



BELIZE

ENERGY REPORT CARD (ERC) FOR 2022





INTRODUCTION



This is the Energy Report Card (ERC) for 2022 for Belize.

The ERC provides an overview of the energy sector performance, highlighting the following areas:

- Installed Conventional and Renewable Power Generation Capacity
- Annual Electricity Generation, from Conventional and Renewable Plants
- Other Electricity Sector Metrics, such as Losses, Consumption, and Tariffs
- Renewable Energy Targets
- Renewable Energy Resource Potential

The ERC also includes sectoral data and information on policies and regulations; workforce; training and capacity building; and related areas.

The data and information that are available in the ERC were mostly provided by the government ministries, agencies, and departments, that have responsibility for statistics and planning, in general, and the energy sector and electricity subsector including the electric utilities, in particular. The data and information collected was supplemented by desk based research and, in instances, information was generated from calculations and analyses that were performed by the CCREEE.

Quality Assurance

The collection and treatment of data and information that is produced for the ERC is consistent with the International Recommendations for Energy Statistics (IRES), which provides a comprehensive methodological framework for the collection, compilation, and dissemination of energy statistics in all countries irrespective of the level of development of their statistical system. The ERC is produced in accordance with these performance standards that seek, as far as is possible, to ensure the quality (i.e., objectivity, utility, and integrity) of data and information that it disseminates to the public.

The CCREEE strives for transparency on the information and methods that are used within the production of the ERC, with a view to improve understanding on how the information should be treated and to facilitate reproducibility of the information. Nevertheless, the Centre recognizes that quality may be limited by the nature and source of the data and information disseminated.

Disclaimer

The ERC includes data and information that is contained in a variety of public sources and, though every effort is made to validate the accuracy and validity of the contents, reliance on the information herein is strictly at the user's risk.

Correction of Errors

If a substantive error is detected after the ERC is disseminated, the CCREEE will make correction and issue an **errata notice**, or other notification as appropriate. Also, the information contained within the ERC may be revised, after initial dissemination to reflect more complete information or other significant changes in the underlying data. The ERC may, from time to time, include information that is preliminary and is expected to be revised, or information that is revised from previously disseminated versions. In such instances, those cases are clearly noted.

Requests for Correction

The CCREEE has established administrative mechanisms to allow persons to seek and obtain, where appropriate, legitimate correction(s) to information maintained and disseminated through the ERC. Any request for corrections should be sent to: energyreportcard@ccreee.org, under the subject: **REQUEST FOR CORRECTION TO ERC 2022 FOR BELIZE.**

Acknowledgements

The CCREEE acknowledges the contributions of the Ministry of Public Utilities, Energy, Logistics & E-Governance, Belize and thanks Geon Hanson, Energy Officer in the Energy Unit of the Ministry, for his supervision of the intern, India Choco, who supported the preparation of the ERC.



ENERGY SECTOR SUMMARY

SOCIOECONOMIC POLICIES

Horizon 2030 Belize: National Development Framework for Belize 2010-2030 ^[5]

Plan Belize Medium-term Development Strategy 2022 - 2026 ^[6]

National Development Plan/ Overall Country Development Strategy

Belize National Energy Policy Framework (2012) ^{2 [7]}

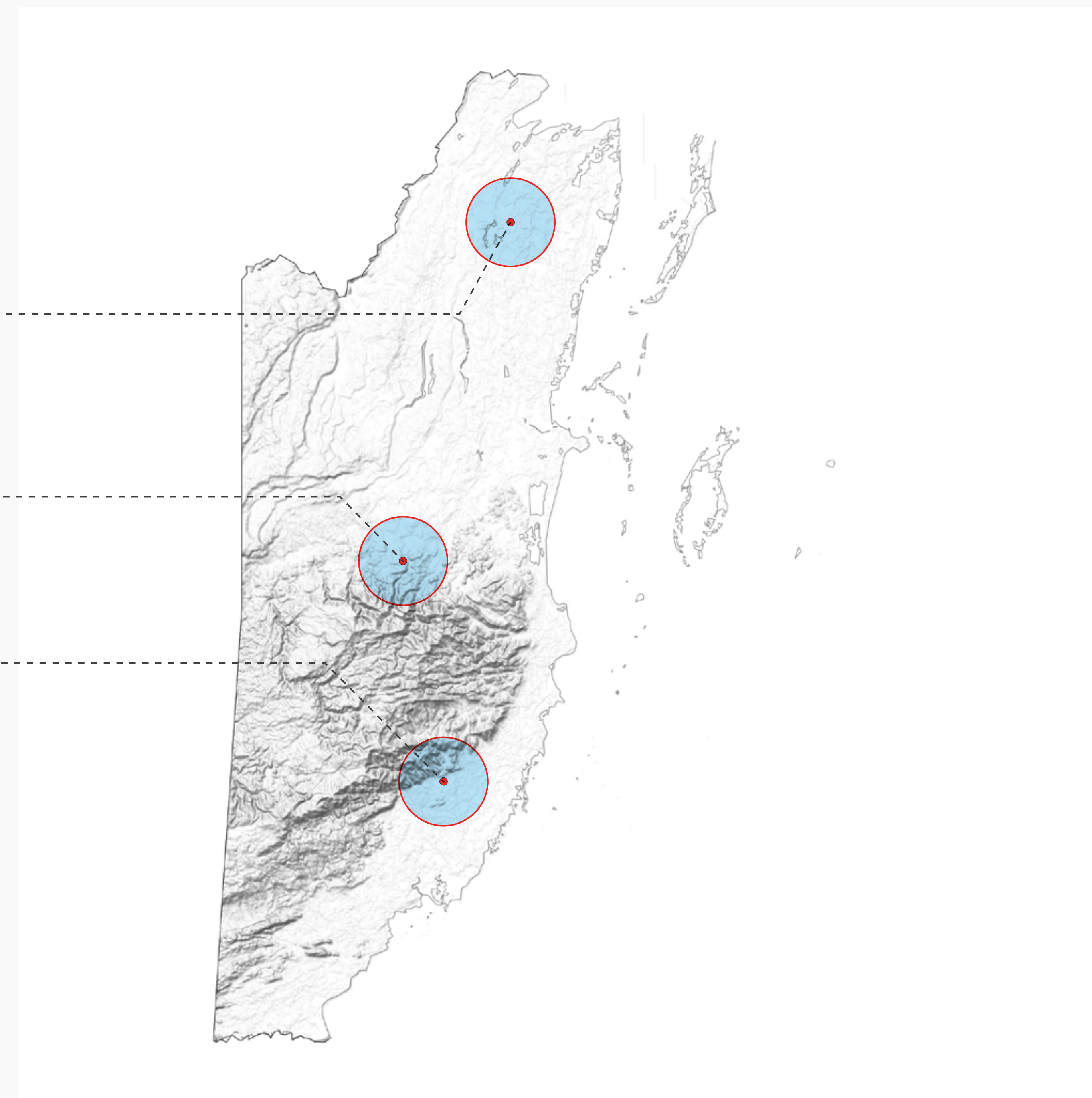
National Energy Policy

Not Established ^{3 [8]}

Renewable Energy (RE) Policy

SOCIOECONOMICS

Population	441,471 ^{1 [1]}
GDP (USD)	\$2,929,250,000 ^[2]
GDP (USD) Per Capita	\$6,585.52 ^[2]
Gross National Income (GNI) Per Capita (USD)	\$6,630 ^[3]
Debt as % of GDP	46.2% ^[2]
Human Development Index	0.683 ^[4]
RE Target	75% RE Share in Gross Electricity Production by 2030 ^[9]



Total Installed Conventional Capacity (MW)	54.4 ^{6 [13] [8]}
Total Installed RE (MW)	80.52 ^{[8] [13]}
Electricity System Losses ⁴ (%)	11.88% ^[13]
Energy Use (kWh) Per Capita	1,597.84 ^[12]
Total Oil Export (BBLs) per day	51.8 ^[12]

