THE BARBADOS LIGHT & POWER COMPANY LIMITED

APPLICATION

PURSUANT TO SECTION 16

OF

THE UTILITIES REGULATION ACT

CAP. 282 OF THE LAWS OF BARBADOS

FOR A REVIEW OF ELECTRICITY RATES

VOLUME 1

INDEX TO THE BARBADOS LIGHT & POWER COMPANY LIMITED APPLICATION FOR REVIEW OF ELECTRICITY RATES

APL.

BARBADOS

THE FAIR TRADING COMMISSION

IN THE MATTER of the Utilities Regulation Act, Cap 282 of the Laws of Barbados;

IN THE MATTER of the Utilities Regulation (Procedural) Rules, 2003;

IN THE MATTER of the Application by Barbados Light & Power Company Limited for a Review of Electricity Rates.

APPLICATION PURSUANT TO SECTION 16 OF THE UTILITIES REGULATION ACT CAP. 282 OF THE LAWS OF BARBADOS FOR A REVIEW OF ELECTRICITY RATES

I. INTRODUCTION

1. The Barbados Light & Power Company Limited ("BLPC" or "the Company") has sought only two base rate increases in the past 38 years, with one increase granted in 1983 and the second granted in 2010.

2. Since the 2010 rate review, BLPC has been successful in its efforts to control costs in producing and distributing electricity even in the absence of any significant sales growth. These efforts included a significant restructuring exercise to increase efficiencies, improve processes and strategically align the business to allow for the planned renewable energy (RE) transition and anticipated electricity market structure changes.

3. BLPC has also embarked on building a strategy that encompasses four strategic pillars, namely Safety, Clean Energy, Customer Experience and Operational Excellence.

4. BLPC has been unrelenting in its commitment and investments to achieve safe work practices, to ensure our staff, contractors, and customers' safety. Additionally, BLPC believes that moving to a future of increased renewable energy (a) provides Barbados with an opportunity to reduce the need for foreign oil and the resulting foreign currency dependence stabilizing energy costs, (b) strengthens the economy and (c) creates new jobs. Over the last decade, BLPC has focused on investing in initiatives to ensure a high level of reliable service and grid resilience and has been unwavering in its commitment to enhance customers' experience and stabilize costs.

5. Necessary investments in infrastructure, new equipment, grid modernization, construction costs, evolving customer expectations and technology, increased operations requirements and inflation are all factors contributing to the need for an adjustment in our electricity base rates. BLPC's rate base has grown from just over $544M to $825.9M.

6. The only general tariff increase requested by the Company during this period of stable electricity prices was granted eleven years ago by the Fair Trading Commission (the "Commission" or the "FTC") on January 25th 2010[1], and raised base revenue by an average of 5.3%.

7. The Company's Rate Review Application ("Application") would raise base revenue by 11.9%. This increase is less than the rate of inflation represented by the Consumer Price Index which increased by over 38% since 2010. Like every business, the Company must adjust its pricing to reflect the increased cost of doing business. In addition, the Company must implement new services to support the clean energy transition which

[1] https://www.ftc.gov.bb/library/blip_app/2010-01-22_commission_decision_No2_of_09_rate_review_barbados_light_and_power_company_limited.pdf

will further increase costs. The increase in base revenue requested in this Application is less than the general increase in prices within the economy.

8. BLPC has delayed an application for rate relief for as long as practicable but, after more than a decade of not filing for a rate review, an adjustment is now necessary to ensure that our company is able to continue its business of providing safe and reliable electricity with enhanced service, while transitioning to a cleaner energy future for the country.

9. There is no ideal time for a rate review and a rate adjustment. Further, BLPC acknowledges that with the impacts of the COVID-19 pandemic, the recent ash fall from the La Soufriere volcano in St. Vincent and the Grenadines and Hurricane Elsa some customers are experiencing economic challenges at this time.

10. BLPC over the years, has sought to provide affordable rates, especially for the most vulnerable in society. Thirty five percent of our residential customers use less than 150 kWh per month and benefit from the lowest rate. This customer class has seen an increase of less than 8% in basic rates since 1983. This compares to the Consumer Price Index (Inflation), which has risen by 259% over the same period.

11. The rate review process can take many months and BLPC can no longer defer a rate review due to (a) increasing production, distribution and administrative costs; (b) significant network investment costs required to support reliability levels and transition towards 100% renewable energy generation and (c) the requirements for new smart technologies essential for modernizing the grid. The issues above have been exacerbated by flat sales, which averaged -0.1% over the period since 2010 to 2019. The recent economic disruptions caused by the COVID-19 pandemic have further aggravated the challenges related to low sales which have declined by a further 6.1% in 2020.

12. It is therefore critical, for the viability of BLPC that interim rate relief at the proposed rates, is allowed by November 1st, 2021 until a final Decision is

made by the Commission on this application. Without the interim rate relief the Company:

i. Would be unable to fund its planned investments to meet customer requirements;
ii. Would not have sufficient resources to attract capital; and,
iii. Would be without the financial resources to respond to financial, economic or environmental shock.

13. BLPC has always had a strong customer focus and has consistently engaged with various stakeholders and customers to understand their needs. This engagement has heavily influenced our investment decisions, which have led to the incorporation of innovative solutions for our customers.

14. Some of these investments include:
- Deployment of Advanced Metering Infrastructure (AMI) to over 95% of customers with a goal to fully completing in 2021.
- Commissioning of a 10MW solar photovoltaic (PV) farm.
- Installation of a 5MW Energy Storage Device (ESD).
- Partnering with the Government of Barbados (GoB) and the Inter-American Development Bank on an LED Streetlight replacement programme which is well advanced and is expected to be completed in 2021.
- Installation of Distribution Automated (DA) switches.
- Deployment of a Geographic Information System (GIS) that provides BLPC better visibility of its assets in the field and enhances reliability to customers.
- Deployment of a Mobile Workforce Management System.
- Equipment life extension for example: Steam Plant, Low Speed Diesel Plant (D10-D13 Units) and GT02

15. BLPC, in its last rate review application, included a request to implement a Renewable Energy Rider Programme (RER). In 2010, with the

Commission's approval, BLPC implemented its RER, which facilitated households and businesses who wished to produce power using distributed solar PV and wind generation systems and allowing them to sell such power back to the grid. The RER was grandfathered in September 2019 and is the predecessor to the new Feed In tariff (FIT) programs implemented by the Commission in 2019 and 2020 respectively. Collectively, the RER and FIT have enabled over 1,500 customers, with a cumulative capacity of over 49MW, to interconnect into the grid to date.

16. BLPC has always been a proactive and progressive company. Apart from introducing the RER, BLPC in 2016, constructed a 10MW solar PV farm at Trents, St. Lucy, when it determined that utility-scale renewable energy plants would be economically viable in Barbados. This solar farm was the first utility-scale PV installation in the Eastern Caribbean. The solar plant's operations is estimated to save the country approximately [2]$8-$10 million annually in foreign exchange assuming fuel costs at US$60 per barrel international oil price.

17. At the Trents, St. Lucy site, BLPC also installed a 5MW ESD to reduce fuel and customer energy costs and enhance grid reliability and resilience. BLPC has also advanced plans to build a utility-scale wind farm at Lamberts, St. Lucy, the first of its kind on the island.

18. To complement our RE transitional plan, BLPC conducted a Demand-Side Management (DSM) Study in 2015 to assess the potential for DSM incentive-based programmes in Barbados. DSM aims to manage the demand for electricity through customer programmes, to contribute to a more efficient generation mix and improved system load management capabilities. Hotels in particular were targeted by BLPC for a DSM pilot, as data from other projects (such as the Caribbean Hotel Energy Efficiency Action Programme (CHENACT) Project) has shown that hotels in Barbados and the Caribbean have significant potential for demand side

[2] All dollar figures in the BLPC's application are quoted in Barbados Dollars unless stated otherwise

management opportunities. BLPC therefore selected a small hotel as one of its partners for investigating the feasibility of a DSM programme for the hotel sector.

19. The goal of the pilot was to assess whether a DSM project is viable and can produce noticeable benefits for both the hotel and the Company. This would therefore inform whether a commercial arrangement or programme could be implemented to achieve the mutual benefits of energy efficiency and renewable energy programmes for hotels and the Company. Conclusions from the pilot were that this initiative holds significant promise for both customers and the Company and BLPC looks forward to pursuing the initiative under the new Customer Energy Savings Financing (CESF) Programme pending approval by the Commission.

20. BLPC also partnered with two schools within its community, embarking on DSM initiatives which, among other things, were geared at changing young consumers' energy usage habits through education. BLPC decided to incorporate students in order to bring awareness to them as well as their parents as it relates to teaching energy conservation in the home.

21. In its efforts to design a DSM programme, BLPC recognized that the largest barrier to customer uptake of equipment that facilitates DSM is customer knowledge and financing.

22. Recognizing BLPC's desire to implement a DSM programme, CARICOM and the German Agency for International Cooperation approached BLPC to develop a customer-driven, innovative Integrated Utility Services (IUS) DSM project. The IUS project would provide upfront financing for specific customer energy efficiency and renewable energy projects that can yield significant energy savings, enabling customers to lower their electricity bills. BLPC is currently seeking the Commission's approval for a pilot programme, the CESF Programme, to provide such up-front financing for customers to install specific energy efficiency or solar PV projects with repayment through their monthly electric bill. This programme would offer significant promise for customers to access energy efficiency and

renewable energy projects to lower their electricity bills with affordable repayment options.

23. BLPC is on a path towards clean energy goals and supporting energy efficiency initiatives but recognizes that fossil fuel will have a significant role in the interim. Fossil fuels are purchased from major oil companies to produce electricity, and the Fuel Clause Adjustment (FCA) is the mechanism that has been approved by the Commission for BLPC to recover the cost of fuel used in electricity production. Fuel purchases are a "pass-through" cost applied equally to all customer groups through the FCA charge, which appears on all BLPC bills. The FCA also includes the payments made to RE producers. The FCA generally accounts for around 50% of customers' electricity bills. Changes in FCA charges result primarily from movements in the purchased price of fuel that are influenced by world oil prices. Fluctuations in fuel prices have been a major source of customer dissatisfaction in recent years, as they translate into significant volatility in the fuel portion of customers’ bills.

24. Over the last decade, BLPC has consistently been vigilant in pursuing fuel hedging opportunities and has made three applications to the Commission for approval to do so. A Decision by the Commission on the Company’s May 8, 2020 application is still pending. Our Company believes that a fuel hedging programme can support fuel price stability during the transition period to 100% RE. Hedging would allow BLPC to secure a fixed price for an approved percentage of fuel purchases, thereby mitigating volatile fuel prices for customers. Hedging would give customers the ability to predict their electricity costs and stabilize fuel prices during the transition to 100% RE.

25. The Commission implemented a Heat Rate Monitoring/Management programme on April 17, 2019 which is intended to create financial incentives for the Company to minimize the amount of fuel consumed by each plant in its production of a unit of electricity by active heat rate monitoring and management. Only fuel costs associated with the targeted

heat rate are allowed to be passed on to customers, while the utility is allowed to benefit from any efficiency gains made. This Application assumes compliance with the heat rate targets.

26. To further reduce the amount of fossil fuel consumed, BLPC is working closely with the GoB and stakeholders to achieve the Barbados National Energy Policy 2019 - 2030 (BNEP)[3] for transitioning to 100% renewable energy by 2030.

27. To achieve 100% RE by 2030, BLPC and many other investors will need to make significant capital investments. In order to execute its capital investment plans, BLPC will be required to borrow the funds needed to invest in costly, long-lived assets. A key enabler to allow BLPC to continue borrowing with reasonable terms is an extension of its existing franchise which is due to expire in 2028. The absence of a licence extension creates increasing uncertainty around BLPC's long-term investment plans and also impacts BLPC's ability to enter into Power Purchase Agreements (PPAs) with Independent Power Producers (IPPs).

28. For the past several years the Company has also been pursuing the renewal of its operating licence, which expires in 2028, with the GoB. It was not until 2019 that real progress began on licence renewal, culminating with a more complex arrangement of five new operational licences anticipated to be issued to the Company in 2021.

29. The Ministry of Energy (MoE), on behalf of the GoB, has presented a suite of five new operational licences encompassed in three documents for execution by BLPC in the areas of (a) Generation and Energy Storage; (b) Transmission, Distribution and Sales and (c) Dispatch. BLPC will be required to take on new obligations and changes to its business under the new Licences. Licence negotiations are at an advanced stage. BLPC will require cost recovery mechanisms to accommodate the impact these new

[3] https://energy.gov.bb/publications/barbados-national-energy-policy-bnep/#:~:text=This%20Barbados%20National%20Energy%20Policy,to%20all%20residents%20and%20visitors.

Licence obligations will have on the business. This new arrangement will require accounting separation of the business units and organizational restructuring, introducing new business risks and costs which are not fully identified and therefore not included in this Application. The Company is awaiting finalisation of the licences to determine what organisational structural changes will be required.

30. The MoE has presented to BLPC its plans for a revised electricity market structure in addition to the new licence obligations. The new market structure will necessitate changes in the various roles and responsibilities of current parties and stakeholders in the sector. In anticipation of these changes, BLPC, in June 2020, submitted an application to the Commission for a Clean Energy Transition Rider (CETR) as a supporting mechanism to facilitate timely cost recovery during this transition between general rate applications.

31. Even with all these and other efforts, BLPC recognizes that Barbados still has a tremendous amount of work to do to achieve its 2030 targets. As such, investments are necessary to ensure that customers can continue to benefit from the high levels of reliable electricity service that they have become accustomed to while we work to implement the objectives of the BNEP.

32. After a significant period of planning and delays in obtaining permissions to replace firm capacity, BLPC was granted permission at the end of 2019 to proceed with the construction of a new 33MW Clean Energy Bridge (CEB) to replace aging and less efficient plant. This 33MW generating plant is expected to be commissioned by the end of 2021 and will support a sustainable progression of the 100% RE plan.

33. Additionally, the GoB strongly encouraged BLPC to install generating capacity while the CEB was being built. BLPC agreed and following a prudent review of timely and cost effective options, decided to rent 12MW of small diesel units and purchase a further 18MW of similar units. These

capacity additions, while invaluable to customers, create the need for additional timely rate relief.

34. A successful transition to renewable energy in Barbados will also need different ratemaking mechanisms than those that currently exist. BLPC is proposing a rate design which is more responsive to the rapidly changing market.

35. After more than a decade of not filing a general rate review, and having made significant investments to maintain reliability for customers, an adjustment is now necessary to ensure that BLPC can continue to function safely and reliably. A safe and reliable electricity service acts as a key cornerstone in maintaining economic development. A financially stable utility is also critical to the achievement of the objectives of the BNEP including the diversification of the economy of Barbados.

36. BLPC remains committed to our business, customers and other key stakeholders as we work diligently and safely to provide energy and energy services that are cost effective and reliable. Barbados can 'count on us' to play our part.

Legislative Framework

37. Pursuant to section 16 of the **Utilities Regulation Act, Cap 282** (URA) of the laws of Barbados ("the Act"), BLPC hereby applies to the Commission for a Review of Electricity Rates for the supply of electricity service ("the Application").

38. Section 16 of the URA provides that where the Commission has not fixed a period of time per Section 15 (1) the Commission may on its own initiative or upon an application by a service provider or consumer, review the rates, principles and standards of service for the supply of utility services.

39. Section 2 of the URA defines “principles” as “the formula, methodology or framework for determining a rate for a utility service.”

40. Section 2 of the URA further sets out that the term “rates” includes every rate, fare, toll, charge, rental or other compensation of a service provider; a rule, practice, measurement, classification or contract of a service provider relating to a rate; and a schedule of tariff respecting a rate.

41. Rule 25 of the **Utilities Regulation (Procedural) Rules, 2003**, (“the Rules”) provides for these proceedings to be commenced by the filing of an application.

42. Additionally, BLPC has structured its Application and the Order being sought per Rule 26 of the Rules.

43. The Application sets out:

    i. a concise statement of facts;

    ii. the grounds for the Application;

    iii. the memoranda and other evidence in support of the Application; and

    iv. the nature of the Order being applied for.

44. This Application is supported and accompanied by written and documentary evidence including Memoranda of Support, accompanying Schedules and Affidavits.

II. CONCISE STATEMENT OF FACTS (Rules 26 and 58 of the Rules)

45. BLPC is a vertically integrated electric utility company, established on May 6, 1955, and incorporated on December 30, 1986, under the **Companies Act,** Cap 308 of the Laws of Barbados. Its registered office is at Garrison Hill, St. Michael, Barbados. Pursuant to the **Barbados Light and Power Company (Extension of Franchise) Act,** Cap 278 of the laws of Barbados, which is attached as **Appendix I**, and Section 35 of the Electric Light and Power Act, 2013 (Act 2013-21)[4] BLPC was granted the right to supply energy for all public and private purposes for forty-two years from August 1, 1986.

46. BLPC is a wholly-owned subsidiary of Emera Caribbean Inc. (the holding company/ECI). ECI is owned by Emera[5]. Emera is a North American leader in the transition to cleaner energy, safely delivering cleaner, affordable and reliable energy to customers. Emera is committed to safety, strong governance, its communities and its teams. Emera provides BLPC with access to international expertise and technical capabilities.

47. BLPC is committed to managing the grid to ensure the electricity network meets the rapidly evolving demands of power producers that supply services to the grid and customers supplied from the grid. BLPC, therefore, must maintain a safe, efficient, reliable network and must continue to invest in its infrastructure to fulfill that obligation.

48. To satisfy the needs of the electric system, BLPC operates four (4) generating plants using a mix of technologies including steam turbines, diesel engines, gas turbines, and solar PV to produce electricity. Electricity is transmitted from the generating stations at 69,000 volts and 24,000 volts and distributed over 3,000 kilometres of transmission and distribution lines facilitated by eighteen (18) substations dispersed across the island. BLPC, as at December 31, 2020 served a total of 131,522

[4] https://energy.gov.bb/publications/electric-light-power-act-supporting-documents/
[5] https://www.emera.com/about-us

customers with a peak demand of 141MW and had an installed capacity of 256.1MW of generating plant. BLPC's installed capacity is supplemented by over 49MW of customer owned solar PV capacity.

49. BLPC has an aspirational goal of achieving a 100/100 Barbados - 100% renewable or clean energy, 100% electrification of business, industry and transportation, and resilience. That goal aims to: a) move our island from a high carbon-intensive generation portfolio to low carbon sources; b) reduce the country's dependence on imported fossil fuel; c) mitigate foreign exchange pressure; d) introduce and maintain price stability; and e) provide high levels of reliability for customers.

50. BLPC's vision is aligned with the policy objectives outlined in the BNEP, which delineates a strategy to transition the energy and transportation sectors towards 100% clean energy by 2030.

51. Since 2010 BLPC has continued to focus on meeting the island's demand for safe, clean and affordable energy, adopting a 100/100 vision for transitioning to 100% renewable energy and 100% electrification. While BLPC continues to operate and maintain its fleet of traditional fossil fuel generating assets including a steam turbine, low speed diesel engines and gas turbines located at its three generating stations (Spring Garden, Seawell and Garrison) the process of transitioning away from a high carbon future to a low carbon future is already underway.

52. To reduce the country's dependence on imported fossil fuel use, reduce foreign exchange pressure and provide increased price stability as well as high levels of reliability for customers, BLPC invested in its first large scale solar PV farm at Trents in St. Lucy. This 10MW solar PV plant was commissioned in 2016 at its St. Lucy Energy Gateway. Shortly thereafter, during 2018, BLPC also commissioned a 5MW ESD to lower fuel cost and enhance grid reliability and resilience. The BNEP calls for substantial storage and installation of batteries. Therefore, BLPC's decision to install the 5MW ESD aligns with the BNEP objectives and provides balancing service for customer-owned and utility scale intermittent RE supply.

53. BLPC further increased its generating assets during December 2019, when it rented 12MW of small diesel units and procured an additional 18 MW of diesel generating capacity to boost reserves while the 33MW CEB was being constructed. This plant consists of 12x1.5MW Caterpillar XQ2000 containerized diesel units and associated balance of plant. This plant is located at Spring Garden. Ten (10) of these units were commissioned during February of 2020 while the additional two (2) units are kept as spares for redundancy.

54. The other generating assets of BLPC include both low speed diesel and steam plants. During 2005 BLPC made a significant capital investment in two 30 MW low speed diesel (LSD) generators which allowed for the retirement of approximately 50 MW of assets. Installation of these fuel efficient LSD units in 2005 was able to mitigate some of the effects of oil price volatility which reached an all-time high during 2008.

55. The steam turbine generators were installed in 1976, and were scheduled for retirement in 2012 as indicated by the Company during the last rate review. As the 2012 retirement date approached, after extensive analysis, and informing the FTC, BLPC determined, based upon the information available at the time that it was most prudent to extend the life of the steam plant. The decision by BLPC, to extend the life of the steam plant, was guided in part by the continuing recession which began in 2009, related flat sales, the then anticipated rapid transition to RE generation and the uncertainty in relation to the extension of BLPC's franchise. The decision is entirely consistent with the technical capacity of a steam plant, often operated for 50 years with appropriate life extension measures. The approach to extend the life of the steam set was aimed at keeping costs down for customers while the island is transitioning ambitiously to 100% RE.

56. At the end of 2020, Unit S2 is out of service and has been repurposed as spares for Unit S1.

57. The CEB, because of its high efficiency, is projected to save over $30M annually based on US$60 per barrel international oil prices. These savings, in addition to reducing the drain on much needed foreign exchange, will also help to stabilize electricity rates with savings being passed directly to customers through the FCA mechanism. This plant will provide both reliability and resiliency to mitigate reduced availability of renewables on any given day. This ability to provide back-up services to the grid is critical to mitigate against the need for excessive battery storage. The CEB is scheduled to be commissioned by the end of 2021.

58. BLPC needed to modify its investment plan in response to the business environment. Between 2012 and 2014, BLPC developed an Integrated Resource Plan (IRP), which was reviewed by the Commission and its consultant, PPA Energy. On April 7, 2014, the Commission advised BLPC that it was satisfied with the approach and the assumptions which had been made by BLPC in preparing the IRP. The IRP considered the GoB's plan to introduce up to 60 MW of combined waste-to-energy and biomass generation between 2016 and 2018. The announcement of the GoB's plans for the development of renewable capacity, coupled with a signed PPA between a project developer and the government for 35MW[6] of firm RE capacity, along with changes to the GoB's licensing regime, low sales growth projections, the new ELPA and anticipated reforms in the electricity market structure caused Barbados' energy environment to become uncertain. As a result, BLPC undertook systematic reviews and adjustments to its investment plans.

59. When BLPC recognized that investor-driven plans to commission up to 60MW of firm renewable capacity were not likely to occur, BLPC advanced plans to install new fossil fuel generating capacity. BLPC had not installed any new fossil fuel capacity since 2005. Nonetheless, it recognized that to maintain adequate system reliability and resilience during the RE

[6] https://www.cahill-energy.com/news-posts/cahill-energy-to-build-and-run-240-million-barbados-waste-to-power-plant-rtrs/

transition, there was an immediate and urgent need for additional fossil fuel generating capacity. BLPC conceived, designed and has now commenced constructing a 33MW CEB generating plant at Trents, St. Lucy.

60. With the construction of the new 33MW CEB generating plant, the present basic electricity rates are now inadequate to allow BLPC to continue to meet its operating and maintenance expenses which have increased over the years, attract new capital to replace plant that is due for retirement and have the opportunity to earn a fair and reasonable return. In addition to fuel oil, there are also several other inputs into the electricity business that have increased significantly during the past few years. BLPC is continuing to expand and improve its generation, transmission, and distribution facilities to meet the demand for electricity. New underground transmission and distribution circuits and upgrades to substations and switchgear are being installed to ensure that BLPC continues to provide a reliable service to customers throughout the island.

61. BLPC is seeking rate relief to ensure that it can maintain the high level of service required by its customers and the developing economy of Barbados, meet its commitments to lenders and shareholders, and invest in the infrastructure needed to support the GoB's goal to transition to 100% RE generation by 2030 as outlined in the BNEP.

62. BLPC therefore finds it necessary to seek the approval of the Commission for a review and change of its existing rates to permit BLPC to:

    i. Earn the revenue required to meet BLPC’s expenses involved in supplying a service which is safe, adequate and reasonable and to continue to deliver a secure and reliable supply of electricity to all customers in an environment where the cost of inputs to BLPC’s operations have risen substantially.

ii. Provide a reasonable rate of return to BLPC, which is essential to attract new capital and satisfy lenders of its ability to repay loans and maintain investors' confidence in its ability to provide reasonable investor returns. This lender and investor confidence is essential to BLPC's access to capital critical for investment in plant and equipment required to deliver service to customers.

iii. Design rates so that the price of electricity to customers is closer to the cost of supplying the service, thereby providing correct price signals to all customers.

63. The scope of the rate review application addresses:

i. Revenue Requirements sufficient to support a reasonable rate of return.
ii. Test Year to serve as the basis for Revenue Requirement calculation.
iii. Rate Base assets and valuation.
iv. Depreciation rates.
v. Rate Design with tariff categories and price signals reflective of actual service costs and flexible rate adjustment mechanisms.
vi. Disaggregation of renewable purchased power from the FCA.

64. By letter dated November 6th 2020 pursuant to Rule 57 of the Rules, BLPC filed a letter with the Commission communicating its intention to file an application for review of the current electricity rates.

65. BLPC corresponded with the Commission in relation to the selection of the Test Year for the rate review application and, after providing its views on the factors to be taken into account to determine the Test Year, it requested that it be allowed to use an audited 2020 Test Year with adjustments to support its application. On March 8, 2021 the Commission accepted BLPC’s Test Year for filing subject to review during this Hearing.

66. BLPC has used the audited financial statements for the year January 1 to December 31, 2020, the Test Year, and has adjusted these, where appropriate, for known and measurable changes.

67. BLPC also requested that the issue of depreciation be heard before the main Application.

68. On April 30, 2019, BLPC filed its application for approval of its Depreciation Policy with the Commission. After the application was filed, the Commission acknowledged BLPC's filing by way of letter dated May 13th, 2019. Following this, in June 2019 the Commission further requested additional information from BLPC to assist with further analysis of the matter. This information was all provided by BLPC by mid-July 2019.

69. In July, 2019 BLPC had also begun meaningful negotiations with the MoE on renewal of its Licence. During those initial discussions with the MoE they indicated that in keeping with the goals set down in the BNEP all of BLPC's existing fossil fuel plant would need to be retired by 2030. As such it was agreed that BLPC would develop scenarios in relation to this targeted timeline.

70. As such BLPC submitted an Addendum to its Application on September 26th, 2019 which outlined updated depreciated rates for our electric plant which has expected useful economic lives that exceed the BNEP's 2030 retirement strategy. No other correspondence was received by BLPC from the Commission on this matter during 2019. The Commission next engaged BLPC in May 2020 indicating its intention to proceed to hear the matter and giving BLPC the opportunity to submit additional information in support of its Application. Due to the time that had elapsed since BLPC had filed its Application, BLPC submitted, in June 2020, updated data using the 2019 financial information which by that time was available along with updated depreciation schedules and the 2030 scenario. BLPC notes that between June and November, 2020 the matter was heard by the

Commission and adjourned for determination once closing statements were sent in by the parties. On March 22, 2021 BLPC advised the Commission that the MoE has proposed retirement dates for BLPC fossil fuel units.

71. As at the filing of this Application, the Commission's Decision on BLPC's application for approval of its Depreciation Policy is still pending. BLPC will request leave of the Commission to adjust its depreciation rates as required when the Commission's Decision is issued and resubmit any revised rate application documentation.

72. BLPC has included in the rate base only the plant which is currently providing or is capable of providing electricity service to its customers and which it has determined to be "used and useful". BLPC's utility plant is stated at historic cost. BLPC proposes a Rate Base of $825,891,134 which is computed on the Test Year with known and measureable changes, the major adjustments relate to the 33MW CEB to be commissioned at the end of 2021.

73. For the 2020 Test Year, the existing return on Rate Base is calculated at 3.31%. This is an inadequate rate of return.

74. BLPC requests that the Commission adopts a rate of return on Rate Base of 8.79%, which is BLPC's Weighted Average Cost of Capital (WACC) stated on a regulatory basis, including the weighted combination of BLPC's cost rates for debt and other sources of funds, and a fair rate of return on equity. This is based on the "Cost of Equity and WACC for BLPC" dated September 20, 2021 which was prepared by The Brattle Group.

75. BLPC proposes a capital structure of 35% Debt and 65% Equity as used in the calculation of the WACC which was approved in the last Rate

Decision[7] and which it considers to be more representative than the existing capital structure of 26% Debt and 74% Equity.

76. BLPC's Revenue Requirement has been developed with the intent to allow it to recover its prudently incurred costs for providing utility services and to provide it with an opportunity to earn an appropriate return on invested capital including a fair and reasonable return on equity.

77. The Revenue Requirement has been determined based on the following rate-making formula and its components:

Rate Base
x Allowed Rate of Return
= Operating Income (required return)
+ Operating Expenses, Depreciation and Taxes
= Revenue Requirement.

78. The requested Rate of Return of 8.79% will result in an overall Revenue Requirement of $440,240,372, an increase of $46,475,310.

79. A continued decline in earnings would negatively impact BLPC's ability to satisfy the concerns of lenders whom BLPC will have to approach for new loans required for expansion of the system and to execute its capital investment plan. BLPC must continue to invest to prevent degradation of system reliability.

80. The rates proposed by BLPC are designed to lessen the impact on those with low levels of consumption. BLPC believes that inadequate rates and inappropriate rate structures do not benefit anyone, customers or investors, and can result in significant cost to the economy through insufficient investment and resulting declines in the availability and reliability of electricity supply.

[7] https://www.ftc.gov.bb/library/blip_app/2010-01-22_commission_decision_No2_of_09_rate_review_barbados_light_and_power_company_limited.pdf

81. The design of BLPC's proposed tariffs was guided by the "Allocated Class Cost of Service Study", dated September 2021 which was undertaken for BLPC by The Brattle Group. BLPC proposes to revise and seek an increase in electricity rates for all existing tariffs, namely Domestic Service, General Service, Employee, Secondary Voltage Power, Large Power and Street Lighting. It also proposes to implement the existing Time of Use Tariff for commercial customers on a permanent basis. BLPC also proposes to revise the Service Charges and disaggregate the renewable purchased power from the FCA. BLPC seeks to continue to encourage energy saving and conservation amongst its customers. As such it proposes to maintain an inclining block rate structure in the Domestic Service, General Service and Employee categories.

82. The current FCA recovers fossil fuel costs, renewable energy purchased power and battery storage costs. BLPC is proposing that the current FCA formula be modified to only recover fossil fuel related costs. BLPC is proposing that the renewable energy purchased power be removed from the FCA. BLPC has developed a "Renewable Purchased Power Adjustment" (RPPA) to be implemented for the recovery of renewable energy purchased power which is received from renewable energy suppliers and IPPs. BLPC is also proposing that the undepreciated portion of the 5MW ESD be subsumed in the overall revenue requirement utilized to determine base rates and therefore discontinued from the FCA.

83. A table of the present and the proposed tariff amendments is attached as **Appendix II** and is incorporated herein and forms part of this Application.

III. **GROUNDS FOR THE APPLICATION** (Rule 26 of the Rules)

84. BLPC is seeking a review and adjustments to the Existing Tariffs on the grounds that:

i. The existing rates are now inadequate and do not provide sufficient revenue to enable BLPC to meet the overall expenses of supplying a service which is safe, adequate and reasonable and provide a fair and reasonable return to investors so that it can continue to deliver a secure and reliable supply of electricity to its customers in an environment where the cost of inputs to BLPC's operations and maintenance have risen substantially.

ii. BLPC's earnings on the existing rates are insufficient to enable it to borrow money under favourable terms and conditions to invest in necessary sustaining capital, satisfy lenders of its ability to repay loans and to maintain the confidence of investors by providing them with a fair and reasonable return so that BLPC can continue to adequately deliver its service to customers.

iii. Given the economic, environmental and other circumstances, BLPC must be enabled to design rates to bring the price of supplying electricity closer to cost of service and also enable it to send correct price signals to all customers with the aim of encouraging energy efficiency and conservation.

IV. MEMORANDA OF SUPPORT AND OTHER EVIDENCE REFERRED TO IN RULE 58 OF THE RULES

85. The following Memoranda and Statements of Support consist of material intended to be introduced as evidence at the hearing of the Application and are set out and attached at Schedules A to O.

SCHEDULE	MEMORANDA	AFFIDAVIT/WITNESSES
A	General Memorandum	Roger Blackman
B	Memorandum on Test Year	Roger Blackman
C	Memorandum on Rate Base	Ricaido Jennings
D	Memorandum on Income Statement	Ricaido Jennings
E	LEFT BLANK INTENTIONALLY	
F	Memorandum on Rate of Return	Ricaido Jennings
G	Memorandum on Revenue Requirement	Ricaido Jennings
H	Memorandum on Sales Projections	Adrian Carter
I	Memorandum on Capital Expansion 2021 – 2025	Rohan Seale Johann Greaves
J	Schedules with Present Tariffs	Adrian Carter
K	Memorandum on Proposed Tariffs	Adrian Carter
L	Memorandum on Five Year Financial Forecasts	Ricaido Jennings
M	Memorandum on Standards of Service	Roger Blackman
N	Statement of Earnings Coverage Test	Ricaido Jennings
O	Statement of Dividends	Ricaido Jennings

STUDIES
Performance Benchmarking Study 2014 – 2019 – Final Report
Cost of Equity and WACC for BLPC
Allocated Class Cost of Service
Barbados Generation and Transmission Master Plan

86. The Application is being supported by the evidence contained in the Affidavits of Roger Blackman, Ricaido Jennings, Rohan Seale, Johann Greaves and Adrian Carter members of the senior management of BLPC and also by the Affidavits of Dr. Bente Villadsen and Dr. Philip Hanser whom BLPC proposes to call as expert witnesses.

87. These Memoranda and Affidavits were prepared by the above-named persons who will be available for questioning at the Hearing.

88. BLPC may call any of the following witnesses of fact and the following expert witnesses:

<u>Witnesses of Fact</u>

(a) Roger Blackman – Managing Director of BLPC
(b) Ricaido Jennings – Director Finance of BLPC
(c) Rohan Seale – Director Asset Management of BLPC
(d) Johann Greaves – Director Operations of BLPC
(e) Adrian Carter – Manager Regulatory Affairs of BLPC

<u>Expert Witnesses</u>

(a) Dr. Philip Hanser - Principal Emeritus, The Brattle Group
(b) Dr. Bente Villadsen - Principal, The Brattle Group

89. BLPC reserves the right to file further Affidavits and to call additional witnesses including expert witnesses. BLPC further reserves the right to amend this Application with the leave of the Commission.

90. BLPC reserves the right to call its witnesses individually or, where appropriate, convene witness panels in accordance with Rule 21 of the Utilities Regulation (Procedural) Rules, 2003.

91. BLPC also reserves the right to claim confidentiality of documents produced in accordance with the **Fair Trading Commission Act** Cap 326B and Rule 13 of the Rules.

V. **RATES** (Section 17 of the Act)

Existing and Proposed Rates

92. The existing rates of BLPC ("the Existing Tariffs"), were approved by the Commission in its 2010 Decision and are shown and attached in Schedules J-1 to J-11.

93. The proposed new rates for existing tariff groups, additional rate options, the new service charges and the new fuel clause (collectively called "the Proposed Tariffs") are as set out in Schedules K-1 to K-11.

Rate Design

94. The Memorandum on Proposed Tariffs presents the electricity tariffs that are being proposed by the Company in its application to the Commission and the rationale for the rate design. The Company also proposes the establishment of a permanent Time-of-Use (TOU) tariff and the disaggregation of the current Fuel Clause Adjustment (FCA) to allow for the establishment of a Renewable Purchased Power Adjustment (RPPA) clause to recover the cost of renewable energy purchases.

95. BLPC analysed the results of the COS study as presented in the Affidavit of Mr. Philip Hanser of the Brattle Group to guide the revenue allocation and rate design process

Justification for the Review Of Rates

96. BLPC believes that the Existing Tariffs should be reviewed and adjusted for the reasons outlined in this Application and also expanded in the various Memoranda and other documents filed with the Application.

VI. TEST YEAR (Rule 60 of the Rules)

97. The Test Year as accepted by the Commission is the year ending December 31, 2020. Details are set out in the Memorandum on Test Year which forms part of the Application as Schedule B. Financial Statements audited by Ernst & Young for the year ended December 31, 2020 are provided in **Appendix III**. BLPC maintains its accounts in accordance with international standards and bases its accounts on the Federal Energy Regulatory Commission's (FERC) Uniform Systems of Accounts.

VII. RATE BASE (Rule 60 of the Rules)

98. The calculation of the Rate Base is set out in the Memorandum on Rate Base and the supporting schedules which are attached as Schedule C.

VIII. RATE OF RETURN (Rule 60 of the Rules)

99. BLPC is requesting a rate of return on rate base of 8.79%. The justification showing how the reasonable return was calculated is provided in the Memorandum on Rate of Return which is attached as Schedule F and also in the Affidavit of Bente Villadsen and the "Cost of Equity and WACC for BLPC" ("the Study") dated September 20, 2021 which was prepared by The Brattle Group. The return on equity, the cost of debt and the WACC

for which BLPC is seeking approval were determined on the basis of the Study.

IX. **REVENUE REQUIREMENT** (Rule 60 of the Rules)

100. The calculation of the Revenue Requirement is set out in the Memorandum on Revenue Requirement and the supporting schedule which are attached as Schedule G.

101. On Existing Tariffs the Test Year revenue is $393,765,062 with Operating Expenses, Depreciation and Taxes of $366,464,731. This results in an Operating Income of $27,300,331, a 3.31% return on Rate Base.

102. The requested Rate of Return of 8.79% will require an Operating Income of $72,610,495 which when added to the Operating Expenses, Depreciation and Taxes of $367,629,877 will result in an overall revenue requirement of $440,240,372, an increase of $46,475,310 grossed up for taxes.

X. **SERVICE STANDARDS** (Section 17 of the Act, Rule 63 of the Rules)

103. Rule 63 (1) of the Rules provides that where a service provider makes an Application for a rate review, proposed service standards must be presented as part of that request. Until the current standards of service expire, BLPC proposes to retain the existing Service Standards which are set out in the Commission's "Decision on Standards of Service for The Barbados Light & Power Company Limited" dated September 2017 and attached as Schedule M-3.

104. New Standards of Service are currently being developed for implementation. Increasing levels of distributed RE systems will create new challenges for voltage regulation, which will require the integration of mitigating solutions like energy storage and voltage regulating equipment.

105. The Company's current Application is premised upon the current standards of service, with the financial and staff resources required to assure compliance with those standards. If the FTC issues new Standards of Service that include significant changes which will affect the financial and staff resources needed to assure compliance, the Company reserves the right to file an amended application to address those changes.

XI. NATURE OF ORDER BEING APPLIED FOR (Rule 26 of the Rules)

106. BLPC requests that:

(a) Phil Hanser – Principal Emeritus, The Brattle Group,
(b) Bente Villadsen – Principal, Brattle Group,

be accepted as Expert Witnesses.

(c) There be Procedural Conferences as warranted pursuant to Rule 35, with all the relevant parties, prior to and during the hearing of the Application.

(d) There be an Issues Conference pursuant to Rule 34, with all the relevant parties prior to the hearing of the Application.

(e) There be a Technical Conference, if warranted, pursuant to Rule 33, with all the relevant parties prior to the hearing of the Application.

(f) There be a Confidentiality hearing in accordance with the Fair Trading Commission Act Cap 326B and Rule 13 of the Rules to determine any requests from BLPC for confidentiality.

107. BLPC seeks the approval of the Commission for the following Orders, that:

(g) Interim rate relief, at the proposed rates, come into effect from November 1, 2021 and shall be applied to all bills from November 1, 2021 and that this remains in place until the Commission issues its final Decision on BLPC's Application.

(h) The Proposed Tariffs come into effect from April 1, 2022.

(i) The Rate Base as computed by BLPC and calculated to be $825,891,134 be approved.

(j) The proposed capital structure of Debt of 35% and Equity of 65% used by BLPC in the determination of its Rate of Return be approved.

(k) The Rate of Return on Rate Base of 8.79% be approved.

(l) The Revenue Requirement of $440,240,372 be approved.

(m) The Existing Tariffs and Riders be replaced by the Proposed Tariffs and Riders, details of which are described at Schedules K1 – K11.

(n) The current FCA formula be modified to only recover fossil fuel related costs.

(o) The renewable energy purchased power and the ESD be removed from the FCA. The renewable energy purchased power be recovered through the establishment of a "Renewable Purchased Power Adjustment" (RPPA) and the ESD be included in rate base.

(p) The existing Standards of Service be retained.

(q) Such further Orders or other relief as may be warranted.

XII. PERSONS AFFECTED BY THE APPLICATION (Rule 26 of the Rules)

108. Pursuant to Rule 26 (4) of the Rules, BLPC advises that it is impractical to set out all the names and addresses of each customer affected by the Application because they are too numerous. However, the persons affected can generally be described as the customers of BLPC that fall within the tariff groups identified in Schedules J-1 to J-8. These customers are affected because BLPC supplies service to them.

DATED THIS 30th DAY OF SEPTEMBER, 2021

SIGNED BY: ....

ROGER BLACKMAN

BLPC'S REPRESENTATIVE AND DULY AUTHORIZED OFFICER

BLPC'S ADDRESS: THE BARBADOS LIGHT & POWER COMPANY LIMITED
GARRISON HILL
ST. MICHAEL
BARBADOS
TELEPHONE NUMBER: (246) 626-4200
EMAIL ADDRESS:

1. Roger.Blackman@blpc.com.bb
2. Kim.Griffith-TangHow@blpc.com.bb
3. Adrian.Carter@blpc.com.bb

I

Supplement to Official Gazette dated 8th February, 1982

BARBADOS LIGHT AND POWER COMPANY (EXTENSION OF FRANCHISE) ACT, 1982 – 2

Arrangement of Sections

Section

BARBADOS

I assent
D. H. L. WARD
Governor-General
29th January, 1982.

1982 – 2

An Act to make provisions respecting the extension of a franchise granted to the Barbados Light and Power Company.

(8th February, 1982) Commencement.

ENACTED by the Parliament of Barbados as follows:

1. This Act may be cited as the *Barbados Light and Power Company (Extension of Franchise) Act, 1982.* Citation

2. The provisional order set out in the Schedule is confirmed. Confirmation of order Schedule

SCHEDULE

(Section 2)

PROVISIONAL ORDER BY MINISTER RESPECTING EXTENSION OF FRANCHISE GRANTED TO BARBADOS LIGHT AND POWER COMPANY

1. This order may be cited as the *Electric Light and Power Provisional Order, 1982.*

2. Without affecting the rights conferred by the orders contained in the First and Second Schedules to the *Electric Light and Power Act*, the Barbados Light and Power Company may, subject to those orders and to this order, supply energy for all public and private purposes defined by that Act for a period of forty-two years from 1st August, 1986.

Cap. 278

3. The rights conferred by this order are not exclusive rights, but in all other respects, the rights granted by this order are subject to the conditions set out in the First and Second Schedules to the *Electric Light and Power Act.*

Cap. 278

II

APPENDIX II

SUMMARY OF CURRENT & PROPOSED TARIFFS

TARIFFS	COMPONENTS	Parameters	CURRENT RATES Monthly	PROPOSED RATES Monthly	$ Change
Domestic Service					
	Customer Charge ($/month)	0-150kWh	$6.00	$8.00	$2.00
		151-500kWh	$10.00	$14.00	$4.00
		Over 500 kWh	$14.00	$20.00	$6.00
	Demand Charge ($/kVA)	Not applicable	---------	---------	
	Base Energy Charge ($/kWh)	0-150 kWh, per kWh	$0.150	*$0.168*	$0.02
		Next 350 kWh, per kWh	$0.176	*$0.214*	$0.04
		Next 1,000 kWh, per kWh	$0.200	*$0.249*	$0.05
		Over 1,500 kWh, per kWh.	$0.224	*$0.280*	*$0.06*
Employee					
	Customer Charge ($/month)	Not applicable	---------	---------	
	Demand Charge ($/kVA)	Not applicable	---------	---------	
	Base Energy Charge ($/kWh)	0-150 kWh, per kWh	$0.108	$0.133	$0.03
		Next 350 kWh, per kWh	$0.127	$0.157	$0.03
		Next 1,000 kWh, per kWh	$0.180	$0.227	$0.05
		Over 1,500 kWh, per kWh	$0.202	$0.255	$0.05
General Service					
	Customer Charge ($/month)	0-100kWh	$8.00	$12.00	$4.00
		101-500kWh	$11.00	$15.00	$4.00
		Over 500 kWh	$14.00	$24.00	$10.00
	Demand Charge ($/kVA)	Not applicable	---------	---------	
	Base Energy Charge ($/kWh)	0-100 kWh, per kWh	$0.184	$0.204	$0.02
		Next 400 kWh, per kWh	$0.217	$0.256	$0.04
		Next 1,000 kWh, per kWh	$0.259	$0.311	$0.05
		Over 1,500 kWh, per kWh	$0.290	$0.354	$0.06
Secondary Voltage Power					
	Customer Charge ($/month)	Each service	$20.00	$169	$149.00
	Demand Charge ($/kVA)	per kVA	$24.00	$28.82	$4.82
	Base Energy Charge ($/kWh)	All kWh, per kWh.	$0.1380	$0.1380	$0.00
Large Power					
	Customer Charge ($/month)	Each service	$300	$1,587	$1,287.00
	Demand Charge ($/kVA)	per kVA	$22	$33.30	$11.30
	Base Energy Charge ($/kWh)	All kWh, per kWh.	$0.1170	$0.1170	$0.00
Time of Use Pilot Tariff					
	Customer Charge ($/month)	Each service	$300	$1,675	$1,375.00
	Demand Charge ($/kVA)	per kVA	$18	$22.88	$4.88
	Base Energy Charge ($/kWh)	On-Peak, per kWh.	$0.219	$0.219	$0.00
		Off-Peak, per kWh.	$0.062	$0.062	$0.00
Streetlights	**Customer Charge**				
		Each 50 Watt HPS light	$7.04	---------	
		Each 70 Watt HPS light	$7.73	---------	
		Each 100 Watt HPS light	$8.59	---------	
		Each service light	---------	$10.00	N/A
	Demand Charge ($/kVA)	Not applicable	---------	---------	
	Base Energy Charge ($/kWh)	All kWh, per kWh.	---------	$0.231	

NOTES

(1) Fuel Clause Adjustment ($/kWh) is applicable to all tariffs

(2) Renewable Purchased Power Adjustment ($/kWh) is applicable to all tariffs

(3) All rates are subject to Value Added Tax (VAT)

Current and Proposed Service Charges			
Charge	**Service**	**Current Charges**	**Proposed Charges**
New Service	Below 200 Amps	$50	$130
	Above 200 Amps	$200	$350
Reconnection/Transfer of Service Non-AMI	Below 200 Amps	$20	$35
	Above 200 Amps	$40	$80
Reconnection/Transfer of Service AMI	Each	N/A	$10
Debt Reconnection Non-AMI	Working Hours Reconnection	$20	$35
	After Hours Reconnection	$40	$70
Shift Meter	Below 200 Amps	$50	$130
	Above 200 Amps	$200	$350
Upgrade Service	Below 200 Amps	$50	$130
	Above 200 Amps	$200	$350
Damaged Meter	1-PH Meter	$50	$260
	3-PH Meter	$200	$650
Special Events/Temporary Service	Below 200 Amps	$60	$85
	Above 200 Amps	$210	$210
Tampering Fee	Each	$250	$390
Provide & Install Sealing Ring	Each	$20	$35
Meter Read - Non AMI	Each	$20	$35
Meter Test	Each	$50	$80
Returned Cheque	Each	Bank Charge plus $10.00	$60
Transformer Rental	Primary voltage	$1.00/kVA of transformer capacity	$1.00/kVA of transformer capacity
Transformer Upgrade-Renewables	Each	N/A	As per the BLPC's customer contribution policy
Off cycle billing - AMI	Each	N/A	$15
Renewable Service- Application Fee	Below 200 Amps	$50	$200
	Above 200 Amps	$200	$520
Connection Impact Assessment	Up to 1 MW Capacity	N/A	$200
	Above 1 MW Capacity	N/A	Cost of Studies
Special After Hours Appointments	Weekday After Hours	N/A	$300
	Weekend	N/A	$600
Renewable refunds processing fee	Each	N/A	$7

NOTE

(1) All rates are subject to Value Added Tax (VAT)

Summary of Current and Proposed Riders

RIDERS	COMPONENTS	PARAMETERS	RATES
Interruptible Service	Demand Credit	per kVA of Monthly Interruptible Demand	
		07.00 - 21.00 hrs option	$12
		08.00 - 16.30 hrs option	$9
Fuel Clause Adjustment (FCA)	per kWh	per kWh	Monthly FCA
Renewable Purchased Power Adjustment (RPPA)	per kWh	per kWh	Monthly RPPA

III

The Barbados Light & Power Company Limited

Non-consolidated Financial Statements

Year ended December 31, 2020
(Expressed in Barbados Dollars)

The Barbados Light & Power Company Limited

Index to the Non-consolidated Financial Statements

Ernst & Young Ltd
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INDEPENDENT AUDITOR'S REPORT

To the Shareholder of the Barbados Light & Power Company Limited

Report on the Audit of the Non-consolidated Financial Statements

Opinion
We have audited the non-consolidated financial statements of The Barbados Light & Power Company Limited ("the Company"), which comprise the non-consolidated balance sheet as at December 31, 2020, and the non-consolidated statement of comprehensive income, non-consolidated statement of changes in equity and non-consolidated statement of cash flows for the year then ended, and notes to the non-consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying non-consolidated financial statements present fairly, in all material respects, the financial position of the Company as at December 31, 2020 and its financial performance and its cash flows for the year then ended in accordance with International Financial Reporting Standards ("IFRS").

Basis for Opinion
We conducted our audit in accordance with International Standards on Auditing ("ISAs"). Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Non-consolidated financial statements* section of our report. We are independent of the Company in accordance with the International Ethics Standards Board for Accountants' Code of Ethics for Professional Accountants ("IESBA Code"), and we have fulfilled our other ethical responsibilities in accordance with the IESBA Code. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

We have fulfilled the responsibilities described in the *Auditor's Responsibilities for the Audit of the Non-consolidated financial statements* section of our report, including in relation to these matters. Accordingly, our audit included the performance of procedures designed to respond to our assessment of the risks of material misstatement of the non-consolidated financial statements. The results of our audit procedures, including the procedures performed to address the matters below, provide the basis for our audit opinion on the accompanying non-consolidated financial statements.

Responsibilities of Management for the Non-consolidated Financial Statements
Management is responsible for the preparation and fair presentation of the non-consolidated financial statements in accordance with IFRS, and for such internal control as the management determines is necessary to enable the preparation of non-consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the non-consolidated financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so. The Board of Directors is responsible for overseeing the Company's financial reporting process.

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INDEPENDENT AUDITOR'S REPORT*....continued*

To the Shareholder of the Barbados Light & Power Company Limited

Auditor's Responsibilities for the Audit of the Non-consolidated Financial Statements
Our objectives are to obtain reasonable assurance about whether the non-consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these non-consolidated financial statements.

As part of an audit in accordance with ISAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the non-consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the non-consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the non-consolidated financial statements, including the disclosures, and whether the non-consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

Building a better
working world

INDEPENDENT AUDITOR'S REPORT*....continued*

To the Shareholder of the Barbados Light & Power Company Limited

Auditor's Responsibilities for the Audit of the Non-consolidated Financial Statements *...continued*
We communicate with management regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide management with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

Ernst & Young Ltd
Barbados
10 March 2021

The Barbados Light & Power Company Limited

Non-consolidated Balance Sheet

As of December 31, 2020

(expressed in Barbados dollars)

	2020 $	2019 $
Assets		
Non-current assets		
Property, plant and equipment (Note 5)	**781,915,206**	691,767,064
Right of use asset (Note 19)	**10,511,680**	11,964,335
	792,426,886	703,731,399
Current assets		
Cash and cash equivalents (Note 6)	**41,969,904**	28,581,379
Trade and other receivables (Note 7)	**65,535,445**	79,294,529
Due from related parties (Note 16)	**1,038,383**	96,033
Corporation Tax receivable (Note 13)	**982,214**	240,169
Inventories (Note 8)	**32,158,642**	31,337,505
	141,684,588	139,549,615
Total assets	**934,111,474**	843,281,014
Equity		
Share capital (Note 9)	**200,000,000**	200,000,000
Retained earnings	**353,985,596**	325,262,353
Total equity	**553,985,596**	525,262,353
Non-current liabilities		
Borrowings (Note 10)	**183,322,153**	76,677,874
Customers' deposits (Note 11)	**47,401,617**	46,411,900
Deferred credits (Note 12)	**39,481,714**	41,240,649
Deferred tax liability (Note 13)	**3,985,015**	3,823,258
Long-term lease liability (Note 19)	**11,170,609**	11,497,755
	285,361,108	179,651,436
Current liabilities		
Trade and other payables (Note 14)	**73,170,610**	73,991,741
Provisions for other liabilities and charges (Note 15)	**8,210,715**	8,957,163
Borrowings (Note 10)	**12,148,058**	52,813,151
Due to related parties (Note 16)	**1,175,887**	2,017,359
Short-term lease liability (Note 19)	**59,500**	587,811
	94,764,770	138,367,225
Total liabilities	**380,125,878**	318,018,661
Total liabilities and equity	**934,111,474**	843,281,014

The accompanying notes form an integral part of these non-consolidated financial statements.

Approved by the Board of Directors on February 17, 2021.

Director ______________________ Director ______________________

The Barbados Light & Power Company Limited

Non-consolidated Statement of Changes in Equity

Year ended December 31, 2020

(expressed in Barbados dollars)

	Share capital $	Retained earnings $	Total $
Balance at December 31, 2018	200,000,000	326,820,550	526,820,550
Total comprehensive income for the year	-	53,441,803	53,441,803
Dividends paid ($0.92 per share)	-	(55,000,000)	(55,000,000)
Balance at December 31, 2019	200,000,000	325,262,353	525,262,353
Total comprehensive income for the year	-	28,723,243	28,723,243
Balance at December 31, 2020	**200,000,000**	**353,985,595**	**553,985,595**

The accompanying notes form an integral part of these non-consolidated financial statements.

The Barbados Light & Power Company Limited

Non-consolidated Statement of Comprehensive Income

Year ended December 31, 2020

(expressed in Barbados dollars)

	2020 $	2019 $
Operating revenue (Note 17)	**393,717,694**	483,031,907
Operating expenses (Note 18)		
Fuel	**202,978,824**	279,734,766
Generation	**44,556,208**	36,490,311
General	**44,539,177**	47,707,055
Distribution	**10,251,161**	10,032,448
Depreciation (Note 5)	**52,300,244**	46,156,736
Depreciation of right of use asset (Note 19)	**406,353**	440,403
Insurance	**8,198,082**	5,803,861
	363,230,049	426,365,580
Operating income	**30,487,645**	56,666,327
Finance and other income (Note 20)	**3,778,895**	3,924,456
Finance and other costs	**(5,872,467)**	(6,405,161)
Income before taxation	**28,394,073**	54,185,622
Taxation (Note 13)	**329,170**	(743,819)
Net income and total comprehensive income for the year	**28,723,243**	53,441,803

The accompanying notes form an integral part of these non-consolidated financial statements.

The Barbados Light & Power Company Limited

Non-consolidated Statement of Cash Flows

Year ended December 31, 2020

(expressed in Barbados dollars)

	2020 $	2019 $
Cash flows from operating activities		
Income before taxation	**28,394,073**	54,185,622
Adjustments for non-cash items:		
Depreciation (Note 5)	**52,300,244**	46,156,736
Depreciation of right of use asset (Note 19)	**406,353**	440,403
Gain on disposal of property, plant and equipment	**(16,255)**	(18,043)
Finance income (Note 20)	**(326,939)**	(389,080)
Finance and other costs	**5,872,467**	6,405,161
Net change in deferred revenue	**(1,758,936)**	(3,190,690)
Net change in provisions for other liabilities and charges	**(746,448)**	5,277,244
Cash flows from operations before working capital changes	**84,124,559**	108,867,353
Decrease/(increase) in trade and other receivables (Note 7)	**13,759,084**	(15,781,711)
Increase in inventories (Note 8)	**(821,137)**	(5,923,220)
(Decrease)/increase in trade and other payables (Note 14)	**(630,288)**	12,063,101
(Decrease)/increase in related party balances (Note 16)	**(1,783,821)**	3,349,198
Cash generated from operations	**94,648,397**	102,574,721
Corporation tax paid (Note 13)	**(251,118)**	(2,413,107)
Interest paid	**(6,143,213)**	(7,817,659)
Net cash from operating activities	**88,254,066**	92,343,955
Cash flows from investing activities		
Additions to property, plant and equipment (Note 5)	**(144,087,441)**	(102,858,507)
Proceeds on disposal of property, plant and equipment	**55,657**	51,532
Decrease in non-current trade receivables (Note 7)	**-**	13,472,773
Interest received- other	**326,939**	389,080
Net cash used in investing activities	**(143,704,845)**	(88,945,122)
Cash flows from financing activities		
Proceeds from borrowings	**76,894,489**	63,351,974
Repayment of borrowings (Note 10)	**(10,644,556)**	(8,061,583)
Dividends paid	**-**	(55,000,000)
Customers' contributions to property, plant and equipment	**1,599,654**	32,508
Customers' deposits (Note 11)	**989,717**	1,285,586
Net cash from financing activities	**68,839,304**	1,608,485
Net increase in cash and cash equivalents	**13,388,525**	5,007,318
Cash and cash equivalents – beginning of the year	**28,581,379**	23,574,061
Cash and equivalents – end of year (Note 6)	**41,969,904**	28,581,379

The accompanying notes form an integral part of these non-consolidated financial statements.

The Barbados Light & Power Company Limited
Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

1. General information

The Barbados Light & Power Company Limited (the "Company") is a limited liability company incorporated under the Laws of Barbados. The principal activity is that of generation, distribution and supply of electricity. The Company is governed by the Electric Light & Power Act (2013) and regulated by the Fair Trading Commission Act Cap.326B and the Utilities Regulation Act Cap.282.

The registered office of the Company is located at Garrison Hill, St. Michael.

Parent company

The Barbados Light & Power Company Limited is a wholly-owned subsidiary of Emera (Caribbean) Incorporated, (ECI) a company incorporated under the laws of Barbados.

The ultimate parent of the Company is Emera Inc., an energy and services company registered in Canada. At December 31, 2020 ownership in ECI stood at 100 percent (2019 – 100 percent).

2. Summary of significant accounting policies

The principal accounting policies applied in the preparation of these non-consolidated financial statements are set out below. These policies have been consistently applied to all years presented unless otherwise stated.

2.1 Basis of preparation

These non-consolidated financial statements of The Barbados Light & Power Company Limited have been prepared in accordance with International Financial Reporting Standards (IFRS) under the historical cost convention as issued by the International Accounting Standards Board (IASB).

