

# 2019 ENERGY REPORT CARD BARBAD05



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### INTRODUCTION

This document presents Barbados' Energy Report Card (ERC) for 2019.

The ERC provides an overview of the energy sector performance in Barbados. The ERC also includes energy efficiency, projects, technical assistance, workforce, training and capacity building information, subject to the availability of data.

This ERC includes data and information that was provided by government ministries, agencies, or departments, with responsibility for energy, utilities, and statistical offices.

The data collected was supplemented by internet research, author calculations and inferences.

This data is a collection from a variety of public sources and as such, is for general information only. It is not intended for decision-making purposes and therefore reliance placed on the information herein is strictly at the user's risk.





# CONTENTS

### **ENERGY SECTOR SUMMARY**

Population

GDP (USD) Per Capita

Debt as % of GDP

Human Development Index (20

National Development Plan/Overall Country Dev

**National Energy Policy** 

**Renewable Energy (RE) Polic** 

**RE Target** 

**Energy Performance Standards/Applian** 

No. of Persons Employed in Energy

Total Oil Import (BOE) per dag

Total Oil Export (BOE) per dag

**Total Installed Capacity (MW** 

Total Installed RE (MW)

Electricity System Losses (%)

Energy Use (kWh) Per Capita

Energy Intensity (BTU/\$1)

Fuel and Oil Imports as % of GI

Oil Imports as % of GDP

**Climate Change Policy** 

**Electric Vehicle Stock** 

**National Determined Contributions** 

National Repository for Energy I



### **Key Data and Information - Energy Sector**

	287,025 [1]
	18,148.20 [2]
	115.41 [3]
018)	0.814 [4]
	National Strategic Plan of Barbados 2005–2025 [5]
velopment Strategy	Medium-term Growth and Development Strategy (MGDS) 2013-2020 [6]
	Barbados National Energy Policy 2019-2030 [7]
У	None
	50 % RE by 2023
	100% renewable energy and carbon neutral state by 2030 [7]
	1. Barbados Energy Label Standard [8]
ce Labelling	2. Adopted the ISO 50002 standard for Energy Audits
-	3. Adopted ISO 50001:2011 standard to be the guide for energy
Contor	
Sector	[טו] נוכ
У	6110.84 [11]
У	None
()	346.8 [12]
	40.4 [12]
	6.68% [12]
a	3,288.17 [12]
	3,777.38 [12]
DP	7% [13]
	5.60% [13]
	National Climate Change Policy Barbados 2012 [14]
	319 [15]
s (NDC)	21 %, compared to 2008 by 2025
	23%, compared to 2008 by 2030 [16]
Data	National Energy Information System [17]



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### **ENERGY SECTOR PERFORMANCE AGAINST TARGETS**



**RENEWABLE ENERGY AS A PERCENTAGE OF INSTALLED CAPACITY** 



National Target by 2030

National Target (Proposed by CARICOM-CSERMS Report) (2027)





### **KEY ENERGY STAKEHOLDERS**

#### **GOVERNMENT MINISTRIES, DEPARTMENTS AND** AGENCIES

- Ministry of Energy, Small Business and Entrepreneurship (previously the Ministry of Energy and Water Resources)
- Barbados National Standards Institute
- Environmental Protection Department
- Government Electrical and Engineering Department
- Ministry of Finance, Economic Affairs, and Investment

#### **FUEL IMPORTERS & SUPPLIERS**

- Barbados National Oil Company Limited
- Barbados National Terminal Company
- National Petroleum Corporation
- Rubis Caribbean
- Rubis Aviation
- SOL (Barbados) Limited

#### **ELECTRIC UTILITY**

Barbados Light and Power Company Limited

#### **INDEPENDENT POWER PRODUCER(S)**

• None

#### **ELECTRICITY REGULATOR**

Fair Trading Commission

#### TRANSPORTATION

Ministry of Transport, Works and Maintenance

#### **OTHER**

Barbados Renewable Energy Association





### **ELECTRICITY SECTOR: POLICY, LEGAL AND REGULATORY (PLR) FRAMEWORK**

	Completed	Draft	In Progress	Not Completed
Energy Policy and Energy Action Plan	$\checkmark$			
RE Target	$\checkmark$			
EE Target	$\checkmark$			
Electricity Regulator	$\checkmark$			
Net Billing / Net Metering	$\checkmark$			
Interconnection Policy/Standards	$\checkmark$			
Feed-in-tariff	$\checkmark$			
RE/EE Act				$\checkmark$