OTHER ENERGY SECTOR SUB-POLICIES

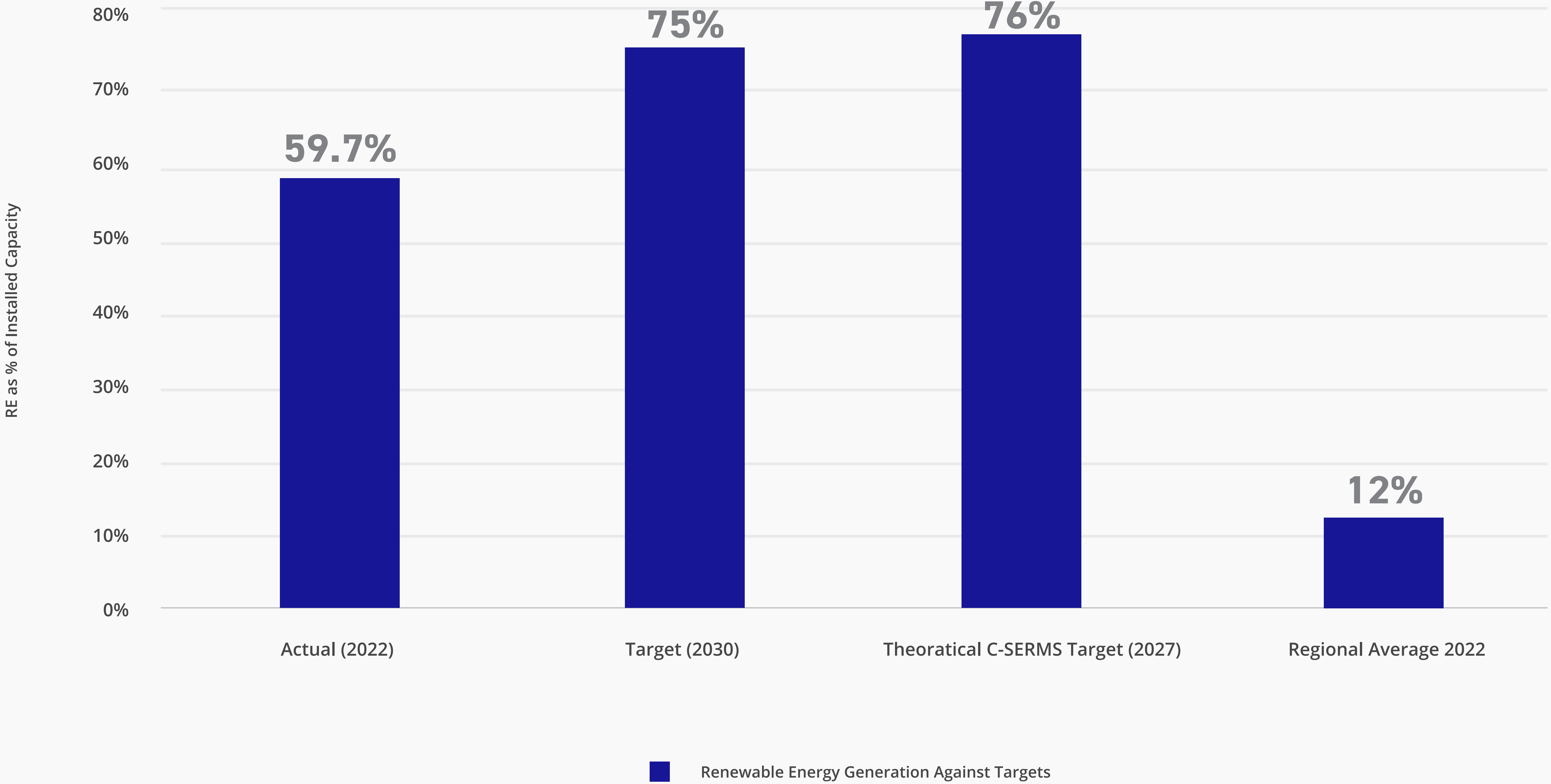
Climate Change Policy	Belize National Climate Change Policy, Strategy and Master Plan (BNCCPSMP) (2021) ^[10]
Energy Performance Standards/Appliance Labelling ^{1 [12]}	Belize Energy Efficiency Labelling Scheme (EELS) ^{5 [11]}
National Determined Contributions (NDC)	A 63% increase in GHG removals related to the Agriculture, Forestry and Other Land Use (AFOLU) sector and an increase of renewable energy projects for grid connected electricity generation. ^[9]
National Repository for Energy Data	Belize National Energy Information System (NEIS) ^[12]

1. Estimated Mid-Year Population by the Statistical Institute of Belize
 2. Belize's National Energy Policy was being updated. The update is expected to be completed by the end of 2023.
 3. Belize does not have a National RE Policy, however the Belize Sustainable Energy Strategy and Action Plan lays out plans and actions to unlock Belize's RE and EE potential.
 4. Overall, the Belize updated NDC represents a 5% increase in overall commitments with the addition of sectoral adaptation actions aimed at

building resilience and development capacity – Belize Annual Energy Report 2022.
 5. The EELS Product Registration System with the establishment of the compulsory standard going into effect in March 2025.
 6. Conventional Capacity in Belize is defined as fossil-fuel based power plants. This figure does not include the capacity imported from the Mexico grid.