The preparation of non-consolidated financial statements in conformity with IFRS requires the use of certain critical accounting estimates. It also requires management to exercise its judgement in the process of applying the Company's accounting policies. In 2020, the outbreak of the novel strain of coronavirus, specifically identified as COVID-19, has resulted in governments worldwide enacting emergency measures to combat the spread of the virus. Management considered the impact of COVID-19 in the Company's estimates and results. It is not possible to reliably estimate the length and severity of the COVID-19 pandemic and the impact on the financial results and condition of the Company in future periods. The areas involving a higher degree of judgement or complexity, or areas where assumptions and estimates are significant to the non-consolidated financial statements are disclosed in Note 4.

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

2. Summary of significant accounting policies *…continued*

2.1 Basis of preparation *…continued*

2.1.1 Changes in accounting policy and disclosures

a) New and amended standards, and interpretations adopted by the Company

The accounting policies adopted are consistent with those of the previous financial year, except for the following amendments to IFRS effective as of January 1, 2020. Unless otherwise noted, the adoption of the revised standard did not have a significant change on the non-consolidated financial statements of the Company.

- **IAS 1 'Presentation of Financial Statements' and IAS 8 'Accounting Policies, Changes in Accounting Estimates and Errors'**, amended October 2018. The amendment revises the definition of 'material'. The new definition states information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions that the primary users of general-purpose financial statements make on the basis of those financial statements, which provide financial information about a specific reporting entity. The amendment is effective for annual statements beginning on or after January 1, 2020 and does not have an impact on the non-consolidated financial statements.

- **IFRS 3 'Business combinations'**, issued October 2018. The amendments clarify that to be considered a business, an acquired set of activities and assets must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs. Here the amendments narrow the definitions of a business and of outputs by focusing on goods and services provided to customers and by removing the reference to an ability to reduce costs. The amendments also added an optional concentration test that permits a simplified assessment of whether an acquired set of activities and assets is not a business. The amendments are effective for business combinations for which the acquisition date is on or after the beginning of the first annual reporting period beginning on or after January 1, 2020 and to asset acquisitions that occur on or after the beginning of that period. Earlier application is permitted. The amendment did not have an impact on the non-consolidated financial statements of the Company.

(expressed in Barbados dollars)

2. Summary of significant accounting policies …*continued*

2.1 Basis of preparation …*continued*

2.1.1 Changes in accounting policy and disclosures …*continued*

b) New standards, amendments and interpretations issued but not effective for the financial year beginning January 1, 2020 and not early adopted

Management has reviewed the new standards, amendments and interpretations to existing standards that are not yet effective and have determined that the following are relevant to the company's operations. The company has not early adopted the new standards, amendments and interpretations:

- **IFRS 3 'Business Combinations',** amended October 2018. The changes in Reference to the Conceptual Framework (Amendments to IFRS 3) update IFRS 3 so that it refers to the 2018 Conceptual Framework instead of the 1989 Framework. The amendments also add to IFRS 3 a requirement that, for transactions and other events within the scope of IAS 37 or IFRIC 21, an acquirer applies IAS 37 or IFRIC 21 (instead of the Conceptual Framework) to identify the liabilities it has assumed in a business combination. Also, added to IFRS 3, an explicit statement that an acquirer does not recognize contingent assets acquired in a business combination. The amendments are effective for annual periods beginning on or after January 1, 2022. Early application is permitted if an entity also applies all other updated references (published together with the updated Conceptual Framework) at the same time or earlier. The amendment will not have an impact on the non-consolidated financial statements of the Company.

- **IAS 1 'Presentation of Financial Statements'**, amended January 2020. The amendments aim to promote consistency in applying the requirements by helping companies determine whether, in the statement of financial position, debt and other liabilities with an uncertain settlement date should be classified as current (due or potentially due to be settled within one year) or non-current. The amendments to IAS 1 affect only the presentation of liabilities as current or non-current in the statement of financial position and not the amount or timing of recognition of any asset, liability, income or expenses, or the information disclosed about those items. The amendment is effective for annual periods beginning on or after 1 January 2023 retrospectively in accordance with IAS 8, with early application permitted. The amendment will not have an impact on the non-consolidated financial statements of the Company.

- **IAS 16 'Property, Plant and Equipment',** issued May 2020. The amendments prohibit deducting from the cost of an item of property, plant and equipment any proceeds from selling items produced while bringing that asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Instead, an entity recognises the proceeds from selling such items, and the cost of producing those items, in profit or loss.

The Barbados Light & Power Company Limited
Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

2. Summary of significant accounting policies *…continued*

2.1 Basis of preparation *…continued*

2.1.1 Changes in accounting policy and disclosures*…continued*

b) New standards, amendments and interpretations issued but not effective for the financial year beginning January 1, 2020 and not early adopted *…continued*

- **IAS 16 'Property, Plant and Equipment' …** *continued*

  The amendments are applied retrospectively, but only to items of property, plant and equipment that are brought to the location and condition necessary for them to be capable of operating in the manner intended by management on or after the beginning of the earliest period presented in the financial statements in which the entity first applies the amendments. The Company shall recognise the cumulative effect of initially applying the amendments as an adjustment to the opening balance of retained earnings (or other component of equity, as appropriate) at the beginning of that earliest period presented). The amendment is effective for annual periods beginning on or after 1 January 2022, with early application permitted. The amendments are not expected to have an impact on the non-consolidated financial statements of the Company.

- **IAS 37 'Onerous Contracts'**. The amendments specify that the 'cost of fulfilling' a contract comprises the 'costs that relate directly to the contract'. Costs that relate directly to a contract consist of both the incremental costs of fulfilling that contract (examples would be direct labour or materials) and an allocation of other costs that relate directly to fulfilling contracts (an example would be the allocation of the depreciation charge for an item of property, plant and equipment used in fulfilling the contract). The amendments apply to contracts for which the entity has not yet fulfilled all its obligations at the beginning of the annual reporting period in which the entity first applies the amendments. Comparatives are not restated. Instead, the Group shall recognise the cumulative effect of initially applying the amendments as an adjustment to the opening balance of retained earnings or other component of equity, as appropriate, at the date of initial application.). The amendment is effective for annual periods beginning on or after 1 January 2022, with early application permitted. The amendments are not expected to have an impact on the non-consolidated financial statements of the Company.

- **IFRS 9 Financial Instruments**. The amendment clarifies that in applying the '10 per cent' test to assess whether to derecognise a financial liability, an entity includes only fees paid or received between the entity (the borrower) and the lender, including fees paid or received by either the entity or the lender on the other's behalf. The amendment is applied prospectively to modifications and exchanges that occur on or after the date the entity first applies the amendment. The amendment is effective for annual periods beginning on or after 1 January 2022, with early application permitted.

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

2. Summary of significant accounting policies *…continued*

2.1 Basis of preparation *…continued*

2.1.1 Changes in accounting policy and disclosures*…continued*

b) New standards, amendments and interpretations issued but not effective for the financial year beginning January 1, 2020 and not early adopted *…continued*

- **IAS 1 'Presentation of Financial Statements',** issued January 2020. The amendments clarify that the classification of liabilities as current or non-current, is based on rights that are in existence at the end of the reporting period. Also, it specifies that classification is unaffected by expectations about whether an entity will exercise its right to defer settlement of a liability, explain that rights are in existence if covenants are complied with at the end of the reporting period. The amendment introduces a definition of 'settlement' to make clear that settlement refers to the transfer to the counterparty of cash, equity instruments, other assets or services. The amendments are applied retrospectively for annual periods beginning on or after 1 January 2023, with early application permitted. The amendment will not have an impact on the non-consolidated financial statements of the Company.

2.2 Non-consolidation

These non-consolidated financial statements contain information about the Company as an individual company. They do not reflect the generally accepted accounting principle of consolidation of the accounts of the Company and the special purpose entity, The Barbados Light & Power Self Insurance Fund. The consolidated financial statements of Emera (Caribbean) Incorporated, its subsidiary companies and the special purpose entity have been prepared in accordance with IFRS for presentation to the shareholder. The consolidated financial statements of ECI are available at the parent's registered office.

2.3 Foreign currency translation

Functional and presentation currency

Items included in the non-consolidated financial statements are measured using the currency of the primary economic environment in which the entity operates ('the functional currency'). The non-consolidated financial statements are presented in Barbados dollars which is also the functional and presentation currency.

Transactions and balances

Foreign currency transactions are translated into Barbados currency using the exchange rates prevailing at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognised in the non-consolidated statement of comprehensive income.

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

2. Summary of significant accounting policies …*continued*

2.4 Property, plant and equipment

Property, plant and equipment are stated at historic cost less accumulated depreciation and impairment losses. Cost represents expenditure that is directly attributable to the acquisition of the items and includes cost of materials, direct labour, supervision and engineering charges and interest incurred during construction which is directly attributable to the acquisition or construction of a qualifying asset.

Subsequent costs are included in the asset's carrying value or recognised as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Company and the cost of the item can be measured reliably. All other repairs and maintenance are charged to the non-consolidated statement of comprehensive income during the financial period in which they are incurred.

The Company includes borrowing costs directly attributable to the acquisition, construction or production of qualifying assets, as part of the cost of that asset once the acquisition or construction period exceeds one year, until the asset is made available for service (Note 2.10).

Contributions received towards construction of electric plant are credited to the cost of work in progress or are shown as deferred credits in the case where construction has not been completed.

Land is not depreciated. No depreciation is provided on work-in-progress until the assets involved have been completed and are available for use. For financial reporting purposes depreciation on other property, plant and equipment is calculated by the straight line method using rates required to allocate the cost of the assets less salvage over their estimated service lives as follows:

Generation	2% - 33%
Transmission and distribution	2% - 5%
Other	2% - 17%

Capitalised spares are written down over the life of the associated plant using the reducing balance method.

When depreciable property, plant and equipment other than motor vehicles and property are retired, the gross book value less proceeds net of retiral expense is charged to accumulated depreciation. For material disposals of motor vehicles and property, the asset cost and accumulated depreciation are removed with any gain or loss credited or charged to current operations. Gains and losses on material disposals of motor vehicles and property are determined by comparing proceeds with carrying amounts.

The assets' residual value, useful lives and depreciation methods are reviewed and adjusted, if appropriate, at each reporting date.

An asset's carrying value is written down immediately to its recoverable amount if the asset's carrying value is greater than its estimated recoverable amount.

(expressed in Barbados dollars)

2. Summary of significant accounting policies *...continued*

2.5 Financial instruments

a) Classification of financial assets

The Company has classified its financial instruments as financial assets at amortized cost. Management determines the classification at initial recognition and reviews the designation at every reporting date. The classification depends on the Company's business model for managing the financial assets and the contractual cash flow characteristics of the financial asset.

Financial assets at amortized cost are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. They are included in current assets, except for maturities greater than 12 months after the reporting date. These are classified as non-current assets. The Company's financial assets at amortized cost comprise cash resources and trade and other receivables.

b) Impairment of financial assets

The Company assesses at each reporting date whether there is objective evidence that a financial asset or a group of financial assets is impaired. For trade receivables, the Company applies a simplified approach in calculating expected credit losses. Therefore, the Company does not track changes in credit risk, but instead recognises a loss allowance based on lifetime expected credit losses at each reporting date. The Company considers its historical credit loss experience, adjusted for forward-looking factors specific to the debtors and the economic environment. The Company considers a financial asset in default when contractual payments are 91 days past due. However, in certain cases, the Company may also consider a financial asset to be in default when internal or external information indicates that the Company is unlikely to receive the outstanding contractual amounts in full before taking into account any credit enhancements held by the Company. A financial asset is written off when there is no reasonable expectation of recovering the contractual cash flows.

c) Derecognition of financial assets

The Company derecognizes a financial asset when the contractual rights to the cash flows from the asset expire, or when it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another party. If the Company neither transfers or retains substantially all the risks and rewards of ownership and continues to control the transferred asset, the Company recognizes its retained interest in the asset and an associated liability for amounts it may have to pay. If the Company retains substantially all the risks and rewards of ownership of a transferred financial asset, the Company continues to recognize the financial asset and also recognizes a collateralized borrowing for the proceeds received.

On derecognition of a financial asset in its entirety, the difference between the asset's carrying amount and the sum of the consideration received and receivable and the cumulative gain or loss that had been recognized in other comprehensive income and accumulated in equity is recognized in profit or loss.

On derecognition of a financial asset other than in its entirety, the Company allocates the previous carrying amount of the financial asset between the part it continues to recognize under continuing involvement, and the part it no longer recognizes on the basis of the relative fair values of those parts on the date of the transfer.

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

2. Summary of significant accounting policies *...continued*

2.5 Financial instruments…*continued*

c) Derecognition of financial assets…*continued*

The difference between the carrying amount allocated to the part is no longer recognized and the sum of the consideration received for the part no longer recognized and any cumulative gain or loss allocated to it that had been recognized in other comprehensive income is recognized in profit or loss. A cumulative gain or loss that had been recognized in other comprehensive income is allocated between the part that continues to be recognized and the part that is no longer recognized on the basis of the relative fair values of those parts.

2.6 Impairment of non-financial assets

Assets that have an indefinite life, e.g. land are not subject to amortisation and are reviewed for impairment annually.

Assets that are subject to amortisation are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows.

2.7 Cash and cash equivalents

Cash and cash equivalents includes cash held in hand, deposits held at call with banks and other short-term highly liquid investments purchased with maturity of three (3) months or less at the date of acquisition.

2.8 Trade receivables

Trade receivables are amounts due from customers for electricity or other services performed in the ordinary course of business. If collection is expected in one year or less (or in the normal operating cycle of the business if longer), they are classified as current assets. If not they are presented as non-current assets. Trade receivables are recognised initially at fair value and are subsequently measured at amortised cost less provision for impairment and discounts (Note 2.5b). In addition, a provision for discounts based on historical experience and adjusted for forward-looking factors, is created in anticipation of accounts that will be settled prior to the scheduled due date. The amount of the provision is recognised in the non-consolidated statement of comprehensive income. When a trade receivable is uncollectible it is written off against income. Subsequent recoveries of amounts previously written off are credited to the non-consolidated statement of comprehensive income.

2.9 Inventories

Inventories of fuel, materials and supplies are valued at the lower of cost and net realisable value. Cost is determined on an average cost basis. Generation spares are carried at cost less provision for obsolescence.

The Barbados Light & Power Company Limited
Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

2. Summary of significant accounting policies *...continued*

2.10 Borrowings

Borrowings are recognised initially at fair value, net of transaction costs incurred. Borrowings are subsequently stated at amortised cost and any difference between the net proceeds and the redemption value is recognised in the non-consolidated statement of comprehensive income over the period of the borrowings using the effective interest method. Borrowings are classified as current liabilities unless the Company has the unconditional right to defer settlement of the liability for at least twelve (12) months after the balance sheet date. Fees paid on the establishment of loan facilities are recognised as transaction costs of the loan.

Borrowing costs directly attributable to the acquisition, construction or production of an asset that necessarily takes a substantial period of time to get ready for its intended use or sale are capitalised as part of the cost of the asset. All other borrowings are expensed in the period in which they occur. Borrowing costs consist of interest and other costs that an entity incurs in connection with the borrowing of funds.

2.11 Trade payables

Trade payables are obligations to pay for goods or services that have been acquired in the ordinary course of business from suppliers. Trade payables are classified as current liabilities if payment is due within one year or less. Trade payables are recognised initially at fair value and subsequently measured at amortised cost.

2.12 Share capital

Common shares are classified as equity. Incremental costs directly attributable to the issue of new shares are shown as a deduction from the proceeds in the non-consolidated statement of changes in equity.

2.13 Taxation

Current and deferred income tax

The tax expense for the period comprises current and deferred tax. Tax is recognised in the non-consolidated statement of comprehensive income except to the extent that it relates to items recognised directly in other comprehensive income in which case it is recognised in other comprehensive income.

The current tax is the expected tax payable on taxable income for the period and is calculated on the basis of the tax rates enacted or substantially enacted at the reporting date. Management periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation. Provisions are established where appropriate on the basis of amounts expected to be paid to the tax authorities.

Deferred income tax is provided in full using the liability method on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the non-consolidated financial statements.

(expressed in Barbados dollars)

2. Summary of significant accounting policies *...continued*

2.13 Taxation*...continued*

Deferred income tax is determined using tax rates that have been enacted by the reporting date and are expected to apply when the asset is realised or the liability is settled.

Deferred income tax assets are recognised to the extent that it is probable that future taxable profits will be available against which the asset can be utilised.

2.14 Deferred credits

Investment and manufacturing tax credits

Investment and manufacturing allowances associated with the acquisition of plant and equipment are being deferred and amortised to income over the estimated useful lives of the respective assets.

2.15 Customers' deposits

Commercial and all other customers except Barbadian residents categorised under the Domestic Service tariff are normally required to provide security for payment. However, Barbadian residents under this tariff may be asked to provide security if they are delinquent in paying their bills. The cash deposit is refunded with accumulated interest when the account is terminated or arrangements made to provide alternative security (e.g. a banker's guarantee).

Given the long term nature of the customer relationship, customer deposits are shown in the non-consolidated balance sheet as non-current liabilities (i.e. not likely to be repaid within twelve months of the reporting date). Interest on deposits is recognised using the effective interest rate method.

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

2. Summary of significant accounting policies *...continued*

2.16 Revenue recognition

Basic Revenue

Basic revenues are recognized when electricity is delivered to customers over time as the customer simultaneously receives and consumes the benefits of the electricity. Revenues are recognized on an accrual basis and include billed and unbilled revenues. Revenues related to the sale of electricity are recognized at rates approved by the Fair Trading Commission and recorded based on metered usage, which occur on a periodic, systematic basis. At the end of each reporting period, the electricity delivered to customers, but not billed, is estimated and the corresponding unbilled revenue is recognized. The Company's estimate of unbilled revenue at the end of the reporting period is calculated by estimating the number of megawatt hours ("MWh") delivered to customers at the established rate expected to prevail in the upcoming billing cycle. This estimate includes assumptions as to the pattern of energy demand, weather, line losses and inter-period changes to customer classes.

Fuel Revenue

Fuel costs are passed to customers through the fuel clause adjustment mechanism which provides the opportunity to recover substantially all fuel costs required for the generation of electricity. The calculation of the fuel charge was approved by the Fair Trading Commission. The Company recognises fuel revenue on the basis of the amount recoverable for the accounting period.

Miscellaneous Revenue

Miscellaneous revenue is generated from the sale of goods and services which do not form part of the principal activity of generating, distributing and supplying of electricity. This includes pole and landing station rentals, office space rentals and service fees. Service fees are recognised as the various services are provided. Revenue for the rental of poles, landing station and office is recognised when the Company provides the assets for use by the customer or when the various services are provided.

Service fees are recognised as the various services are provided.

Other

Value add taxes collected by the Company concurrent with revenue-producing activities are excluded from revenue.

The Barbados Light & Power Company Limited

(expressed in Barbados dollars)

2. Summary of significant accounting policies *...continued*

2.17 Employee benefits

The Company operates a fully insured purchased annuity plan pension scheme. This scheme takes the form of a defined benefit scheme and pension costs are accounted for on the basis of contributions payable in the year. The Company pays an annual insurance premium to fund the post-employment benefit plan and will not have a legal or constructive obligation to either:

a) pay the employee benefits directly when they fall due; or
b) pay for the benefits if the insurer does not pay all future employee benefits relating to employee service in the current and prior periods.

Since the benefits due to employees have been secured by the payment of premiums, and the insurer has sole responsibility for paying the benefits, the plan has been accounted for as if it were a defined contribution plan as allowed by IAS 19.

2.18 Employee Common Share Purchase Plan

The employees of the Company have the option to purchase the common shares of Emera Inc. Employees may contribute a minimum of $25 Canadian dollars (CAD) per month or a maximum of $15,000 USD per fiscal year. The Company will contribute 20% at the end of each fiscal quarter on all contributions. The company’s contribution is recognised as an expense which is included in employee benefits.

2.19 Bonus plans

The Company recognises a liability and an expense for bonuses on a formula that takes into consideration the profit attributable to the Company’s shareholder. The Company recognises a provision where it is contractually obligated or where there is a past practice that has created a constructive obligation.

2.20 Related parties

Parties are considered related if one party has the ability to control the other party or exercise significant influence over the other party in making financial and operating decisions. Individuals, associates or companies that directly or indirectly control or are controlled by or are under common control with the Company are also considered related parties.

2.21 Provisions

Provisions are recognised when the Company has a legal or constructive obligation, as a result of past events, it is probable that an outflow of resources will be required to settle the obligation, and a reliable estimate of the amount can be made.

The Barbados Light & Power Company Limited
Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

2. Summary of significant accounting policies *...continued*

2.22 Dividend distribution

Dividend distribution to the Company's shareholder is recognised as a liability in the Company's non-consolidated financial statements in the period in which the dividends are approved by the Board of Directors.

2.23 Leases

The company assesses whether a contract is or contains a lease, at inception of a contract. The company recognises a right-of-use asset and a corresponding lease liability with respect to all lease agreements in which it is the lessee except for short-term leases with a lease term of 12 months or less and leases of low value assets. For these leases, the company recognises the lease payments as an expense on a straight-line basis in the non-consolidated statement of comprehensive income over the term of the lease.

For all other leases, at lease commencement date, the company recognises a right-of-use asset and a lease liability on the balance sheet. The right-of-use asset is measured at cost, which is made up of the initial measurement of the lease liability, any initial direct costs incurred by the company, and any lease payments made in advance of the lease commencement date. The company measures the lease liability at the present value of the lease payments unpaid at that date, discounted using the interest rate implicit in the lease if that rate is readily available or the company's incremental borrowing rate. Lease payments included in the measurement of the lease liability are made up of fixed payments and payments arising from options reasonably certain to be exercised.

The company depreciates right-of-use assets on a straight-line basis from the lease commencement date to the earlier of the end of the useful life of the right-of-use asset or the end of the lease term. The company also assesses the right-of-use asset for impairment when such indicators exist.

The lease liability is subsequently reduced for payments made and increased for interest on the lease liability, using the effective interest method. It is remeasured to reflect any reassessment or modification, or if there are changes in in-substance fixed payments. When the lease liability is remeasured, the corresponding adjustment is reflected in the right-of-use asset, or profit and loss if the right-of-use asset is already reduced to zero. There was a lease reassessment in 2020.

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

3. Financial risk management

3.1 Financial instruments by category

A financial instrument is any contract that gives rise to both a financial asset in one entity and a financial liability or equity of another entity.

The accounting policies for financial instruments have been applied to the items below:

Loans and receivables

	2020 $	2019 $
Assets as per non-consolidated balance sheet		
Cash and cash equivalents (Note 6)	**41,969,904**	28,581,379
Trade and other receivables excluding prepayments (Note 7)	**53,925,095**	61,305,903
	95,894,999	89,887,282

Financial liabilities at amortised cost

	2020 $	2019 $
Liabilities as per non-consolidated balance sheet		
Borrowings (Note 10)	**195,719,538**	130,261,705
Trade and other payables excluding statutory liabilities (Note 14)	**68,163,620**	69,313,851
Customer deposits (Note 11)	**47,401,617**	46,411,900
Lease liabilities (Note 19)	**11,230,109**	12,085,566
	322,514,184	258,073,022

3.2 Financial risk factors

The Company's activities expose it to a variety of financial risks: market risk (including foreign exchange, price risk, cash flow and interest rate risk), liquidity, credit risk and underinsurance risks. The Company's overall risk management policy is to minimise potential adverse effects on its' financial performance and to optimise shareholders' value within an acceptable level of risk. Risk management is carried out by the Company's management under direction from the Board of Directors.

The Company's exposure and approach to its key risks are as follows:

(expressed in Barbados dollars)

3. Financial risk management*....continued*

3.1 Financial instruments by category *.... continued*

a) Market risk

i) Foreign currency risk

This is the potential adverse impact on the Company's earnings and economic value due to movements in exchange rates.

Foreign exchange risk arises when future commercial transactions or recognised assets or liabilities are denominated in a currency that is not the entity's functional currency. The Company is exposed to foreign exchange risk arising primarily from foreign currency borrowings and purchases of plant, equipment and spares from foreign suppliers.

Borrowings have been formally fixed to the United States dollar (US$) to limit exposure to fluctuations in foreign currency exchange rates, since there is a fixed exchange rate between the Barbados dollar and United States dollar. Additionally, most purchases are transacted in United States dollars. At December 31, 2020 borrowings of $20,952,695 (2019 - $23,656,269) are denominated in United States dollars.

The Company has not entered into forward exchange contracts to reduce its exposure to fluctuations in foreign currency exchange rates.

ii) Price risk

Commodity price risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in commodity (copper, aluminum) prices. Prices for these commodities are impacted by world economic events that dictate the levels of supply and demand. The Company's financial position or performance is currently not vulnerable to this particular risk.

The Barbados Light & Power Company Limited
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3. Financial risk management *...continued*

3.2 Financial risk factors *... continued*

a) Market risk *... continued*

iii) Cash flow and fair value interest rate risk

Interest rate risk is the potential adverse impact on the earnings and economic value of the Company caused by movements in interest rates.

As the Company has no significant interest bearing assets, its income and operating cash flows are substantially independent of changes in market interest rates except as noted below.

The Company's interest rate risk arises from long-term borrowings. Borrowings issued at variable rates expose the Company to cash flow interest rate risk. Borrowings issued at fixed rates expose the Company to fair value interest rate risk.

The Company's borrowings are at fixed rates thereby minimising cash flow interest rate risk. Exposure to fair value interest rate risk on its borrowings results from fluctuations in the fair value of borrowings in response to changes in market interest rates. Movement in the fair value of the Company's borrowings are not reflected in the income statement as they are carried at amortised cost.

The Company's interest rates on deposits and the terms of borrowings are disclosed in Notes 11 and 10, respectively.

(expressed in Barbados dollars)

3. Financial risk management *...continued*

3.2 Financial risk factors *...continued*

b) Liquidity risk

Liquidity risk refers to the risk that the Company will not be able to meet its financial obligations as they fall due.

The Company currently settles its financial obligations out of cash and cash equivalents. The ability to do this relies on the Company collecting its accounts receivable in a timely manner and maintaining sufficient cash and cash equivalents in excess of anticipated financial obligations. To support the cash flow position, the Company has in place a planning and budgeting process to help determine the funds required to support the Company's normal operating and capital requirements.

Management monitors the Company's liquidity reserve which comprises undrawn borrowing facility to meet operational needs so that the Company does not break covenants (where applicable) on its borrowing facilities. Management monitors cash and cash equivalents (Note 6), on the basis of expected cash flows and is of the view that the Company holds adequate cash and credit facilities to meet its short-term obligations.

The table below analyses the Company's financial assets and liabilities into relevant maturity groupings based on the remaining period at the reporting date to the contractual maturity date. Balances due within 12 months equal their carrying balances. The amounts included in the table below for borrowings and trade and other payables will not reconcile to the non-consolidated balance sheet as they are the contractual cash flows.

	Less than 1 year $	Between 1 and 2 years $	Between 2 and 5 years $	Over 5 years $	Total $
At December 31, 2020					
Borrowings	**17,103,282**	**20,634,148**	**156,121,845**	**29,450,000**	**223,309,275**
Trade and other payables	**68,163,620**	**-**	**-**	**-**	**68,163,620**
Customers' deposits	**-**	**-**	**-**	**47,401,617**	**47,401,617**
Lease liabilities	**59,500**	**561,970**	**1,612,065**	**8,996,574**	**11,230,109**
Total liabilities	**85,326,402**	**21,196,118**	**157,733,910**	**85,848,191**	**350,104,621**
Cash and cash equivalents	**41,969,904**	**-**	**-**	**-**	**41,969,904**
Trade and other receivables	**65,535,445**	**-**	**-**	**-**	**65,535,445**
Assets held for managing liquidity	**107,505,349**	**-**	**-**	**-**	**107,505,349**

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(expressed in Barbados dollars)

3 Financial risk management *...continued*

3.2 Financial risk factors *...continued*

b) Liquidity risk ...continued

The table below analyses the Company's financial assets and liabilities into relevant maturity groupings based on the remaining period at the reporting date to the contractual maturity date.

	Less than 1 year $	Between 1 and 2 years $	Between 2 and 5 years $	Over 5 years $	Total $
At December 31, 2019					
Borrowings	56,779,909	11,256,479	71,308,345	3,351,974	142,696,707
Trade and other payables	69,313,851	-	-	-	69,313,851
Customers' deposits	-	-	-	46,411,900	46,411,900
Lease liabilities	587,811	561,970	1,612,065	9,323,720	12,085,566
Total liabilities	126,681,571	11,818,449	72,920,410	59,087,594	270,508,024
Cash and cash equivalents	28,581,379	-	-	-	28,581,379
Trade and other receivables	79,294,529	-	-	-	79,294,529
Assets held for managing liquidity	107,875,908	-	-	-	107,875,908

(expressed in Barbados dollars)

3 Financial risk management *...continued*

3.2 Financial risk factors *...continued*

c) Credit risk

Credit risk is the inherent risk that counterparties may experience business failure or otherwise avoid their contractual obligations to the Company.

Credit risk arises from cash and cash equivalents, deposits with banks and financial institutions as well as credit exposure to customers, including outstanding receivables and committed transactions. The Company's bank deposits and financial instruments are placed with highly reputable financial institutions to limit its exposure. Credit risk with respect to trade receivables is substantially reduced due to the policies implemented by management. Deposits are required from commercial customers upon application for a new service and management performs periodic credit evaluations of its general customers' financial conditions. Management does not believe significant credit risk exists at December 31, 2020. Further analysis of the company's trade receivables is disclosed in Note 7.

The maximum credit risk exposure is as follows:

	2020 **$**	**2019** **$**
Cash and cash equivalents (Note 6)	**41,969,904**	28,581,379
Trade and other receivables excluding prepayments (Note 7)	**53,925,095**	61,305,903
	95,894,999	89,887,282

d) Underinsurance risk

Prudent management requires that a company protect its assets against catastrophe and other risks. In order to protect its customers and investors, the Company, has established a "Self Insurance Fund" ("The Fund") in accordance with the Insurance Act – Insurance Regulations 1998 (Act 1996-32) to set aside funds on an annual basis to mitigate this risk. The Fund was required under the Act in order to self-insure the schedule of assets of the Company against damage and consequential loss as a result of a catastrophe.

The Fund is periodically reviewed by a risk consultant who makes recommendations to ensure the continued security and solvency of the Fund.

(expressed in Barbados dollars)

3 Financial risk management *...continued*

3.2 Financial risk factors *...continued*

e) Public Health Risk

An outbreak of infectious disease, a pandemic or a similar public health threat, such as the COVID-19 pandemic, or a fear of any of the foregoing, could adversely impact the Company, including causing operating, supply chain and project development delays and disruptions, labour shortages and shutdowns (including as a result of government regulation and prevention measures), which could have a negative impact on the Company's operations. Any adverse changes in general economic and market conditions arising as a result of a public health threat could negatively impact demand for electricity, revenue, operating costs, timing and extent of capital expenditures, results of financing efforts, or credit risk and counterparty risk; which could result in a material adverse effect on the Company's business. The Company maintains pandemic and business contingency plans to manage and help mitigate the impact of any such public health threat. The Company's top priority continues to be the health and safety of its customers and employees.

3.3 Capital risk management

The Company's objectives when managing capital are to safeguard its' ability to continue as a going concern and maintain an optimal capital structure to reduce the cost of capital.

In managing capital, the Company estimates its future cash requirements by preparing a budget annually for review and approval by the Board of Directors. The budget establishes the activities for the upcoming year and estimates costs of these activities.

The Company also monitors capital on the basis of the debt to equity ratio. This ratio is calculated as total borrowings divided by total debt and equity.

The gearing ratios at December 31, 2020 and December 31, 2019 were as follows:

	2020 **$**	**2019** **$**
Total borrowings (Note 10)	**195,719,538**	130,261,703
Total equity	**553,985,595**	525,262,353
Debt to equity ratio	**26%:74%**	20%:80%

In accordance with the Trust deed securing certain borrowings the Company is required to ensure the ratio does not deteriorate below 50:50. The Company complied with the requirement under the Trust Deed in 2020 and 2019.

The Barbados Light & Power Company Limited

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3. Financial risk management *…continued*

3.4 Fair value estimation

Fair value amounts represent estimates of the consideration that would currently be agreed upon between knowledgeable, willing parties who are under no obligation to act and is best evidenced by a quoted market price, if one exists. A market is regarded as active if quoted prices are readily and regularly available from an exchange, dealer, broker, industry Company, pricing service, or regulatory agency, and those prices represent actual and regularly occurring market transactions on an arm's length basis.

The carrying values of cash and cash equivalents, trade receivables less impairment provision and payable are assumed to approximate their fair values. The fair value of financial liabilities (Note 10) for disclosure purposes is estimated by discounting the future contractual cash flows at the current market interest rate that is available to the Company for similar financial instruments.

4. Critical accounting estimates and judgements

4.1 Critical accounting estimates and assumptions

Estimates and judgements are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

The development of estimates and the exercise of judgement in applying accounting policies may have a material impact on reported assets, liabilities, revenues and expenses.

4.2 Impairment of financial and non-financial assets

When the fair value declines or when there is objective evidence of impairment, management makes assumptions about the declines in value to determine whether it is an impairment that should be recognized in the non-consolidated statement of income.

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5 Property, plant and equipment

	Generation $	Transmission and distribution $	Other $	Work in progress $	Total $
For the year ended December 31, 2020					
Opening net book amount	**243,035,170**	**323,443,445**	**51,538,259**	**73,750,190**	**691,767,064**
Additions and transfers	**50,046,532**	**26,743,585**	**6,013,374**	**61,022,338**	**143,825,829**
Retirals	**(1,447,003)**	**71,661**	**(2,100)**	**-**	**(1,377,442)**
Depreciation charge	**(27,498,036)**	**(20,278,544)**	**(4,523,665)**	**-**	**(52,300,245)**
Closing net book Amount	**264,136,663**	**329,980,147**	**53,025,868**	**134,772,528**	**781,915,206**
At December 31, 2020					
Cost	**685,639,849**	**650,035,195**	**127,057,232**	**134,772,528**	**1,597,504,804**
Accumulated depreciation	**(421,503,186)**	**(320,055,048)**	**(74,031,364)**	**-**	**(815,589,598)**
Net book amount	**264,136,663**	**329,980,147**	**53,025,868**	**134,772,528**	**781,915,206**

	Generation $	Transmission and distribution $	Other $	Work in progress $	Total $
For the year ended December 31, 2019					
Opening net book amount	237,559,028	306,051,015	50,225,220	41,296,027	635,131,290
Additions and transfers	26,880,142	38,720,379	5,543,800	32,454,163	103,598,484
Retirals	(877,148)	74,249	(3,075)	-	(805,974)
Depreciation charge	(20,526,852)	(21,402,198)	(4,227,686)	-	(46,156,736)
Closing net book amount	243,035,170	323,443,445	51,538,259	73,750,190	691,767,064
At December 31, 2019					
Cost	652,119,267	629,184,992	121,223,642	73,750,190	1,476,278,091
Accumulated depreciation	(409,084,097)	(305,741,547)	(69,685,383)	-	(784,511,027)
Net book amount	243,035,170	323,443,445	51,538,259	73,750,190	691,767,064

Interest was capitalised was $1,088,362 in 2020 (2019 – Nil).

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements

Year ended December 31, 2020

(expressed in Barbados dollars)

6. Cash and cash equivalents

	2020 $	2019 $
Cash in hand and at bank	**40,995,029**	27,628,242
Short term bank deposits	**974,875**	953,137
Cash in hand and at bank	**41,969,904**	28,581,379

7. Trade and other receivables

	2020 $	2019 $
Trade receivables	**50,419,786**	52,083,220
Less: allowance for expected credit losses and discounts	**(1,742,000)**	(1,442,000)
Trade receivables, net	**48,677,786**	50,641,220
Other receivables	**5,247,309**	10,664,683
Prepayments	**11,610,350**	17,988,626
	65,535,445	79,294,529

The fair values of trade and other receivable equal their carrying values due to the short term nature of these assets.

The Barbados Light & Power Company Limited
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7. Trade and other receivables...*continued*

The movement in the allowance for expected credit losses and discounts was as follows:

	2020 $	2019 $
Balance - beginning of period	**1,442,000**	1,408,000
Increase allowance for expected credit losses and discounts	**300,000**	34,000
Balance - end of period	**1,742,000**	1,442,000

Based on the historic trend and expected performance of customers, the Company believes that the above allowance for doubtful receivables sufficiently covers the risk of default. Direct write offs for impaired receivables to the non-consolidated statement of comprehensive income were $62,520 (2019 - $467,684).

The ageing of trade and other receivables is as follows:

	2020			2019		
	Trade receivables $	**Other receivables $**	**Expected credit losses $**	**Trade receivables $**	**Other receivables $**	**Expected credit losses $**
Less than 30 days	**23,656,798**	**4,010,703**	**346,592**	33,933,704	8,999,813	298,615
31 - 60 days	**8,682,280**	**434,870**	**127,202**	8,349,424	323,448	73,475
61 - 90 days	**4,222,538**	**275,089**	**61,864**	3,728,415	191,522	32,810
Over 90 days	**13,858,170**	**526,647**	**203,034**	6,071,677	1,149,900	53,431
	50,419,786	**5,247,309**	**738,692**	52,083,220	10,664,683	458,331

As of December 31, 2020, trade receivables and other receivables of $ 27,667,501 (2019 - $42,933,517) were fully performing.

Due to the nature of the business and based on historical information, some trade receivables that are more than 61 days past due are not considered impaired. As of December 31, 2020, trade and other receivables of $18,882,444 (2019 - $11,141,514) were past due but not impaired.

The Barbados Light & Power Company Limited
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(expressed in Barbados dollars)

8. Inventories

	2020 $	2019 $
Fuel	**7,073,368**	10,202,630
Materials and spares	**17,848,196**	18,663,998
Goods in transit	**7,237,078**	2,470,877
	32,158,642	31,337,505

The cost of inventories written down and recognised as an expense during the year is included in operating expenses in the amount of $277,658 (2019 - Nil).

9. Share capital

The share capital in the Company is represented by:

Authorised

100,000 - 5.5% Cumulative preference shares of no par value
500,000 - 10% Cumulative redeemable preference shares of no par value
100,000,000 Common shares of no par value

Issued

	2020 $	2019 $
60,000,000 (2019- 60,000,000) common shares	**200,000,000**	200,000,000

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

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10. Borrowings

	2020 $	2019 $
Bank of Nova Scotia USD 10,333,333 (2019 - USD 11,666,667) repayable in 2020 Interest is payable at a rate of 4.5% per annum	**20,952,696**	23,656,269
National Insurance Board - Debenture Stock Certificates (Total facility BDS$20,000,000) repayable by 2040 Interest is payable semi-annually at a rate of 3.5% per annum	**20,000,000**	20,000,000
Royal Bank of Canada $3,520,379 (2019 – BDS$6,253,462) repayable by 2022 In monthly installments of blended principal at 4% interest rate per annum	**3,520,379**	6,253,462
National Insurance Board - Debenture Stock Certificates (Total facility BDS$20,000,000) repayable by 2025 Interest is payable semi-annually at a rate of 5.875% per annum	**20,000,000**	20,000,000
Bank of Nova Scotia $51,000,000 (2019- BDS$57,000,000) repayable by 2024 Interest is payable quarterly at a rate of 2.25%	**51,000,000**	57,000,000
Bank of Nova Scotia $76,894,489 (2019- Nil) repayable by 2025 Interest is payable quarterly at a rate of 2.05%	**76,894,489**	-
Government of Barbados LED Streetlight BDS$3,351,974 repayable by 2029 Unsecured, Interest rate 0%	**3,351,974**	3,351,974
Total borrowings	**195,719,538**	130,261,705
Less transactions costs	**(798,431)**	(1,194,481)
Accrued interest	**549,104**	423,801
	195,470,211	129,491,025
Less current portion	**(12,148,058)**	(52,813,151)
Total long term borrowings repayable after one year	**183,322,153**	76,677,874

The Barbados Light & Power Company Limited

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Year ended December 31, 2020

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10. Borrowings *...continued*

With the exception of the Government of Barbados LED streetlight loan, all long term loans are secured under a Debenture Trust Deed, which creates a first and floating charge on the Company's property, present and future. The Debenture Trust Deed restricts the Company from issuing debentures ranking pari passu with the floating charge created, unless the Company can meet the earnings coverage ratio and the equity/debt ratio set out in the Trust Deed. The Company may however issue a first security to manufacturers in respect of individual items of plant and machinery of up to 90% of the purchase price thereof and for a period not exceeding fifteen years.

The financial ratios were met by the Company for 2020 and 2019.

The maturity of borrowings is as follows:

	2020	**2019**
	$	**$**
Less than 1 year	**11,598,954**	52,389,352
Between 1 and 2 years	**30,254,370**	8,895,380
Between 2 and 5 years	**130,514,240**	65,624,999
Over 5 years	**23,351,974**	3,351,974
Total	**195,719,538**	130,261,705

The carrying amount and fair value of the non-current borrowings are as follows:

	Carrying amount		**Fair value**	
	2020	**2019**	**2020**	**2019**
	$	**$**	**$**	**$**
Borrowings	**184,120,584**	77,872,355	**183,906,344**	50,754,528

The fair value of current borrowings approximates their carrying value as the impact of discounting is not significant. The fair value is based on cash flows discounted using a rate based on the average borrowing rates of 3.70% (2019 - 4.18%)

As at December 31, 2019, the company had undrawn loan facilities with the Bank of Nova Scotia for $63,105,511 (2019 - $110,000,000).

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements

Year ended December 31, 2020

(expressed in Barbados dollars)

11. Customers' deposits

Commercial and non-resident customers are required to pay a security deposit for energy connections that are refundable when service is no longer required. Interest accrues on these deposits at a rate of 3.5% (2019 – 3.5%) per annum.

	2020	**2019**
	$	**$**
Balance - beginning of year	**46,411,900**	45,126,314
New deposits	**1,232,116**	2,053,591
Deposits refunded	**(1,639,049)**	(2,134,906)
Net interest	**1,396,649**	1,366,901
Balance - end of year	**47,401,616**	46,411,900

12. Deferred credits

	2020	**2019**
	$	**$**
Accumulated investment tax credit (Note 20)	**17,232,462**	18,609,793
Accumulated manufacturing tax credit (Note 20)	**19,078,160**	19,740,451
Customer contributions for work not yet started	**3,171,092**	2,890,405
	39,481,714	41,240,649

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

13. Taxation

a) Corporation tax expense

	2020 $	2019 $
Current tax	**-**	1,005,429
Current tax adjustment from prior year	**(490,927)**	-
Deferred tax credit	**161,757**	(261,610)
Tax (credit)/charge	**(329,170)**	743,819

The tax on income before taxation differs from the theoretical amount that would arise using the corporation tax rate of 5.5% (2019 -5.5%) for the following reasons:

	2020 $	2019 $
Income before taxation	**28,394,073**	54,185,622
Corporation tax at 5.5% (2019 – 5.5%)	**1,561,674**	2,980,209
Depreciation on assets not qualifying for capital allowances	**36,840**	36,227
Manufacturing allowance net of deferred portion	**(1,628,286)**	(99,355)
Investment tax credit net of deferred portion	**(75,753)**	(77,921)
Under provision of prior year's tax	**(490,927)**	-
Other permanent differences	**(19,808)**	-
Effect of reduction in tax rate for deferred tax liability	**-**	(472,273)
Effect of difference in deferred tax rate verses theoretical rate	**(204,133)**	(285,360)
Effect of Sliding Scale Rate	**468,874**	(1,361,930)
Depreciation on right of use asset	**22,349**	24,222
Tax (credit)/charge	**(329,170)**	743,819

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

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13. Taxation *...continued*

b) Corporation tax receivable

	2020 $	2019 $
Balance-beginning of year	**(240,169)**	1,167,509
Taxation charge	**(490,927)**	1,005,429
Taxes paid (net)	**(251,118)**	(2,413,107)
Corporation tax receivable	**(982,214)**	(240,169)

c) Deferred tax liability

The net deferred tax liability is calculated in full on temporary differences under the liability method using a average effective tax rate of 2.34% (2019 - 2.34%). This rate was calculated based on future estimated tax expense and taxable income. The movement on the account is as follows:

	2020 $	2019 $
Balance - beginning of year	**3,823,258**	4,084,868
Transfer to the non-consolidated statement of comprehensive income – current year credit	**161,757**	(261,610)
Balance - end of year	**3,985,015**	3,823,258

The deferred tax liability on the non-consolidated balance sheet consists of the following components:

	2020 $	2019 $
Accelerated tax depreciation	**197,174,018**	190,144,874
Taxed provisions	**(26,573,662)**	(25,996,004)
	170,600,356	164,148,870
Deferred tax liability at corporation tax rate 2.34% (2019 - 2.34%)	**3,985,015**	3,823,258

Accelerated tax depreciation and taxed provisions have no expiry dates.

The Barbados Light & Power Company Limited
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Year ended December 31, 2020

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14. Trade and other payables

	2020 $	2019 $
Trade payables	**28,575,323**	29,942,865
Accrued expenses	**39,588,297**	39,370,986
Social security and other taxes	**5,006,990**	4,677,890
	73,170,610	73,991,741

15. Provisions for other liabilities and charges

	2020 $	2019 $
At beginning of year	**8,957,163**	3,679,918
Additional provisions	**7,958,798**	11,618,328
Paid during the year	**(8,705,246)**	(6,341,083)
At end of year	**8,210,715**	8,957,163

The provision for other liability and charges relate to employee benefits and other customer related costs.

16. Related party transactions – Unsecured, interest free and repayable on demand

The Company is controlled by Emera (Caribbean) Incorporated, (the Parent) which owns 100% of the Company's shares.

i) The following transactions occurred with related parties:

Key management compensation:

	2020 $	2019 $
Salaries and other short term benefits	**2,225,085**	2,247,773
Pension	**336,698**	297,174
Directors' Fees	**50,000**	50,000
	2,611,783	2,594,947

The Barbados Light & Power Company Limited
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(expressed in Barbados dollars)

16. Related party transactions *...continued*

ii) Year end balances arising from the above transactions:

	2020 $	2019 $
Due from related parties		
Due from Self Insurance Fund	**44,838**	-
Due from Emera Caribbean Renewables Limited	**993,545**	96,033
	1,038,383	96,033
Due to related parties		
Due to Emera Inc.	**30,175**	15,410
Due to Emera (Caribbean) Incorporated	**1,145,712**	2,001,950
	1,175,887	2,017,360

17. Operating revenue

An analysis of revenue by customer base is detailed as follows:

	2020 $	2019 $
Large power	**69,491,543**	97,764,976
Secondary voltage power	**134,095,839**	171,402,298
Domestic service	**145,009,700**	160,719,298
General service	**24,254,910**	30,041,991
Street lighting	**4,815,141**	5,922,344
Time of use	**11,349,869**	10,100,221
Miscellaneous	**4,700,692**	7,080,779
Total revenue	**393,717,694**	483,031,907

The Barbados Light & Power Company Limited

Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

18. Expenses by nature

	2020 $	2019 $
Fuel	**202,978,824**	279,734,766
Depreciation (Note 5)	**52,300,244**	46,156,736
Depreciation of right of use asset	**406,353**	440,403
Maintenance of plant	**13,133,079**	14,991,081
Employee benefits (excluding amounts capitalised)	**39,856,499**	38,450,905
Insurance	**8,198,082**	5,803,861
Other expenses	**46,356,968**	40,787,828
Total operating expenses	**363,230,049**	426,365,580

Employee benefits comprise:

	2020 $	2019 $
Wages and salaries	**40,557,797**	39,035,508
Social security costs	**2,802,875**	2,638,027
Pension expense (Note 21)	**5,171,097**	5,556,378
Other benefits including share discount	**987,104**	840,845
	49,518,873	48,070,758

Allocated as follows:

	2020 $	2019 $
Operating expenses	**39,856,499**	38,450,905
Capitalised	**9,662,374**	9,619,853
	49,518,873	48,070,758

The Barbados Light & Power Company Limited

(expressed in Barbados dollars)

19. Leases

The Company has leases for land and commercial space. With the exception of short-term leases and leases of low-value underlying assets, each lease is reflected on the balance sheet as a right-of-use asset and a lease liability. Current leases have remaining lease terms of 3 years to 27 years.

The carrying amounts of the Company's right-of-use assets, lease liabilities and the movements during the period are as follows:

	Right-of-use Assets Land $	Lease liability $
As at January 1, 2020	**11,964,335**	**12,085,566**
Lease remeasurement	**(1,046,302)**	**(1,046,302)**
Depreciation expense	**(406,353)**	**-**
Interest expense	**-**	**250,345**
Payments	**-**	**(59,500)**
As at December 31, 2020	**10,511,680**	**11,230,109**

	Right-of-use Assets Land $	Lease liability $
As at January 1, 2019	12,404,738	12,404,738
Additions	-	-
Depreciation expense	(440,403)	-
Interest expense	-	275,828
Payments	-	(59,500)
Accrued	-	(535,500)
As at December 31, 2019	11,964,335	12,085,566

The Barbados Light & Power Company Limited
Notes to the Non-consolidated Financial Statements
Year ended December 31, 2020

(expressed in Barbados dollars)

19. Leases...*continued*

No right-of-use assets were subleased and there were no variable lease payments or sale-and-lease-back transactions for the year ended December 31, 2020. The following amounts were recognised within general expenses in the statement of comprehensive income:

	2020 $	2019 $
Expense relating to short-term leases	**287,114**	265,800

The maturity of lease liabilities is as follows:

	2020 $	2019 $
Less than 1 year	**59,500**	587,811
Between 1 and 2 years	**561,970**	561,970
Between 2 and 5 years	**1,612,065**	1,612,065
Over 5 years	**8,996,574**	9,323,720
Total	**11,230,109**	12,085,566

20. Finance and other income

Finance and other income is comprised as follows:

	2020 $	2019 $
Finance income	**326,939**	389,080
Other income	**1,412,333**	312,178
Deferred investment tax credit	**1,377,331**	1,416,748
Deferred manufacturing tax credit	**662,292**	1,806,450
	3,778,895	3,924,456

21. Retirement benefits

Pension expense for the year amounted to $5,171,097 (2019 - $5,556,378).

(expressed in Barbados dollars)

22. Bank Overdraft facilities

The Company renewed its agreement with Royal Bank of Canada on March 14, 2013 to create a debenture for $15,000,000. This was issued in accordance with the provisions of the Debenture Trust Deed (Note 10) to secure overdraft facilities granted to the Company.

23. Commitments

a) Capital commitments

The Company has $88,090,553 (2019 - $90,414,490) in capital commitments as at December 31, 2020.

b) Standby Letter of Credit

The company has a standby letter of credit in the amount of USD$5.6 million (2019- USD$27.8 million). This letter of credit is for a term of one year and can be renewed annually as required.

24. Contingent liabilities

The Company is contingently liable in respect of various claims brought during the normal course of business. The amounts are considered negligible and are usually covered by insurance.

The Barbados Light & Power Company Limited

Operating Statistics

Year ended December 31, 2020

(expressed in Barbados dollars)

		2020	2019	2018	2017	2016	2015
GENERATING PLANT (Megawatts)							
Installed capacity	Steam	40.0	40.0	40.0	40.0	40.0	40.0
	Diesel	140.1	125.1	113.1	113.1	113.1	113.1
	Gas turbine	86.0	86.0	86.0	86.0	86.0	86.0
	Solar PV	10.0	10.0	10.0	10.0	10.0	-
	TOTAL	276.1	261.1	249.1	249.1	249.1	239.1
PEAK DEMAND		141.0	150.5	152.3	159.1	157.3	155.2
GENERATION AND SALES (GWh)							
Gross generation	Steam	82.2	25.0	192.6	109.2	142.7	207.0
	Diesel	531.7	683.5	604.8	648.9	622.1	667.7
	Gas turbine	271.4	284.0	196.5	244.8	254.7	135.7
	Temp. Gen	16.5	0.0	-	6.0	-	-
	Solar PV	28.4	18.9	18.3	18.0	8.9	-
	Battery	0.8	1.8	2.7	-	-	-
	TOTAL	930.9	1,013.2	1,014.9	1,026.9	1,028.4	1,010.4
Net generation		899.1	980.0	970.4	989.3	989.6	967.8
Purchased Power		52.3	33.7	25.8	19.8	27.1	18.7
Total Power		951.4	1,013.7	996.2	1,009.1	1,016.7	986.5
Sales (GWh's)	Domestic	347.1	328.9	319.8	324.1	321.0	307
	Commercial	542.9	618.8	622.7	619.9	622.7	608
	TOTAL	890.0	947.7	942.5	944.0	943.7	915
Load factor (%)		79.4	79.4	78.0	75.1	76.4	75.6
Losses (%)		5.79	6.68	5.2	6.2	6.9	6.9
NUMBER OF CUSTOMERS AT YEAR END	Domestic	115,275	114,550	113,654	112,054	109,947	109,181
	Commercial	16,247	16,308	16,331	17,058	16,425	17,009
		131,522	130,858	129,985	129,112	126,372	126,190
No. of Streetlights		32,846	32,886	32,432	32,550	30,884	30,886

IV

DRAFT
16 March 2021

Licence No. [●]

GENERATION AND ENERGY STORAGE LICENCE

granted under the
Electric Light and Power Act 2013-21
to

THE BARBADOS LIGHT & POWER COMPANY LIMITED

DRAFT
16 March 2021

Licence No. [●]

TRANSMISSION, DISTRIBUTION AND SALES LICENCE

granted under the
Electric Light and Power Act 2013-21
to

THE BARBADOS LIGHT & POWER COMPANY LIMITED

[redacted]

DRAFT
16 March 2021

Licence No. [●]

DISPATCH LICENCE

granted under the
Electric Light and Power Act 2013-21
to

THE BARBADOS LIGHT & POWER COMPANY LIMITED

[redacted]

[redacted]

V

Performance Benchmarking Study 2014-2019
Final Report

Prepared for:

THE BARBADOS LIGHT & POWER COMPANY LIMITED

Garrison Hill
St. Michael
BARBADOS

This report has been prepared by:

Verlaan Consulting

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Willemstad
Curaçao

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This Report has been prepared under the terms of a *Confidentiality and Non Disclosure Agreement* as entered into between The Barbados Light & Power Company Limited and Verlaan Consulting Limited on the 29th day of October 2018.

The consultant has made reasonable efforts to check the validity and consistency of the data collected. The information presented in this report is intended for the sole purposes of this study. Any error or inaccuracy in the data included in this report is involuntary and the consultant does not assume any responsibility for it, or for unintended uses of the results.

April 28, 2021.

Contents

Table of Figures

1. Executive summary

1.1 Introduction

The Barbados Light & Power Company Ltd. (BLPC) retained the services of Verlaan Consulting Ltd. for preparing a report demonstrating the efficiency and effectiveness of BLPC's operations when benchmarked against other utilities in the Caribbean as well as larger utilities in Europe and North America.

This Report contains the results of the Benchmarking Study covering 24 performance indicators of a selection of 10 Caribbean electric utilities, as calculated for the years 2014 through 2019. The analysis in this Benchmarking Study Report will highlight the relative change in BLPC's performance over this period. Next to comparing the performance of BLPC with other Caribbean island utilities during the 6-years period, it has furthermore been decided to also benchmark the performance of BLPC against North American and European Utilities. In this report commentary will be provided in a separate Chapter on the general performance of island systems (with emphasis on BLPC's operations) as compared to large, interconnected, mainland utility systems.

For the sake of confidentiality the names of the utilities who participated in the study are kept anonymous, and will as such appear in this report as A, B, C., etc. Furthermore it has been agreed upon that every participating utility will – in appreciation of their willingness to participate in this Benchmarking Study - receive tables and graphs with the comparisons of performance indicators for each year, with only the utility's name mentioned and the other utilities (including BLPC) kept anonymous.

For processing all data needed for calculating the performance indicators, a database has been prepared and models in Excel files with which different ways of presenting performance indicators can be generated, making use of equations for calculating the performance indicators. Benchmarking Study results are presented in this report with different types of graphs and tables comparing the utilities through the years 2014 to 2019, as follows:

- graphs and tables, each showing performance indicators of all utilities through the years as well as the average of the performance indicators per year;
- graphs and tables showing trends of the performance of BLPC and the peer group of utilities through the years, with additional the indicators of all utilities in the final year 2019;
- overviews showing changes of performance indicators of BLPC and of the average of the peer group's indicators between 2014 and 2019; this overview also shows the ranking of BLPC per performance indicators in the years 2014 and 2019;
- a so-called radar diagram which shows all of BLPC's performance indicators compared with the average of the peer group's indicators. This way it is shown in one view in which performance indicators BLPC is performing better or worse than the average performance of the peer group. A similar radar diagram has been prepared showing major performance indicators of BLPC compared with the average performance indicators of mainland utilities;

Per utility the total amount of 'raw data' of the 6 benchmarking years, needed for calculating all performance indicators, amounts to 450. In this report it has been attempted to make use of this wealth of information in such a structured way that the objective of the Benchmarking Study is clearly met, which is: *demonstrating the efficiency and effectiveness of BLPC's operations when* *benchmarked against other utilities in the Caribbean as well as larger utilities in Europe and North America.*

1.2 Major conclusions based on high level observations

With all raw data gathered the information on performance indicators can be captured in different ways. The formats in which BLPC's performance per year can be observed and analyzed in comparison with the other utilities will enable the retrieval of insights in the development of performance indicators through the years. At the same time trends can be identified, as well as similarities and/or differences in which BLPC's indicators can be distinguished from the other utilities. When looking at the group of island utilities it can be identified whether the size of the island utilities have impact on the performance of utilities, whether large islands may already have the advantage of better economies of scale and finally also a comparison with large mainland utilities should show how economies of scale, interconnection with other power systems, more diverse types of fuel, better fuel prices, and other factors lead to much better performance when it comes to important issues like efficiency, reliability and productivity.

1.2.1 Impact of Caribbean utility sizes

Before identifying the highlights of BLPC's performance on efficiency, financial performance, effectiveness and customer issues, compared with the other utilities, first an analysis is given of the impact on the average cost of energy per MWh of both the maximum load as well as of the average usage per customer. It shows that within a broad difference of usage per customer and also within a broad difference of maximum loads the impact on the average cost per MWh is relatively low. So there is not much difference in cost per MWh between a larger island and a small island. Only very small islands have substantially higher cost per MWh.

