



CARIBBEAN ASSOCIATION OF
INVESTMENT PROMOTION
AGENCIES



INVESTING IN THE RENEWABLE ENERGY SECTOR IN THE CARIBBEAN



Funded by the



INVEST IN RENEWABLE ENERGY

SECTOR BOOKLET

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THE CARIBBEAN REGION INVESTMENT CLIMATE

The Caribbean¹ provides exciting investment opportunities and growth prospects. The region has several features offering a competitive edge and diverse investment opportunities, with promising emerging sectors including Business Process Outsourcing, Niche Tourism and Renewable Energy.

The region is characterised by a stable economic and political climate, a desirable and privileged geographic location and openness to trade which gives access to attractive markets, it also offers skilled labour supply, modern infrastructure and supportive government, with relatively low levels of red tape and bureaucracy.

ECONOMIC & POLITICAL STABILITY

The Caribbean provides strong foundations for businesses. Most countries have an outstanding track record of economic and political stability.

Figure 1: The Caribbean quick macroeconomics facts

COUNTRY	GDP 2015 MILLIONS USD	GDP GROWTH AVERAGE 2010-15	INFLATION RATE 2015	POPULATION 2014	UNEMPLOYMENT RATE 2015	IMPORTS 2014 % GDP	EXPORTS 2014 % GDP
The Bahamas	8,705	0.9%	1.8%	383,054	15,4%	60.9%	43.9%
Barbados	4,412	0.3%	0.54%	283,380	12,0%	66.3%	60.8%
Belize	1,763	2.5%	-0.59%	351,706	11,5%	48.3%	36.5%
Dominican Republic	67,492	4.9%	0.83%	10,405,943	15,0%	30.5%	25.7%
Guyana	3,164	4.5%	-0.32%	763,893	11,1%	80.8%	51.0%
Haiti	8,618	3.3%	7.5%	10,572,029	6,8%	53.1%	18.6%
Jamaica	13,924	0.5%	4.6%	2,720,554	13,2%	53.3%	31.1%
Suriname	5,192	2.6%	6.8%	538,248	5,6%	45.1%	30.4%
Trinidad & Tobago	24,553	0.1%	4.6%	1,354,483	4,0%	31.4%	44.4%

Source: World Economic Outlook Database 2016, GDP growth measured as CAGR 2010-15, IMF; Unemployment Rate and Import & Export - World Bank national accounts data

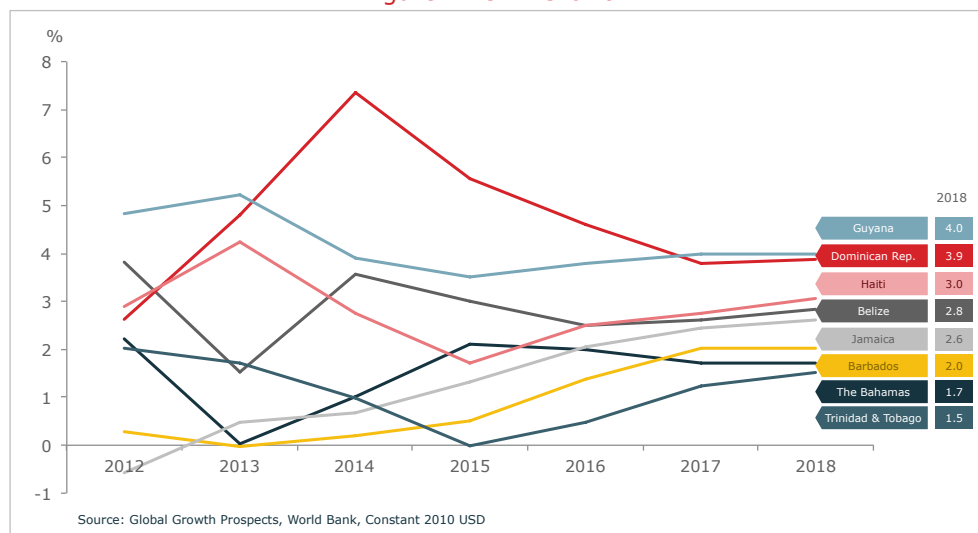
¹ The following report draws on regional general data but will focus on nine economies in the region, namely The Bahamas, Barbados, Belize, Dominican Republic, Guyana, Jamaica, Haiti, Suriname and Trinidad & Tobago.

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The Caribbean economies are small and very open to international trade. High trade to GDP ratios demonstrate the region's openness to international trade and economic integration. The region's² total GDP was US\$143.6 billion in 2015 (at current prices USD). The service sector, mainly tourism and business services, dominates the majority of the economies in the region, contributing to more than 50% of GDP in most countries. However, Guyana, Suriname and Trinidad & Tobago are commodity-based and in these economies the mining and energy sector, including gold mining and oil and gas, are the largest contributors to economic activity, whilst the Belize economy is primarily agro-based. There are several opportunities to upgrade and diversify the value chain with investments in future sectors of growth and innovation, such as renewable energy and sustainable niche tourism.

The regional economy grew 1.7% in 2015 and future economic growth prospects remain positive, the World Bank estimates show growth prospects between 1.5% and 4% in the coming years.

Figure 2: GDP Growth³



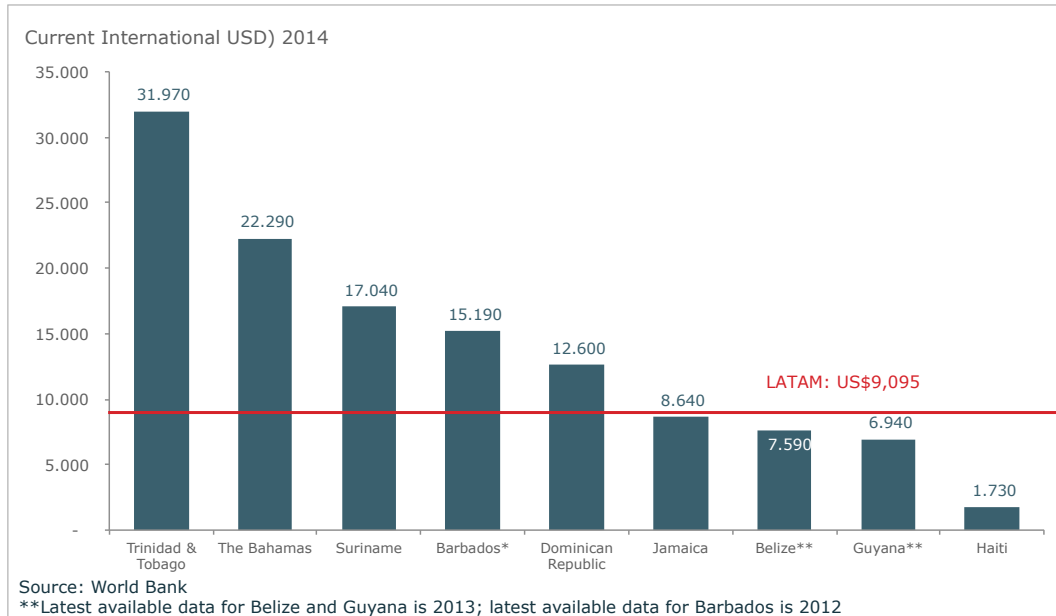
The Gross National Income (at Purchasing Power Parity) per capita increased a 42% over the last decade from US\$9,700 to US\$13,780 regionally, however this average hides some inequalities; Barbados and Trinidad & Tobago have the highest GNI per capita and are classified as high-income economies, whilst Haiti's GNI per capita is US\$1,730.

² <http://www.imf.org/external/data.htm>. The Caribbean includes: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad & Tobago

³ Latin America and Caribbean Economic Prospects, World Bank excludes Suriname, for which data limitations prevent the forecasting of GDP components.

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Figure 3: GNI per capita 2014



In addition to positive economic growth forecast and high income per capita, the regional average inflation rate has fallen since 2011 and is not expected to exceed 3.5% in the next years⁴. The Caribbean public debt is higher than the average of small economies⁵, however the ratio of public debt to GDP has been improving in many countries.