#### **KEY ACHIEVEMENTS: PLR FRAMEWORK TIMELINE FOR ELECTRICITY** SECTOR

Name	Year
Electricity Act [18]	1936
Fair Trading Commission Act [19]	2002
Utilities Regulation Act [20]	2002
Barbados Sustainable Development Policy [21]	2004
Sustainable Energy Framework for Barbados [22]	2010
Integrated Resource Plan [23]	2012
Electric Light and Power Act [24]	2013
Draft National Sustainable Energy Policy [25]	2013
Electric Light and Power (Amendment) Act [26]	2015
Barbados National Energy Policy 2017-2037 [27]	2017
Barbados National Energy Policy 2019-2030 [7]	2019
Electric Light and Power (Amendment) Bill [28]	2019

### **POLICIES AND LEGISLATION RELEVANT TO** THE ENERGY SECTOR

**Policies:** 

- Barbados Sustainable Development Policy [21]
- Draft National Sustainable Energy Policy [25]
- Barbados National Energy Policy 2019-2030 [7]
- Implementation Plan for the Barbados National Energy Policy [29]

Legislation:

- Offshore Petroleum Act 2007 (Amended 2012) [30] [31]
- Offshore Petroleum Act (Taxation) Act 2007 (Amended 2012) [32] [33]
- Offshore Petroleum Regulations 2013 [34]
- Storage of Petroleum Act 1987 [35]
- National Petroleum Corporation 1979 [36]

#### **POLICIES AND LEGISLATION RELEVANT TO** THE TRANSPORTATION SECTOR

**Policies**:

- Barbados Sustainable Development Policy [21]
- Barbados National Energy Policy 2019-2030 [7]
- Implementation Plan for the Barbados National Energy Policy [29]

Legislation & Regulation:

- Transport Authority Act [37]
- Road Traffic Act 1981 Last Amended 2018 [38] [39]
- Transport Board Act 1955 Last Amended in 2008 [40]









### **ELECTRICITY & ENERGY** EFFICIENCY

### **ELECTRICITY GENERATION**







## ELECTRICITY & ENERGY EFFICIENCY (CONT'D)

TOTAL GENERATION (GWH)

TOTAL SALES (GWH)

ELECTRICITY SYSTEM LOSSES



400 600 800 1000 1200

1014

946





## ELECTRICITY & ENERGY EFFICIENCY (CONT'D)

#### TARRIFS

Rate	Monthly Consumption / Demand	Fixed Customer Charge (US\$)	Tariff / (US\$/kWh)	Demand Charge (US\$/kVA)
Residential	0 - 150 kWh	3.03	0.08	
	151 - 500 kWh	5.05	0.09	
	500 - 1500 kWh	7.07	0.10	
	> 1500 kWh	7.07	0.11	
Commercial (General Service)	0 - 100 kWh	4.04 + VAT	0.093 + VAT	
	101 - 500 kWh	5.56 + VAT	0.110 + VAT	
	500 - 1500 kWh	7.07 + VAT	0.131 + VAT	
	> 1500 kWh	7.07 + VAT	0.146 + VAT	
Secondary Voltage Power (For company-owned transformer(s))	≥ 5kVA	10.10 + VAT	0.070 + VAT	12.12 + VAT
Secondary Voltage Power For customer-owned transformer(s)	≥ 5kVA	10.10 + VAT	0.070 + VAT	11.11+ VAT
Industrial/Large Power	≥ 50 kVA	152.52 + VAT	0.06 + VAT	11.11+ VAT
Streetlights				

#### EFFICIENCY

EE Target

Electricity System Losses (%)

Energy Use (kWh) Per Capita

Energy Intensity Index (EII) BTU/US\$1 Unit of output

20% below business as usual (BAU) by 2030 [7]
<b>6.7</b> %
3290
3777





## ELECTRICITY & ENERGY EFFICIENCY (CONT'D)

RE Resource	Installed Capacity (MW)	Year Commissioned
Wind	0	
Solar	40.4	2016 [12]
Hydro	N/A	
Geothermal	N/A	
Biomass/WTE	0	
Total	10	

Potential Capacity (MW)	Assessment Conducted?
300	2019 [7]
310	2019 [7]
N/A	N/A [7]
N/A	N/A [7]
15	2019 [7])
625	
	Potential Capacity (MW)   300   310   N/A   N/A   15   625







