No.	Subject	Terms and Conditions of the Loan
		<p>competent European Union institutions or bodies in connection with any alleged or suspected occurrence of a Prohibited Conduct and shall provide the Bank and EIB, or ensure that the Bank and EIB are provided, with all necessary assistance for this purpose.</p> <p>The Borrower shall request any disbursements from, and make any payments to, the Bank under this Loan Agreement to or from, as the case may be, a bank account in the name of the Borrower held with a duly authorised financial institution in the jurisdiction where the Borrower is incorporated or has its place of residence or where the Project is undertaken by the Borrower.</p>
23.	<b>Reports and Information</b>	<p>Except as the Bank may otherwise agree, the Borrower shall furnish or cause to be furnished to the Bank, the reports and/or other information set out in the <b>Reporting Requirements</b> in the form specified therein, or in such form or forms as the Bank may require, not later than the times specified therein for so doing.</p> <p>Except as the Bank may otherwise agree, the Borrower shall furnish or cause to be furnished to the Bank within three (3) months of Project completion, a completion report on the implementation and on the early operation stage of the Project, including its climate action aspects, in content and in form specified in the <b>Reporting Requirements</b>, or otherwise as the Bank may require.</p>
24.	<b>Other Condition(s)</b>	<p>The Borrower shall, by December 31, 2021 or such later date as the Bank may agree, decommission the existing Caye Caulker Power Station in accordance with the DOE approved decommission plan.</p>
25.	<b>Additional Funds</b>	<p>The Borrower shall be responsible for meeting any amount by which the total cost of the Project exceeds eight million six hundred and sixty-five thousand United States dollars (USD8,665,000).</p>
26.	<b>Borrower/Executing Agency Contribution to the Project</b>	<p>The Borrower shall contribute to the Project an amount of not less than three million six hundred and fifty thousand Belize dollars (BZD3,650,000).</p> <p>Except as the Bank may otherwise agree, the contribution which the Borrower is required to make to the Project shall be expended by the Borrower in a timely manner on the components of the Project designated for financing by the Borrower as shown in the <b>Financing Plan</b>, up to the respective limits specified therein.</p>

No.	Subject	Terms and Conditions of the Loan
27.	<b>Additional Events of Default, Cancellation and Suspension</b>	<p>The Bank may by notice to the Borrower suspend, cancel or call in the whole or any part of the Loan if:</p> <p>The Borrower's operating licence terminates (whether through revocation, non-renewal, assignment or otherwise) before the Loan is repaid in full.</p>

**APPENDICES TO CHAPTER 1- STRATEGIC CONTEXT AND RATIONALE****APPENDIX 1.1 MACROECONOMIC CONTEXT DETAILS****MACROECONOMIC CONTEXT**

*(Unless otherwise stated, amounts are in Belize Dollars)*

**1. OVERVIEW**

1.1 The Belizean economy continued to recover in 2018. The recovery was led by tourism, and there was some rebound in agriculture, particularly sugarcane. However, manufacturing declined. New tax measures and some expenditure cuts were introduced in the 2018-19 Budget, as the Government of Belize (GOBZ) sought to meet the conditions of the 2017 debt restructuring.

1.2 In 2017 GOBZ paid the final installments for nationalisation of Belize Telemedia Limited (BTL). These were funded by the sale of some shares in BTL and Belize Electricity Limited (BEL), issuance of new domestic debt, and external sources. The final settlement was payable in United States dollars, which meant drawing down on Belize's foreign reserves. Debt as a share of Gross Domestic Product (GDP) increased. Towards the end of the year, a court ruling required that the Government should pay \$90 million (mn) to a local bank, related to a previously provided guarantee. This liability has been recognised, but payment has not yet been agreed by Parliament.

1.3 CDB projects economic growth of 2.5% in 2018, based on growth in agriculture, fishing and tourism. The current account deficit is expected to narrow, although this may be affected by rising oil prices, and by appreciation of the United States dollar, against which the Belizean dollar is pegged. Downside risks include the possibility of an extreme weather event. Due to financial constraints and still high levels of debt, GOBZ will need to prioritise its expenditure and maximise the available concessionary finance.

**2. REAL SECTOR**

2.1 Belize's economy continued to grow in 2018, following contraction in 2016 and recovery in 2017. The economy grew by an estimated 2.5% in 2018. The tourism sector was the main contributor to growth. Hotels and restaurants output rose by 14.0%. Stay-over tourist arrivals rose by 14.6% to 489,261 visitors, supported by increased air capacity, sustained marketing efforts and heightened economic growth in key source markets. Meanwhile, cruise ship disembarkations expanded by 19.1% to 1,208,137 visitors, as calls to the Belize City and Harvest Caye ports rose.

2.2 The primary sector experienced growth, but this was mostly driven by sugar production. Sugarcane deliveries increased by 2.3% to 1.5 mn long tones. However, banana output fell by 7.5% to 72.5 metric tonnes. Citrus production also fell, by 22.7% to 2.7 mn boxes. Heavy rains at the beginning of the harvest period, and the ongoing effects of greening disease, affected both orange and grapefruit production. Fisheries output fell by almost one third, mainly due to declining shrimp production related to ongoing challenges with disease.

2.3 Manufacturing activity declined by 4.2%, largely thanks to crude oil extraction falling by 16.6% to 278,985 barrels during the year to the end of November. In addition, citrus greening meant that 25% less citrus juice was produced.

## **Unemployment and Prices**

2.4 According to the April 2018 Labour Force Survey, the overall unemployment rate was 9.4%, varying from 5.6% in Corozal to 13.6% in Cayo. Despite economic growth, this represented a slightly worse performance than 9% in April 2017, but is still well below the rates seen after the great recession. In the year to April 2018, female unemployment fell from 15.6% to 14.9% while male unemployment rose from 4.8% to 5.6%, but there is still a large difference. Similarly, the rate of the underemployed (working less than 18.3 hours per week) was much higher for females (20.2%) than for males (10.3%). Youth unemployment (ages 14-24) was 21.3% (13.8% for males and 32.4% for females). The working age population increased by 14% between April 2013 and April 2018, and is expected to continue increasing.

2.5 Inflation slowed to 0.3% in 2018 from 1.2% in 2017. The price of transport (airfares and fuel) remained relatively unchanged, having increased by 10% in 2017. The cost of housing (including fuels) rose slightly, and the increase in the price of alcoholic beverages was less than in the previous year when new excise taxes were introduced.

## **3. EXTERNAL SECTOR**

3.1 The balance of payments deficit was financed by a drawdown of gross international reserves. The current account deficit in the nine months to the end of September was \$179.1 mn, worse than the \$151.4 mn recorded in same period in 2017. The trade deficit widened (by 15.5% to \$609.5 mn). However, the balance on services increased by 11.3%, thanks in large part to higher tourism earnings. There was an increase in net outflows of primary income, mostly as a result of increased profit repatriation by foreign-owned companies. Also, the surplus on secondary income rose slightly, supported by increases in remittance inflows, inward transfers to religious and non-profit organizations and donations to non-government institutions.

3.2 The surplus on the capital account was slightly higher (\$0.9 mn), due to an uptick in EU grants to support the banana and sugar industries, as well as financing for other development projects. The surplus on the financial account (\$18.2 mn) reflected net foreign direct investments of \$44.8 mn.

3.3 The financial account surplus narrowed to \$138.2 mn, despite an expansion in net foreign direct investment inflows, which rose to \$189.3mn and were mainly channelled in tourism-related construction and real estate activities. However, the expansion in inward investments was eclipsed by a \$41.6mn build-up in domestic banks' net foreign asset balances and a marked reduction in net borrowings by Central Government. Net disbursements to Central Government fell to \$24.1mn from \$65.6mn in the first nine months of 2017, as financing under the Venezuelan Petrocaribe Agreement Initiative wound down.

3.4 By the end of September 2018, reserves had fallen by USD32.0 mn to USD296.0 mn, the equivalent of 3.7 months of merchandise imports.

## **4. FINANCIAL SECTOR**

4.1 Broad money expanded by 1.8% in the first nine months of 2018, reflecting an increase in net foreign assets of the banking system, and an expansion in net domestic credit. Net foreign assets of the domestic banks rose, thanks to the steady growth in tourism earnings and proceeds from sale of a group of banana farms to Fyffes in March. Meanwhile the CBB's net foreign assets declined; inflows declined by 40.1% to \$158.2 mn due to lower loan disbursement proceeds, sugar export receipts and foreign currency proceeds



from banks. Foreign currency outflows fell by 27.8% to \$120.6mn, with 88.4% of the amount allocated to Government mainly for debt servicing.

4.2 CBB Net credit to CG fell by \$12.7 mn, having been much higher the previous year to fund the final BTL payments. CG increased its deposits with banks and reduced its overdraft with the CBB. Meanwhile, borrowing by other public sector entities grew by \$38.9 mn, most of which was disbursed to Belize Telemedia Limited to fund its projects.

4.3 Credit to the private sector expanded by \$43.2 mn (2.1%) in the three quarters of 2018, including domestic banks' booking of relatively large loans from foreign banks for sugar and beverage producers. Loan write-offs amounted to \$34.0 mn. These write-offs mainly related to loans for banana production, construction and personal. The banking system's ratio of non-performing loans to total loans (net of provisions) at the end of September 2018 was 2.9%, slightly higher than 2.4% at the end of 2017. In the same period the reported capital adequacy ratio rose from 24.2% to 25.2%.

4.4 The pressure on Correspondent Banking Relationships (CBRs) continued to ease but commercial banks remain vulnerable. All banks previously affected by the loss of CBRs have found alternative arrangements to process cross-border transactions. However, the situation is still fragile, since most of the banks in Belize rely on the same overseas correspondent bank. While the authorities have taken measures to strengthen the Anti-Money Laundering/Combating the Financing of Terrorism Framework, further measures may be necessary to protect the banks' access to global markets.

## **5. CENTRAL GOVERNMENT OPERATIONS AND DEBT**

5.1 By restructuring its USD526 mn commercial bond in March 2017, GOBZ was able to create some fiscal space. Interest payable on the bond fell<sup>1</sup>, and principal repayments were pushed back to 2030–34, instead of beginning in August 2019. Having been downgraded after initial announcement of the intention to restructure (in November 2016), and again following a delayed coupon payment in February 2017, Belize's foreign currency rating was upgraded<sup>2</sup> in March.

5.2 The restructuring required some fiscal tightening. A main condition of the refinancing was that GOBZ commit to tighten its fiscal stance by 3% of GDP in Fiscal Year (FY) 2017-18, in order to meet primary surplus targets of 2% of GDP for the subsequent three years. If these targets are not met, GOBZ must request International Monetary Fund technical assistance to recommend remedial measures. Furthermore, interest payments on the bond will become payable on a quarterly rather than semi-annual basis.

5.3 The 2017-18 Budget announced a number of measures, which were intended to increase revenues by 2.2% of GDP and reduce expenditure by 1.5% of GDP. Tax measures included higher excise taxes and higher import duties on selected goods, an increase in the environmental levy on most imported goods, and adjustments in the General Sales Tax (GST). On the expenditure side, there would be cuts in capital expenditure and a freeze in expenditure on goods and services.

5.4 The primary balance improved from a deficit of 1.9% of GDP in 2016-17 to a surplus of 1.3% in 2017-18. The overall balance was -1.6% in 2017-18, compared to -6.7% the previous year. The main reason for this improvement was the \$75.4 mn (33%) reduction in capital expenditure to \$151.9 mn. Current expenditure rose by 5.1% to \$1,021 mn, mainly due to increases in wages and pensions. Interest payments

<sup>1</sup> The interest rate fell from 5% to 4.9%, when it had been due to rise to 6.8% in August 2017.

<sup>2</sup> Standard and Poor's upgraded the foreign currency rating back to B-, with a stable outlook. In April, Moody's upgraded from Caa2 to B3.

grew by \$8.0 mn, following increased domestic borrowing to fund the final settlement of the nationalisation of BTL. Revenues were \$75.4 mn higher than in 2016-17; there were increased collections of personal income tax, business tax, and general sales tax, but revenues from international trade and transactions declined. In the first quarter of 2018-19, the primary surplus almost doubled, from \$33.3 mn to \$65.2 mn.

5.5 The sale of shares in BTL to the Social Security Board helped finance the outstanding compensation related to the nationalisation of BTL. Additional finance came from the issue of domestic debt and from external sources. Debt as a share of GDP increased to 95.3% at the end of 2017. In addition, towards the end of 2017, the Caribbean Court of Justice ruled that GOBZ should pay \$90 mn to a local bank, related to a guarantee provided by the Government in the 1990s. In 2018 GOBZ recognised the liability, but had not yet affected the payment as at the end of October.

5.6 Revenue performance in 2017-18 was slightly below target, mainly due to shortfalls in import duties (especially) and GST. Therefore further measures were announced in the 2018-19 Budget. These were mainly amendments to excise duties and to GST to reduce avoidance and improve compliance. According to the 2019-20 Budget Statement, current revenue exceeded budget in 2018-19, mainly due to strong income tax and GST performance. Meanwhile current expenditure was lower than forecast. The primary surplus was reported to be 2.2%.

## 6. **OUTLOOK**

6.1 CDB projects that the economy will grow by 2.3% in 2019. There should be continued recovery in the agricultural and fishing sectors, combined with a rebound in tourism. Belize should benefit from continued economic growth in the United States, its main source market for tourism and also a significant source of remittances. The current account deficit is expected to narrow, although this may be affected by rising oil prices. Over the medium term, there will be further expansion of the tourism sector, and agriculture will continue to recover boosted by investments in infrastructure. This will be necessary to limit the current account deficit and prevent a decline in reserves below the three-month level. The current account could be affected by continued appreciation of the United States dollar, which impacts economic competitiveness due to the exchange rate peg. An additional risk is the possibility of an extreme weather event, which could harm agriculture as it did in 2016.

6.2 If fiscal performance in the six months to the end of September continues, then there is a good chance of meeting the budgeted 2.2% primary surplus. Similar fiscal discipline will be required to repeat this performance in the following two years, as required by the commercial bond restructuring. In addition, GOBZ needs to start setting aside reserves to meet the principle payments bond, due from 2030.

6.3 Considering new loans agreed in 2018, with CDB and other development partners, debt is expected to fall to 93% of GDP by the end of 2018, and it should continue to fall in the following years. However, this trajectory is dependent on CBB's growth expectations and on fiscal forecasts being robust. A shock to growth, for example from an extreme weather event or a falloff in tourism; or an increase in recurrent expenditure, for example from a higher than budgeted wage settlement, will increase the debt-to-GDP ratio. The table below summarises debt-GDP forecasts for the next few years.

### **Debt/GDP 2018-2023**

%	2018	2019	2020	2021	2022	2023
Base case	92.9	91.0	89.0	87.2	85.6	84.4
0% growth	92.9	92.9	92.8	92.8	92.9	93.3
5% increase in budgeted payroll	92.9	91.6	90.8	90.8	91.7	93.6
Both	92.9	93.5	94.7	94.7	99.4	103.4

**APPENDIX 1.2      SOCIAL CONTEXT DETAILS**

**APPENDIX 1.2**

**MACRO SOCIAL CONTEXT**

Overview

1.0 The cayes of Belize are islands located between the mainland and the Barrier Reef. One such island in the Belize District is Caye Caulker, the second most populated and popular of the cayes in terms of tourism. Ambergris Caye is the largest and most popular tourist destination. The Belize Barrier Reef, the second largest in the world is visible from this island. Caye Caulker is located approximately 20 miles (32 km) north-northeast of Belize City, and is accessible by a 45-minute high-speed water taxi ride or by small plane. It measures approximately five miles (8.0 km) (north to south) and less than one mile (1.6 km) (east to west).

1.2 The main ethnic group on Caye Caulker is Mestizo, but other ethnic groups are represented and include Maya, Creole, Garifuna and East Indian. The 2010 Census estimated the population to be 1,763 persons (875 males and 888 females) in 555 households with an average household size of 3.2 persons. The Caye Caulker Village Council estimates an average daily population of up to 5,000 persons on the island including residents, 500 seasonal and non-seasonal workers in the tourism industry, and 2000 overnight tourists. The number of tourists has been increasing steadily from 2014, as shown in Table 1 below.

**TABLE 1- TOURIST ARRIVALS**

Year	2014	2015	2016	2017	2018
Total Tourists	85,249	105,460	125,997	143,539	178,133

*Source: Belize Tourism Board, 2018*

1.3 Historically, Caye Caulker became well-liked by 17th-century British buccaneers as a place to stop for water and repair their boats. Then in the late 1840s, Mestizos fleeing the Mexican Caste Wars arrived in northern Belize – Corozal and Orange Walk Districts. The area that became the village on Caye Caulker was formally purchased by Luciano Reyes around 1870 and parcels of land were sold to other families. Today, many of their descendants still hold these plots. Caye Caulker was originally a fishing settlement but during the 20th century, coconut processing, fishing, lobster trapping and boat building formed the backbone of the Caye’s economy. The island sits in the middle of natural migration routes for fish and

feeding grounds for conch and lobster and as such, it was one of the first islands to establish a fisherfolk cooperative in the 1960s, allowing members to receive quick payment for their catch. Tourism began in the late 1960s and 1970s when small numbers of budget travellers found their way to the island. Today, the primary income-earner is tourism-related businesses with fishing, boat building, and construction having receded to secondary means of livelihood. Merchants, bakers and skilled artisans including masons and carpenters started and expanded businesses on the island to provide services to the growing population.

### Tourism Sector

1.4 The tourism industry with its service-oriented activities, including an active night life, has had socio-cultural implications. Value systems and behaviours have been altered with evident changes in community structure and family relationships. Many locals seek their livelihood in the tourism industry and several employees who originate from mainland Belize leave their children and elders in the care of paid caregivers. Apartment rental to the increasing number of tourism sector workers has become commonplace and this has developed into a lucrative business for property owners. Illnesses related to poor sanitation, poor self-care and non-adherence to medical instructions for chronic/non-communicable diseases are common especially among the poorer segments of the population. Residents with higher economic status seek services at two private doctors' clinics or leave the island for care in Belize City or neighboring Mexico. Although Caye Caulker is categorised in the Statistical Institute of Belize Quintile 3 wealth rank, poverty is evident in households represented in the lower quintiles.

### Infrastructure and Services

1.5 All communities in Caye Caulker have landlines or cellular phone service or broadband or mobile internet services. Electricity is provided to communities by Belize Electricity Limited through four generators located on the island. Belize Water Services provide potable water to the island which owns and manages its own desalination plant. Most households use the public water supply while few have their own source of water.

1.6 In Caye Caulker, public utilities including electrical poles and wiring run along the beach area connecting to overwater structures. The poles used to run electric transmission wires are also used as support for telephone and cable television wires. In addition, water pipes are routed underground in the beach area and fed into the piers. Caye Caulker does not have a centralised sewer system, hence piping from the overwater structures such as restaurants run into septic tanks on land. The island is also serviced by several water taxis, including San Pedro Belize Express and Ocean Ferry. Tropic Air and Maya Island Air also provide airplane service to Caye Caulker.