RENEWABLE ENERGY GENERATION AGAINST TARGETS



1. The generation also includes off-grid systems and excludes the capacity imported from Mexico.



KEY ENERGY STAKEHOLDERS

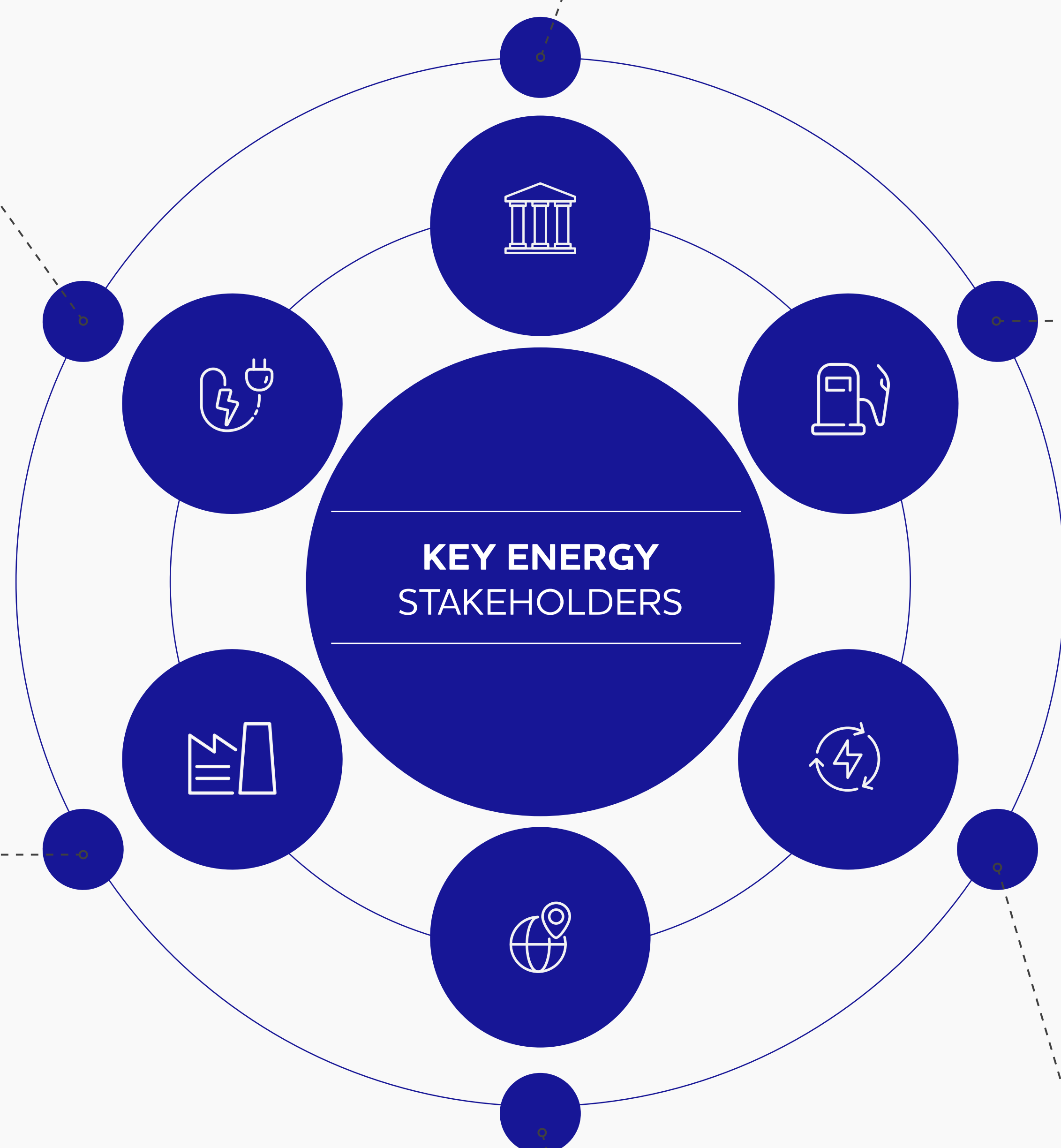


Electricity Regulator

Public Utilities Commission ^[32]

Independent Power Producer

- BELCOGEN ^[8]
- Blair Athol Power Company (BAPCo) ^[8]
- Fortis Belize Limited ^{9 [30]}
- Farmers Light Plant Corporation Limited ^[8]
- Santander Sugar Energy Limited ^[31]
- Hydro Maya Limited ^[8]
- Japan International Cooperation Agency (JICA) Solar Farm in Partnership with University of Belize ^[8]
- Comisión Federal de Electricidad, Mexico ^{10 [8]}



Government Ministries, Departments and Agencies

- Ministry of Public Utilities, Energy, Logistics and E-Governance ^[16]
 - Energy Unit ^[17]
- Ministry of Sustainable Development, Climate Change and Disaster Risk Management ^[18]
 - Department of the Environment Services ^[19]
 - National Climate Change Office
- Ministry of Finance, Economic Development & Investment ^[20]
 - Climate Finance Unit
- Social Security Board ^{8 [21]}
- Ministry of Blue Economy and Civil Aviation ^[22]
- Ministry of Youth, Sport, and Transport
 - Department of Transport ^[23]
- Belize Port Authority ^[24]

Fuel Importers & Suppliers

- | | |
|---|--|
| Belize Natural Energy (BNE) ^[25] | Puma Energy Bahamas SA ^[27] |
| National Gas Company (Belize) Limited ^[26] | UNO Belize ^[27] |
| Zeta Gas ^[27] | SOL Belize Limited ^[28] |
| Gas Tomza Limited ^[27] | Belize Western Energy Limited (BWEL) |

Electric Utility

Belize Electricity Limited (BEL) ^[29]

Other

The Belize Bureau of Standards ^[33]

8. Shareholder in the Electric Utility

9. Formerly Belize Electric Company Limited (BECOL)

10. Electricity is imported from Comisión Federal de Electricidad in Mexico.



POLICY, LEGAL AND REGULATORY (PLR) FRAMEWORK

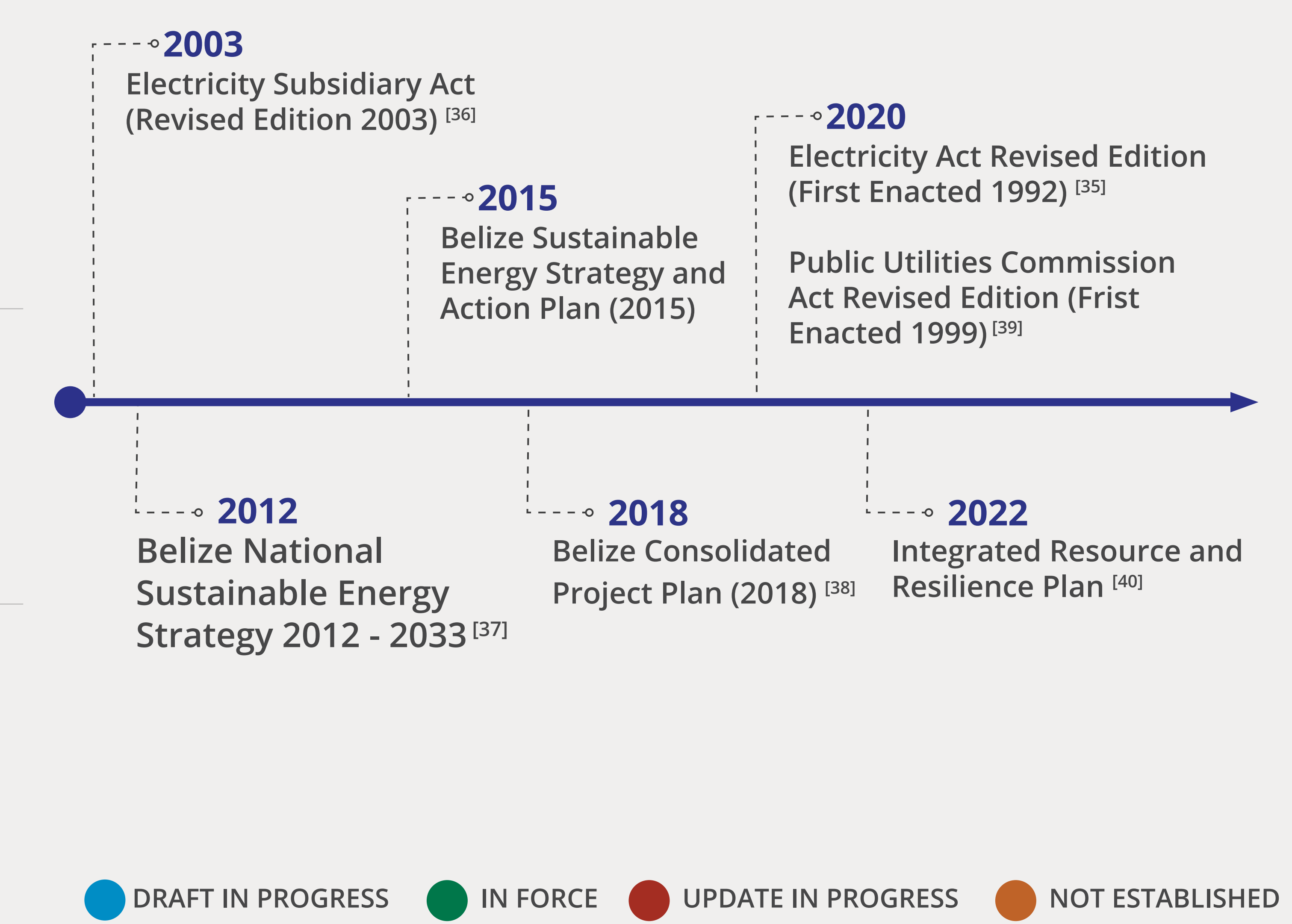


POICIES RELEVANT TO THE ENERGY SECTOR

2011	National Energy Policy Framework [7] This policy framework outlines a path to an efficient energy sector within the context of Belize's particular strengths and constraints.	
2012	Ministry of Energy, Science and Technology, and Public Utilities Strategic Plan 2012 - 2017 [41] This plan outlines the transitioning the energy sector and economy toward low carbon development.	
2015	Belize Sustainable Energy Strategy Volume 1 and 2 [42] This Strategy aims to improve energy efficiency and conservation in order to transform to a low carbon economy by 2033	
2016	Growth and Sustainable Development Strategy (2016-2019) [43] Goals include facilitating the development or emergence of other types of employment-generating opportunities, including activities related to renewable energy.	Belize Consolidated Project Plan (CPP) [44] The Plan seeks to identify opportunities within the electricity sector that offer significant economic, social, and environmental benefits for Belizeans.
2018	Comprehensive National Transportation Master Plan for Belize [45] The Plan facilitates better sector planning and a more efficient and effective transport of freight and people within Belize, and between Belize and its main trading partners. It includes actions to: implement regulations on heavy-duty vehicle emissions, facilitate energy efficiency in light-duty vehicles, introduce electric vehicles and, consider biofuels as an alternative for fossil fuels in the transport sector.	
2022	Integrated Resource and Resilience Plan [40] The Plan maps how the country can supply their need for electricity in the future (demand forecasting), ensuring reliable sources of power, minimising the negative impacts on the environment, and enhancing the resilience of power systems to hazards and risks, while minimizing costs to consumers. The preferred plan allows for the expansion of the generating capacity through independent power producers using solar PV, gaseous fuels, hydro power, biomass and wind power.	