The Caribbean is a reliable business partner, it has one of the lowest perceived risks in the LAC region⁶ and it is a comparatively politically stable region with well-functioning institutions, efficient government and low level of corruption. Transparency International's Corruption Perception Index 2015 ranks countries on perceived level of public sector corruption. The Caribbean is way above average, of 168 countries Haiti ranked 17, Guyana 29, Dominican Republic 33, Suriname 36 and Trinidad & Tobago 39⁷.

The overall regulatory system is conducive to business activity. The Worldwide Governance Indicators (WGI) reports governance indicators for over 200 economies. The countries in this report, with the exception of Haiti, score in the top 50% in terms of political stability and both Bahamas and Barbados are placed among the top 20%

⁴ Private Sector Development in the Caribbean, EIU, 2015

⁵ IMF

⁶ According to the Trading Economics credit rating, a composed Index of Standard & Poors, Fitch and Moody's; <http://www.tradingeconomics.com/country-list/rating>

⁷ The rest of the countries in this report were not part of the ranking.

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Figure 4: Political Stability Indicators 2014⁸



INTERNATIONAL LINKAGES AND ACCESS TO LARGE MARKETS

The Caribbean's privileged geographic location makes the region a perfect gateway to markets in North, Central and South America. The region is strongly integrated with international markets and has extensive trade relations. The Caribbean boasts several trade agreements, which give preferential access to a vast market of nearly 1 billion customers in North America, the European Union and South America.

Figure 5: Free Trade Agreements in Operation in force

FTE	Region / Countries	Population (millions)	GDP (US\$ billions)
CARICOM Single Market and Economy (CSME)	The Caribbean (15 members)	16.7	US\$64.1
CARIFORUM- EU Economic Partnership agreement	European Union (27 member states)	507.4	US\$18,495
Caribbean Basin Initiative (CBI) (duty free access to most goods)	United State of America	318.9	US\$17,419
Canada – Caribbean Community (CARICOM)	Canada (under negotiation)	35.2	US\$1,785
CARICOM – Republic of Colombia Trade, Economic & Technical Cooperation Agreement	Colombia	48.3	US\$377.7
CARICOM-Republic of Venezuela Trade & Investment Agreement	Venezuela	30.4	US\$438.3
CARICOM-Republic of Costa Rica Free Trade Agreement	Costa Rica	4.8	US\$49.6

⁸ The Worldwide Governance Indicators (WGI); Kaufmann, Kraay and Mastruzzi. Percentile rank indicates the country's rank among all countries covered by the aggregate indicator with 0 corresponding to lowest rank and 100 to highest rank.

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The CARICOM Single Market and Economy (CSME) allows for economies of scale and cluster promotion. Other important trade and economic agreements include:

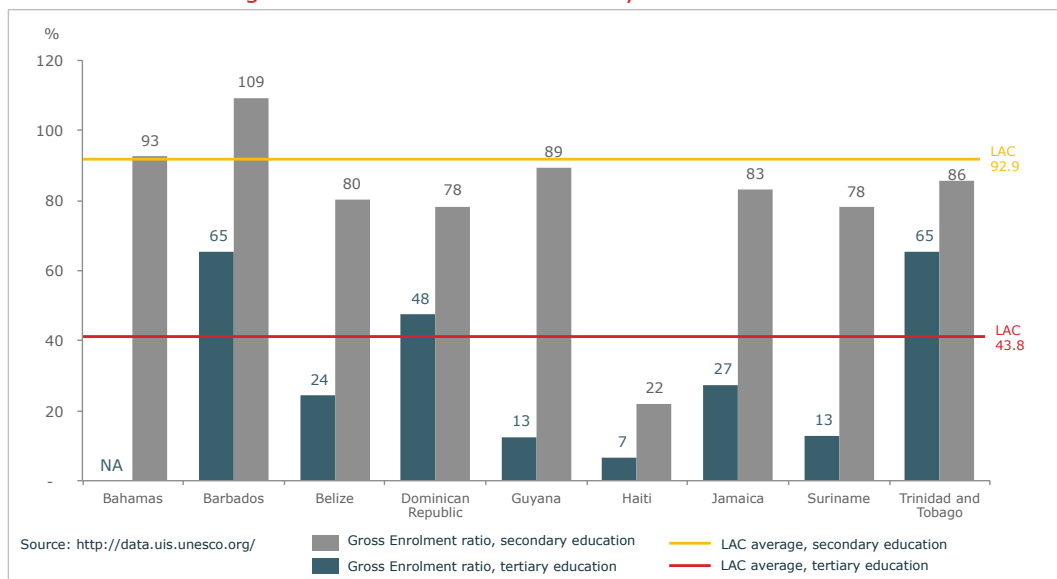
- Dominican Republic-Central America Free Trade Agreement, facilitating trade between Central American territories, Dominican Republic and the US
- Haitian Hemispheric Opportunity through Partnership Encouragement, granting preferential access to the US market

The region's openness is also demonstrated by the active engagement of Diasporas in economic and business development. Research shows that Diasporas create strong links to the rest of the world, facilitating business contacts and technology transfers.⁹

SKILLED AND FLEXIBLE LABOUR FORCE

Young and skilled, the Caribbean ensures access to a 13 million strong and qualified work force. Overall, the Caribbean has a high percentage of secondary and tertiary education enrolment. Over 70,000 students graduate from higher education every year. The region also has the advantage of speaking several global languages; English, French, Spanish and Dutch are spoken fluently. Furthermore, the Caribbean has a flexible labour regime when compared to Latin America.

Figure 6: Gross Enrolment rate by education Levels



⁹ Newland & Plaza, 2013, *What we know about diasporas and economic development*, Policy Brief No. 5, Migration Policy Institute

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MODERN INFRASTRUCTURE

TRANSPORTATION

The region has a well-developed logistics infrastructure; the region possesses some of the best port infrastructures in the world, it has high concentration of international airports¹⁰ and good quality roads that facilitate efficient transportation of goods and people.

Figure 7: Quality of Transport Infrastructure¹¹

COUNTRIES	OVERALL RANKING	ROADS	PORTS	AIRPORTS
Dominican Republic	60	4.3	4.5	4.7
Jamaica	62	3.6	4.7	4.9
Trinidad & Tobago	66	4.1	4.0	4.6
Guyana	95	3.2	3.6	3.8
Haiti	135	2.3	2.6	2.9
	Above Average			

1 = extremely underdeveloped – among the worst in the world; 7 = extensive and efficient – among the best in the world

The CSME is continuously developing market access and integration within the region, as well as promoting the free movement of goods, services, capital and labour.

ENERGY

Broad access and high quality of electricity supply, 90% or more of the population have access to electric power¹² at affordable prices.

The region is heavily reliant on imported fuel oil and diesel for power generation with the exception of Trinidad & Tobago, which is an oil and gas exporter. Natural energy sources such as hydropower, biomass, wind and solar energy are emerging sectors¹³ with promising investment opportunities.

Furthermore, many countries are investing to improve the access, reliability and cost of electricity. Between 1990 and 2014 Dominican Republic, Guyana, Haiti and Jamaica registered 30 electricity infrastructure projects with a private investment value of US\$ 4,178 million.

¹⁰ Caribbean Knowledge series 2013, Air Transport in the OECS: Flying Solo?, World Bank LAC

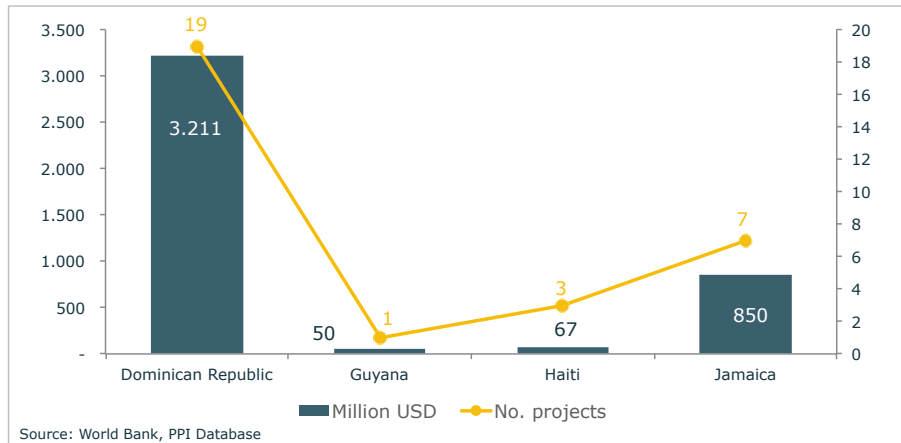
¹¹ Competitiveness Rankings 2016, WEF. The Bahamas, Barbados, Belize and Suriname are not assessed