1.7 A waste transfer station managed by the Belize Solid Waste Management Authority is located on the island and garbage is transported to the facility by private collection vehicles and carts. The waste is dumped and loaded onto a barge for transportation by sea to the regional sanitary landfill in Belize City. Traditional residential dwellings are constructed from timber with metal roofing while newer homes have concrete walls with concrete or metal roofing. Caye Caulker has a public and a private primary school, a secondary school, police station, public library, parks, playgrounds and three cemeteries.

**APPENDIX 1.3**

**CHAPTER 1 - ADDITIONAL APPENDICES**

PREVIOUS CDB INVOLVEMENT IN THE SECTOR

<b>Type of Financing</b>	<b>Year Approved</b>	<b>Amount Approved (US\$'000)</b>	<b>Description of Works</b>	<b>Comments</b>
Loan	1971	1,528.32	Generation and Distribution Capacity Expansion	Completed
Loan	1974	992.16	Generation and Distribution Capacity Expansion	Completed
Loan	1976	1,008.7	Generation and Distribution Capacity Expansion	Completed
Contingently recoverable TA Loan	1977	65	Electricity Expansion Study	Completed
Loan	1980	5,000	Electricity Expansion Project	\$4,912,727 Cancelled
TA Grant	1984	116.4	Stream Gauging Project	Completed
Loan	1986	3,079	Upgrade and Expansion of Distribution System; Loss Reduction Programme	Completed
TA Grant	1990	132	Institutional Strengthening	Completed
Contingently recoverable TA Loan	1994	42	Environmental Study	Completed
Loan	1994	7,500	Electricity Upgrade and Expansion Project	Completed
Additional Loan	1995	5,810	Electricity Upgrade and Expansion Project	Completed
Loan	2004	9,190	Electricity Upgrade and Expansion Project	\$9,190,000 Cancelled
Loan	2013	11,213	Electricity System Upgrade and Expansion Project	Under implementation (30% Complete)

## **APPENDICES TO CHAPTER 2 - PROJECT DESCRIPTION**

### **APPENDIX 2.1 COMPONENT DETAILED DESCRIPTION**

#### **Project Preparation**

- Submarine Cable Feasibility Study to determine the economic and technical feasibility of a proposed submarine cable project to supply to Caye Caulker from Ambergris Caye. The study undertook comprehensive multi-criteria analysis including Environmental and Social Impact Assessment (ESIA), options mapping, constraint mapping, load growth forecasting and modelling to identify the different feasible routes to connect Caye Caulker up to the main grid network and assess these routes in order to recommend a preferred route. The consultant has also supported BEL during public consultations required for ESIA approval and supporting the development of tender documents and the technical specifications for the cable and terrestrial works.

#### **Land**

- While, the majority of the project will take place on the seabed there is a requirement for the acquisition of relatively small amounts of land for the cable take-off and landing sites (each is expected to require approximately 160m<sup>2</sup>). Other land requirements include the temporary rental of land opposite the current generation station on Caye Caulker during the construction of the new substation. Based on the initial discussions with landowners, BEL are optimistic that both the purchase and rental of the respective sections will be resolved within the forecast project timeline. In the event BEL is unable to acquire land by agreement on reasonable terms it can use provisions in the Electricity Act 2000 and Land Acquisition Acts to undertake compulsory acquisition. All other land requirements pertain to the construction of either overhead or underground lines to connect the submarine cable with the new substation on South Caye Caulker. The proposed network design follows the "road reserve" a corridor that covers a 5m zone adjacent to a public road where BEL have the right to install electrical lines. As with the other land requirements, BEL can request compulsory acquisition to install lines should they be required to run outside the road reserve or where a road reserve may not exist.

#### **Infrastructure Works**

- **Ambergris Caye to Caye Caulker Submarine Cable:** Engineering, procurement, construction and installation of approximately 10.4 km of 15MVA, 46 kV insulated high voltage submarine cable from Ambergris Caye to Caye Caulker (CC). Including the take-off structure on Ambergris Caye and CC;
- **Underground feeders:** approximately 5 km of 46 kV underground cable on CC,

- **The Split crossing:** installation of approximately 0.25 km of submarine cable at the “Split” crossing between the northern and southern islands of CC, and
- **New Substation:** construction of a new 34.5/6.6 kV substation on the site of the existing power plant on South Caye Caulker.
- **Generation Station Decommissioning:** This includes environmental Clean-up of the existing Caye Caulker Power Station, including the construction of the new Caye Caulker substation. The power station will operate as a back-up station only with BEL planning to undertake a phased removal of the existing generation upon successful completion of the project.

#### Engineering and construction-related services

- **Engineering Supervision Consultant:** Responsible for certification of works, including acceptance of technical designs, the fabrication of the cable to standard, verification that construction works adhere to specifications and certification of final electrical tests.
- **Climate Risk and Vulnerability Assessment:** The objectives of the CRVA are to (i) identify and evaluate the potential effects of climate change on the Sub-marine cable project on the project area and (ii) recommend resilience measures to address the identified risks and vulnerabilities and minimise impacts. This should include consultation with stakeholders to get a better understanding of the nature of the climate risk and adaptation issues, especially the historical experience of climate related hazards, the response and to agree on the scope.

#### Project Management

- The Project Coordinator (PC) shall report to the Senior Manager of System Planning and Engineering of Belize Electricity Limited (BEL) and will be accountable for the effective implementation of the Project. PC’s primary functions during project implementation will include overall planning, scheduling and monitoring of project activities, cost control, supervising procurement procedures and construction and coordinating the work of the consultants and other parties involved in the execution of the Project (see Appendix 6.5.1 for full TOR).
- The PE will report to the PC and will mainly be responsible for oversight of the installation crews installing the submarine cable and the also the relevant land-based works required to complete the project (see Appendix 6.5.3 for full TOR).
- The Environmental Safeguards Supervisor (ESS) will report to the PC and will mainly be responsible for oversight of the installation crews installing the submarine cable and the also the relevant land-based works required to complete the project (see Appendix 6.5.4 for full TOR).
- Community Liaison Officer (CLO) will manage the internal and external communication, public education, social outreach and stakeholder engagement outlined in the SEP (see Appendix 5.2.5 for full TOR).



**APPENDIX 2.2****RESULTS MONITORING PLAN**

<b>Indicator</b>	<b>Baseline</b>	<b>Year 2018</b>	<b>Year 2019</b>	<b>Year 2020</b>	<b>Year 2021</b>	<b>Responsibility for Data Collection</b>
1.1 Reduced System Average Interruption Duration Index (SAIDI) (#)	12.96; 1/1/2019					Project Coordinator
1.2 Sufficient capacity to meet increased projected demand (MW)	1.88; 12/13/2018	1.88	1.88	2.55		PC
1.3 Reduced Carbon Emissions (Tonnes)	8000; 1/1/2019					PC
1.4 Reduced System Average Interruptions Frequency Index (SAIFI) (#)	20.41; 1/1/2019					PC

<b>Indicator</b>	<b>Baseline</b>	<b>Year 2018</b>	<b>Year 2019</b>	<b>Year 2020</b>	<b>Year 2021</b>	<b>Responsibility for Data Collection</b>
1.1 Station Decommissioned (Yes/No)	no; 12/13/2018					PC
2.1 Supply lines installed or upgraded (Km)	0; 12/13/2018	0	0	0	10.4	PC
Urban ;						
Rural ;						

**APPENDICES TO CHAPTER 3 - FINANCING PLAN**

**APPENDIX 3.1      PROJECT COSTS AND PHASING PLAN**

## PROJECT COSTS PHASING AND FINANCING PLAN

Components	OCR-USD		Total	COUNTERPART		Total
	EIB CALC Resources	Equity and Market Resources		BEL	Executing Agency Counterpart Forecast	
<b>2018 TOTAL</b>						
Project Preparation			-	360,000	-	360,000
Project Management			-	-	-	-
<b>Base Cost</b>			-	<b>360,000</b>	-	<b>360,000</b>
Physical Contingency			-	36,000	-	36,000
Price Contingency			-	-	-	-
<b>Total Project Cost</b>			-	<b>396,000</b>	-	<b>396,000</b>
Interest During Implementation			-	-	-	-
Commitment Fees			-	-	-	-
<b>Total Financing</b>			-	<b>396,000</b>	-	<b>396,000</b>
<b>Percentage Financing</b>	<b>0.00%</b>	<b>0.00%</b>	-	<b>100.00%</b>	-	<b>100.00%</b>
<b>2019 TOTAL</b>						
Infrastructure Works	555,554	638,334	1,193,888	-	-	1,193,888
Engineering and Construction-related Services		25,000	25,000	20,716	-	45,716
Project Management			-	73,608	-	73,608
<b>Base Cost</b>	<b>555,554</b>	<b>663,334</b>	<b>1,218,888</b>	<b>94,324</b>	-	<b>1,313,212</b>
Physical Contingency	111,115	130,170	241,285	7,358	-	248,643
Price Contingency	10,734	12,742	23,476	6,372	-	29,848
<b>Total Project Cost</b>	<b>677,403</b>	<b>806,246</b>	<b>1,483,649</b>	<b>108,054</b>	-	<b>1,591,703</b>
Interest During Implementation	-	-	-	82,815	-	82,815
Commitment Fees	6,915	8,122	15,037	-	-	15,037
<b>Total Financing</b>	<b>684,318</b>	<b>814,368</b>	<b>1,498,686</b>	<b>190,869</b>	-	<b>1,689,555</b>
<b>Percentage Financing</b>	<b>40.50%</b>	<b>48.20%</b>	<b>88.70%</b>	<b>11.30%</b>	-	<b>100.00%</b>
<b>2020 TOTAL</b>						
Land			-	300,000	-	300,000
Infrastructure Works	1,111,112	1,276,669	2,387,781	-	-	2,387,781
Engineering and Construction-related Services		50,000	50,000	41,434	-	91,434
Project Management			-	132,223	-	132,223
<b>Base Cost</b>	<b>1,111,112</b>	<b>1,326,669</b>	<b>2,437,781</b>	<b>473,657</b>	-	<b>2,911,438</b>
Physical Contingency	222,220	260,332	482,552	43,224	-	525,776
Price Contingency	42,940	50,970	93,910	12,746	-	106,656
<b>Total Project Cost</b>	<b>1,376,272</b>	<b>1,637,971</b>	<b>3,014,243</b>	<b>529,627</b>	-	<b>3,543,870</b>
Interest During Implementation	-	-	-	165,632	-	165,632
Commitment Fees	13,832	16,244	30,076	-	-	30,076
<b>Total Financing</b>	<b>1,390,104</b>	<b>1,654,215</b>	<b>3,044,319</b>	<b>695,259</b>	-	<b>3,739,578</b>
<b>Percentage Financing</b>	<b>37.17%</b>	<b>44.24%</b>	<b>81.41%</b>	<b>18.59%</b>	-	<b>100.00%</b>
<b>2021 TOTAL</b>						
Infrastructure Works	833,334	957,504	1,790,838	250,000	-	2,040,838
Engineering and Construction-related Services		50,000	50,000	-	-	50,000
Project Management			-	99,169	-	99,169
<b>Base Cost</b>	<b>833,334</b>	<b>1,007,504</b>	<b>1,840,838</b>	<b>349,169</b>	-	<b>2,190,007</b>
Physical Contingency	166,665	196,499	363,164	59,918	-	423,082
Price Contingency	32,205	38,229	70,434	9,561	-	79,995
<b>Total Project Cost</b>	<b>1,032,204</b>	<b>1,242,232</b>	<b>2,274,436</b>	<b>418,648</b>	-	<b>2,693,084</b>
Interest During Implementation	-	-	-	124,224	-	124,224
Commitment Fees	10,374	12,185	22,559	-	-	22,559
<b>Total Financing</b>	<b>1,042,578</b>	<b>1,254,417</b>	<b>2,296,995</b>	<b>542,872</b>	-	<b>2,839,867</b>
<b>Percentage Financing</b>	<b>36.71%</b>	<b>44.17%</b>	<b>80.88%</b>	<b>19.12%</b>	-	<b>100.00%</b>
<b>TOTALS</b>						
Project Preparation			-	360,000	-	360,000
Land			-	300,000	-	300,000
Infrastructure Works	2,500,000	2,872,507	5,372,507	250,000	-	5,622,507
Engineering and Construction-related Services		125,000	125,000	62,150	-	187,150
Project Management			-	305,000	-	305,000
<b>Base Cost</b>	<b>2,500,000</b>	<b>2,997,507</b>	<b>5,497,507</b>	<b>1,277,150</b>	-	<b>6,774,657</b>
Physical Contingency	500,000	587,001	1,087,001	146,500	-	1,233,501
Price Contingency	85,879	101,941	187,820	28,679	-	216,499
<b>Total Project Cost</b>	<b>3,085,879</b>	<b>3,686,449</b>	<b>6,772,328</b>	<b>1,452,329</b>	-	<b>8,224,657</b>
Interest During Implementation	-	-	-	372,671	-	372,671
Commitment Fees	31,121	36,551	67,672	-	-	67,672
<b>Total Financing</b>	<b>3,117,000</b>	<b>3,723,000</b>	<b>6,840,000</b>	<b>1,825,000</b>	-	<b>8,665,000</b>
<b>Percentage Financing</b>	<b>35.97%</b>	<b>42.97%</b>	<b>78.94%</b>	<b>21.06%</b>	-	<b>100.00%</b>

**APPENDICES TO CHAPTER 4 - PROJECT VIABILITY**

**APPENDIX 4.1 TECHNICAL ANALYSIS**

**APPENDIX 4.1.1: CAYE CAULKER GREEN HOUSE GAS EMISSION CALCULATIONS  
BASELINE VS SUBMARINE CABLE**

**1. METHODOLOGY**

1.1 To calculate the forecast emission reductions of the project the following assumptions have been used:

- (a) A baseline generation amount is calculated using the two-year average from 2016-2017 on Caye Caulker, as it is the most complete data set available.
- (b) The forecast consumption on Caye Caulker for 2022 uses the high-side scenario. This has been used as it represents the theoretical maximum load and therefore emissions that would be attributed to the load on Caye Caulker by 2022.
- (c) Full site decommissioning is forecast for 2022, it is forecast the diesel generation plant will operate in a back-up capacity, with 52 hours of operation over the year. This is equivalent to 0.06% of total annual running hours and has a very small effect on the total emissions calculations.
- (d) It is assumed that the submarine cable services 100% of the load on Caye Caulker after the full site decommissioning.

**GENERATION BASELINE**

<b>Description</b>	<b>Amount</b>	<b>Unit</b>	<b>Source</b>
2016-2017 Average Annual CC generation	10,096	MWh	BEL
2021 CC Diesel Back-up Generation	68.3	MWh	BEL

**LOAD GROWTH PROJECTIONS**

<b>Description</b>	<b>Amount</b>	<b>Unit</b>	<b>Source</b>
CC Consumption Growth per year HIGH	4.1	%	Mott Macdonald analysis
Forecast Annual consumption 2022 HIGH	11,389	MWh	Mott Macdonald analysis

**EMISSION FACTORS USED**

<b>Description</b>	<b>Amount</b>	<b>Unit</b>	<b>Source</b>
CC Baseline Emission Factor	0.8	(tCO <sub>2</sub> /MWh)	The emission factor of 0.8 t-CO <sub>2</sub> /MWh, stated in the small-scale CDM methodology AMS-I.F. “ <i>Renewable electricity generation for captive use and mini-grid</i> ”
BEL Grid Emission Factor	0.3038	(tCO <sub>2</sub> /MWh)	UNEP RISOE, 2013, 3-year generation weighted average of the Average OM emission factor for the period 2009-2011.

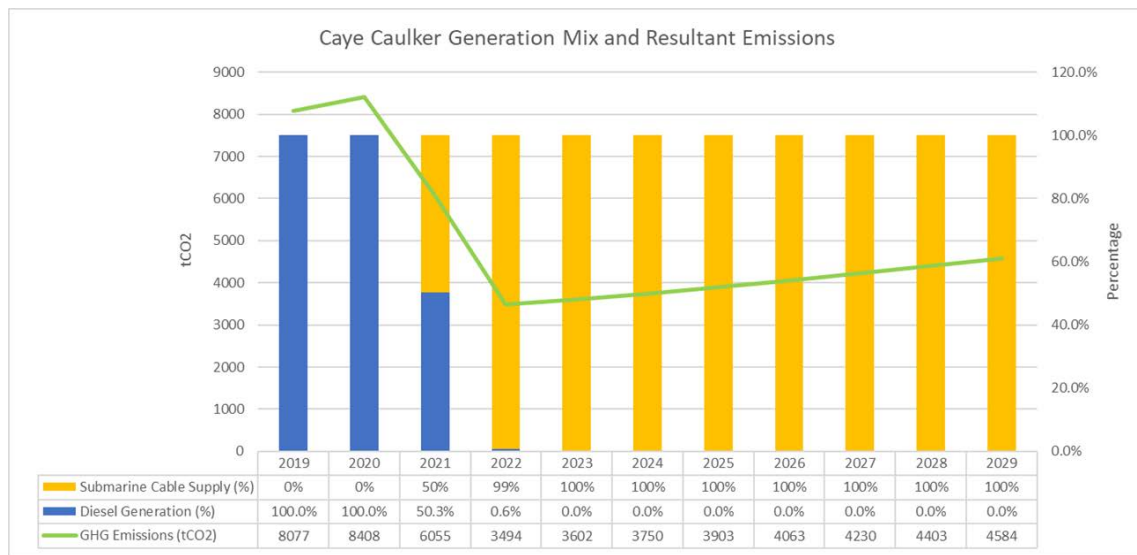
**2. RESULTS**

2.1 The results show a 57% reduction in emissions under the high load growth scenario.

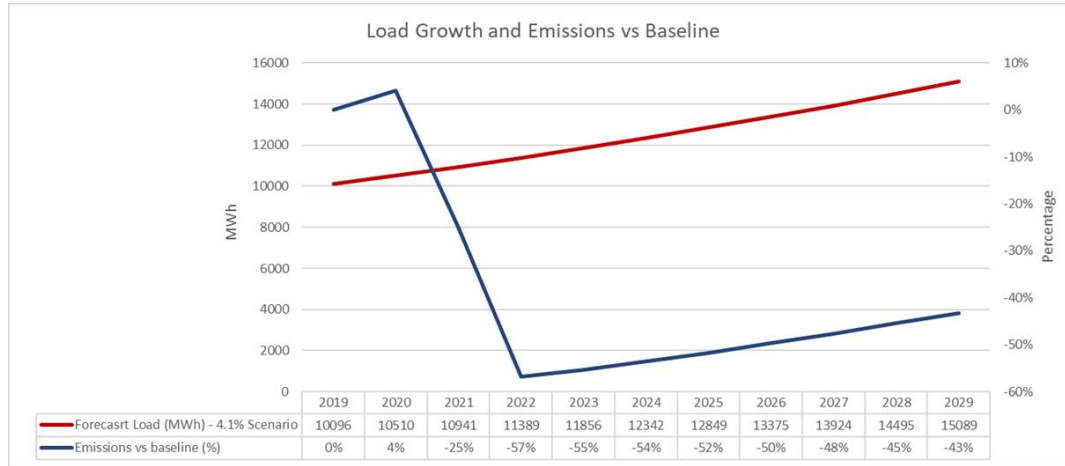
Description	Amount	Units
Caye Caulker 2018 Baseline Carbon emissions	8076.8	tCO2/year
Caye Caulker 2022 Target Carbon Emissions (High Growth)	3494.0	tCO2/year
Reduction vs baseline (tCO2/year)	4582.8	tCO2/year
Reduction vs baseline (%)	57%	Percentage

2.2 The results, see Figure 1 below, show emissions reductions following the installation of the cable, this includes: 2021 when the diesel plant will operate for approximately 4-6 months until the cable is fully operation; and 2022 when the diesel plant will operate for approximately 52 hours in a back-up capacity.

