



2017 ENERGY REPORT CARD

BELIZE

This document presents Belize's Energy Report Card (ERC) for 2017, which was prepared using data and information submitted by the Member State as well as supplemental data extracted from online resources (see list of References). The ERC provides an overview of energy sector performance in Belize by focusing on two priority sub-sectors: Electricity and Transportation. The ERC also includes energy efficiency, climate change, energy sector workforce, training and capacity building information, subject to the availability of data.

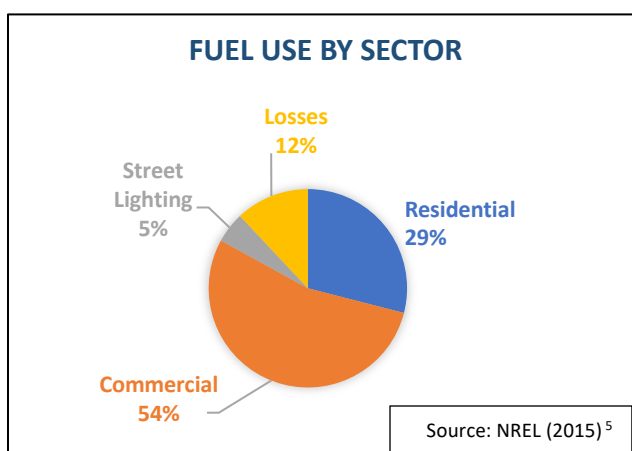
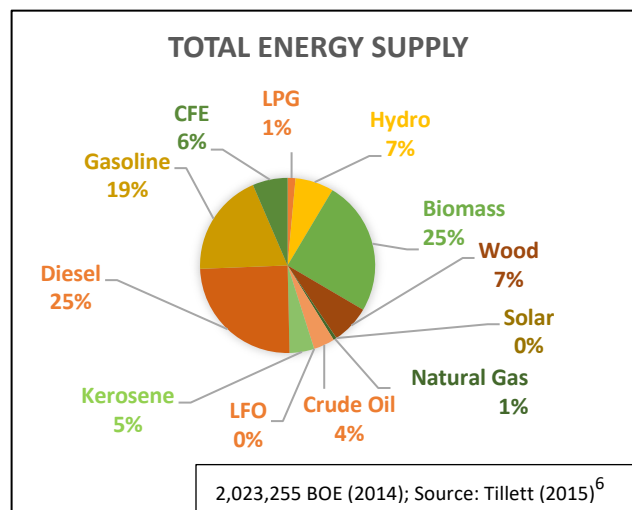
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“AT-A-GLANCE” SUMMARY OF BELIZE’S ENERGY SECTOR

KEY DATA & INFORMATION – ENERGY SECTOR	
Population	360,346 (2017 est.) ¹
GDP (USD) Per Capita	\$8,300 (2017 est.) ²
Debt as % of GDP	99% (2017 est.) ²
Human Development Index	0.708 (2017) ³
National Development Plan/ Country Development Strategy	Yes (2011) ⁴
National Energy Policy	Yes (2012) ⁵
Renewable Energy (RE) Policy	
RE Target	80% by 2020; 90% by 2030 ⁸
Energy Performance Standards/Appliance Labelling	Suggested/preparatory stage (2015) ⁶
Number of Persons Employed in Energy Sector	316 - Belize Electricity Ltd. (2017) ⁷
Total Oil Import (BOE) per day	0 (2017) ⁸
Total Oil Export (BOE) per day	731.7 (2017) ⁸
Total Installed/Supply Capacity (MW)	203.68 MW (2017) ⁸
Total Installed RE (MW)	98.48 (2017) ⁸
Electricity System Losses (%)	12% (2017) ⁸
Energy Use (kWh) Per Capita	1,749 (2017) ⁹
Energy Intensity (BTU/US\$1 Unit of output)	3,923 ¹⁰
Fuel and Imports as % of GDP	7% (2017) ⁸
Climate Change Policy	Yes (2014) ¹¹
National Determined Contributions (NDC)	Yes (2015) ¹²
National Repository for Energy Data	



BELIZE’S ENERGY SECTOR PERFORMANCE AGAINST TARGETS

Indicator	Base /Current Performance (Year)	National Target	National Target (Proposed by CARICOM – CSERMS Report) ¹³	Indicative RE Oil Displacement^{14,15} Potential Annually**
RE as % of Installed Capacity	48% (2017)	80% by 2020 ⁸	76% by 2027	1 MW wind displaces 1,760 barrels of oil equivalent (BOE) 1 MW hydro displaces 3,300 BOE 1 MW solar displaces 1,210 BOE
*Energy Intensity (BTU/US\$1 Unit of output)	3,923 ¹⁰			Energy Intensity (EI)¹⁶: EI measures how energy benefits the economy and is calculated by taking the ratio of total primary energy use (all of the fuels and flows that a country uses to get energy) to GDP (the total money made in a country). EI indicates how effectively an economy uses their fuels and flows.
% Reduction in Energy Sector Emissions (NDC)				

*The energy efficiency target for CARICOM is 33% reduction in energy intensity by 2027, compared to a reference of Average Annual Energy Intensity of ~13,000 BTU per USD of GDP in 2015.