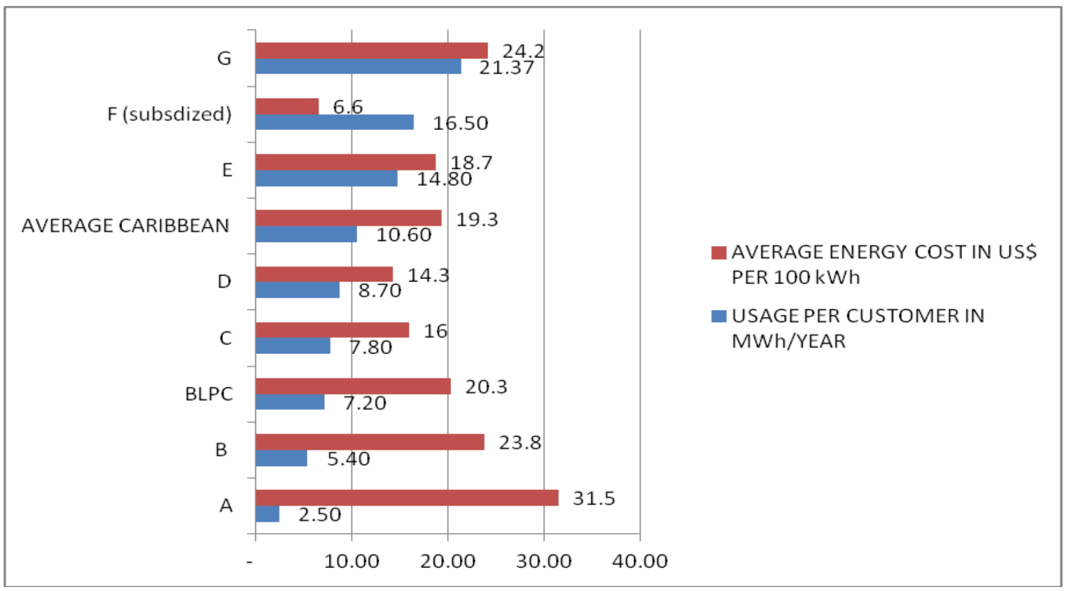

Figure 1: Average energy cost compared with usage per customer in 2019

For utilities A through D (including BLPC) the average energy cost is decreasing with growing usage per customer. Utilities E and G however, with high usages per customer (15 MWh per year and 22 MWh per year) still show much higher energy cost per 100 kWh and therefore do not show economy of scale as would be expected.

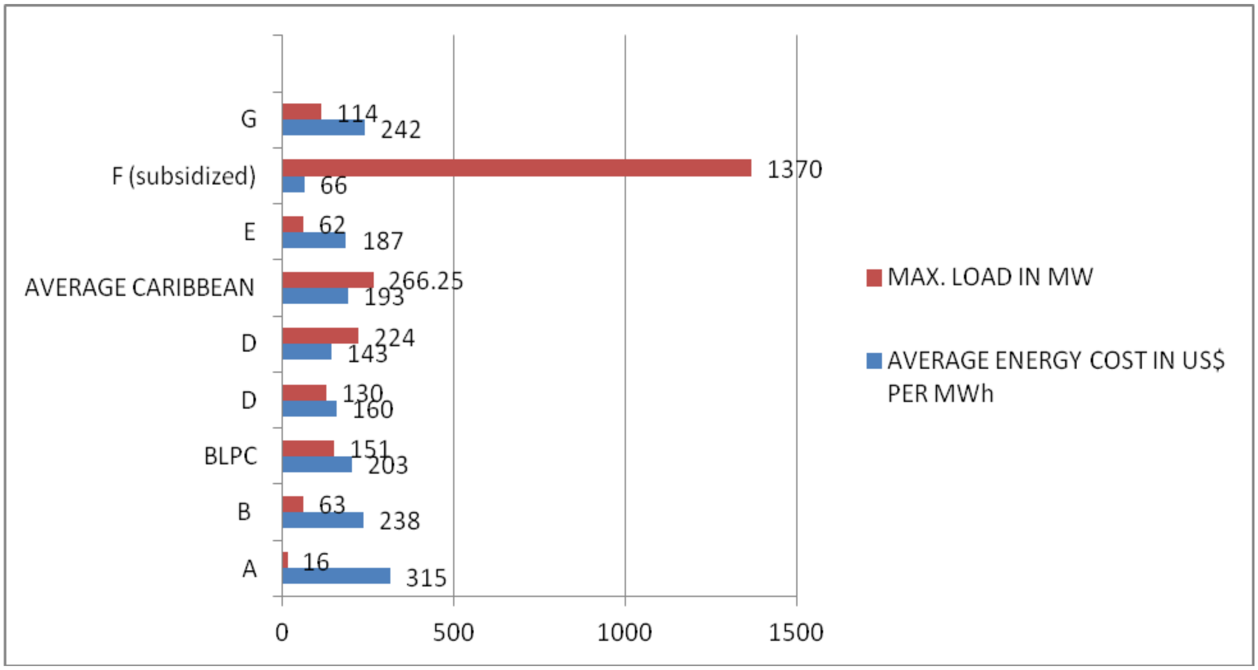

Figure 2: Average energy cost compared with maximum load in 2019

A similar phenomenon can also be identified when comparing the average energy costs of these utilities with their maximum loads. The curve of average energy cost remains rather flat at maximum loads varying from 62 to 224 MW, when excluding utility A with a maximum load of only 16 MW and when not counting the subsidized utility F with a maximum load of 1370 MW. Since the average maximum load of this group of utilities is 257 MW no economies of scale could apparently be reached for utilities with such varying sizes. Utility F with a high max. load of 1370 MW is still included in the graph, like also in figure 1, just to show the differences that occur for this substantially subsidized utility.

The overviews in figures 1 and 2 are representing figures as applicable for the year 2019. For the previous years 2014-2018 the overviews are very similar, only slowing slight differences and with no considerable position changes of utilities against each other in the graphs.

1.2.2 BLPC and major performance indicators, including tariffs

In Chapter 3 all performance indicators of BLPC during the years 2014-2019 are presented and analyzed, comparing them with the average of the peer group’s performance indicators in those years and also showing the performance indicators of the individual utilities in the year 2019. This way trends can be identified, both in the development of BLPC’s performance and in the average performance of the peer group. Furthermore these graphs show where BLPC stands in the final year 2019 of this survey. As already mentioned, the graphs and tables of all performance indicators in all years of the survey are shown in Appendix 1.

In this executive summary we will concentrate on the major performance indicators, focusing on efficiency, reliability, productivity, financial indicators and tariffs. The results are based on the survey among Caribbean utilities.

Comparisons with mainland utilities are shown in Chapter 1.2.4

a) Average energy cost in US$/MWh

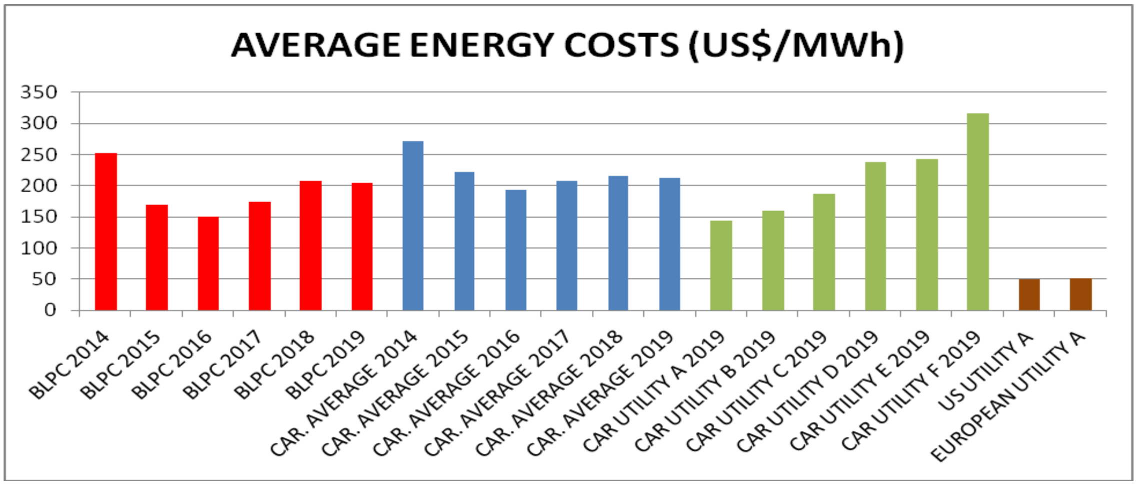

Figure 3: Average energy cost in US$/MWh

BLPC's energy cost per MWh has been lower than the Caribbean average through the years 2014-2019. For utility A it must be noted that almost half of the energy is produced with hydro power at a low cost per MWh. The graph shows a strong decrease in costs after the year 2014, which is caused by the decrease of fuel costs. In the performance indicator on fuel costs as well as in the overview of the utilities' fuel surcharges a similar impact of lower prices can be observed.

In the table in Chapter 1.2.3 it is shown that the average energy cost of the peer group's utilities decreased from 2014 to 2019 by 21.3%, mainly because of the drop of fuel prices in 2015.

BLPC's average costs went down in this period with 19.4% (from US$ 252.9/MWh to US$ 203.6/MWh) and was lowest in 2016: US$ 150.74/MWh.

As said fuel costs have a high impact on the average energy costs. When looking a generation costs without fuel costs in the last three years it can be seen that the cost level of BLPC remained quite stable, while in the averages of the Caribbean utilities generation costs without fuel costs slightly went up in these years.

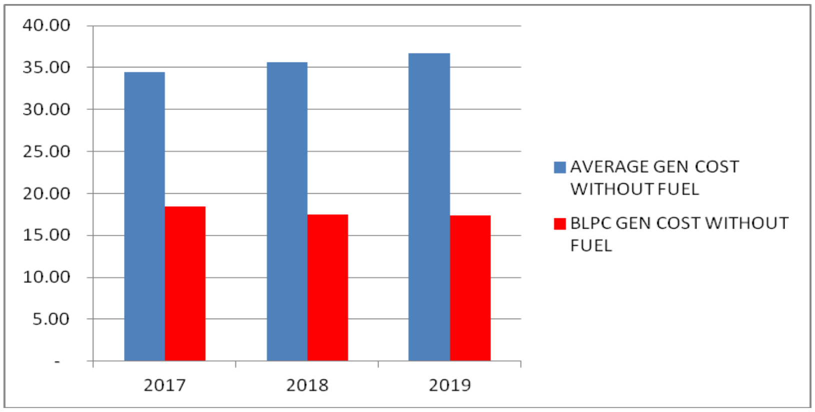

Figure 4: Generation cost without fuel cost

b) Supply Side Energy Efficiency

On Supply Side Energy Efficiency two performance indicators are of importance:

- System Losses
- Plant Energy Consumption (or: Power Station Own Usage).

Regarding System Losses it can be observed that BLPC is performing well, also when compared with mainland systems as to be clarified in Chapter 1.2.4. BLPC' s system losses of 6.3% in 2019 are low compared with the Caribbean average of 11.04% and slightly higher than utility A with 6.63%.

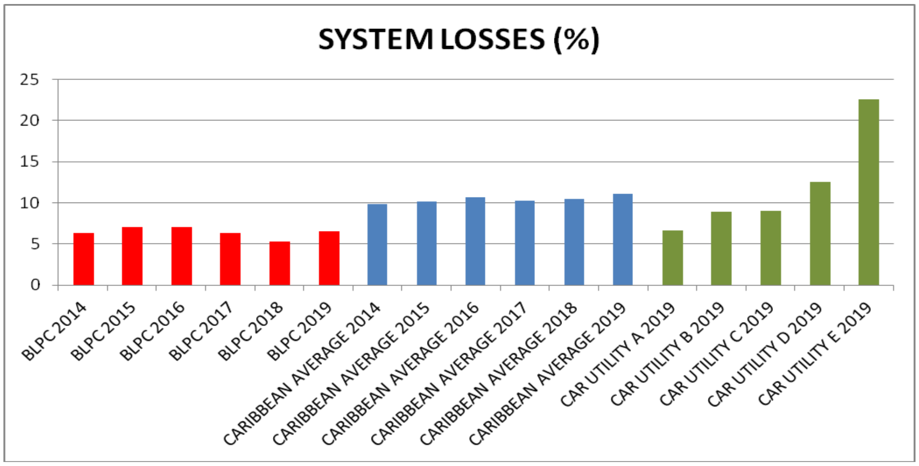

Figure 5: System Losses

In Plant Energy Consumption (Station Losses) the percentage of BLPC is rather high. From 2016 until 2018 the Station Losses went down from 6.83% to 5.28% but in 2019 there was an upward trend towards 6.91%. In 2019 we did not see much difference in energy produced, but system capacity was 284 MW in 2019 and 249 MW in 2018. Maybe higher power plant usage appeared when deploying new generating units.

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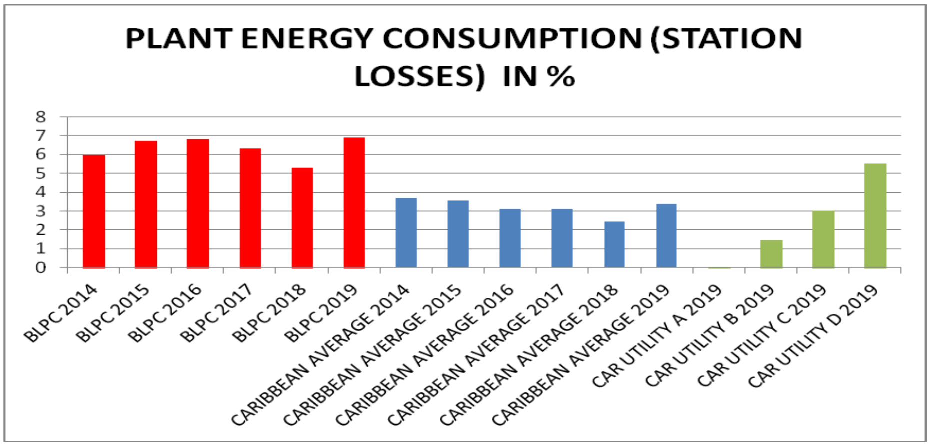


Figure 6: Plant Energy Consumption

c) Tariffs

The typical total bills for usages of 150, 250 and 400 kWh per month show only 1 utility in 2019 with lower total bills, while for commercial and industrial customers BLPC has the lowest typical total bill.

Regarding base rates the figures as reported by the utilities are all presented in Appendix 1. The results show that BLPC's base rate is lowest in all usage categories. The graphs show big differences in both base rates and fuel surcharges among the Caribbean utilities. For example for a domestic user of 400 kWh/month BLPC's base rate is US$ 35.20 against US$ 87.28 for the utility with the highest base rate, but the latter utility has a lower fuel surcharge. Note that some utilities include the fuel surcharge in the base rate.

Another aspect is that fuel costs are differing per utility because of different fuel mixes (HFO, diesel, Jet Fuel) and different fuel efficiencies of generating units.

Also we have two utilities in the peer group which have almost all the large users close to each other and not far from the power plant, while also the transmission voltage is relatively high. This way more efficiency can be achieved in T&D costs and system losses.

This all means that there is the danger of comparing apples and oranges. However, in the Benchmarking Study the total bills for different usage categories are anyway giving a reasonable impression of the tariffs and the differences between the utilities. For all usage categories the graphs and tables are given in Chapter 3 and in Appendix 1.

The typical bill below for a domestic customer using 400 kW/month, here given as an example chosen from all typical bill comparisons, shows that only one utility has a lower 400 kWh/month bill than BLPC and that through the years BLPC's rates were below the average of the peer group.

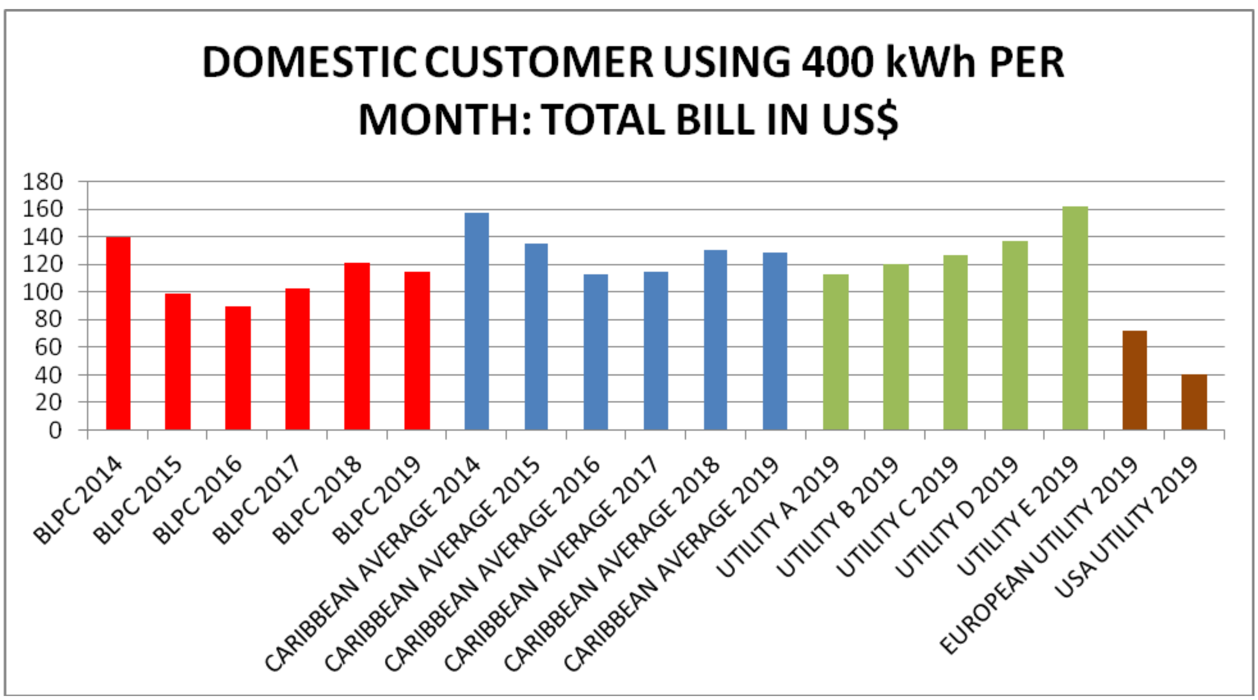


Figure 7: Bill for a domestic customer using 400 kWh/month

Note that the impact of lower fuel prices as of 2015 is clearly reflected in the tariffs.

d) On **labor productivity,** also a measure of efficiency**,** the following results are shown below.

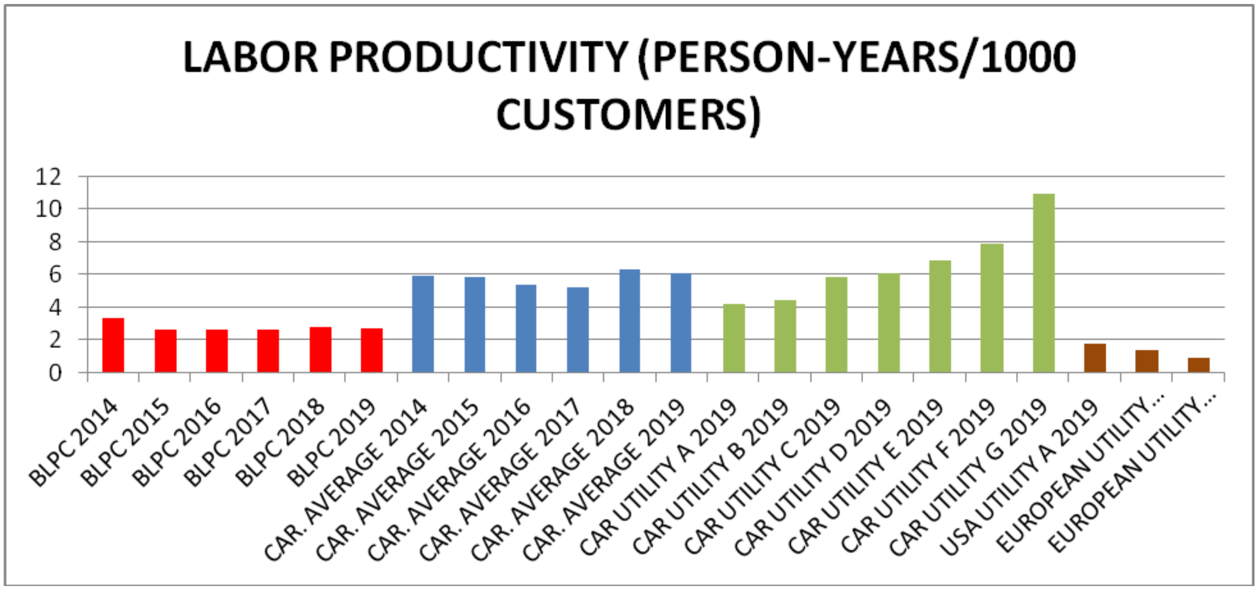


Figure 8: Labor Productivity

Throughout the years BLPC's labor productivity was substantially higher than the average labor productivity of the Caribbean peer group. BLPC's labor productivity was 3.35 person-years per 1000 customers in 2014 and 2.69 in 2019, with the peer group's average in 2019 at 6.11.

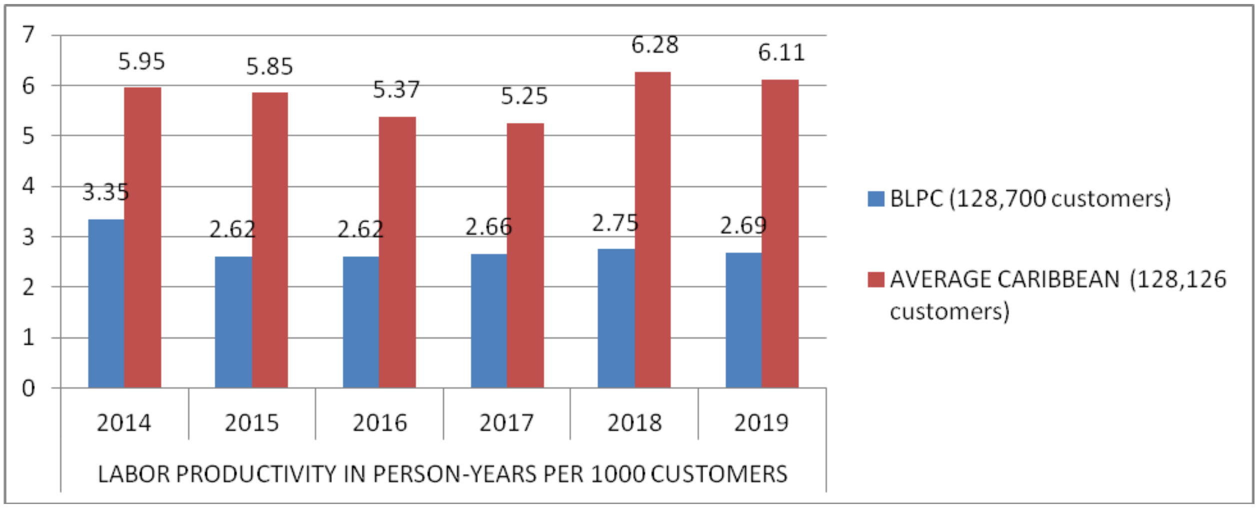


Figure 9: BLPC's Labor Productivity compared with the Caribbean average

e) Reliability

For benchmarking the reliability of BLPC's power system with the peer group's utilities the indices SAIDI (System Average Interruption Duration Index) and SAIFI (System Average Interruption Frequency Index) have been used. Regarding SAIDI BLPC shows the second best performance in the Caribbean peer group with for 2019 an average interruption duration of 3.5 hours.The Caribbean average ended in 2019 at 5.71 hours. The Caribbean average in 2018 and 2019 is much lower than in the previous years, because one utility with very high SAIDI figures in 2014 through 2017 did not provide its SAIDI figure for 2018 and 2019.

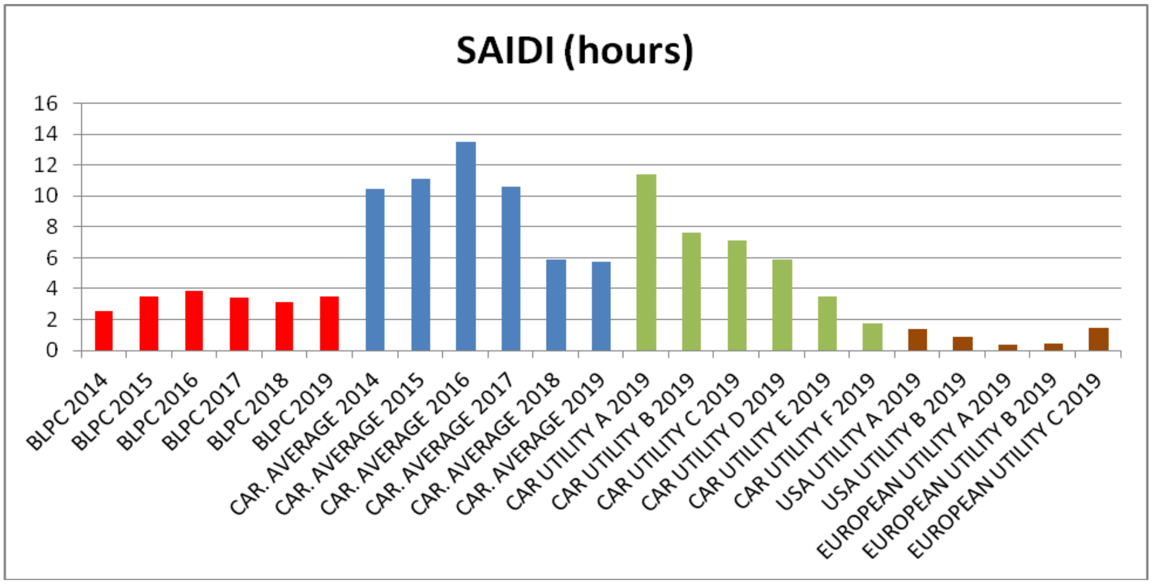


Figure 10: SAIDI

On the contrary BLPC's score for SAIFI is on the high side, namely 4.9 in 2019 (although lowest since 2014). Only Caribbean utilities E and F have a higher score. This means that customers suffered as an average 4.9 times from an interruption in the year 2019, but since the average interruption duration (SAIDI) in this year was low (3.5 hours), the duration per interruption must have been relatively low.

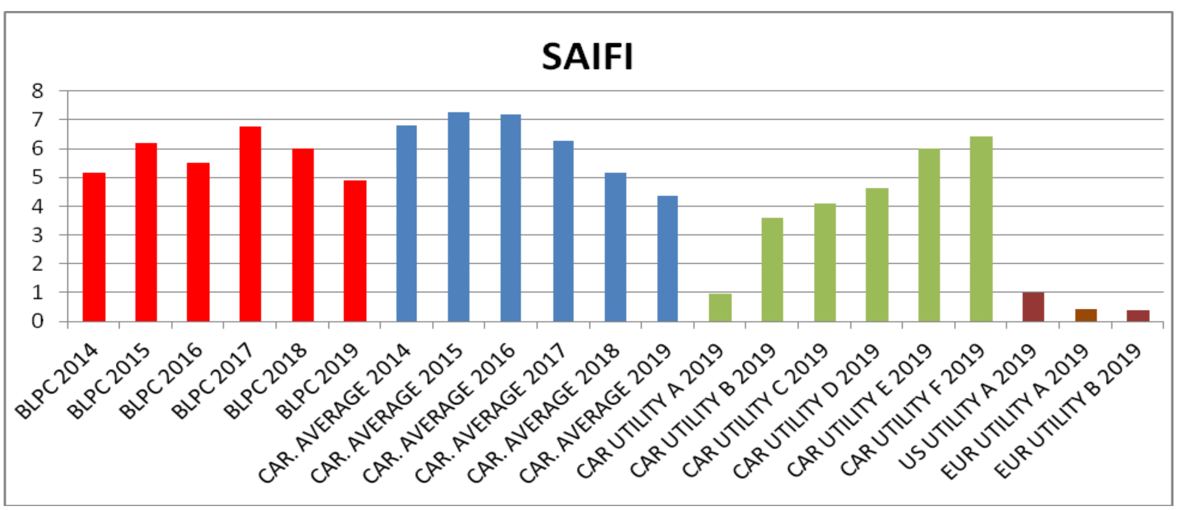


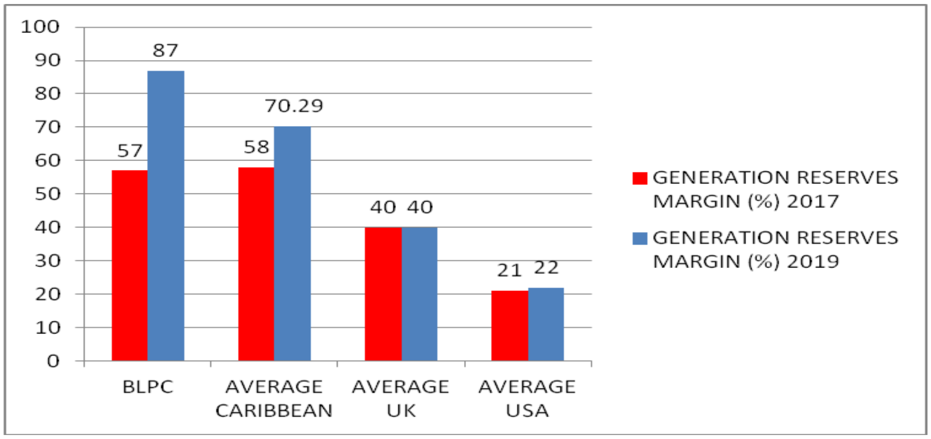
Figure 11: SAIFI

f) Generation availability and reserves margin

With a generation availability of 84% BLPC is nicely at the average of the peer group's percentages. Also compared with mainland utilities 84% is a good score for availability.

Reserves margins of island systems are generally higher than in mainland systems, given their isolated situation. In island systems reserves margins of 50 to 70% are quite common, while in the big mainland countries with their interconnections 40% is quite usual and in the USA reserves margins are even lower.

Still BLPC's reserves margin which usually was around 60% went up to 87% in 2019, which was caused by an increase of the installed production capacity.



Generally the number and size of generating units in the production park are based on the so-called n-2 criterion or on the so called LOLP (Loss of Load Probability), while unit sizes should remain limited in order to avoid domino effects and blackouts in case a unit fails and the size of this failing unit is too high compared with the load.

The graphs and tables for generation availability and for the reserves margin are shown in Chapter 3.

Furthermore it should be mentioned here that because of the rather high reserves margins the Utilization Factor of the island systems is relatively low and as an average even below 50%.

All together this also contributes to less efficiency compared with mainland systems, on top of higher fuel prices in the remote islands, while also missing a large economy of scale given the small sizes of the island utilities.

These factors are all reflected in the high level of tariffs of the island systems, which will further be analyzed in the section with comparisons with mainland utilities.

g) Financial information

Utilities need to achieve a reasonable operational profit margin and a reasonable return on assets, in order to keep up their financial health and to meet shareholders' dividend targets.

The average operational profit margin was relatively low during the period from 2014 to 2019, with only a modest peak of 5.23% in 2015 and an average value of 3.09% in 2019. However, the differences between the utilities are large, as to be seen in figure 12 on the next page. Still three utilities performed well and achieved high profit margins of over 10%.

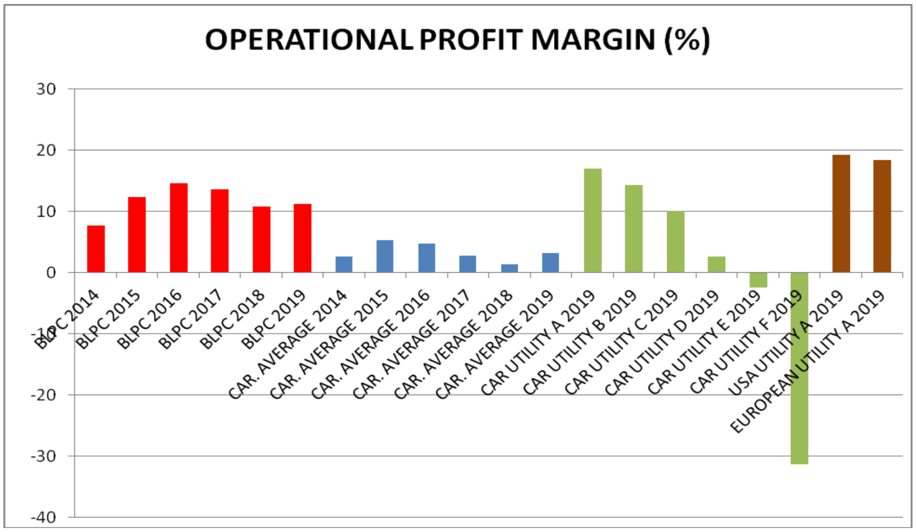


Figure 12: Operational Profit Margin trends

For BLPC we see a profit margin of 11.22% in 2019, coming from 7.62% in 2014 and with a peak of 14.61% in 2016.

In the raw data obtained from BLPC it can be seen that the net Income before tax is growing per year, from some $ 21.1M in 2014 up to $ 27.1M in 2019, while at the same time the Operational Revenue (as well as the Total Cost) went down in 2014-2019 (also impacted by lower fuel prices, which resulted in lower revenues because of the lower fuel surcharges). With a lower revenue amount and still a rather similar net income, the percentage of the net income against operational revenues (the profit margin) will go up.

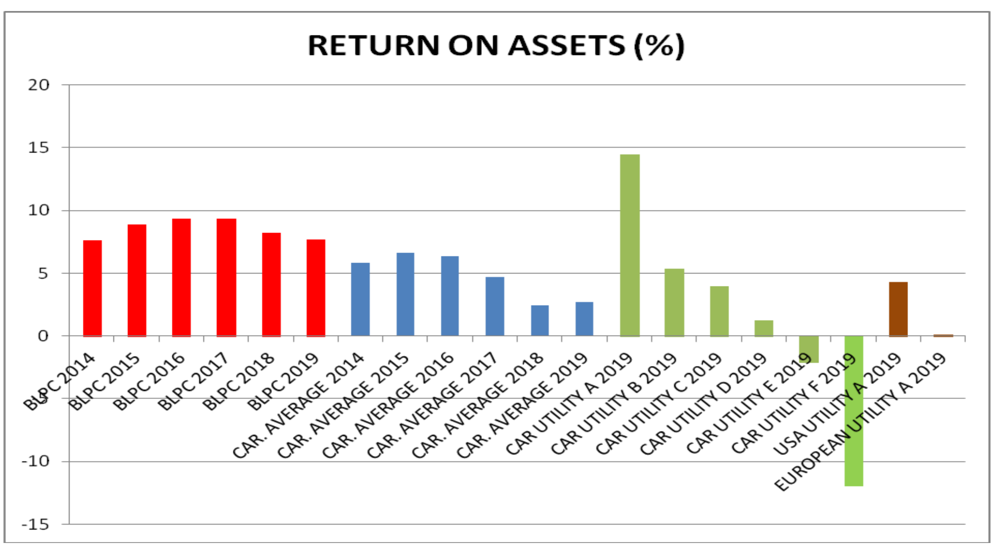


Figure 13: Return on assets trends

For the Return on Assets again a group of reasonably well performing utilities can be identified, among them BLPC with an RoA growing from 7.59% in 2014 to 7.7% in 2019, with a peak of 9.35% in 2016, far above the peer group's average (2.68% in 2019). Like for the Operational profit margin also three utilities suffered from negative results, down to -12%.

1.2.3 BLPC's ranking position and performance trends among the peer group

The table below shows for each performance indicator :

- BLPC's position on the rankings of the years 2014 and 2019;
- The percentage of progress or decline made by BLPC from 2014 until 2019 ;
- The percentage of progress or decline of the average performance of the peer group from 2014 until 2019.

Performance improvements are given in percentages in the green boxes. Regression of performance is expressed in percentages in the red boxes.

It can be seen that the peer group's average values of 9 performance indicators decreased in the period from 2014 until 2019, while the average of 14 performance indicators is showing improved performance. On the contrary BLPC shows 7 decreasing performance indicators from 2014 to 2019. All other 16 indicators show an improved performance.

	ranking 2014	ranking 2019	BLPC 2014-2019	AVERAGE 2014-2019
Service coverage	1	1	0%	0.43%
System Losses	1	1	3.2%	-11%
System Load Factor	3	4	2.6%	4.7%
Average Energy Cost	4	3	19.4%	21.3%
Operational profit margin	6	3	47%	22%
Return on Assets	5	2	1.4%	-54%
Debt Level	1	1	-9.6%	-23.0%
Labor Productivity	2	1	19%	-2.6%
SAIDI	2	3	-37%	46%
SAIFI	6	6	5.2%	36%
T&D Cost	2	1	20.6%	20%
T&D Productivity	4	1	37%	-20.0%
Generation Reserves Margin	5	2	52.6%	-4.0%
System equivalent availability	3	5	0.0%	8.0%
Plant energy consumption	9	5	15.5%	9.0%
Utilization factor	3	6	-12.5%	4.0%
Fuel Cost	4	4	21.0%	37.0%
Generation Cost	3	3	13.0%	32.0%
Generation Productivity	3	1	20.0%	-7.0%
Complaints / 1000 customers	5	3	-66.0%	42.0%
Commercialization Cost	1	3	-8.0%	50.0%
Bad debt	1	1	-49.0%	-49.0%
Commercialization Productivity	1	1	6%	-24%

Figure 14: Ranking position and performance trends

Please note that figure 14 only gives actual figures on BLPC's ranking position, but figures could be misinterpreted if not considered in the context of comparing performance indicators among the peer group utilities. As an example it can be mentioned that the level of SAIDI decreased 37% in the years from 2014 to 2019. At the same time the comparisons show that BLPC's SAIDI figures were much lower in 2019 than the SAIDI figures of the other utilities. This is showing very good performance through the years, even while there was a decrease of 37% of BLPC's own figures (which means that SAIDI went up from 2.56 in 2014 to 3.51 in 2019, which is a decrease of performance).

When it comes to total bill amounts and base rates for different usage categories it can be seen below that BLPC's base rates were the lowest among the peer group through the years 2014 until 2019.

In the low usage categories BLPC's total bills are ranked nr. 2, but for commercial and industrial customers BLPC's total bill is lowest. Total bills went down particularly after fuel prices dropped in 2015. BLPC's total bills decreased with 17% to 30% in the period from 2014 and 2019. The average decrease of the peer group was lower, between 4% and 18%, indicating that fuel surcharge and additional charges must have been lower, which could partly be a result of higher fuel efficiency of BLPC's production park.

Figure 15: Total bill and base rate trends 2014-2019

		Ranking and Trends Base Rate and Total Bill		BLPC 2014-2019	AVERAGE 2014-2019
		Ranking 2014	Ranking 2019	BLPC 2014-2019	AVERAGE 2014-2019
Total bill 150 kWh		3	2	20%	9%
Base rate bill 150 kWh		1	1	21%	4%
Total bill 250 kWh		4	2	17%	11%
Base rate bill 250 kWh		1	1	12%	14%
Total bill 400 kWh		4	2	18%	18%
Base rate bill 400 kWh		1	1	8%	4.8%
Total bill 2000 kWh		2	1	19%	9%
Base rate bill 2000 kWh		1	1	4.8%	9.5%
Total bill 5000 kWh		2	1	20.00%	8%
Base rate bill 5000 kWh		1	1	2%	2.3%
Total bill 100,000 kWh		5	1	20.00%	4%
Base rate bill 100,000 kWh		1	1	0%	32%

= decrease

= increase

1.2.4 The Caribbean and mainland utilities

It is obvious, like this has been confirmed in many studies before, that (small) island systems are less efficient and less effective than large mainland systems. Also in this Benchmarking Study the advanced position and the characteristics of the mainland utilities of which publicly available information could be obtained, result in differences in performance which could be expected. In Chapter 5.1 the factors which contribute to less efficiency and less effectiveness are mentioned.

The major differences are in the average cost per MWh and in the tariffs.
BLPC's cost per MWh is four times higher than the cost of mainland systems, while the average cost per MWh of the Caribbean peer group is 4.3 times higher in 2019.

BLPC's total bill tariffs in different usage categories are in 2019 around 1.6 times higher than European utilities in Western European countries like Germany, The Netherlands and the UK, and are around 2.8 times higher than in the Southeast of the USA. The difference with European tariffs has become smaller because of increased tax charges imposed on electricity tariffs. The figures 16 and 17 show the differences in total bills for usage of 400 kWh per month and for 2000 kWh per month.

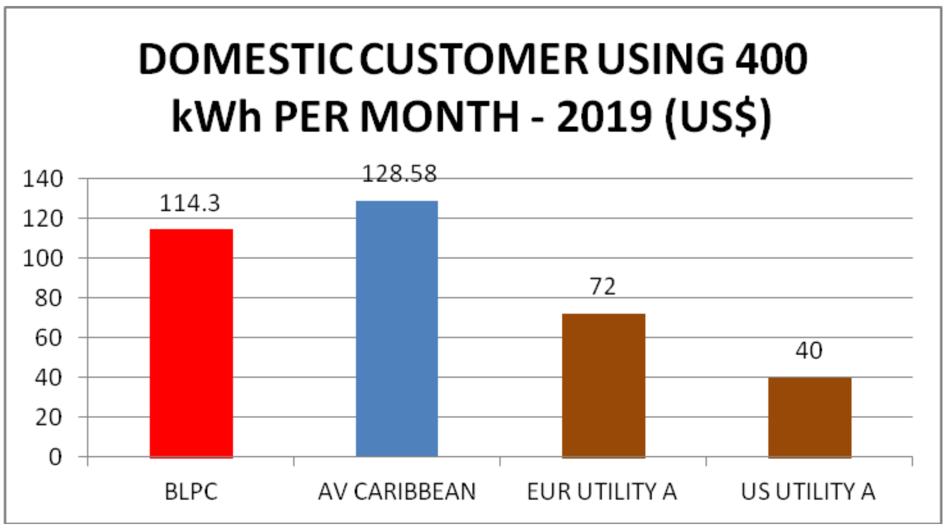


Figure 16: Total bills for usage of 400 kWh per month

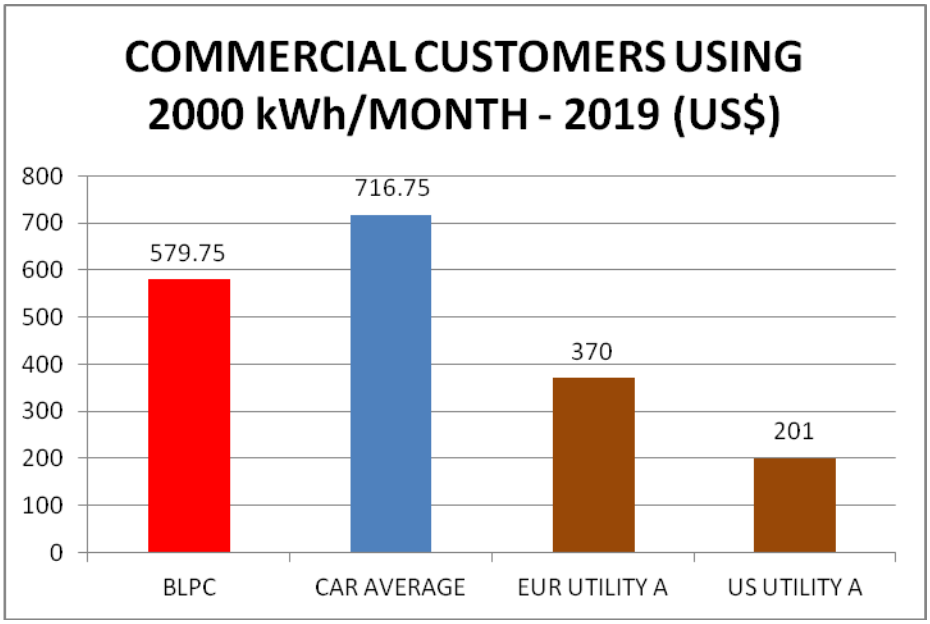


Figure 17: Total bills for usage of 2000 kWh per month

So far the large differences between BLPC and the mainland utilities are clear, although the differences are not as large anymore as observed some 10 years ago in the Carilec studies.

The radar diagram in Figure 18 shows the most important performance indicators of BLPC in 2019 against the average of the mainland utilities. The blue circle represents the score of the mainlands' indicators, all set at 100%, and in red BLPC's score against this peer group's 100% is shown. This way the radar diagram gives an overview of where BLPC stands in 2019 compared with mainland utilities, when looking at most important performance indicators. Scores within the blue circle show better performance of mainland utilities.

The diagram shows clearly that on average cost, tariffs, operational profit margin, labor productivity, SAIDI and SAIFI the performance of mainland systems is better.

Still BLPC performs better when it comes to percentages of Return on Assets, Debt level, Generation reserves margin and Bad Debt, while on System Losses and Generation Availability the score of BLPC is equal to the score of the mainland utilities and as such positioned on the blue circle.

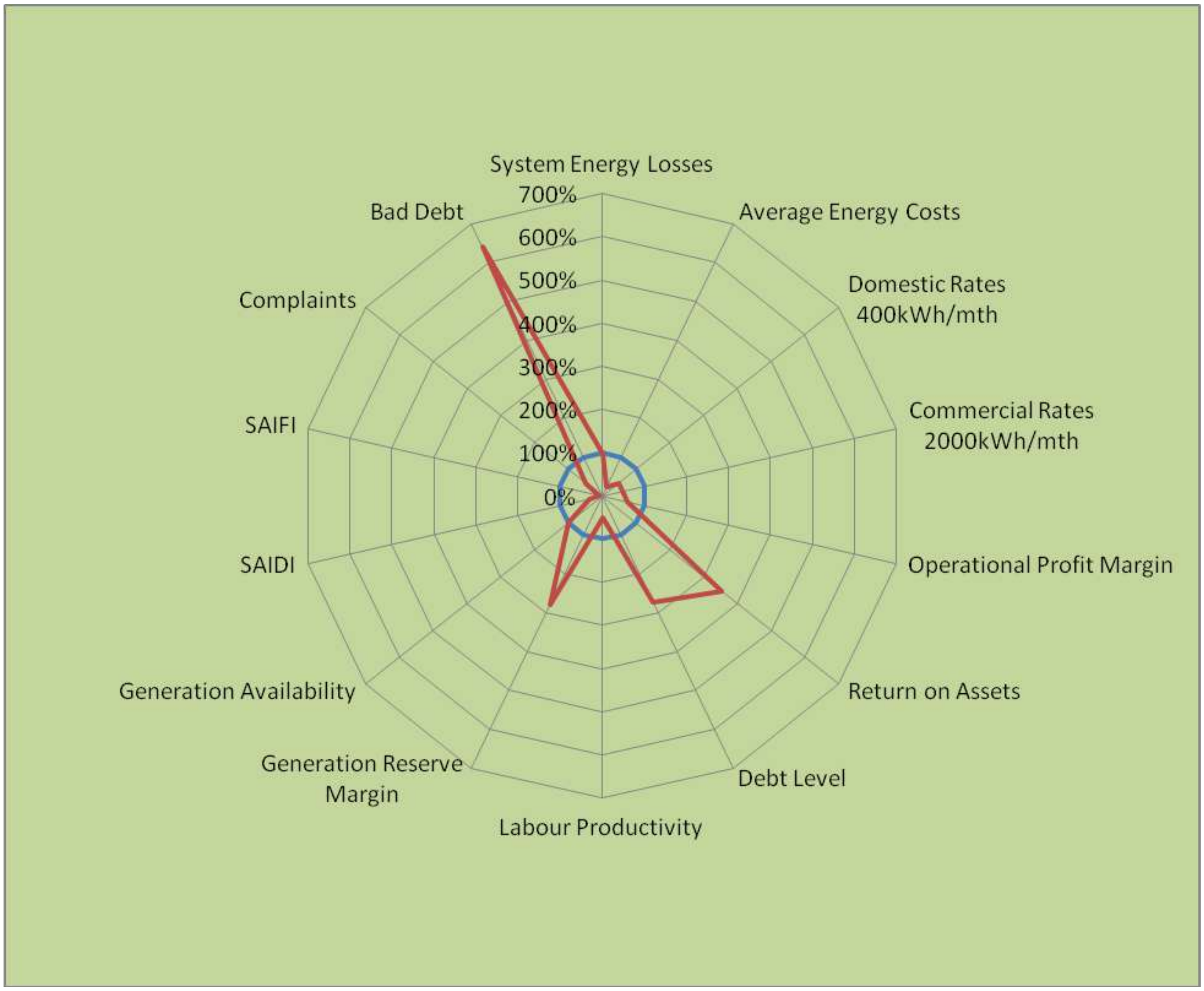


Figure 18: Radar diagram comparing BLPC with mainland utilities

When looking at performance indicators, which are known to be quite different between island and mainland systems it can be observed that through the years BLPC has made progress in getting closer to these large utilities, as follows:

- In labor productivity BLPC is getting close to labor productivity of European and US utilities, which are serving many millions of customers while BLPC "only" serves 130,389 customers.
- In Operational Profit Margin a large US utility reaches a 1.66 times higher percentage, but against this same utility BLPC's percentage of Return on Assets was 3.5 times higher (7.7% against 2.17%).
- The average interruption duration as defined in the SAIDI index of the Caribbean utilities is 5.4 times higher than SAIDI of European and US utilities, but BLPC's SAIDI is only 3.3 times higher than at mainland utilities. BLPC's average interruption frequency index is high and about 12 times higher than the mainland utilities' SAIFI (5.4 against 0.4).
- With a score of 6.5% in System Losses BLPC competes with the three selected utilities in Europe and the USA with system losses at an average of 6.33%.
- BLPC's Bad Debt is lowest among the peer group and lower than the Bad Debt we found for one US utility.

2. Introduction to the Benchmarking Study

2.1 Introduction

The Barbados Light & Power Company Ltd. (BLPC) retained the services of Verlaan Consulting Ltd. for preparing a report demonstrating the efficiency and effectiveness of BLPC's operations when benchmarked against other utilities in the Caribbean as well as larger utilities in Europe and North America.

This Report contains the results of the Benchmarking Study covering 24 performance indicators of a selection of 10 Caribbean electric utilities, as calculated for the years 2014 through 2019. The analysis in this Benchmarking Study Report will highlight the relative change in BLPC's performance over this period. Next to comparing the performance of BLPC with other Caribbean island utilities during the 6-years period, it has furthermore been decided to also benchmark the performance of BLPC against North American and European Utilities. In this report commentary will be provided on the general performance of island systems (with emphasis on BLPC's operations) as compared to large, interconnected, mainland utility systems.

For the sake of confidentiality the names of the utilities who participated in the study are kept anonymous, and will as such appear in this report as A, B, C., etc. Furthermore it has been agreed upon that every participating utility will – in appreciation of their willingness to participate in this Benchmarking Study - receive tables and graphs with the comparisons of performance indicators for each year, with only the utility's name mentioned and the other utilities (including BLPC) kept anonymous.

2.2 Peer group

Initially 10 Caribbean utilities were selected for the Benchmarking Study's peer group and it was targeted to gather information from West-European utilities and utilities in the South west of the USA. Ten Caribbean utilities responded by providing the data as requested in a Date Request file. Of the not responding utilities we found performance indicators for the years 2014 and 2015 in the Carilec Benchmark Study report 2014/2015 as well as figures for 2016 and 2017 as obtained in an earlier study. This way the peer group of earlier years contain sometimes up to 12 utilities, while in later years some data was only provided by 8 utilities.

The Caribbean peer group consists of electric utilities of which most have a maximum load between 62 and 224 MW, while one utility has a maximum load 1370 MW. Furthermore there is one small utility in the peer group with a maximum load of 16 MW.
The utilities' generating units are mostly fired with diesel or HFO, or a combination of both. BLPC also uses Jet Fuel. Some of the utilities also get power delivered from fossil fuel fired IPP's. When it comes to renewable energy it shows that one utility has large scale wind power operated by IPP's. Furthermore the amount of solar power is growing in the islands but in the benchmarking period the percentage of energy delivered by solar systems is still very limited.
Some of the utilities also have some power from small hydro generation and biomass. One of the participating utilities gets almost 50% of the energy from an IPP which is operating a large hydro power plant.

Some of the utilities are partly subsidized. In preparing the performance indicators and the comparisons we have left out the data of the subsidized utilities in those indicators where relevant, avoiding comparison of apples and oranges.
The island systems, although varying in size and in usage per customer, all suffer from being isolated, small and dependent on (high) fuel cost. This means they don't have the economy of scale as in large mainland countries, their lower fuel prices and their interconnections with other power systems.
For these reasons small island systems have higher energy cost, higher labor cost per customer/per MWh, higher generation reserves margins because of their isolated situation and lower reliability, also because of the lack of interconnections. On the other hand system losses can be as low as in large mainland countries and it can be seen that some of the utilities in this Benchmarking Study have a percentage of system losses which is lower than in many mainland countries. This is also shown in this report with the comparison with mainland utilities.

Large utilities in North America and Europe did not react to our data request. It has then been decided to gather most relevant information of large utilities in these continents like this has also been done for the Carilec Benchmarking Studies in the days when Carilec still performed such studies (up to 2015). This means that relevant data has been found in publicly available sites and documents, such as utility web sites, annual reports, studies done by governmental and other institutions like World Bank, articles and information provided by regulators, etc. In Chapter 5 we will provide commentary on the general performance of island systems (with emphasis on BLPC's operations) as compared to large, interconnected, mainland utility systems, based on relevant information as gathered for these utility systems.

For information on European systems we have mainly focused on utilities in The Netherlands, the UK and the large island Ireland and in North America we focused on utilities in the Southeast of the USA like FP&L and Gulf. (generally the Southern States perform better and have lower rates and in Southern States there is more availability of publicly available data).

The European and North American utilities are all privately owned, but among the Caribbean utilities the following can be observed:

- In the peer group only 3 utilities are government owned, the other utilities are privately owned, in some cases still with minority ownership of the government.
- All Caribbean utilities are vertically integrated, except for one utility which is only in charge of T&D and commercialization, but still has some own generation and provides fuel to the IPPs.

Nine of the Caribbean utilities have reported different types of regulation, applicable in their islands. Most of them have a price setting mechanism based on a Cost of Service/Rate of Return percentage and only a few have Revenue Cap Performance Based Regulation.
Some also have some form of Quality Regulation, mostly focused on Customer Service and Power Quality, not yet with performance regulation on SAIDI and SAIFI (the Q-factor).

2.3 Performance Indicators

For benchmarking the performance of BLPC in the period 2014-2019 the following comparative indicators have been selected. For some of these indicators no or not enough information was available for calculating and presenting them. We have mentioned these indicators under "missing performance indicators".

General Indicators:

1. Service Coverage.
   This indicator shows the percentage of users within the area served by the utility with electricity service as a percentage of the total population in the area.

2. System Energy Losses.
   Shows total system energy losses as a percentage of the net energy entering the system.

3. System Load Factor.
   The load factor of the system is a measure of utilization of system capacity.

4. Average Energy Cost.
   Shows the average system cost of energy (including losses) per MWh.

5. Operational profit margin.
   Shows the profit margin from operations as a percentage of operational revenues.

6. Return on Assets.
   Shows the rate of return on utility's assets. It measures how effectively assets are used to generate a return on investment. Only non-current assets are considered.

7. Debt level.
   Shows the level of indebtedness of the company as a percentage of the assets value.

8. Labor Productivity.
   Shows staff utilization in person-years per 1,000 customers served.

Customer service rates:

9. Customer service rates.
   Very detailed data has been gathered for presenting the customer service rates, namely for each of the years considered rate information has been gathered for:

   - Domestic customers with a monthly usage of 150 kWh
   - Domestic customers with a monthly usage of 250 kWh
   - Domestic customers with a monthly usage of 400 kWh
   - Commercial customers with a monthly usage of 2000 kWh
   - Commercial customers with a monthly usage of 5000 kWh
   - Industrial customers with a monthly usage of 100,000 kWh

   with for each of these categories the following rate components:
   - Base rate
   - Fuel surcharge
   - Other charges
   - Total Bill

Generation indicators:

10. Generation reserves margin.
    Shows the margin of generation reserves as a percentage of system peak load.

11. System equivalent availability.
    Shows the availability of system capacity accounting for forced and planned outages as a percentage of the total MW of system installed capacity during 8760 hours.

12. Plant Energy Consumption.
    Shows internal consumption of energy in generation plants as a percentage of gross generation. It is an indicator of plant generation efficiency.

13. Utilization factor.
    Shows the capacity utilization factor for the system. It measures how much of the generating capacity of the system is actually used.

14. Fuel Cost
    Average cost of the fuel component per thermal MWh generated.

15. Generation Cost.
    Average cost per MWh generated including capital costs.

16. Generation Productivity.
    Shows staff utilization in person-years per 10 MW installed.

T&D indicators:

17. SAIDI.
    System Average Interruption Duration Index.

18. SAIFI.
    System Average Interruption Frequency Index

19. T&D Cost.
    Average T&D cost per MWh delivered. It is a measure of cost effectiveness of T&D operations.

20. T&D Productivity.
    Shows T&D staff utilization per 10,000 MWh delivered. It is a measure of productivity.

Commercialization indicators:

21. Number of complaints.
    This indicator shows the number of complaints received per 1,000 customers served. It is an indicator of customer service quality.

22. Commercialization Cost.
    Average commercialization cost per costumer served. It is a measure of cost effectiveness of commercial activities.

23. Bad debt.
    Percentage of receivables deemed uncollectible. It considers bills unpaid after 180 days.

24. Commercialization productivity
    Commercial staff utilization per 1,000 customers served. It is a measure of productivity.

Missing performance indicators

25. Generation non-served energy.
    Measures energy not supplied due to generation outages in ‰ of the total energy delivered plus the non-served energy

26. T&D non-served energy
    Measures energy not delivered due to T-D interruptions in ‰ of the total energy delivered plus the non-served energy.

27. Non-technical losses
    Energy losses due to non-registered consumptions minus the technical grid losses (non-technical losses) which is electricity for which the utility is not paid.

2.4 Benchmarking Methodology and Models

For gathering all raw data needed for the Benchmarking Study, and as specified in the overview of equations for calculating the performance indicators in Appendix 2, a data request file has been prepared to be filled in by participating utilities. Furthermore a database has been developed in such a way that data from the data requests could easily be copy/pasted into the database. The database file also contains sheets with tables in which performance indicators are calculated from the raw data for each year and for each utility, making use of the relevant equations.
From the tables graphs can subsequently be generated showing the performance indicators of the utilities through the years compared with each other. This way a large series of tables and graphs has been prepared as well as a special overviews of tariffs, containing tariff information for 6 usage categories per year, every time subdivided in base rate, fuel surcharge, other charges, total bill, all together 24 figures per utility per year.

The large set of straightforward graphs and tables of all performance indicators per year in detail, are all presented in this Report's Appendix 1, while out of all this information the following has been extracted and processed in models with the objective of showing how BLPC's performance has evolved during the six-years period:

- Graphs (and tables) for each performance indicator showing per year the indicator of BLPC, the average indicator of all Caribbean utilities and when applicable the average indicator of the large mainland utilities. This way the performance development of BLPC is shown in one view compared with the performance development of (the average of) the Caribbean utilities and of the Mainland utilities. These graphs and tables are included in Chapter 3. Major indicators are also in the Executive Summary.

- Ranking of BLPC's performance among the Caribbean utilities is given in tables for all performance indicators in the year 2014 and 2019, also showing progress or regression of BLPC and the Caribbean average for each indicator. These overviews are in the Executive Summary's Chapter 1.2.3.
- Radar diagram
  In radar diagrams (or also called: spider diagrams) all indicators of BLPC in one year are shown compared with the average of the performance indicators of the peer group's utilities. The average of the peer group is set at 100% for each indicator while the performance of BLPC is expressed in a percentage as well. It shows in one view where weak and strong points are situated and also relationships between indicators can be identified We included a radar diagram for the year 2019, showing BLPC's indicators against the average of Caribbean utilities, as well as one radar diagram in which BLPC's performance against mainland utilities is presented.