**FIGURE 1: CAYE CAULKER GENERATION MIX AND RESULTANT GREEN-HOUSE-GAS EMISSIONS.**



2.3 Furthermore, the significant reduction vs the baseline is expected to remain for the lifetime of the project although load growth will reduce this reduction over the period, see Figure 2 below.

**FIGURE 2: CAYE CAULKER LOAD GROWTH AND THE EFFECT ON EMISSIONS.****APPENDIX 4.1.2 SHORTLISTED ROUTES**

1.01 BEL selected Route 5 as the preferred route for the cable after multi-criteria analysis was used during the preparatory feasibility study. The multi-criteria used included: the ability of the route to meet the project's objectives; technical feasibility; economic feasibility; environmental feasibility; social feasibility; and future resilience. The following tables show a summary of the features of the different routes that affect cost and also the scores from the multi-criteria analysis.

**TABLE 4.1.2.1: SUMMARY OF ROUTES**

Route No.	Route Description	Cable Length (km)	Terrestrial works required			Implementation Cost (USD)
			Feeders	'Split' crossing	34.5/6.6 kV Substation	
1	North Point Landing with New Caye Caulker North Island substation	9.16	Underground	Required	New location on North Caulker	4,834,655
2	North Point Landing with Re-development of Caye Caulker Diesel Power Station Substation	9.16	Underground	Required	Redevelop Diesel Power station site	4,833,780
3	Caye Caulker Diesel Power Station Landing with Substation Re-development	15.67	Not required	Not required	Redevelop Diesel Power station site	6,717,500
4	Landing South of Forest Reserve with New Caye Caulker North Island substation	10.4	Underground	Required	New location on North Caulker site	4,927,875
5	Landing south of Forest Reserve with Re-development of Caye Caulker Diesel Power Station Substation	10.4	Underground	Required	Redevelop Diesel Power station site	4,927,000

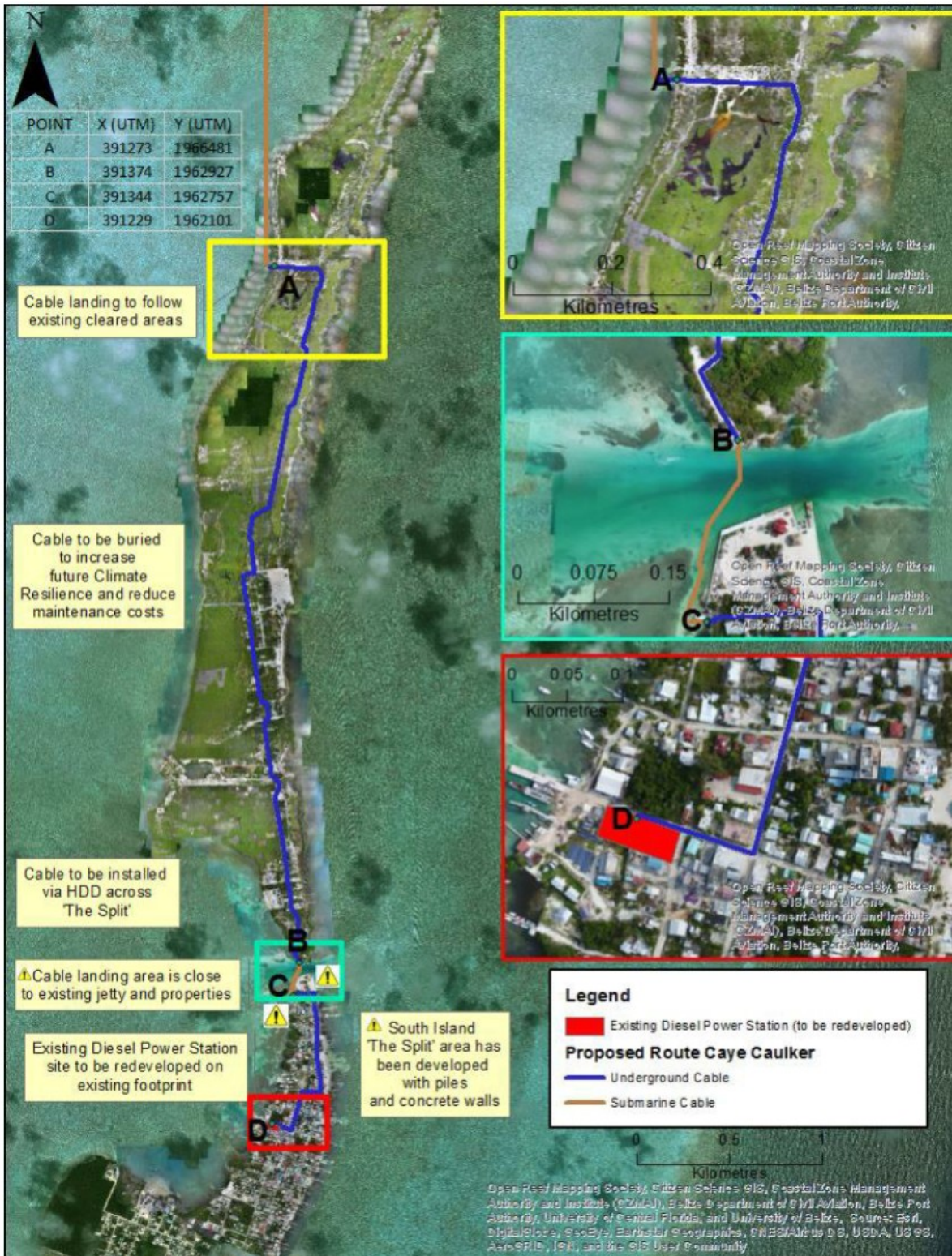
Criteria (Weighting)	Meet obj	<b>TABLE 4.1.2.2: SUMMARY OF MULTI-CRITERIA ANALYSIS USED TO SELECT ROUTE 5</b>						
BAU	1.33	2.67	3	2.25	2	2	17.25	powered generator.
Route 1	4.67	2.67	3.5	3	2.67	3.5	27.35	Greatest environmental impact and requires significant new infrastructure on the north of Caye Caulker which could escalate costs.
Route 2	4.67	2.33	2.5	3	4.33	3.5	27.33	Greatest environmental impact. Redeveloping existing power station while keeping it operational could be problematic. From a technical point of view significant infrastructure could be required in the north of Caye Caulker.
Route 3	4.67	2.67	3	3	3	4.5	28.18	Submarine cable will be expensive. Redeveloping existing power station while keeping it operational could be problematic.
Route 4	4.67	3.33	3.5	2.75	2.67	4	28.92	Reduces installation risks and costs relative to Route 1, while protecting the highest quality area of forest at the northern tip of Caye Caulker and reducing the amount of new infrastructure required for cable installation and operation/ maintenance.
Route 5	4.67	3.33	3.5	2.75	4.33	4	30.58	Provides more cost-effective route than Route 3. Reduces installation risks and costs relative to Route 1, while protecting the highest quality area of forest at the northern tip of Caye Caulker and reducing the amount of new infrastructure required for cable installation and operation/ maintenance.

**APPENDIX 4.1.3 ROUTE 5 – LANDING SOUTH OF THE FOREST RESERVE WITH RE-DEVELOPMENT OF CAYE CAULKER DIESEL POWER STATION**



Source: Mott MacDonald, 2018. Data sources: Aerial Imagery - ArcMap Base Map, Existing infrastructure – BEL.

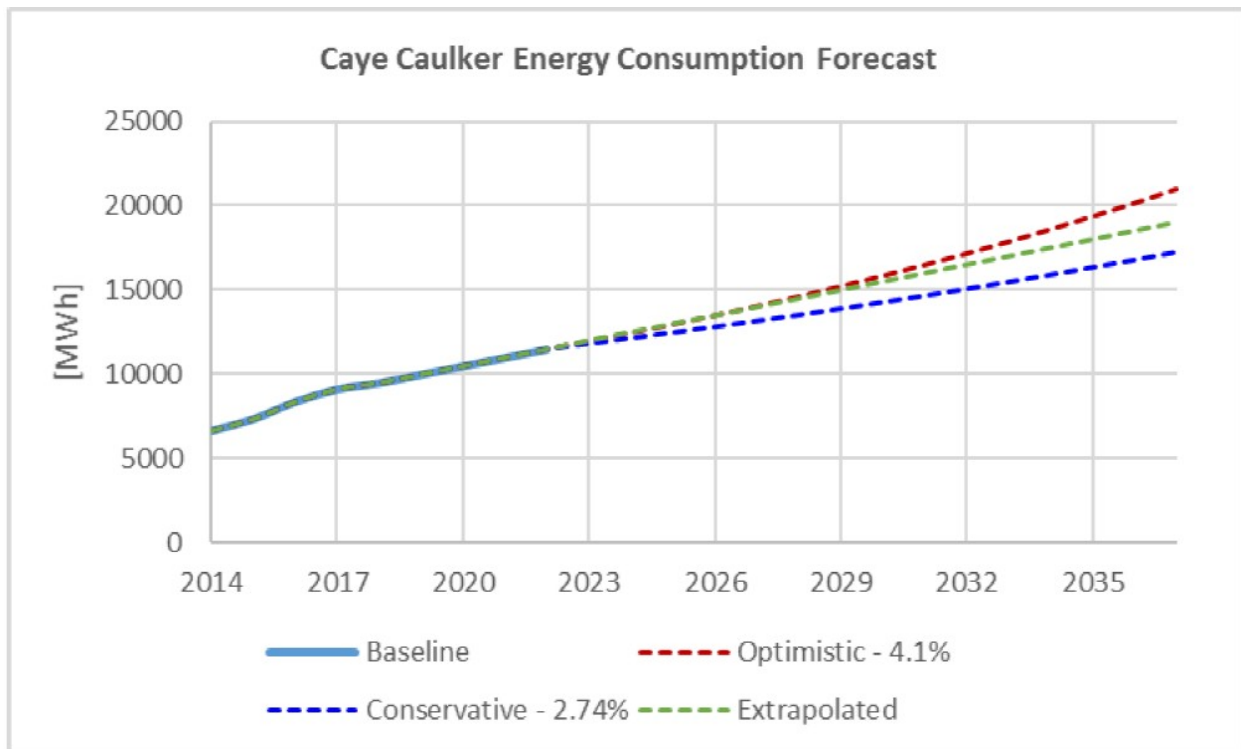




Source: Mott MacDonald, 2018

#### **APPENDIX 4.1.4    LOAD GROWTH ON CAYE CAULKER**

1.1     A load growth assessment was carried out during the feasibility study for Caye Caulker to forecast the magnitude of the future demand (Figure below). The central estimate predicts a doubling in maximum load demand by 2037 to 4.0 MW. These estimates were used to inform the route infrastructure specifications and cost estimates.



Source: Mott MacDonald, 2017.

1.2     Using the load demand profile information for the feeders supplied from the main Caye Caulker substation the maximum load demand of the substation was determined. The multiplying factors determined from the energy consumption forecast to 2037 were applied to the 2017 maximum load demand to forecast the 2037 maximum load. The summary of the forecast of the maximum load demands under each load growth scenario is shown in the Table 1 below.

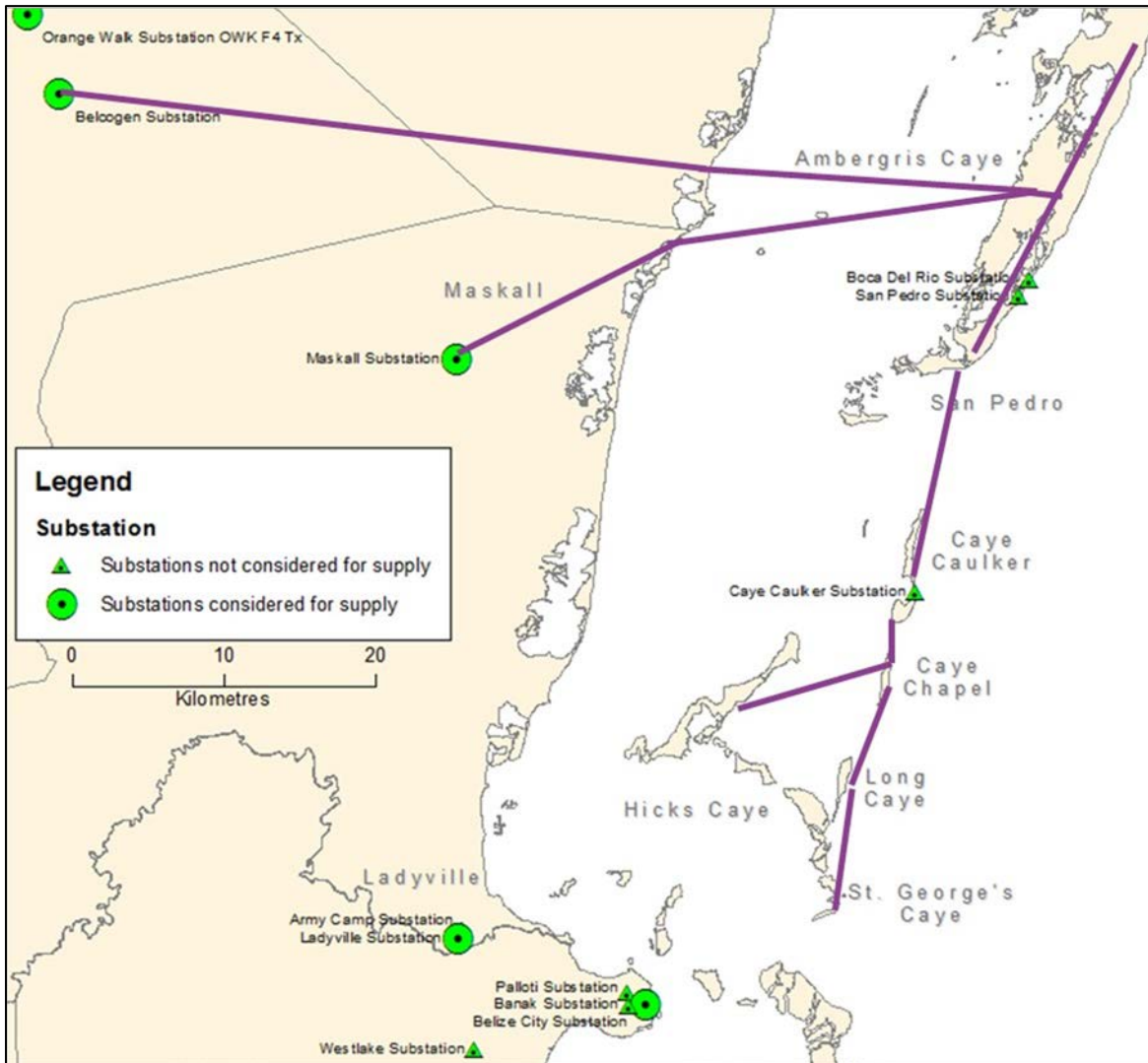
**Table 1: Summary of load demand growth at Caye Caulker**

SCENARIO	Multiplier relative to 2017 level [%]	2017 peak load demand [MW]	2037 peak load demand [MW]	Growth headroom by 2037 [MW]
Pessimistic (2.74%)	189.1	1.88	3.555	1.675
Extrapolated	208.8	1.88	3.925	2.045
Optimistic (4.1%)	230.5	1.88	4.333	2.453

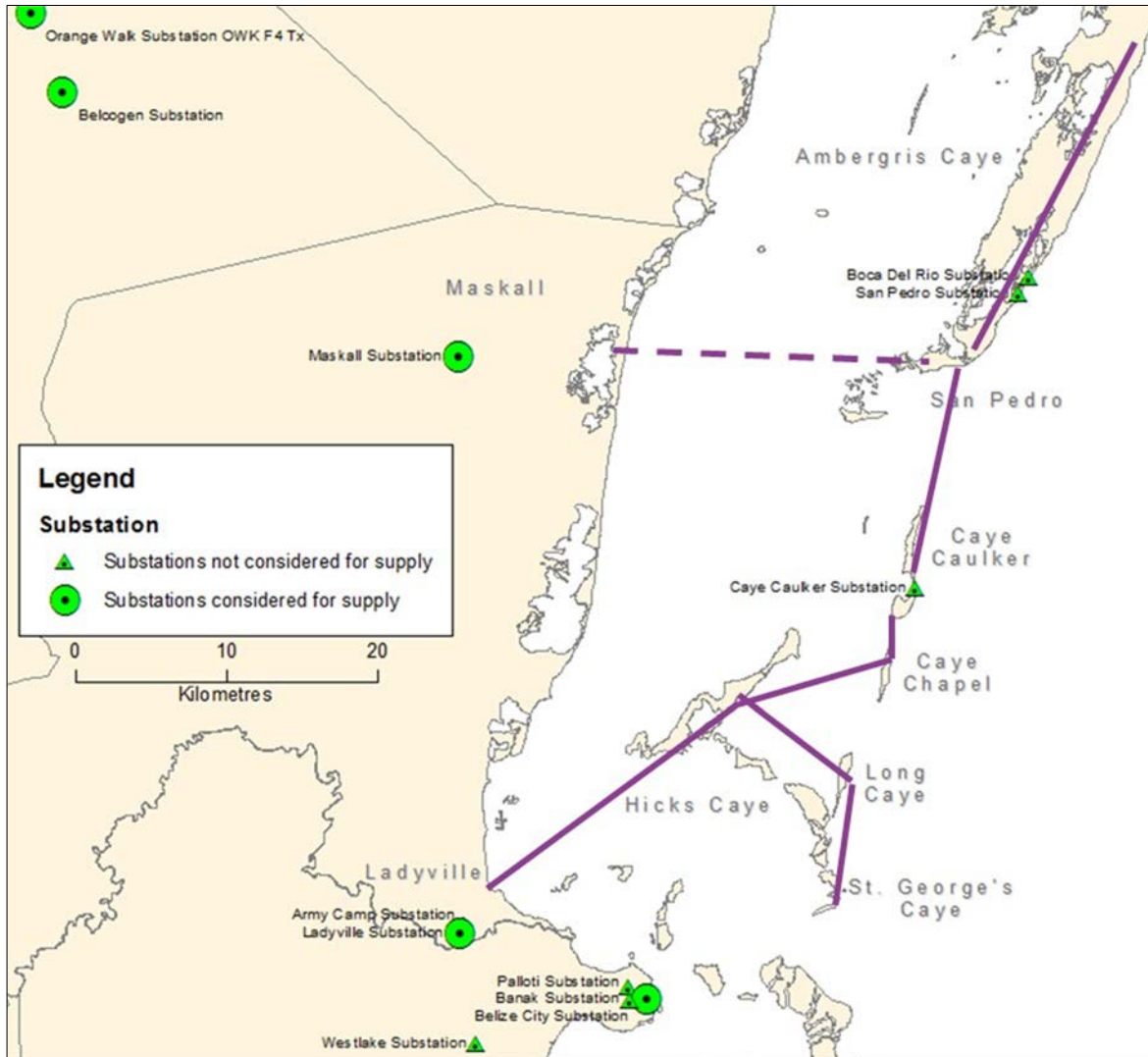
Source: Mott MacDonald, 2017.