**Based on capacity factors of 0.32 for wind, 0.6 for hydro and 0.22 for solar.¹⁴

KEY ENERGY SECTOR STAKEHOLDERS: BELIZE

Key electricity stakeholders include⁸:

GOVERNMENT MINISTRIES, DEPARTMENTS AND AGENCIES¹⁷:	 Ministry of Labour, Local Government and Rural Development, Public Service, Energy & Public Utilities  Ministry of Education, Science & Technology, Culture, Youth and Sports  Ministry of Economic Development, Petroleum, Investment, Trade and Commerce  Ministry of Finance and Natural Resources
ELECTRIC UTILITY(IES):	 Belize Electricity Limited (BEL)
INDEPENDENT POWER PRODUCER(S)¹⁸:	 Hydro Maya Limited (hydro facility)  BELCOGEN Limited (using bagasse fuel)  BAPCOL (using No. 6 HFO fuel oil)  Commission of Federal Electricity (CFE) - Mexico
REGULATOR:	 Public Utilities Commission

Other key electricity stakeholders include⁸:

-  Energy Unit within the Ministry of Public Service, Energy and Public Utilities
-  PUMA Energy
-  Belize Bureau of Standards
-  Belize Natural Energy
-  Ministry of Finance

Key Stakeholders: Road Transportation Sub-sector¹⁷

- Ministry of Transport (Transportation Regulator – licensing of vehicles and regulation of public transportation system⁸)
- Ministry of Finance and Natural Resources
- Ministry of Works

POLICY, LEGAL AND REGULATORY FRAMEWORK: BELIZE

Electricity Sector: Policy, Legal and Regulatory (PLR) Framework ^{8, 23, 13}

✓ Energy Policy and Energy Action Plan	
✓ RE Targets	
✓ EE Targets	
✓ Electricity Regulator	
✓ Net billing/Net metering	
✓ Interconnection Policy/Standards	
✗ Feed-in-tariff	
✗ RE/EE Act	
 Completed/ In place  In progress/ In Development  Not yet started/ Not established	

Key Achievements: PLR Framework Timeline for the Electricity Sector ^{8, 19, 20,21}



Policies and Legislation Relevant to the Transportation Sector

Policies	 National Energy Policy Framework
Legislation & Regulation¹⁹	 Motor Vehicles and Road Traffic Act, 2000

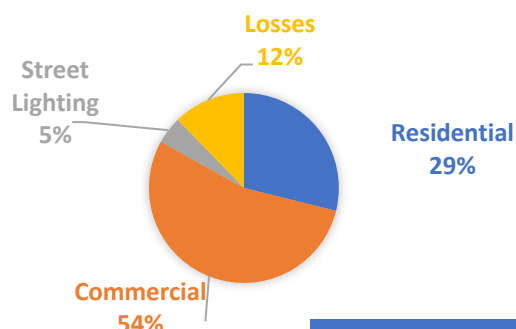
Climate Change Framework - Belize

Climate Change Policy	Yes (2014) ¹¹
National Determined Contributions	Yes ¹²
Emissions Reduction Target	
Priority Sectors for NDC	Electricity, Transport, Forest and Waste sectors ¹²
National Communications (NC) to the UNFCCC	NC1 submitted in 2002, NC2 in 2011 and NC3 in 2016 ²²
Greenhouse Gas (GHG) Inventory	

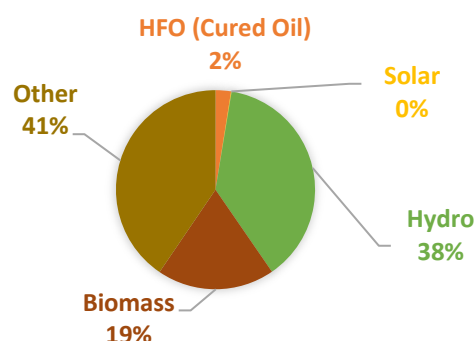
ELECTRICITY SUBSECTOR & ENERGY EFFICIENCY: BELIZE

