FAIR TRADING COMMISSION

DECISION

The Application by the BL&P for Approval to Apply the Results and Costs of Hedging to the Calculation of the Fuel Clause Adjustment

Document No: FTC/UR/DECCHFCA/2016-04 **Dated: December 29, 2016**

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SECTION 1 EXECUTIVE SUMMARY

1. The Fair Trading Commission (the Commission) has completed its analysis of the Application by the Barbados Light and Power Company Limited (BL&P) for approval to apply the results and costs of fuel hedging to the calculation of the Fuel Clause Adjustment (FCA).

2. In March 2016, the Commission received an Application from the BL&P for approval to apply the administrative results (losses or gains) and costs of a fuel hedging programme to the calculation of the FCA (the Application). This was done in accordance with Section 16 of the Utilities Regulation Act, CAP.282 of the Laws of Barbados (URA). This section gives the Commission the authority, on its own motion or by application, to review the rates, principles and standards of service for the supply of a utility service.

3. The proposed fuel hedging programme would allow the BL&P to hedge 80% to 90% of its Heavy Fuel Oil (HFO) consumption volumes with a third party and would be a financial hedge, using fixed price swaps. The annual administrative cost was estimated at BDS$600,000 with Emera Energy Services, an affiliate based in Nova Scotia, identified as the hedge administrator. No specific duration was stated in the Application.

4. In accordance with Rule 37 of the Utilities Regulation (Procedural) Rules, 2003 (S.I. 2003 No. 104) (URPR), made under Section 39 of the URA, the Commission invited written submissions from interested parties on May 23, 2016. The written hearing gave the parties an opportunity to be heard and ensured that there was transparency in the Decision of the Commission.

5. Five interested parties met the criteria to participate in the hearing through the submission of letters of intervention. They were CARITEL, Mr. Tony Gibbs, Division of Energy and Telecommunications, CIBC FirstCaribbean and Mr. Andrew Hart. The written submissions received from these intervenors were considered during the Commission's decision making process.

6. The responses received varied – some intervenors argued that the BL&P had not provided sufficient evidence to support the application of hedge losses/gains and administrative costs to the determination of the FCA and that any decisions to hedge should come after attempts to improve its generation efficiencies; other intervenors considered that the use of such a financial risk strategy to control price risk could be beneficial to the Barbadian consumer. Issues generally addressed one of three categories: risk, transparency related to administrative costs and plant efficiency.

7. While hedging has proved to be beneficial in reducing volatility, it also comes with significant risks. Additionally, despite this ability to reduce volatility, the existence of a hedge programme could result in higher overall costs of electricity. This exposes the BL&P to the possibility of incurring accumulated losses, which would ultimately be passed on to the customer in the form of higher bills.

8. After a detailed analysis of the issues involved, the Commission determined that:

   The BL&P's Application to apply the results and costs of fuel hedging to the FCA is hereby denied on the following grounds:

   - **The Commission is conscious of the risks associated with fuel hedging and does not agree that the BL&P should be allowed to pass the cost of hedging and associated gains or losses onto the consumers of Barbados.**

   - **The Applicant has not provided enough evidence to suggest that the Barbadian public is willing to pay for the reduced volatility in fuel prices.**

SECTION 2 INTRODUCTION

9. On March 29, 2016, the BL&P applied to the Commission for approval to apply the results and the costs associated with a fuel hedging programme, to the calculation of the FCA. The Barbados National Oil Company Limited (BNOCL) is the sole, authorised importer of fuel into Barbados. Therefore, while the BL&P is not in a position to undertake physical fuel hedging, it is not restricted from engaging in financial hedging. The BL&P purchases fuel under contract with BNOCL, with prices linked to the New York Harbor Residual Fuel No. 6 index. The BL&P uses approximately 250,000 tons of fuel each year at an estimated cost of BDS $205 million[1]. Based on projected fuel prices to the end of 2016, total fuel cost for this year is estimated at BDS $200 million. Seventy-five percent of the total cost of fuel is attributed to HFO. The remainder of the cost is distributed between aviation jet fuel (21%) and diesel (4%). The Application relates to hedging on HFO.

10. Fuel cost is a "pass through" charge that is applied equally to all customer classes through the FCA charge. Fluctuations in the FCA mainly arise due to movements in the purchase price of fuel. In undertaking a fuel hedging programme, the aim of the BL&P would be to secure a less volatile price for a percentage of its fuel purchases (80% increasing to 90% of its HFO), thereby reducing the potential impact of volatile fuel prices on its consumers.