**APPENDIX 4.1.5 BEL WIDER ASSESSMENT OF POTENTIAL OPTIONS TO CONNECT OUTER CAYES**

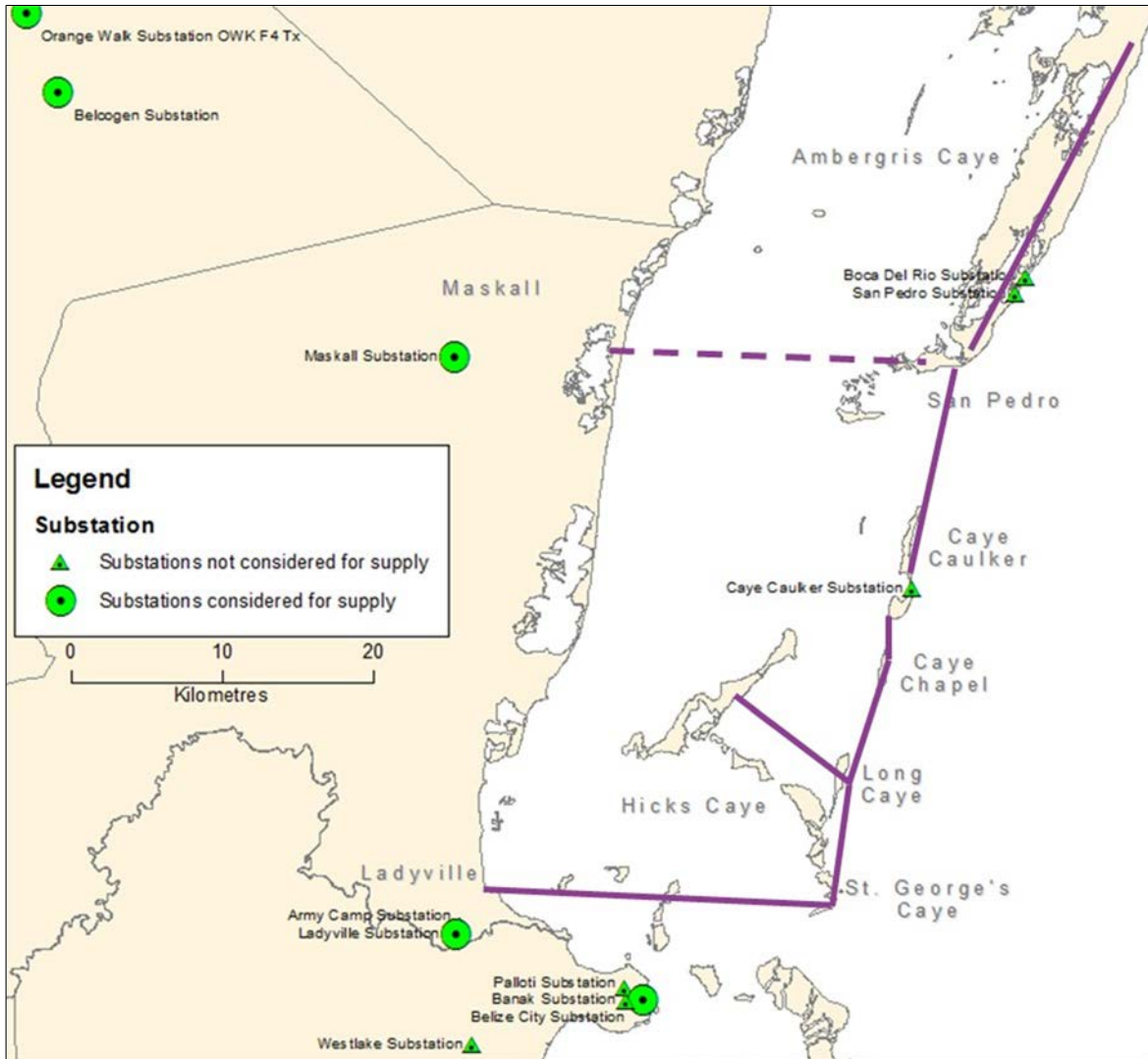
**FIGURE 1: TWO NEW AMBERGRIS SUBMARINE CABLES, CONNECTING ALL ISLANDS.**



**FIGURE 2: ISLAND RING NETWORK OPTION 1**



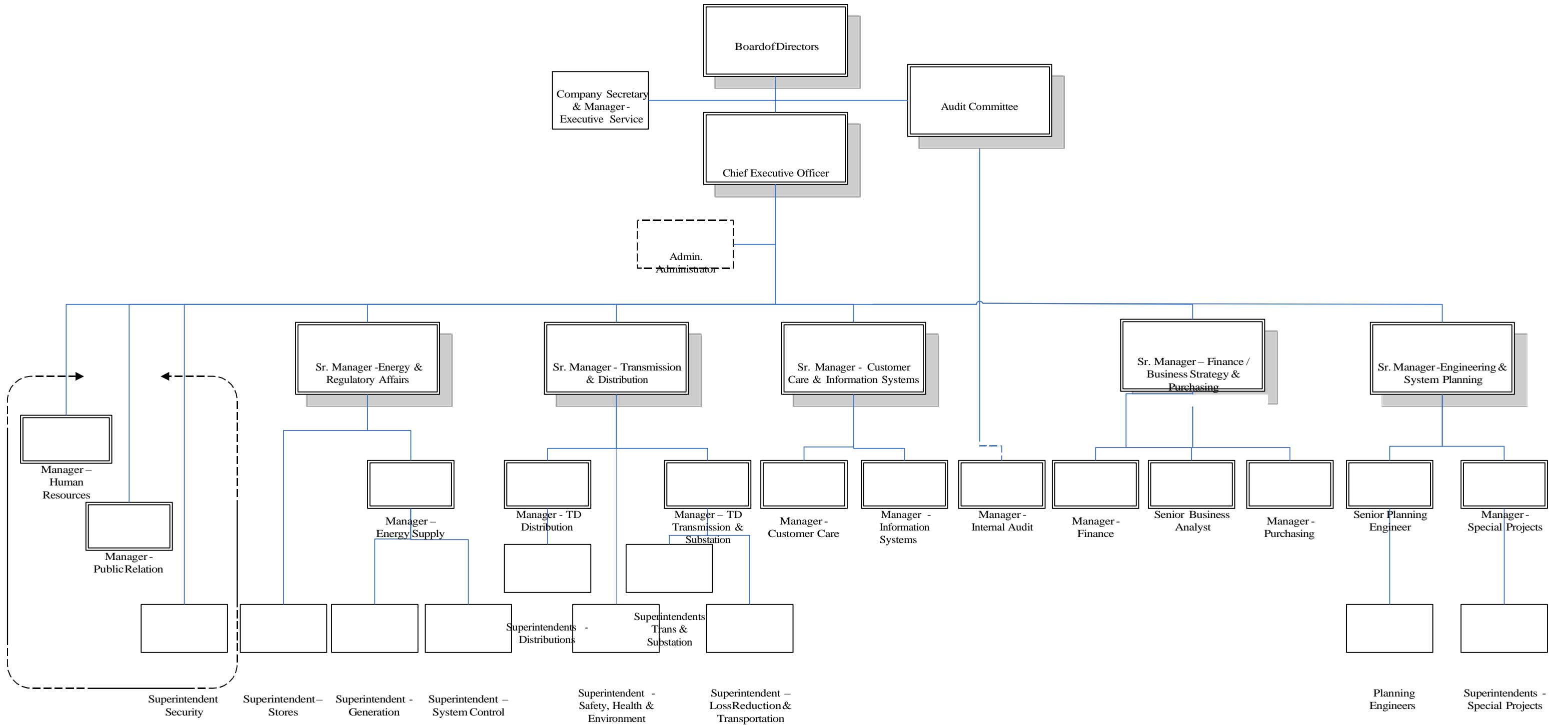
**FIGURE 3: ALTERNATIVE ISLAND RING NETWORK.**





## Belize Electricity Limited High Level Organisational Chart

Management (Approved)  
Date: August 2017





**APPENDIX 4.3      FINANCIAL ANALYSIS**

**HISTORICAL BALANCE SHEET AS AT  
DECEMBER 31**

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.



**HISTORICAL INCOME STATEMENT**  
**FOR THE YEARS ENDING DECEMBER 31**  
**(\$ '000)**

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.



**HISTORICAL KEY FINANCIAL RATIOS AS AT DECEMBER 31**

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.



**ASSUMPTIONS TO THE FINANCIAL ANALYSIS**

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.



**PROJECTED BALANCE SHEET AS AT DECEMBER 31**  
**(\$'000)**

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.





**PROJECTED INCOME STATEMENT FOR THE PERIOD ENDED DECEMBER 31**  
**(\$'000)**

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.



**PROJECTED CASH FLOW STATEMENT FOR THE YEAR ENDED DECEMBER 31**  
**(\$'000)**

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**PROJECTED KEY FINANCIAL RATIOS AS AT DECEMBER 31**

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.



**PROJECTED DEBT SERVICE SCHEDULE FOR THE YEARS ENDING DECEMBER 31  
(\$'000)**

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.





**ASSUMPTIONS TO THE FINANCIAL RATE OF RETURN**

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**TABLE 1: FINANCIAL RATE OF RETURN CALCULATION**

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**APPENDIX 4.4      ECONOMIC ANALYSIS**  
**ASSUMPTIONS TO THE ECONOMIC ANALYSIS**

1. For the purpose of the analysis, benefits and costs are stated in constant 2018 prices.
2. The analysis was performed for a 20-year period of operations.
3. The financial costs of the Capital Works have been converted to their economic cost equivalents by applying an overall conversion factor of 0.93. The calculations are shown in Table 3.
4. Conversion factors for the different cost components are provided in Table 1 below:

**TABLE 1: CONVERSION FACTORS FOR COST ADJUSTMENT**

<b>Item</b>	<b>Shadow Rate</b>	<b>Standard Conversion Factor</b>	<b>Base Factor</b>
Skilled labour	1.00	0.93	0.93
Materials Local	0.90	0.93	0.84
Materials Foreign	1.00	0.93	0.93
Equipment	1.00	0.93	0.93

5. The derivation of the Specific Conversion Factors (SpCFs) used to convert financial cost of the capital works is given in Table 2 below:

**TABLE 2: DERIVATION OF SPECIFIC CONVERSION FACTORS**

<b>Item</b>	<b>Skilled Labor</b>	<b>Local Materials</b>	<b>Imported Materials</b>	<b>Equipment</b>	<b>SpCF</b>
<b>Base Factor</b>	<b>0.93</b>	<b>0.84</b>	<b>0.93</b>	<b>0.93</b>	
1. Project Preparation	-	-	-	-	-
2. Land	-	-	-	-	-
3. Infrastructure Works	0.20	-	0.60	0.20	0.93
4. Engineering and Construction-related Services	0.90	-	-	0.10	0.93
5. Project Management	0.90	-	-	0.10	0.93

6. Computation of the overall Conversion Factor for the Project is shown in Table 3.

**TABLE 3: OVERALL CONVERSION FACTOR FOR THE PROJECT**

<b>Item</b>	<b>Financial Cost</b>	<b>SpCF Materials</b>	<b>Economic Cost</b>
1. Project Preparation	720	1.00	720
2. Land	575	1.00	575
3. Infrastructure Works	13,523	0.93	12,576
4. Engineering and Construction-related Services	300	0.93	279
5. Project Management	732	0.93	681
<b>Total Base Cost &amp; Physical Contingencies</b>	<b>15,850</b>		<b>14,831</b>
<b>Overall Conversion Factor</b>			<b>0.94</b>

7. The quantified benefits assumed in the analysis relates reduced fuel imports for generation of electricity in Caye Caulker as well as reduction in CO<sup>2</sup> emissions following decommissioning of the of the existing diesel Plant on the island
8. The analysis assumes that the Project will result in the displacement of 734,371 (US) gallons of imported diesel fuel per annum based on average annual fuel usage at the power plant over the past 5 years. The economic cost of imported diesel fuel in Belize was assessed at \$4.86 per gallon and the efficiency rate at 12 kwhs per gallon of fuel.
9. Benefits associated with reduction in CO<sup>2</sup> emissions were valued based on research undertaken by the United States Interagency Working Group (IWG), on the Social Cost of Carbon (SCC). SCC is a comprehensive estimate of climate change damage and includes agricultural productivity, human health and property damage from increased flood risk. IWG based these estimates on a linking of global climate and economic models, allowing for the valuation of economic damage associated with increasing CO<sup>2</sup> emissions and thereby enabling the damage caused by CO<sup>2</sup> to be monetised for incorporation into cost-benefit analyses. Based on this work, a value of USD61/tonne of CO<sub>2</sub> was used in this analysis.
10. Historical analysis of fuel consumption pattern at the Caye Caulker Plant suggest approximately 12,000 tons of CO<sup>2</sup> could be avoided by displacement of the diesel generators. However, as only 50% of the energy supplied via the submarine cable originates from renewable sources, the CO<sup>2</sup> emissions avoided has been conservatively estimated at 6,000 tons.
11. Project assets are assumed to be fully depreciated over the Project assumed life of 20 years.

<b>ERR CALCULATION</b>				
<b>(\$'000)</b>				
<b>Year</b>	<b>Capital Cost</b>	<b>Social Cost of Carbon Benefits</b>	<b>Displaced Diesel Imports</b>	<b>Net Benefits</b>
2018	737			(737)
2019	6,026			(6,026)
2020	4,939		1,785	(3,154)
2021	3,128	244	2,677	(207)
2022		488	3,569	4,057
2023		488	3,569	4,057
2024		488	3,569	4,057
2025		488	3,569	4,057
2026		488	3,569	4,057
2027		488	3,569	4,057
2028		488	3,569	4,057
2029		488	3,569	4,057
2030		488	3,569	4,057
2031		488	3,569	4,057
2032		488	3,569	4,057
2033		488	3,569	4,057
2034		488	3,569	4,057
2035		488	3,569	4,057
2036		488	3,569	4,057
2037		488	3,569	4,057
2038	-	488	3,569	4,057
<b>ERR CALCULATION</b>				<b>26%</b>
<b>NPV</b>				<b>\$10,518</b>

**APPENDIX 4.5      SOCIAL ANALYSIS**  
**DRAFT TERMS OF REFERENCE**  
**COMMUNITY LIAISON OFFICER**

**1.      BACKGROUND**

1.1      Belize Electricity Company (BEL) has received financing from the Caribbean Development Bank (CDB) for the interconnection of Caye Caulker Island with the Belize Mainland via a 10 km long submarine cable. The Project aims to procure and install a 15M VA rated submarine cable designed to operate between 34.5 kV and 46 kV.

**2.      OBJECTIVE/OUTCOME**

2.1      The expected outcome of the Project is improved quality and reliability of electricity supply to Caye Caulker with sufficient capacity that caters to projected demand to 2037. This will be achieved through an interconnection of the distribution network on the island with the Belize mainland transmission via a submarine cable.

**3.      SCOPE OF SERVICES**

3.1      The Community Liaison Officer (CLO) will promote constructive partnerships and communication between BEL and the communities on issues relating to project implementation and will be responsible for implementing community engagement activities as set out in the Stakeholder Engagement Plan (SEP). Among other activities, the CLO will:

- (a)      Review SEP with a view to identifying and documenting any gaps in the (i) stakeholder identification and analysis that was undertaken; (ii) stakeholder engagement programme (e.g., information to be disclosed, format and communication methods; stakeholder consultation methods); and (iii) schedule for the various stakeholder engagement activities. Information in the Environmental and Social Impact Assessment should be used to support SEP review and implementation. The SEP must be updated to address any gaps identified;
- (b)      Maintain updates to the SEP as necessary based on issues arising during implementation. Any major changes to the Project activities and/or schedule will be duly reflected in the updated SEP;
- (c)      Provide timely feedback to BEL on concerns raised by community leaders;
- (d)      Provide timely feedback to community members on project implementation, concerns raised or important decisions taken by BEL in accordance with agreed protocols;
- (e)      Develop public relations programmes along with BEL, Non-Governmental Organisations, and Community-Based Organisations to educate community members about the Project and encourage their continuous buy-in and active participation throughout the project cycle;
- (f)      Facilitate dialogue and sensitise Project communities as necessary, with particular attention being paid to obtaining information from the less vocal persons in the communities through the use of differential participation techniques;
- (g)      Identify potential grievances or project risks/opportunities;

- (h) Assist BEL with management of grievances lodged through the Grievance Redress Mechanism of the SEP;
- (i) Support BEL managers as needed (e.g. during the local labour recruitment process by assisting with drafting gender-responsive local hiring policies and procedures) especially where community requirements are being solicited;
- (j) Manage stakeholder engagement logistics such as soliciting suggestions/grievances from suggestion boxes, placing communication materials on notice boards and via social media, and arranging community meetings;
- (k) Facilitate stakeholder participation at all relevant levels in accordance with the identified needs of the different categories of stakeholders, particularly women. This may include other activities – participatory assessments and problem-solving of issues, concerns and opportunities, focus group discussions, information-sharing, and community meetings;
- (l) Assist in evaluating the social, environmental and economic impacts of Project activities on the well-being of community members using participatory approaches;
- (m) Assist the Project Coordinator (PC) in ensuring that the implementation of project activities is in conformance Belize’s and CDB’s environmental and social requirements;
- (n) Attend Project Steering Committee meetings as required and provide information on community discussions, highlighting any current and/or potential challenges likely to impact implementation progress;
- (o) Maintain comprehensive and updated minutes of meetings with the community and other stakeholders;
- (p) Prepare and submit to the PC inputs for incorporation into monthly progress reports to CDB;
- (q) Prepare and submit to the PC, inputs for incorporation into a Project Completion Report, within three months after practical completion of the works; and
- (r) Promote awareness of health and safety risks directly associated with the Project.