¹² World Bank Development Indicators 2015. The exception is Guyana where 79% of the population have access to electricity and Haiti where 37.9% of the population have access to electricity

¹³ Caribbean Knowledge Series, 2013, Got steam? Geothermal as an Opportunity for Growth in the Caribbean, World Bank LAC

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Figure 8: Private Investment in electricity infrastructure projects

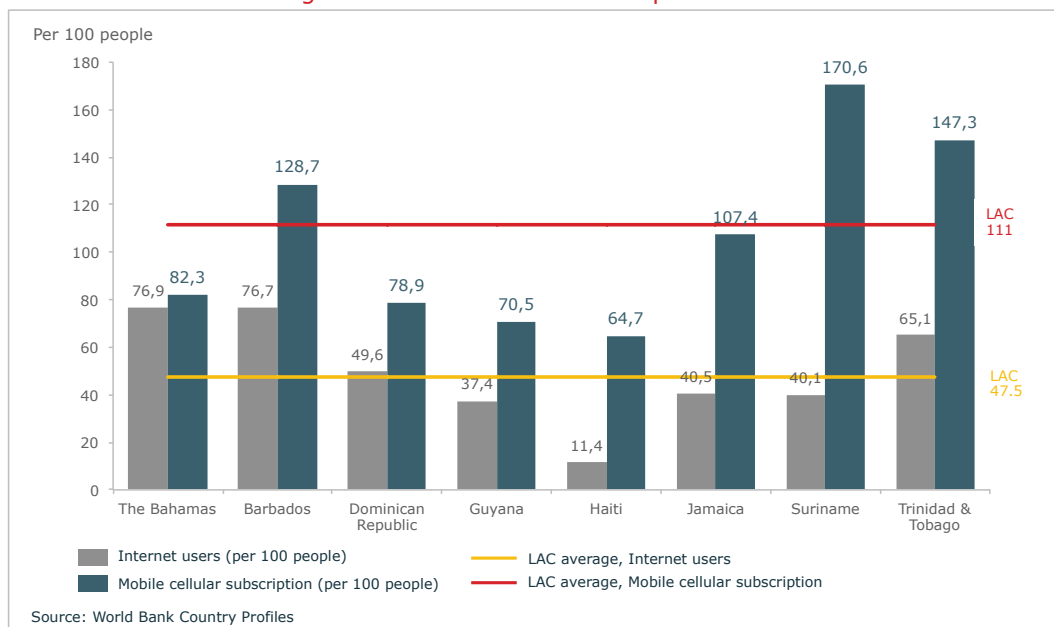


TELECOMMUNICATION

The Caribbean region ranks well in technology readiness, it has a higher than global average percentage of Internet users, 49% of the Caribbean population are internet users as compared to 43% of the global population¹⁴.

The Caribbean's telecom infrastructure is supported by the international submarine fibre optic ring that connects all islands in the region. The region's access to broadband supports business activities and provide connectivity to international and regional markets.

Figure 9: Telecommunications penetration

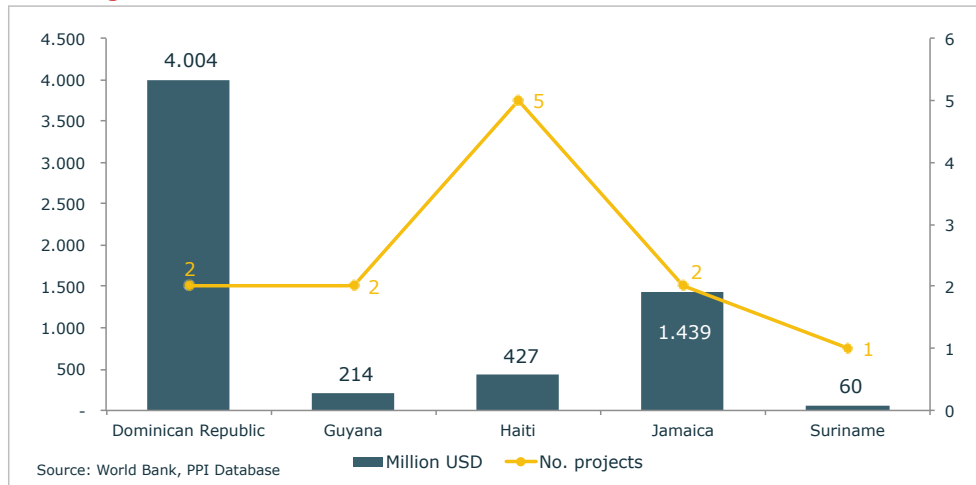


¹⁴The Economist Intelligence Unit, 2015

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Telecom infrastructure has improved dramatically in the past decade, public-private partnership have grown exponentially. According to the World Bank, Dominican Republic, Guyana, Haiti, Jamaica and Suriname registered 13 telecommunications infrastructure projects between 1990 and 2014 with a private investment value of 6,144 million USD.

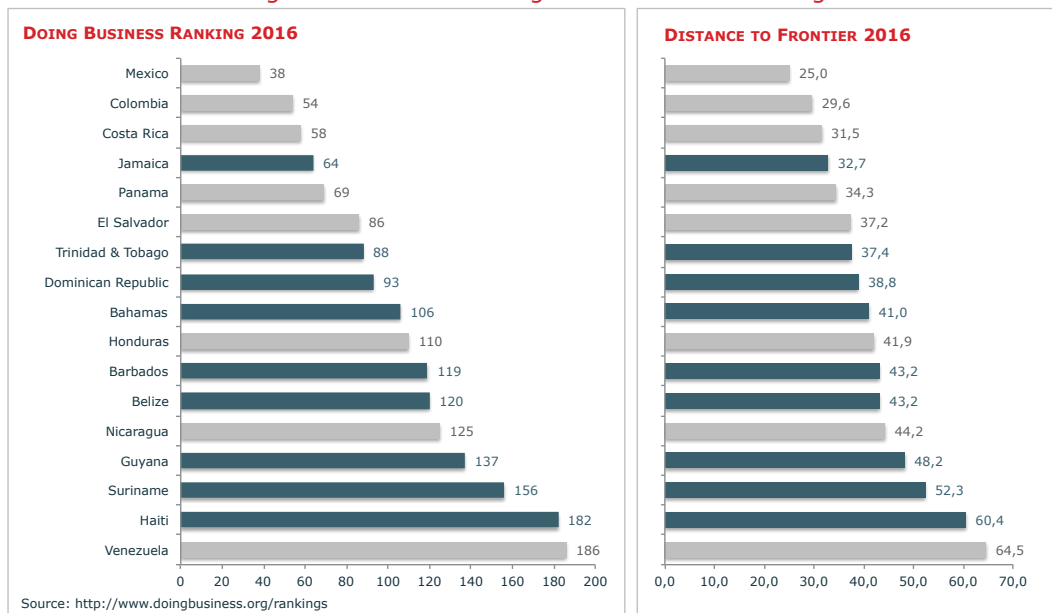
Figure 10: Private Investment in Telecommunications Infrastructure



EASE OF DOING BUSINESS

The Caribbean has one of the most conducive business environments when compared with Central and South American countries. The region ranks well in critical areas for investors such Starting a Business, Dealing with construction permits and Getting Electricity.

Figure 11: Ease of Doing Business 2016 ranking



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The ease of doing business has improved in the Caribbean region over the last couple of years¹⁵, indicating a positive development for foreign investors. Several of the Caribbean countries have undertaken reforms to improve the business climate. This is reflected in the countries' "distance to the frontier". The Dominican Republic, Jamaica and Trinidad & Tobago now rank amongst the top 50% of all the countries covered by the World Bank.