	YEAR
Energy Policy and Energy Action Plan ¹¹ [7]: ●	2012
RE Target [9]: ●	2021
EE Target: ●	2021
Electricity Regulator [34]: ●	1999
Net Billing/Net Metering: ●	
Interconnection Policy/Standards: ●	
Feed-in-tariff: ●	
RE/EE Act: ●	

KEY ACHIEVEMENTS: PLR FRAMEWORK TIMELINE FOR ELECTRICITY SUB-SECTOR



11. Belize's National Energy Policy was being updated. The update is expected to be completed by the end of 2023.



POLICY, LEGAL AND REGULATORY (PLR) FRAMEWORK



LEGISLATION RELEVANT TO THE ENERGY SECTOR

1992 **The Petroleum Act Chapter 225 [46]**

The Act covers the various aspects of petroleum exploration to include operation rights, surface rights, government revenue, the type and nature of contracts.

Petroleum Regulation [47]

The Petroleum Regulations implement the provisions made in the Petroleum Act and regulate the exploration and exploitation of petroleum resources as it relates to environment and pollution control, drilling practices, reporting on activities, application for exploration or exploitation licenses, bidding, etc.

Environmental Protection Act (CAP 328) (Revised 2000) [48]

Establishes protection for the environment which includes water, coasts, seas, air and land and the interacting relationship from adverse effects of activities.

Belize City Council Act (CAP 85) (Revised 2000) [49]

2000 The Act outlines the constitution, operation, procedure and duties of the appointed urban authorities. The legislation also outlines the maintenance of Belize City.

Belize Port Authority Act (CAP 233) (Revised 2000) [50]

2001 Enables the Belize Port Authority to regulate and control uses of the ports and facilities.

Motor and Vehicles and Road Traffic Act (Revised 2011) [51]

2011 This Act covers rules for vehicular use on the roads of Belize, and the management and operations of the Transport Board.

Public Roads Act (CAP 232) (Revised 2011) [52]

This Act outlines procedures for road maintenance and construction.

Harbours and Merchant Shipping Act (CAP 234) (Revised 2011) [53]

This Act makes provisions for the maritime navigation of waters of Belize inclusive of the harbours and rivers and overseeing same.

Belize Airport Authority Act (CAP 238) (Revised 2011) [54]

The Belize Airport Authority Act establishes the Belize Airport Authority to manage and administer prescribed airports and provide all essential services and facilities necessary for their efficient operations.

National Integrated Water Resources Act (Revised 2020) [55]

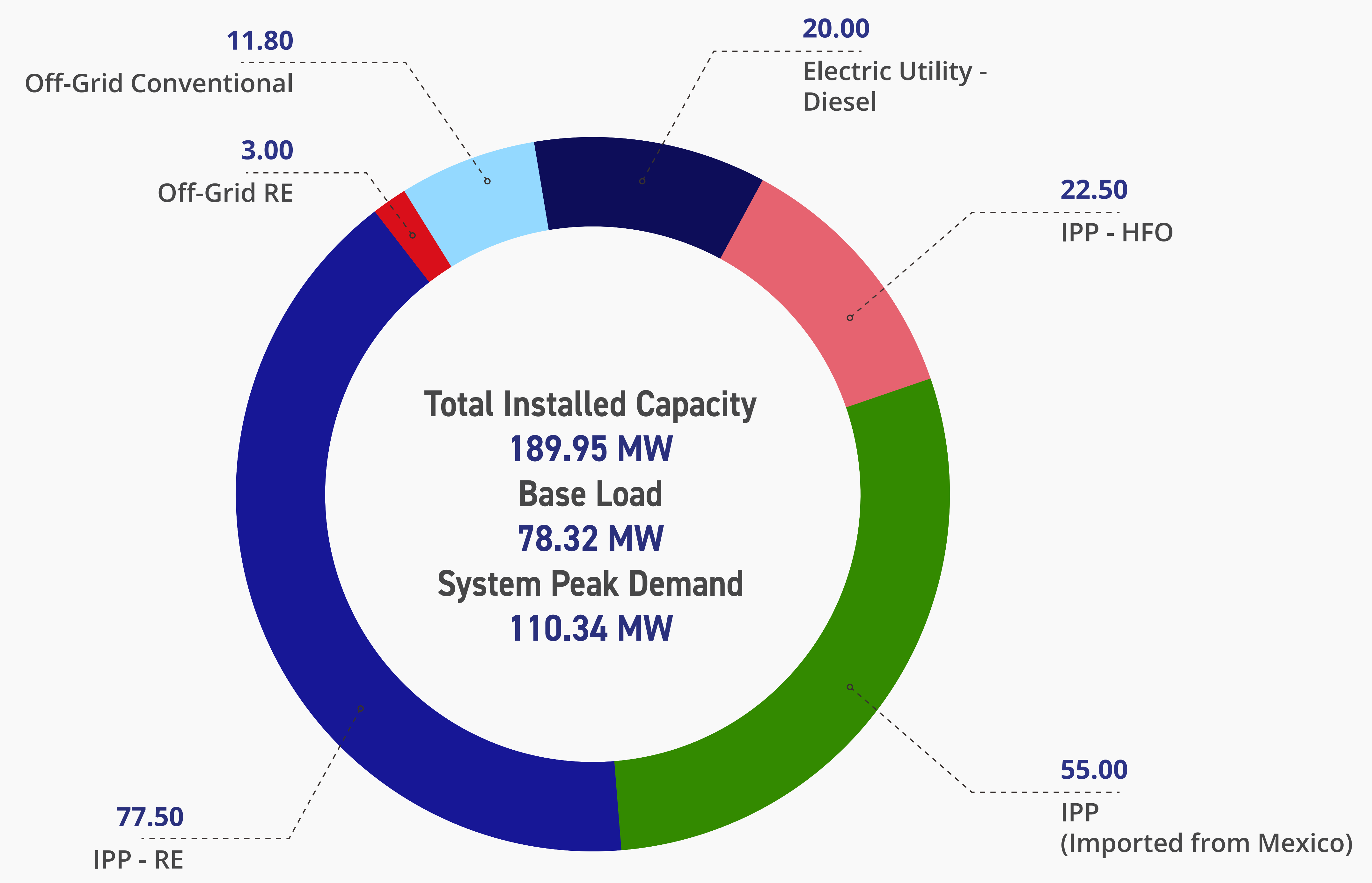
2020 Establishes the management and conservation of water resources in Belize, where conservation measures aim to prevent pollution of water resources.