### **PROJECTS IN THE PIPELINE**

#### **ENERGY EFFICIENCY PROJECTS**

Energy Efficiency	Old/Existing Infrastructure (Number/Size)	Consumption (KWh)	Annual Costs (USD)	Energy Service Companies (Yes/No)	Expected Change in Technology	Relative Difference Operating Consump Costs (USD)
Street Lighting	29,000	4,383,066	2,932,258.77	Yes	Light Emitting Diode (LED) Technology	1,857,193.08
Public Buildings	Retrofit of 15 Government- owned buildings with energy efficient technologies				A total of 2.4 MW installed	
Electric Vehicles	6 fossil fuel vehicles				6 electric vehicles	

Renewable Energy Source	<b>Resource and Projects Capacity</b>	Development Partner	Funding Source
Solar Photo-Voltaic	Public Sector Smart Energy Programme (PSSEP): (15) public buildings retrofitted to solar PV systems with a total of 2.4MW installed.	Inter-American Development Bank	Inter-American Development Bank (Loan European Union (Grant)
	The Water Sector Resilience Nexus for Sustainability in Barbados project: Integrating photovoltaic renewable energy back-up for natural gas turbines at three (3) pumping stations	Caribbean Community Climate Change Centre	Green Climate Fund (Grant), Barbados Water Authority (co-financing)









### NUMBER AND TYPE OF TERTIARY LEVEL & VOCATIONAL TRAINING SUSTAINABLE ENERGY PROGRAMMES OFFERED

Name of Education	on No. of Persons		ame of Education No. of Pers		No of Persons		Types of Programme	•	Programme Link
Programme Provider	En	rolled	Graduated	Vocational Certificate	Apprenticeship	M.Sc.			
Barbados Community College	Male	94		Photovoltaic Installation - Electrical Technician			http://www.bcc.edu.bb/ Divisions/Technology/ CertificateinPhotovoltaicDes		
	Female	3		Level 3			<u>aspx</u>		
Samuel Jackman Prescod Institute of	Male		91	Photovoltaic Installation 1			http://sjpi.edu.bb/?page_id=3		
Technology	Female								
	Male		272	Photovoltaic Electrical Installation			http://sjpi.edu.bb/?page_id=3		
	Female								
Barbados Vocational Training Board	Male				Solar Water Heater Technician		https://bvtb.gov.bb/apprentic programme/solar_water_heat technician/ http://www.sbcs.edu.tt/progra		
	Female						windpower/		
The University of the West Indies - Cave Hill Campus	Male	23	27			Renewable Energy Management	https://www.cavehill.uwi.edu/ gradstudies/programmes/sci and-technology-folder/renew		
	Female	12					<u>energy-management.aspx</u>		









### WORKFORCE











#### **NO. OF PERSONS TRAINED IN ENERGY SECTOR MINISTRY OF ENERGY AND ENERGY INDUSTRIES**





### **TRANSPORTATION SECTOR**

### FUEL USE IN TRANSPORT SECTOR (BOE)





### **TRANSPORTATION SECTOR** (CONT'D)

**CONVENTIONAL VEHICLE STOCK / VEHICLE** REGISTRATION







### **CLIMATE CHANGE FRAMEWORK**

Climate Change Policy

National Determined Contributions

**Emissions Reduction Target** 

**Priority Sectors for NDC** 

National Communications (NC) to the UNFCC

#### **GREENHOUSE GAS (GHG) INVENTORY [22]**

Gas	Sector	Volume / Gg CO <sub>2</sub> equivalent
Carbon Dioxide (CO2)	Energy	992
	Road Transport	449
	Industrial Processes	101
	Land Use Land-use Change and Forestry	-51
Methane (CH4)	Energy	15
	Agriculture	35
	Waste	288
Nitrous Oxide (N2O)	Agriculture	24
	Energy	4
	Waste	7
HFC / SF6	Industrial Processes	67

	National Climate Change Policy Barbados (2012) [14]
	21 %, compared to 2008 by 2025 23%, compared to 2008 by 2030 [16]
	20% below business as usual (BAU) by 2030 [7]
	Agriculture, Water resources, Fisheries, Tourism, Insurance, Human Health, Coastal Resources and Human Settlements [16]
CC	Barbados' First National Communication Under the United Nations Framework Convention on Climate Change [41]]
	Barbados' Second National Communication Under the United Nations Framework Convention on Climate Change [42]





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