Furthermore, regional studies show that the region's strong institutions benefit the efficiency of the business environment. For example, in all countries, with the exception of Belize and Guyana, firms state that customs and trade regulations are no, or only minor, obstacles to doing business.¹⁶ The same study shows that senior managers in the Caribbean only have to devote half of the time dealing with government regulation, as compared to the global average. On average, senior management in the Caribbean spend 5 per cent of their time per week dealing with government regulation as compared to the global average of 10 per cent and the Latin American average of 14 per cent.¹⁷

GOVERNMENT COMMITMENT

The Governments are committed to supporting the development of key sectors; most of the countries offer attractive incentives for investment, tax holidays or preferential income taxes, exceptions from duties on imports, property tax exemptions, an extensive range of free economic zones, among others.

¹⁵ The Economist Intelligence Unit

¹⁶ *ibid*

¹⁷ *ibid.*

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RENEWABLE ENERGY AT A GLANCE

GLOBAL INDUSTRY TRENDS

WORLD TRANSITION TO RENEWABLES

The global demand for Renewable Energy is growing at a fast pace, both in terms of capacity installed and energy produced, with emerging markets taking the lead. As the energy sector is going through this major transition process, governments around the globe are now adopting policies to support the shift from fossil fuels to Renewable Energies.

INCREASING COST-COMPETITIVENESS

Renewables have expanded both in terms of capacity installed and energy produced. Global renewable energy power capacity has grown 85% over the last ten years. This trend has been driven partly by the decline in renewable energy costs. In many countries renewables are now broadly competitive with conventional energy sources.

SOLAR AND WIND POWER AS LEADING TECHNOLOGIES

Solar and wind power have been the leading subsectors in terms of investment in renewables over the last two years. Although both developed and developing countries have increased their investments in renewables, developing economies are responsible for the majority of investments in wind power, small-scale hydro and geothermal power.

EMERGING MARKETS PREFERRED DESTINATION FOR NEW INVESTMENTS IN RENEWABLES

Emerging markets registered US\$126 billion in new investments in renewable power generation during 2014. For the first time emerging markets received more than half of all new global investments in renewables - a 39% increase compared to the previous year.

THE RENEWABLE ENERGY INDUSTRY IN THE CARIBBEAN

The region of the Caribbean has already started the journey of developing Renewable Energy sources, with its governments in the respective countries fully committed to the task.

There are differences between countries in the region, in terms of matureness and capacity, technology and needs. Many islands in the region are using their year-round sunshine, not only to attract tourists but to develop renewable energy. The reasons behind the strategy to develop renewables varies between needing lower energy costs, as the price of electricity is considered high in some countries, less dependency on fossil fuels and also to ensure a more reliable output.

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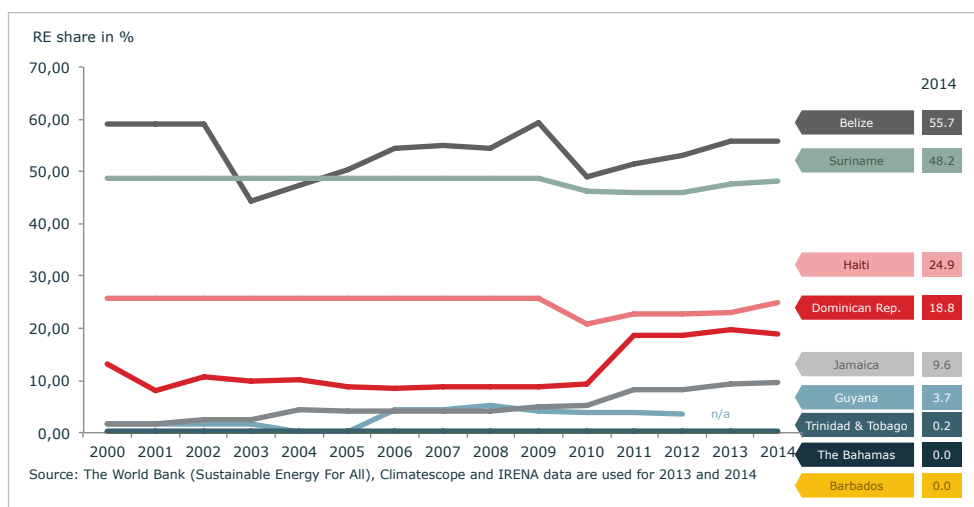
Existing & Potential capacity in renewables by country

COUNTRY	FOSSIL FUELS (2014) MW	HYDRO (2014) MW		WIND (2014) MW		SOLAR (2014) MW		BIOMASS & WASTE (2014) MW	
	MW	MW	POTENTIAL	MW	POTENTIAL	MW	POTENTIAL	MW	POTENTIAL
The Bahamas	576	0	0	0	229	0	60	0	1
Barbados	239	0	n/a	0	40	0	40	0	24
Belize	69	54	70	0	n/a	0	42	32	n/a
Dominican Republic	3,050	606	n/a	85	n/a	2	n/a	0	n/a
Guyana	147	0	7,000	0	n/a	0	576	30	60.2 GWh
Haiti	191	63	897	0	27,300	0	2	0	8
Jamaica	854	29	56	42	1,313	0	1.876	0	192
Suriname	190	189	1,700	0	n/a	5	n/a	0	n/a
Trinidad & Tobago	2,368	0	n/a	0	50	0	308	0	n/a
Total	7,684	941	9,723	127	28,932	7	2,904	62	244

Sources: global-climatescope.com & C-SERMS report 2015; Note "0" indicates there is no installed capacity at present, n/a indicates that data were not available at the time of the publication

The electricity demand in the Caribbean region is forecasted to double by 2027 as populations and market size will increase, and where Renewable Energy is key in meeting future capacity requirements. As all countries in the region are lagging behind in their potential for Renewable Energy, natural energy sources such as hydropower, biomass, wind and solar energy are emerging sectors presenting new, interesting investment opportunities.

Renewable generation capacity share of total generation capacity (2000-14)



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WHY THE CARIBBEAN?

ABUNDANCE OF NATURAL RESOURCES

The Caribbean with its beautiful nature and weather, has a long history of attracting visitors and investments in the tourism industry sector, offering high-end quality services – from luxury resorts to eco-tourism and exploration of the region’s cultural heritage. Now many countries in the region are looking at Renewable Energy as a way of creating further growth and competitiveness.

The Caribbean offers an abundance of natural resources, making it an attractive region for investments in the development of Renewable Energy. The opportunities range from solar and wind energy to hydro and biomass renewables. The region can present existing and proven solutions, coupled with advanced research and development of new, disruptive technology, exploiting untapped Renewable Energy resources.

RISING DEMAND FOR ENERGY

The electricity demand in the Caribbean region is projected to reach 32,812 GWh in 2027, an increase by 58% over 2013, as populations and market size will increase. Renewable Energy is key in meeting current and future capacity requirements and domestic demand.

It is important to take into consideration that the Caribbean region is characterized by differences in terms of market size, level of development and access to electricity. In addition, the average retail electricity price per kWh varies as much as from US 39 cents in the Bahamas to rates as low as US 7 cents in Suriname and Trinidad & Tobago. The region’s diversity, the abundance of natural resources, growing demand and generally high electricity prices create numerous and diverse investment opportunities.

UNTAPPED POTENTIAL

Despite substantial wind, solar and biomass resources; renewable energy, including hydropower, represents less than 13% of the region's total installed generation capacity, very small compared to the huge and untapped potential yet to be exploited.

In 2014, the Caribbean had a total installed capacity of 8.8 GW

- The bulk is represented from fossil fuels: oil and diesel, natural gas and coal
- Renewables represent 12.8% of the total mix: hydro (10.6%), wind (1.4%), biomass (0.7%) and solar (0.1%)

In 2014 the Caribbean had 1,140 MW of renewable energy installed capacity, considerable below its 41,800 MW minimum proven potential. Every country punches below its potential in virtually every source of renewable energy presented

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Renewables Investment Potential and investment climate

COUNTRY	HYDRO	WIND	SOLAR	BIOMASS	RENEWABLES INVESTMENT CLIMATE INDEX
The Bahamas					
Barbados					
Belize					
Dominican Republic					
Guyana					
Haiti					
Jamaica					
Suriname					
Trinidad & Tobago					

POSITIVE INVESTMENT CLIMATE

The Caribbean provides exciting investment opportunities and growth prospects. The region has several features offering a competitive edge and diverse investment opportunities. The region is characterized by a stable economic and political climate, privileged geographic location and openness to trade which gives access to attractive markets, it also offers skilled labour supply, modern infrastructure and supportive government, with relatively low or moderate levels of bureaucracy.