11. Historically, the BL&P has not hedged its commodity purchases. A similar application, however, was made to the Commission in 2014. That application was rejected due to a lack of supporting information.

12. The aim of this Application was to reduce the BL&P's and, ultimately, the end consumers' exposure to fuel cost volatility. It was intended that the administration fees and the profit or loss arising from hedging would be applied to the actual cost of the fuel purchased. The current FCA formula is:

[1] Fuel costs for 2015. In 2015, the BL&P used 205,090 tons of HFO. HFO accounted for 64% of fuel cost over the twelve month period ending July 2016.

$$FCA_n = \frac{FuelCost_{n-1}}{EnergyGeneration_{n-1} \cdot (1 - Aux_{n-1}) \cdot (1 - losses)} \left[\frac{BD\$}{kWh} \right] \qquad \textbf{Equation 1}$$

Where:

FCA_n = Fuel Clause Adjustments for the current month n

$Energy\ Generation_{n-1}$ = Energy generated in previous month

Aux_{n-1} = Auxiliary consumption as a percentage of total generation in previous month

Losses = System losses as a percentage of total generation calculated based on a 12 month running average

$Fuel\ Cost_{n-1}$ = Fuel cost in previous month including cumulative under/over recovery, purchase power.

13. Should hedging be allowed, the revised FCA formula would be as follows:

$$FCA_n = \frac{FuelCost_{n-1} + Hedge\,\mathrm{Results}_{n-1} + Ad\,\min\,Costs_{n-1}}{EnergyGeneration_{n-1} \cdot (1 - Aux_{n-1}) \cdot (1 - losses)} \left[\frac{BD\$}{kWh} \right] \qquad \textbf{Equation 2}$$

Where:

$Hedge\ Results_{n-1}$ = gains/losses from fuel hedge in previous month

$AdminCosts_{n-1}$ = Administrative costs of hedging programme in the previous month.

All other terms remain as defined in Equation 1.

SECTION 3 LEGISLATIVE FRAMEWORK

14. Under Section 4 (3) (a) of the Fair Trading Commission Act, CAP. 326B of the Laws of Barbados (FTCA), the Commission is responsible for establishing principles for arriving at the rates to be charged by service providers. The Commission also has this duty under Section 3 (1) of the URA which states, *inter alia*:

> *"The functions of the Commission under this Act are, in relation to service providers, to*
>
> *(a) establish principles for arriving at the rates to be charged;"*

15. In accordance with Section 2 of the FTCA and the URA, "principles" refer to the formula, methodology or framework for determining a rate for a utility service.

16. Additionally, Section 2 of the URA states that "rates" include:-

> "a) *every rate, fare, toll, charge, rental or other compensation of a service provider;*
> *b) a rule, practice, measurement, classification or contract of a service provider relating to a rate; and*
> *c) a schedule or tariff respecting a rate;"*

17. By virtue of Section 16 of the URA, where the Commission has not fixed a period of time in accordance with Section 15 (1) of the said Act, 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 a utility service. In light of this provision, the BL&P has correctly filed an application with the Commission seeking approval to apply the results and costs of hedging to the calculation of the FCA.

18. On October 11, 2013, the Commission issued its decision on its own Motion to Review the FCA, pursuant to Section 16 of the URA. The FCA is approved by the Commission as a principle or formula that the BL&P is permitted to use to "pass through" the cost of fuel used to generate electricity for use by its customers.

19. By virtue of Section 36 of the FTCA, the Commission may, on application or on its own motion, review and vary or rescind any decision or order made by it and, where

under the Act a hearing is required before any decision or order is made, such decision or order shall not be altered, suspended or revoked without a hearing.

20. Essentially, the Application filed by the BL&P, if successful, would result in the alteration of the FCA formula as previously approved by the Commission in the manner outlined at Equation 2 on page 6, herein.

SECTION 4 INTERVENORS' PARTICIPATION

21. On May 23, 2016, the Commission published a Notice in the media advising members of the public that the BL&P had sought approval to apply the results and costs of fuel hedging to the calculation of the FCA. The Commission invited written submission from interested parties to be received no later than May 30, 2016.

22. Upon request, the Commission granted an extension until August 18, 2016 for interested parties to apply for intervenor status. Intervenor status was granted to the following who actively participated in the hearing:

- CARITEL;
- Mr. Tony Gibbs;
- Division of Energy and Telecommunications;
- CIBC FirstCaribbean; and
- Mr. Andrew Hart.