POLICIES AND LEGISLATION RELEVANT TO THE FISCAL INCENTIVES SECTOR

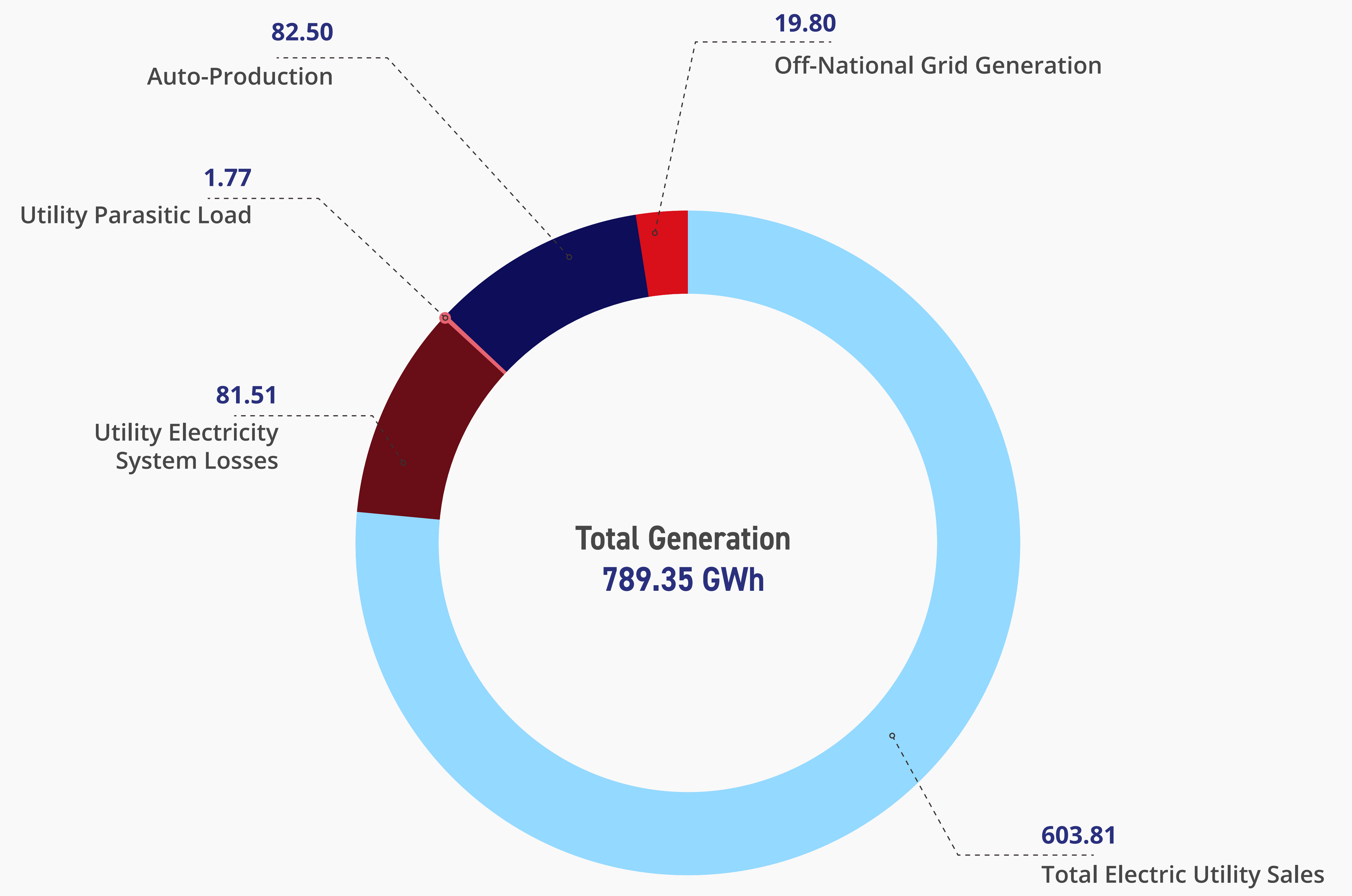
Fiscal Incentive Act [56]

2022 The Fiscal Incentive Act seeks to streamline the fiscal incentive programme to improve the regulatory functions to allow foreign companies to apply for incentives; to offer new fiscal incentives; to improve access to incentives for MSMEs

+ INSTALLED CAPACITY (MW)



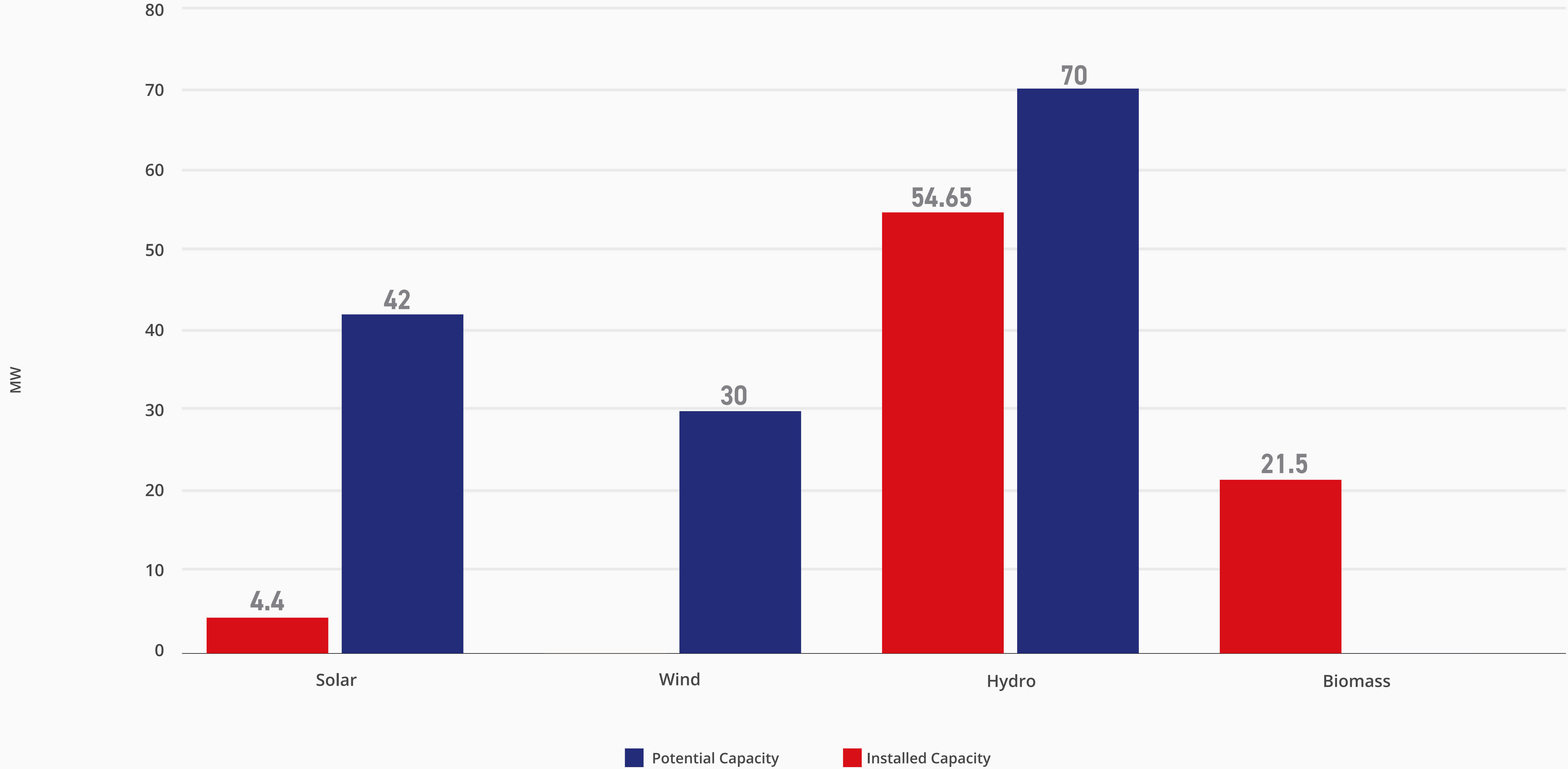
+ ENERGY CONSUMPTION (GWh)



¹². The Belize Energy Unit reports on the Total Electricity Supply which is reflected in this graph. The definition of the TES can be summarized as all electricity available within national borders, whether indigenously generated or imported, or whether consumed on-site or distributed for sale.
¹³. The Total Generation of Electricity encompasses auto-production and off-grid production as well as utility generation. The auto-production total consist of bagasse generation, diesel, crude oil and solar PV from small scale IPP.