AMBITIOUS TARGETS

The Government is fully dedicated to the task of further developing Renewable Energy, with the goal of achieving the ambitious targets as per below, of clean energy in total power generation by 2027. As most countries in the region are highly dependent on fossil fuels, their Governments are relying on renewables to cover some or all of the future demands, thus opening up for substantial investment potential for companies in all renewables sectors.

Renewable Targets by country

COUNTRY	C-SERMS TARGETS BY 2027	
	% IN CAPACITY	% IN GENERATION
The Bahamas	55	63
Barbados	67	55
Belize	76	85
Dominican Republic	25	n/a
Guyana	84	90
Haiti	46	52
Jamaica	40	40
Suriname	52	60
Trinidad and Tobago	52	29

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INCENTIVES SCHEME

The Government is committed to supporting the development of the Renewable Energy sector; most of the countries offer attractive incentives for investment, tax holidays or preferential income taxes, exceptions from duties on imports, property tax exemptions, and an extensive range of free economic zones, among others.

Regulations and incentives in place / in development, by country

Type of Incentive	Bahamas	Barbados	Belize	Dominican Republic	Guyana	Haiti	Jamaica	Suriname	Trinidad & Tobago
Feed-in Tariffs									
Public Loans/Grants									
Tax Credits									
Tax Reduction/Exemption									
Net Metering/Billing									
Inter-Connection Standards									
In development In place									

EASE OF DOING BUSINESS

The ease of doing business has improved in the Caribbean region over the last couple of years, indicating a positive development for foreign companies. Several Caribbean countries have undertaken reforms to improve their business climate. This is reflected in the countries' "distance to the frontier". The Dominican Republic, Jamaica and Trinidad & Tobago now rank amongst the top 50% of all the countries covered by the World Bank. Furthermore, regional studies show that the region's strong institutions benefit from the efficacy of the business environment.

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PROOF OF CONCEPT

The Caribbean region has attracted more than 20 new foreign-owned renewable energy projects during the past ten years, with a total investment value of US\$3,700 million, creating close to 2,200 new job opportunities. The table below presents the ten largest and more recent investments from well-known brands, in terms of capital investment.

Ten largest Renewable Energy FDI projects in the Caribbean, 2009-2016

Year	Investing Company	Destination Country	Sector	Capital Investment (US\$ million)	Est number of jobs
2016	Benchmark Renewable Energy	Jamaica	Biomass power	95	58
2015	General Energy Solutions	Dominican Republic	Solar electric power	110	9
2015	First Colombia Gold	Suriname, Jamaica, Belize	Solar electric power	428	207
2015	WRB Enterprises	Jamaica	Solar electric power	60	11
2014	Cahill Energy	Barbados	Biomass power	240	43
2013	Wircon (Wirsol)	Dominican Republic	Solar electric power	253	175
2011	Viaspace Green Energy	Dominican Republic	Biomass power	91	109
2010	Synergy Holdings	Guyana	Hydroelectric power	156	22
2009	Inveravante Inversiones Universales	Dominican Republic	Wind electric power	506	350
2009	Nacel Energy	Dominican Republic	Wind electric power	253	175

Source: fDi Markets

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INVESTMENT OPPORTUNITIES

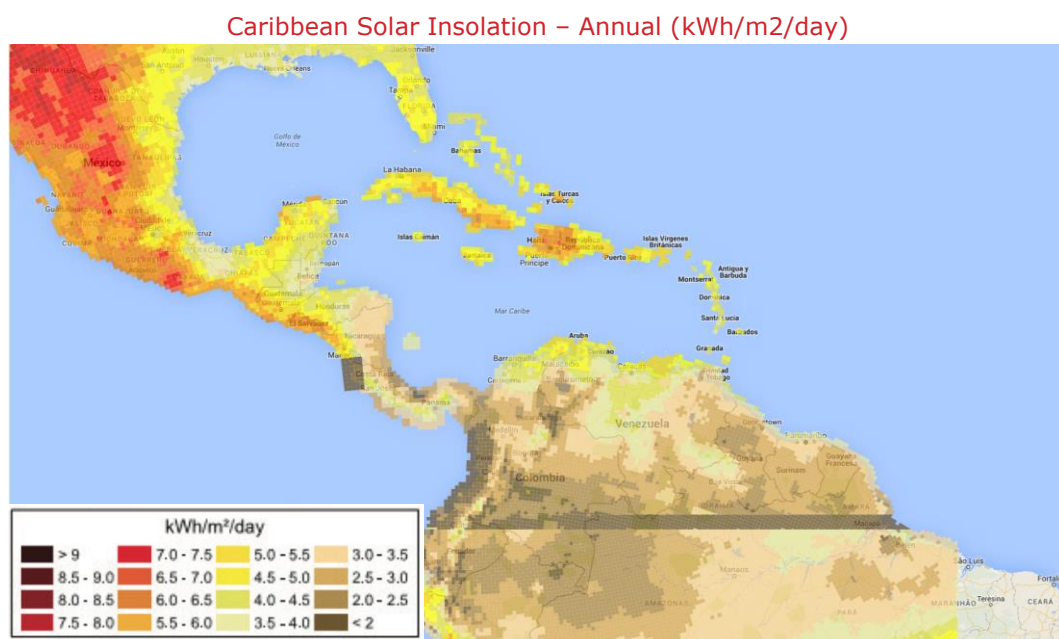
INFRASTRUCTURE INVESTMENTS

- The growing demand of electricity will require substantial investments in the physical infrastructure of the electricity grid in the region. Since a large part of the population in countries like Haiti, Guyana, Suriname and Belize are not connected to the grid, the potential for investments in this area is quite substantial.
- The transmission and distribution networks need to be upgraded and modernized to increase reliability and reduce transmission loss. In Haiti the transmission loss is as high as 50%, in Jamaica close to 40%.
- Additional storage capacity will be required, especially in smaller islands like The Bahamas and Barbados, relying on solar and wind.
- The need to enhance energy efficiency, i.e. switching to more efficient electronics and machinery will require investments targeting both the residential and the industrial segment.

SOLAR

By using their great asset and advantage of high sunshine radiation throughout the year, The Bahamas, Barbados, Belize, Dominican Republic, Haiti, Jamaica, Trinidad & Tobago offer interesting opportunities in solar energy, with an average of 2,755 hours of sunshine per year.

The average solar insolation (Direct Normal Irradiance – DNI) in the Caribbean region is between 5 and 6 kWh/m²/day, which is favourable for solar power generation. As a comparison, insolation per year is twice as high than in Germany (2.5) and equivalent to Spain (5.6), two of the world's largest solar power markets.



Source: SWERA June 2016

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Notable PV projects in the Caribbean (a selection)

Country	Project	Developer	Capacity
Jamaica	Parish of Clarendon Utility-Scale PV plant	Global Energy Services	28.5 MW*
	Gran Palladium Report	Sofos	1.6 MW
Dominican Republic	Monte Plata Solar - utility scale PV plant	Neo Solar Power Corp	33.4 MW
Belize	Placencia PV plant	Natcore	10 MW*
Barbados	St. Lucy Energy Gateway	Grupotec	10 MW*

*Forthcoming power – Plant under construction

Source: solarpowermarket.net; Barbados: <http://www.solarbarbados.com/2015/09/22/10mw-solar-farm-to-be-built-in-barbados/>

Solar energy has a minimum generation proven potential of 3,000 MW in the Region, furthermore, the Caribbean shows potential of creating a regional cluster of solar energy, offering investment opportunities throughout the value chain. For instance, Trinidad & Tobago has the potential to attract investments in the entire value chain, i.e. manufacture the solar panels, assembly, generate and distribute the energy and, at the end of the chain, recycle. Here, the competitive, low cost of energy is a key differentiator.