3. Benchmarking Study Results

In this Chapter all performance indicators of BLPC during the years 2014-2019 are presented and analyzed, comparing them with the average of the Caribbean peer group's performance indicators in those years and also showing the performance indicators of the individual utilities of the year 2019. This way trends can be identified, both in the development of BLPC's performance as well as in the average performance of the peer group and finally the graphs show where BLPC stands in the final year 2019 of this survey. As already mentioned graphs and tables of all performance indicators of all utilities in each year are shown in Appendix 1.

3.1 Service Coverage

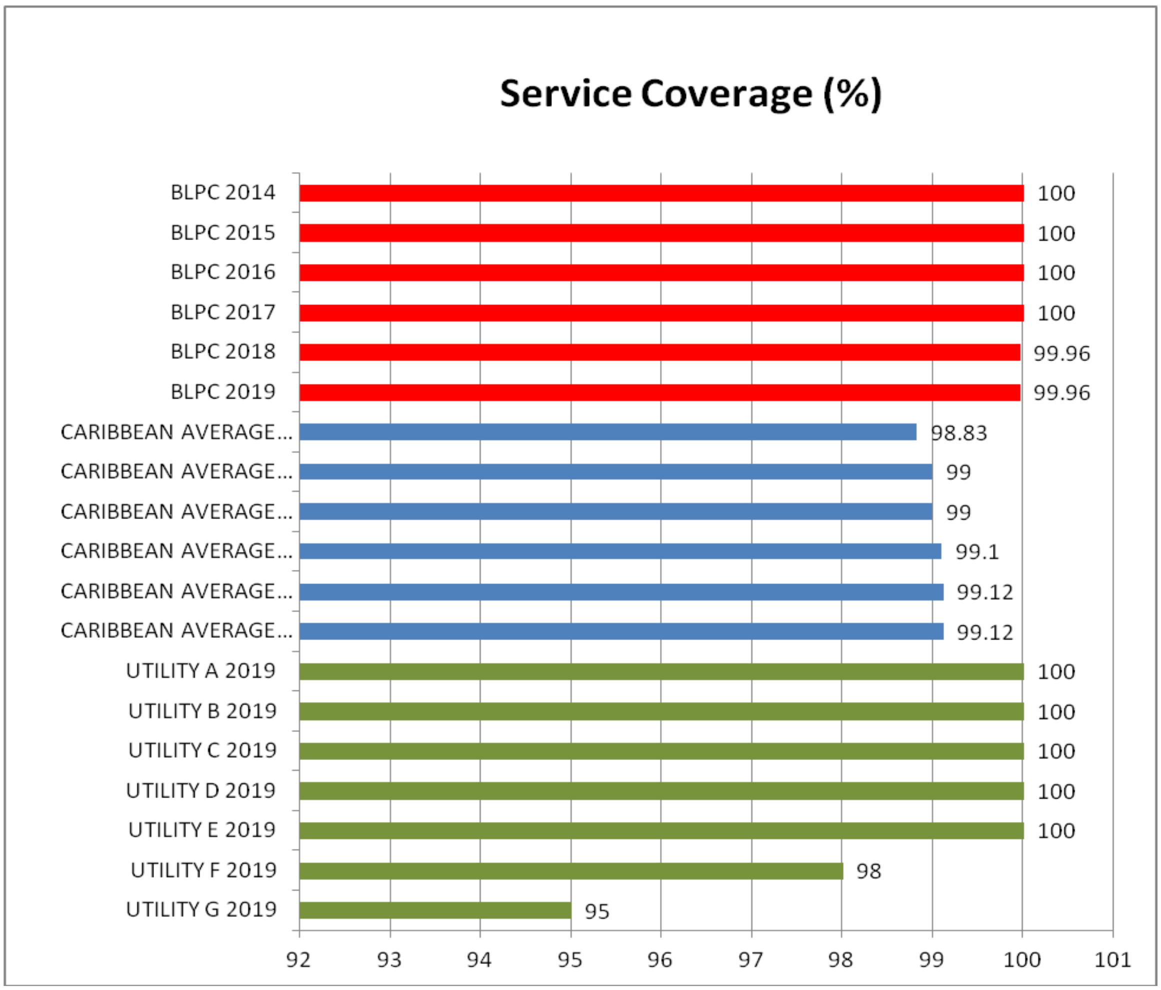


Figure 19: Service Coverage (%)

Most utilities have the optimal service coverage through the years of 100% like BLPC, while two other utilities have coverage of 98 and 99%. Only one utility has a lower coverage (94%). While BLPC always reported a service coverage of 100% in previous years a percentage of 99.96 was given for 2018 and 2019, this way recognizing that not the whole population is serviced by BLPC, which may also be the case for other utilities who reported a service coverage of 100%.

3.2 System Energy Losses

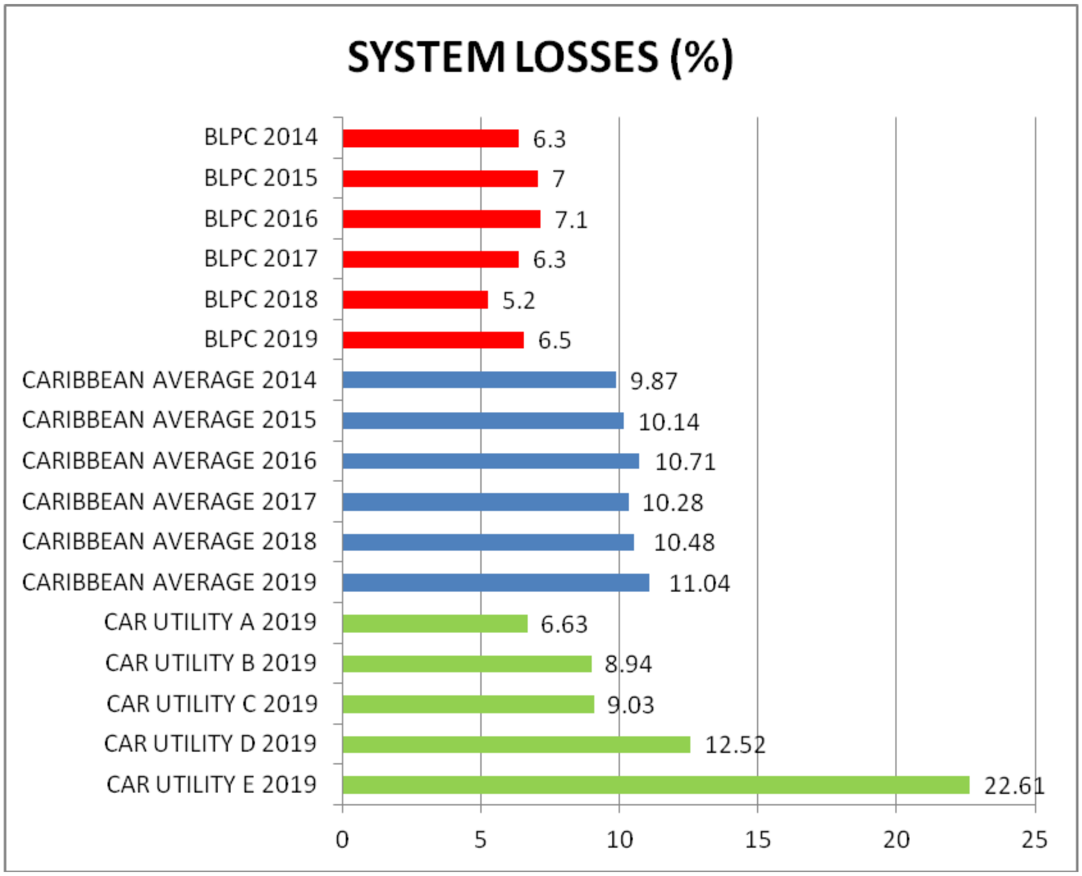


Figure 20: System Losses (%)

BLPC's lowest system losses occurred in 2018 and amounted to 5.2% of the energy entering the system. With this percentage BLPC is not only among the best in class in the Caribbean, but also in comparison with system losses in European countries and North America, as described further in Chapter 5.

In the power system of utility A (with system losses of 6.63%) it can be seen that most of the load is concentrated close to the power plant while transmission to these load centers is under a relatively high transmission voltage. Two utilities have high system loss percentages, namely 12.52% and 22.61%. Here a substantial part of these losses are considered to be non-technical losses, although no figures of non-technical losses have been provided.

3.3 System Load Factor

The System Load Factor is a measure of utilization of system capacity. The load factors across the region are very similar except for utilities F and G with somewhat higher load factors of over 80%, reflecting the characteristics of higher load demand on these islands compared with their values of maximum load. BLPC's load factor is rather constant and at the level of the Caribbean average load factor, which is also quite constant through the years.

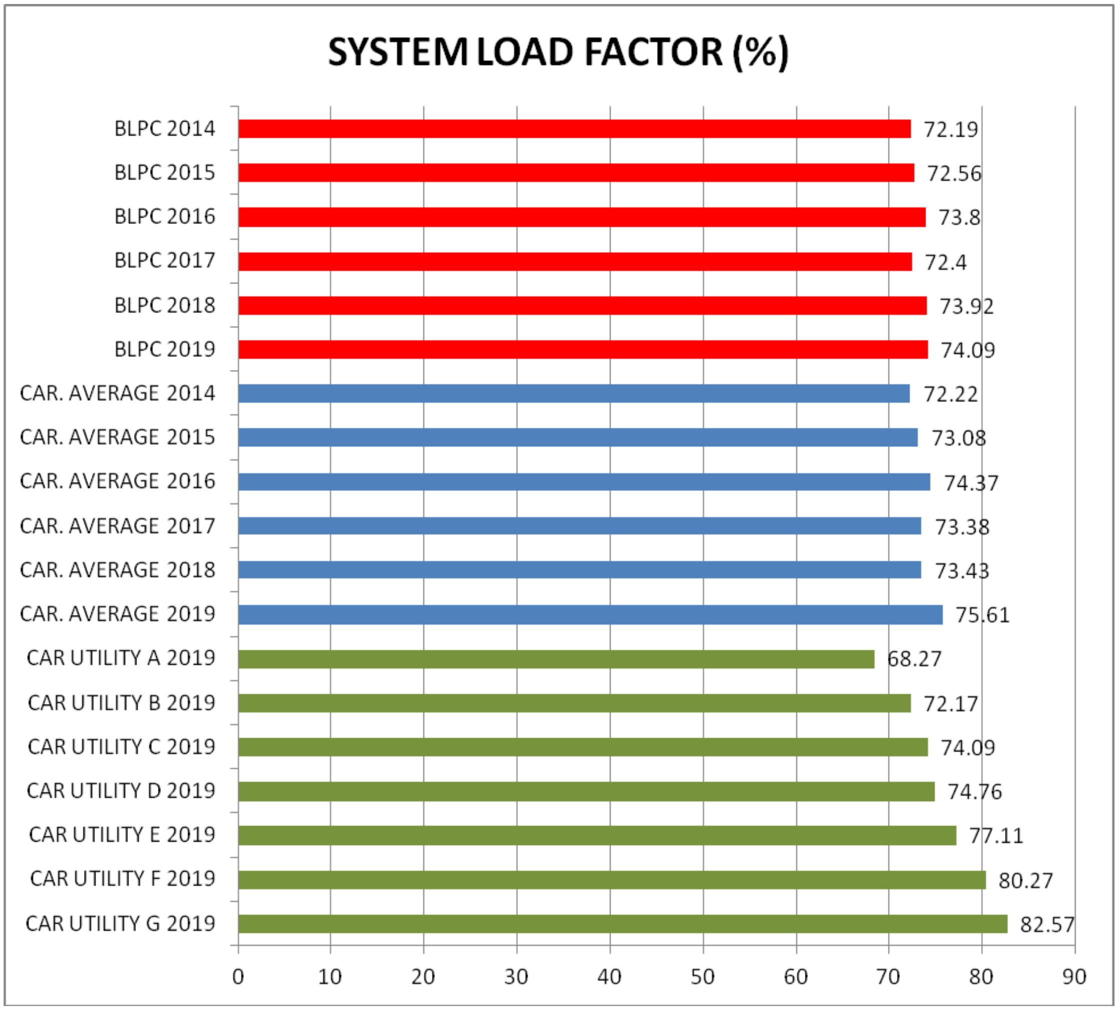


Figure 21: System Load Factor (%)

3.4 Average Energy Cost in US$ / MWh

BLPC average energy cost in Figure 22 are lower than the average energy cost of the peer group. Still we see three utilities with lower average energy costs. Note that fuel cost and cost of energy purchased from IPP's are included in the average energy costs. The substantially lower cost in the years 2015-2017 are due to the dramatic drop of fuel prices as of 2015. The same impact is shown in Chapter 3.14 (Fuel Cost) and Chapter 3.15 (Generation Cost). In the graph below also the big difference in energy cost can be seen with a European utility which has the advantage of large economy of scale and cheaper fuels.

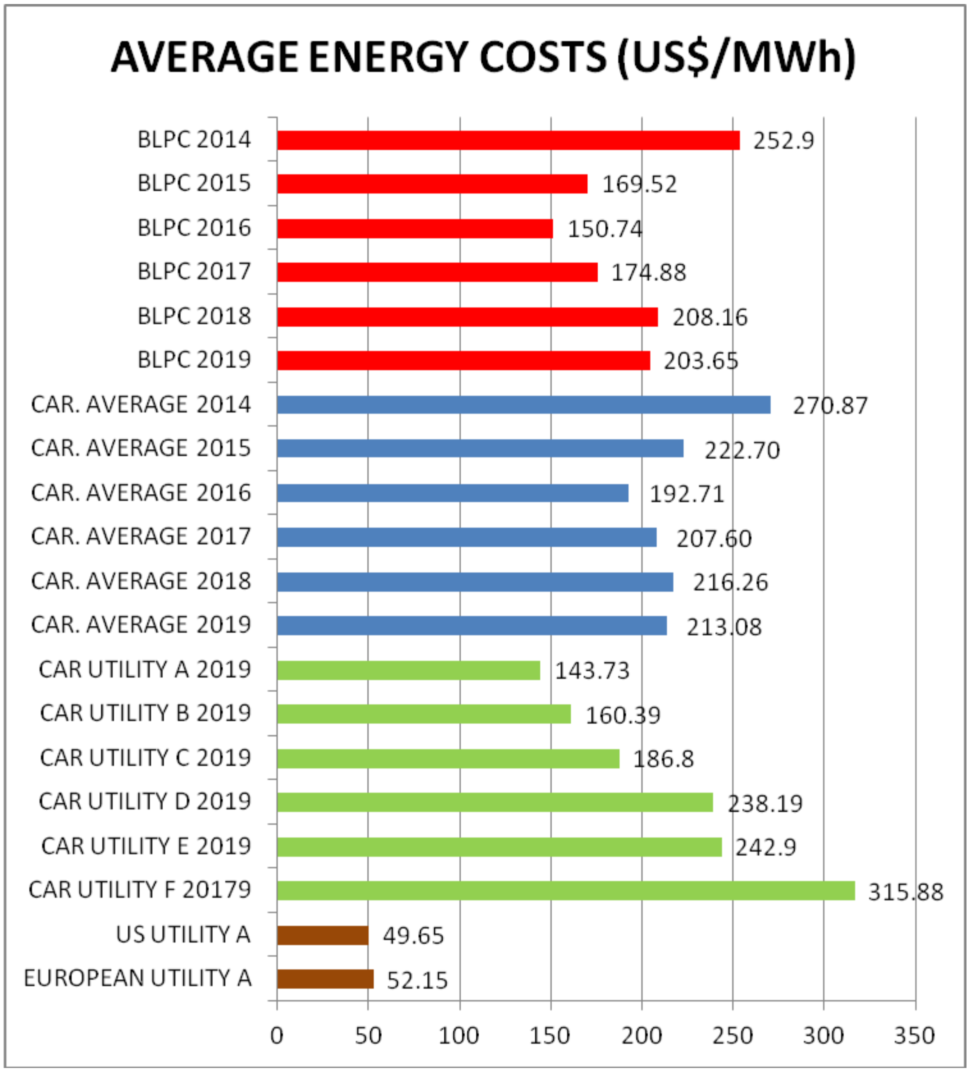


Figure 22: Average Energy Cost (US$/MWh)

3.5 Operational profit margin

BLPC's operational profit margin is rather high compared with the average of the peer group in the benchmarking years. As already explained the profit margin grew substantially in 2015 through 2017 because the amount of the Net Income against the much lower Operational Revenues (due to substantially lower fuel surcharges) resulted in a higher percentage. Apart from this, also the Net Income itself grew, which indicates more efficient operations of the utility. In 2018 and 2019 BLPC still managed to keep the operational profit margin above 10%, with only 2 utilities with a higher score. Also note that two utilities suffered from negative operational profit margins.

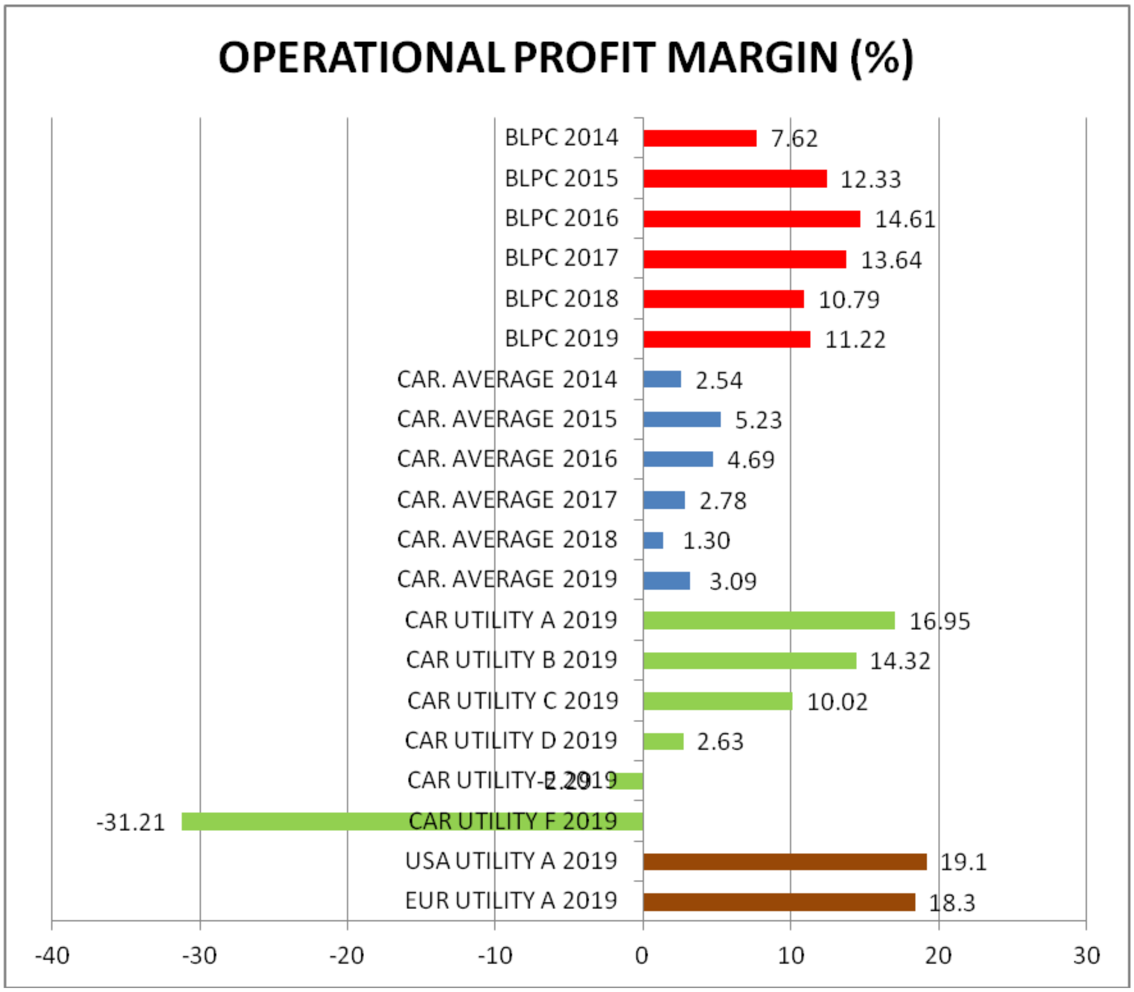


Figure 23: Operational Profit Margin (%)

3.6 Return on Assets

The Return on Assets is expressed in a percentage of the Net Income against the value of the non-current assets. A high percentage have been achieved by utility A. Through the years this utility reached high values. Utilities E and F had negative returns on assets all through the years 2014 to 2019, like they also had negative Operational Profit Margins.
In the figures provided by BLPC the assets value increased in the years 2019 with 8.5% compared with 2018, but the Net income also increased, with 2.2%, which resulted in a relatively small drop of the return on assets from 8.2% to 7.7%.

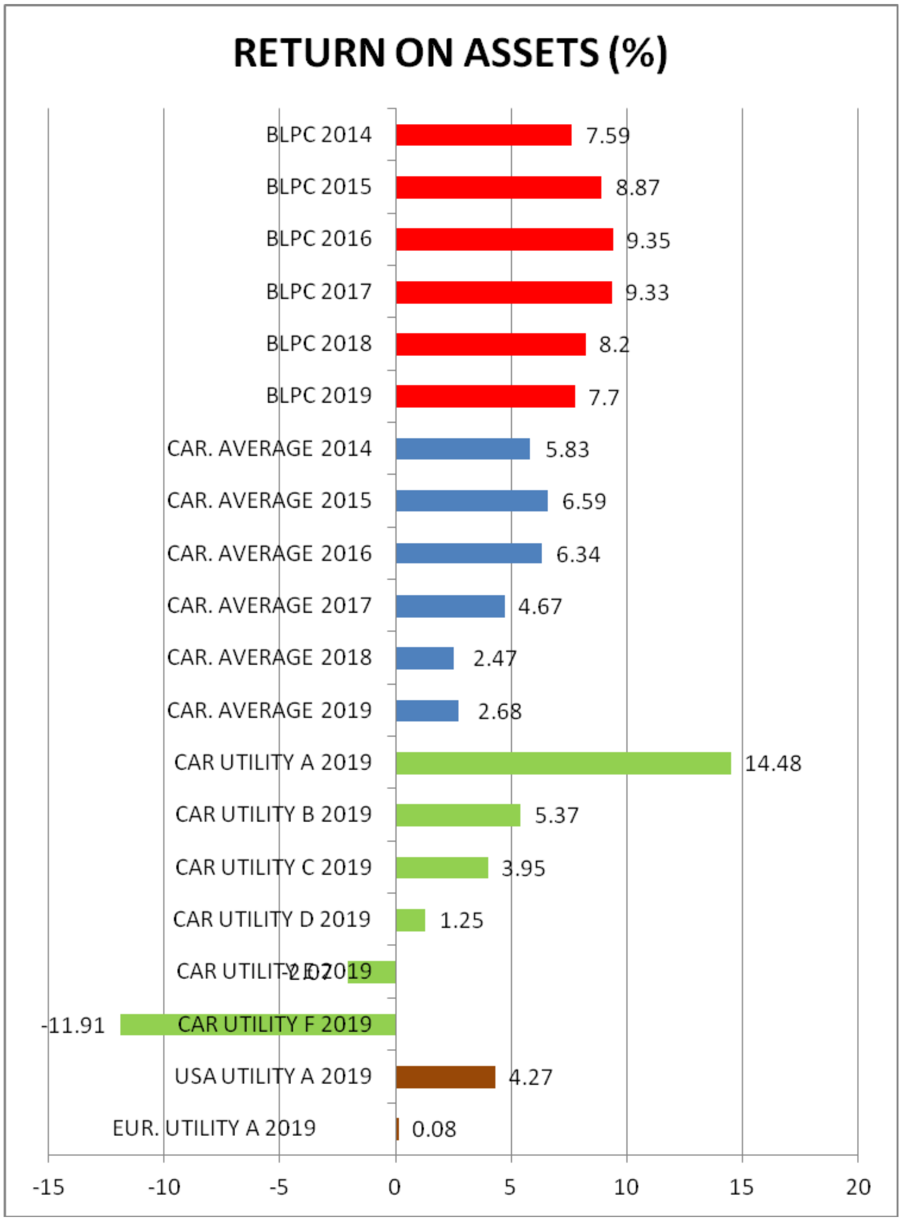


Figure 24: Return on Assets (%)

3.7 Debt level

Through the years 2014-2019 BLPC had the lowest debt level of all utilities in the peer group. If we look back in Carilec studies we see that BLPC's debt level went down from 23% in 2005 to 18% in 2010, and subsequently stayed below 15% as of 2011.

The debt level of European utility A is 34% and of USA utility A is 26%. These values are quite usual, but the value of Caribbean utility F is extremely high. We see debt levels of more than 30% at Caribbean utilities, much higher than BLPC's debt level.

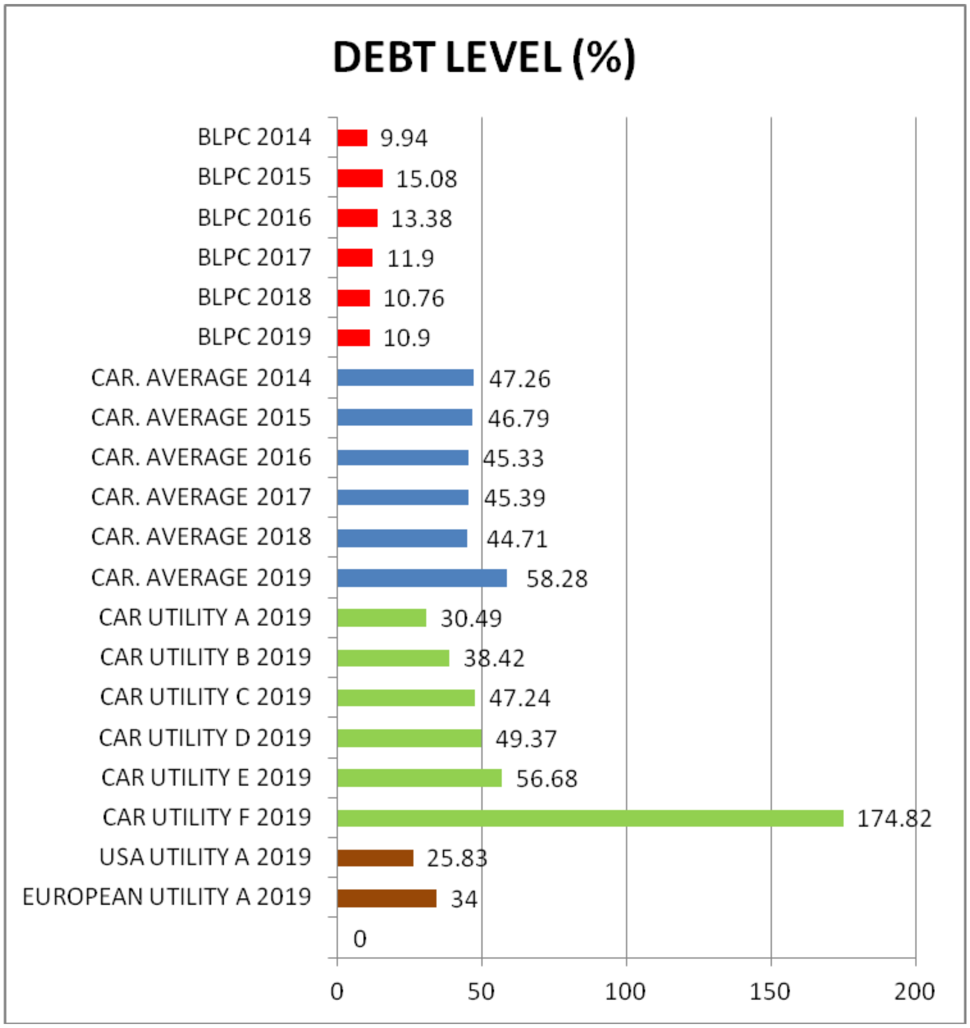


Figure 25: Debt Level (%)

3.8 Labor Productivity

Labor productivity measures labor effort per customer. In this ratio, the more person-years required to serve customers, the lower labor productivity is achieved. Conversely, a lower value of Labor Productivity indicates higher productivity. The average value of Labor productivity at Caribbean utilities for 2019 was 6.11 person-years per thousand customers. The minimum value was 2.69 for BLPC. The trend of the average labor productivity of the peer group shows some better productivity in 2016 and 2017. BLPC had a rather constant level of productivity through the years from 2015. Between 2005 and 2010 labor productivity varied between 4.3 and 4.6, since 2011 an upward trend started. Comparison with mainland utilities will be discussed in Chapter 5.

Finally it is noted here, that some utilities are outsourcing activities, like for example meter reading, linesmen work, etc, and may not have added personnel for outsourced work to the utility's labor force.

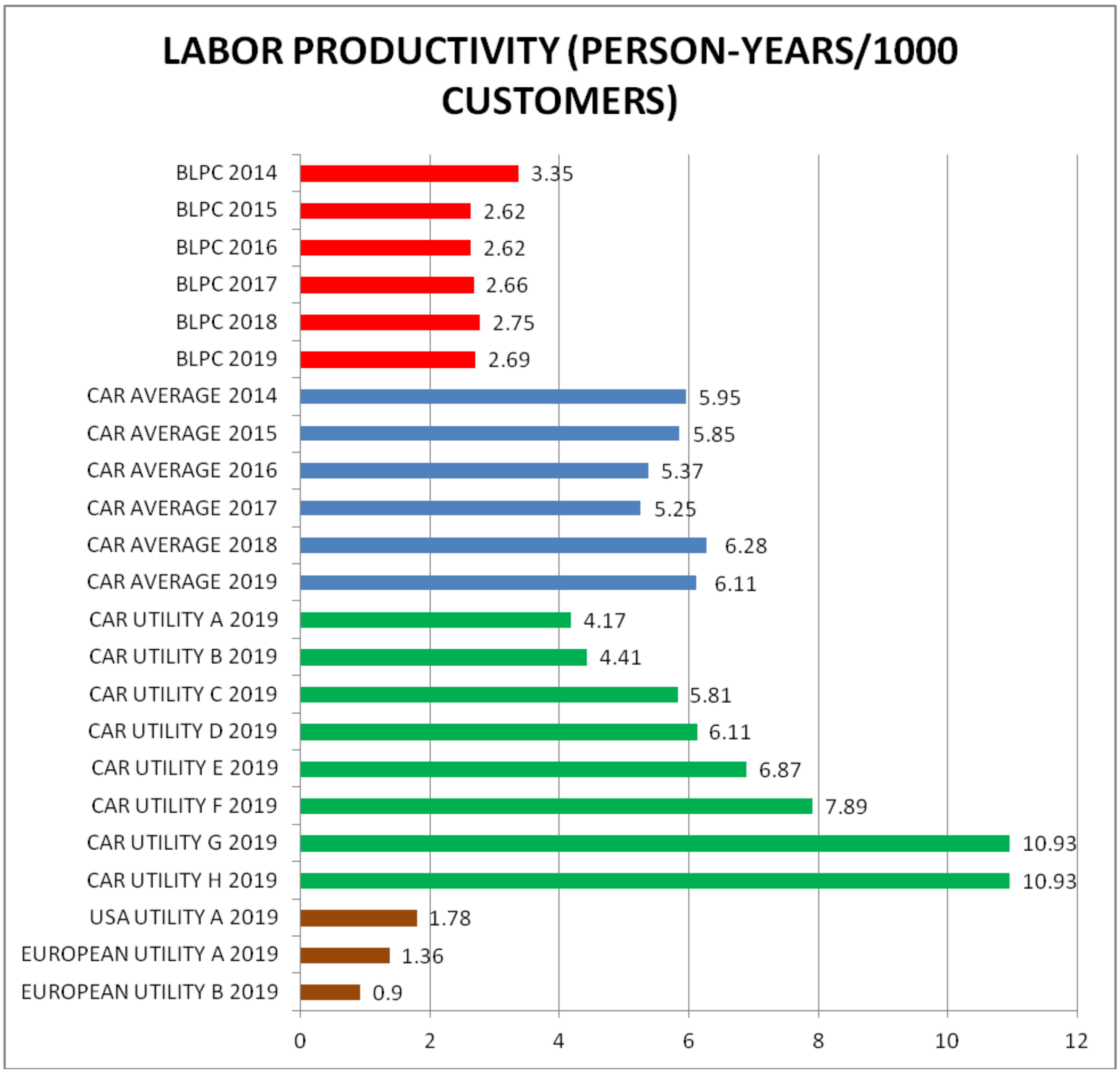


Figure 26: Labor Productivity (person-years per 1000 customers)

3.9 Customer service rates.

Very detailed data has been gathered for presenting the customer service rates, namely for each of the years considered rate information has been gathered for:

- Domestic customers with a monthly usage of 150 kWh
- Domestic customers with a monthly usage of 250 kWh
- Domestic customers with a monthly usage of 400 kWh
- Commercial customers with a monthly usage of 2000 kWh
- Commercial customers with a monthly usage of 5000 kWh
- Industrial customers with a monthly usage of 100,000 kWh

with for each of these categories the following rate components:
- Base rate
- Fuel surcharge
- Other charges
- Total Bill

In this section the total bill trends are presented in a similar format like the previous performance indicators.

Graphs and tables for each of the usage categories, including total bill amounts, base rates and fuel surcharges are included in Appendix 1, section 9.
The following should be remarked:
- Different utilities don't apply a fuel surcharge and have included fuel costs in the base rate.
- Overviews of base rates and fuel surcharges are therefore only limited to utilities who applied both a base rate and a fuel surcharge.
- Other additional charges are only small amounts, only applied by 4 utilities, among them BLPC. These amounts can be found in the database with raw data.
- Heavily subsidized utilities have been left out of the graphs and tables. Their figures are to be found in the database with all raw data.

As a general remark it should be noted here that some differences between participating utilities are due to the impact of fuel hedging, sometimes positive, sometimes negative, not to be disclosed here further given the confidentiality of data provided.

a) Total bill in US$ for customers using150 kWh per month

The total bill for usage of 150 kWh per month shows that only utility A's bill is slightly lower than BLPCs bill in 2019.

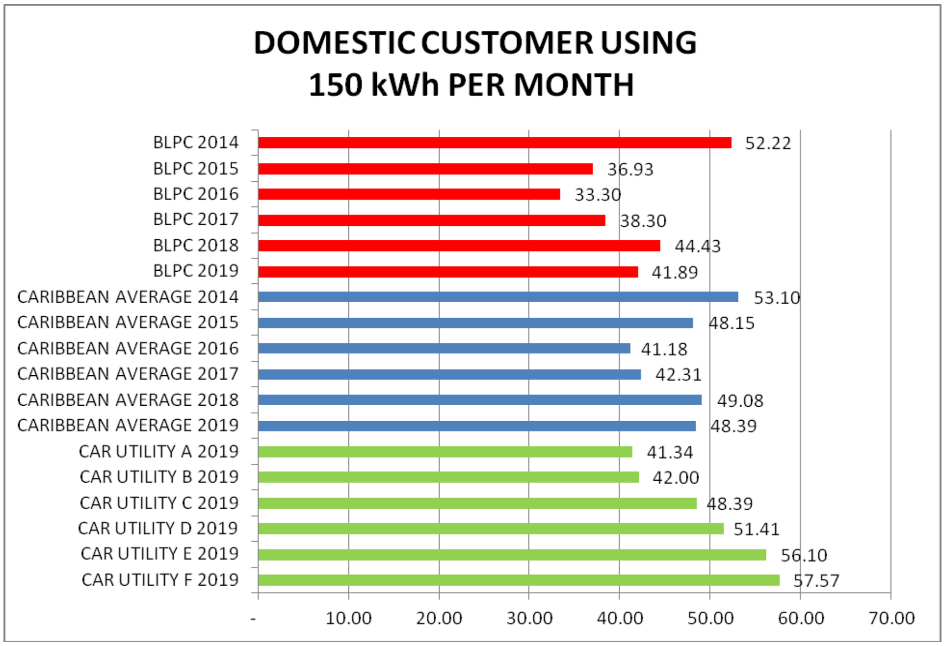


Figure 27: Total bill in US$ for domestic customers using 150 kWh per month

b) Total bill in US$ for customers using 250 kWh per month

Also in this usage category there is only one utility with a lower bill (US$68.90) than BLPC (US$ 73.64).

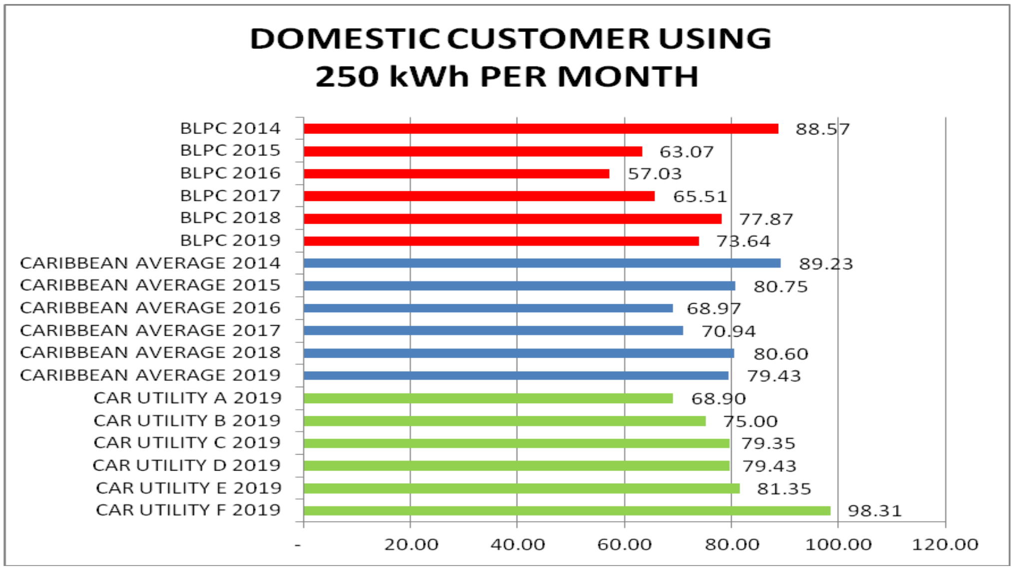


Figure 28: Total bill in US$ for domestic customers using 250 kWh per month

c) Total bill in US$ for customers using 400 kWh per month.

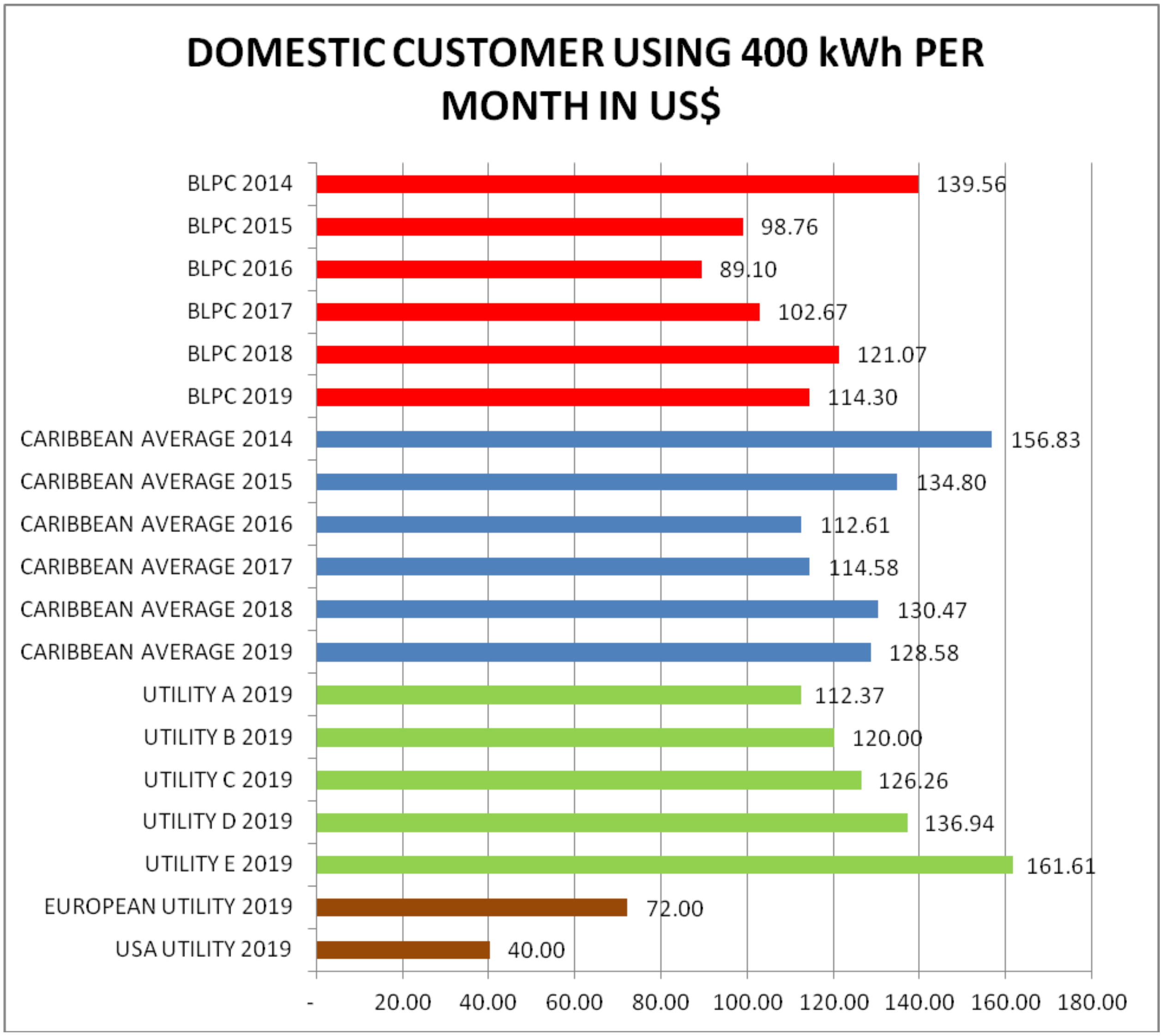


Figure 29: Total bill in US$ for domestic customers using 400 kWh per month

For the three usage categories (domestic users with 150 kWh/month, 250 kWh/month and 400 kWh/month) there is only one utility with a slightly lower bill. In the following categories (commercial and industrial users in figures 30, 31 and 32, BLPC's total bill is lowest.

d) Total bill commercial customer using 2000 kWh per month in US$

In the year 2014 BLPC's total bill ended nr. 2 but as of 2015 BLPC's total bill for a commercial customer using 2000 kWh per month was lowest each year. In 2019 utility A's bill was 17% higher than BPC's bill.
Differences with European and North American utilities will be discussed in Chapter 5.

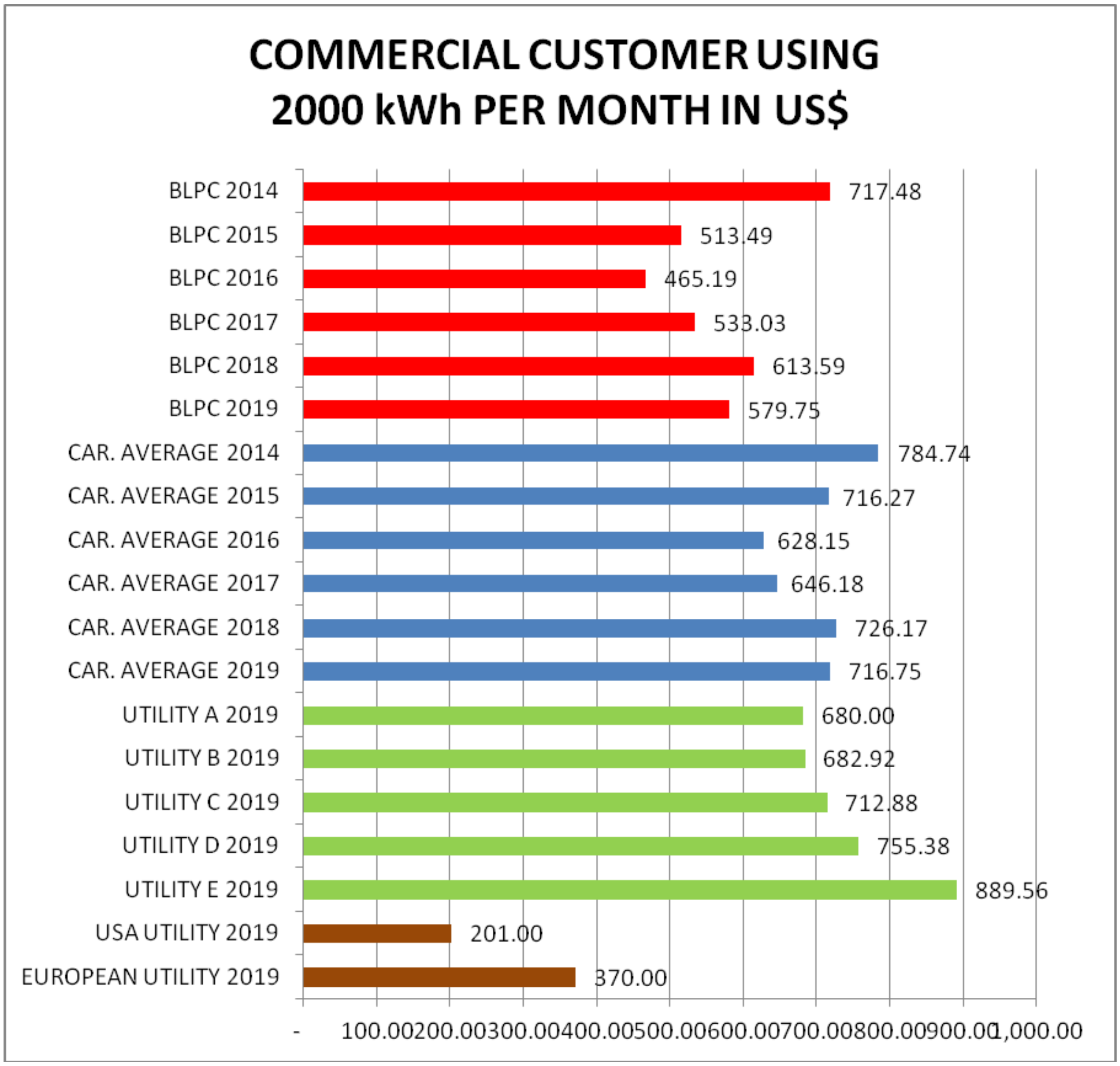


Figure 30: Total bill in US$ for commercial customers using 2000 kWh per month

e) Total bill commercial customer using 5000 kWh per month in US$

The yearly trend and the score of BLPC is similar to the results shown for a commercial customer using 2000 kWh per month, which means that BLPC ended with the best score again in the years 2015-2019, again with a difference of around 17% in 2019.

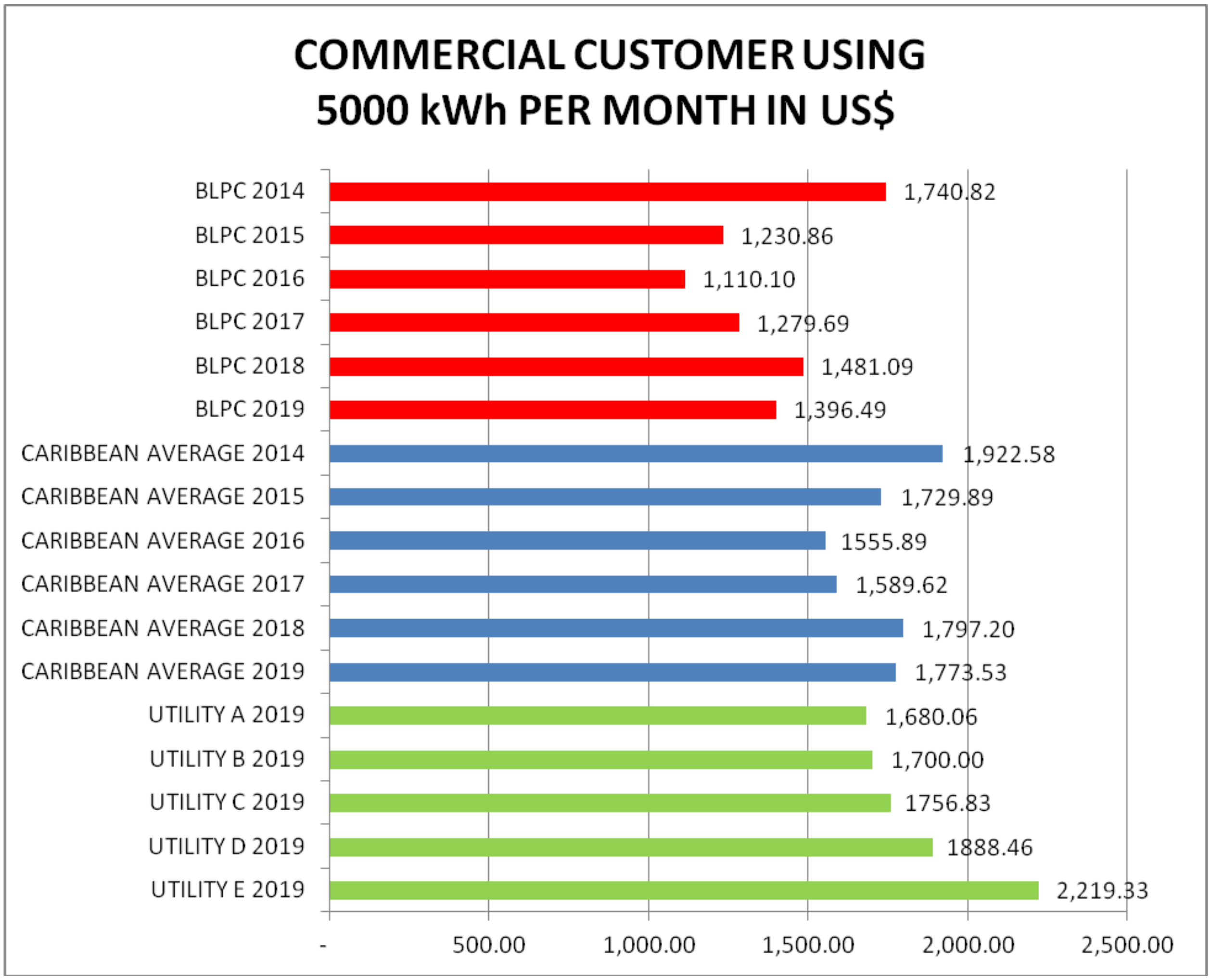


Figure 31: Total bill in US$ for commercial customers using 5000 kWh per month

f) Total bill industrial customer using 100,000 kWh per month

Also in this usage category BLPC's bill is lowest, again with a difference of some 17% with utility A, who ended nr. 2.

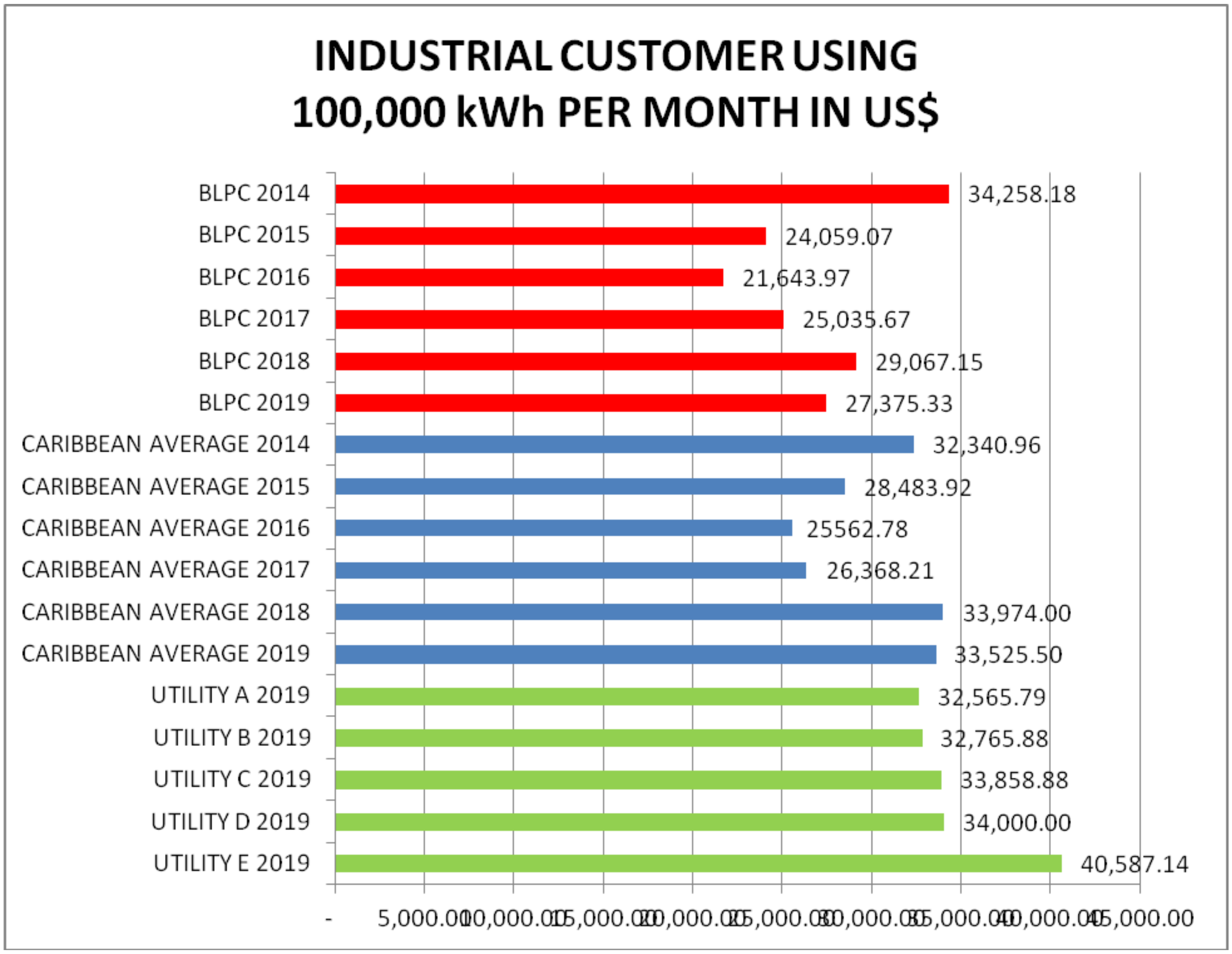


Figure 32: Total bill in US$ for industrial customers using 100,000 kWh per month

3.10 Generation Reserves Margin

Through the years it has shown in Carilec Benchmarking Studies that the generation reserves margin of the Caribbean isolated island utilities with no interconnections, tend to be between 50% and 75%, with some exceptions of higher and lower percentages. In large mainland systems reserves margins are lower, mostly between 25% and 40%. This is one of the differences between mainland systems and small island systems and in Chapter 5 more elaboration will be given to this aspect, also in relationship with other aspects like the utilization factor and generation availability.
BLPC's reserves margin remains nicely between 54 and 64% in 2014 through 2018, but was almost 87% in 2019, caused by an increase of the system installed capacity with 35 MW. As a result of that we can also see that the utilization factor (figure 36) went down from 47.7% in 2018 to 42% in 2019.

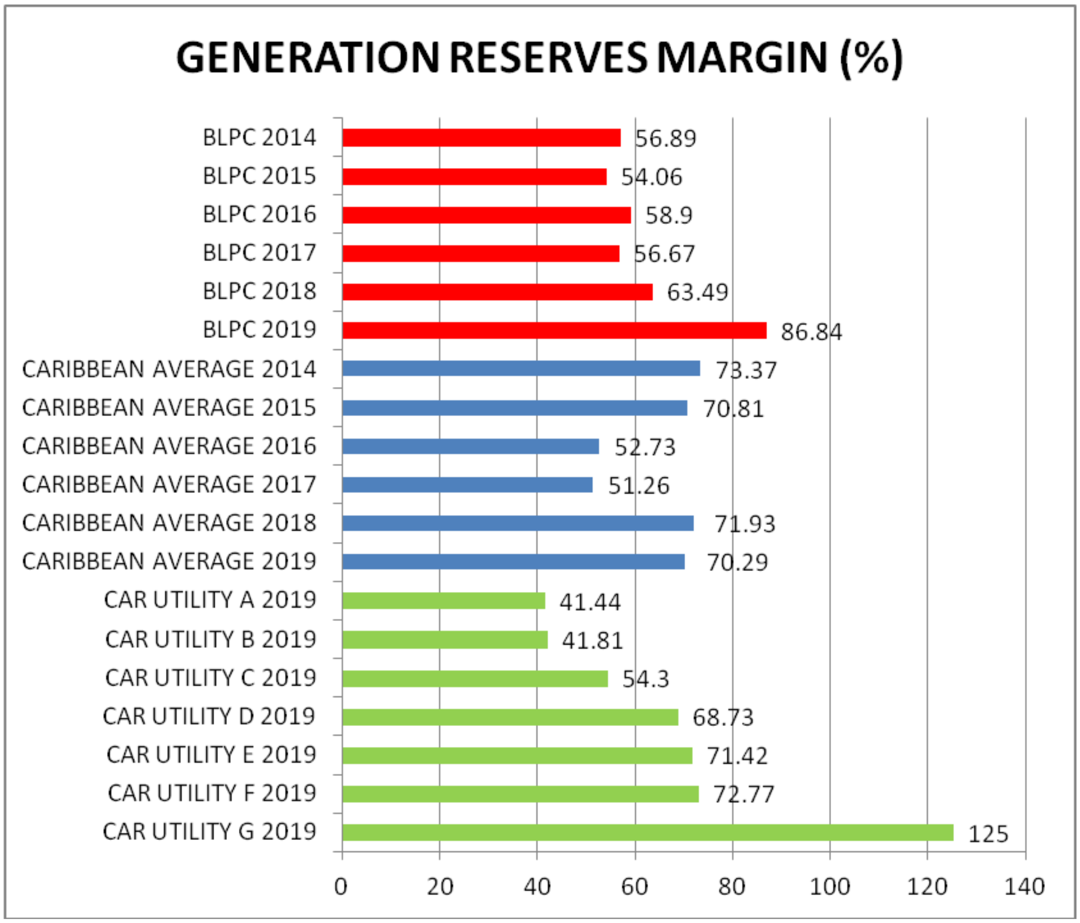


Figure 33: Generation reserves margin (%)

3.11 System equivalent availability (%)

In the years 2014 – 2019 BLPC's availability figure varied between 81% and 84%. Percentages above 80% are quite usual, but we found utilities A and B with scores of more than 96%, although these utilities scored much lower in previous years, such as around 85% in 2018.
System equivalent availability is also a measure of maintenance practices. Looking back in previous Carilec Studies we see many years when BLPC reached availability percentages far above 80%, even 88.4% in 2007. So improvement of this percentage to a value above 84% is recommendable, while in the end the system's reliability is also dependent on the reserves margin, the Loss of Load Probability and/or the n-2 criterion.