KEY DATA & INFORMATION	
CONVENTIONAL ENERGY	
1. Fuel Consumption – Electricity Subsector (BOE)	372,645 (2014) ⁶
2. Total Installed Capacity (MW)	203.68 MW (2017) ⁸
3. Installed Conventional Capacity – Electric Utility (MW)	25 MW (2017) ⁸
4. Installed Conventional Capacity – IPPs (MW)	80.2 MW (2017) ⁸
5. Base Load (MW)	
6. System Peak Demand (MW)	104.5 (2017) ⁸
7. Total Generation (MWh)	630,159 (2017) ⁸
8. Total Sales (MWh)	552,478 (2017) ⁸
9. Total Number of Customers	94,465 (2017) ⁸
RENEWABLE ENERGY	
10. Total Installed RE Capacity (MW)	98.48 (2017) ⁸
11. RE Capacity – Electric Utility (MW)	
12. RE Capacity – IPPs (MW)	
13. RE as % of Total Installed Generating Capacity	48% (2017)
14. RE Target	80% by 2020 ⁸
TARIFFS	
15. Residential Tariff (US\$/kWh)	\$0.19 (2017) ⁸
16. Commercial (US\$/kWh)	\$0.2 - \$0.21 (2017) ⁸
17. Industrial/Large Power (US\$/kWh)	\$0.15 (2017) ⁸
18. Street Lights (US\$/kWh)	\$0.225 (2017) ⁸
EFFICIENCY	
19. Electricity System Heat Rate	
20. Electricity System Losses (%)	12% (2017) ⁸
21. Energy Use (kWh) Per Capita	1,749 ⁹
22. Energy intensity index (EII) BTU/US\$1 Unit of output	3,923 ¹⁰
23. EE Target	Transport (5% (2020), 15% (2030)), Industry (10% (2020), 30% (2030)), Buildings (10% (2020), 30% (2030)), Public Sector (20% (2020), 50% (2030)) ⁸
MANAGEMENT OF ENERGY DATA/KNOWLEDGE	
24. Name of Energy Knowledge Management System	
25. Name of Energy Data Management System	

FUEL USE BY SECTOR

Source: NREL (2015)⁵

ELECTRICITY GENERATION MIX (2017)



Ministry of Finance, Public Service, Energy & Public Utilities (2018)

RE Resource	Installed Capacity (MW)	Year Commissioned
Wind		
Solar	0.48 (2017) ⁸	
Hydro	54.5 (2017) ⁸	
Geothermal		
Biomass/ WTE	43.5 (2017) ⁸	
Total	98.48	

RE as % of installed Power Capacity = 48%

RE Resource Potentials	Potential Capacity (MW)	Assessment Conducted?
Wind	20 (2015) ²³	
Solar	42 (2015) ¹³	
Hydro	70 (2015) ¹³	
Geothermal		
Biomass/ WTE	<42 (2015) ²³	
Total		

TRANSPORTATION SUBSECTOR: BELIZE

Key Transportation Data and Information	
Fuel Consumption, Transportation (BOE)	837,339 ^{24,25}
Energy-related transportation targets?	Participation in SIDS DOCK Diesel Fuel Replacement Program (2015) ¹³
Sustainable /Alternative fuels used?	
Total Imports for Alternative Fuels	
Conventional Vehicle Stock/Vehicle Registration	
Trucks	
Cars	
Buses	
SUVs	
Hybrid vehicle stock	
Electric vehicle stock	
Fuel Quality Standards?	

Breakdown of Fuel Use in the Transportation Sector		
Type of Fuel/s	Quantity (BOE)	Purpose (Road, Railway, Aviation, Marine)
Gasoline	353,593 (2013) ²⁶	
Diesel	649,297 (2013) ²⁶	
Kerosene		

WORKFORCE: ENERGY SECTOR, BELIZE

Number of Persons Employed in the Energy Sector

NAME OF ENTITY	PRIVATE OR PUBLIC?	NUMBER OF PERSONS EMPLOYED	BREAKDOWN BY GENDER AND EMPLOYMENT LEVEL	
			Females: Managerial Level: Supervisor: Technical: Administrative:	Males: Managerial Level: Supervisor: Technical: Administrative:
Belize Electricity		316 (2017) ⁷		

Number of Persons Trained in the Energy Sector in 2017

NAME OF ENTITY	PRIVATE OR PUBLIC?	NUMBER OF PERSONS TRAINED	BREAKDOWN BY GENDER AND EMPLOYMENT LEVEL	
			Females: Managerial Level: Supervisor: Technical: Administrative:	Males: Managerial Level: Supervisor: Technical: Administrative:

Indicative Number and Type of Tertiary level and vocational training SE Programmes Offered in Belize