WIND

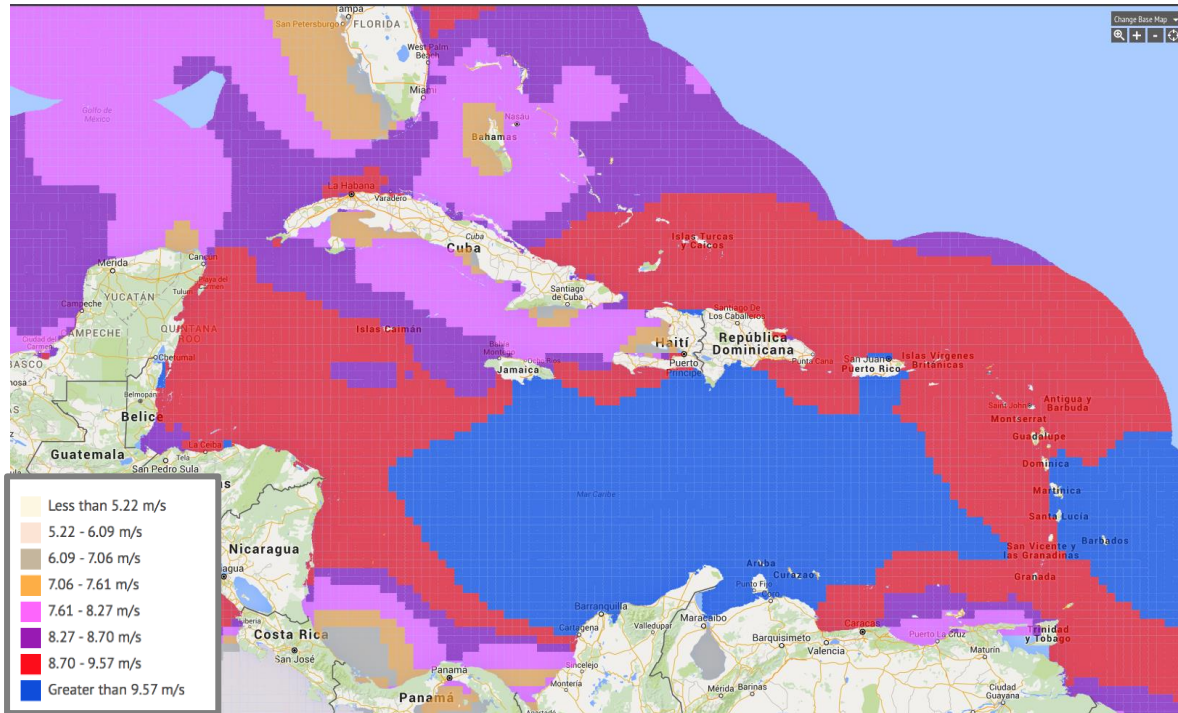
The Bahamas, Barbados, Dominican Republic, Haiti, Jamaica and Trinidad & Tobago are leveraging their position as providers of wind energy.

All Caribbean islands have significant wind energy potential. Measurements of wind intensity show an annual average wind speed of more than 8 m/s (measured in 90 m above sea level), in some islands wind speed is above 9 m/s. In comparison, Continental Europe's wind parks are considered to be economically interesting at an average annual wind speed of 5.5 m/s. Wind is also an issue for some nations depending on offshore wind farms versus their coastal geography, in tourist bound places, wind farms must not become a drawback but an asset.

Wind potential in the Caribbean is estimated at about 30,000 MW.

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Caribbean Wind Intensity Annual (m/s at 90 m ASL)



Source: SWERA June 2016; Caribbean Renewable Energy Development Programme - CREDP

Notable Wind farms projects in the Caribbean (a selection)

Country	Project	Developer	Capacity	Turbines
Jamaica	Wington Wind Farm	Petroleum Corporation of Jamaica	38.7 MW	32
	Malvern	BMR Jamaica Wind Limited	36.3	11
	Munro	Jamaica Public Service Company	3.2	5
Dominican Republic	Los Cocos-Quilvio Cabrera	EGE Haina	33.5 MW	19
	El Guanillo	GAMESA	50 MW	25
	Larimar	EGE Haina	49.5 MW	15
	Los Guzmancitos	Poseidon Energia Renovable	100 MW	55
Guyana	Hope Beach	Guyana Windfarm Inc.	25 MW*	10
The Bahamas	Over Yonder Cay	Northern Power Systems	1	3

*Forthcoming power – Farm under construction; Source: www.thewindpower.net

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HYDRO

The abundant water resources, i.e. rivers, lakes, waterfalls, etc., in Guyana, Haiti and Suriname make the potential for hydro electrical development strong in these countries.

The region has about 940 MW installed hydropower capacity and a known potential of around 9,700 MW

BIOMASS

The Caribbean possess relevant biomass energy resources from agricultural crop residues, forestry and cruise and municipal solid waste

- Agriculture land of 25% of total land area and forest area of 48%.
- Strong agricultural sectors provide crop residues such as: Bagasse, Sorghum, Coffee husk, Rice straw, Coconut shells, Woody biomass

Biomass has a high potential, estimated at about 250 MW, and current low implementation (62 MW)

In Belize and Guyana, the vast forestry resources enables development of renewables in biomass. Guyana, with its location on the South American continent, is showing potential in exporting biomass products, as it is a storable renewable energy source. In Belize, the grid integration with Mexico opens up possibilities of becoming a net exporter of electricity. The waste from the islands large cruise ship traffic and big hotels could potentially be turned from waste to green energy, in particular in Gran Bahama/Freeport.

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ANNEXES

SNAPSHOT OF INVESTOR-READY INVESTMENT OPPORTUNITIES

The following investment opportunities have been identified from a sample of projects submitted by each Caribbean territory:

BARBADOS



RE-NERGY SOLUTIONS

RE-Nergy Solutions Inc. is a startup company that creates and implements innovative renewable energy technologies from all sources of alternative energy that changes and enhances the end user's daily lifestyle. The company focus will be on the public and private sectors. RE-Nergy has attracted a client base within an initial 5 countries within the Caribbean, Central America, South America and Asia. These client projects enable the company to create smart buildings and smart cities by using existing and new technology.

Estimated value of investment required: US\$ 3 m

Key figures:

- Price of electricity (US\$ cents per kWh): **22**
- Electricity net consumption (million kWh): **938**
- Installed capacity (MW): **239**
- Renewables share installed capacity: **0%**
- Target renewable share of generation 2027: **55%**

BELIZE



GSR ENERGY HOLDINGS LTD

Development of a Brazilian designed, fully integrated sugarcane bio-ethanol distillery and biomass electricity plant utilizing 40,000 acres of sugarcane feedstock estimating 30 million gallons of bio-ethanol annually with 25 MW of dispatchable electricity under the Request for Proposals for Energy Generation (RFPEG 2013). Notable effort in EIA documentation completed.

Estimated value of investment required: US\$ 229 m

NATIONAL LPG LANDING TERMINAL

The National Liquefied Petroleum Gas (LPG) Landing Terminal in Belize is proposed by LPG importers at an undetermined maritime port of entry to serve as a central

Key figures:

- Price of electricity (US\$ cents per kWh): **22**
- Electricity net consumption (million kWh): **605**
- Installed capacity (MW): **155**
- Renewables share installed capacity: **56%**
- Target renewable share of generation 2027: **85%**

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hub for LPG delivery, storage, testing and blending.
Estimated value of investment required: US\$22 m

DOMICAN REPUBLIC



360 MW LNG POWER GENERATOR

ENERGIA 2000 – COPEY, MONTECRISTI

Energía 2000 SRL is a Dominican company that has developed studies and permissions to build a thermal electric plant for liquefied natural gas with a generation capacity of 360MW. This project is located in Copey, 4 kilometers away from Manzanillo bay in Montecristi, and will facilitate the development of the Northern region of the island.

The construction and execution partner is EDF (Electricité de France), whom secured the gas contract with CHENIERE and will destine 1GM3 annually to the Dominican Republic and is also in the process of obtaining the definitive concession from the Dominican government.

Estimated value of investment required: US\$ 700 m

Key figures:

- Price of electricity (US\$ cents per kWh): **25**
- Electricity net consumption (million kWh): **11,899**
- Installed capacity (MW): **3,742**
- Renewables share installed capacity: **18.5%**
- Target 2025: **25%** share in eh overall energy matrix

TRANSMISSION LINE FOR PUNTA CATALINA COAL FIRED POWER PLANT

The Dominican Government has placed an International Public Tender for the construction of the Transmission Line for Punta Catalina Coal Fired Power Plant by way of the decree 307-14 that declares this as an emergency process, therefore it modifies the regular tender process.