#### **4. DURATION**

- 4.1 The consultancy is expected to last no more than twenty-four (24) months from the date of contract signing.

#### **5. REPORTS/DELIVERABLES**

- 5.1 CLO will have an office on site and shall report to BEL’s Communications Manager. CLO will furnish reports/deliverables on the assignment as set out below:
  - (a) Prior to commencement of the works and in conjunction with BEL, develop and implement a results-based, gender-sensitive Monitoring and Evaluation (M&E)

framework/plan for the SEP that monitors the implementation of the SEP and includes the following indicators:

- (i) Number of consultation meetings and other public discussions (forums, focus groups, etc.) conducted within a reporting period. The reporting period will be defined in the framework (e.g. monthly, quarterly, or annually);
  - (ii) % of women participating in consultations by reporting period;
  - (iii) Number of grievances received within a reporting period, number of those resolved within the prescribed timeline, disaggregated by sex of the complainant; and
  - (iv) Number of project-related press materials published /broadcasted in the national media.
- (b) Other information to be collected shall include:
- (i) Geographic origin and type of grievances received, and reasons for non-resolution within the prescribed timeline including an analysis of trends;
  - (ii) Analysis of project-related press releases content: proportion that is favourable, unfavourable, neutral, and trends;
- (c) Provide a weekly (structured) field report to BEL including consultations undertaken, attendance registers (where applicable), concerns raised, requests raised, concerns resolved, potential risks, grievances or opportunities identified;
- (d) Assist in compiling a quarterly report for external stakeholders on stakeholder engagement activities undertaken during the previous quarter including the current status of M&E actions. The quarterly report shall include summarised information on participatory methods employed, grievances received from stakeholders (including information on incidents and events that resulted in grievances) and will be collated by the responsible staff and referred to the PC. These summaries will be accompanied by information on the implementation status of associated corrective and preventative actions and recommendations. This report shall form part of the quarterly status reporting (provided by the PC) for the Project; and
- (e) Assist in the compilation of relevant sections of the Project Completion Report.

## **6. QUALIFICATIONS AND EXPERIENCE**

6.1 The consultant should possess the following minimum qualifications:

- (a) A post-graduate degree or equivalent qualification in the Sociology, Anthropology, International Development, Community Development or other relevant discipline.
- (b) A minimum of ten (10) years relevant practical experience encompassing stakeholder engagement practice, community development, and/or social research using participatory approaches.



- (c) Fluency in English and competence in Spanish are required.

**BUDGET**

**USD**

<b>ITEM</b>	<b>TOTAL</b>
Consultancy Services	90,000
Contingencies	10,000
<b>TOTAL</b>	<b>100,000</b>

**APPENDIX 4.6      GENDER MARKER ANALYSIS**

<b>Project Cycle Stage</b>	<b>Criteria</b>	<b>Score</b>
Analysis 1	Consultations with relevant categories of males and females and relevant gender-related public/ private sector organisations and Non-Governmental/ Community-Based Organisations will take / have taken place	Yes
Analysis 2	Socioeconomic, Sector and/or Institutional analysis considers gender risks and/or gender disparities that impact the achievement of project outcomes.	Yes
Design 1	Project interventions / policies address existing gender disparities.	No
Design 2	Project objective / outcome includes the enhancement of gender equality or the design of gender-responsive policies or guidelines.	No
Implementation 1	Implementation arrangements include either: Capacity building initiatives to enhance gender mainstreaming of the executing and/or implementing agency. Or Active participation of representatives of gender-relevant stakeholders in project execution.	No
Implementation 2	Terms of Reference of consultancy/project coordinating unit/project management unit includes responsibilities and resources, including budgets for gender mainstreaming.	No
Monitoring and Evaluation 1	Sex-disaggregated data included in the baselines, indicators and targets of the RMF. Or Collection of sex-disaggregated data is part of the project.	Yes
Monitoring and Evaluation 2	At least one gender-specific indicator at the outcome and/or output level in the RMF or included in tranche releases of PBLs.	No

<b>Analysis</b>	<b>Design</b>	<b>Implementation</b>	<b>Monitoring &amp; Evaluation</b>	<b>Score</b>	<b>Code</b>
1.0	0.0	0.0	0.5	1.5	Marginally Mainstreamed (MM)

**APPENDIX 4.7      ENVIRONMENTAL ANALYSIS**

**APPENDIX 4.7.1 - DRAFT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT  
SUMMARY**

**1. PROJECT DESCRIPTION AND RATIONALE**

1.1 Caye Caulker is a limestone island off the coast of Belize located 32 kilometres north-northeast of Belize City. Currently, this island is not connected to the main national electricity grid but is instead supplied using diesel power generation. The existing supply is unable to meet the future load demand predicted to be 4MW by 2037, whilst the diesel generators themselves cause local nuisances due to high-levels of noise and air pollution. BEL aims to connect Caye Caulker to the main national grid power network in order to meet the required future electricity demands; improving upon the existing system reliability whilst ensuring a continuity of supply and reduced system losses. As a result of the requirements for increased electricity load supply, as well as an increase in the reliability of supply, the option of providing a connection to the main electricity grid via Ambergris Caye was developed. This will be achieved by (a) installing a submarine cable between Caye Caulker and Ambergris Caye, (b) constructing of a new sub-station, and (c) installing a 5 km of 46kV underground cable on Caye Caulker from the cable landing site to the new sub-station. The Project also includes decommissioning of BEL's diesel power plant on Caye Caulker, which is currently a source of air and noise pollution in the community.

1.2 The focus of the assessment was on those environmental and social impacts that were considered to be most significant. Information about issues that were felt to be important to key stakeholders and the general public was obtained through a rigorous process of public consultations.

**2. EVALUATION OF ALTERNATIVES**

**Terrestrial Cable Routing**

2.1 The cable will be located in a manner which will optimise resilience of the infrastructure. As the cable will require routing over terrestrial regions, an economic assessment was conducted to compare the whole-life cost of providing terrestrial routing using OHL as opposed to buried cable. The assessment found that, compared to OHL, buried cable will require minimal maintenance after the installation as opposed to the OHL where the maintenance cost would be significantly higher. Moreover, the replacement cost of OHL, resulting from severe hurricane damage is much higher than the employment of buried cable. Hence, the employment of buried cable was recommended instead of OHL.

**Submarine Cable Routing**

2.2 Four alternative options were evaluated for cable routing as follows:

- Route 1: North Point Landing with New Caye Caulker North Island Substation
- Route 2: North Point Landing with Re-development of Caye Caulker Diesel Power Station Substation
- Route 3: Caye Caulker Diesel Power Station Landing with Substation Re-development
- Route 4: Landing South of Forest Reserve

2.3 Given the composition of the seabed and bathymetry along the proposed route, the preferred selected installation techniques for most of the route will include: (i) combined trenching, cable installation and burial using a tracked vehicle; and (ii) trenching and cable installation as two separate processes (iii) Horizontal Directional Drilling (HDD) and (iv) Direct buried or ducted solution with J-tubes at the

termination. This wide range of techniques reflect the variation in the cabling requirements based on the zone through which the cable is being laid. In cases where the bathymetry is too shallow for vessels to trench, it is expected that the cable will be laid on the seabed and then buried using high power water jets, a process which effectively turns the seabed in the vicinity of the jet into a fluid causing the cable to gradually sink on its own weight. For landfall, the cable will be buried at around 1.5m depth to provide additional protection. HDD is expected to be used for the crossing of the split for additional protection and minimal marine disruption as it is an area of high vessel activity.

### **3. BASELINE ENVIRONMENTAL AND SOCIAL INFORMATION ON PROJECT AREA AND BENEFICIARIES.**

3.1 Caye Caulker has a population of 1,763 inhabitants (Statistical Institute Belize, 2010). Tourism and fishing are the main sources of employment for the labour force. Tourism is a significant contributor to Caye Caulker's economy, principally tourism related to water activities/sports like scuba diving and snorkelling. However, these activities are known to be potentially harmful to the local marine life and can compromise water quality.

3.2 Belize's has a tropical to subtropical with ~80% humidity. The country has a notable wet and dry season. Caye Caulker's dry season runs from December to May and the wet season, from June to November. Belize is also susceptible to natural hazards such as hurricanes and tropical storms, with the hurricane season coinciding with the wet season (beginning in June and ending in November) which can have major impacts on local infrastructure with economic consequences, notably in the agricultural sector. Rainfall ranges between ~1,350 mm / year in the north and west area of Belize and ~ 4,500 mm / year in the South. Temperatures vary depending on the area in Belize; along the coast temperatures can fluctuate by  $\pm 5^{\circ}\text{C}$  compared to inland locations. Throughout the year Caye Caulker has an average temperature of  $26.6^{\circ}\text{C}$ , with a seasonal variation of  $\pm 4^{\circ}\text{C}$ . The cooler months are between October to February (with May to September being the warmest months). The temperature differences are most significant during morning and night, due to the influence of the sea winds and the accelerated cooling of the soils which can result in temperatures reaching as low as  $15^{\circ}\text{C}$ .

3.3 Caye Caulker's marine area is generally shallow, with depths mostly less than 5 metres and some areas between 5 to 10 metres. The pH along Caye Caulker's marine areas varies between ~7.6-8.9. Sea temperatures in the region range around  $31\text{-}35^{\circ}\text{C}$ . However, Belize does not currently have a surface water standard and consequently the maximum and minimum temperatures that the ecosystem can withstand are unknown. The noise level, in the absence of any construction work, is typical of a busy village area and city area dominated by the cumulative effect of many unidentifiable sounds, mostly related to road traffic.

#### **Marine and Terrestrial Habitats and Flora and Fauna:**

3.4 Belize has six MPAs designated for different reasons. Two of these MPAs, Caye Caulker Forest Reserve (CCFR) and Hol Chan Marine Reserve (HCMR), overlap with the proposed cable route. The marine component of the CCFR encompasses an area of 39,113.36 ha, surrounding the northern tip of Caye Caulker, extending out to the barrier reef and then southward running parallel to the barrier reef to include reef areas as far south as Caye Chapel. The northern section of the reserve is dominated by a succession of mangrove species. The coastal waters around the CCFR comprises of two known coral reef systems and a total of 31 coral species have been documented on patch reefs within the CCFR. The extensive seagrass beds (Turtle grass (*Thalassia testudinum*), Shoal grass (*Halodule wrightii*) and Manatee grass (*Syringodium*) in the lagoon ecosystem support a variety of fauna including the endangered Antillean manatee (*Trichechus manatus*).

3.5 HCMR is located approximately 6.4km to the south of San Pedro and covers an area more than 18km<sup>2</sup> and overlaps the northern section of the current proposed cable route from Caye Caulker to San Pedro. Prior to the reserve's designation in 1987 seagrass and mangrove habitats were subjected to heavy pressures from unregulated fishing effort, which led to the removal of large carnivorous fish from the reef and the depletion of commercially valuable conch and lobster populations. The reserve is habitat for: reef systems, low lying mangrove swamps and seagrass beds amidst the lagoon system.

3.6 The coral reef and other marine ecosystems of the CCFR and the HCMR are sensitive ecosystems and represent important national assets which provide the basis for economic activities such as tourism and fisheries

#### **4. LEGAL, INSTITUTIONAL AND POLICY FRAMEWORK**

4.1 The Environmental Protection Act (1992/2003) is principal legislation for environmental protection, and the management of natural resources in Belize. Under the Act, The DOE has institutional responsibility for supervising and controlling the compliance of the regulations mentioned in this Law and to take necessary actions to accomplish the Regulations. This allows DoE to control and address prevention and control of pollution, conservation and environment improvement, rationalise use of Belize's natural resources and supervise EIA process. The Act seeks to prevent projects or any other activities, to produce, cause, emit or discharge any pollutant or contaminant into the environment outside of the allowed limits. This Act is considered the principal legislation for environmental protection in Belize. DOE is also responsible for implementing The Pollution Regulations. S.I 56/1996 and amendments of 2009. This regulation refers to issues of air, water, and noise and soil pollution.

4.2 The Coastal Zone Management Act (2002/2003) is another important piece of legislation within the framework for environmental management and protection is. This Act facilitates the management of coastal resources through the establishment of The Coastal Zone Management Authority and Institute who advise the Government on the sustainable use and management of resources, creating guidelines for developers. Caye Caulker is one of the Planning Areas in the Coastal Zone Management Plan developed in 2016, being included in the Central Zone of Belize. Other complementary legislation that are important to the project include National Lands Act. No. 6/1992.2000 and 2003, Fisheries Act.2000, Forest Act, and the National Protected Areas System Act 2015.

#### **5. ENVIRONMENTAL AND SOCIAL IMPACTS**

##### **Impacts during Construction**

5.1 The Project will be implemented over a period of 2.5 years. A full ESIA was undertaken for the Project, including extensive public consultations and the presentation of findings of the draft ESIA report at public meetings in Caye Caulker. Environmental impacts during the construction phase will include: Impact identification considered the entire on-shore and off-shore project area over the life of the Project. Environmental and social impacts were screened against: marine biological environment, terrestrial biological environment, sediment transport, water quality, air quality, geology and se-floor sediments, navigation, and social factors. A summary of the key impacts and proposed mitigation measures is shown in Table 1.

5.2 Overall most of the potential adverse impacts will occur during construction, however these are generally short term and localised in nature. There are significant beneficial impacts during operation of the scheme, particularly positive social impacts due to the increased reliability of electricity and reduction in pollution risk from the existing diesel generators. A Summary of key impacts and mitigation Measures is highlighted at Table 1.

### **Marine Flora and Fauna**

5.3 During construction Noise and disturbances will cause small temporary adverse impacts on marine fauna. However, with the application of construction best practice, these impacts are predicted to have minor adverse impact on marine fauna. Trenching of the cable will cause some disturbance to marine flora habitats. To mitigate these impacts, the route has been designed to avoid sensitive areas of flora and re-planting will be undertaken where required. Overall this is predicted to result in minor adverse impact.

### **Terrestrial Flora**

5.4 There is potential for mangroves to be impacted at the landing site of the cable. To minimise mangrove clearance, surveys were conducted to identify the landing sites that would result in least damage to mangroves.

### **Sediment Transport**

5.5 During installation of the cable there will be some small localised disturbance to sediments. However, due to the shallow layer of sand present and the localised nature of the disturbance, the predicted adverse impact on sediment transport during will be minor.

### **Water Quality**

5.6 During construction and installation of the cable, elevated levels of suspended sediments will be released into the coastal waters. However, this will generally be localised and sediment traps can be used to reduce these impacts. There is also a risk of pollution from construction vessels which will be mitigated by the adopting the best construction practice of using well maintained vehicles will reduce the risk of pollution.

### **Air Quality**

5.7 Gases and particulates will be emitted from construction vehicles, due to the small scale of the construction project. However, these will only have a negligible impact on air quality during construction.

### **Navigation**

5.8 Vessel movements will be restricted in some areas. This will likely affect movement for smaller fishing vessels, transport vessels and recreational vessels which provide a source of income for the community. The construction will be undertaken in stages so that diversions can be put in place and the link between Caye Caulker and San Pedro can still be undertaken by boat. Early and ongoing engagement with key stakeholders will be critical for reducing the impacts and disruption of the construction works. During construction, continuous monitoring of vessel activity will be undertaken for early prevention of collisions and reducing the disruption to navigation pathways through radio connections where practicable. Overall following this mitigation, during construction, there will be a minor adverse impact on navigation for smaller vessels.

### **Social Impacts**

5.9 The construction of the cable will likely result in a variety of impacts on communities of different severities and on different timescales due to the dependence of Caye Caulker and San Pedro communities on coastal tourism. During construction there will be disruption to the community on Caye Caulker and

Ambergris Caye due to construction vehicles, noise, restricted access in areas and visual disturbance. Some fisherfolks from both communities will be affected and will need to relocate their static gear (e.g. traps, casitas) from the selected route to avoid loss or damage. Transportation of plant and materials to and from the construction site is also likely to generate impacts on communities due to increased traffic and increased likelihood of accidents, noise, waste and emissions. In addition, construction vehicles and plant activities will generate noise from general movement to and from site as well as due to excavations.

5.10 Other potential adverse impacts during the construction phase include:

- (a) visual disturbance;
- (b) safety risks to the public from generator decommission;
- (c) Temporary restriction to access;
- (d) Access restrictions during construction as construction works will require the installation of the cable and associated infrastructure using specialist plant and equipment; and
- (e) restrict the movements and activities of fishing vessels. In particular, the works may promote disruption and closure of local navigation routes between San Pedro and Caye Caulker to mitigate the risk of collision with other vessels.

5.11 A Grievance Management Plan will be implemented to engage with stakeholders about any required beach closures and disturbances to tourist diving and water sport activities that bring economic benefits to the region. However, the disturbance will be effectively managed through stakeholder engagement and will only be short term during construction. Overall, during construction there is predicted to be a minor adverse impact on the Caye Caulker community.