RENEWABLE ENERGY RESOURCES





ELECTRICITY TARIFFS 14 [57]



Rate Class	Monthly Consumption/Demand	Rate (US\$)
Social Rates¹⁵	0-60	\$0.11
	Minimum Charge	\$2.50
Residential Tariff	0-50	\$0.17
	51-200	\$0.19
	>201	\$0.22
	Average per kWh	\$0.19
	Minimum Charge	\$5.00
Commercial 1¹⁶	0-50	\$0.17
	51-200	\$0.19
	> 201	\$0.22
	Average per kWh	\$0.19
	Minimum Charge	\$5.00
Commercial 2	0-10,000	\$0.21
	10,001-20,000	\$0.20
	>20,001	\$0.19
	Average per kWh	\$0.20
	Service Charge	\$75.00
Industrial/Large Power I	Energy (per kWh)	\$0.15
	Demand Charge (kVA)	\$17.91
	Service Charge	\$125.00
Industrial/Large Power II	Energy (per kWh)	\$0.13
	Demand Charge (kVA)	\$11.50
	Service Charge	\$125.00
Streetlights	Energy (kWh)	\$0.23

14. The Industrial/Large Power Rate Class was redefined from 2021 based on the Public Utilities Commission (PUC) annual tariff review (AR) exercises and Full Tariff Review (FTR) which is done every four years. These rates are valid for period July 1, 2021 to June 30, 2024

15. Social Classification is defined as a small residential dwelling, including rental homes and apartments, which consume energy of an average 60 kWh or less monthly, solely for domestic use.

16. Commercial customers with average consumption less than 2,500 kWh



PROJECTS IN PIPELINE

+ PROGRAMMES

Donor Funding and Technical Assistance Landscape	Donor Organization & Banks	Technical Assistance Providers	Funding Awards	Year
Renewable Energy, Energy Efficiency (EDF-11) ^[12]	European Union	Lait Up Belize! Project Office	Publicly Unavailable	2021
Organic Waste to Energy Feasibility Study (EDF-11) ^[12]	European Union	Lait Up Belize! Project Office	Publicly Unavailable	2022
Expanding Generation Capacity ^[12]	Millenium Challenge Corporation (MCC)	Yet to be determined	Yet to be determined	2024
Renewable Energy, Geothermal Resource Mapping (Yacimientos II and the GEO II) ^[12]	Federal Institute for Geosciences and Natural Resources (BGR) and the German Agency for International Cooperation (GIZ).	BGR, ICE (Costa Rica), GIZ	Not available	2017 (on-going)

+ ENERGY EFFICIENCY PROJECTS

Energy Efficiency	Old/Existing Infrastructure	Consumption (kW)	Annual Costs (USD)	Energy Audits	Energy Efficiency Legislation or Regulations	Energy Service Companies	Change in Old/Existing Infrastructure Expected in Upcoming Calendar Year	Expected Change in Technology
Energy Management in Public Buildings (EDF-11) ^[12]		Unavailable	Unavailable	Yes	No legal framework in place	No		Retrofitting/ Replacement of ACs, lighting fixtures, installation of air quality meters and roof repainting, installation of energy consumption monitoring equipment
Energy Efficiency Labelling Scheme (EDF-11) ^[12]	Refrigerators, Lighting, Air-conditioning units	Unavailable	Unavailable	Not Available	No legal framework in place	No	Unrolling of new appliance labels with selected retailers	New equipment meeting minimum energy efficiency standards and the removal of old and inefficient appliances in the Belizean market.



PROJECTS IN PIPELINE



SUSTAINABLE TRANSPORT PROJECTS

Energy Efficiency	Old/Existing Infrastructure	Consumption (kW)	Annual Costs (USD)	Energy Audits	Energy Efficiency Legislation or Regulations	Energy Service Companies	Change in Old/Existing Infrastructure Expected in Upcoming Calendar Year	Expected Change in Technology
E-Mobility in Public Transport (EDF-11) ^[12]	Old (20+ yr) and inefficient school buses for public transportation	Unavailable	Unavailable	No	No legal framework in place	No	Introduction of 5 battery electric buses within the public transportation sector and its associated charging infrastructure	New technology in the form of full electric buses being piloted on Belizean roads

RENEWABLE ENERGY PROJECTS

Renewable Energy Source	Location	Resource and Projects Capacity	Implementing Partner	Total Estimated Cost	Funding Source	Ownership
Solar Photo-Voltaic ^[12]	Corazon Creek	72 kW	Belize Electricity Limited, Community	\$1,000,000 USD	CDW Foundation	Utility-owned
	Jalacte & San Vicente (EDF-11)	223 kW	Belize Electricity Limited, Community	\$4,500,000 USD	European Union/BEL	Utility-owned
	Indian Church & San Carlos (EDF-11)	165 kW	Belize Electricity Limited, Community		European Union/BEL	Utility-owned
	San Benito Poite (EDF-11)	98 kW	Belize Electricity Limited, Community		European Union/BEL	Utility-owned

 No data was available for the transportation sector for 2022.

¹⁵. In May 2023, the Generation Procurement Entity (GPE) published an Expression of Interest (EoI for the supply of up to Net 100 MW of the Electricity Generation from Renewable Energy Based Power Generation Facilities on a Build, Own and Operate (BOO) Basis. [88]



TERTIARY PROGRAMMES OFFERED



PROGRAMMES

Name of Education Programme Provider	Vocational Certificate	Associate Degree	Bachelor's Degree	Programme Link
Galen University			Environmental Science	https://galen.edu.bz/faculty-of-art/environmental-science/
St. John's College Junior College		Environmental Science		https://www.sjc.edu.bz/_files/ugd/343ada_bb888cb362fa4529b941c37defafbbe_3.pdf
Sacred Heart Junior College		Natural Resource Management		https://shjc.edu.bz/academics/science-department/nrm/
University of Belize		Building and Civil Engineering		https://www.ub.edu.bz/admissions/program-requirements/#prelim_fea_fmss
		Natural Resource Management		
			Natural Resource Management	
Cayo Center for Employment Training (CET)	Electrical Installation Level 1			http://cayocet.bz/programmes/electrical-installation-level-1/
	Electrical Installation Level 2			http://cayocet.bz/programmes/electrical-installation-level-2/
Institute for Technical and Vocational Education and Training (ITVET) ¹⁷	Renewable Energy & Efficiency Program			

17. This is a newly introduced program and has not had a graduating class as yet.



CLIMATE CHANGE FRAMEWORK

Climate Change Policy	<p>National Climate Change Policy, Strategy and Master Plan (2021) ^[10]</p> <p>The Master Plan presents a five-year programme to build the capacity of Belize to mitigate GHG emissions and adapt to the challenges of climate change in an inclusive matter in line with long-term national development goals.</p>
National Determined Contributions:	A 63% increase in GHG removals related to the Agriculture, Forestry and Other Land Use (AFOLU) sector and an increase of renewable energy projects for grid connected electricity generation. ^[9]
Emissions Reduction Target:	The mitigation actions included in the updated NDC are estimated to result in over 5.6 MTCO ₂ e in cumulative avoided emissions by 2030, and a reduction of 1.0 MTCO ₂ e in annual emissions by 2030 (not including additional deforestation targets) ^[9]
Priority Sectors for NDC ^[9]	<ul style="list-style-type: none"> • Agriculture, Forestry and Other Land Use (AFOLU) • Energy, • Transport • Waste
National Communications (NC) to the UNFCCC:	<p>Belize’s First National Communications to the Conference of the Parties of the United Nations Framework Convention on Climate Change (2002) ^[58]</p> <p>Belize’s Second National Communications to the Conference of the Parties of the United Nations Framework Convention on Climate Change (2012) ^[59]</p> <p>Belize’s Third National Communications to the United Nations Framework Convention on Climate Change (2016) ^[60]</p> <p>Belize’s Fourth National Communications prepared for the United Nations Framework Convention on Climate Change (2022) ^[61]</p>

SUMMARY OF BELIZE’S GHG EMISSIONS AND REMOVALS (MASS / Gg CO₂) ^[12]

Categories	Mass / Gg CO ₂ equivalent		
	Carbon Dioxide (CO ₂)	Methane (CH ₄)	Nitrous Oxide (N ₂ O)
Energy	139.1	4.7600	7.68
Civil Aviation	12.8	0.0020	0.11
Road Transportation	519.6	3.2600	7.68
Navigation	0.64 *	0.002 *	0.005 *
Residential	144.8	4.6900	0.8800
Fugitive Emissions from Fuels	0.00094	0.000015	0.000005
Marine International Bunker	N/A	N/A	N/A
Aviation International Bunker	54.6	N/A	N/A