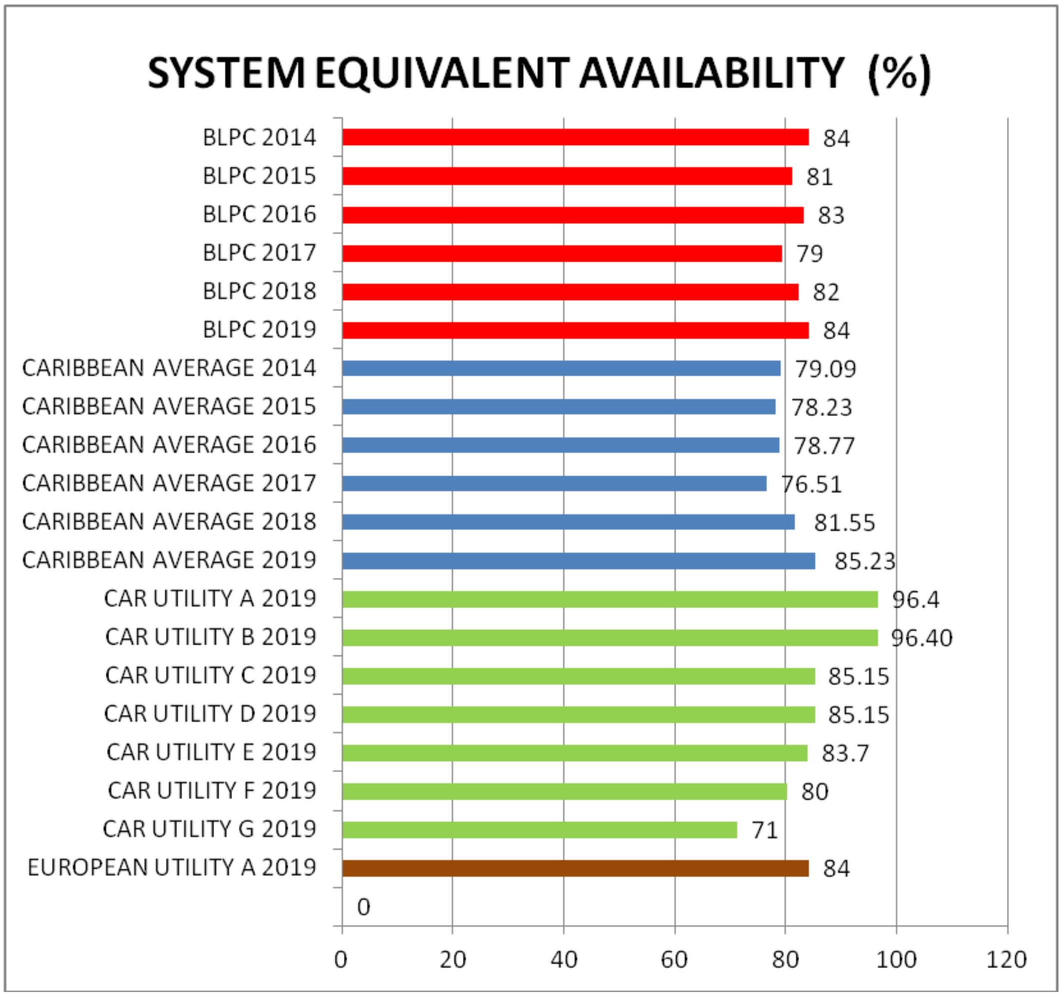


Figure 34: System Equivalent Availability (%)

3.12 Plant Energy Consumption (Station Losses)

Plant Energy Consumption at BLPC is high. Usually a percentage between 3 and 4% is observed, like also shown for the averages in the years 2014 to 2019. It is remarkable that both at BLPC and in the average of the peer group plant energy consumption was lower in 2018, which cannot be explained by lower fuel cost, because the percentage is based on plant usage in kWh against gross energy generated in MWh. Since gross energy generated and energy entering the system did not change much in 2019 compared with 2018, it should be investigated why BLPC's station losses went up from 5.28% in 2018 to 6.91% in 2019. The only significant change in data received is that the installed generation capacity increased in 2019 with 35 MW.

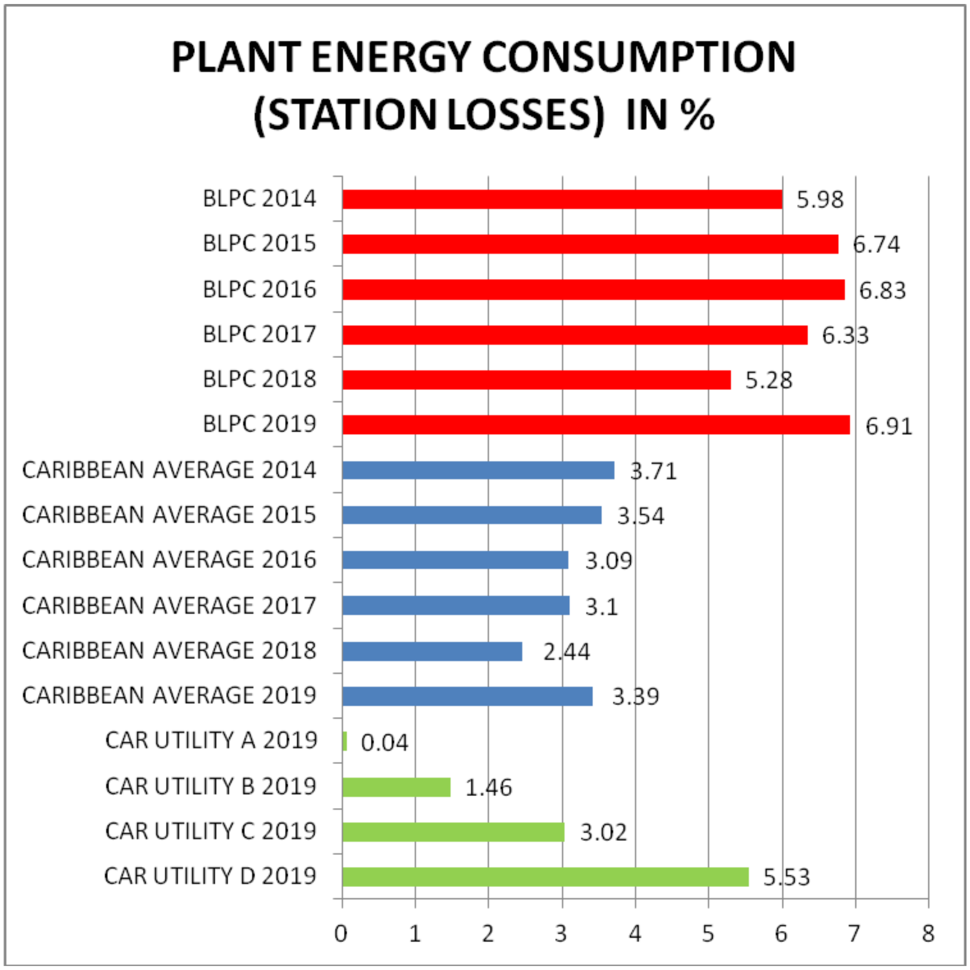


Figure 35: Plant Energy Consumption (Station Losses) in %

3.13 Utilization factor

Utilization factors show low figures due to relatively high regional reserve margins and subsequent surplus capacity. In 2019 utilization factors vary from 37 to 53 in the peer group with an average factor of 45.6. Through the years the average value only varied between 43.7% and 48.4% with a value in 2019 of 45.6%.
BLPC's utilization factor went down in 2019 from 48% to 42% due to an increased reserves margin in 2019.

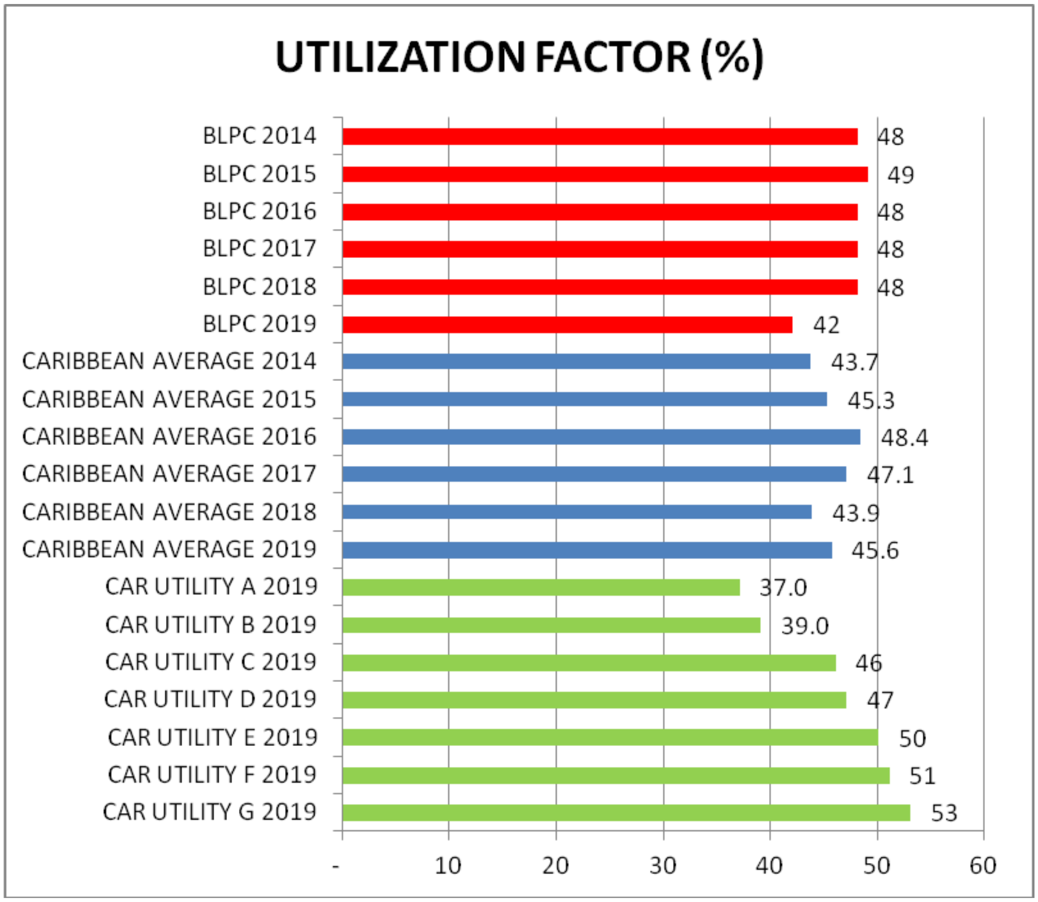


Figure 36: Utilization Factor (%)

3.14 Fuel Cost

Fuel costs show important differences among utilities, reflecting differences in fuel prices, fuel types (HFO, diesel nr. 2, Jet Fuel), usage efficiency and islands' remoteness.
Up to 2017 BLPC stayed with its fuel cost lower than the Caribbean average, but fuel cost went up significantly in 2018 and 2019. After fuel prices were lower in 2015 through 2017, these prices went up in 2018 and 2019, but at BLPC the increase of fuel cost was higher than the average. The differences are in some cases caused by the impact of fuel hedging.

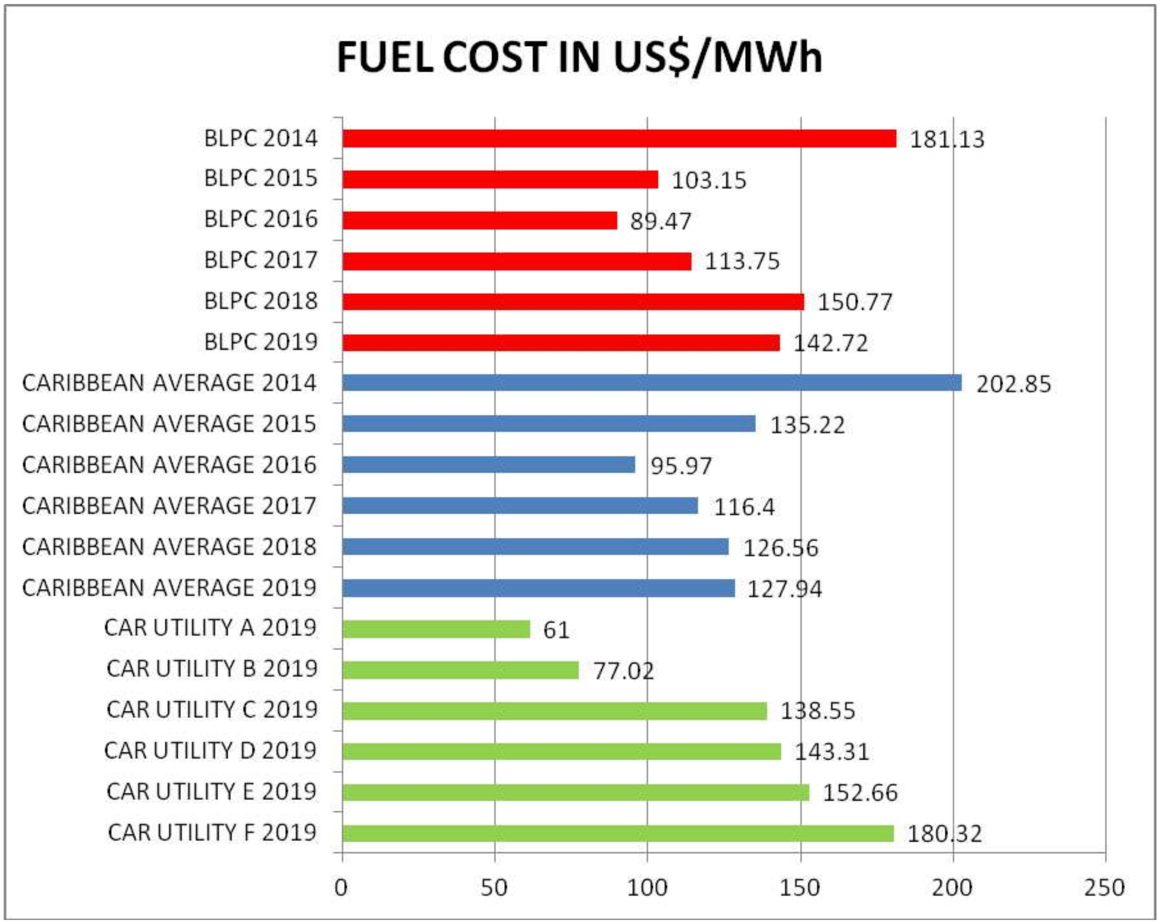


Figure 37: Fuel Cost in US$/MWh

3.15 Generation Cost

Although BLPC's fuel cost was higher than the average in 2019, the generation cost was lower than the average in this same year. BLPC's Generation Cost including fuel cost has been lower than the Caribbean average through all the years of this study. Still two utilities had lower generation cost than BLPC in the year 2019. Given the differences in the indicators of fuel cost and generation cost also a sole comparison of Generation Cost minus Fuel Cost has been prepared (figure 39). This way the cost of O&M, capital cost, overhead cost can also be compared.
But first, table 38 below shows the comparison of Generation Cost (including Fuel Cost).

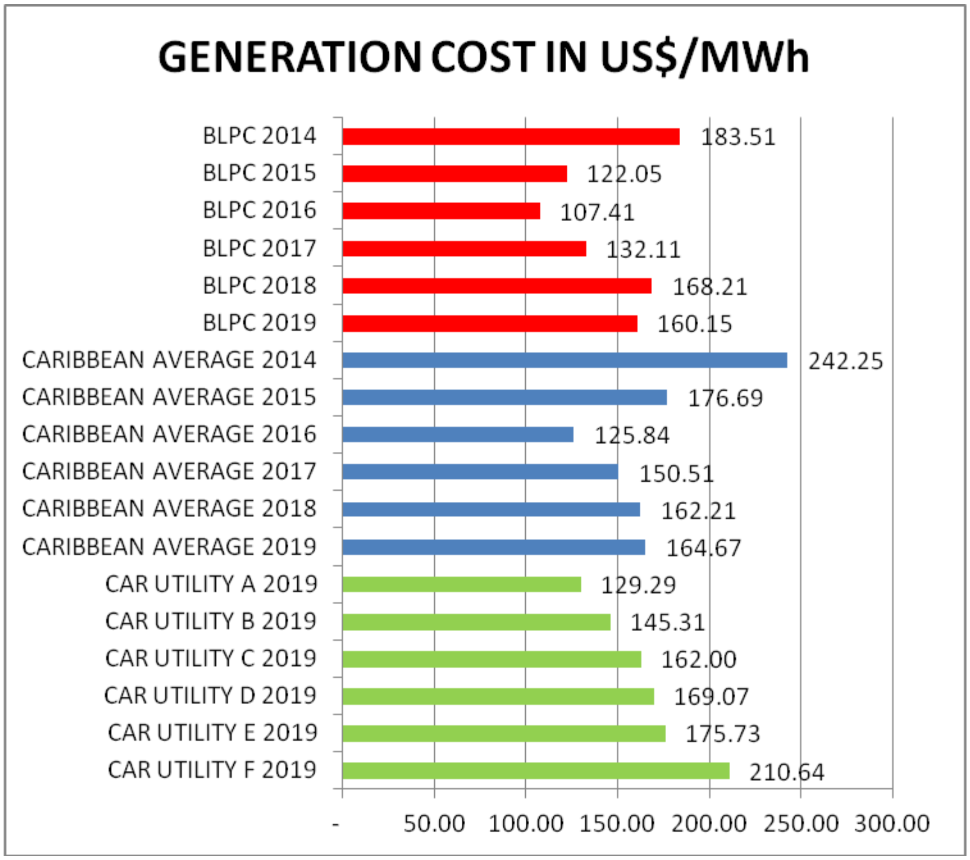


Figure 38: Generation Cost in US$/MWh

For obtaining insight in this extra Performance Indicator, called Generation Cost minus Fuel Cost, the graph below has been prepared for the years 2017 through 2019 (see Figure 39). This graph shows that BLPC's generation cost minus fuel cost is much lower than the average It can be seen that BLPC's generation cost in 2019 were more than 50% lower than the average. which should be caused by a higher efficiency (in O&M and possibly lower capital and overhead costs).

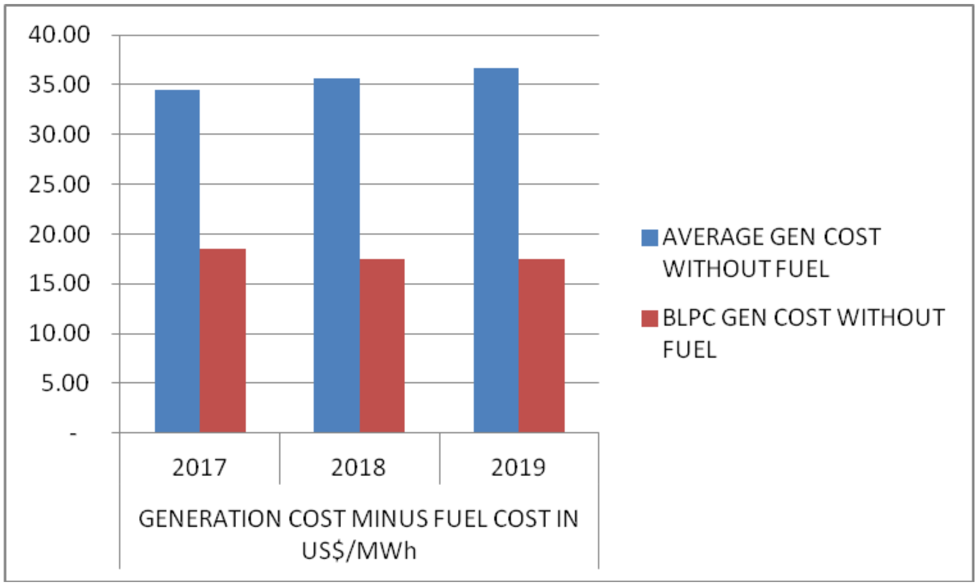


Figure 39: Generation Cost without Fuel Cost in US$/MWh

BLPC's Generation Cost without Fuel Cost varied between 17.43 US$/MWh and US$18.46/MWh in this three-years period. One factor of BLPC's better efficiency can be identified in the next performance indicator which is about generation productivity.

3.16 Generation Productivity

BLPC's generation productivity is lowest in the peer group and has steadily improved from 4.64 person-years per 10 MW in 2014 to 3.7 person-years per 10 MW in 2019, with the best score of 3.17 in 2017. The high level of generation productivity must be one of the reasons of the relatively low generation cost.

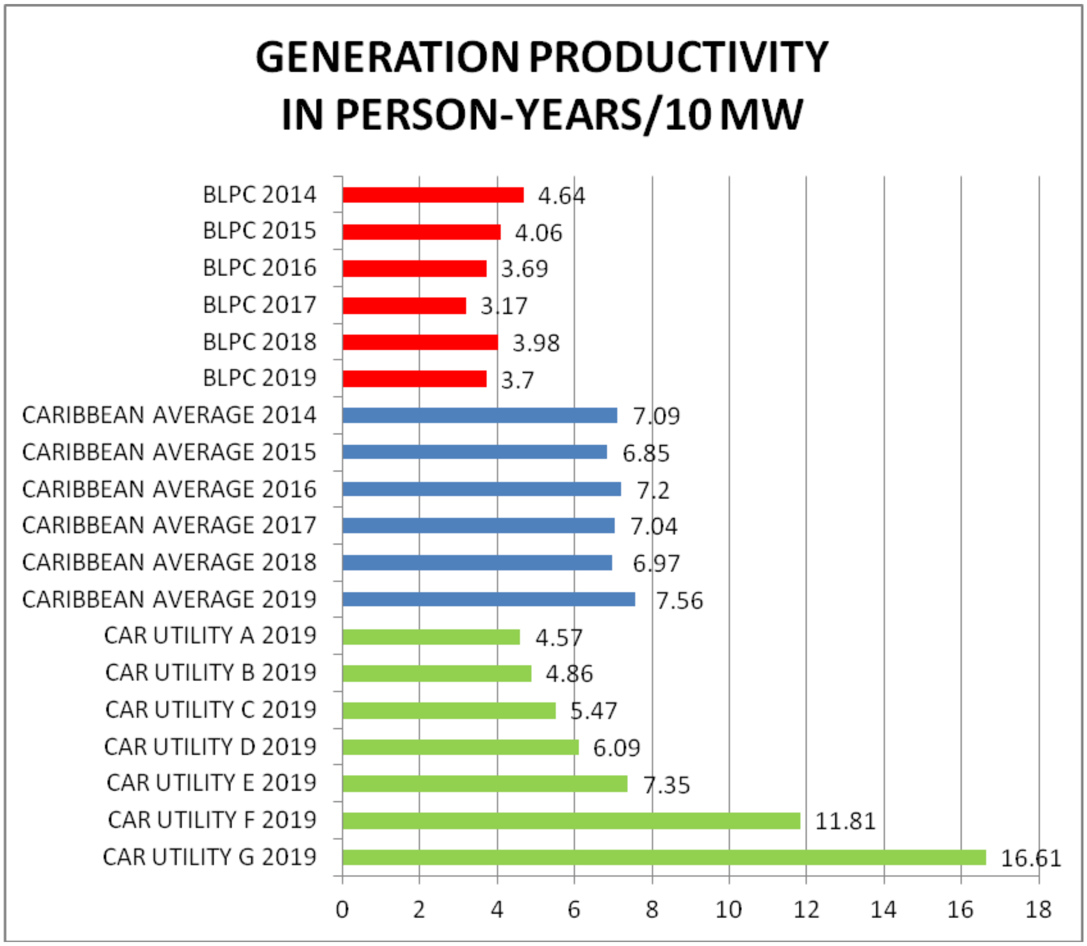


Figure 40: Generation Productivity in person-years / 10 MW

3.17 SAIDI (System Average Interruption Duration Index)

As already mentioned in the Executive Summary BLPC is performing well with its figure of 3.51 hours for SAIDI in 2019 and its much lower figures than the Caribbean average through the years 2014 – 2019. Still it can be observed that some Caribbean island utilities reported SAIDI figures in 2019 of 1.35 and 3.5 hours, which can be considered excellent for isolated island systems. In mainland systems SAIDI is usually below 1 hour.

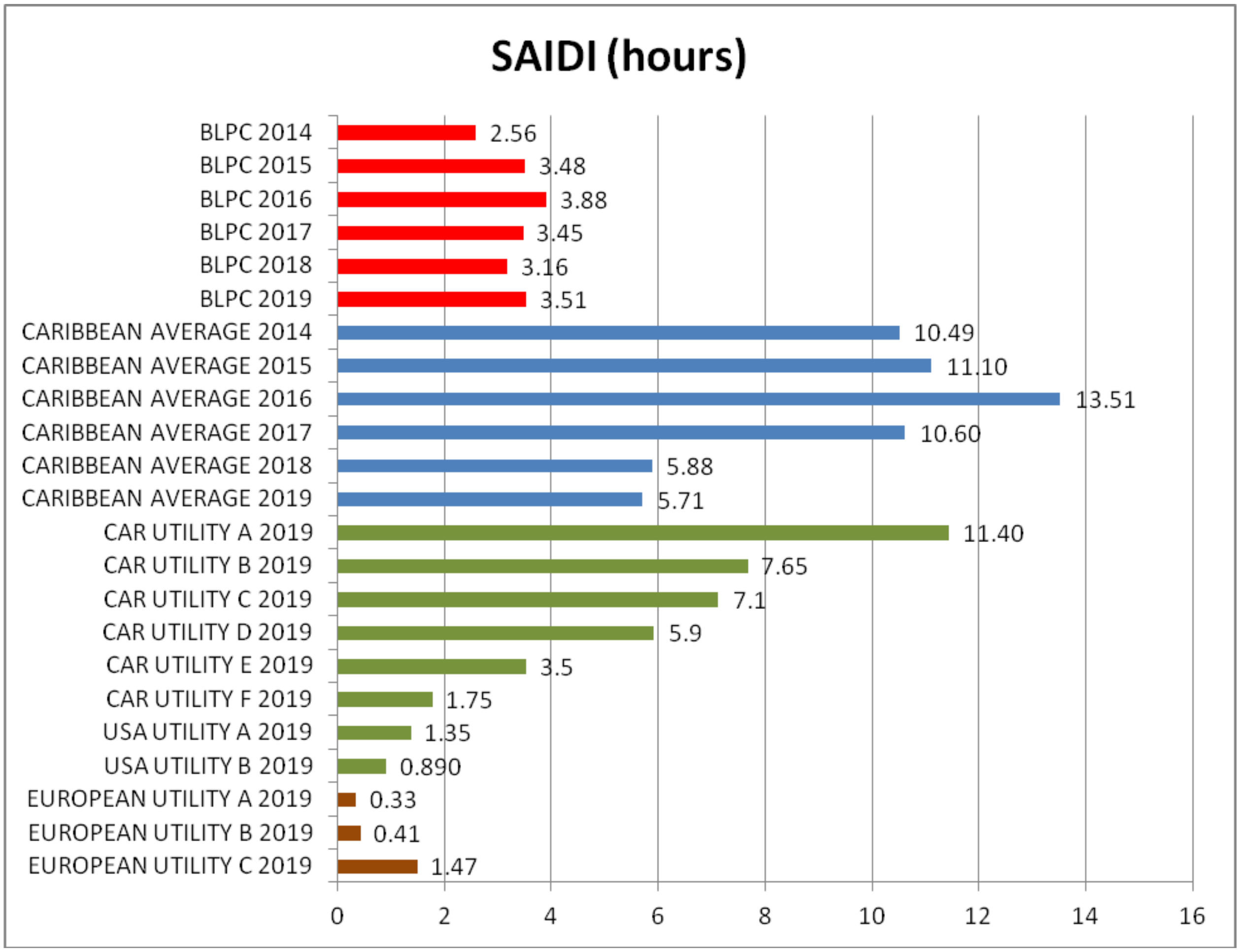


Figure 41: SAIDI (hours)

3.18 SAIFI (System Average Interruption Frequency Index)

Reliability performance in the Caribbean features a relatively high frequency of interruptions. Through the years BLPC's figures are around the average which is rather high, while in 2019 BLPC's SAIFI figure is higher than the average (4.9 against 4.37).
It must be noted that because of BLPC's relatively low SAIDI figures, the duration per outage will be relatively short compared with interruption periods in most of the other islands.

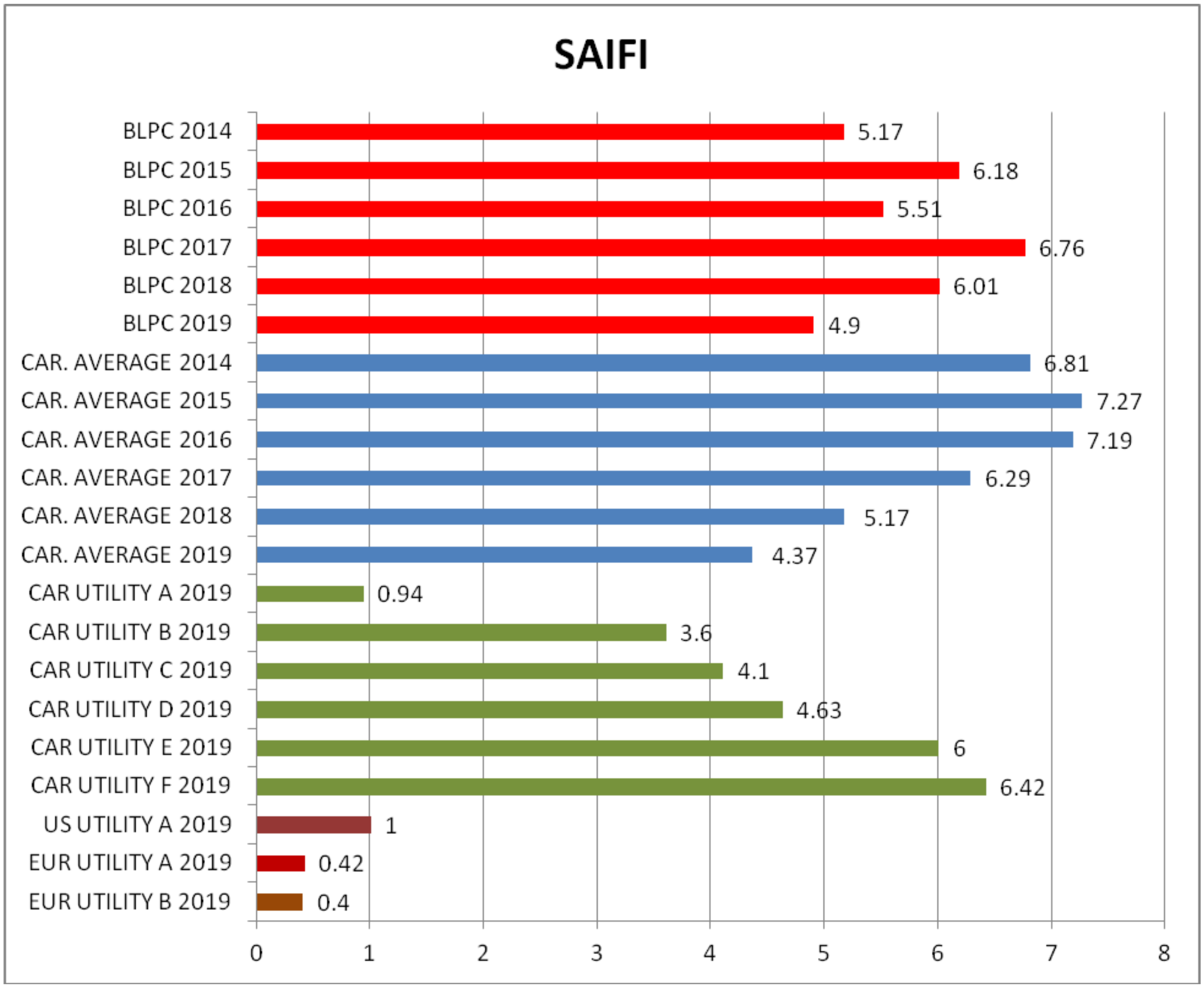


Figure 42: SAIFI

3.19 T&D Cost

The graph below shows BLPC and Caribbean utility A with relatively low T&D costs. BLPC's T&D Cost did not vary much through the years and ended at US$5.32 per MWh in 2019. The values in 2014 through 2019 are much better than in the years before 2012 when Carilec Benchmark Study Reports indicate T&D Cost figures for BLPC of around US$ 20 per MWh. The average of the Caribbean peer group in 2019 was US$ 19.86 per MWh. Three utilities show very high percentage, while despite these high T&D Cost still performance on SAIDI, SAIFI and system losses was not among the best at these utilities.

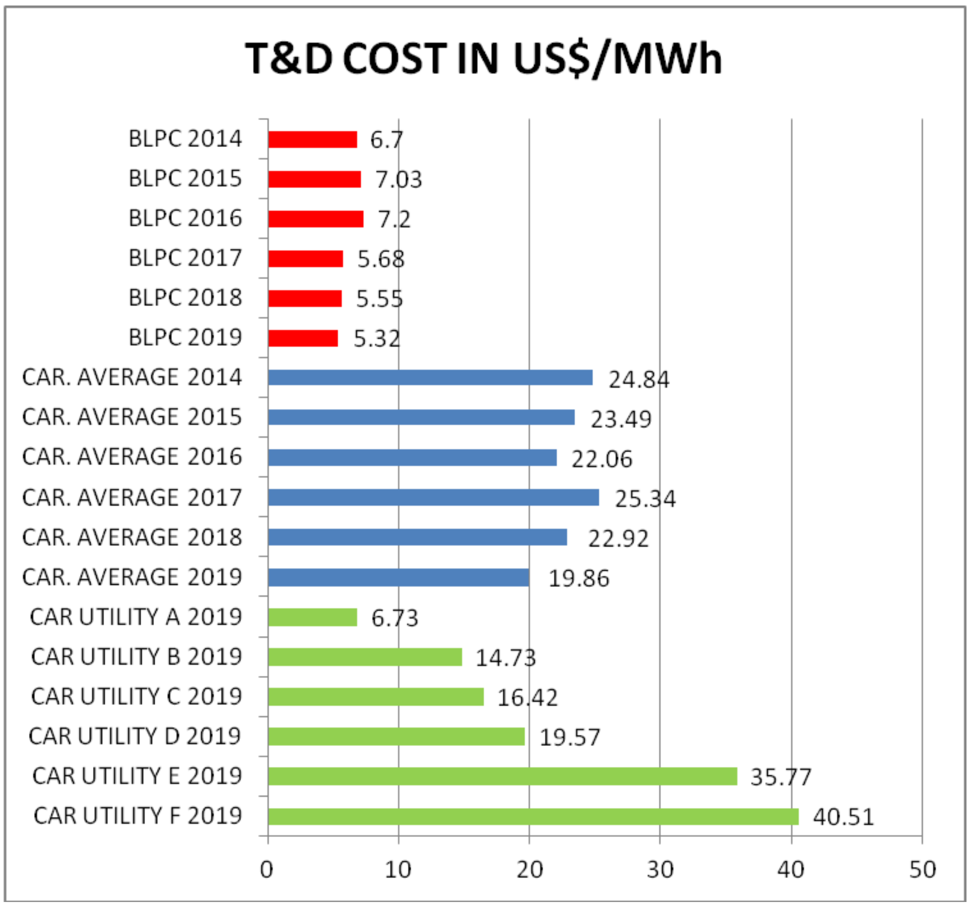


Figure 43: T&D Cost in US$/MWh

3.20 T&D Productivity in person-years per 10,000 MWh

Like in Generation Productivity we also see a high and steady productivity improvement per year at BLPC, with yearly figures below the average and with only utility A with a higher productivity in the year 2019.
In the figure below we see four other utilities also performing well except for utility G.

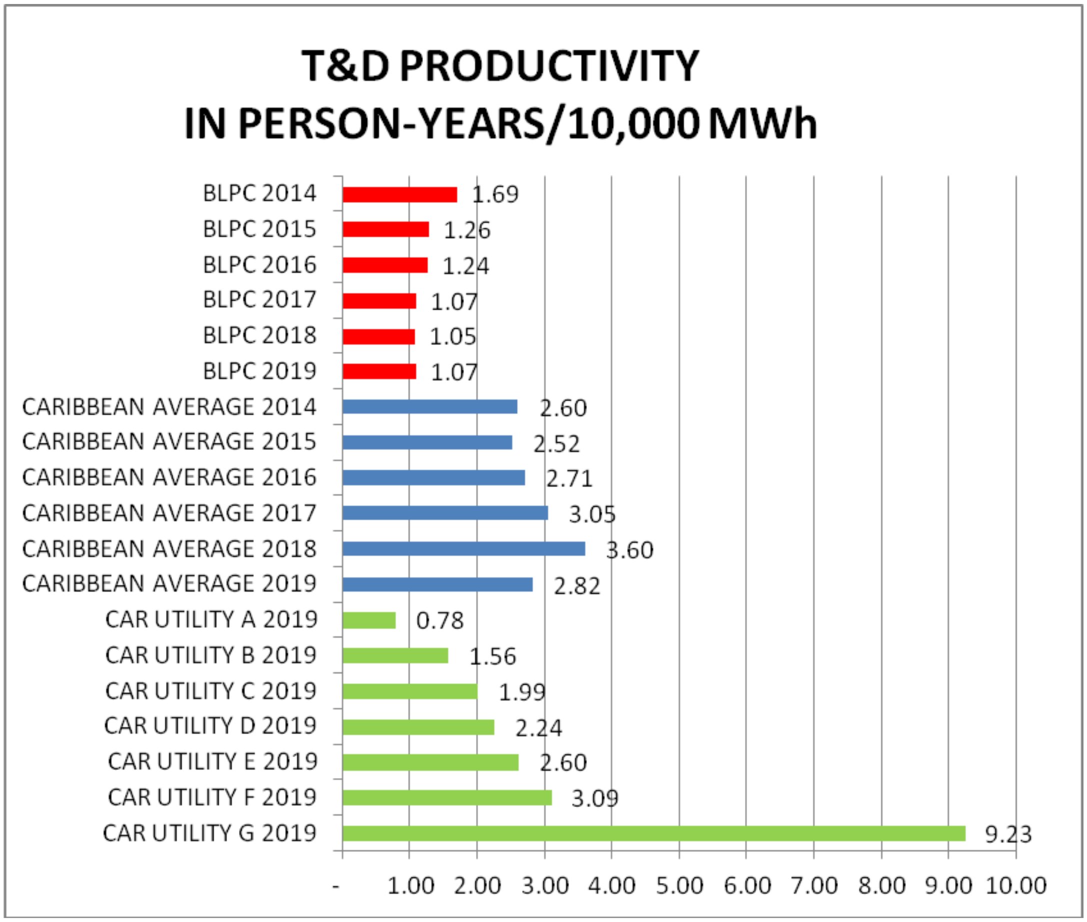


Figure 44: T&D Productivity in person-years per 10,000 MWh

3.21 Number of complaints per 1000 customers

The number of complaints in the Caribbean is relatively high with an average of 31.86 in 2015 and 19.54 in 2019, after a dip down to 12.58 in 2018. Utilities A and B however, show low levels of complaints in 2019, even lower than at European utility A.
BLPC's level of complaints was highest in 2019 (19.35 per 1000 customers)
From previous studies we have learned that the number of complaints is often much lower in countries with a relatively high GDP (and relatively high usage per customer) than in countries with a relatively lower GDP (and lower usage of electricity per customer), which is also the case for the utilities A and B in 2019.

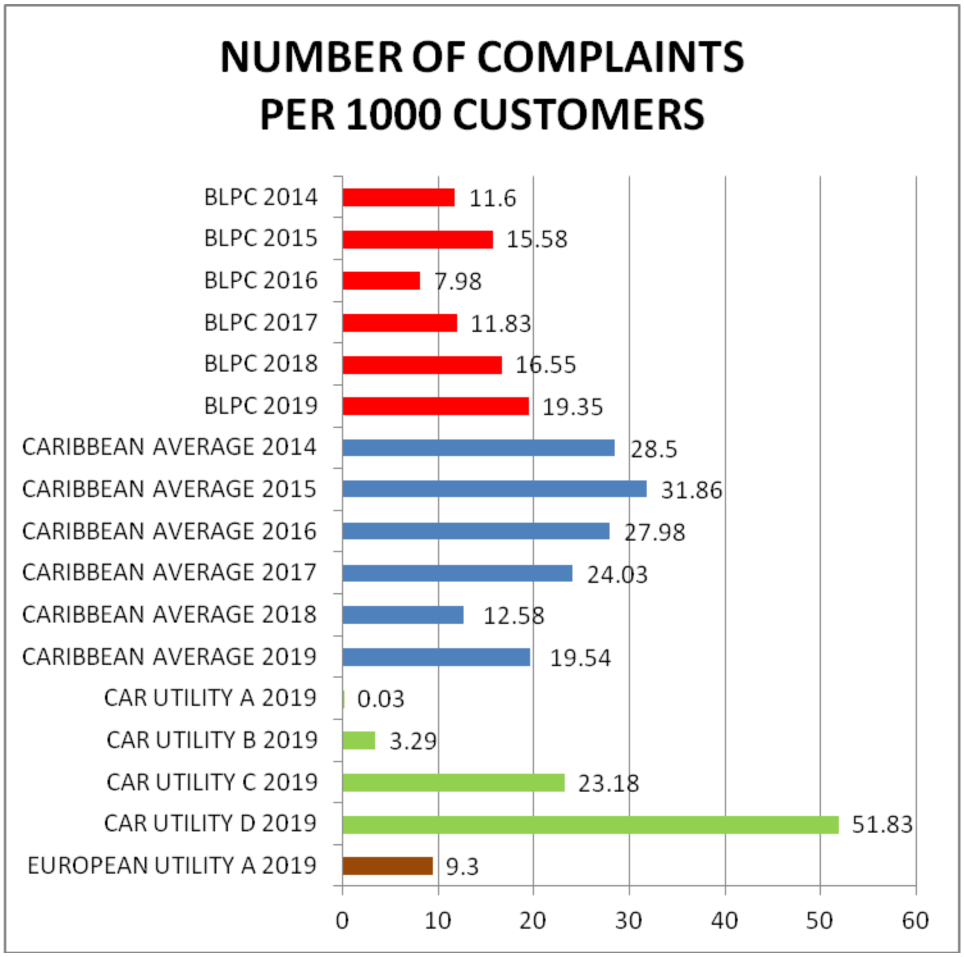


Figure 45: Number of complaints per 1000 customers

3.22 Commercialization Cost in US$/customer

While through the years BLPC's Commercialization Cost in US$ per customer was relatively low, the Caribbean average went down substantially in the period 2014-2019. Still BLPC's score in 2019 is much lower than the average, but at the same time we see in 2019 utilities A and B as the best performing utilities. In 2014 through 2018 BLPC ended two times as the best and two times as second best (as already mentioned all figures of all years can be found in tables in Appendix 1).

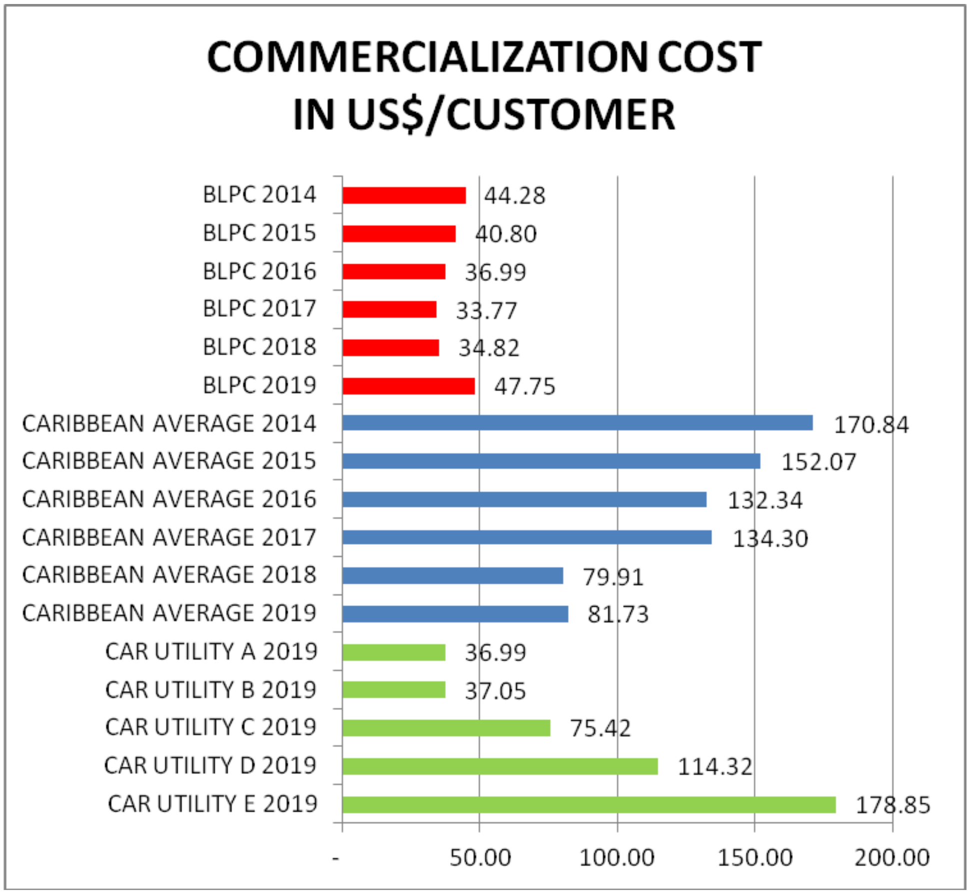


Figure 46: Commercialization Cost in US$ per Customer

3.23 Bad debt

The graph below shows the low level of bad debt at BLPC. Year by year BLPC managed to keep the bad debt level very low (lower than other utilities and even lower than the two mainland utilities in the graph). But particularly utilities A, B, C and D also performed relatively well in 2019 Previous studies showed that at utilities with a high bad debt, also the level of non-technical losses was high in many cases. From experience it is known that bad payment behavior and illegal tapping of electricity sometimes go hand in hand in countries with a low GDP per capita. In this survey however, we did not get the information for calculating the non-technical losses. As a matter of fact utility F have high system losses of which it is assumed that most losses are non-technical losses, when calculating at what level the technical losses should be.
At BLPC we see that both system losses and bad debt are lowest among the peer group.

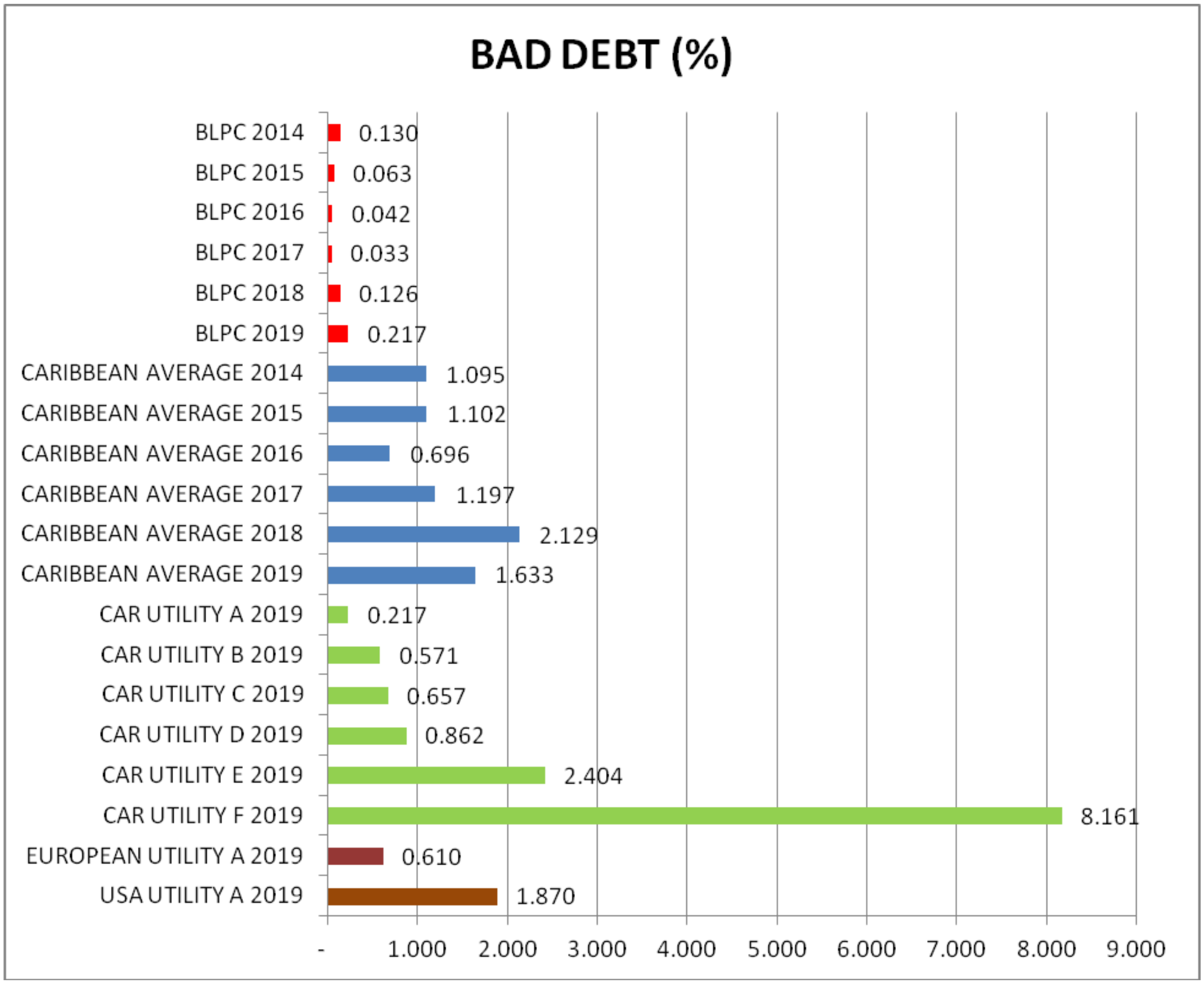


Figure 47: Bad Debt (%)

3.24 Commercialization Productivity in person-years per 1000 customers

In all years from 2012 to 2017 BLPC ended nr. 1 with the highest productivity level. The figure below shows clearly the high productivity through the years compared with the much higher level of the peer group's average.

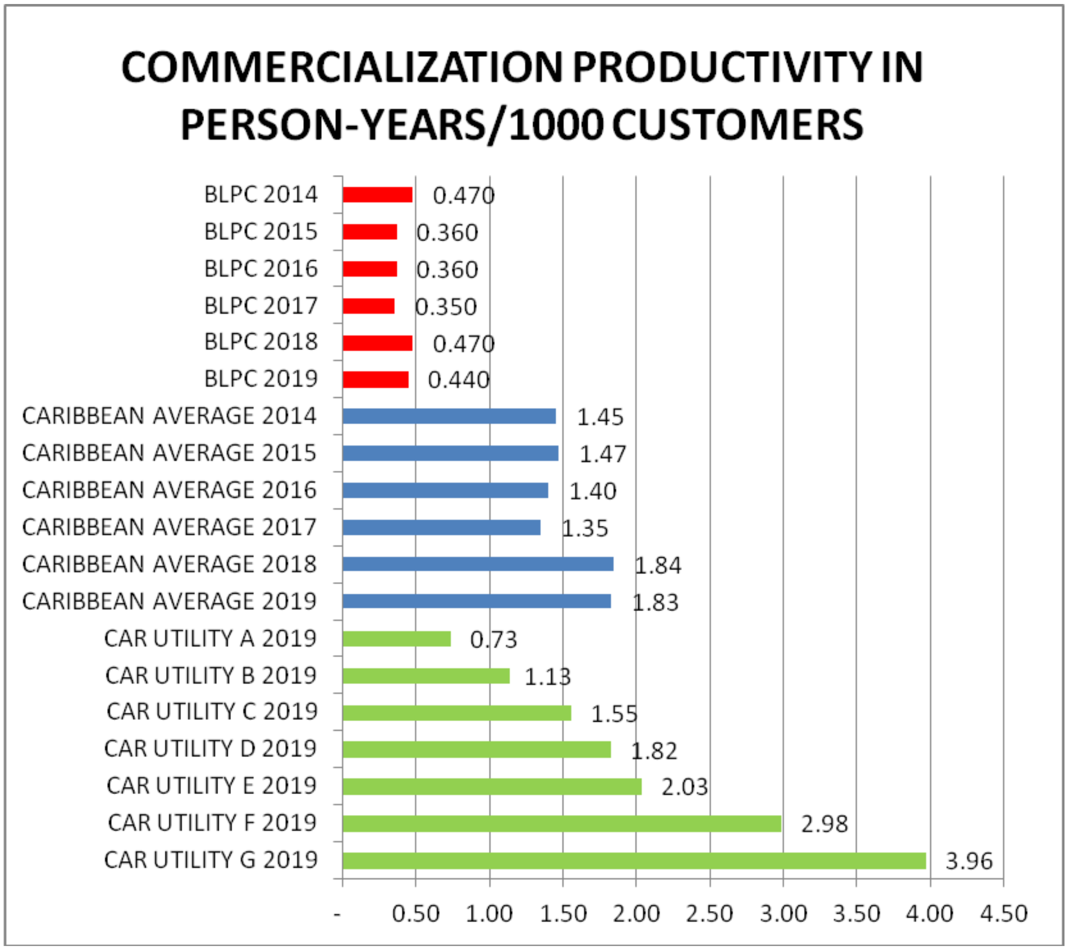


Figure 48: Commercialization Productivity in person-years / 1000 customers

4. Additional Analysis

The radar diagram below shows all performance indicators of BLPC in 2019 against the average of the Caribbean peer group in one view. The blue circle represents the score of the peer group's indicators, all set at 100%, and in red the score against the peer group's 100% is shown. Only for six indicators it shows that BLPC is just under the 100% level of the peer group. These six indicators are:

- System load factor
- Generation availability
- Plant energy consumption (station losses)
- Utilization factor
- Fuel cost
- SAIFI

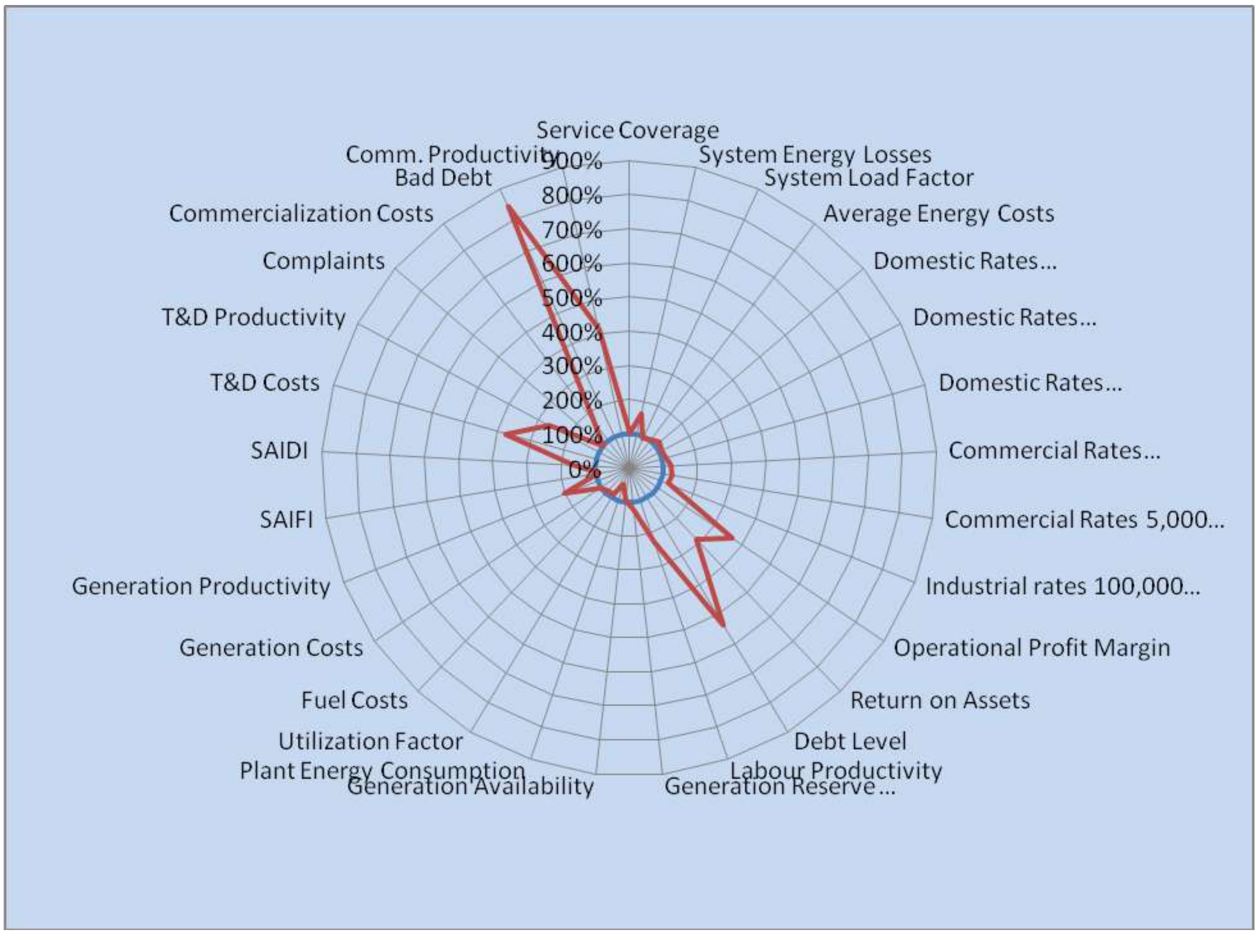


Figure 49: Radar diagram showing all BLPC performance indicators against Caribbean average

Since the radar diagram contains some high peaks showing very good performance compared with the average performance, a second diagram without these peaks has been prepared in order to have a better view on the scores in the diagram around the 100% circle. In the diagram on the next page we left out the high scores for Debt Level, Bad Debt and Commercialization Productivity.