**TABLE 1: SUMMARY OF KEY IMPACTS AND MITIGATION MEASURES**

<b>ENVIRONMENT</b>	<b>KEY IMPACTS</b>	<b>MITIGATION</b>
<b>Marine Biological Environment</b>		
Construction Impacts	<ul style="list-style-type: none"> <li>• Noise and disturbance</li> <li>• Trenching for cable laying – short term displacement of sea-grass</li> </ul>	<ul style="list-style-type: none"> <li>• Design and construction best practices</li> <li>• Cable routing to avoid reef areas</li> <li>• Monitoring of sea-grass re-development following cable installation</li> </ul>
Operational Impacts	<ul style="list-style-type: none"> <li>• Electromagnetic Fields</li> </ul>	<ul style="list-style-type: none"> <li>• Design requires burial of cables</li> </ul>
<b>Terrestrial Biological Environment</b>		
Construction Impacts	<ul style="list-style-type: none"> <li>• Noise and light</li> <li>• Mangrove Clearance</li> </ul>	<ul style="list-style-type: none"> <li>• Nesting bird survey prior to construction and application of best construction methods</li> <li>• Site selection for landing area to reduce any required vegetation clearing</li> </ul>
<b>Sediment Transport</b>		
Construction Phase	<ul style="list-style-type: none"> <li>• Sediment disturbance during trenching of cable</li> <li>• Shoreline disturbance during construction at landing site</li> </ul>	<ul style="list-style-type: none"> <li>• Best practice guidelines</li> <li>• Bathymetry to be reinstated at landing site and across cable route to same levels prior to construction</li> </ul>



<b>ENVIRONMENT</b>	<b>KEY IMPACTS</b>	<b>MITIGATION</b>
Operation Phase	<ul style="list-style-type: none"> <li>Exposed cable could impact negatively on sediment transport</li> </ul>	<ul style="list-style-type: none"> <li>Design to ensure that cable is adequately buried so as not to become exposed</li> </ul>
<b>Water Quality</b>		
Construction Phase	<ul style="list-style-type: none"> <li>Suspended sediments (localized and short-term)</li> <li>Pollution risk from construction vessels</li> </ul>	<ul style="list-style-type: none"> <li>Use best practice guidelines</li> <li>Use well maintained vessels</li> <li>Use sediment traps to reduce suspended sediment movement in water</li> </ul>
<b>Air Quality</b>		
	<ul style="list-style-type: none"> <li>Construction related impacts</li> </ul>	<ul style="list-style-type: none"> <li>Best construction practices</li> <li>Use well maintained and modern vehicles to reduce emissions</li> </ul>
<b>Geology</b>		
Construction Phase	<ul style="list-style-type: none"> <li>Disturbance to top 1-2 m soil and seabed</li> </ul>	<ul style="list-style-type: none"> <li>Ground investigations prior to construction to ensure that construction techniques are correct and impacts are full understood</li> </ul>
<b>Navigation</b>		
Construction Phase	<ul style="list-style-type: none"> <li>Some disruption to small fishing vessels and tourist boats during construction</li> </ul>	<ul style="list-style-type: none"> <li>Stakeholder meetings to be held in advance communicate when and where disruptions will take place</li> <li>Seek opportunities to use local vessels during construction works</li> </ul>
<b>Communities</b>		
Construction Phase	<ul style="list-style-type: none"> <li>Minor construction impacts from construction vehicles and vessels</li> <li>Noise impacts</li> <li>Visual intrusion</li> </ul>	<ul style="list-style-type: none"> <li>Stakeholder engagement events prior to construction</li> <li>Plan deliveries and vehicle routes to avoid key residential and tourist areas</li> <li>Stakeholder plan developed as part of the ESIA with Grievance Mechanism proposed and set out</li> </ul>

### **Operational impacts**

5.12 Most of the potential adverse environmental impacts during operation will either be negligible or non-existent. For example, during operation the cable will remain buried and access is unlikely to be required for maintenance. Therefore, there is predicted to be a negligible impact on marine flora. On the other hand, most of the operational impacts will be beneficial. Once operational, the new system will improve the electricity supply, efficiency and reliability on Caye Caulker, and will provide a system which can take the future load growth demand that is projected for Caye Caulker. This will be able to encourage further economic investment and growth on Caye Caulker as well as improve the service provided to the local community.

### **Construction of New Sub-Station/Decommissioning of Diesel Power Plant**

5.13 The technical service life of existing diesel sub-station has been reached. As such, this plant will be dismantled to make way for the construction of the new sub-station on the same site now occupied by the diesel plant. The installation of a new substation for distribution is thus dependent upon successfully decommissioning the existing diesel power generator on the proposed site. Decommissioning of the existing generator provides a number of risks that could compromise the provision of ecological goods and services; and community health and safety through activities such as the movement and installation of heavy equipment, poorly secured dangerous and hazardous work areas; and potential discovery of polluted or contaminated soil associated with poor handling and management of diesel fuel. These potential risks will be mitigated by applying the methodology outlined in the decommissioning plan, including site remediation.

5.14 The new substation will be located on the current diesel power station site. To ensure continuity of power supply during the construction of this new substation the current diesel substation will be relocated to a new site which will function as a backup, operating one hour per week. Relocating the existing plant and establishing temporary operations of the diesel substation at the new location during construction of the new Caye Caulker substation will require mitigations to minimise environmental and social impact on the local community. Several activities will be required to ensure smooth relocation of the diesel generators including:

- (a) Assessing the equipment condition for its immediate safety and suitability for continued use;
- (b) Developing a site plan for the proposed temporary site with all necessary measurements;
- (c) Relocating equipment to alternative site to re-establish a power supply to Caye Caulker-generators, transformers, fuel tanks and other accessories with the appropriate heavy equipment;
- (d) Isolating all live equipment to ensure safety and install a ground grid;
- (e) Installing of a fence around the substation with danger signs;
- (f) Identifying and remove hazardous materials; and
- (g) Conducting an environmental assessment and carrying out appropriate remediation works;

5.15 The final decommissioning of the diesel plant (which will be undertaken in 2021) will involve the following tasks:

- (a) Disconnection of the main components such as generators, transformers, fuel tanks, among others;
- (b) Dismantling equipment, where required, for transportation;
- (c) Load, transport and proper disposal of the equipment which cannot be utilised; and Recycling of useful equipment in an appropriate manner at other locations in the system.

## **6. ENVIRONMENTAL AND SOCIAL MONITORING REQUIREMENTS**

6.1 Environmental and social monitoring (ESM) is important in ensuring sensitive marine and terrestrial ecosystems maintain their functionality during the beyond project implementation. As such, environmental monitoring and supervision responsibilities for the project during construction phase of the project have been established to assess any changes in environmental conditions, or to identify mitigation measures that might be required, as a result of the proposed project implementation.

6.2 To facilitate effective ESM, an Environmental Monitoring Consultant (EMC) will be appointed by BEL to implement the Environmental Monitoring Plan (EMP). The EMC will be tasked with the preparation of an EMP in collaboration with the PMU and the DOE.

6.3 The monitoring programme will be implemented during both the construction and operation phases of the project, covering direct and indirect indicators of emissions, effluents, and resource use. The frequency of monitoring will involve sufficient recording data that can offer a representative evaluation for each project component in question. The generation of data is to be accomplished by competently trained individuals adopting standardised monitoring and analysis protocols. The integrity of collected data is subject to the deployment of routinely calibrated equipment. All data that is to be collected must be analysed and reviewed at regular intervals to guarantee precision and accuracy throughout the monitoring process. Timing and responsibility for implementing the proposed mitigation measures will be the responsibility of the PMU. Specific areas for ESM include:

- (i) Seagrass and mangrove cover;
- (ii) Fish abundance and diversity;
- (iii) Wildlife associated with the terrestrial environment;
- (iv) Water quality assessment;
- (v) Ground and water contamination;
- (vi) Socio-economic issues and community participation;
- (vii) Beach dynamics; and
- (viii) Human health and safety issues.

6.4 A Summary of the Draft EMP shown at Table 2

**TABLE 2: SUMMARY OF THE ENVIRONMENTAL MONITORING PLAN**

<b>WHAT</b>	<b>HOW</b>	<b>WHO</b>	<b>WHEN</b>
Environmental and social management plan oversight	Appoint an Environmental Consultant.	BEL	Before construction
Acoustic noise levels	Acoustic measurements.	Contractor	Before, during and after construction
Soil contaminants	Take soil samples using either boreholes, window samples or trial pits subject to the design and required excavation depth.	Contractor	Before construction
Seabed bathymetry	Bathymetry survey. Trident ROV - track and record. Sea floor imagery.	Contractor	Before (baseline) and after construction for 6 months
Sediment stability	Ground investigation (GI).	Contractor	Before construction
Water quality including pH, temperature, dissolved oxygen, suspended sediment, salinity, nutrients	Water sample, take a turbidity measurement. Combination of instruments will be required to monitor the various parameters.*	Contractor	Before (baseline), during (weekly) and after construction (2 weeks after, 1 month after then 1 year after - to ensure no long-term changes)

Mangrove cover, composition and health	Visual inspections and assessment of cover, extent and density.*	Contractor	Before (baseline), during (to ensure mangroves are not affected) and post construction (to assess any impacts)
Stakeholder (social and community) opinion on works	Keeping a complaints log as part of the Grievance Mechanism Plan (GMP) using questionnaires and feedback or comment cards available to the public during exhibitions.*	Contractor/ Consultant	Before (during ESIA consultation) and during construction
Vessels quantity and location	Review past record inspections and visual inspections.	Consultant	Before and during construction
Seagrass cover in construction area	Visual inspections and assessment of cover, extent and density.*	Environmental Consultant	Before (baseline) and every 6 months following construction for 2 years
Key sensitive marine and bird fauna	Record sightings of sensitive fauna through visual inspections.	Contractor/ Environmental Consultant	Before (baseline), during (to monitor presence and potentially halt construction) and after construction (to assess any impacts)
Minimisation of construction	Specification contained in cable laying plan to confine the survey	Environmental Consultant	During construction
<b>WHAT</b>	<b>HOW</b>	<b>WHO</b>	<b>WHEN</b>
footprint on marine and terrestrial biological environment	footprint. Weekly Contractor reports to record location of works. to be reviewed by Environmental Consultant		
Air quality	No maintenance required due to low, short term impact	n/a	n/a

Source: Mott MacDonald, 2018.

## 7. **CONCLUSION**

7.1 Overall, most of the potential adverse impacts will occur during construction, however these are generally short term and localised in nature. There will be beneficial impacts during the operations of the scheme, particularly positive social impacts due to the increased reliability of electricity and reduction in pollution risk from the existing diesel generators.

**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

ACTIVITY	SOURCE OF RISK	DESCRIPTION OF POTENTIAL RISK	MITIGATION MEASURES	RESPONSIBILITY
<b>ENVIRONMENTAL IMPACTS DURING CONSTRUCTION PHASE</b>				
Cable Installation	<ul style="list-style-type: none"> <li>Noise from construction activities</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance to fauna including nesting birds impacts during nesting periods.</li> </ul>	<ul style="list-style-type: none"> <li>Use modern vehicles and equipment which are less likely to produce as much noise.</li> <li>Undertake very noisy work outside of the nesting period.</li> </ul>	Contractor
	<ul style="list-style-type: none"> <li>Sub-tidal cable laying using cable trench</li> </ul>	<ul style="list-style-type: none"> <li>Damage to vegetation/habitats - removal or destruction of mangroves.</li> </ul>	<ul style="list-style-type: none"> <li>Confine construction footprint to as narrow path as possible.</li> <li>Horizontal directional drilling (HDD) allows the cable to pass through natural habitats that are difficult to access.</li> <li>Mangrove replanting elsewhere as compensation if a significant amount is disturbed, however this is currently assumed to not be necessary.</li> </ul>	Contractor
	<ul style="list-style-type: none"> <li>Trenching of the submarine cable.</li> </ul>	<ul style="list-style-type: none"> <li>Damage to vegetation/habitats - removal or destruction of terrestrial flora.</li> <li>Clearance of forests to prevent damage to cable from falling trees</li> </ul>	<ul style="list-style-type: none"> <li>Confine construction footprint to as narrow path as possible.</li> <li>Vehicles must stick to designated access routes</li> <li>Undertake survey for</li> </ul>	Contractor

**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

ACTIVITY	SOURCE OF RISK	DESCRIPTION OF POTENTIAL RISK	MITIGATION MEASURES	RESPONSIBILITY
		<ul style="list-style-type: none"> <li>• Loss of habitats and displacement of nesting birds</li> <li>• Fragmentation of species/habitats.</li> </ul>	<p>nesting birds and clear any trees nearby to deter nesting prior to construction.</p>	
	<ul style="list-style-type: none"> <li>• Accidental pollution and spillage from marine vessels and construction equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• Oil/hydrocarbons spills from marine vessels - water quality reduction including potential salinity variations</li> </ul>	<ul style="list-style-type: none"> <li>• Contain all fuel, lubricants and transmission fluids in double walled tanks on vessels and, if in tanks, store below deck. Identify the type of diesel used. Provide an oil spill plan.</li> </ul>	Contractor
	<ul style="list-style-type: none"> <li>• Trenching to lay the cable releases suspended sediment into the water.</li> </ul>	<ul style="list-style-type: none"> <li>• An accumulation of organic matter from the release of suspended sediment.</li> <li>• Trenching can cause the resuspension of harmful pollutants.</li> <li>• Sediment dispersion can cause increases in turbidity/suspended sediment concentrations. Most of the route consists of sand and silt sediments.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop oil spill contingency plan.</li> <li>• Ensure that material used for fill material has been properly sourced is free from contamination and fine materials have been removed.</li> <li>• Ensure that vessels are not permitted to dispose of ballast water in the area.</li> <li>• Use local vessels where possible.</li> <li>• Limit the total quantity of material that can be removed.</li> <li>• Prohibit the disposal of sediments at sea unless</li> </ul>	

**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

ACTIVITY	SOURCE OF RISK	DESCRIPTION OF POTENTIAL RISK	MITIGATION MEASURES	RESPONSIBILITY
			<p>as identified and agreed with relevant authorities and only permissible in an area of low ecological value.</p> <ul style="list-style-type: none"> <li>• Develop waste management plan for the storage and handling of hazardous materials.</li> </ul>	
Cable Installation		<ul style="list-style-type: none"> <li>• Sediment transport processes disturbed due to changing currents/flows/turbidity.</li> </ul>	<ul style="list-style-type: none"> <li>• Apply Best practice guidelines will to avoid unnecessary sedimentation of surrounding habitats during trenching activities</li> <li>• Use floating turbidity barrier or similar to control sediment disturbance.</li> <li>• Minimise sedimentation is shallow area by proper washing of operational vessels</li> </ul>	Contractor
<b>ENVIRONMENTAL IMPACTS DURING OPERATIONS PHASE</b>				
	<ul style="list-style-type: none"> <li>• Presence of new overhead cable.</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of habitats within the Caye Caulker Forest Reserve - reduction in habitat for breeding and nesting birds.</li> </ul>		
	<ul style="list-style-type: none"> <li>• Location of submarine cable. Should cable</li> </ul>	<ul style="list-style-type: none"> <li>• Impact on longshore sediment transport</li> </ul>	<ul style="list-style-type: none"> <li>• Bury cable and ensure ground is re-established to previous levels.</li> </ul>	Contractor

**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

ACTIVITY	SOURCE OF RISK	DESCRIPTION OF POTENTIAL RISK	MITIGATION MEASURES	RESPONSIBILITY
	burial area become raised or depressed			
	<ul style="list-style-type: none"> <li>• Thermal radiation from the cable.</li> </ul>	<ul style="list-style-type: none"> <li>• Transportation of energy through the cable can raise water temperatures</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate burial depth will be chosen to mitigate against excess heat escaping in situ.</li> <li>• Fit Cable with Polyethylene (XLPE) and Ethylene propylene rubber (EPR) insulation to protect the cables and to reduce thermal radiation.</li> </ul>	Designer
<b>SOCIAL IMPACTS</b>				
	<ul style="list-style-type: none"> <li>• Noise from construction activities</li> <li>• Trenching of the submarine cable.</li> </ul>	<ul style="list-style-type: none"> <li>• Disruption to small fishing vessels and tourist boats during construction</li> <li>• Minor construction impacts from construction vehicles and vessels</li> <li>• Noise impacts</li> <li>• Visual intrusion</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct stakeholder engagement events prior to construction</li> <li>• Plan deliveries and vehicle routes to avoid key residential and tourist areas</li> <li>• Stakeholder plan developed as part of the ESIA with Grievance Mechanism proposed and set out</li> </ul>	Community Liaison Officer, BEL



**APPENDIX 4.7.3: ENVIRONMENTAL AND SOCIAL ROLES AND RESPONSIBILITIES OF THE PMU**

The PMU will be required to monitor implementation of ESMP plans, as provided in the loan and, and to submit periodically monitoring reports on their implementation performance as part of routine reporting requirements. In respect of monitoring and reporting, the executing agency through the PMU will:

- (i) ensure the baseline conditions are recorded and properly benchmark the elements to be monitored;
- (ii) establish and maintain procedures to monitor the progress of implementation of environmental safeguards;
- (iii) verify the compliance with environmental measures and whether they are achieving the intended outcomes (mitigated level of impact);
- (iv) identify necessary corrective and preventive actions including actions required when the grievance redress mechanism has been triggered i.e. the report will outline where work has not complied with the ESMP and what steps (and timeline) were taken to rectify it;
- (v) document and disclose the monitoring results;
- (vi) follow up on these actions to ensure progress toward the required outcomes;
- (vii) where required (for in locations with particularly sensitive receptors) retain qualified and experienced external experts or qualified CSOs/NGOs to verify monitoring results; and
- (viii) submit periodic monitoring reports on the E&S mitigation measures as agreed with DOE and CDB.

## **APPENDIX 4.8      CLIMATE CHANGE VULNERABILITY ASSESSMENT**

### **APPENDIX 4.8.1                      DRAFT TERMS OF REFERENCE CLIMATE RISK AND VULNERABILITY ASSESSMENT**

#### **1. BACKGROUND**

1.1 Belize Electricity Company (BEL) has received funding from the Caribbean Development Bank (CDB) for the interconnection of Caye Caulker Island with the Belize Mainland via a 10 km long submarine cable. The Project aims to procure and install a 15MVA rated submarine cable designed to operate between 34.5 kV and 46 kV. The expected outcome of the project is improved quality and reliability of electricity supply to Caye Caulker with sufficient capacity that caters to projected demand to 2037. This will be achieved through an interconnection of the distribution network on the island with the Belize mainland transmission via a submarine cable. Project components will be exposed to multiple natural hazards and climate risks. A Climate Risk and Vulnerability Assessment (CRVA) will be conducted on the project components as part of the design process to ensure that they are strengthened against climate risks.

#### **2. OBJECTIVES**

2.1 The objectives of the CRVA are to (i) identify and evaluate the potential effects of climate change on the Sub-marine project on the project areas and (ii) recommend resilience measures to address the identified risks and vulnerabilities and minimise impacts. This should include consultation with stakeholders to get a better understanding of the nature of the climate risk and adaptation issues, especially the historical experience of climate related hazards, the response and to agree on the scope.

#### **3. METHODOLOGY**

3.1 The consultants are expected to develop a database, if one does not already exist, that would include, *inter-alia*, the following data and information:

- (a) Background information on BEL's infrastructure – generation, transmission, distribution; and
- (b) Locational characteristics of the project area geographic scope.

#### **4. SCOPE OF SERVICES**

4.1 The consultants will be required to perform the following tasks:

- (a) **Identification and description of project components**
- (b) **Hazard Identification and Characterisation**
  - (i) Summarise the key current and expected future climate hazards relevant in the context of the project, and of the associated potential climate-related risks/implications for the Project, that should be addressed in the CRVA, during the construction and operational phases;

- (ii) Establish a climate baseline for the relevant climate variables and establish a climate baseline; and
- (iii) Undertake an in-depth assessment, combining an analysis of historical events and present day conditions in order to establish a climate baseline, with an analysis of future conditions (mid-century as well as the design life of the investment) using scenario-based methodologies. Climate variables could include the following:
  - (aa) sea level and wave action; (bb) storm surges
  - (cc) peak rainfall events;
  - (dd) temperatures;
  - (ee) profiles of past extreme weather events; and (ff) wind speed.

**(a) Assessment of Exposure**

4.1 The consultant will (i) assess the exposure of project components that could be exposed to the hazards identified above and the extent of this exposure. This should include preparation of hazard maps showing the spatially distributed expected exposure levels for different frequencies (i.e. 50-yr, 100-yr and 150-yr return periods) and for different hazard types (extreme precipitation, flooding, landslides, sea level rise, etc).