BIBLIOGRAPHY



- [1] Statistical Institute of Belize, "Population Mid-Year Estimates," Statistical Institute of Belize, 2022. [Online]. Available: <https://sib.org.bz/statistics/population/>. [Accessed 2023].
- [2] Central Bank of Belize, "Major Economic Indicators (2001-2022)," Central Bank of Belize, 2023. [Online]. Available: [https://www.centralbank.org.bz/home/statistics/general-statistics/major-economic-indicators-\(2001-2022\)](https://www.centralbank.org.bz/home/statistics/general-statistics/major-economic-indicators-(2001-2022)). [Accessed June 2023].
- [3] The World Bank Group, "GNI per capita, Atlas method (current US\$)," The World Bank Group, 2023. [Online]. Available: <https://data.worldbank.org/indicator/NY.GNP.PCAP.CD>. [Accessed 27 July 2023].
- [4] United Nations Development Programme, "Human Development Report 2021/2022," 8 September 2022. [Online]. Available: https://hdr.undp.org/system/files/documents/global-report-document/hdr2021-22pdf_1.pdf. [Accessed 14 September 2022].
- [5] Government of Belize, "Horizon 2030: The National Development Framework for Belize," 2010. [Online]. Available: <https://med.gov.bz/wp-content/uploads/2020/09/Horizon2030PreparationandImplementationProcess.pdf>. [Accessed 5 June 2023].
- [6] Government of Belize, "Belize Medium-Term Development Strategy 2022-2026," January 2023. [Online]. Available: <https://med.gov.bz/wp-content/uploads/2023/04/Belize-Med-Term-Dev-Strategy-Action-Plan-2022-to-2025.pdf>. [Accessed 5 June 2023].
- [7] Ministry of the Public Service, Constitutional and Political Reform and Religious Affairs, "Belize National Energy Policy Framework," Ministry of the Public Service, Constitutional and Political Reform and Religious Affairs, 30 November 2011. [Online]. Available: <https://www.publicservice.gov.bz/index.php/medias/news-and-events/item/56-belize-national-energy-policy-framework>. [Accessed 5 June 2023].
- [8] Energy Unit, "Belize Annual Energy Report 2022 Edition," Ministry of Public Utilities, Energy, Logistics, and E-Governance, Belmopan City, Belize, 2023.
- [9] Ministry of Sustainable Development, Climate Change & Disaster Risk Management, "Belize Updated Nationally Determined Contribution," 2021. [Online]. Available: <https://unfccc.int/sites/default/files/NDC/2022-06/Belize%20Updated%20NDC.pdf>. [Accessed 21 July 2023].
- [10] Ministry of Sustainable Development, Climate Change and Disaster Risk Management, "National Policies & Plans where Environment, Climate Change and Disaster Indicators are required," 2023. [Online]. Available: https://www.cepal.org/sites/default/files/presentations/belize-workshop-2_1-ministry-sustainable-national-policies-plans.pdf. [Accessed 31 January 2024].
- [11] Belize Bureau of Standards, "Introduction to the Energy Efficiency Labelling Scheme," Belize Bureau of Standards, 2017. [Online]. Available: <https://bbs.gov.bz/background/>. [Accessed 5 June 2023].
- [12] Energy Unit, Ministry of Public Utilities, Energy and Logistics, Energy Data, Projects in the Pipeline, Climate Change Data, Belize City, 2023.
- [13] Belize Electricity Limited, Electricity and Energy Efficiency, Belmopan, Belize: Belize Electricity Limited, 2023.
- [14] Caribbean Community Climate Change Centre, "A National Climate Change Policy, Strategy and Action Plan to Address Climate Change in Belize," 2014. [Online]. Available: https://cdn.climatepolicyradar.org/navigator/BLZ/2014/national-climate-change-policy-strategy-and-action-plan_ae5a3e27936278cc89018599c0b4a8f6.pdf. [Accessed 21 July 2023].
- [15] A. Ochs, M. Konold, K. Auth, E. Musolino and P. Killeen, "Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS) Baseline Report and Assessment," Worldwatch Institute, Washington, D.C., 2015.
- [16] Ministry of Public Utilities, Energy, Logistics & E-Governance, "Senior Management," Ministry of Public Utilities, Energy, Logistics & E-Governance, 2023. [Online]. Available: <https://www.mpuele.gov.bz/senior-management/>. [Accessed 9 October 2023].
- [17] Ministry of Public Utilities, Energy, Logistics & E-Governance, "The Belize Energy Unit," Ministry of Public Utilities, Energy, Logistics & E-Governance, 2023. [Online]. Available: <https://www.mpuele.gov.bz/energy-unit/>. [Accessed 9 October 2023].
- [18] Ministry of Sustainable Development, Climate Change and Disaster Risk Management, "About," Ministry of Sustainable Development, Climate Change and Disaster Risk Management, 2023. [Online]. Available: <https://sustainabledevelopment.gov.bz/about/>. [Accessed 9 October 2023].
- [19] Department of the Environment Services, "About Us," Department of the Environment Services, 2023. [Online]. Available: <https://doe.gov.bz/about/>. [Accessed 9 October 2023].



BIBLIOGRAPHY



- [20] Government of Belize, "Ministry of Finance, Economic Development, & Investment," Government of Belize, 2023. [Online]. Available: <https://portalclone.azurewebsites.net/Ministry/Ministry%20of%20Finance,%20Economic%20Development,%20&%20Investment>. [Accessed 9 October 2023].
- [21] Social Security Board, "Management," Social Security Board, 2021. [Online]. Available: <https://www.socialsecurity.org.bz/management/>. [Accessed 9 October 2023].
- [22] Government of Belize Press Office, "The Office of the Prime Minister Announces New Chief Executive Officers," Government of Belize Press Office, 25 November 2020. [Online]. Available: <https://www.pressoffice.gov.bz/the-office-of-the-prime-minister-announces-new-chief-executive-officers/>. [Accessed 11 June 2023].
- [23] Department of Transport Belize, "Meet the Team," Department of Transport Belize, 2022. [Online]. Available: <https://transportbelize.org/page-team/>. [Accessed 11 June 2023].
- [24] Belize Port Authority, "Meet our Management Team," Belize Port Authority, 2023. [Online]. Available: <https://portauthority.bz/management/>. [Accessed 11 June 2023].
- [25] Belize Natural Energy, "Leadership Team," Belize Natural Energy, [Online]. Available: <https://www.bne.bz/bne-leadership-team/>. [Accessed 5 June 2023].
- [26] National Gas Company (Belize) Limited, "The NGC Team," National Gas Company (Belize) Limited, 2023. [Online]. Available: <https://nationalgas.bz/the-ngc-team/>. [Accessed 7 June 2023].
- [27] Energy Unit, Ministry of Public Utilities, Energy and Logistics, Energy Data, Belize City, Belize: Private Communication, 2022.
- [28] SOL Belize Limited, "Belize," SOL Belize Limited, 2023. [Online]. Available: <http://solpetroleum.net/belize>. [Accessed 9 June 2023].
- [29] Belize Electricity Limited, "Leadership Team," Belize Electricity Limited, [Online]. Available: <https://www.bel.com.bz/Leadership%20Team.aspx>. [Accessed 9 June 2023].
- [30] Fortis Belize Limited, "We are Fortis Belize: About Us," Fortis Belize Limited, 2023. [Online]. [Accessed 20230.....00.....].
- [31] Santander Sugar Group, "About Santander Sugar Group," Santander Sugar Group, [Online]. Available: <http://www.santandersugar.com/about>. [Accessed 9 October 2023].
- [32] Public Utilities Commission, "About The PUC," Public Utilities Commission, 2023. [Online]. Available: <https://www.puc.bz/puc/>. [Accessed 9 June 2023].
- [33] Belize Bureau of Standards, "Background and Mandate," Belize Bureau of Standards, 2017. [Online]. Available: <https://bbs.gov.bz/introduction/>. [Accessed 9 October 2023].
- [34] Public Utilities Commission, "PUC Act Chapter 223 Revised Edition 2000," Public Utilities Commission, 2023. [Online]. Available: <https://www.puc.bz/puc-act-chapter-223-revised-edition-2000>. [Accessed 24 August 2023].
- [35] Public Utilities Commission, "Cap 221 Electricity Act Chapter 221," Public Utilities Commission, 2023. [Online]. Available: <https://www.puc.bz/cap-221-electricity-act-chapter-221/>. [Accessed 18 June 2023].
- [36] Public Utilities Commission, "Electricity Subsidiary Act CAP 221(S)," Public Utilities Commission, 2023. [Online]. Available: <https://puc.bz/electricity-subsiary-act-cap-221s/>. [Accessed 9 October 2023].
- [37] International Energy Agency, "Belize National Sustainable Energy Strategy 2012-2033," 28 March 2017. [Online]. Available: <https://www.iea.org/policies/6319-belize-national-sustainable-energy-strategy-2012-2033>. [Accessed 9 October 2023].
- [38] Kaitlyn Bunker, Roy Torbert, "Belize Consolidated," 2018. [Online]. Available: https://www.energy.gov.bz/wp-content/uploads/2020/09/Belize_CPP_Report_20180910-1.pdf. [Accessed 5 July 2023].
- [39] Public Utilities Commission, "Public Utilities Commission Act," 2020. [Online]. Available: <https://www.puc.bz/public-utilities-commission-act-chapter-223/>. [Accessed 31 January 2024].
- [40] Belize Energy Unit, "Integrated Resource and Resilience Plan," 2020. [Online]. Available: <https://www.energy.gov.bz/integrated-resource-resilience-plan-irrp/>. [Accessed 3 6 2021].
- [41] Ministry of Energy, Science and Technology and Public Utilities, "Ministry of Energy, Science & Technology and Public Utilities Strategic Plan 2012-2017: Integrating energy, science and technology into national development planning and decision making to catalyze sustainable development," 26 September 2012. [Online]. Available: https://www.publicservice.gov.bz/jdownloads/Strategic%20Plans/MESTPU_Strategic_Plan_-_2012-2017.pdf. [Accessed 4 July 2023].