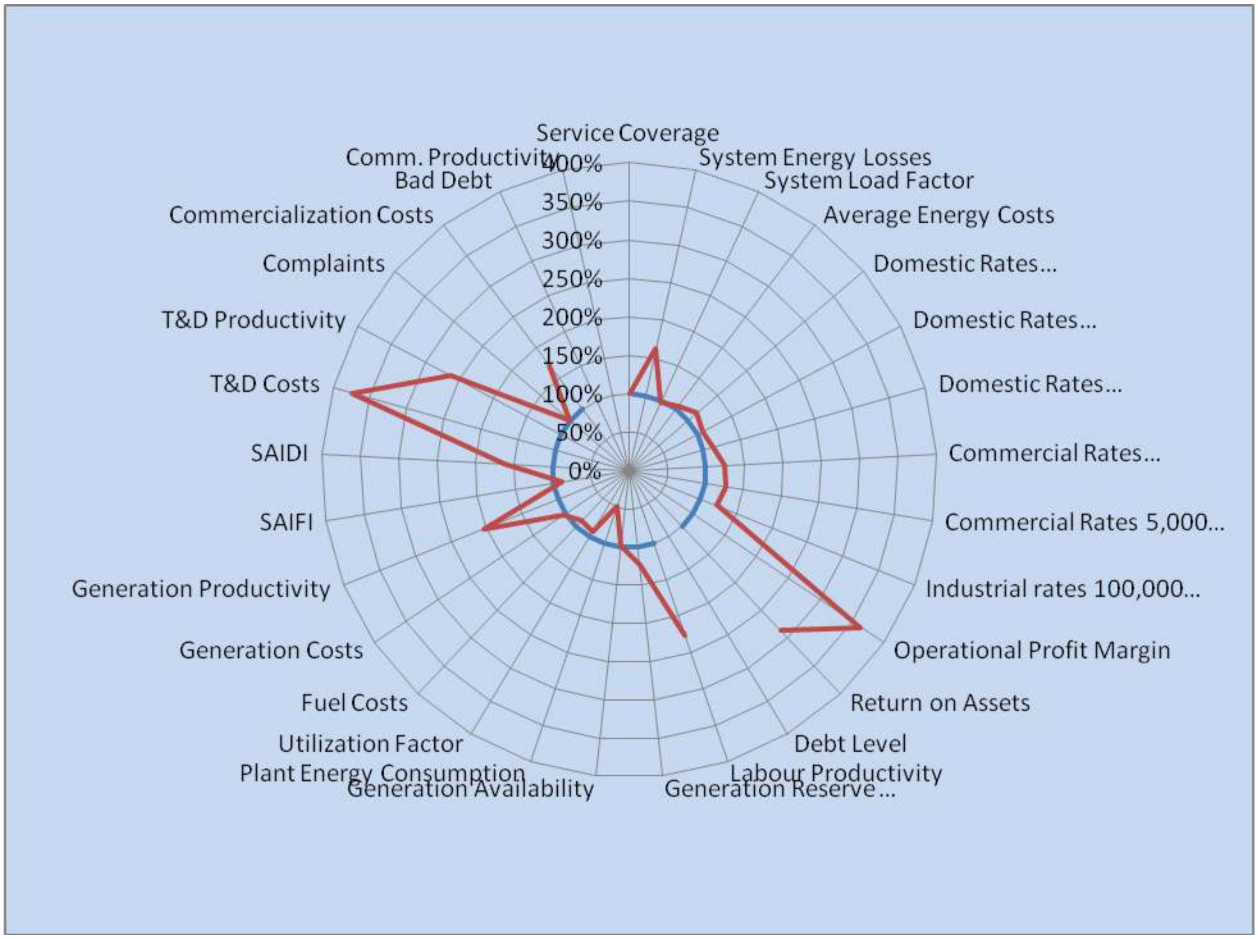


Figure 50: Radar diagram similar to figure 49, but without the three highest performance peaks

Next to the six already mentioned indicators showing BLPC's performance just under the average performance, it can also be seen that apart from the very high scores, the average energy cost and the tariffs in all usage categories are showing better performance (outside of the blue circle).

The total score of BLPC represented in this radar diagram (as well as the improvements made in the years from 2014 to 2019 as shown in Chapter 1.2.3) indicates that BLPC has in general reached a higher level of efficiency and effectiveness than the average of the peer group's utilities with just a few indicators with slightly lower performance (except for Plant Energy Consumption). The tables in Chapter 1.2.3 have furthermore shown BLPC's progress from 2014 until 2019 per performance indicator in percentages.

5. Benchmarking against European and North American Utilities

5.1 Introduction

This section of the report compares the operating results of utilities in the Caribbean region with performance indicators of European and North American utilities, in order to assess the standing of BLPC and the regional utilities against mainland practices.
In order to present the international performance indicators and compare those with island utilities, the consultant selected relevant performance indicators for which non-confidential information was available.

It is necessary to take into account that international values are not always directly comparable with the results of small Caribbean utilities due to differences in important factors like

- the physical environment,
- the degree of economic development,
- population income,
- the structure and regulation of the power industry,
- the availability and prices of energy resources,
- the production and distribution technologies used and their economies of scale,
- the size of utilities in terms of capacity and load demand,
- remoteness of island systems,
- the isolated situation of island systems and lack of interconnections with other utilities,
- the size and composition of markets served,
- differences in technological development and labor markets.

Generally it can be observed that major differences between large electric utilities in Europe and North America and the Caribbean utilities are in the following performance indicators:

- average cost per MWh
- tariffs
- labor productivity
- SAIDI and SAIFI
- Fuel Cost (where mainland utilities are also generating with coal, nuclear, and increased usage of large scale renewables like for example in Germany and Denmark)
- Generation Cost
- Generation reserves margin
- Utilization factor

In this Chapter these differences will be shown, also looking at how close BLPC, as one of the best performing utilities in the Caribbean peer group, has come compared with the mainland utilities.

Note that for certain performance indicators small island systems can compete with the large mainland systems, such as:

- Service coverage
- System losses
- Generation system equivalent availability
- Operational profit margin and RoA, dependent on regulatory rules and rate setting mechanisms

- Bad debt
- Number of complaints

The information of European and North American utilities compared corresponds to the years 2017-2019.

5.2 Comparisons

a) Average Energy Cost in US$/MWh

Through the years of Carilec's Benchmarking Studies as of the year 2002 it could be observed that Average Energy Cost of Caribbean utilities were three to four times higher than in Europe and North America. The impact of the differentiating factors as mentioned in Chapter 5.1 is substantial. With a Caribbean average of US$ 213/MWh and with BLPC at US$ 203 per MWh the average energy cost in the European and the US utility is around 4 times lower. In the calculation of the Caribbean average we did not include a subsidized Caribbean utility that reported average energy costs at US$ 66.1 per MWh.

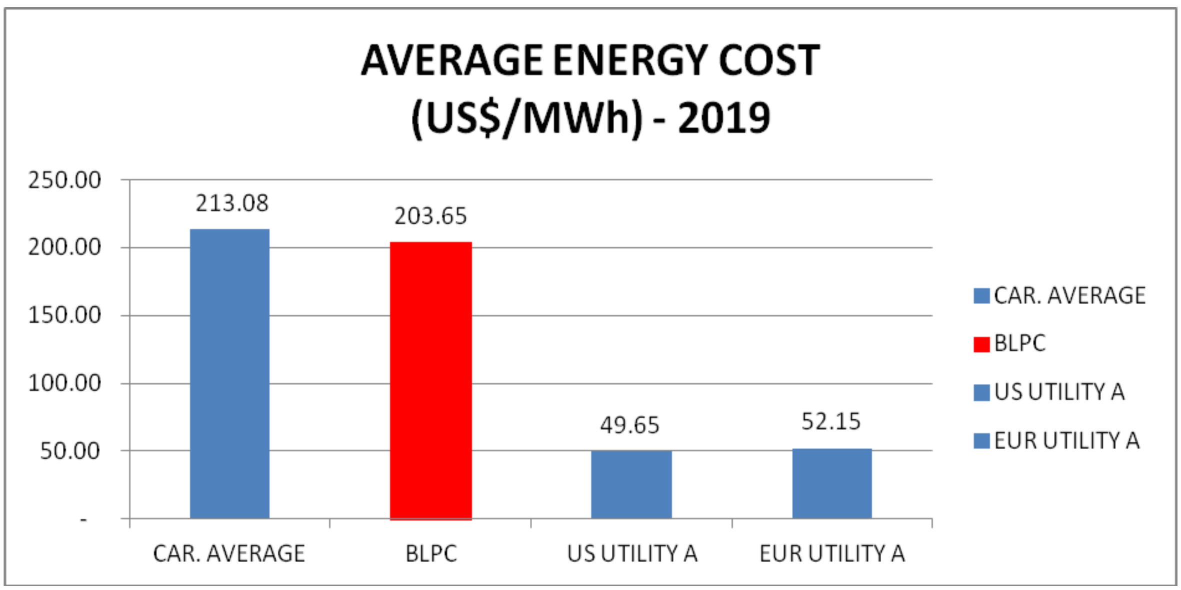


Figure 51: Average Energy Cost against US and European utilities

b) Labor Productivity in person-years per 1000 customers

Also for this performance indicator the difference between mainland utilities with millions of customers and small island utilities with some hundred thousands of customers is substantial. Labor productivity is usual 2.5 to 5 times better in mainland utilities. This is also the case when looking at the Caribbean average, but BLPC gets close to some of the mainland utilities, as to be seen in Figure 55 (next page)..

With 128,700 customers BLPC's productivity is 2.69 person-years per 1000 customers in 2019, while the productivity figure for European utility A (8.2M customers) is 1.36 and

1.78 for US utility A (4.9M customers). We also see that BLPC came from 3.35 person-years per 1000 customers in 2012.

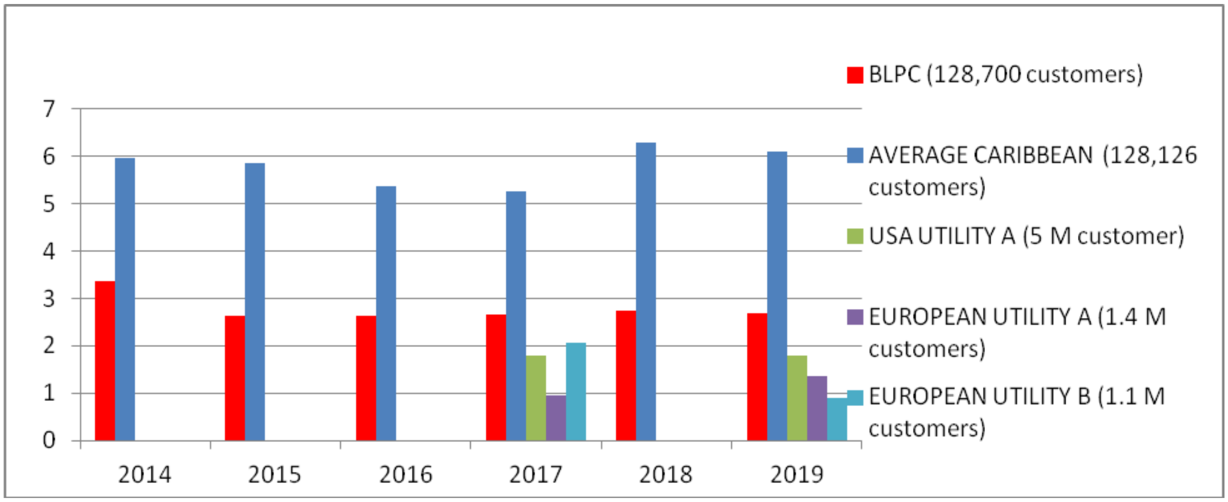


Figure 52: Comparison of labor productivity with mainland utilities

c) Tariffs

In most European countries we can identify wholesale energy trading under EU regulations. Next to Generation companies selling electricity to the wholesale market, we see strongly regulated Transmission and Distribution companies, while sales of electricity to the consumers occurs in a competitive retail market, with often multiple energy suppliers in the household and the non-household segment. This means that electricity prices for domestic and commercial customers are varying among the competing suppliers.

It can be noted that in an increasing number of countries substantial percentages of taxes are imposed on electricity prices for reasons of climate change and the environment. In Germany and The Netherlands such taxes are already very high, at 40% in the Netherlands.

So while we see a large difference in average energy cost between the Caribbean islands and the USA, the distance is becoming smaller when it comes to comparing Caribbean with European tariffs.

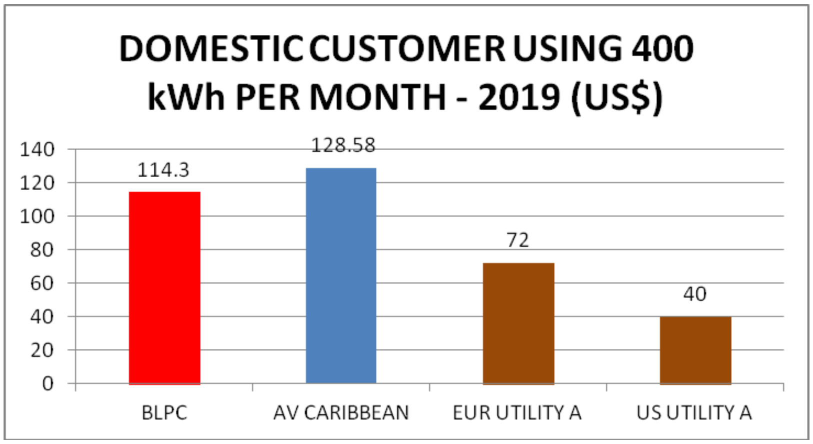
Such high taxes are not really the case in the Southeast of the USA where our study focused on tariffs. Residential rates are staying around US$ 0.10 per kWh in this part of the USA while in Europe tariffs exist of around US$ 0.18 per kWh, while BLPC the residential rate was around US$ 0.28 per kWh in 2019.

It should be noted that no separate fuel surcharges exist in most of the mainland States and that the cost of the diverse mix of fuel (oil, nuclear, other fuels) is incorporated in the total tariff.

When it comes to commercial rates we see that the average tariff in the UK drops to somewhat between US$ 0.18 and $ 0.19, with US$ 0.29 at BLPC.

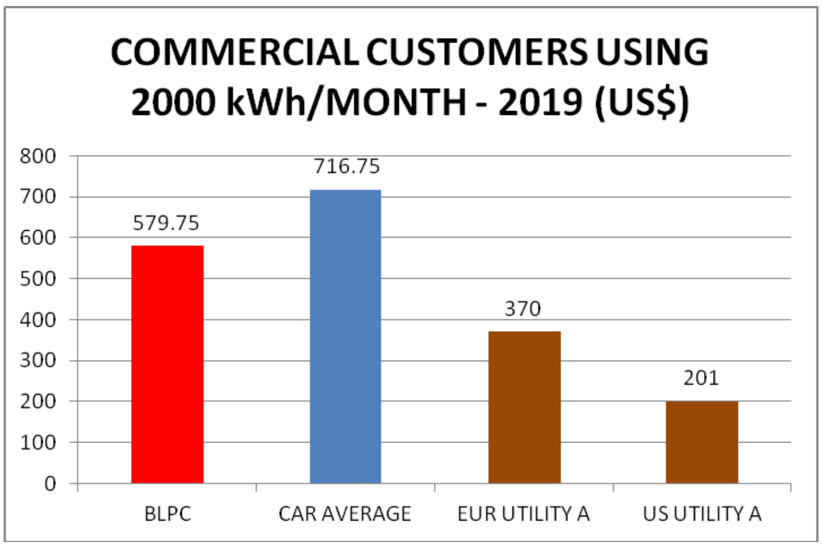
The phenomenon often seen in the Caribbean as well as in Europe that commercial tariffs are higher than residential tariffs, is getting less visible in the past few years. Differences have become smaller.

The graphs on the next page are illustrating the differences in tariffs between BLPC and the mainland utilities.



BLPC:	US$ 114
Av. Caribbean:	US$ 129
European utility:	US$ 72
US utility:	US$ 40

Figure 53: Domestic Customer using 400 kWh/month (2019)



BLPC:	US$ 580
Av. Caribbean:	US$ 717
European utility:	US$ 370
US utility:	US$ 201

Figure 54: Commercial Customer using 2000 kWh/month (2019)

d) Operational profit margin and Return on Assets

As already mentioned the Operational Profit Margin and Return on Assets are dependent on shareholders' targets on profit and return, as well as regulatory rules and rate setting mechanisms. A utility with a performance based rate setting mechanism can suffer from a lower profit and return if performance targets on efficiency and/or quality requirements are not met. As such this happened with some utilities, including European utility A in the graph below. Others (Government owned utilities) suffered from rate reductions imposed by the Government of which some received subsidies afterwards. One had a substantial loss caused by costs for restoration after a hurricane. There is also a group of utilities with a Rate of Return rate setting mechanism, but based on a base rate to be kept during 5 years or longer.

With these different backgrounds the overview of Operational Profit Margins looks diverse, also compared with European utilities while US utilities usually reach a good profit margin, with the utility in the graph below at a percentage of 19.1% in 2019, after percentages of around 25% have been achieved in 2016 and 2017.
As already noticed operational profit margins increased during some years as of 2015 because of lower fuel prices, simply because the percentage is calculated from the Net income against the Operational revenues, which went down because of much less revenues from fuel surcharges (and of course costs of fuel also went down accordingly). This effect is not applicable for the Return on Assets since the Net Income is in this case calculated against the assets value.

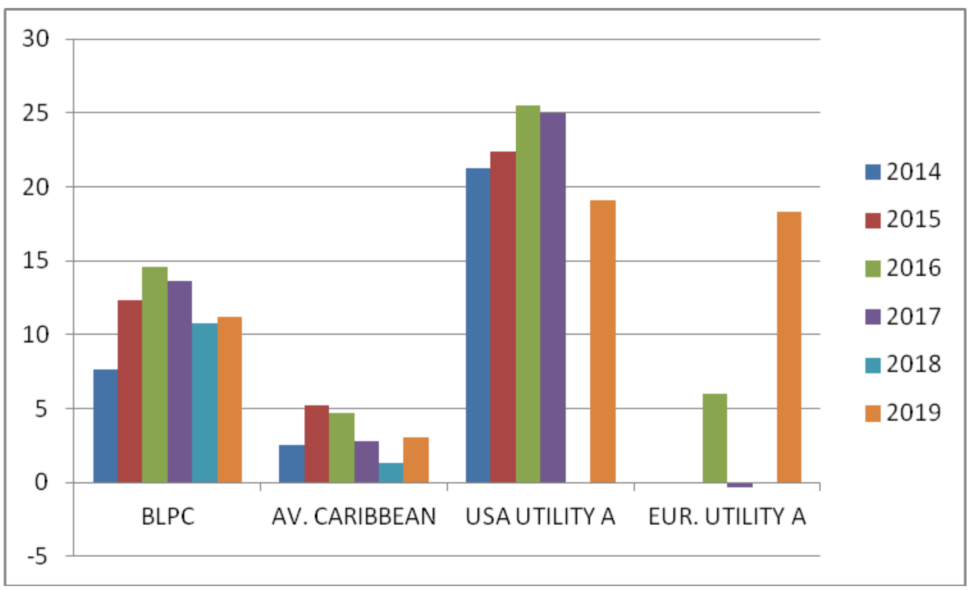


Figure 55: Operational profit margin (%) compared with US and European utilities

	OPERATIONAL PROFIT MARGIN (%)					
	2014	2015	2016	2017	2018	2019
BLPC	7.62	12.33	14.61	13.64	10.79	11.22
AV. CARIBBEAN	2.54	5.23	4.69	2.78	1.30	3.09
USA UTILITY A	21.25	22.36	25.5	24.94	0	19.1
EUR. UTILITY A			5.97	-0.31	0	18.3

A similar graph and table is shown below, now with the percentages of Return on Assets. Since the actual value of BLPC's non-current assets is higher than the value of Operational Revenues, the percentage of the Return on Assets is lower than the Operational Profit's percentage. Also in the case of USA Utility A the value of non-current assets is higher than Operational Revenues.
Likewise this is even has a substantial impact for European Utility A.

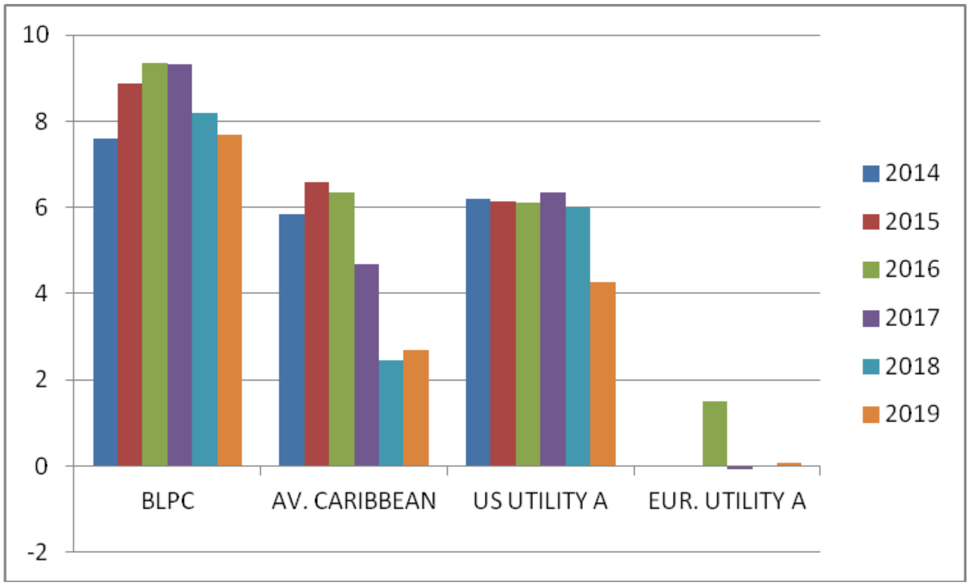


Figure 56: Return on Assets (%) compared with US and European utilities

RETURN ON ASSETS (%)

	2014	2015	2016	2017	2018	2019
BLPC	7.59	8.87	9.35	9.33	8.2	7.7
AV. CARIBBEAN	5.83	6.59	6.34	4.67	2.47	2.68
US UTILITY A	6.19	6.13	6.11	6.35	5.98	4.27
EUR. UTILITY A			1.5	-0.08		0.08

e) System Losses

BLPC's System Losses varied between 5.2 and 7.1% through the years 2014-2019, which are good figures when compared to utilities worldwide (Italy 8%, New Zealand 9%, Ireland 5%) and with a Caribbean average above 10% as of 2015.
The mainland utilities that we selected are performing better than the Caribbean average, but as to be seen in the graph and table below, BLPC is best in class in 2019.

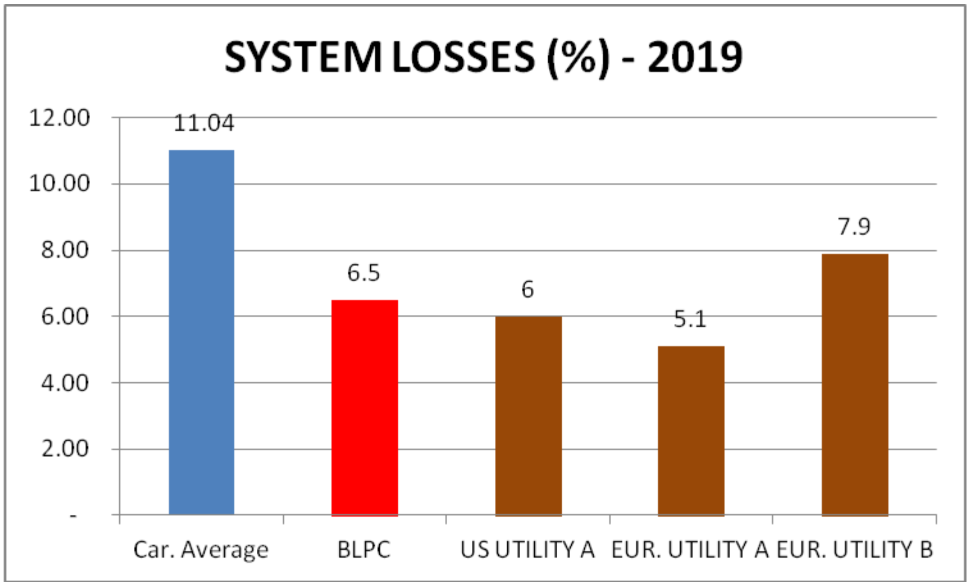


Figure 57: System Losses (%) in 2019 compared with US and European utilities

f) SAIDI and SAIFI

The System Average Interruption Index is very low in the large interconnected mainland utilities. In Europe SAIDI is as an average lowest since many European utilities have distribution ring systems, while in the USA distribution is often done with radial distribution feeders.

The big difference between the Caribbean average and BLPC and the mainland utilities can be seen in figure 58 below.

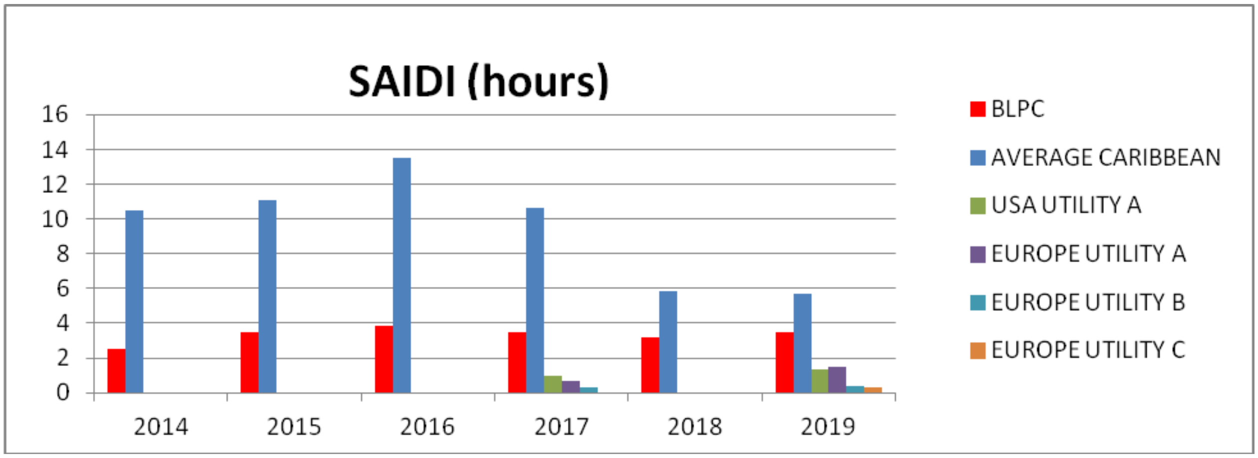


Figure 58: SAIDI (hours) compared with the average of the Caribbean utilities and with US and European utilities in 2017 and 2019.

For US utilities A and B SAIDI is 1.75 and 1.35 hours with BLPC having 3.5 hours and the Caribbean average is 5.7 hours. European utilities have a very good score: 1.47 hours and lowest scores were even 0.41 and 0.33 hours.

For SAIFI we present the following graph:

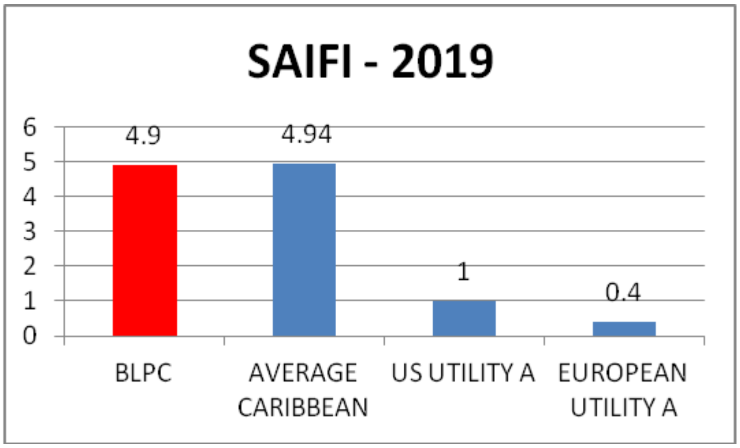


Figure 59: SAIFI in 2017 compared with the average of Caribbean utilities and a US utility

BLPC had a relatively high SAIFI in 2019 and. SAIFI was highest in 2017 at 6.76 against 4.9 in 2019. At the US utility SAIFI was only 1 and in the European utility SAIFI ended at the low figure of 0.4.
With a relatively high number of interruptions in 2019 with however low average interruption durations in this year, the duration of each interruption at BLPC is relatively short.

g) Generation reserves margin and system equivalent availability

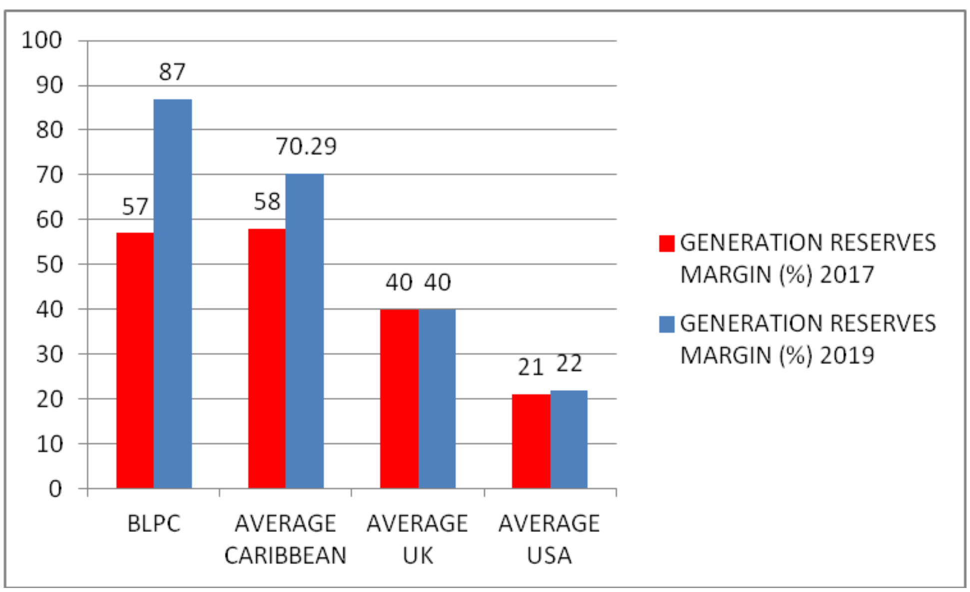


Figure 60: Generation reserves margin (%) in 2017 and 2019

Figure 60 shows generation reserves margins in 2017 and 2019. Generally it can be observed that generation reserves margins are higher for island systems, usually between 50 and 60%. In mainland systems reserves margins are generally between 25 and 40%, with in the graph around 40% for the UK's average and around 22% for the US average. Because of the higher reserves margins the utilization factor of island systems is lower than of the mainland systems. However, because of the lack of interconnections, the island systems have higher reserves for the sake of reliability and availability (the utility's effectiveness), which on the other hand is one of the factors which affect the island system's efficiency. The reserves margin at BLPC increased substantially in 2019 up to 87% due to an increase of the installed production capacity with 35 MW.

As already mentioned in the Executive Summary the balance between reserves margin, utilization factor, availability and reliability is different for island systems compared with mainland systems. On top of the mainland utilities' economy of scale and lower fuel costs, a lower reserves margin and a higher utilization factor is a further enhancement of the efficiency while still keeping up a high effectiveness when it comes to operational performance.

The figures received for system equivalent availability show usual levels between 80 and 90% (BLPC 84%, European utility A 84%, Caribbean average 85.2%) but two Caribbean utilities reported exceptionally high percentages of system equivalent availability of 96.4% which should have resulted in an average of only 13 days per year for engines to be out of service for maintenance and any failures.

The comparison of system equivalent availability in % with Caribbean utilities and European utilities is shown in figure 61.

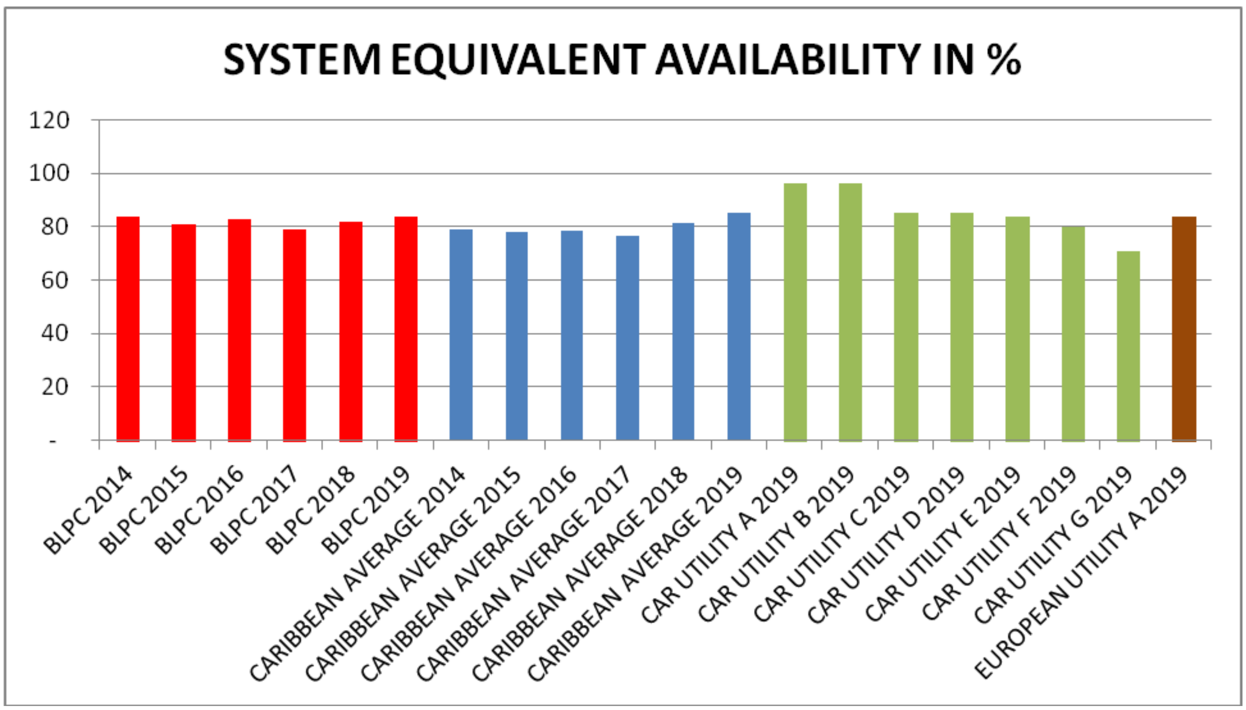


Figure 61: System Equivalent Availability (%) compared with Caribbean and European utilities

h) Bad debt

BLPC's bad debt level went down to 0.126% in 2018 and 0.217% in 2019, lower than US utility A with a bad debt of 1.87% and European utility A with 0.61%. .Among the other utilities in the peer group the lowest bad debt level is 0.2%.

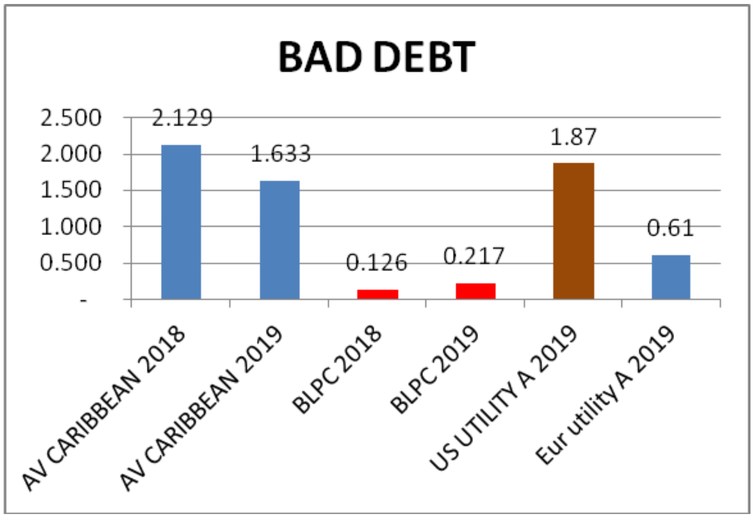


Figure 62 : Comparison of Bad Debt (%) in 2018 and 2019

i) Number of complaints

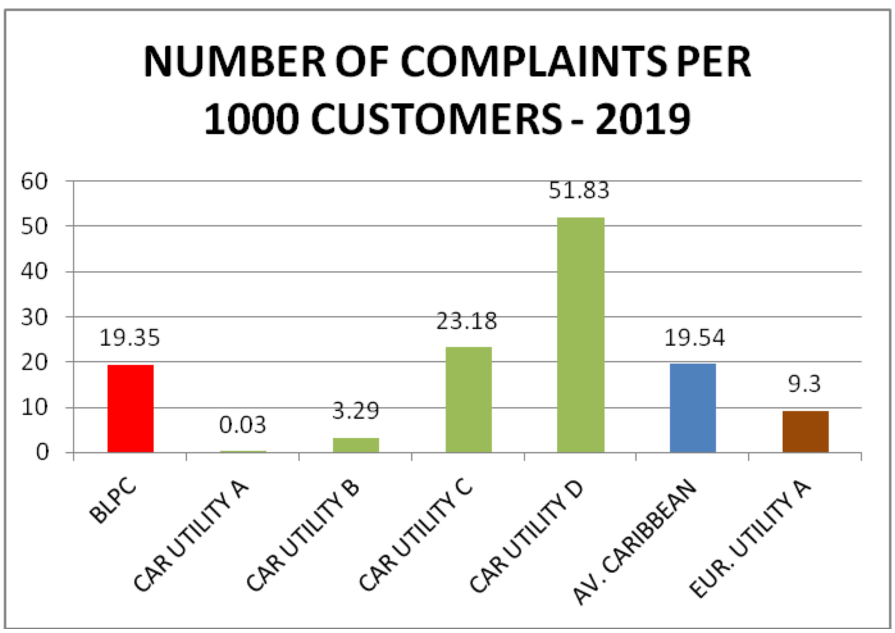


Figure 63: Number of complaints per 1000 customers in 2019 compared with Caribbean and European utilities

Figure 63 shows two Caribbean utilities with a lower number of complaints while utility D reached a high value of 51.83 complaints. The European utility's number of 9.3 complaints is rather low, still two Caribbean utilities have less complaints.

5.3 Conclusions

It is obvious, like this has been confirmed in many studies before, that (small) island systems are less efficient and less effective than large mainland systems. Also in this Benchmarking Study the advanced position and the characteristics of the limited number of mainland utilities of which publicly available information could be obtained, results in differences in performance which could be expected. In Chapter 5.1 the factors which contribute to less efficiency and less effectiveness are mentioned.

The major differences are in the average cost per MWh and in the tariffs.
BLPC's cost per MWh is four times higher than the cost of mainland systems, but was even five times higher in 2014.
The average cost of the Caribbean peer group is 4.26 times higher in 2019.

BLPC's total bill tariffs in different usage categories are in 2017 1.6 times higher than European utilities in Western European countries like Germany, The Netherlands and the UK, and are 2.5 times higher than in the Southeast of the USA. The difference with European tariffs becomes smaller because of increased tax charges imposed on electricity tariffs.

So far the large differences between BLPC and the mainland utilities are clear, although the differences are not as large anymore than observed some 10 years ago.

When looking at other performance indicators, which are known to be quite different between island and mainland systems it can be observed that through the years BLPC has made progress in getting closer to these large utilities, as follows:

- In labor productivity BLPC is getting closer to labor productivity of European and US utilities, which are serving many millions of customers while BLPC serves 128,700 customers. In 2019 BLPC had 2.69 person-years per 1000 customers against around 1.78 at a large US utility and 1.36 and 0.9 person-years per 1000 customers at two large European utilities. In 2012 BLPC still had almost 4 person-years per 1000 customers;
- The average interruption duration as defined in the SAIDI index of BLPC is 3.3 times higher than the average of five mainland utilities, but the average SAIDI in the Caribbean is 5.4 times higher than the average of mainland utilities. Since 2008 and 2009 BLPC's performance improved (down from average 6-7 to around 3, which reduced the difference with mainland utilities which remained quite stable with SAIDI and SAIFI
- BLPC's average interruption frequency index (SAIFI) is high and about 12.5 times higher than the mainland utilities' SAIFI. The Caribbean average is even almost 13 times higher than the average of mainland utilities. Here improvement is needed, since we have seen SAIDI figures of only around 1 in 2010 and before.
- In System Losses BLPC performs with 6.5% in 2019 better than many utilities in the world and is just slightly higher than the average of three selected utilities in Europe and the USA.
- In Operational Profit Margin the average percentage of a US and a European utility was 1.7 times higher in 2019, but at the same BLPC reached a 3.5 times higher percentage for the Return on Assets.

Furthermore we see that BLPC is somewhat on the high side in the range of percentages for generation reserves margins of island systems, knowing that isolated islands need a higher reserves margin compared with mainland utilities.
On system equivalent availability BLPC's percentage was 84% in 2019, equal to the percentage of 84% for the mainland utility. Target should be 85 to 90%. Mainland utilities often achieve 90%.

BLPC's Bad Debt is lowest among the peer group and lower than the Bad Debt we found for one US utility.

BLPC's number of complaints per 1000 customers is somewhat more than twice as high than at two European utilities. With higher tariffs and more interruptions customers may have more complaints.
But the average number of complaints of the Caribbean peer group is still twice as high as BLPC's number of complaints. Improvement in customer service and customer relations could help bringing the complaints down.

Radar diagram with comparison of scores

The radar diagram (figure 64 on the next page) with the performance indicators which were available for a comparison with US and European utilities shows a 100% blue circle, representing the levels of all average performance indicators of US and European utilities. The levels of BLPC are expressed in percentages against the US and European 100% circle.

It is clear that BLPC is an island system that cannot match the mainland performance levels for:
- Average energy costs
- Tariffs
- Operational profit margin
- Labor productivity
- SAIDI
- SAIFI
- Number of complaints per 1000 customers

(which are the typical areas of performance where economies of scale, being interconnected and not isolated, and lower fuel costs are much more favorable for large mainland utilities compared to small island utilities)

while for the following indicators BLPC shows a better performance:
- Generation reserves margin
- Return on assets
- Debt level
- Bad debt
-

and while BLPC's performance is equal to the mainland utilities' performance on System Losses and System Equivalent Availability.

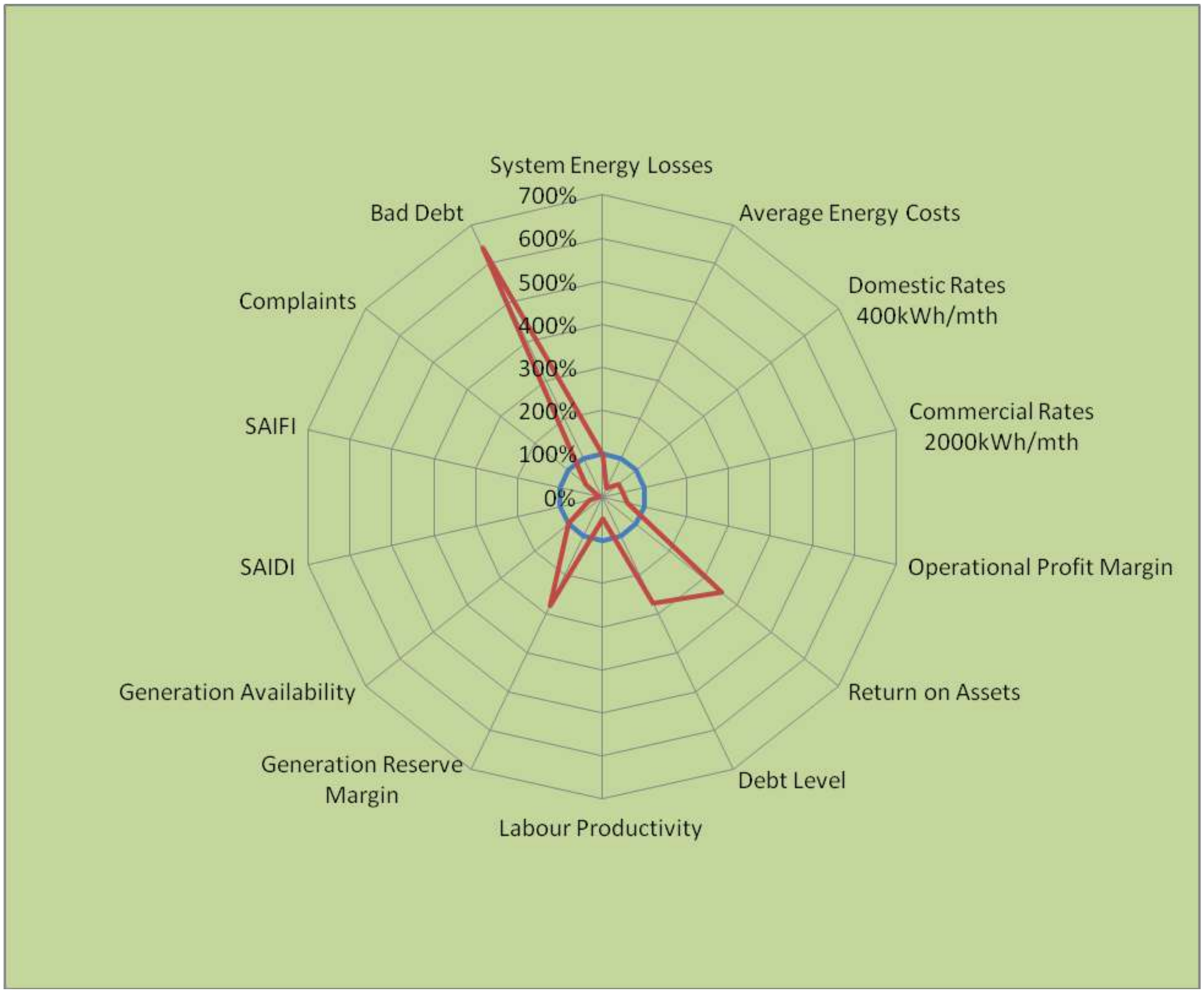


Figure 64: Radar diagram showing BLPC performance indicators compared with the average of US and European utilities

Finally, it would be interesting to undertake an effort on determining the frontiers of excellence of island systems like BLPC, so the real differences between excellent island systems and mainland systems could be identified.

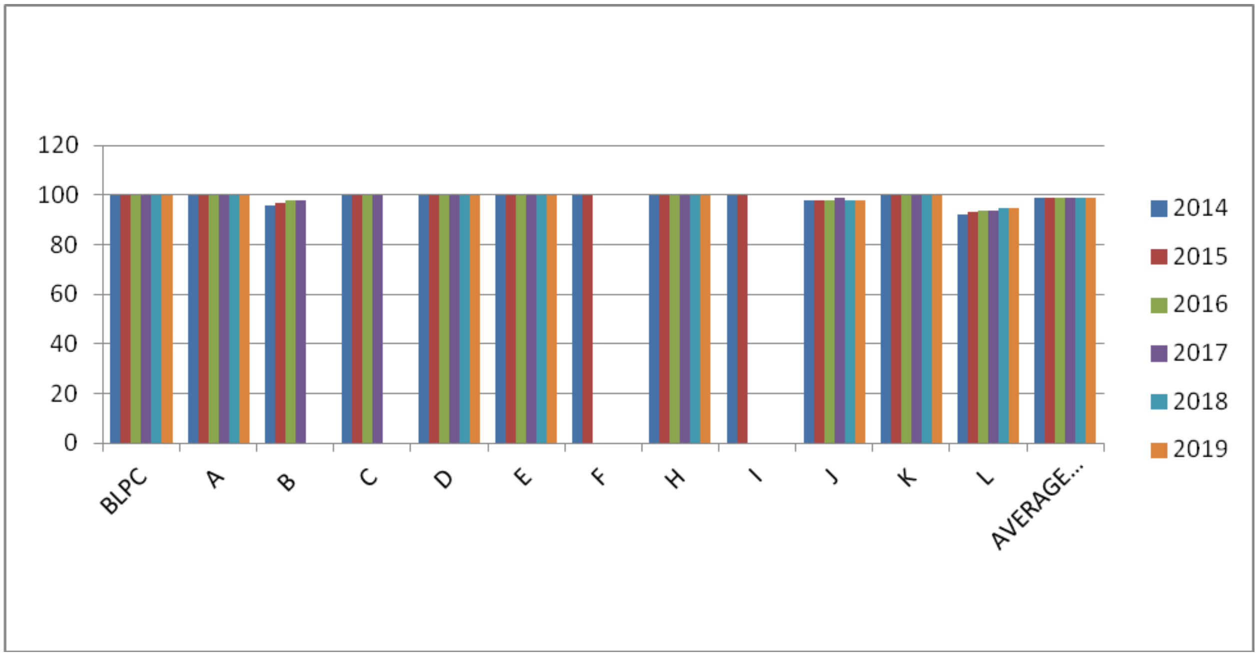
A methodology could be by starting with a Greenfield situation in which the island's customer base, the loads, and legal and regulatory requirements are known and by designing a most optimal power system with most optimal and reliable technologies for production, transmission, distribution, and customer service, maybe quite different from the current situation which has historically grown to its present status.

Appendix 1: Tables and graphs

Data received from the respondents to the data request has been processed and in this Appendix all data received for the years 2014 through 2019 is presented in graphs and tables per performance indicator. The performance indicators have been described in Chapter 2.3 of this Benchmarking Study Report and the equations used for calculating these indicators are described in Appendix 2.

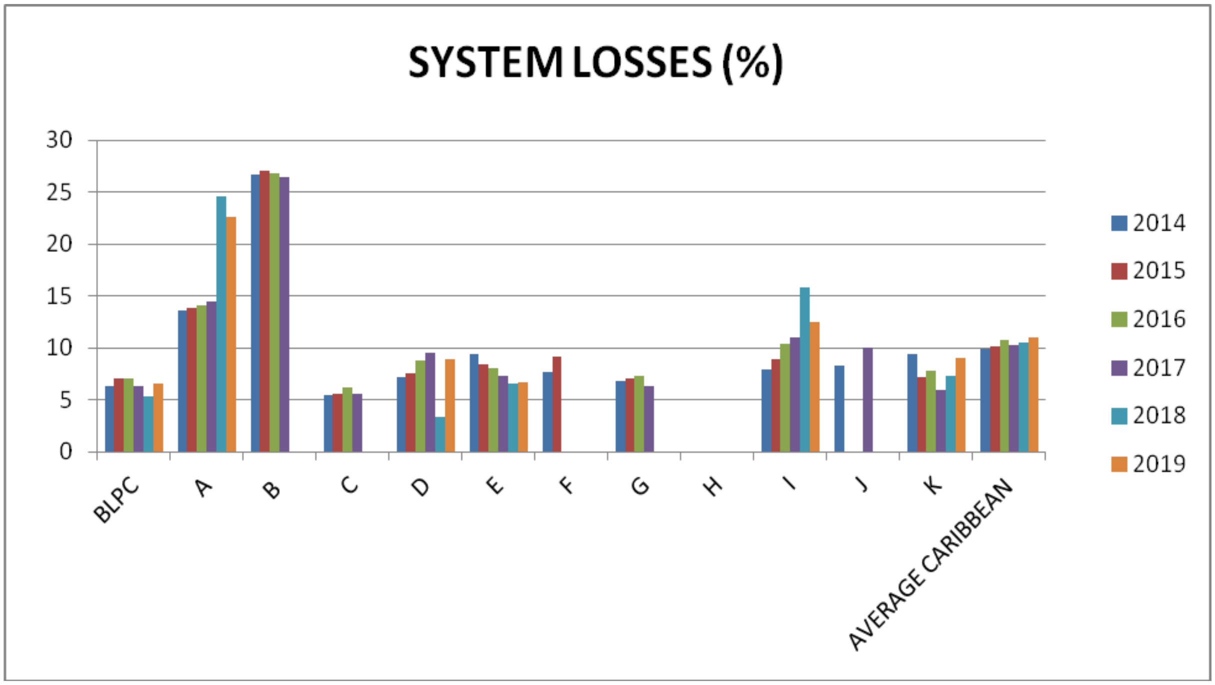
General Indicators

1. SERVICE COVERAGE (%)



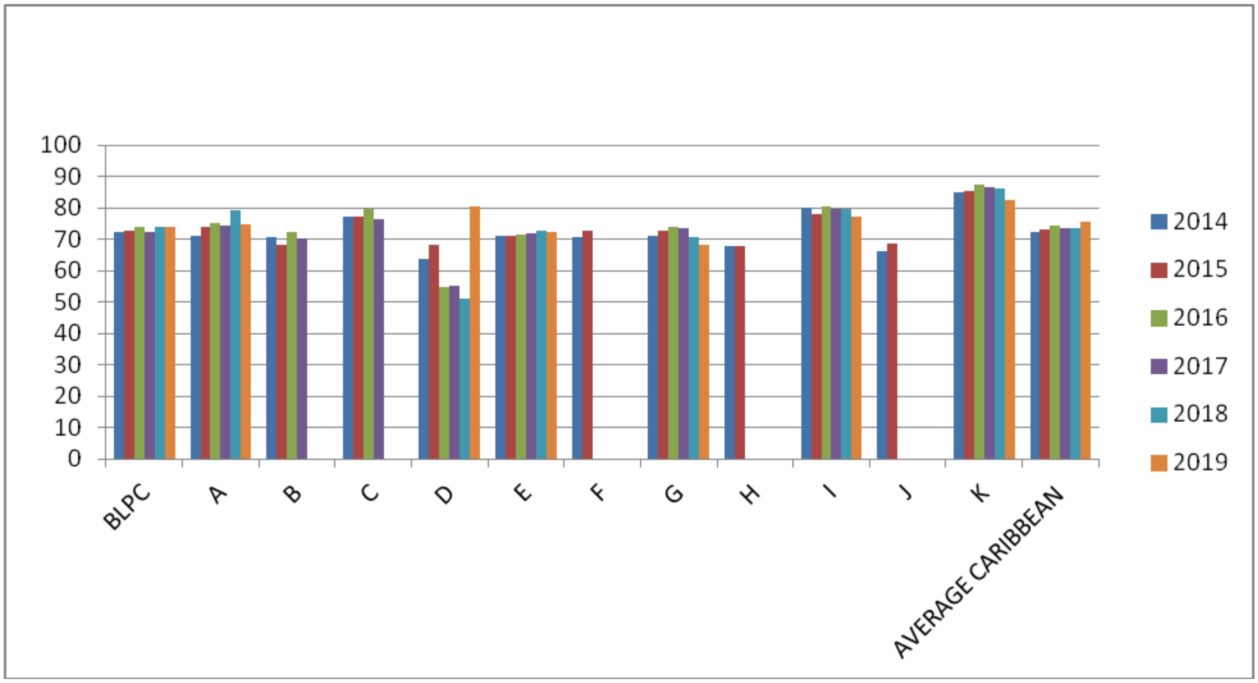
	2014	2015	2016	2017	2018	2019
BLPC	100	100	100	100	99.96	99.96
A	100	100	100	100	100	100
B	96	97	98	98		
C	100	100	100	100		
D	100	100	100	100	100	100
E	100	100	100	100	100	100
F	100	100				
H	100	100	100	100	100	100
I	100	100				
J	98	98	98	99	98	98
K	100	100	100	100	100	100
L	92	93	94	94	95	95
AVERAGE CARIBBEAN	98.83	99.00	99.00	99.1	99.12	99.12

2. SYSTEM LOSSES (%)



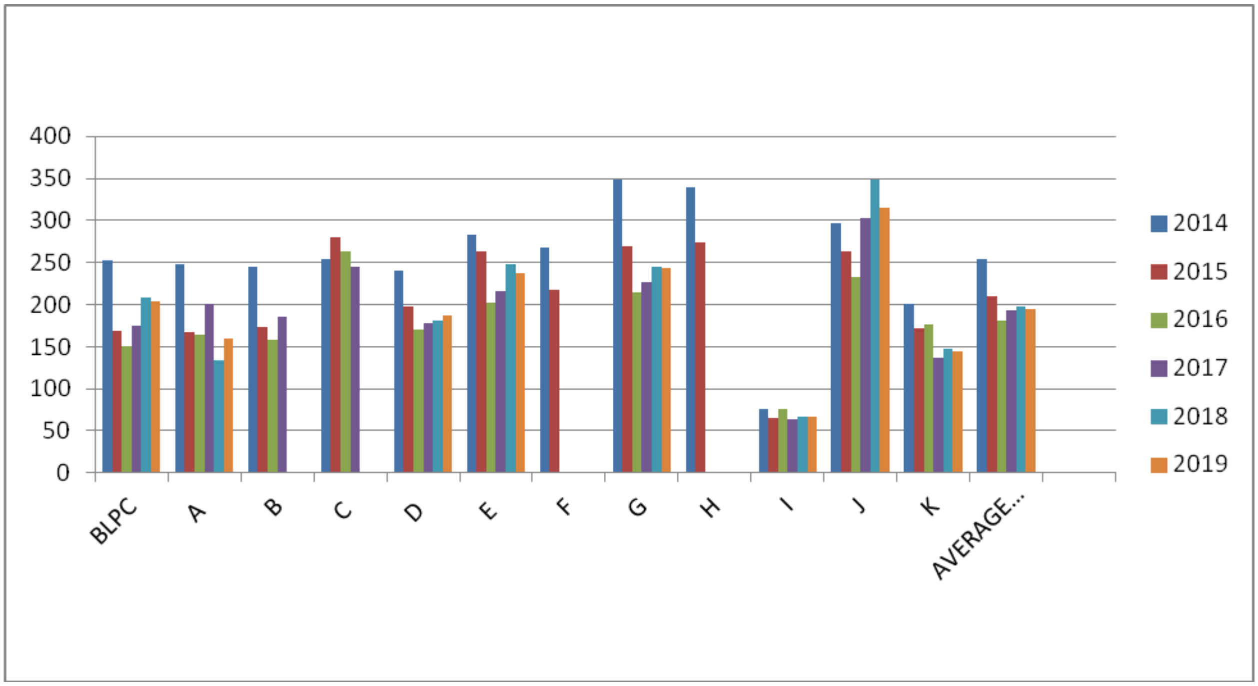
Utility:	2014	2015	2016	2017	2018	2019
BLPC	6.3	7	7.1	6.3	5.3	6.5
A	13.57	13.85	14.14	14.43	24.6	22.61
B	26.73	27	26.8	26.46		
C	5.39	5.57	6.12	5.52		
D	7.15	7.53	8.78	9.52	3.37	8.94
E	9.36	8.39	8.05	7.33	6.57	6.63
F	7.7	9.1				
G	6.81	7.02	7.23	6.28		
H						
I	7.88	8.86	10.35	11.02	15.8	12.52
J	8.3			10		
K	9.36	7.11	7.79	5.9	7.25	9.03
AVERAGE CARIBBEAN	9.87	10.14	10.71	10.28	10.48	11.04