**(b) Vulnerability Assessment**

4.2 The consultant will establish climate change scenarios and assess the relationship between the changes in the climate parameters agreed on in (b) above, and the impacts on project components. The assessment of vulnerabilities considers in detail how the project components, and communities would be vulnerable to the identified hazards according to different climate scenarios, as well as non-climate factors.

**(c) Risk Assessment**

4.3 The consultant will conduct a risk assessment, a quantitative expression of the vulnerability assessment: the consequences of the hazards, in economic and social impact terms, on project components.

**(d) Adaptation Assessment**

4.4 The consultant shall identify the most appropriate adaptation measures that could be incorporated into the Project in order to address the vulnerabilities and risks identified. This may include structural, technological and behavioural measures.

## 1. **REPORTING REOUIREMENTS**

5.1 The consultants will report to the BEL's Project Manager. The Technical Proposal of the selected consultant shall outline a work plan and approach to the assignment, the scope and methodology, the tasks and responsibilities and a time schedule for the completion of the assignment. The following reports, one hard copy each, along with an electronic copy, either by electronic mail, on CD ROM or flash drive, shall be submitted to CDB and BEL at the times indicated below.

- (a) Inception Report within three weeks of commencement of the assignment;
- (b) Draft report on completion of the risk assessment; and
- (c) Final report on the CRVA specifying the recommended design changes to take account of climate risks, including an analysis of structural and non-structural measures.

## 2. **TIMING AND OUALIFICATIONS**

6.1 Duration: 30 days.

6.2 The consultancy shall be conducted by a team of three experts, who shall have the following competencies:

- (a) **Climate Change Specialist:** Responsible for identifying the climate change parameters to be assessed; collection of relevant local historical climate data and climate change projections; identify the probabilities of specific climate change occurrences; conduct field investigations with local stakeholders to identify existing vulnerabilities. In consultation with other team members, contribute to the identification of adaptation options, including their costs and benefits and prioritisation. The consultant is expected to have at least five years' work experience in the area of climate change impacts adaptation and mitigation. Knowledge of the Climate Change Adaptation context in the Caribbean region would be a plus.
- (b) **Engineer:** Civil Engineer will lead the characterisation and technical assessment of project infrastructure and operations in the energy sector; conduct interviews with relevant organisations and stakeholders; and undertake site visits to determine the existing infrastructure conditions and proposals for rehabilitation. The specialist will assist in the preparation of cost estimates for capital and recurrent costs for the recommended resilience measures.
- (c) **Economist:** The Economist should have at least 10 years' experience and a graduate degree or equivalent. Experience should include economic analysis of development projects and sector strategies based on economic analyses. Experience with incorporating climate change concerns into economic analysis as well as multi criteria analysis will also be required.

**DRAFT**  
**BUDGET**  
**(USD)**

<b>Item</b>	<b>GOBZ/BEL</b>
Consultancy Fees	40,500
Stakeholder Consultations	2,000
Professional and Administrative Support	15,000
<b>Sub-total</b>	<b>56,500</b>
Contingencies (10%)	5650
<b>Total</b>	<b>62,150</b>

**APPENDICES TO CHAPTER 5 - RISK ASSESSMENT AND MITIGATION**

*There are no appendices related to Chapter 5 (Risk Assessment and Mitigation)*

**APPENDICES TO CHAPTER 6 - IMPLEMENTATION AND PROJECT MANAGEMENT**

**APPENDIX 6.1      PROJECT IMPLEMENTATION SCHEDULE**

**Project Specific Milestones**





**APPENDIX 6.2**

**ESTIMATED QUARTERLY DISBURSEMENT SCHEDULE**

**ESTIMATED QUARTERLY DISBURSEMENT SCHEDULE**

<b>Year</b>	<b>Quarter</b>	<b>OCR-USD</b>	<b>Finance Charges</b>	<b>Total</b>	<b>Cumulative</b>
2019	2019 - Q2	-	-	-	-
	2019 - Q3	743,841	7,518	751,359	751,359
	2019 - Q4	739,808	7,519	747,327	1,498,686
<b>Sub-total</b>		<b>1,483,649</b>	<b>15,037</b>	<b>1,498,686</b>	<b>1,498,686</b>
2020	2020 - Q1	739,810	7,519	747,329	2,246,015
	2020 - Q2	739,810	7,519	747,329	2,993,344
	2020 - Q3	739,811	7,519	747,330	3,740,674
	2020 - Q4	794,812	7,519	802,331	4,543,005
<b>Sub-total</b>		<b>3,014,243</b>	<b>30,076</b>	<b>3,044,319</b>	<b>4,543,005</b>
2021	2021 - Q1	778,312	7,519	785,831	5,328,836
	2021 - Q2	756,312	7,520	763,832	6,092,668
	2021 - Q3	739,812	7,520	747,332	6,840,000
<b>Sub-total</b>		<b>2,274,436</b>	<b>22,559</b>	<b>2,296,995</b>	<b>6,840,000</b>
<b>Total</b>		<b>6,772,328</b>	<b>67,672</b>	<b>6,840,000</b>	<b>6,840,000</b>

**APPENDIX 6.3      PROCUREMENT PLAN**

**All Estimated Costs Are In USD**

**A. General**

**1. Project Information**

Country: Belize

Borrower: Belize Electricity Limited

Project Name: Seventh Power Project (Caye Caulker Submarine Cable)

Implementing Agency: Belize Electricity Limited

**2. Bank's Approval Date of the Procurement Plan:** June 03, 2019

**3. This Procurement Plan is valid until:** June 30, 2020

**4. Prior Review Thresholds:** Procurement decision subject to prior review by the Bank as stated in Appendix 2 to the Guidelines for Procurement:

Procurement Method	Prior Review Threshold	Comments
ICB	—	
SSS	—	

**5. Reference to relevant Procurement Guidelines**

- CDB's Guidelines for Procurement (2006)
- CDB's Guidelines for the Selection and Engagement of Consultants by Recipients of CDB Financing (2011)

**6. Any Other Special Procurement Arrangements**

- Where EIB CALC II resources are being used together with CDB's Equity and Market resources to finance contracts, procurement eligibility shall be extended to countries eligible for procurement under EIB-funded projects which are not CDB Member Countries. The value of the contracts with the aforementioned extended procurement eligibility is estimated to be \$3.723 mn. In accordance with the provisions of the EIB CALC II Finance Contract, where contracts are financed under the EIB CALC II, procurement and contract award notices, above prevailing EU thresholds, shall be published in the Official Journal of the European Union and successful bidders for contracts will be required to submit the "Covenant of Integrity" in the form attached in the Annex to this Procurement Plan.

#### **7. Procurement Waivers**

No Procurement Waviers were required as part of this Appraisal

**B. Goods and Works and Non-Consulting Services**

<b>Ref No.</b>	<b>Contract (Description)</b>	<b>Estimated Cost</b>	<b>Procurement Method</b>	<b>Prequalification (Yes/No)</b>	<b>Review by Bank (Prior/Post)</b>	<b>Expected Bid-Opening Date</b>	<b>Comments</b>
	Generation Station Decommissioning	—	NBF	No	n/a		
	Submarine Cable and Associated Works	—	ICB	Yes	Prior		

**C. Consulting Services**

<b>Ref No.</b>	<b>Assignment (Description)</b>	<b>Estimated Cost</b>	<b>Selection Method</b>	<b>Review by Bank (Prior/Post)</b>	<b>Expected Proposal Submission Date</b>	<b>Comments</b>
	Climate Risk and Vulnerability Assessment (CRVA)	—	NBF	Prior		
	Community Liaison Officer	—	NBF	Prior	July 2019	
	Engineering Supervision Consultant	—	SSS	Prior	June 2019	The Consulting firm that has undertaken the Preparatory Feasibility Study is selected to undertake the engineering supervision. This has been justified for the following reasons: first, the role follows-on from their existing contract that involves an identical set of specialists and expertise, it is therefore considered is a natural continuation of their existing work. Second, staff are satisfied that the initial procurement that was undertaken using CDB Procurement Guidelines has delivered a competitive rate.
	Environmental Safeguards Supervisor	—	NBF	Prior	July 2019	
	Project Coordinator	—	NBF	Prior	October 2018	Will be assigned from within BEL
	Project Engineer	—	NBF	Prior	July 2019	Will be assigned from within BEL

**D. Procurement Capacity Building activities for the Implementing/Executing Agency**

**E. Summary of Proposed Procurement Arrangement**

Project Components / Contracts	CDB ('000)		NBF ('000)		Total Cost ('000)
	ICB	SSS	Counterpart	Co-Financing	
<b>Infrastructure Works</b>	█	-	█	-	█
Submarine Cable and Associated Works	█	-	-	-	█
Generation Station Decommissioning	-	-	█	-	█
<b>Engineering and Construction-related Services</b>	-	█	█	-	█
Engineering Supervision Consultant	-	█	-	-	█
Climate Risk and Vulnerability Assessment (CRVA)	-	-	█	-	█
<b>Project Management</b>	-	-	█	-	█
Community Liaison Officer	-	-	█	-	█
Environmental Safeguards Supervisor	-	-	█	-	█
<b>Summary Costs</b>	█	█	█	-	█



**Goods, Works and Non-Consultancy Services**

- NCB - National Competitive Bidding
- ICB - International Competitive Bidding
- LIB - Limited International Bidding
- RCB - Regional Competitive Bidding
- Shopping - Shopping
- DC - Direct Contracting
- FA - Force Account
- UCS - Use of Country Systems
- NBF - Non-Bank Financed
- Other

**Consultancy Services:**

- QCBS - Quality and Cost-Based Selection
- QBS - Quality-Based Selection
- FBS - Fixed Budget Selection
- LCS - Least-Cost Selection
- CQS - Consultants' Qualification Selection
- SSS - Single Source Selection
- ICS - Individual Consultants Selection
- UCS - Use of Country Systems
- NBF - Non-Bank Financed
- Other

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.

**COVENANT OF INTEGRITY**

**to the \_\_\_\_\_ from a Tenderer,  
Contractor, Supplier or Consultant to be attached to its Tender (or to the  
Contract in the case of a negotiated procedure)**

“We declare and covenant that neither we nor anyone, including any of our directors, employees, agents, joint venture partners or sub-contractors, where these exist, acting on our behalf with due authority or with our knowledge or consent, or facilitated by us, has engaged, or will engage, in any Prohibited Conduct (as defined below) in connection with the tendering process or in the execution or supply of any works, goods or services for [*specify the contract or tender invitation*] (the “**Contract**”) and covenant to so inform you if any instance of any such Prohibited Conduct shall come to the attention of any person in our organisation having responsibility for ensuring compliance with this Covenant.

We shall, for the duration of the tender process and, if we are successful in our tender, for the duration of the Contract, appoint and maintain in office an officer, who shall be a person reasonably satisfactory to you and to whom you shall have full and immediate access, having the duty, and the necessary powers, to ensure compliance with this Covenant.

If: (i) we have been, or any such director, employee, agent or joint venture partner, where this exists, acting as aforesaid has been, convicted in any court of any offence involving a Prohibited Conduct in connection with any tendering process or provision of works, goods or services during the five years immediately preceding the date of this Covenant; or (ii) any such director, employee, agent or a representative of a joint venture partner, where this exists, has been dismissed or has resigned from any employment on the grounds of being implicated in any Prohibited Conduct; or (iii) we have been, or any of our directors, employees, agents or joint venture partners, where these exist, acting as aforesaid has been excluded by the Caribbean Development Bank (CDB), the European Union institutions or any major Multi-lateral Development Bank (including World Bank Group, African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank or Inter-American Development Bank) from participation in a tendering procedure on the grounds of Prohibited Conduct, we give details of that conviction, dismissal or resignation, or exclusion below, together with details of the measures that we have taken, or shall take, to ensure that neither this company nor any of our directors, employees or agents commits any Prohibited Conduct in connection with the Contract [*give details if necessary*].

In the event that we are awarded the Contract, we grant the \_\_\_\_\_, CDB, the European Investment Bank (EIB) and auditors appointed by any of them, as well as any authority or European Union institution or body having competence under European Union law, the right of inspection of our records and those of all our sub-contractors under the Contract. We accept to preserve these records generally in accordance with applicable law but in any case for at least six (6) years from the date of substantial performance of the Contract.

For the purpose of this Covenant, Prohibited Conduct includes<sup>3</sup>:

- (a) **Corrupt Practice** is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

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<sup>3</sup> Most definitions are those of the IFI Anti-Corruption Task Force’s Uniform Framework of September 2006.

- (a) **Fraudulent Practice** is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
- (b) **Coercive Practice** is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of any party to influence improperly the actions of a party;
- (c) **Collusive Practice** is an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;
- (d) **Obstructive Practice** is: (a) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or (b) acts intended to materially impede the exercise of CDB or the EIB's contractual rights of audit or access to information or the rights that any banking, regulatory or examining authority or other equivalent body of the European Union or of its Member States may have in accordance with any law, regulation or treaty or pursuant to any agreement into which the EIB has entered in order to implement such law, regulation or treaty;
- (e) **Money Laundering** as defined in EIB's Anti-Fraud Policy;
- (f) **Terrorist Financing** as defined in EIB's Anti-Fraud Policy;
- (g) **Corrupt practices, fraudulent practices, collusive practices and coercive practices** as defined in CDB's Guidelines for Procurement; and
- (h) **Project Owner** means.....

**Note:** This Covenant must be sent to CDB and EIB together with the contract in the case of an international procurement procedure (as defined in CDB's Guidelines for Procurement). In other cases, it must be kept by ..... and made available upon request from CDB or EIB. The Covenant is not mandatory for contracts awarded prior to CDB or EIB involvement in the Project. Nevertheless, recipients of CDB financing who are seeking or may seek to utilise resources provided by EIB to CDB in a project, are advised to include it in order to promote integrity among the tenderers/contractors. This is particularly relevant in the case of a recipient of CDB financing who has already implemented a number of previous CDB-financed projects and is considering further CDB financing utilising resources provided by EIB to CDB.

Name: \_\_\_\_\_

In the capacity of: \_\_\_\_\_

Signed: \_\_\_\_\_

Duly authorised to sign the bid for and on behalf of: \_\_\_\_\_

Dated on: \_\_\_\_\_ day of \_\_\_\_\_

**APPENDIX 6.4      BORROWER****APPENDIX 6.4.1      THE BORROWER AND GUARANTOR****1.      THE BORROWER****Legal Status**

1.1      BEL is a public company limited by shares. It was incorporated by GOBZ on September 5, 1992 with the primary objective of exercising the rights and assuming the liabilities of the former Belize Electricity Board and of carrying on the business of an electricity-generating company and a public utility supplier. Its current operating licence, issued by the Minister of Energy and Communications under section 15 of the Electricity Act on July 1, 2000 will expire on June 30, 2025. BEL has the option to renew the licence for a further period of ten years. Under the license, BEL has exclusive power to:

- (a)      generate electricity for the purposes of giving a supply to or enabling a premises in Belize;
- (b)      transmit electricity for the purposes of giving a supply to or enabling a supply to be given to any premises in Belize; and
- (c)      distribute and supply electricity to any premises in Belize as a public electricity supplier.

1.2      The company is empowered to carry on its business, conduct its affairs and exercise its powers in Belize and in any jurisdiction outside of Belize and has the requisite legal status and authority to carry out the Project.

**Power to Borrow**

1.3      The Companies Act of Belize and BEL's Articles of Association empower BEL's Board of Directors to borrow money upon the credit of the company and to mortgage, charge, pledge or otherwise create a security interest in all or any of the assets and undertaking of BEL including its uncalled capital. The Company is empowered to borrow the proposed amount from CDB for the Project.

**Shareholding**

1.4      BEL's share capital comprised of 69,023,009 issued and fully paid ordinary shares of \$2.00 each, and one special rights redeemable preference share of \$1.00. The special rights redeemable preference share is held by GOBZ, which entitles it to appoint two directors to the Board of Directors of the Company, one of whom is to serve as chairman, in addition to receive notice of, and to attend and speak at any general meeting of any class of shareholders of the company. That arrangement was put in place when the company was privatised in 1999. The company has since been re-nationalised and the shares held by the former owner, Fortis Inc., were acquired by the Government in 2011. In September 2015 as part of the settlement, the Government of Belize and Fortis Inc. by way of Statutory Instrument No. 12 of 2015 settled in part with shares totaling to 33.3% shareholding in the Company, making Fortis Inc. one of the major shareholders. After the settlement, Government of Belize and the Belize Social Security Board combined to retain majority shares totaling to 63.8% shareholding in the Company.

1.5 The current shareholding of BEL is as follows:

(i)	Government of Belize	-	32.63%
(ii)	Belize Social Security Board	-	31.2%
(iii)	Fortis Inc. Cayman Islands	-	33.3%
(iv)	Other organisations	-	2.9%

## 2. **THE GUARANTOR**

2.1 GOBZ may, pursuant to Section 3(1) of the Loans (Caribbean Development Bank) Act, Chapter 59 of the Laws of Belize [the Loans (CDB) Act], in such manner and on such terms as may be agreed between GOBZ and CDB, borrow, or guarantee the borrowing of, such sums as may be required by GOBZ. Any agreement between GOBZ and CDB in respect of sums borrowed or guaranteed under this power must be made in the name of the Minister responsible for Finance (the Finance Minister) for and on behalf of GOBZ and may be signed by the Finance Minister for or on behalf of GOBZ. No such agreement shall be executed unless the conditions thereof have been first approved by resolution of the House of Representatives to that effect.

2.2 The loans by CDB to the statutory authorities have been made under the guarantee of GOBZ pursuant to Section 8(1) of the Loans (CDB) Act. CDB has approved a loan of USD4,896 mn to the University of the West Indies (UWI) of which an amount of \$301,874 has been guaranteed by GOBZ.

2.3 Where any sum becomes payable by GOBZ under a guarantee given by GOBZ, that sum is charged to Consolidated Revenue Fund and the Finance Minister must direct payment to be issued out of that Fund accordingly. GOBZ is current with its loan payments to CDB.