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References

- ¹ Central Intelligence Agency. (2017). *The World Factbook 2017*. Retrieved from <https://www.cia.gov/library/publications/download/download-2017/index.html>
- ² Central Intelligence Agency. (2018). *The World Factbook: Central America – Belize*. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/bh.html>
- ³ United Nations Development Programme. (2018). *Human Development Reports: Table 2. Human Development Index Trends, 1990-2017*. Retrieved from <http://hdr.undp.org/en/composite/trends>
- ⁴ Ministry of Economic Development and Petroleum. (2011). *Horizon 2030: The National Development Framework for Belize (2010-2030)*. Retrieved from <http://med.gov.bz/horizon-2030-the-national-development-framework-for-belize/>
- ⁵ Government of Belize. (2012). *National Energy Policy Framework*. Retrieved from <https://www.iea.org/media/pams/belize/EnergyPolicyFramework.pdf>
- ⁶ Tillett, A. (2015). *National Energy Policy Belize 2011-2040*. Retrieved from http://www.oas.org/en/sedi/dsd/Energy/SECBI/03_Belize-Presentation.pdf
- ⁷ Belize Electricity Limited. (2018). *Annual Report 2017*. Retrieved from http://www.bel.com.bz/annual_reports/Annual%20Report%202017.pdf
- ⁸ Ministry of Finance, Public Service, Energy and Public Utilities (Focal Point: Dr. Peter Allen). (2018). *CARIFORUM Energy Report Card Input Data 2017 (completed for Belize)*.
- ⁹ Calculated using generation and population figures.
- ¹⁰ Calculated using 2015 Total Energy Supply and GDP.
- ¹¹ Caribbean Community Climate Change Centre. (2014). *A National Climate Change Policy, Strategy and Action Plan to Address Climate Change in Belize*. Retrieved from <http://extwprlegs1.fao.org/docs/pdf/blz169290.pdf>
- ¹² Government of Belize. (2015). *Nationally Determined Contribution under the United Nations Framework Convention on Climate Change*. Retrieved from <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Belize%20First/BELIZE%27s%20%20NDC.pdf>
- ¹³ Worldwatch Institute. (2015). *Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS) Baseline Report and Assessment*. Retrieved from http://www.worldwatch.org/system/files/C-SERMS_Full_PDF.pdf
- ¹⁴ Ministry of Science, Energy, Technology and Mining. (2013). *Grid Impact Analysis and Assessment for Increased Penetration of Renewable Energy into the Jamaican Electricity Grid*. Retrieved from https://www.mset.gov.jm/sites/default/files/pdf/Grid%20Impact%20Analysis%20for%20Renewable%20Energy%20Penetration_2.pdf
- ¹⁵ Sustainable Energy Ireland – Renewable Energy Information Office. (2011). *Energy Unit Conversion Tool*. Retrieved from https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/make-it-be_energy_unit_conversion_tool.xlsx
- ¹⁶ J.M.K.C. Donev et al. (2018). *Energy Education - Energy intensity*. Retrieved from https://energyeducation.ca/encyclopedia/Energy_intensity.

- ¹⁷ Government of Belize. (2018). *The Official Government Portal: Ministries*. Retrieved from <http://www.belize.gov.bz/>
- ¹⁸ Belize Public Utilities Commission. (2013). *The Electricity Sector*. Retrieved from <http://www.puc.bz/index.php/about-us/electricity>
- ¹⁹ Belize Legal Information Network Online. (2000). *The Laws of Belize, Revised Edition 2000*. Retrieved from <http://www.belize-law.org/web/lawadmin/index2.html>
- ²⁰ Government of Belize – Ministry of Economic Development. (2016). *Belize 2016 to 2019 Growth and Sustainable Development Strategy*. Retrieved from <http://cdn.gov.bz/belize.gov.bz/files/gds/FINAL%20GSDS%20-%20March%2030%202016.pdf>
- ²¹ Inter-American Development Bank. (2014). *The Energy Sector in Belize*. Retrieved from <https://publications.iadb.org/bitstream/handle/11319/6742/The-Energy-Sector-in-Belize.pdf?sequence=1>
- ²² United Nations Framework Convention on Climate Change. (2018). *Process and Meetings: National Communication submissions from Non-Annex I Parties*. Retrieved from <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-update-reports-non-annex-i-parties/national-communication-submissions-from-non-annex-i-parties>
- ²³ National Renewable Energy Laboratory. (2015). *Energy Transition Initiative: Islands Energy Snapshot - Belize*. Retrieved from <https://www.nrel.gov/docs/fy15osti/62707.pdf>
- ²⁴ Gardner, D., Alleyne, D. and Gomes, C. (2013). *An assessment of fiscal and regulatory barriers to deployment of energy efficiency and renewable energy technologies in Belize*. Retrieved from https://www.cepal.org/sites/default/files/project/files/lcarw1_belize_0.pdf
- ²⁵ Inter-American Development Bank. (2014). *The Energy Sector in Belize*. Retrieved from <https://webimages.iadb.org/publications/english/document/The-Energy-Sector-in-Belize.pdf>
- ²⁶ Binger, A. Some Benefits & Challenges of R3E Implementation in the Caribbean. Retrieved from http://www.un.org/en/ga/president/68/pdf/sts/wsse-presentations/AI_Binger.pdf