3. SYSTEM LOAD FACTOR (%)



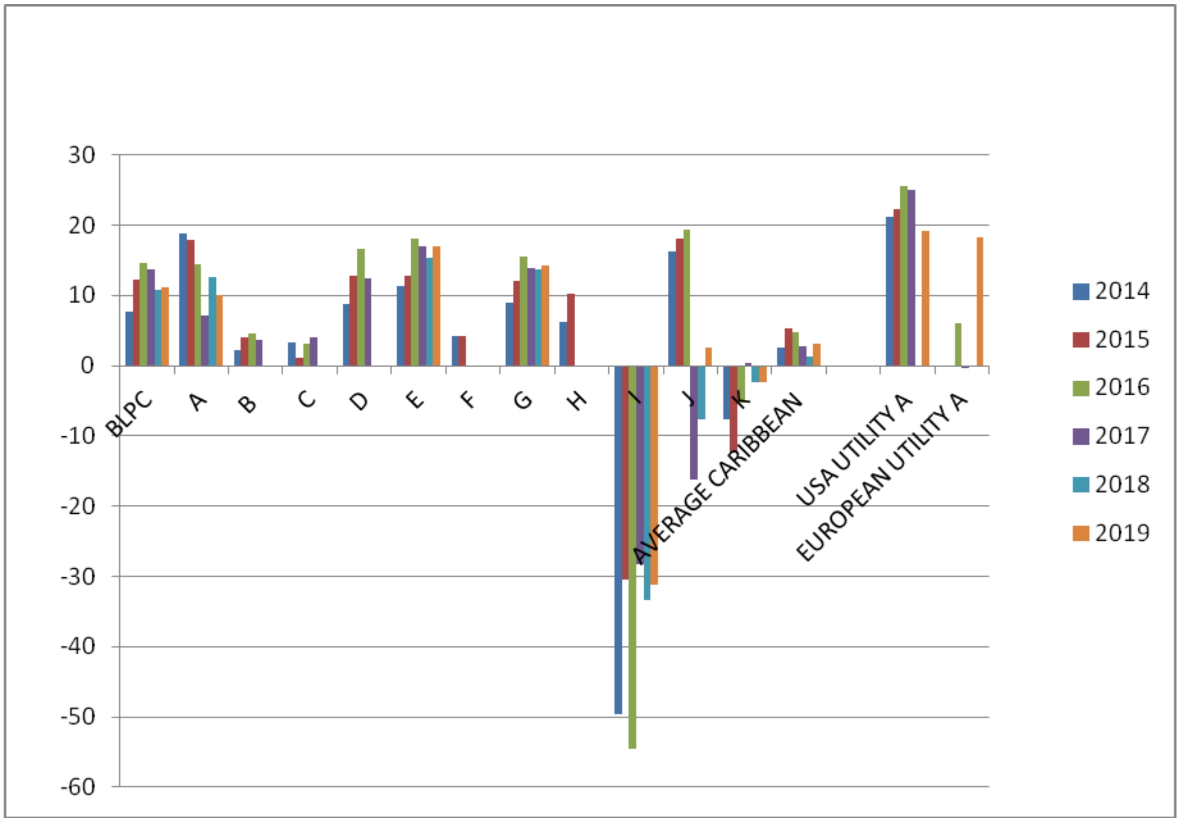
Utility:	2014	2015	2016	2017	2018	2019
BLPC	72.19	72.56	73.8	72.4	73.92	74.09
A	71.14	74.11	75.25	74.5	79.2	74.76
B	70.49	68.36	72.21	70.21		
C	77.39	77.28	79.67	76.42		
D	63.92	68.13	54.83	55.37	51.13	80.27
E	70.98	71.29	71.7	71.81	72.91	72.17
F	70.7	72.7				
G	71.02	72.71	74.03	73.54	70.72	68.27
H	67.8	67.9				
I	80.06	78.21	80.27	79.68	79.84	77.11
J	66	68.5				
K	84.9	85.22	87.53	86.46	86.27	82.59
AVERAGE CARIBBEAN	72.22	73.08	74.37	73.38	73.43	75.61

4. AVERAGE ENERGY COST (US$ / MWh)



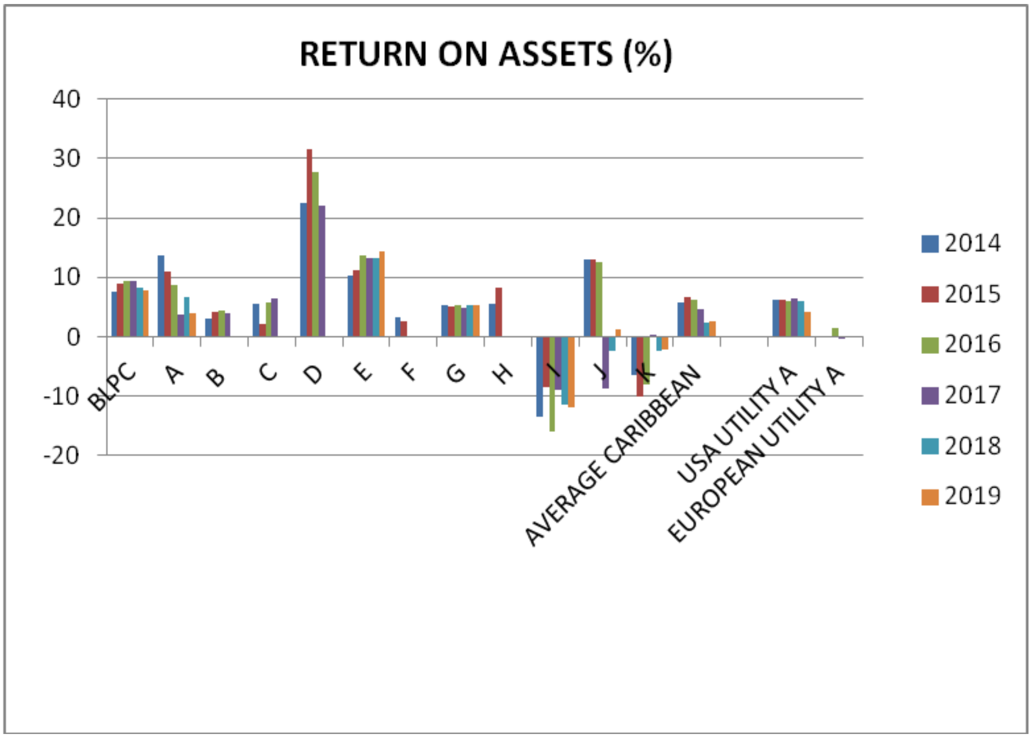
Utility:	2014	2015	2016	2017	2018	2019
BLPC	252.9	169.52	150.74	174.88	208.16	203.65
A	248.16	167.87	164.68	200.38	133.89	160.39
B	245.25	173.85	158.81	186.36		
C	254.96	279.88	263.67	244.87		
D	241.09	198.05	169.93	177.73	181.5	186.8
E	283.46	263.7	202.36	216.78	248.38	238.19
F	268.28	217.71				
G	349.34	268.72	214.6	226.86	245.79	242.9
H	339.25	274.52				
I	76.08	65.66	75.84	64.41	66.66	66.31
J	296.48	263.36	233.15	303.12	348.03	315.88
K	200.42	172.54	176.48	137.42	148.1	143.73
AVERAGE CARIBBEAN	254.64	209.62	181.03	193.28	197.56	194.73

5. OPERATIONAL PROFIT MARGIN (%)



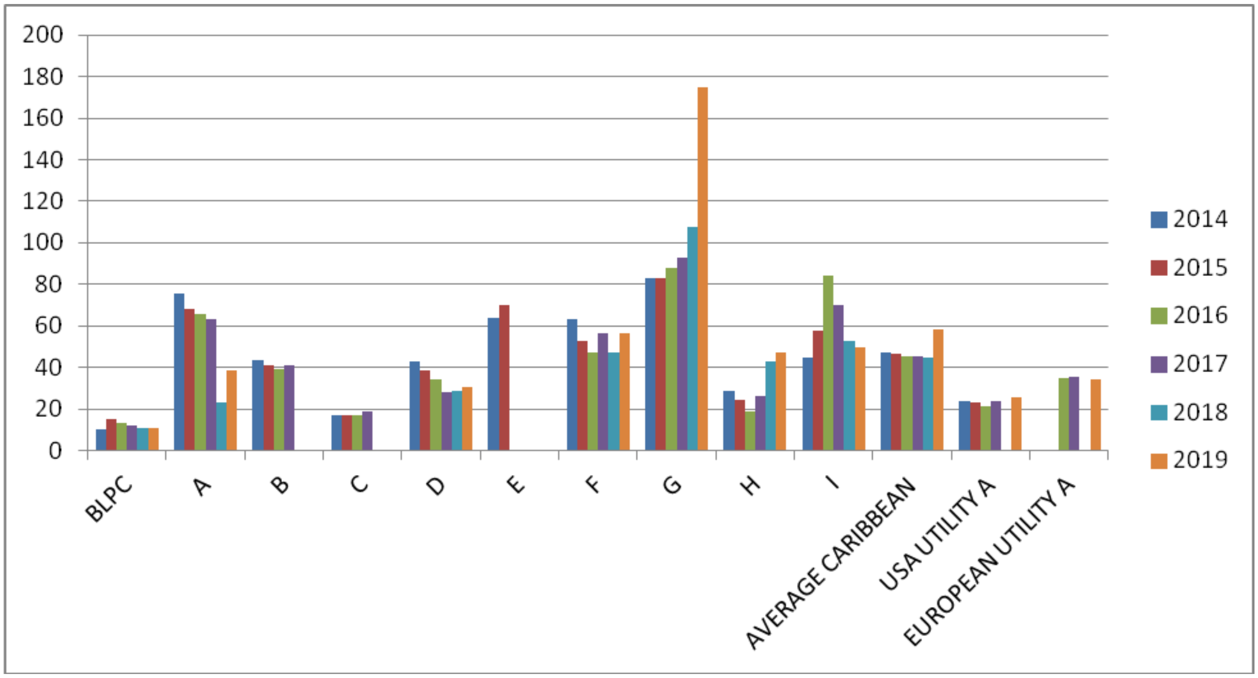
Utility:	2014	2015	2016	2017	2018	2019
BLPC	7.62	12.33	14.61	13.64	10.79	11.22
A	18.72	17.91	14.45	7.17	12.57	10.02
B	2.17	4.06	4.63	3.69		
C	3.39	1.12	3.15	3.97		
D	8.72	12.78	16.67	12.42		
E	11.3	12.81	18.11	17.01	15.33	16.95
F	4.3	4.3				
G	8.98	12.09	15.59	13.91	13.76	14.32
H	6.3	10.2				
I	-49.6	-30.51	-54.54	-28.24	-33.39	-31.21
J	16.21	18	19.41	-16.13	-7.58	2.63
K	-7.65	-12.31	-5.22	0.38	-2.38	-2.29
AVERAGE CARIBBEAN	2.54	5.23	4.69	2.78	1.30	3.09
USA UTILITY A	21.25	22.36	25.5	24.94		19.1
EUROPEAN UTILITY A			5.97	-0.31		18.3

6. RETURN ON ASSETS (%)



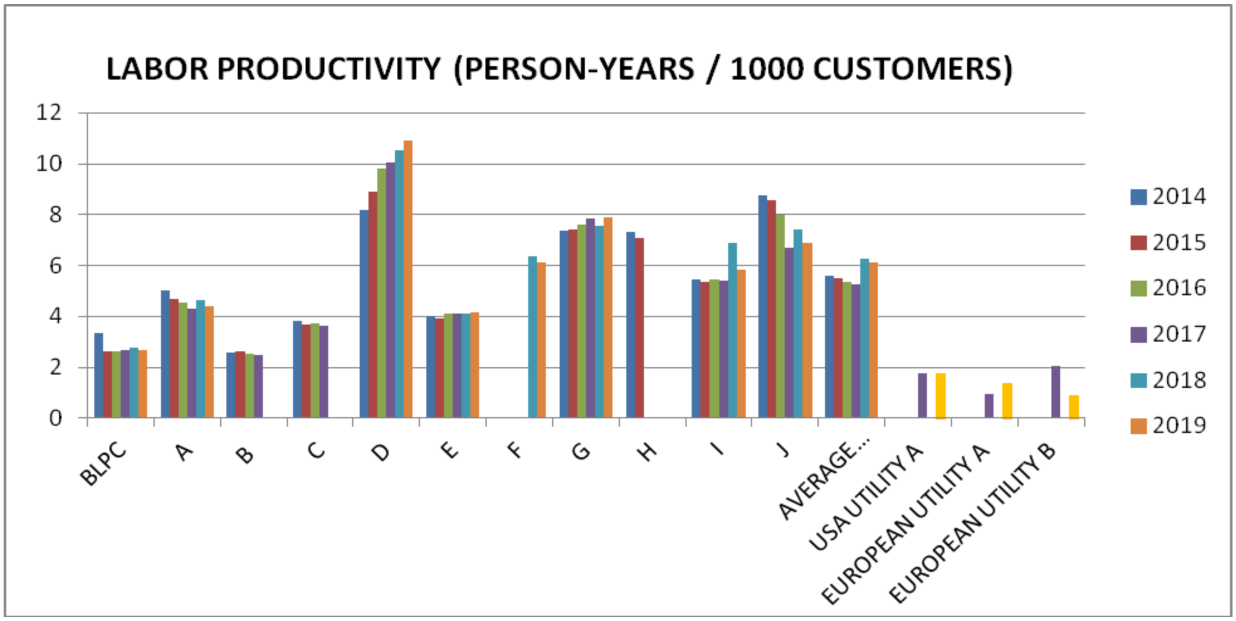
Utility:	2014	2015	2016	2017	2018	2019
BLPC	7.59	8.87	9.35	9.33	8.2	7.7
A	13.64	10.89	8.71	3.82	6.69	3.95
B	3.03	4.16	4.51	3.86		
C	5.6	2.11	5.67	6.52		
D	22.62	31.52	27.79	22.14		
E	10.37	11.26	13.63	13.35	13.26	14.48
F	3.3	2.6				
G	5.23	5.06	5.36	4.84	5.21	5.37
H	5.5	8.2				
I	-13.41	-8.58	-16.05	-8.94	-11.37	-11.91
J	13	13.01	12.49	-8.62	-2.45	1.25
K	-6.52	-10.03	-8.11	0.42	-2.27	-2.07
AVERAGE CARIBBEAN	5.83	6.59	6.34	4.67	2.47	2.68
USA UTILITY A	6.19	6.13	6.11	6.35	5.98	4.27
EUROPEAN UTILITY A			1.5	-0.08		0.08

7. DEBT LEVEL (%)



	2014	2015	2016	2017	2018	2019
BLPC	9.94	15.08	13.38	11.9	10.76	10.9
A	75.74	68.06	65.65	63.36	23.32	38.42
B	43.3	41.31	38.89	40.88		
C	17.18	17.15	17.21	18.86		
D	42.92	38.85	34.42	27.93	28.44	30.49
E	64	70				
F	62.94	52.46	47.36	56.26	47.12	56.68
G	83.22	82.69	87.97	92.98	107.36	174.83
H	28.71	24.48	19.1	26.4	42.64	47.24
I	44.69	57.79	83.95	69.97	53.04	49.37
AVERAGE CARIBBEAN	47.26	46.79	45.33	45.39	44.67	58.28
USA UTILITY A	23.78	23.41	21.33	23.91		25.83
EUROPEAN UTILITY A			35.05	35.6		34

8. LABOR PRODUCTIVITY IN PERSON-YEARS PER 1000 CUSTOMERS



Utility:	2014	2015	2016	2017	2018	2019
BLPC	3.35	2.62	2.62	2.66	2.75	2.69
A	5	4.67	4.55	4.31	4.63	4.41
B	2.56	2.61	2.55	2.48		
C	3.81	3.7	3.72	3.65		
D	8.2	8.9	9.8	10.06	10.51	10.93
E	4.01	3.94	4.09	4.1	4.09	4.17
F					6.36	6.11
G	7.38	7.41	7.6	7.85	7.58	7.89
H	7.3	7.09				
I	5.43	5.36	5.43	5.41	6.88	5.81
J	8.75	8.56	8.01	6.72	7.4	6.87
AVERAGE CARIBBEAN	5.58	5.49	5.37	5.25	6.28	6.11
USA UTILITY A				1.78		1.78
EUROPEAN UTILITY A				0.96		1.36
EUROPEAN UTILITY B				2.07		0.9

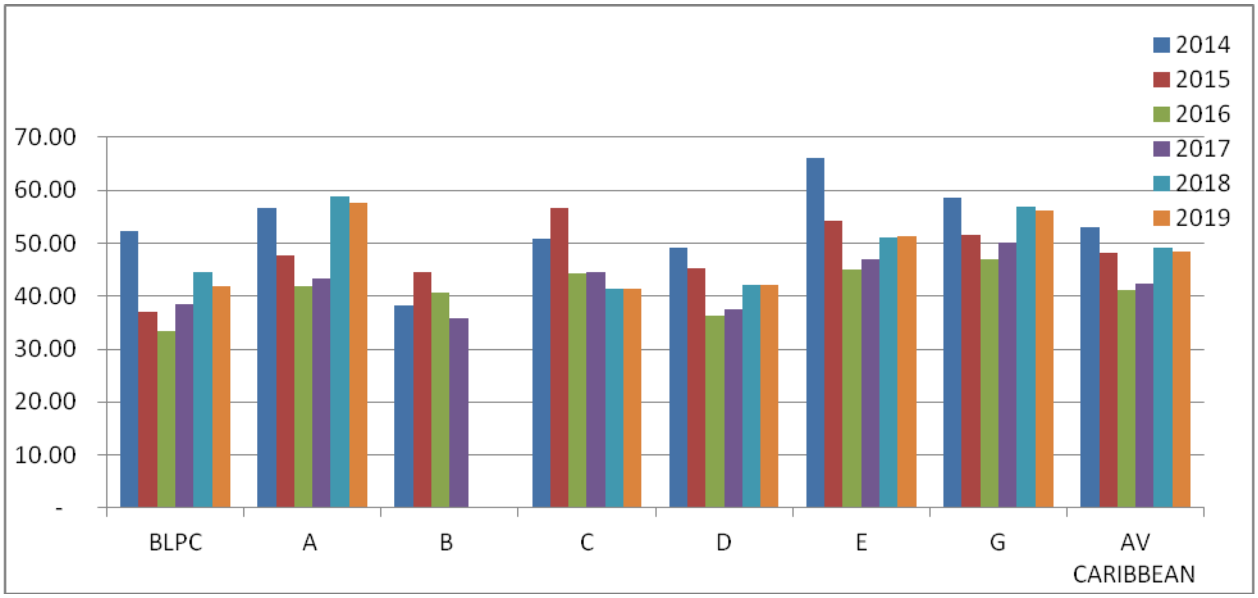
9.

CUSTOMER SERVICE RATES

Per usage category the graphs and tables show the comparison of total bills as well as of base rates and fuel surcharges applied for these categories.

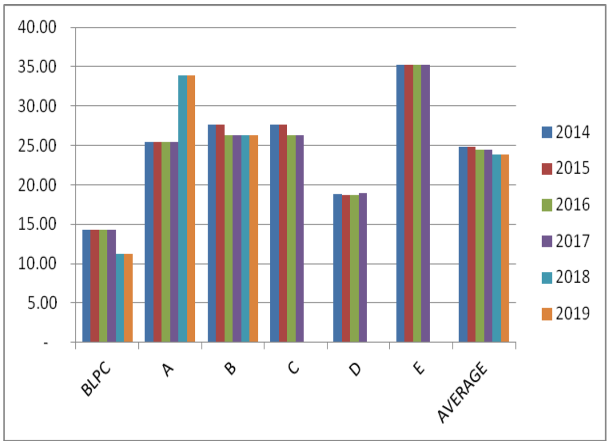
a) Domestic customer using **150 kWh per month**

Total bill in US$

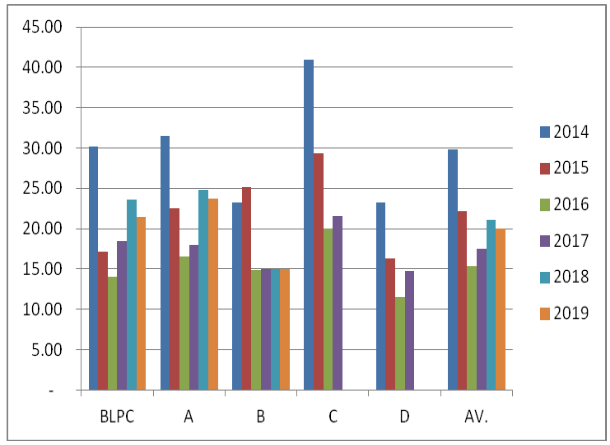


	2014	2015	2016	2017	2018	2019
BLPC	52.22	36.93	33.30	38.39	44.43	41.89
A	56.74	47.60	41.96	43.33	58.72	57.59
B	38.14	44.46	40.61	35.71		
C	50.82	56.73	44.25	44.44	41.34	41.34
D	49.19	45.37	36.20	37.47	42.00	42.00
E	66.00	54.27	45.05	46.86	51.17	51.41
G	58.57	51.67	46.86	50.06	56.84	56.10
AV CARIBBEAN	53.10	48.15	41.18	42.32	49.08	48.39

The following tables and graphs are showing the Base Rates and Fuel surcharges for 150 kWh per month. However, at some utilities fuel costs are included in the base rate, and not all utilities gave the detailed information on rates. For this reason the number of comparative utilities is limited.



Base rate for usage of 150 kWh/month (US$)

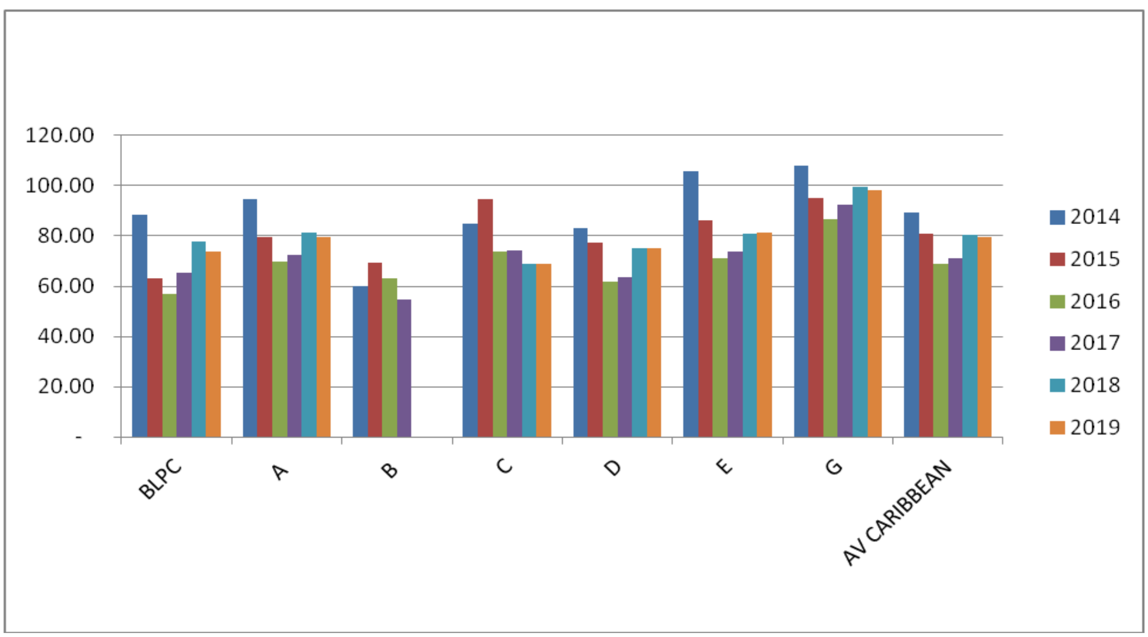


Fuel surcharge for usage of 150kWh/month (US$)

BASE RATES 150 kWh/month						
	2014	2015	2016	2017	2018	2019
BLPC	14.25	14.25	14.25	14.25	11.25	11.25
A	25.50	25.50	25.50	25.50	33.91	33.91
B	27.59	27.59	26.34	26.34	26.34	26.34
C	27.59	27.59	26.34	26.34		
D	18.81	18.65	18.73	18.92		
E	35.30	35.30	35.30	35.30		
AVERAGE	24.84	24.81	24.41	24.44	23.83	23.83

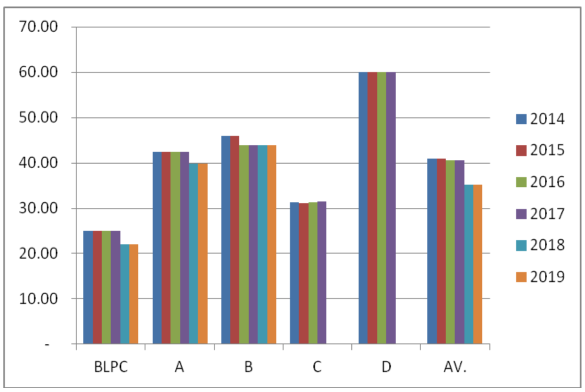
FUEL SURCHARGES 150 kWh/month						
	2014	2015	2016	2017	2018	2019
BLPC	30.2	17.18	14.09	18.42	23.57	21.41
A	31.50	22.50	16.50	18.00	24.81	23.68
B	23.24	25.19	14.82	15.00	15.00	15.00
C	40.95	29.38	20.05	21.61		
D	23.28	16.37	11.56	14.76		
E						
AVERAGE	29.83	22.12	15.40	17.56	21.13	20.03

b) Domestic customer using **250 kWh per month**, total bill in US$



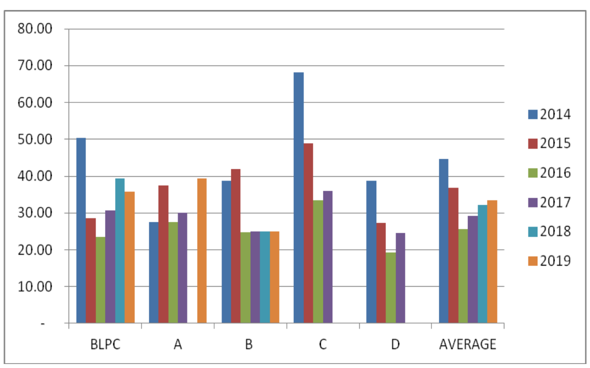
	2014	2015	2016	2017	2018	2019
BLPC	88.57	63.07	57.03	65.51	77.87	73.64
A	94.57	79.34	69.93	72.21	81.24	79.35
B	59.86	69.47	63.06	54.89		
C	84.70	94.55	73.75	74.07	68.90	68.90
D	83.28	77.29	61.62	63.74	75.00	75.00
E	105.84	86.29	70.91	73.87	80.99	81.35
G	107.79	95.25	86.51	92.32	99.57	98.31
AV CARIBBEAN	89.23	80.75	68.97	70.94	80.60	79.43

The graphs and tables for Base Rates and Fuel Surcharges for domestic customers using 250 kWh per month are shown below.



	2014	2015	2016	2017	2018	2019
BLPC	25.05	25.05	25.05	25.05	22.00	22.00
A	42.50	42.50	42.50	42.50	39.89	39.89
B	45.98	45.98	43.91	43.91	43.9	43.9
C	31.36	31.09	31.22	31.53		
D	59.96	59.96	59.96	59.96		
AV.	40.97	40.92	40.53	40.59	35.26	35.26

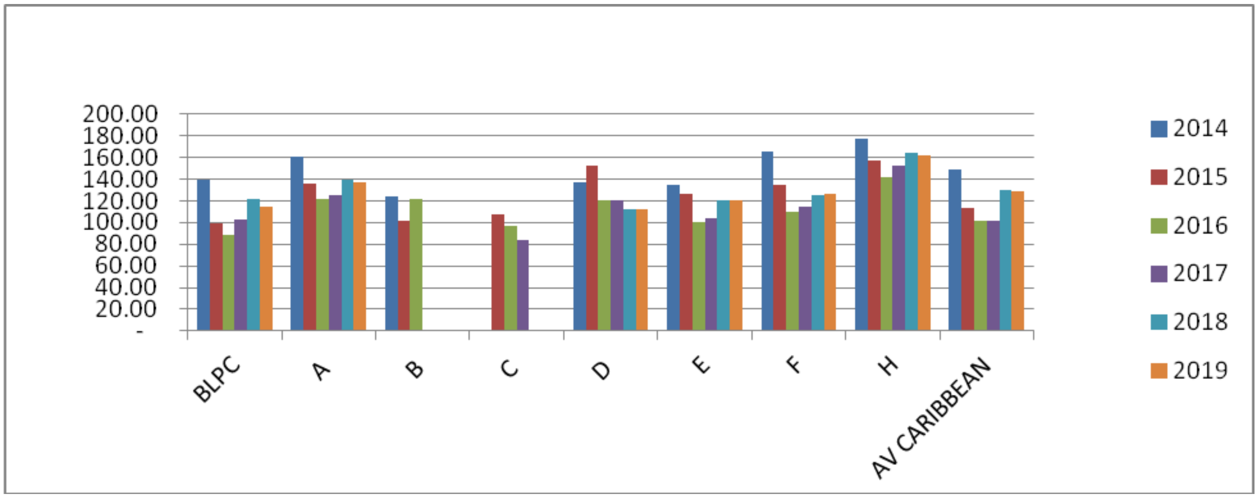
Base Rates for customers using 250 kWh/month



	2014	2015	2016	2017	2018	2019
BLPC	50.33	28.63	23.49	30.70	39.28	35.68
A	27.50	37.50	27.50	30.00		39.46
B	38.73	41.98	24.70	25	25	25
C	68.25	31.71	31.36	36.01		
D	38.79	27.28	19.27	24.6		
AV.	44.72	36.87	25.68	29.26	32.14	33.38

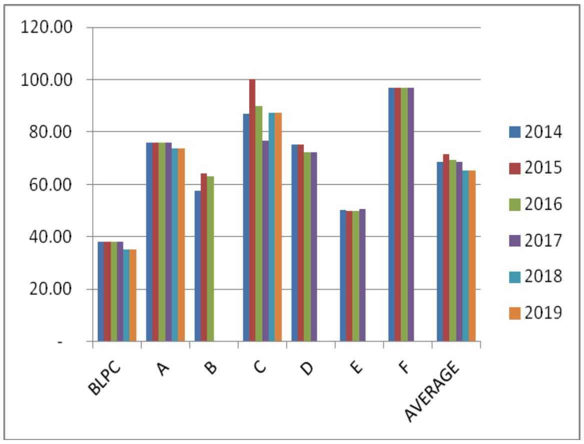
Fuel Surcharges for customers using 250 kWh/month

c) Domestic customer using **400 kWh per month**



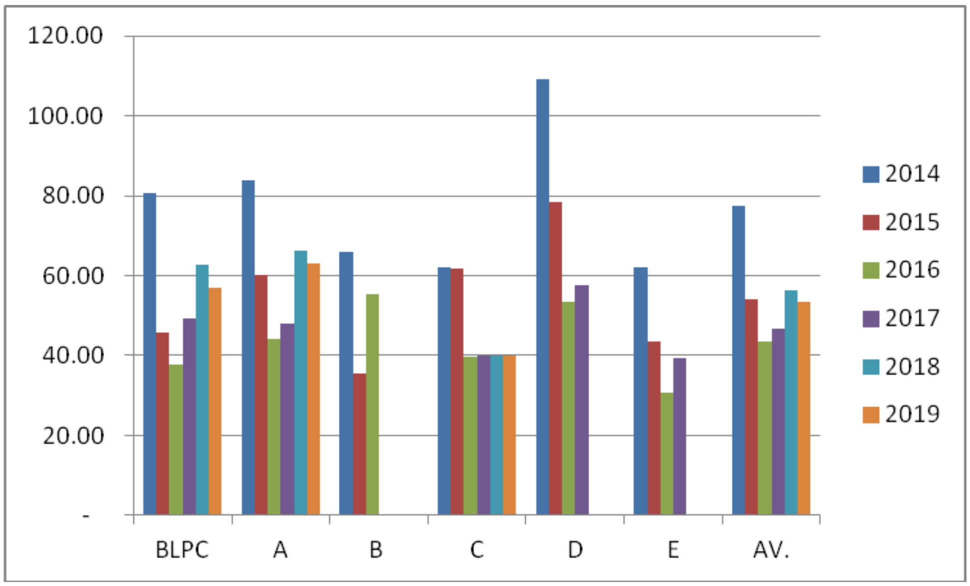
	2014	2015	2016	2017	2018	2019
BLPC	139.56	98.76	89.10	102.67	121.07	114.30
A	160.51	136.13	121.08	124.73	139.95	136.94
B	123.67	101.87	121.07			
C		106.99	96.72	83.66		
D	137.00	152.87	120.29	120.81	112.37	112.37
E	135.23	126.25	100.58	103.98	120.00	120.00
F	165.51	134.33	109.69	114.39	125.73	126.26
H	177.10	156.61	142.34	151.83	163.67	161.61
AV CARIBBEAN	148.37	113.45	101.18	101.12	130.47	128.58

Graphs and tables with Base Rates and Fuel Surcharges for usage of 400 kWh per month are shown on the next page.



Base Rates for usage of 400 kWh per month.

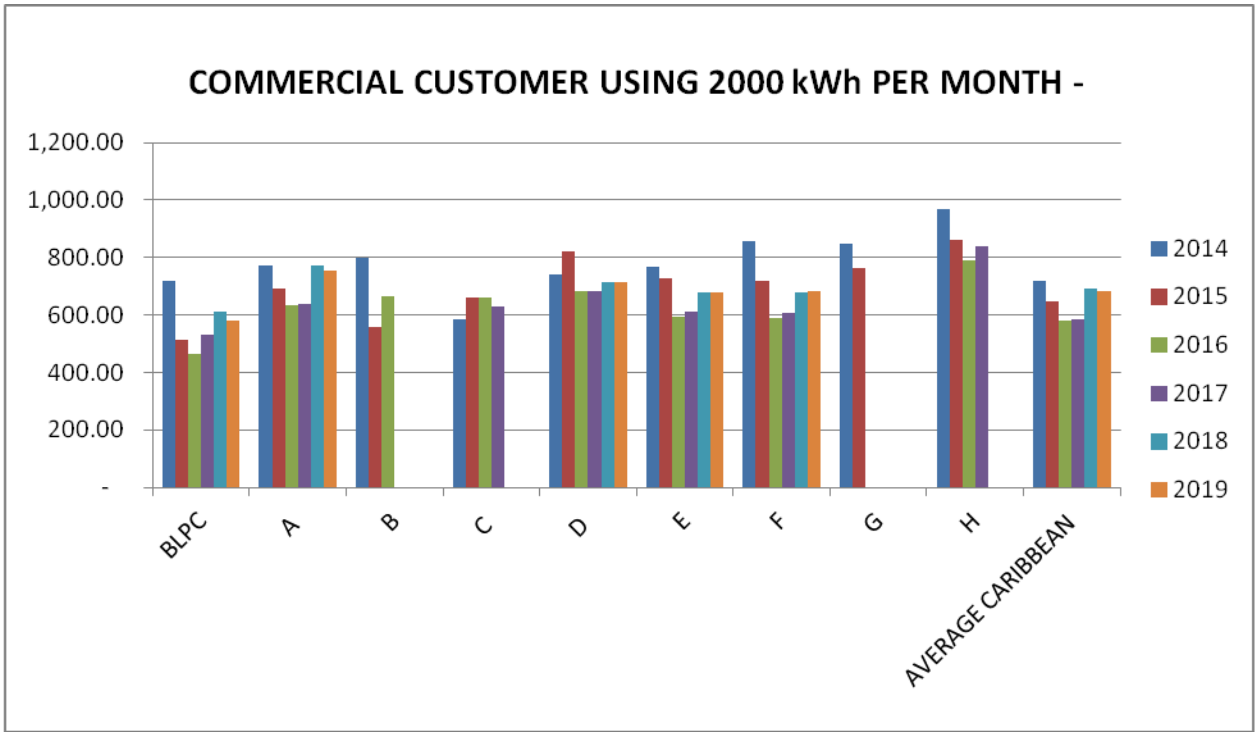
	2014	2015	2016	2017	2018	2019
BLPC	38.25	38.25	38.25	38.25	35.2	35.2
A	76.00	76.00	76.00	76.00	73.8	73.8
B	57.61	64.24	63.25			
C	86.89	100.04	89.78	76.71	87.28	87.28
D	75.04	75.04	72.38	72.38		
E	50.17	49.74	49.95	50.44		
F	96.95	96.95	96.95	96.95		
AV.	68.7	71.47	69.51	68.46	65.43	65.43



Fuel Surcharges for usage of 400 kWh per month

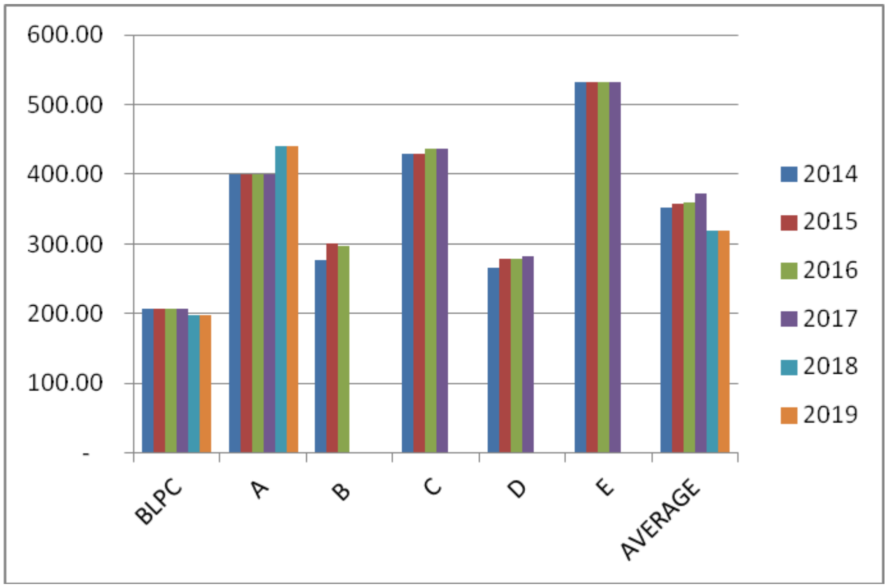
	2014	2015	2016	2017	2018	2019
BLPC	80.52	45.80	37.58	49.13	62.84	57.08
A	84.00	60.00	44.00	48.00	66.15	63.14
B	66.06	35.44	55.25			
C	61.96	61.76	39.53	40.00	40	40
D	109.19	78.35	53.47	57.62		
E	62.07	43.65	30.83	39.35		
AV.	77.30	54.17	43.44	46.82	56.33	53.41

d) Commercial customer using **2000 kWh per month** in US$



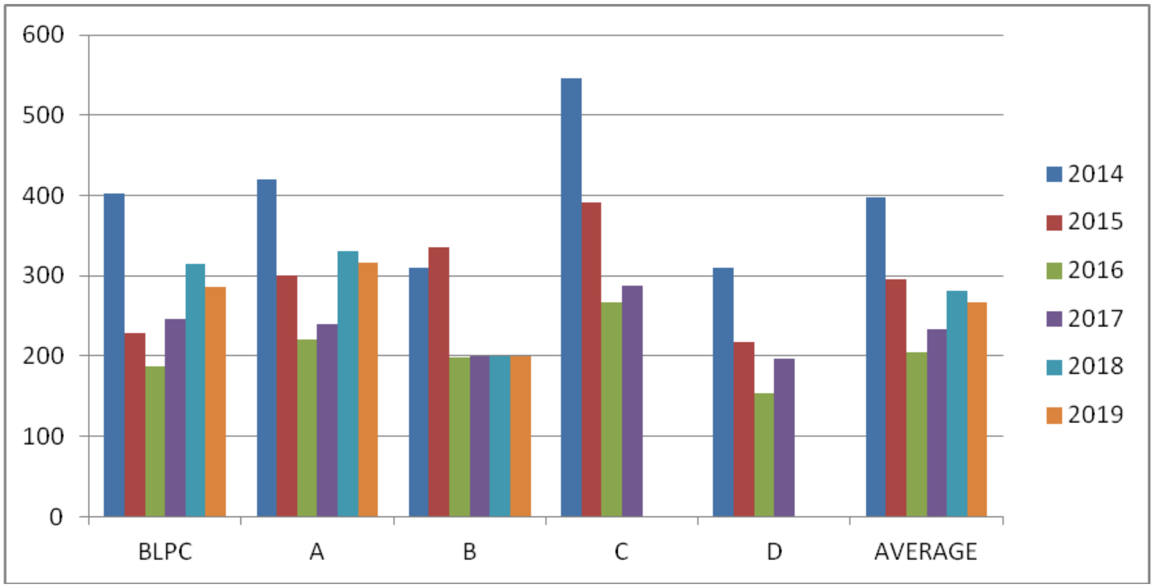
	2014	2015	2016	2017	2018	2019
BLPC	717.48	513.49	465.19	533.03	613.59	579.75
A	770.66	692.31	635.60	639.78	770.44	755.38
B	797.91	557.83	667.39			
C	586.67	659.89	659.89	631.00		
D	739.45	822.86	681.71	684.29	712.88	712.88
E	766.31	726.38	593.08	610.07	680.00	680.00
F	856.51	719.74	590.96	605.22	679.88	682.92
G	850.00	764.00				
H	969.64	863.74	790.00	839.02		
AVERAGE CARIBBEAN	720.89	647.25	580.68	585.58	691.36	682.19

Base Rates for commercial customers using 2000 kWh per month in US$:



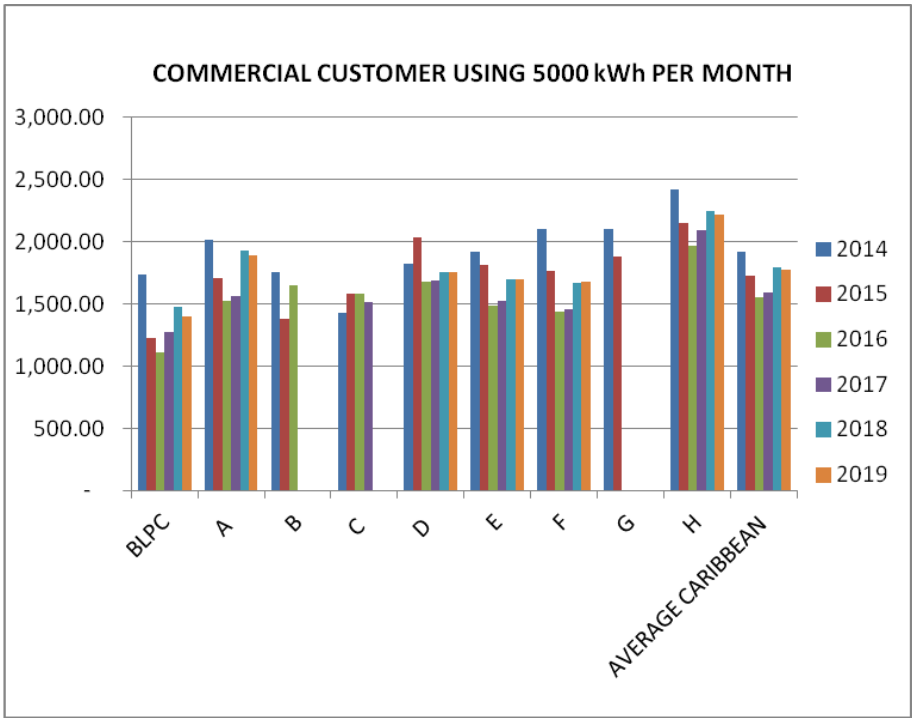
	2014	2015	2016	2017	2018	2019
BLPC	208.00	208.00	208.00	208.00	198	198
A	400.00	400.00	400.00	400.00	439.67	439.67
B	277.35	301.60	296.63			
C	429.65	429.65	436.55	436.55		
D	266.79	278.12	279.26	282.02		
E	532.81	532.81	532.81	532.81		
AVERAGE	352.43	358.36	358.88	371.88	318.84	318.84

Fuel Surcharges for commercial customers using 2000 kWh per month in US$:



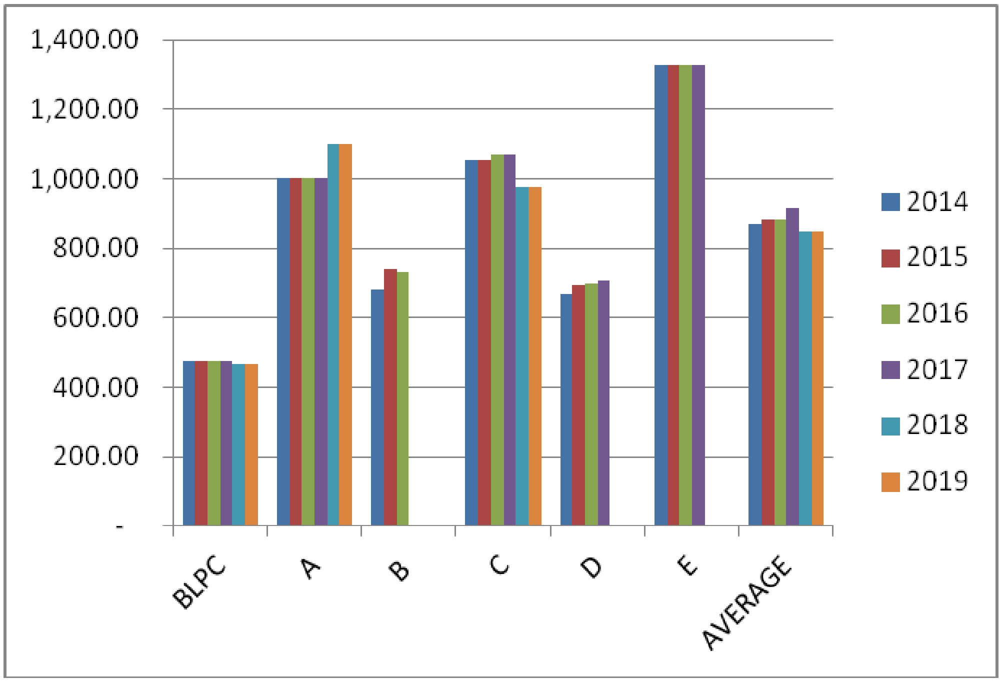
	2014	2015	2016	2017	2018	2019
BLPC	402.62	229.02	187.91	245.66	314.2	285.4
A	420	300	220	240	330.77	315.71
B	309.8	335.8	197.6	200	200	200
C	545.97	391.74	267.34	288.09		
D	310.35	218.26	154.15	196.77		
AVERAGE	397.75	294.96	205.40	234.10	281.66	267.04

e) Commercial customer using **5000 kWh per month** in US$



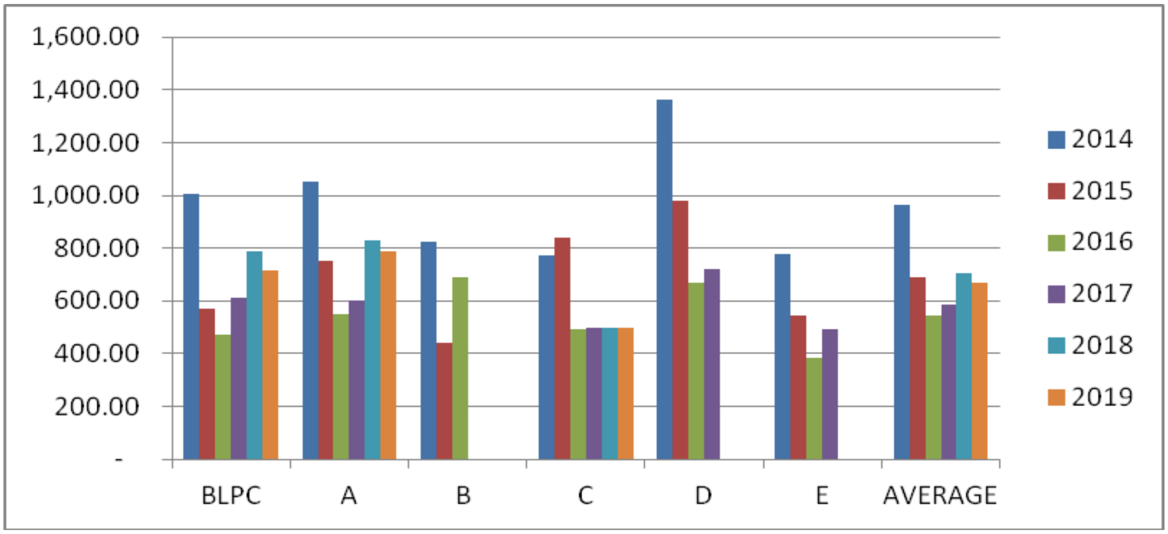
	2014	2015	2016	2017	2018	2019
BLPC	1,740.82	1,230.86	1,110.10	1,279.69	1,481.09	1,396.49
A	2,014.78	1,710.11	1,521.92	1,567.52	1,926.10	1,888.46
B	1,755.09	1,381.03	1,654.96			
C	1,425.00	1,587.22	1,587.22	1,515.00		
D	1,826.40	2,033.36	1,679.80	1,686.25	1,756.83	1,756.83
E	1,915.79	1,815.95	1,482.69	1,525.18	1,700.00	1,700.00
F	2,105.78	1,770.67	1,439.99	1,460.74	1,673.10	1,680.06
G	2,100.00	1,885.00				
H	2,419.53	2,154.78	1,970.44	2,092.98	2,246.00	2,219.33
AVERAGE CARIBBEAN	1,922.58	1,729.89	1,555.89	1,589.62	1,797.19	1,773.53

Base Rates for Commercial customers using 5000 kWh per month in US$



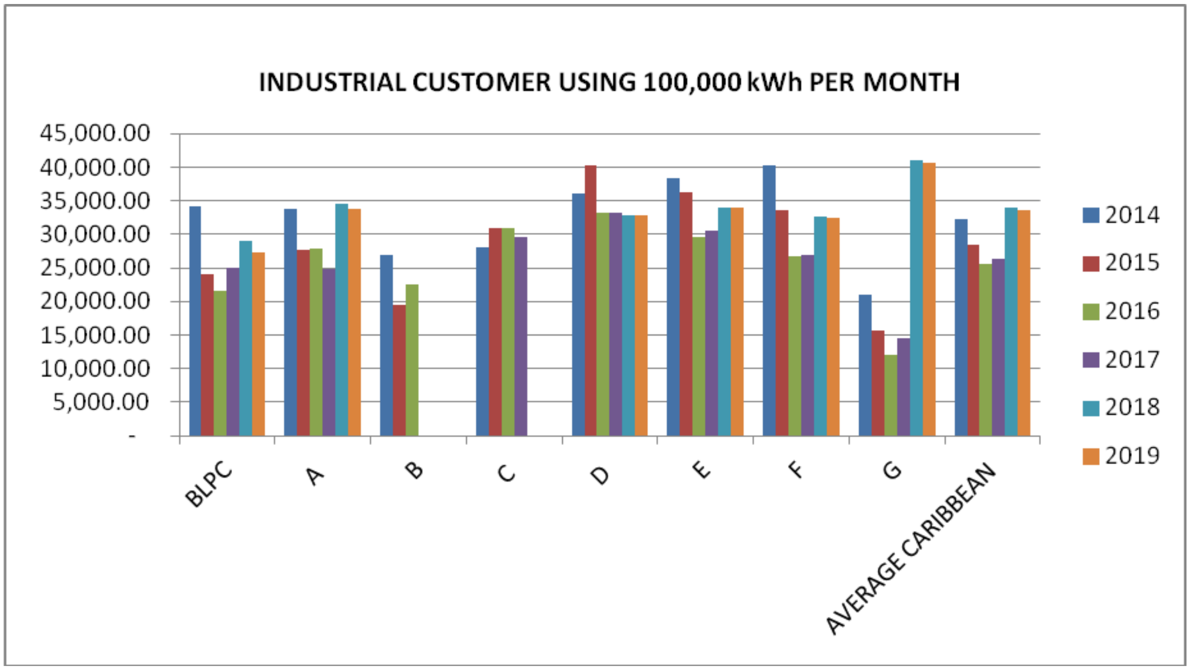
	2014	2015	2016	2017	2018	2019
BLPC	475.00	475.00	475.00	475.00	465.00	465.00
A	1,000.00	1,000.00	1,000.00	1,000.00	1,099.18	1,099.18
B	680.78	742.38	729.97			
C	1,051.90	1,051.90	1,068.60	1,068.60	977.50	977.50
D	666.98	695.30	698.15	705.05		
E	1,328.06	1,328.06	1,328.06	1,328.06		
AVERAGE	867.12	882.11	883.30	915.34	847.23	847.23

Fuel Surcharges for Commercial customers using 5000 kWh per month in US$



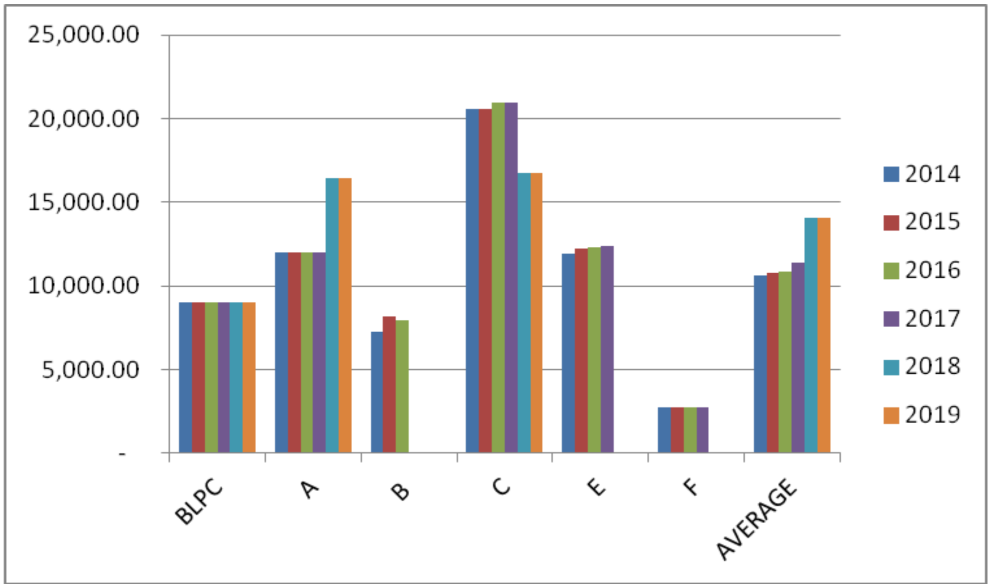
	2014	2015	2016	2017	2018	2019
BLPC	1,006.55	572.54	469.77	614.10	785.50	713.50
A	1,050.00	750.00	550.00	600.00	826.92	789.29
B	825.74	443.05	690.60			
C	774.50	839.50	494.00	500.00	500.00	500.00
D	1,364.92	979.35	668.35	720.22		
E	775.88	545.66	385.37	491.92		
AVERAGE	966.27	688.35	543.02	585.25	704.14	667.60

f) Industrial customer using **100,000 kWh per month** in US$



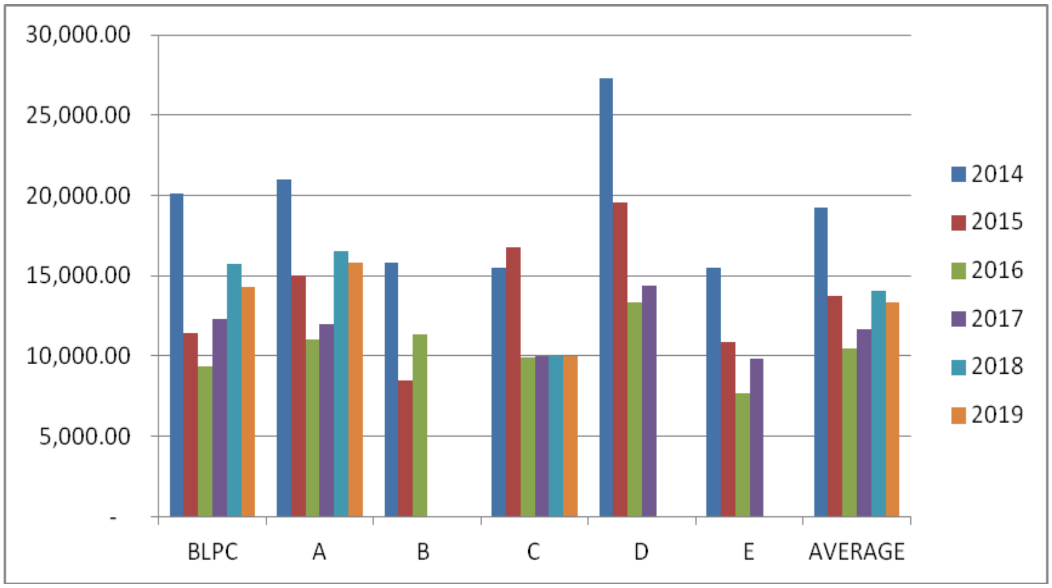
	2014	2015	2016	2017	2018	2019
BLPC	34,258.18	24,059.07	21,643.97	25,035.67	29,067.15	27,375.33
A	33,793.89	27,700.49	27,869.86	24,848.79	34,611.63	33,858.88
B	26,953.88	19,465.50	22,488.61			
C	27,977.22	30,952.78	30,952.78	29,508.33		
D	36,090.95	40,195.06	33,126.29	33,255.39	32,765.88	32,765.88
E	38,315.73	36,318.97	29,653.89	30,503.52	34,000.00	34,000.00
F	40,365.28	33,502.17	26,776.22	26,984.38	32,728.86	32,525.79
G	20,972.51	15,677.32	11,990.58	14,441.36	41,120.47	40,587.14
AVERAGE CARIBBEAN	32,340.96	28,483.92	25,562.78	26,368.21	34,049.00	33,518.84

Base Rates for industrial customers using 100,000 kWh per month in US$



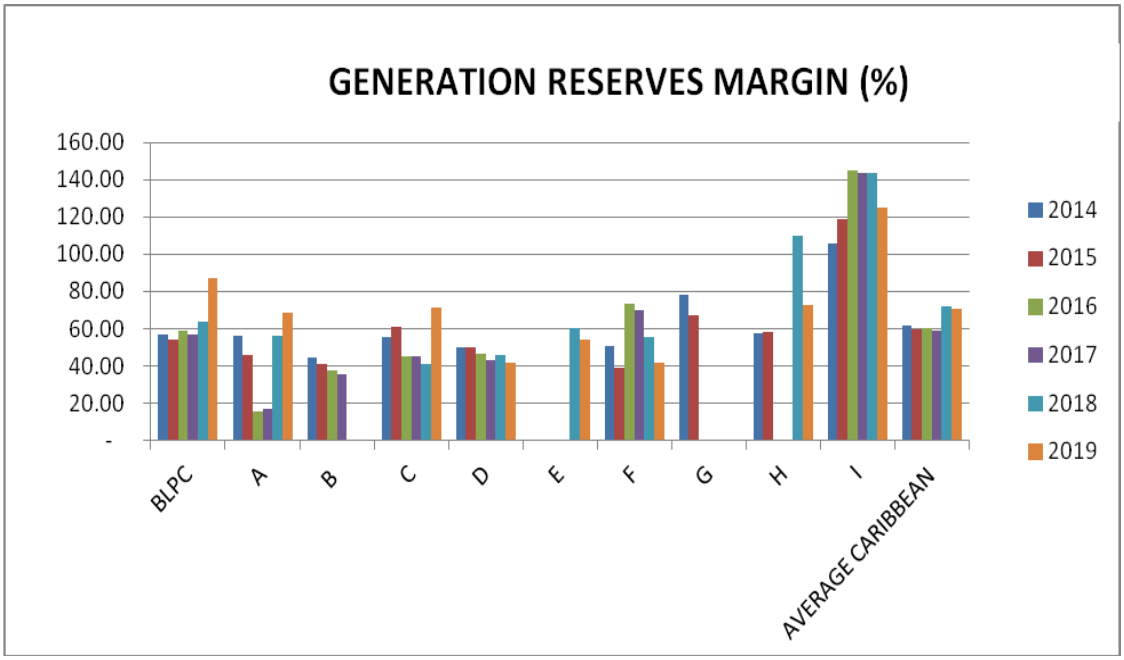
	2014	2015	2016	2017	2018	2019
BLPC	9,025.00	9,025.00	9,025.00	9,025.00	9,025.00	9,025.00
A	12,000.00	12,000.00	12,000.00	12,000.00	16,404.76	16,404.76
B	7,281.78	8,202.02	7,963.56			
C	20,600.75	20,600.75	20,935.25	20,935.25	16,750.00	16,750.00
E	11,952.60	12,212.70	12,266.20	12,384.60		
F	2,719.28	2,719.28	2,719.28	2,719.28		
AVERAGE	10,596.57	10,793.29	10,818.21	11,412.83	14,059.92	14,059.92