BIBLIOGRAPHY



- [42] Government of Belize, “Belize Sustainable Energy Strategy Volume 1 and 2,” 2015. [Online]. Available: <https://energy.gov.bz/wp-content/uploads/2020/09/Belize-Sust-Energy-Strategy-Final-Vol-1-1-1.pdf>. [Accessed 10 October 2023].
- [43] Government of Belize, “Growth and Sustainable Development Strategy for Belize 2016-2019,” 2016. [Online]. Available: <https://observatorioplanificacion.cepal.org/sites/default/files/plan/files/BelizeGSDS.pdf>. [Accessed 31 January 2024].
- [44] K. Bunker, R. Torbert, P. Allen, H. Armstrong,, G. C. Vasconez, R. Cobb, D. Davis, J. Locke, J. Locke, A. S. Mifsud, S. Mushegan, C. Smith, S. Teelucksingh, A. Tillett and Torbert, “Belize Consolidated Project Plan,” 2018. [Online]. Available: https://www.energy.gov.bz/wp-content/uploads/2020/09/Belize_CPP_Report_20180910-1.pdf. [Accessed 6 6 2021].
- [45] Government of Belize, “Comprehensive National Transportation Master Plan for Belize,” 2018. [Online]. Available: <https://edc.gov.bz/wp-content/uploads/2020/12/5.-CNTMP-Final-Report-April-201807220714.pdf>. [Accessed 10 October 2023].
- [46] Government of Belize, “Petroleum Act,” 2000. [Online]. Available: <https://gpd.gov.bz/wp-content/uploads/2022/04/Belize-Petroleum-Act.pdf>. [Accessed 10 October 2023].
- [47] Government of Belize, “Petroleum Regulations,” 1992. [Online]. Available: <https://med.gov.bz/wp-content/uploads/2020/08/Belize-Petroleum-Regulations.pdf>. [Accessed 10 October 2023].
- [48] Government of Belize, “Environmental Protection Act (CAP 328),” 2000. [Online]. Available: https://www.vertic.org/media/National%20Legislation/Belize/BZ_Environmental_Protection_Act.pdf. [Accessed 11 October 2023].
- [49] Government of Belize, “Belize City Council Act Chapter 85,” 2000. [Online]. Available: <https://elections.gov.bz/wp-content/uploads/2021/02/Chapter-85-Belize-City-Council-Act.pdf>. [Accessed 10 October 2023].
- [50] Government of Belize, “Belize Port Authority Act (CAP 233),” 2000. [Online]. Available: <https://www.csabelize.com/wp-content/uploads/2011/12/cap233.pdf>. [Accessed 10 October 2023].
- [51] Government of Belize, “Motor and Vehicles and Road Traffic Act,” 2011. [Online]. Available: https://www.ruraltransformation.gov.bz/docs/35/Cap_230_Motor_Vehicles_and_Road_Traffic_Act.pdf. [Accessed 19 October 2023].
- [52] Government of Belize, “Public Roads Act (CAP 232),” 2011. [Online]. Available: <https://www.midh.gov.bz/wp-content/uploads/2022/09/Public-Road-Act.pdf>. [Accessed 10 October 2023].
- [53] Government of Belize, “Harbours and Merchant Shipping Act (CAP 234),” 2011. [Online]. Available: https://portauthority.bz/wp-content/uploads/2017/12/Cap_234_Harbours_and_Merchant_Shipping_Act_2011_Substantive_Laws.pdf. [Accessed 10 October 2023].
- [54] Government of Belize, “Belize Airport Authority Act (CAP 238),” 2011. [Online]. Available: http://www.belizeairportsauthority.com/wp-content/uploads/2017/08/BAA_ACT_Chap_238_Arrangement_of_sections.pdf. [Accessed 10 October 2023].
- [55] Government of Belize, “National Integrated Water Resources Act,” 2020. [Online]. Available: <https://faolex.fao.org/docs/pdf/blz194033.pdf>. [Accessed 11 October 2023].
- [56] Government of Belize, “Fiscal Incentive Bill,” 2022. [Online]. Available: <https://www.nationalassembly.gov.bz/wp-content/uploads/2022/12/Fiscal-Incentives-Bill-2022.pdf>. [Accessed 16)ctober 2023].
- [57] Belize Electricity Limited, “Rate Schedule,” Belize Electricity Limited, 2021. [Online]. Available: https://www.bel.com.bz/Rate_Schedule.aspx. [Accessed 31 January 2024].
- [58] Ministry of Natural Resources, the Environment, Commerce and Industry, “Belize’s First National Communications to the Conference of the Parties of the United Nations Framework Convention on Climate Change,” Government of Belize, Belmopan, Belize, 2002.
- [59] Govenment of Belize, “Belize’s Second National Communications to the Conference of the Parties of the United Nations Framework Convention on Climate Change,” 2012. [Online]. Available: <https://unfccc.int/sites/default/files/resource/blznc2.pdf>. [Accessed 21 July 2023].
- [60] National Climate Change Office, Ministry of Agriculture, Forestry, the Environment and sustainable Development, “Belize’s Third National Communication to the United Nations Framework Convention on Climate Change,” 2016. [Online]. Available: <https://unfccc.int/sites/default/files/resource/blznc3rev.pdf>. [Accessed 21 July 2023].
- [61] National Climate Change Office, Ministry of Sustainable Development, Climate Change and Disaster Risk Management, “Fourth National Communication,” 2022. [Online]. Available: <https://unfccc.int/sites/default/files/resource/Belize%20National%20Communication.pdf>. [Accessed 21 July 2023].
- [62] Government of Belize, “Civil Aviation Act (CAP 239),” 2020. [Online]. Available: <https://civilaviation.gov.bz/index.php/technical-library/civil-aviation-act?download=314:belize-civil-aviation-act>. [Accessed 10 October 2023].