This project takes place in the municipality of Bani of the Province of Peravia.

Estimated value of investment required: US\$ 300 m

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HAITI



GSR ENERGY HOLDINGS LTD

Development of a Brazilian-designed, fully integrated sugarcane bio-ethanol distillery and biomass electricity plant.

Estimated value of investment required: US\$ 229 m

RE-VOLT S.A.

RE-VOLT provides an off-grid utility, highly efficient, reliable, full DC (direct current), pay-as-you-go, solar-powered, energy service to people that have no or no reliable access to an AC grid. RE-VOLT is serving 13,000 clients in Haiti with plans to grow to 300,000 in 18 months with appropriate investment. RE-VOLT has also developed a new system that offers rural internet and TV as well as other emergency services, intended to roll out to commercial customers within 6 months.

Investment Required: USD \$2.5 m

Key figures:

- Price of electricity (US\$ cents per kWh): **36**
- Electricity net consumption (million kWh): **452**
- Installed capacity (MW): **255**
- Renewables share installed capacity: **25%**
- Target renewable share of generation 2027: **52%**

SMALL SCALE POWER GENERATION FROM RENEWABLE SOURCES

Project	Estimated value of investment required (US\$)
10Power project with Askanya Chocolate Factory	75,200
10Power project with Peanut Butter Factory	332,639
10Power project with Midwife Clinic	73,100
10Power project with National Gas Station	35,452
10Power project with Canaan Orphanage	329,523
10Power project with dloHaiti	340,142
10Power project with Eye Clinic	27,448
10Power project with Clerin Factory	456,973
10Power project with Mango Juice Factory in Mirabaleis	299,918
10Power project with Carbon Roots	106,336
10Power project with CETEMOH	79,771
10Power project with University in Limbe	28,666
10Power project with Haiti Communitere	183,703
10Power project with Rebuild Globally	265,706
10Power project with Magdoos	82,829
10Power project with Hotel ROI Henry Christophe	99,230
10Power project with El Fuego del Sol	22,490
10Power project with Ag Project	30,100
10Power project with P&C Ceramic Center	143,320
10Power project with Ice Cream Business	133,097
10Power project with Soap Business	132,987
10Power project with Moulin Sur Mer	406,100
10Power project with Plantian Chips Business	320,160

SURINAME



SOLAR PROJECT INTERIOR, UPPER REACHES OF THE SURINAME RIVER

The project is designed to create an environment that will allow 7 large villages (2,500 households or 15,000 inhabitants) in the upper reaches of the Surinamese river to have 24 hours of electricity by installing 5MW capacity of solar panels. The average electricity consumption per household for basic household purposes is estimated around 300 watt per day. Given the geographical distribution of people in and around the villages, the idea is to use both centralized areas where solar panels are installed as well as solar panels on individual houses.

The concept is to partially subsidize the price of solar energy by the GoS (financial and replacement cost) and have the local population pay only for the operation cost (the lowest cost element). Local population will be trained to do maintenance and simple repairs, but the oversight will be done by a government agency. The project does not exclude the use of a hybrid system of fuel generated electricity as an emergency backup system.

Estimated value of investment required: US\$20 mn

Key figures:

- Price of electricity (US\$ cents per kWh): **7**
- Electricity net consumption (million kWh): **1,572**
- Installed capacity (MW): **384**
- Renewables share installed capacity: **51%**
- Target renewable share of generation 2027: **60%**

TRINIDAD & TOBAGO



SILICON INDUSTRIAL CLUSTER

The plants within this manufacturing complex would be:

1. Metallurgical Silicon (MGSi) Plant; Thirty four thousand (34,000) Tons/Year
2. Polysilicon (PolySi) Plant; Ten thousand (10,000) Tons/Year
3. Integrated Photovoltaic Manufacturing encompassing Ingot, Wafer, Cell and Module steps (Solar-PV); Seven Hundred and Fifty (750) MW
4. Float Glass plant; Five Hundred (500) Ton per Day

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Each industry could operate independently however there are significant synergies and cost advantages in co-locating the plants.

The facilities would be located within two dedicated industrial estates comprising a total of 250 hectares of land in the greater Point Lisas area.

Estimated value of investment required:

- US\$1,785m for the entire cluster
- US\$185m – Float Glass Plant;
- US\$200m – Metallurgical Silicon Plant;
- US\$900m – Polysilicon Plant;
- US\$500m – Solar/PV Plant

Key figures:

- Price of electricity (US\$ cents per kWh): **7**
- Electricity net consumption (million kWh): **8,365**
- Installed capacity (MW): **2,368**
- Renewables share installed capacity: **0%**
- Target renewable share of generation 2027: **29%**

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INVESTOR SUCCESS STORIES

RENEWABLE ENERGY IN THE DOMINICAN REPUBLIC

The Dominican Republic is an attractive destination for renewable energy investments. Over the last couple of years investments in clean energy projects and wind, solar, hydroelectric and biomass energy have exceeded US\$600 million.¹⁸ However, there is still scope for growth and the Dominican Republic is strongly encouraging investments in renewables by creating tax benefits and other incentives for green energy investors under "Law 57-07".

GENERAL ENERGY SOLUTIONS



General Energy Solutions (GES) is based in Houku, Taiwan, and is a leading renewable energy company with offices in the United States, The United Kingdom and Japan.

MONTE PLATA SOLAR

Monte Plata Solar is the Dominican Republic's first solar park, inaugurated in March 2016 with a total investment value of US\$110 million.

It is the largest renewable energy project built in the Caribbean region and when completed will boast of more than 270 000 solar panels. Monte Plata Solar will reduce contamination and provide clean energy to more than 50 000 households on the island.

Behind the investment is General Energy Solutions in association with Soventix Caribbean, a subsidiary to the German construction company Soventix, and Phanes Group, the Swiss and Dubai-based solar energy developer and investment manager.

Monte Plata Solar has received strong governmental support, as the project will facilitate the country's target of 25 per cent renewables by 2025.

TESTIMONIALS

The president of GES, Mr Quincy Lin, thanked the Dominican President for the government's unconditional support during the opening ceremony and stated:

*- With this, we are contributing to eradicate the problems of the national electrical sector and to promote a green culture, which maximises utilization of the country's natural advantages.*¹⁹

¹⁸ CEI-RD, 2016, <http://cei-rd.gob.do/en/investment/renewable-energy/>

¹⁹ CEI-RD, 2016-03-29, Government inaugurates first solar park in the country, <http://cei-rd.gob.do/en/government-inaugurates-first-solar-park-in-the-country/>

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RENEWABLE ENERGY IN THE BARBADOS

Historically Barbados has been heavily reliant on oil imports but the economy is undergoing a structural change towards green energy promoting the country's natural advantages of solar and wind power. The "Greening Barbados" agenda sets a target for 29 per cent renewable energy by 2029.

The government have put in place several incentives to speed up the green transformation. For example, investors in renewables enjoy duty free concessions on renewable energy and energy efficient products as well as income tax benefits.

However, the most important structural change is the revision of the Barbados Electric Light and Power Act which enable private, independent power producers to sell electricity to the grid.



GRUPOTEC

Grupotec is an international company specialised in engineering and consulting services as well as the development, building and financing of renewable energy projects. In 2015 the company had permanent offices in 8 countries on 3 different continents and a sales revenue of € 99, 3 million.

SOLAR FARM IN TRENTS, ST. LUCY

The Barbados Light and Power Company (BL&P) signed a contract with Spanish based company Grupotec for the construction of solar farm in August 2015. Construction started in January 2016 and when finished the farm will have 40 000 solar panels and have generated approximately 80 direct jobs.

The BL&P expects this farm to be the first of many utility scale solar developments in Barbados.²⁰

TESTIMONIALS

When publicly announcing the contract with Grupotec the BL&P interim managing director Sarah Macdonald stated that the power company is focusing on transforming energy generation on the island, and Grupotec managing partner Manuel Folgado underscored that the company "is proud to be part of the strategic move to renewables within Barbados".²¹

²⁰ SolarBarbados, 2015-09-22, 10MW Solar Farm to be built in Barbados

²¹ CBC, 2015-08-13, Photovoltaic Plant soon,

http://www.grupotec.es/data/enlosmedios/barbados/descarga/cbc.bb_barbados_news.pdf

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RENEWABLE ENERGY IN JAMAICA

Jamaica is a leader in sustainable energy transition in the Caribbean region. The government has put in place strong policies for shifting the country's electricity mix with a target for 30 per cent renewable energy by 2030.