Fuel Surcharges for industrial customers using 100,000 kWh per month in US$



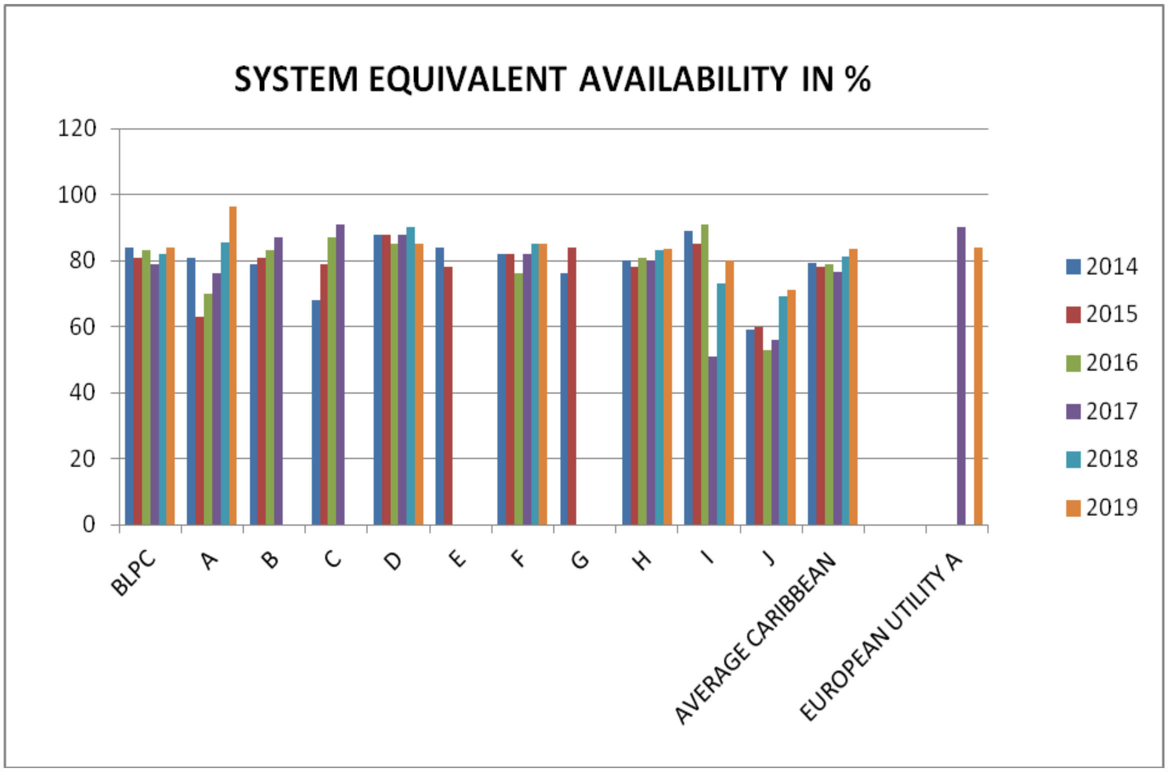
	2014	2015	2016	2017	2018	2019
BLPC	20,130.90	11,450.80	9,395.40	12,281.95	15,713.00	14,273.00
A	21,000.00	15,000.00	11,000.00	12,000.00	16,538.46	15,785.71
B	15,854.60	8,506.56	11,339.97			
C	15,490.00	16,790.00	9,880.00	10,000.00	10,000.00	10,000.00
D	27,298.30	19,586.90	13,367.00	14,404.40		
E	15,517.69	10,913.17	7,707.31	9,838.42		
AVERAGE	19,215.25	13,707.91	10,448.28	11,704.95	14,083.82	13,352.90

10. GENERATION RESERVES MARGIN (%)



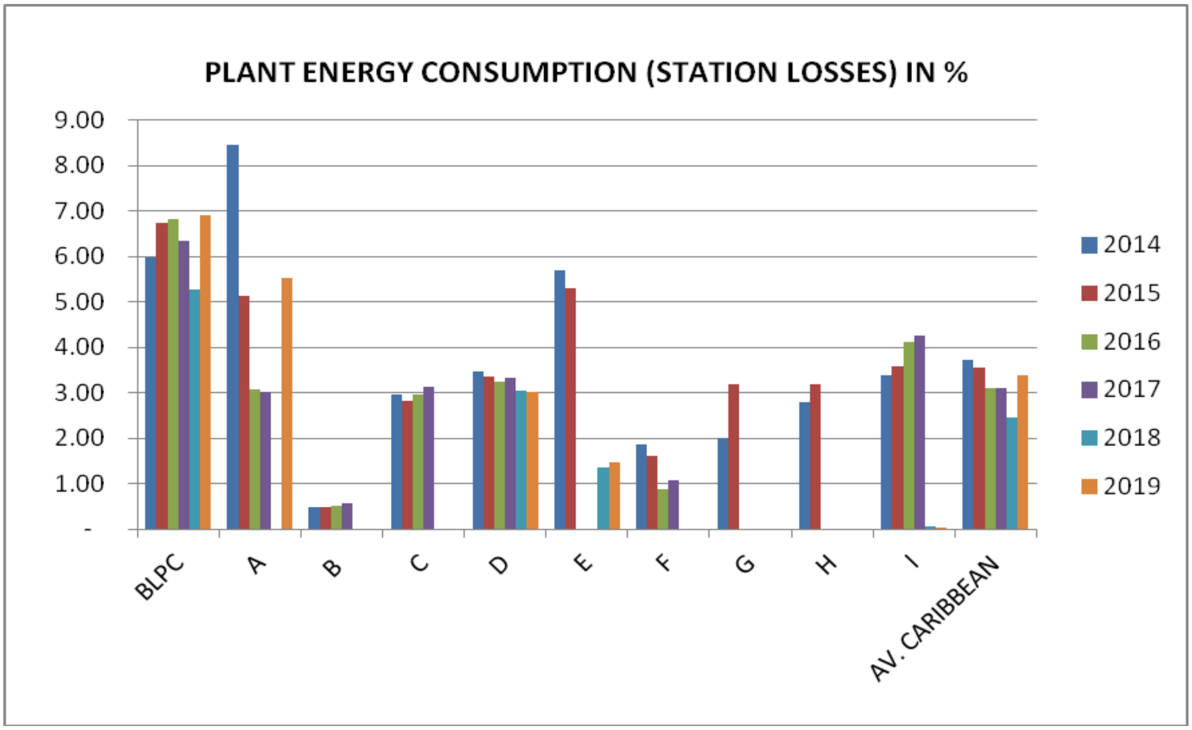
Utility:	2014	2015	2016	2017	2018	2019
BLPC	56.89	54.06	58.90	56.57	63.49	86.84
A	56.06	45.80	15.67	16.54	55.88	68.73
B	44.46	40.99	37.59	35.34		
C	55.75	60.89	44.87	45.09	41.18	71.43
D	50.08	49.83	46.60	43.27	45.87	41.44
E					60.27	54.3
F	50.33	38.63	73.43	69.81	55.36	41.81
G	78.00	67.00				
H	57.44	58.25			109.52	72.77
I	105.70	118.63	144.81	143.48	143.84	125
AVERAGE CARIBBEAN	61.63	59.34	60.27	58.59	71.93	70.29

11. SYSTEM EQUIVALENT AVAILABILITY (%)



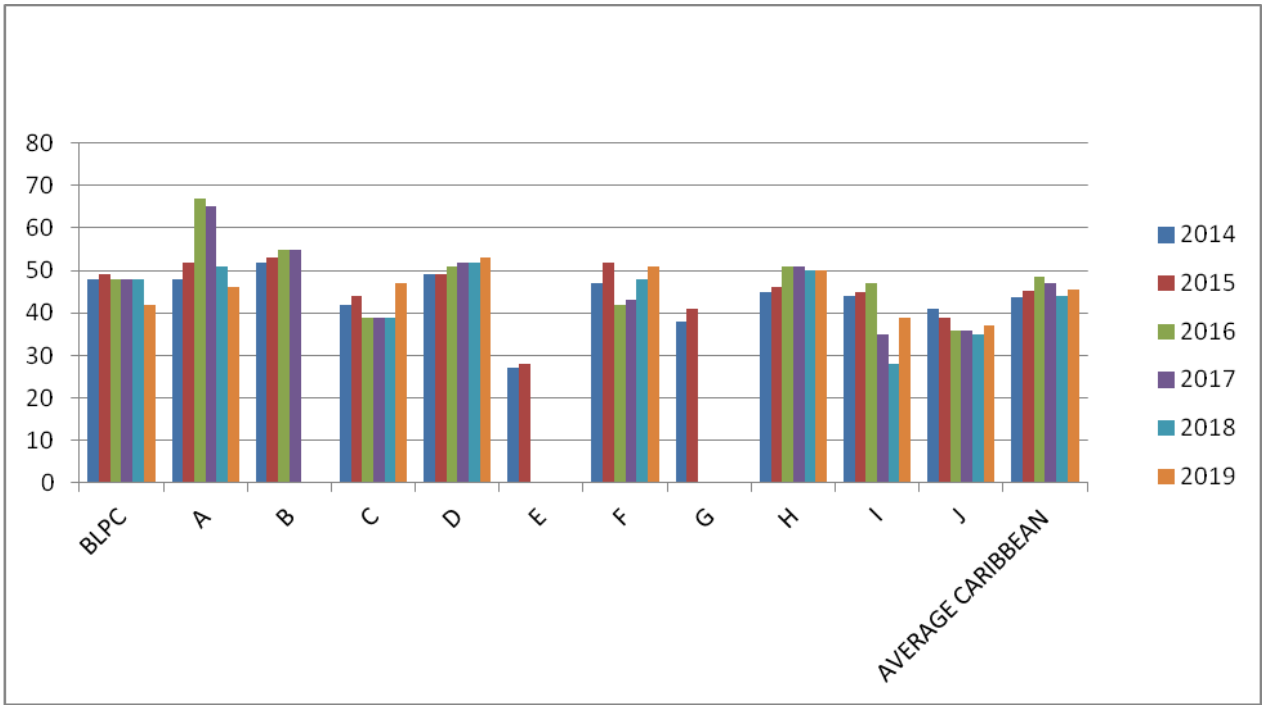
Utility:	2014	2015	2016	2017	2018	2019
BLPC	84	81	83	79	82	84
A	81	63	70	76	85.3	96.4
B	79	81	83	87		
C	68	79	87	91		
D	88	88	85	88	90	85
E	84	78				
F	82	82	76	82	85	85
G	76	84				
H	80	78	81	80	83.1	83.7
I	89	85	91	51	73	80
J	59	60	53	56	69	71
AVERAGE CARIBBEAN	79	78	79	77	81	84
EUROPEAN UTILITY A				90		84

12. PLANT ENERGY CONSUMPTION (%)



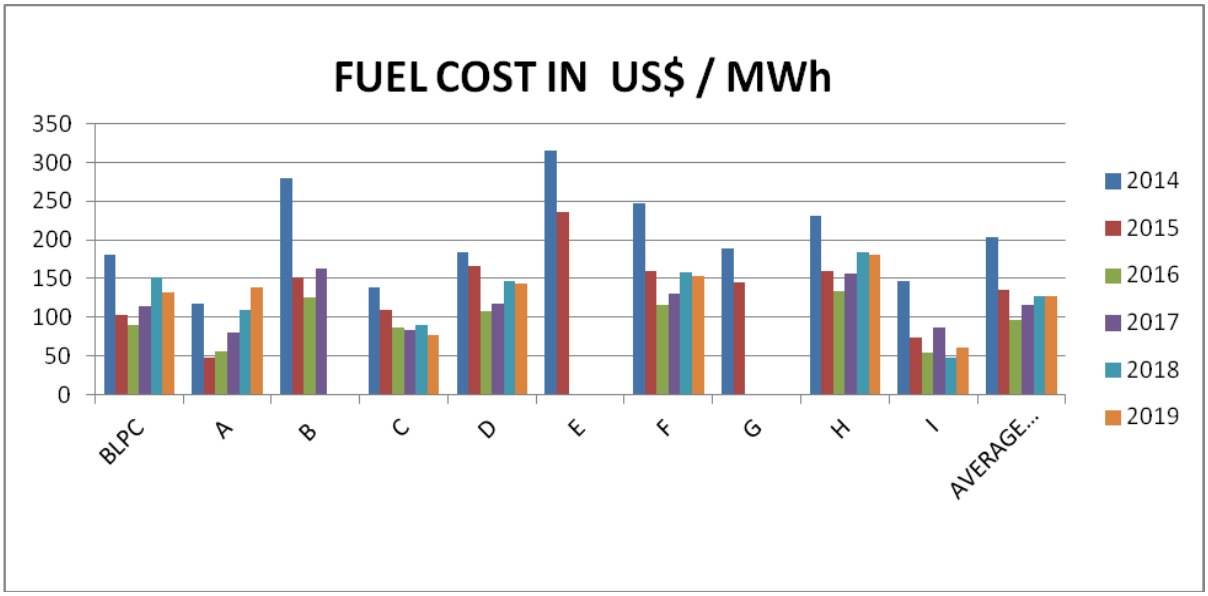
Utility:	2014	2015	2016	2017	2018	2019
BLPC	5.98	6.74	6.83	6.33	5.28	6.91
A	8.47	5.13	3.08	3.03	n.a.	5.53
B	0.49	0.47	0.50	0.56		
C	2.97	2.82	2.95	3.12		
D	3.48	3.36	3.25	3.34	3.05	3.02
E	5.70	5.30			1.36	1.46
F	1.86	1.60	0.88	1.06		
G	2.00	3.20				
H	2.80	3.20				
I	3.37	3.59	4.13	4.26	0.07	0.04
AV. CARIBBEAN	3.71	3.54	3.09	3.10	2.44	3.39

13. UTILIZATION FACTOR (%)



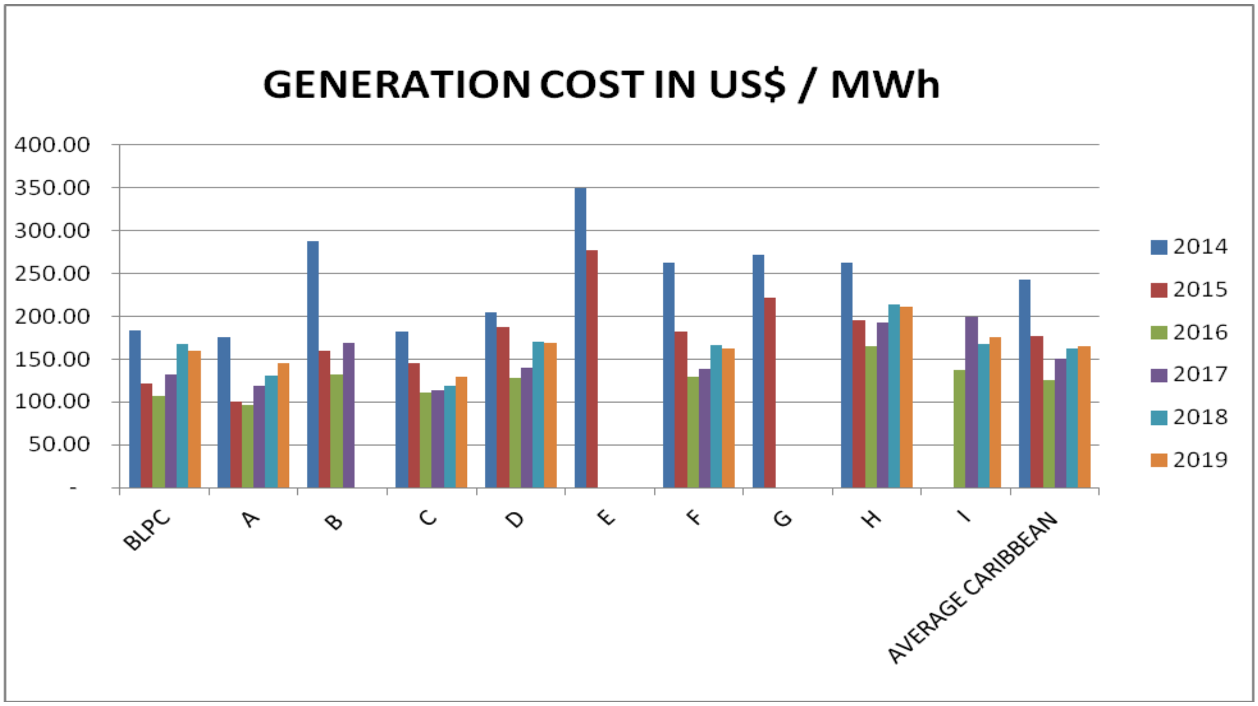
Utility:	2014	2015	2016	2017	2018	2019
BLPC	48	49	48	48	48	42
A	48	52	67	65	51	46
B	52	53	55	55		
C	42	44	39	39	39	47
D	49	49	51	52	52	53
E	27	28				
F	47	52	42	43	48	51
G	38	41				
H	45	46	51	51	50	50
I	44	45	47	35	28	39
J	41	39	36	36	35	37
AVERAGE CARIBBEAN	43.7	45.3	48.4	47.1	43.9	45.6

14. FUEL COST (US$ / MWh)



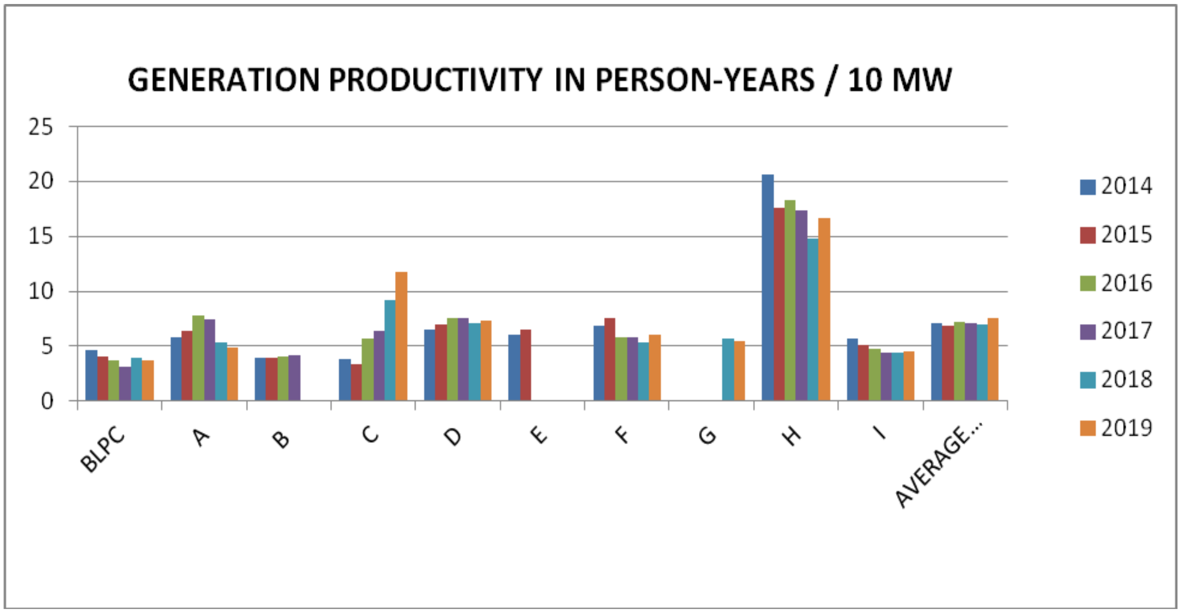
Utility:	2014	2015	2016	2017	2018	2019
BLPC	181.13	103.15	89.47	113.75	150.77	132.72
A	117.13	47.55	55.55	80.48	110.04	138.55
B	280.17	152.22	124.99	163.11		
C	138.95	108.83	86.17	82.92	89.17	77.02
D	184.54	166.1	108	117.32	145.94	143.31
E	314.49	236.14				
F	246.41	159.59	115.72	131.19	157.82	152.66
G	188.21	145.71				
H	231.05	159.33	133.15	156.04	183.84	180.32
I	146.42	73.65	54.74	86.39	48.37	61
AVERAGE CARIBBEAN	202.85	135.227	95.97375	116.4	126.5643	126.5114

15. GENERATION COST (US$ / MWh)



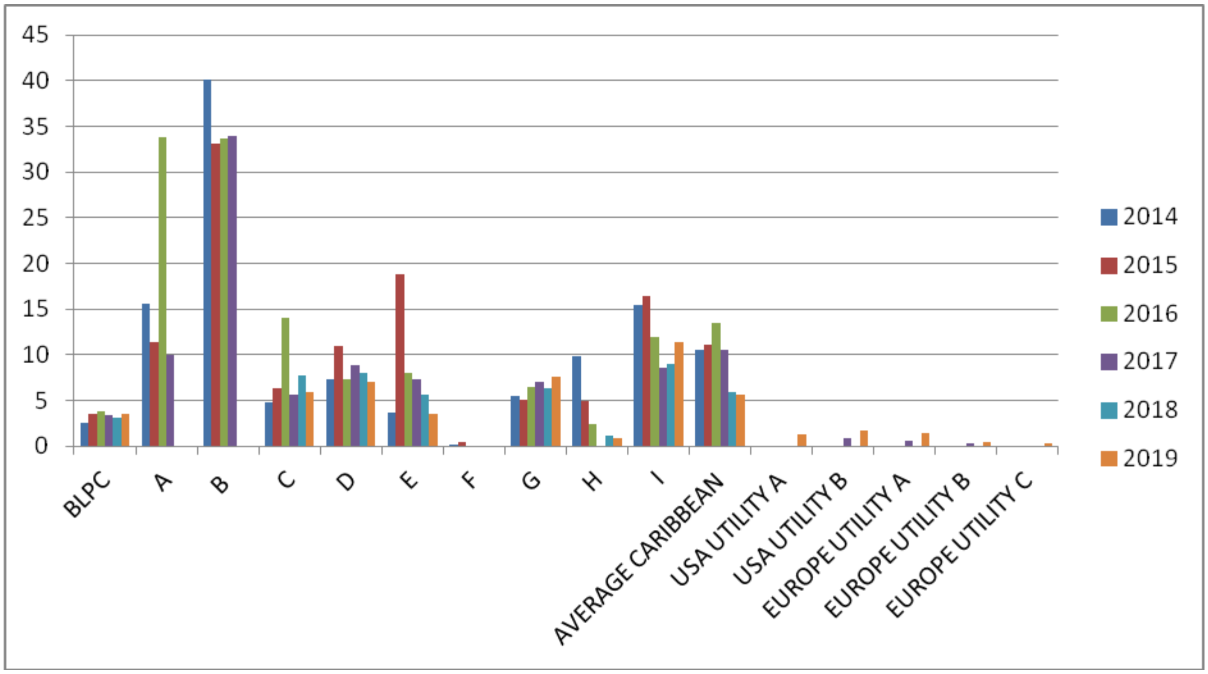
Utility:	2014	2015	2016	2017	2018	2019
BLPC	183.51	122.05	107.41	132.11	168.21	160.15
A	175.87	100.12	96.94	118.71	130.42	145.31
B	286.96	159.57	131.91	169.53		
C	182.13	145.11	111.09	114.13	119.16	129.79
D	204.97	187.3	128.09	139.66	169.72	169.07
E	350	277				
F	262.35	182.55	129.26	138.15	165.78	162
G	272	221				
H	262.42	195.51	164.39	192.61	214.23	210.64
I			137.62	199.2	167.93	175.73
AVERAGE CARIBBEAN	242.25	176.69	125.84	150.51	162.21	164.67

16. GENERATION PRODUCTIVITY IN PERSON-YEARS PER 10 MW



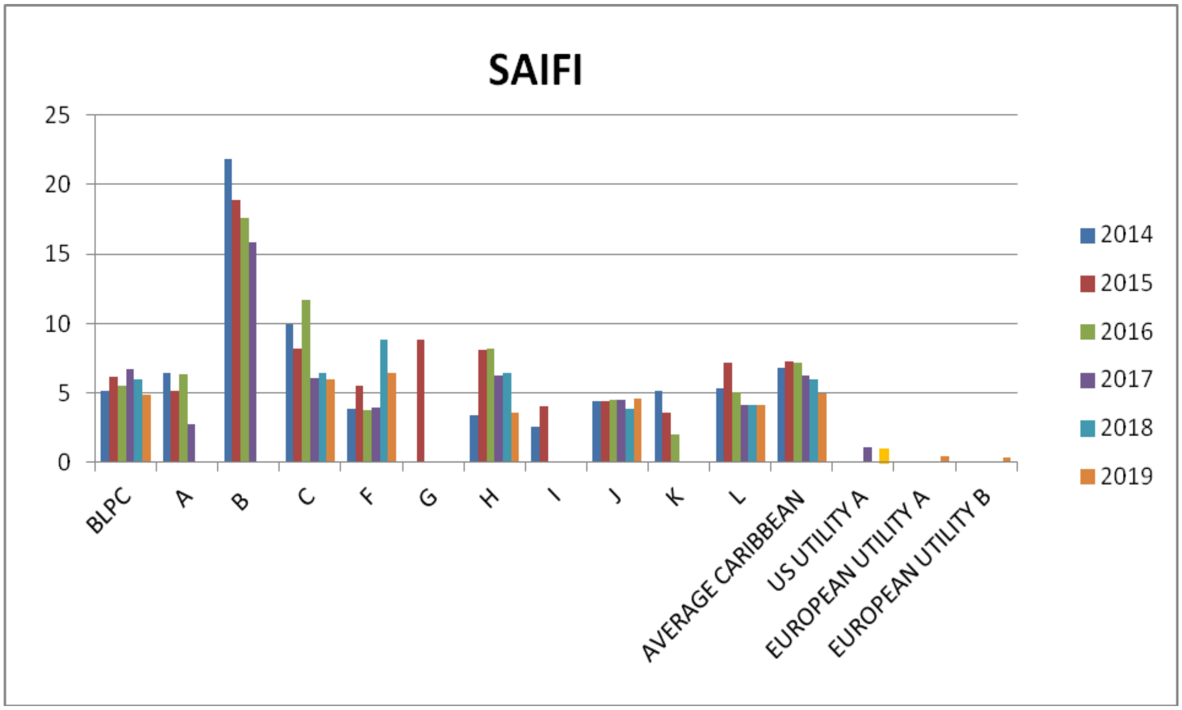
Utility:	2014	2015	2016	2017	2018	2019
BLPC	4.64	4.06	3.69	3.17	3.98	3.7
A	5.78	6.44	7.81	7.48	5.28	4.86
B	3.93	3.98	4.03	4.14		
C	3.79	3.38	5.64	6.36	9.17	11.81
D	6.56	7.01	7.58	7.58	7.13	7.35
E	6.07	6.5				
F	6.8	7.59	5.75	5.86	5.28	6.09
G					5.68	5.47
H	20.58	17.57	18.31	17.38	14.78	16.61
I	5.7	5.13	4.77	4.38	4.44	4.57
AVERAGE CARIBBEAN	7.09	6.85	7.20	7.04	6.97	7.56

17. SAIDI (hours)



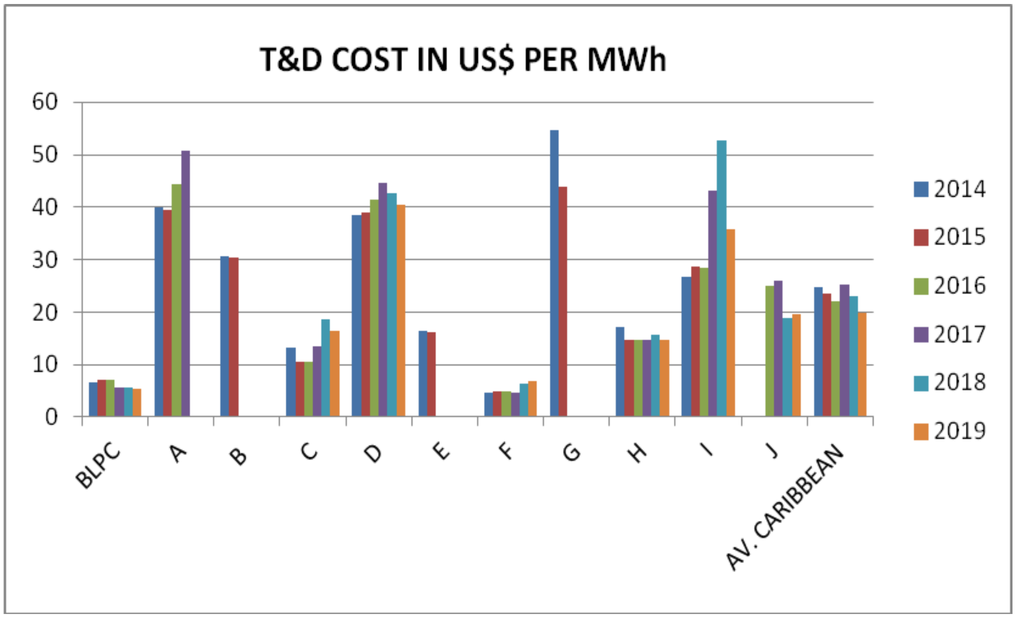
	2014	2015	2016	2017	2018	2019
BLPC	2.56	3.48	3.88	3.45	3.16	3.51
A	15.58	11.32	33.83	10.03		
B	40.07	33.06	33.72	34		
C	4.8	6.4	14.1	5.6	7.8	5.9
D	7.35	11.03	7.27	8.89	8.04	7.1
E	3.66	18.8	8	7.27	5.6	3.5
F	0.06	0.45				
G	5.45	5.11	6.42	6.98	6.34	7.65
H	9.84	5	2.4		1.21	0.89
I	15.5	16.4	12	8.6	9	11.4
AVERAGE CARIBBEAN	10.49	11.11	13.51	10.60	5.88	5.71
USA UTILITY A						1.35
USA UTILITY B				0.94		1.75
EUROPE UTILITY A				0.66		1.47
EUROPE UTILITY B				0.28		0.41
EUROPE UTILITY C						0.33

18. SAIFI



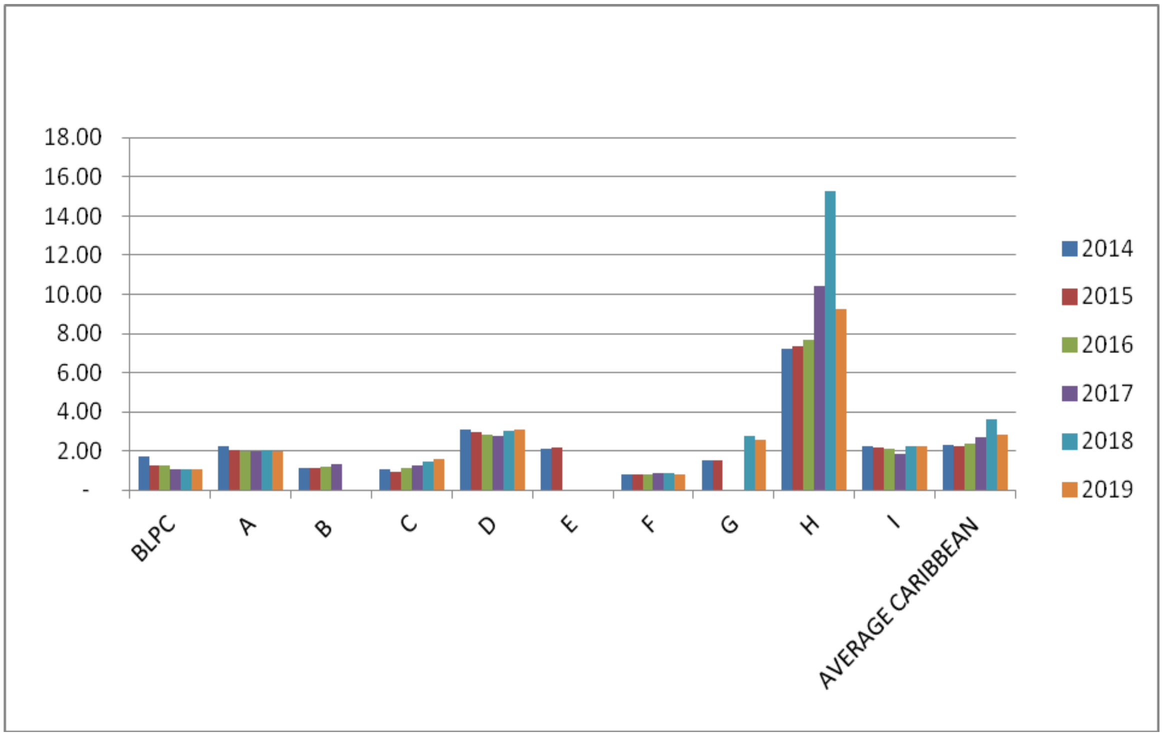
Utility:	2014	2015	2016	2017	2018	2019
BLPC	5.17	6.18	5.51	6.76	6.01	4.9
A	6.45	5.11	6.34	2.8		
B	21.8	18.85	17.55	15.87		
C	9.9	8.2	11.7	6.1	6.4	6
F	3.82	5.51	3.81	3.97	8.85	6.42
G		8.88				
H	3.41	8.09	8.15	6.23	6.4	3.6
I	2.58	4				
J	4.43	4.4	4.53	4.47	3.86	4.63
K	5.19	3.6	2			
L	5.3	7.2	5.1	4.1	4.1	4.1
AVERAGE CARIBBEAN	6.81	7.27	7.19	6.29	5.94	4.94
US UTILITY A				1.06		1
EUROPEAN UTILITY A						0.42
EUROPEAN UTILITY B						0.4

19. T&D COST (US$ per MWh)



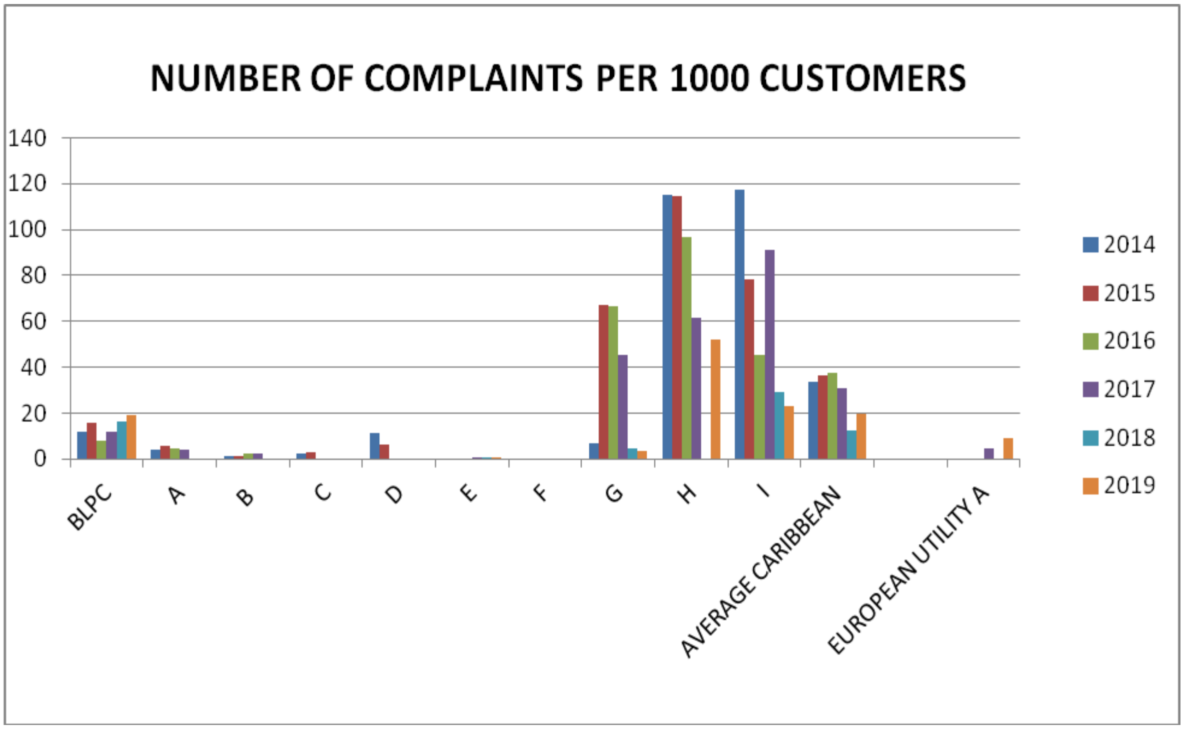
Utility:	2014	2015	2016	2017	2018	2019
BLPC	6.7	7.03	7.2	5.68	5.55	5.32
A	39.88	39.55	44.46	50.62		
B	30.62	30.46				
C	13.18	10.65	10.55	13.49	18.67	16.42
D	38.38	38.91	41.48	44.57	42.65	40.51
E	16.45	16.18				
F	4.64	4.9	4.79	4.74	6.3	6.73
G	54.78	43.82				
H	17.1	14.75	14.65	14.58	15.69	14.73
I	26.64	28.65	28.38	43.08	52.7	35.77
J			24.97	25.93	18.87	19.57
AV. CARIBBEAN	24.84	23.49	22.06	25.34	22.92	19.86

20. T&D PRODUCTIVITY IN PERSON-YEARS PER 10,000 MWh



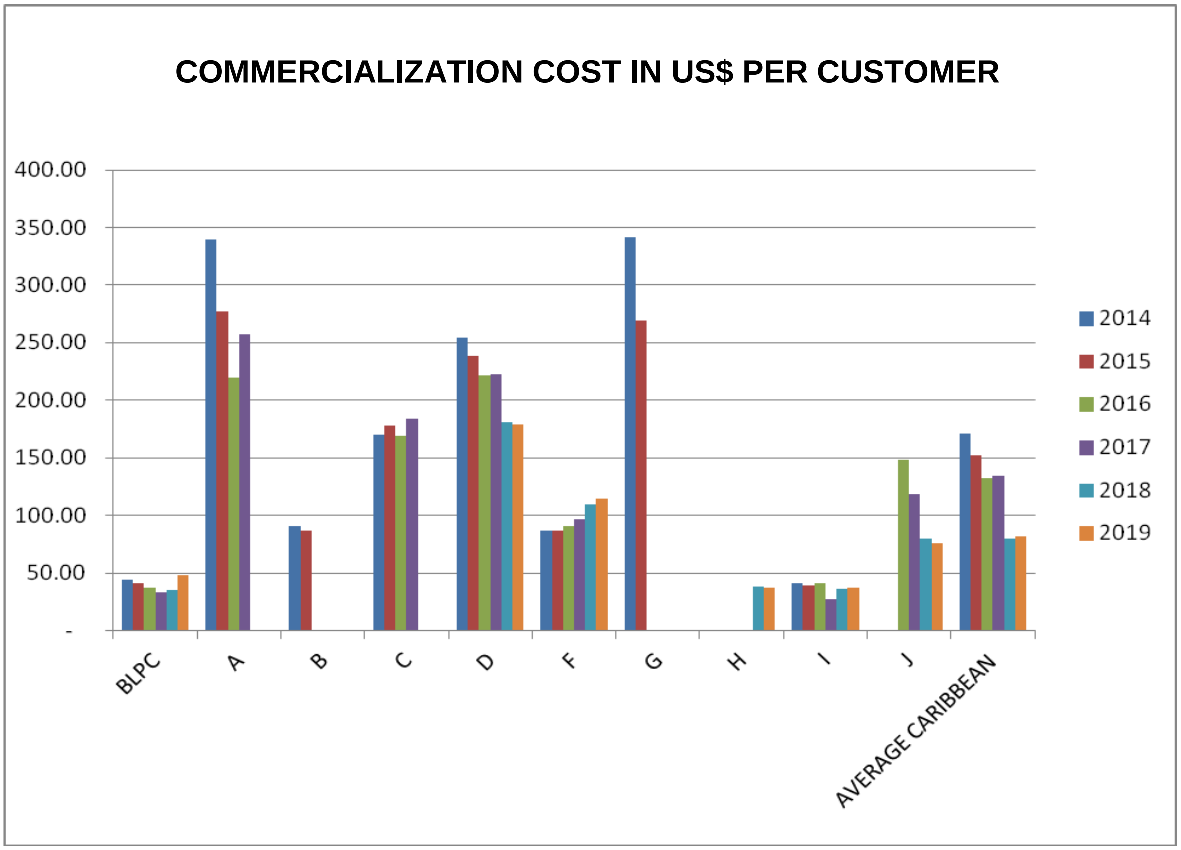
Utility:	2014	2015	2016	2017	2018	2019
BLPC	1.69	1.26	1.24	1.07	1.05	1.07
A	2.25	2.02	1.97	2.01	2.06	1.99
B	1.14	1.16	1.17	1.31		
C	1.08	0.93	1.12	1.29	1.46	1.56
D	3.07	2.99	2.81	2.75	3.01	3.09
E	2.12	2.19				
F	0.78	0.79	0.81	0.90	0.89	0.78
G	1.54	1.54			2.79	2.6
H	7.24	7.37	7.65	10.44	15.28	9.23
I	2.25	2.18	2.11	1.85	2.26	2.24
AVERAGE CARIBBEAN	2.32	2.24	2.36	2.70	3.60	2.82

21. NUMBER OF COMPLAINTS PER 1000 CUSTOMERS



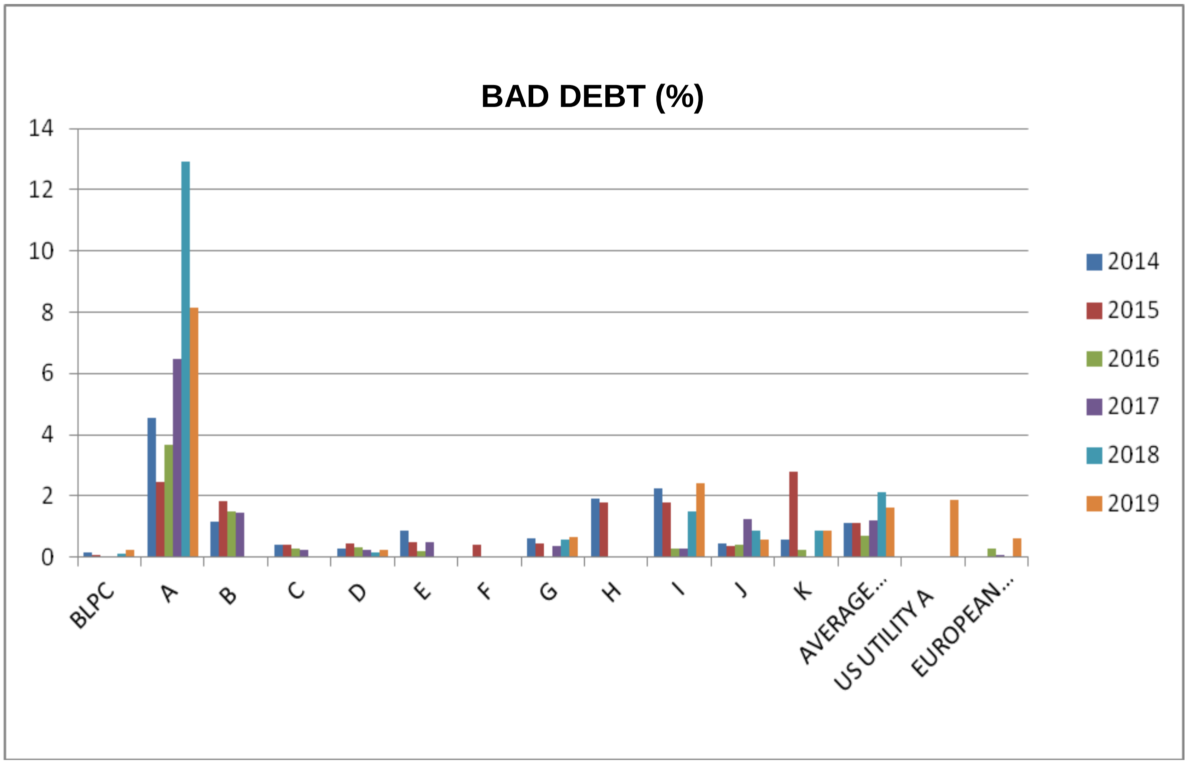
Utility:	2014	2015	2016	2017	2018	2019
BLPC	11.6	15.58	7.98	11.83	16.55	19.35
A	4.26	5.44	4.75	3.9	n.a.	n.a.
B	1.32	1.03	2.6	2.36		
C	2.2	2.7				
D	11.2	6.2				
E				0.03	0.07	0.03
F						
G	6.64	67.11	66.44	45.45	4.4	3.29
H	115.26	114.41	96.47	61.62		51.83
I	117.16	78.16	45.59	91.11	29.3	23.18
AVERAGE CARIBBEAN	33.705	36.32875	37.305	30.9	12.58	19.536
EUROPEAN UTILITY A				4.34		9.3

22. COMMERCIALIZATION COST IN US$ PER CUSTOMER



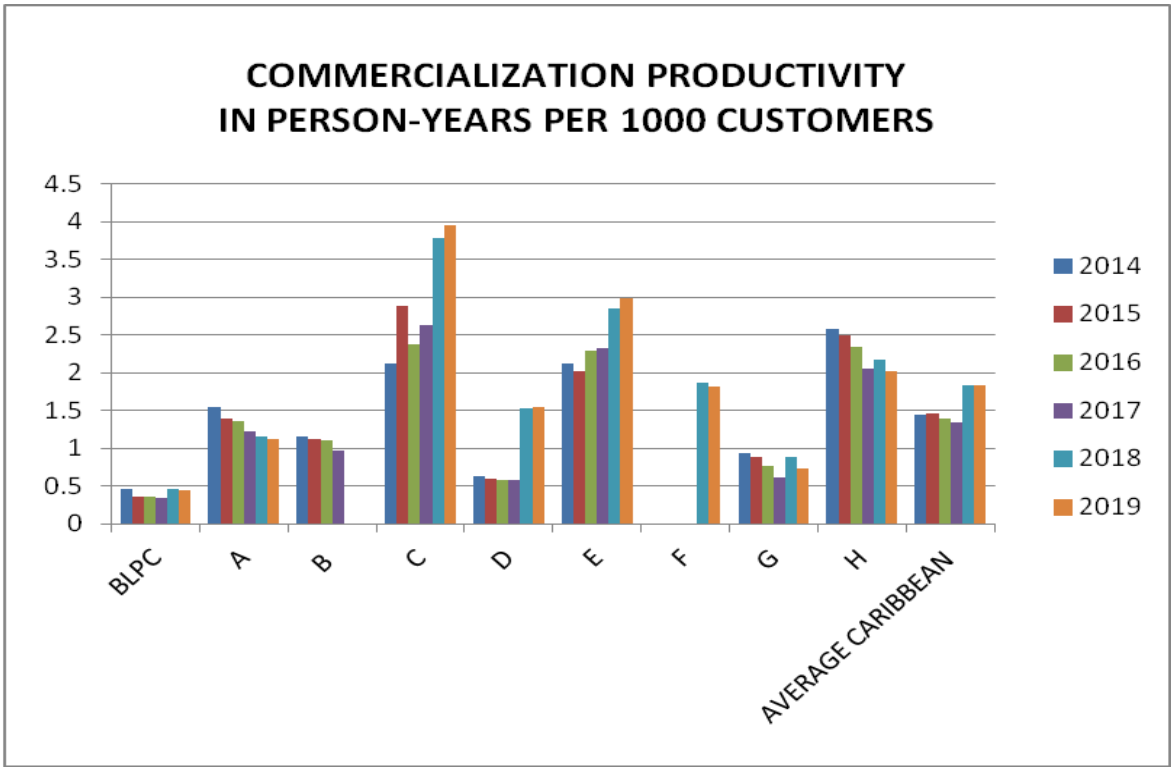
Utility:	2014	2015	2016	2017	2018	2019
BLPC	44.28	40.80	36.99	33.37	34.82	47.75
A	339.04	276.76	219.19	257.49		
B	90.38	87.12				
C	170.48	177.95	168.52	184.26		
D	254.03	238.71	221.72	222.22	180.42	178.85
F	86.25	86.43	90.27	96.43	109.55	114.32
G	341.39	269.19				
H					38.58	36.99
I	40.87	39.6	41.49	27.47	36.11	37.05
J			148.2	118.88	79.97	75.42
AVERAGE CARIBBEAN	170.84	152.07	132.34	134.30	79.91	81.73

23. BAD DEBT



Utility:	2014	2015	2016	2017	2018	2019
BLPC	44.28	40.80	36.99	33.37	34.82	47.75
A	339.04	276.76	219.19	257.49		
B	90.38	87.12				
C	170.48	177.95	168.52	184.26		
D	254.03	238.71	221.72	222.22	180.42	178.85
F	86.25	86.43	90.27	96.43	109.55	114.32
G	341.39	269.19				
H					38.58	36.99
I	40.87	39.6	41.49	27.47	36.11	37.05
J			148.2	118.88	79.97	75.42
AVERAGE CARIBBEAN	170.84	152.07	132.34	134.30	79.91	81.73

24, COMMERCIALIZATION PRODUCTIVITY in PERSON-YEARS PER 1000 CUSTOMERS



Utility:	2014	2015	2016	2017	2018	2019
BLPC	0.47	0.36	0.36	0.35	0.47	0.44
A	1.55	1.4	1.36	1.23	1.16	1.13
B	1.15	1.12	1.1	0.98		
C	2.13	2.88	2.37	2.63	3.79	3.96
D	0.63	0.6	0.59	0.58	1.53	1.55
E	2.12	2.02	2.3	2.32	2.85	2.98
F					1.87	1.82
G	0.93	0.89	0.77	0.62	0.88	0.73
H	2.58	2.5	2.35	2.05	2.18	2.03
AVERAGE CARIBBEAN	1.45	1.47	1.40	1.35	1.84	1.83

Appendix 2: Performance Indicators

Performance Indicators Equations

GENERAL INDICATORS	
Indicator	**Definition**
Technical	
Service Coverage (%)	$\frac{\textit{Population with electricity service x 100}}{\textit{Total population}}$
	Shows the percentage of users within the area served by the Utility with electricity service. It is a measure of the overall efficacy of utility service.
System Energy Losses (%)	$\frac{\textit{Net energy entering the system – Total energy sold}}{\textit{Net energy entering the system}} \textit{ x 100}$
	Net energy entering the system = net energy generated + energy purchased Shows total system energy losses as a percentage of the net energy entering the system. It is a measure of the overall technical efficiency of utility service.
System Load Factor (%)	$\frac{\textit{Net energy entering the system (MWh)}}{\textit{Maximum system demand (MW) x 8760}} \textit{ x 100}$
	Shows the load factor of the system. It is a measure of utilization of system capacity. The *maximum system demand* is the annual system peak load.
Economical	
Average Energy Cost ($/MWh)	$\frac{\textit{Total annual costs (US\\$)}}{\textit{Gross energy entering the system (MWh)}}$

GENERAL INDICATORS	
Indicator	**Definition**
	Gross energy entering the system = gross energy generated + energy purchased Shows the average system cost of energy (including losses). It measures cost effectiveness of utility service.
Customer Service Rates ($)	*End-Use Electricity Rates ($)*
	Average rates in a year for the following categories: a) residential customer using 400 kWh per month b).commercial customer using 5000 kWh per month c) industrial customer using 100,000 kWh per month
Financial	
Operational Profit Margin (%)	$\frac{\textit{Net income (US\$)}}{\textit{Operational Revenue (US\$)}} \times 100$
	Shows profit margin from operations. It is an indicator of the profitability of utility operations.
ROA Return on Assets (%)	$\frac{\textit{Net income (US\$)} \times 100}{\textit{Assets Value}}$
	Shows the rate of return on utility's assets. It measures how effectively assets are used to generate a return on investment. Only non-current assets are considered.
Debt Level (%)	$\frac{\textit{Long term Debt (US\$)} \times 100}{\textit{Assets value (US\$)}}$
	Shows the level of indebtedness of the company. It is a measure of financial risk.

Labor Productivity (man-years/1,000 customers)	$\dfrac{\textit{FTE of staff (man-years)}}{\textit{Total number of customers served / 1000}}$
	Shows staff utilization per 1,000 customers served; FTE stands for full-time equivalent employees. It is a measure of how effective is the organization.

GENERATION INDICATORS	
Indicator	**Definition**
Technical	
Generation Reserves Margin (%)	$\frac{\text{(System installed capacity – System peak load)}}{\text{System peak load}} \times 100$
	Shows the margin of generation reserves as a percentage of system peak load. It measures the long-term adequacy of generating capacity to supply load.
System Equivalent Availability (%)	$\frac{\Sigma \text{ Unit rating (MW) x available hours}}{\text{System installed capacity (MW) x 8760}} \times 100$
	Shows the availability of system capacity accounting for forced and planned outages. It is a measure of the reliability of generation equipment.
Plant Energy Consumption (%)	$\frac{\text{Gross energy generated – Net energy generated}}{\text{Gross energy generated}} \times 100$
	Shows internal consumption of energy in generation plants as a percentage of gross generation. It is an indicator of plant generation efficiency.
Utilization Factor (%)	$\frac{\text{Gross energy generated}}{\text{System installed capacity (MW) x 8760}} \times 100$
	Shows the capacity utilization factor for the system. It measures how much of the generating capacity of the system is actually used.
Generation Non-Served Energy (‰)	$\frac{\text{Non served energy}}{\text{Total energy delivered + non served energy}} \times 1000$
	Measures energy not supplied due to generation outages. It is an indicator of generation service reliability.

GENERATION INDICATORS	
Indicator	**Definition**
Fuel Cost ($/MWh)	$\dfrac{\textit{Total fuel costs (US\$)}}{\textit{Energy generated by thermal plants (MWh)}}$
	Average cost of the fuel component per thermal MWh generated. It shows the impact of fuel costs on generation costs.
Generation Cost ($/MWh)	$\dfrac{\textit{Total generation costs (US\$)}}{\textit{Total gros energy generated (MWh)}}$
	Average cost per MWh generated including capital costs. It measures cost effectiveness of generation activities.
Generation Productivity (man-years/10 MW)	$\dfrac{\textit{FTE of generation staff (man-years)}}{\textit{System installed capacity (MW)/10}}$
	Shows staff utilization per 10 MW installed. It is a measure of productivity.

<table>
<tr><th colspan="2">TRANSMISSION-DISTRIBUTION INDICATORS</th></tr>
<tr><th>Indicator</th><th>Definition</th></tr>
<tr><td colspan="2">Technical</td></tr>
<tr><td rowspan="2">T-D Non-Served Energy (‰)</td><td>$\dfrac{\textit{Non served energy}}{\textit{Total energy delivered + non served energy}} \times 1000$</td></tr>
<tr><td>Measures energy not delivered due to T-D interruptions. It is an indicator of T-D service reliability.</td></tr>
<tr><td rowspan="2">SAIFI
System Average Interruption Frequency Index</td><td>$\dfrac{\Sigma \textit{ Total number of customers interrupted}}{\textit{Total number of customers served}}$</td></tr>
<tr><td>Reliability index representing how often the customers experience sustained interruptions in average. Sustained interruptions are those longer than five minutes.</td></tr>
<tr><td rowspan="2">SAIDI
System Average Interruption Duration Index (hours)</td><td>$\dfrac{\Sigma \textit{ Customer interruption durations}}{\textit{Total number of customers served}}$</td></tr>
<tr><td>Reliability index representing the average duration of service sustained interruptions for customers. Sustained interruptions are those longer than five minutes.
Example with 7 sustained (>5 min) interruptions in a year, total number of customers is 2000.:
<table>
<tr><th>Interruption</th><th>Duration (min)</th><th>Number of Customers</th><th>Interruption Type</th></tr>
<tr><td>1</td><td>8.17</td><td>200</td><td>S</td></tr>
<tr><td>2</td><td>0.5</td><td>400</td><td>M</td></tr>
<tr><td>3</td><td>71.3</td><td>600</td><td>S</td></tr>
<tr><td>4</td><td>30.3</td><td>25</td><td>S</td></tr>
<tr><td>5</td><td>1</td><td>2,000</td><td>M</td></tr>
<tr><td>6</td><td>267.2</td><td>90</td><td>S</td></tr>
<tr><td>7</td><td>120</td><td>700</td><td>S</td></tr>
<tr><td>8</td><td>10</td><td>1,500</td><td>S</td></tr>
<tr><td>9</td><td>40</td><td>100</td><td>S</td></tr>
</table>
SAIDI = (8.17*200+71.3*600+30.3*25+267.2*90+120*700+10*1500+40*100)/2000
SAIFI = (200+600+25+90+700+1500+100)/2000 = 1.61</td></tr>
<tr><td colspan="2">Economical</td></tr>
</table>

TRANSMISSION-DISTRIBUTION INDICATORS	
Indicator	**Definition**
Transmission-Distribution Cost ($/MWh)	$$\frac{Total\ T-D\ costs\ (US\$)}{Total\ energy\ delivered\ (MWh)}$$
	Average T-D cost per MWh delivered. It is a measure of cost effectiveness of T-D operations.
Organizational	
Transmission-Distribution Productivity (man-years/ 10,000 MWh)	$$\frac{FTE\ of\ T-D\ staff\ (man-years)}{Total\ energy\ delivered\ (MWh)/10{,}000}$$
	Shows T-D staff utilization per 10,000 MWh delivered. It is a measure of productivity.

COMMERCIALIZATION INDICATORS	
Indicator	**Definition**
Technical	
Non-Technical Losses (%)	$$\frac{\text{Available energy} - \text{Energy Sold}}{\text{Available energy}} \times 100$$
	Available energy= net energy generated + energy purchased – grid losses Shows energy losses due to non-registered consumptions (non-technical losses). It measures electricity delivered for which the utility is not paid.
Number of Complaints (#/1,000 customers)	$$\frac{\text{Number of complaints}}{\text{Total number of customers served / 1,000}}$$
	Shows the number of complaints received per 1,000 customers served. It is an indicator of customer service quality.
Economical	
Commercialization Cost ($/customer)	$$\frac{\text{Total commercialization costs (US\$)}}{\text{Total number of customers served}}$$
	Average commercialization cost per costumer served. It is a measure of cost effectiveness of commercial activities.
Bad Debt (%)	$$\frac{\text{Bad debt (US\$)}}{\text{Operational Revenues (US\$)}} \times 100$$
	Measures receivables deemed uncollectible. It considers bills unpaid after 180 days.
Organizational	
Commercialization Productivity (man-years/1,000 customers)	$$\frac{\text{FTE of commercial staff (man-years)}}{\text{Total number of customers served / 1,000}}$$
	Shows commercial staff utilization per 1,000 customers served. It is a measure of productivity.

Appendix 3: Data Sources

- Data request files have been filled in and returned by 10 Caribbean utilities up to 217 and 8 utilities with additional data for 2018 and 2019. For the sake of consistency and completeness some of these utilities have been contacted for reviewing and/or completing the data.
- The Carilec Benchmarking Study Reports 2013 and 2014/2015 have been used for gathering additional data and for identifying trends of some performance indicators in earlier years (before 2014).
- Information from utilities in the Southeast of the USA and in Western Europe (mainly the UK, The Netherlands and Ireland) has been gathered from different publicly available sources such as utility company's web sites, annual reports, web sites of energy retail companies, web sites of Associations of Utility Companies, Government sites and Regulator's sites, Reports prepared for international institutions like World Bank, etc.
  For the sake of keeping the utilities and the utilities' performance anonymous, no names are given of sites and companies mentioned above.