**APPENDIX 6.5 PROJECT MANAGEMENT DUTIES AND RESPONSIBILITIES****APPENDIX 6.5.1- DUTIES AND RESPONSIBILITIES OF PROJECT COORDINATOR****1. SCOPE OF WORKS**

1.1 The Project Coordinator (PC) shall report to the Senior Manager of System Planning and Engineering of Belize Electricity Limited (BEL) and will be accountable for the effective implementation of the Project. PC's primary functions during project implementation will include overall planning, scheduling and monitoring of project activities, cost control, supervising procurement procedures and construction and coordinating the work of the consultants and other parties involved in the execution of the Project. PC's duties will also include the following:

- (a) representation of BEL in all its dealings with consultants, suppliers and contractors;
- (b) issue of tenders, evaluation of bids and recommendation of the award for the supply, installation and construction contracts;
- (c) management and administration of the implementation of supply, installation and construction contracts;
- (d) expedition of submission to the Caribbean Development Bank (CDB) of claims for disbursement/reimbursement;
- (e) liaison with CDB on all technical and administrative aspects of the Project;
- (f) maintenance of separate accounts for project-related expenditures and disbursement activities;
- (g) submission to CDB of the consultants' monthly progress reports referred to in Appendix 6.8.1 within four weeks of the end of each month;
- (h) preparation and submission to CDB of quarterly progress reports including a report on the investment cost of the project in the form shown at Annex 1 to Appendix xxx or in such other forms as may be specified by CDB within 6 weeks of the end of each quarter, commencing with the quarter following start of the assignment;
- (i) submission to CDB of the consultants' completion report within three months of the issue of the certificate of practical completion of the Project; and
- (j) preparation and submission to CDB of a Project Completion Report not later than six months after final disbursement on the Project or date of issue of the certificate of practical completion, whichever is later.

## **2. QUALIFICATIONS AND EXPERIENCE**

2.1 The successful candidate should ideally be a power engineer with experience in electricity transmission and distribution and project management. Relevant experience must include the preparation of project schedules and budgets, monitoring of project execution, and project reporting. Excellent oral and written communication skills are necessary.

### **DRAFT TERMS OF REFERENCE** **ENGINEERING SUPERVISION**

#### **1. BACKGROUND**

1.1 Belize Electricity Limited (BEL) has received financing from the Caribbean Development Bank (CDB) for the interconnection of Caye Caulker Island with the Belize mainland via a 10km long submarine cable. The project aims to procure and install a 15MVA rated submarine cable designed to operate between 34.5kV and 46kV. The installation will be undertaken by an Engineer, Procure and Construct contractor procured by BEL.

#### **2. OBJECTIVES**

2.1 The objective of this consultancy is to provide independent certification and reporting of the proposed works. The consultant will be responsible for ensuring contract compliance with contract document and certification of the completion of the project.

#### **3. SCOPE OF WORK**

3.1 The Engineering Consultant will undertake the following tasks:

- (a) technical inspection of the Submarine Cable installation for compliance with the contract documents, Environmental and Social Management Plan (ESMP) and Climate Change Vulnerability Assessment (CCVA) ;
- (b) certification of work done for payment;
- (c) consultation and advice to BEL during installation.
- (d) preparation of monthly reports on the progress of the works, indicating any engineering difficulties affecting their efficient and timely execution, commencing one month after the start date as defined in the construction contract;
- (e) issuance of certificates of completion to the contractor upon completion of the construction contract; and
- (f) preparation of a Completion Report on installation of the Project within three months after the date of issue of a certificate of practical completion of the Project.

#### **4. QUALIFICATIONS AND EXPERIENCE**

- (a) **Key Expert No. 1: Lead Engineer**

- (i) Education: BSc in Electrical Engineering.
- (ii) Experience: At least 10 years' experience in submarine cable design and construction of cables up to 69kV.

4.1 It is envisaged that part-time inputs would be required from the following other experts:

- (a) Marine Surveyors.
- (b) CAD Technicians.
- (c) Sociologist.
- (d) Environmental Specialist

## 5. **DURATION**

5.1 The assignment expected to last for a period of approximately 12 calendar months.

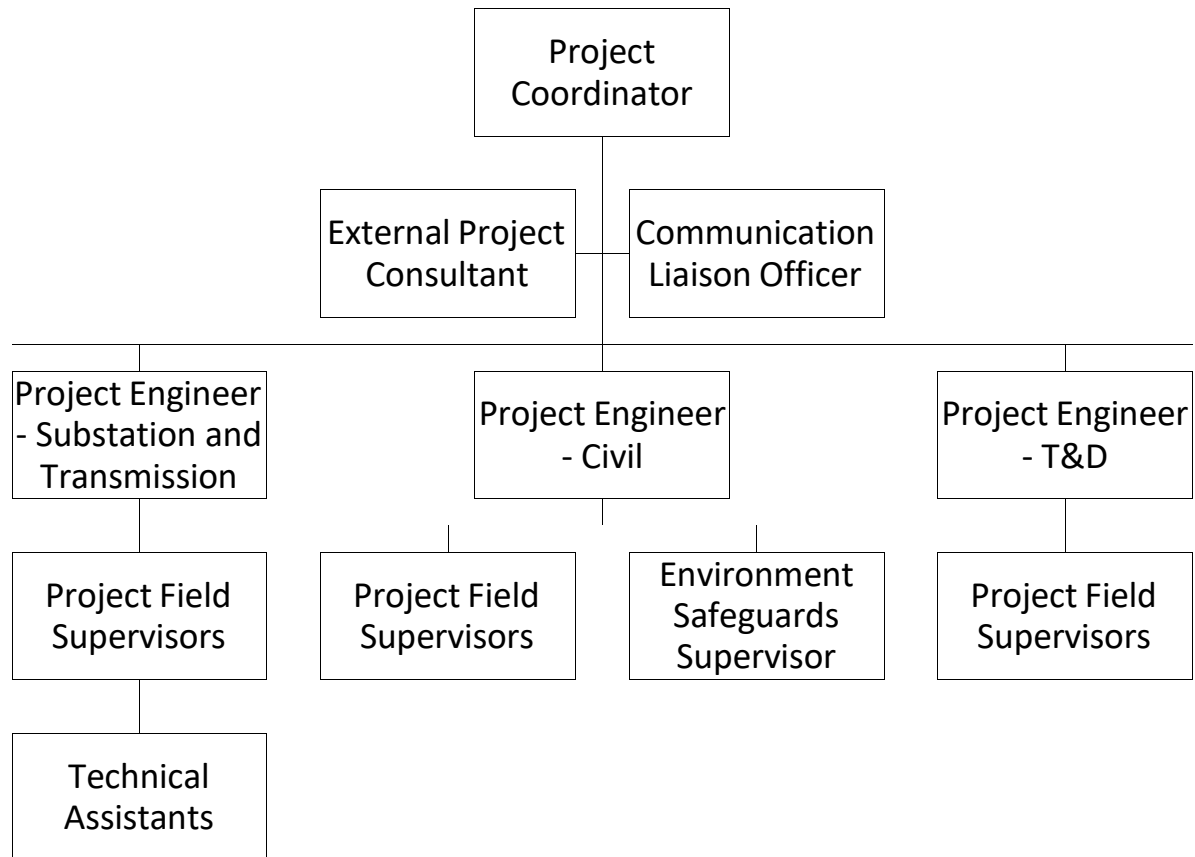
### **BUDGET** **(USD)**

<b>Items</b>	<b>CDB</b>
Technical Support/Non-key Experts	105,000
International Transport	15,000
Local Transport, Accommodation and Communication	5,000
<b>Total</b>	<b>125,000</b>



**APPENDIX 6.5.3: DUTIES OF THE ENVIRONMENTAL SAFEGUARDS SUPERVISOR**

- (a) Assist in implementing the ESMP and the environmental monitoring programme for the Project.
- (b) Advise the PC on any deviations from the ESMP and/or new or emerging environmental and climate change risks.
- (c) Assist in ensuring that any conditions attached to the Environmental Compliance Certificate are adequately adhered to.
- (d) Review the bid documents and certify that environmental mitigations, recommended in the ESMP are fully addressed.
- (e) Ensure safeguard instruments are integrated in the bidding documents and construction contracts.
- (f) Assist the PC in day-to-day activities related to the project including budgeting, planning and design and execution of activity plans as required.
- (g) Support the PC in ensuring that all national regulatory requirements for the project has been met.
- (h) Work with the PC to ensure reporting, monitoring and evaluation fully address the safeguard issues identified for the project; providing a well-documented, evidence- based compliance reports to be incorporated into the project annual reports.
- (i) Assist the PC with the preparation of a Project Completion Report by the deadline specified in the Reporting Requirements contained in CDB's Appraisal Report.
- (j) Assist in designing and delivering environmentally related capacity building activities that may arise for BEL.
- (k) Ensure that social and environmental grievances are managed effectively and transparently through the grievance redress mechanisms.
- (l) Any other tasks assigned by the PC to support the project with respect to the environmental issues.

**APPENDIX 6.6**      **PROJECT ORGANISATION CHART****PROJECT MANAGEMENT UNIT - ORGANISATION CHART**

## **APPENDIX 6.7      IMPLEMENTATION SUPPORT PLAN**

### **PROJECT IMPLEMENTATION SUPPORT PLAN**

1. CDB has had considerable experience in the energy sector of its BMCs. This experience provides the basis for providing implementation support to BEL. The implementation support will be provided as part of CDB's project supervision functions, and will include, among other things:
  - (a) reviewing implementation progress and achievement of project outcomes;
  - (b) addressing implementation issues;
  - (c) monitoring systems to ensure their continued adequacy through monitoring reports, audit reports, and field visits; and
  - (d) monitoring changes in risks and compliance with legal agreements, as needed.
2. The Implementation Support Plan (ISP) will be reviewed annually to ensure that it continues to meet the implementation support needs of the Project. In addition to reviewing implementation progress, ISP aims at providing technical support to BEL in the achievement of the results.
3. The strategy for implementation support has been developed based on the design of the Project, its risk profile, and an assessment of the Borrower and BEL. The strategy remains a flexible tool that may be amended during project implementation in response to the changing needs of the Project and the Borrower/Executing Agency.

#### **Strategy and Approach for Implementation Support**

4. Supervision of the Project will be undertaken by a team comprising the lead supervisor, supported by legal counsel and specialists in the areas of environment; procurement; financial analysis; and social analysis. Formal supervision and field visits will be undertaken at least semi-annually during the implementation phase of the Project.
5. The Lead Project Supervisor will coordinate CDB's team to ensure that project implementation is consistent with the requirements as specified in the Procurement Plan, Terms and Conditions and other legal documents. The supervision team will prepare annual Project Supervision Reports identifying the status of project implementation and any issue requiring the resolution of management. On the completion of the Project, or after 90% of the funds have been disbursed, staff will conduct an Exit Workshop to assess project results, discuss implementation issues, and identify lessons. A Draft Project Completion Report (PCR) will be prepared and discussed with the client during the Exit Workshop. The Final PCR will be validated by the Office of Independent Evaluation (OIE). Staff will prepare a management response to OIE's Validation Report. The Validation Report and management's response will be presented to the Audit and Post-Evaluation Committee.

**TABLE 1: STAFF SKILLS REQUIRED**

<b>Period</b>	<b>Focus</b>	<b>Skills and Resources Estimate</b>	
March 2019– June 2021	<u>Specific</u> 1. Support in satisfying Conditions Precedent. 2. Provide procurement support relating to draft procurement notices, resolving procurement bottlenecks.  <u>General</u> 1. Monitor Project Budgeting and Allocations. 2. Monitor Project Physical Works progress and quality, including field trips. 3. Monitor Project Results Framework. 4. Provide technical support to PC and Executing Agency. 5. Preparation of annual Project Supervision Report. 6. Review and certification of requests for disbursement. 7. Review of TA reports. 8. Review of Quarterly Reports.	Lead Project Supervisor  Legal Counsel  Financial Analyst  Environmental Specialist  Social Specialist  Gender Specialist  Procurement Specialist  Administrative Assistant  Divisional Secretary	12 weeks  1 week  3 weeks  2 week  2 week  1 week  2 week  5 weeks  3 week

**APPENDIX 6.8      PROCUREMENT****APPENDIX 6.8.1      EIB EXCLUDED ACTIVITIES**

1. BEL shall not finance, with the proceeds of the Loan, any activity involving:
  - (a) the manufacture and distribution of weapons and ammunition, arms and military equipment;
  - (b) the manufacture and distribution of tobacco or alcohol products;
  - (c) gambling and betting;
  - (d) detention facilities e.g. prisons, police stations, schools with custodial functions;  
and
  - (e) sectors with a strong ethical dimension considered to carry significant reputational risk.

**APPENDIX 6.9      REPORTING REQUIREMENTS**

**REPORTING REQUIREMENTS**

<b>Report Implementation</b>		<b>Frequency</b>	<b>Deadline for Submission</b>	<b>Responsibility</b>
1.	Quarterly progress reports on Submarine Cable Installation.	Quarterly	Within six weeks of the end of each quarter commencing with the quarter following the assignment of PC, until installation is completed.	PC
2.	Report on Investment Cost (Sample Guidelines in Annex 1).	Quarterly	Within six weeks of the end of each quarter commencing with the quarter following the assignment of PM, until installation is completed.	PC
3.	Procurement Plan	Annually	Within six weeks of the end of the Project Year, until completion.	PC
4.	BEL Project Implementation Completion Report.	-	Within three months of practical completion.	PC



**GUIDELINES FOR COMPLETION OF  
REPORT ON PROGRESS OF INVESTMENT COST**

1. Elements of Programme - The elements of the Programme as outlined in the Appraisal Report must be recorded in this column. If it becomes necessary to further sub-divide the main elements of the Programme, then the sub-elements should be grouped to facilitate the determination of the expenditure related to the main elements identified in the Appraisal Report.
2. Expenditure for this Quarter - The expenditure incurred in the quarter to which the report relates in respect of each element of the Programme must be recorded in this column.
3. Cumulative Expenditure to Date - The expenditure incurred in respect of each element of the Programme from the commencement of the Programme to the end of the quarter to which the report relates must be recorded in this column.
4. Projected Expenditure for Quarter - An estimate of the expenditure to be incurred in each of the next three quarters must be recorded in the columns 41, 42, and 43.
5. Estimate of Expenditure to complete Programme - This column should be completed only in respect of those elements of the Programme, construction/installation of which stretches beyond three quarters from the end of the quarter to which the report relates. Where a programme extends over more than one year - four quarters - an estimate of the expenditure to be incurred in the period subsequent to the year must be recorded in this column.
6. Latest Estimate of Expenditure - The amounts to be recorded in this column should be derived by adding columns 3, 41, 42, and 43. The amounts recorded in this column should be the best estimate of expenditure to be incurred in respect of each element of the Programme. These amounts may be less or greater than the appraised expenditure.
7. Programme Estimates as per Appraisal Report - The estimate of expenditure to be incurred in respect of each element of the Programme, as outlined in the Appraisal Report, must be recorded in this column.
8. Variance - The difference between columns 6 and 7 must be recorded in this column. Where the amount in column 6 is less than that in column 7, a favourable variance results. An adverse variance results where the amount in column 6 is greater than that in column 7.
9. Comments - An explanation should be given for each variance which is more than 10% of the programme estimates as per Appraisal Report.



## Figures and Charts

4/5/2019

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### Submarine Salvation For Dirty Diesel On Caye Caulker Thu, March 14, 2019



No

matter where you are watching this tonight, your electricity is probably coming from BEL's national power grid. That is, of course, unless you are in Caye Caulker - where, if you listen hard enough, you can probably hear the thrum and whistle of diesel generators laboring into the night. The growing island is still not connected to the national grid - but an ambitious new BEL project hopes to change that. Jules Vasquez found out more today:

#### *Jules Vasquez reporting*

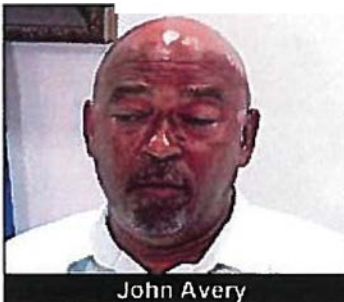
The brilliant sapphire waters on the leeward, or western side of Caye Caulker seem completely unspoiled and, to the east, the windward side, is bordered by the spectacular barrier reef.

And while they frame to Caye Caulker's matchless natural beauty, and lay the scene for an emergent tourist mecca

Lola Carinosa has a dirty secret. All the power on the island comes from decades old diesel generators, a costly, noisy and non renewable source of energy. It's causing air and noise pollution on the island, and one year ago, the PUC told them to end it, quickly:

**May 07, 2018**

**John Avery - Chairman, PUC**



John Avery

*"Caye Caulker is currently isolated from the grid, which means that 100% of the power comes from fossil fuel and we've been spending over \$3 million dollars a year on diesel for Caye Caulker alone. That helps no one. BEL cannot make any mark up on that and that is the most expensive source of power in the country. Actually, we are just throwing money into these diesel trucks that come in and continue to operate Caye Caulker on diesel."*

And, now, BEL is throwing its money - 15 million dollars - behind a project to end that diesel dependency on Caye Caulker.

This morning, the company took the media to San Pedro where they explained the proposed project

And toured the area where they will run a submarine cable six miles from the tip of Southern San Pedro to Northern Caye Caulker.

[www.7newsbelize.com/printstory.php?func=print&nid=48273](http://www.7newsbelize.com/printstory.php?func=print&nid=48273)

4/5/2019

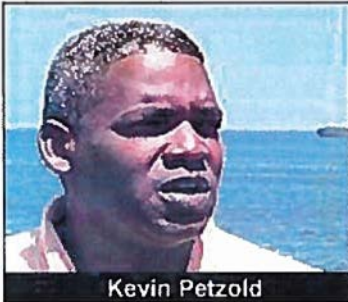
**Kevin Petzold, Project Manager**

*"It's not sustainable to keep the generators running to provide the kind of supply that Caye Caulker will need. So its planning for the future and also taking environment into consideration."*

The route would traverse the Hol Chan Marine Reserve. And also the sweet spots for recreational fishers and lobster fishers:

**Reporter**

*"What precautions are taken to ensure that the marine environment, especially the Hof Chan Reserve is not affected?"*

**Kevin Petzold, Project Manager, BEL**

*"Well BEL is being very responsible in that manner. In fact, that's probably one of the key things, we have been in very close consultation with the Hof Chan Marine office. Their input has been heavily considered and they are going along the journey with us in terms of the design."*

But what islanders on Caye Caulker want most is a reliable power supply:

**Reporter**

*"Are you able to convince the residents that the sub-marine cable will be impervious and immune from small exogenous events?"*

**Kevin Petzold, Project Manager, BEL**

*"I hope that we can. We are trying our best to do that. I think we were successful in San Pedro and we'd like to see the same level of success for Caye Caulker, where the outage has reduced dramatically over the last few years. The line itself has not experience any issue for over 20 years."*

That San Pedro submarine cable, laid in 1998 comes 16 miles across from Bomba on the mainland and comes aground here on south Ambergris Caye:

**Kevin Petzold**

*"Clearly having something like what San Pedro enjoys which is similar sub-marine cable, is big benefit to them."*

Now, BEL is having its first public consultation next week to make that pitch to Hicaquenos:

**Kevin Petzold**

*"We have been extensively communicating with stakeholders including the residents. We have held many forums, one on one with the residents and we don't see no significant concern. The residents seem to have faith in BEL's being responsible."*

**So, while that public consultation on the environmental and Social Impact Assessment will be held next week Thursday night at 6:30 in the village, BEL says it has been consulting with the village council and residents since 2019.**

**Again, the 15 million dollars project is pending environmental approval, and after that BEL will seek funding from the CDB.**