There is a robust enabling environment of tax exemptions and incentives as well as natural advantages within wind, biomass, hydro and solar energy. The Jamaica Public Service (JPS) is the sole distributor of electricity on the island. The market was liberalised in 2004 which made it possible for independent power producers (IPPs) to sell power to JPS.²²

BMR



BMR Energy is based in New York and is focused on development, acquisition, finance and construction operations of energy infrastructure in the Caribbean and Central America. The Malvern Wind Farm was developed by the company's Jamaican subsidiary, BMR Jamaica Wind.

MALVERN WIND FARM

The Malvern Wind Farm is developed, operated and owned by BMR Energy. At capacity the farm will be an 11 turbine strong wind farm with a nominal power of 36 300 kW.²³ The investment totalled US\$90M and estimates show that the new wind farm is expected to save the country importation of up to 6 000 000 barrels of oil over 20 years.

Working closely with the government, BMR transformed an idea of expanding to the Jamaican market in 2012 to a fully operational wind farm in 2016. In order to create long term stability the Jamaican energy supplier JPS signed 20-year long power purchase agreement for the power of the Malvern wind farm.²⁴

TESTIMONIALS

BMR Energy considered Jamaica as a potential market because of their need for additional generation capacity, the high cost of electricity due to their dependence on oil-fueled facilities, and the opportunities for renewables in many of the rural regions of the country. Bruce Levy, president and principal of BMR Energy, said: *"Our success today is due to the hard work and commitment of our development team, the staff of Jamaica Public Service Company ("JPS"), the Government of Jamaica and the lenders"*²⁵

²² Renewable Energy World, 2015-05-07, Winds of Change for Jamaican Renewable Energy

²³ http://www.thewindpower.net/windfarm_en_16104_malvern.php

²⁴ JPS. 2014-06-25, US\$90M Investment in 34MW Wind Power Plant for Jamaica

²⁵ <http://www.bmrenergy.com/news.php>

INVEST IN RENEWABLE ENERGY SECTOR BOOKLET

SUMMARY OF INCENTIVES AVAILABLE TO INVESTORS

Figure 21: Summary of incentives²⁶

Countries	Incentive	Applicable sector	Summary of benefits							
			Corporate tax holiday or reduction	Exemption from withholding taxes (dividends, royalties)	Import duties exemptions	Export duties exemption	Other (real property, payroll, local taxes)	Zero-rated VAT, reduced, deferment	Investment allowance, accelerated depreciation	Tax credits or rebate
Bahamas	Hotels Encouragement Act	Tourism			✓		✓			
	Family Islands Development Act	Construction of residences and businesses			✓					
	Industries Encouragement Act	Manufacturing			✓	✓	✓			
	Vacation Plan and time-sharing Act	Tourism - timeshare			✓					
	Tariff Act	Agriculture, Fisheries, Light Industries, Commercial Printing			✓					
	Agricultural Manufactories	Food processing			✓					
	The City of Nassau Revitalization Act	Infrastructure			✓					
	Freeport – Free Trade Port (Hawksbill Creek Agreement Act.)	Tourism, Industry, Logistics		✓		✓	✓			
Barbados	Duties & taxes	Manufacturing, agricultural and fishing			✓			✓		
	Small business development Act	Small manufacturers	✓	✓	✓					
	Fiscal Incentives Act	Manufacturing	✓	✓	✓					
	Income Tax Act	Manufacturing exporters				✓		✓		
	International Business Company Act	Manufacturing	✓	✓	✓				✓	
	Tourism and Manufacturing Guarantee Facility and Industrial Credit Fund Technical Assistance Grant	Tourism and manufacturing								✓
Belize	Export Processing Zone (EPZ)	Manufactured goods and		✓	✓	✓				

²⁶ Benchmarking Investment Incentives in CARIFORUM Countries, ICA & Caribbean Export, July 2013; IPAs websites

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Countries	Incentive	Applicable sector	Summary of benefits								
			Corporate tax holiday or reduction	Exemption from withholding taxes (dividends, royalties)	Import duties exemptions	Export duties exemption	Other (real property, payroll, local taxes)	Zero-rated VAT, reduced, deferment	Investment allowance, accelerated depreciation	Tax credits or rebate	Financial assistance / Grants
		agriculture for export markets									
	Fiscal Incentive Programme	Tourism, agriculture, forestry, agro-processing, IT, fishing, healthcare, manufacturing			✓						
	Commercial Free Zones	Manufacturing, processing, packaging, warehousing and distribution of goods and services	✓	✓	✓						
	International Business Companies Act	Any business of a non-resident	✓	✓							
	Offshore Banking Act	Financial Services	License allows to transact offshore banking business without restriction								
Dominican Republic	Promotion of the Free Trade Zones of Exportation	Manufacturers of goods and services for exportations			✓	✓					
	Promotion of the Touristic Development for the Poles of Scarce Development and New Poles in Provinces and Localities of Great Potentiality		✓	✓	✓	✓					
	Cyber Park of Santo Domingo	Various			✓	✓					
	That declares of national priority the sectors belonging to the textile chain	Textile & Garment			✓	✓					
	Incentives for the Development of Renewable Sources of Energy and its Special Regiments	Energy and renewable fuel			✓						
	Special Border Development Zone	Border Zone	✓					✓			
Guyana	General Incentives	Available to Domestic and Foreign Investors		✓	✓				✓		

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Countries	Incentive	Applicable sector	Summary of benefits								
			Corporate tax holiday or reduction	Exemption from withholding taxes (dividends, royalties)	Import duties exemptions	Export duties exemption	Other (real property, payroll, local taxes)	Zero-rated VAT, reduced, deferment	Investment allowance, accelerated depreciation	Tax credits or rebate	Financial assistance / Grants
	Specific Incentives	Non-traditional products for export				✓				✓	
		Agribusiness			✓			✓	✓		
		Manufacturing			✓			✓			
		Tourism	✓		✓			✓			
		Fisheries			✓			✓			
		Forestry			✓			✓			
		Mining	✓		✓			✓			
		Housing									
		Aviation						✓			
		ICT	✓		✓				✓		
Haiti	General Incentives	Oriented to export and re-export; Agriculture, Handicraft, Tourism; other special sectors	✓		✓		✓		✓		
	Foreign Trade Zones	No particular activity	✓		✓		✓		✓		
Jamaica	Special Economic Zones (SEZ)	Free Zone / Cross Sector	✓		✓	✓					
	Fiscal Incentives Act	Small and Medium businesses						✓	✓	✓	
	The Income Tax Relief (LPPIA)	Large-scale projects and Pioneer Industries					✓		✓		
	Export Industry Encouragement Act	Manufacturing	✓		✓	✓		✓			
	Hotels Incentives	Tourism	✓		✓						
	Urban Renewable Act	Construction - Special Development Areas	✓				✓		✓		
	Income Tax Act - Junior Stock Exchange	Listed companies	✓								
	Bauxite and Alumina Act	Bauxite & Alumina Producers			✓						
Suriname	Fiscal Incentives Law	Various: Export-oriented goods and services,	✓		✓				✓		

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Countries	Incentive	Applicable sector	Summary of benefits								
			Corporate tax holiday or reduction	Exemption from withholding taxes (dividends, royalties)	Import duties exemptions	Export duties exemption	Other (real property, payroll, local taxes)	Zero-rated VAT, reduced, deferment	Investment allowance, accelerated depreciation	Tax credits or rebate	Financial assistance / Grants
		agriculture, herding, aquaculture, forestry, mining, tourism									
Trinidad & Tobago	Fiscal Incentives for non-energy sectors	Manufacturing	✓		✓			✓			
		Creative Industries							✓	✓	
		Tourism	✓		✓		✓		✓		
		Agriculture							✓	✓	
		Maritime			✓			✓			
	Approved Small Company Status	Manufacturing							✓		
	Research & Development Facility	Across all sectors						✓		✓	
Free Trade Zones	Export-driven projects		✓	✓		✓	✓				

INVEST IN RENEWABLE ENERGY SECTOR BOOKLET

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