23. Pursuant to Rule 4 of the URPR, the parties were issued with Procedural Directions. The Procedural Directions guided the parties on the procedural elements of the hearing and outlined timelines for the process.

24. All intervenors were invited to make written submissions by way of sworn affidavit to the Commission and to submit interrogatories for the BL&P.

Affidavits and Written Submissions

25. The Commission received written submissions from all five intervenors.

26. All written submissions and interrogatories were shared with the BL&P and circulated amongst the intervenors. Parties were given an opportunity to respond to each other's submissions.

27. The BL&P responded to the submissions and these responses were circulated to all parties.

28. Mr. Tony Gibbs and Mr. Andrew Hart requested information related to the administrative costs associated with hedging. This information was provided to the Commission by the BL&P under confidential cover.

29. The Commission thanks the intervenors for their contributions.

SECTION 5 WRITTEN SUBMISSIONS AND AFFIDAVITS

CARITEL

30. CARITEL opined that the BL&P has not provided sufficient evidence that fuel hedging would offer the required benefit to the consumer. It added that the BL&P has neither shown that the proposed hedge administrator has the required track record in hedging, nor has it demonstrated whether the associated cost is fair and reasonable. Further, CARITEL noted that the current oil market price does not require the implementation of a price risk management strategy. To this end, CARITEL was of the view that the BL&P should not be allowed to apply results and costs to the FCA.

Mr. Tony Gibbs

31. Mr. Gibbs' submissions dealt with volatility, over-the counter fixed price swaps, basis risk, St. Lucia Electric Services Limited's (LUCELEC's) hedging experience and plant efficiency.

32. Volatility – Mr. Gibbs stated that the BL&P has not provided sufficient evidence to prove that volatility will adversely affect ratepayers and that it has made no attempt to quantitatively analyse said volatility.

33. Over-the-counter fixed price swaps – Mr. Gibbs submitted that the BL&P has not indicated how it arrived at the proposed hedge ratio of 80% - 90%. Therefore, he was of the view that the BL&P should implement a hedging programme using a carefully staged approach. This would allow it to assess the outcomes of the programme, making changes as necessary, and limit its exposure to regulatory risks.

34. Basis Risk – Mr. Gibbs was also concerned about the lack of correlation between the grade of HFO being purchased by the BL&P and the grade of HFO on which the hedges would be based. According to him, this disparity would give rise to basis risk. He further contended that the changes in the price of the hedged index may not completely offset the changes in the price of the underlying assets, potentially resulting in losses to the BL&P, and would ultimately be reflected as increased customer bills.

35. LUCELEC's Hedging Experience – Mr. Gibbs referenced the LUCELEC experience. LUCELEC started hedging on a limited pilot basis in 2009, increasing to 75% coverage in 2012 using fixed price swaps. In 2013, the company lost EC$39.8 million and gained EC$5.5 million in 2014 after revising the programme to use option contracts. LUCELEC's customers did experience a decline in FCA over the period 2012 to 2015 and lower volatility. However, it did not benefit from falling oil prices that were seen in the market during the 2014 to 2015 period and therefore its customers paid comparatively higher prices than the Barbadian consumers.

36. It was also highlighted that the BL&P's Application does not mention the "risk potential of hedging", neither does it show the risk appetite of the consumer who ultimately bears the costs. Mr. Gibbs also raised questions related to the independence, experience and skill level of the proposed hedge administrator.

37. Plant Heat Rate/Optimum Dispatch/Fuel Efficiency– Mr. Gibbs contended that the BL&P is currently operating an old steam plant, which is well past its design life, to satisfy base load. He suggested that: 1) if this plant was able to operate at the same efficiency as its LSD counterpart, the BL&P could save over 10,000 barrels of HFO monthly and 2) if the BL&P were to follow the examples of LUCELEC and Grand Bahama (two subsidiary companies), it would seek to improve its operational efficiencies prior to embarking on a hedging programme. This point also applied to improving its fuel efficiency.

Division of Energy and Telecommunications

38. The submission from the Division of Energy and Telecommunications related to the geopolitical perspective of the oil market. It proposed to amend the FCA in order to incentivise efficiency and it advocated options as the preferred hedging tool as opposed to swaps.

CIBC FirstCaribbean

39. CIBC FirstCaribbean collaborated with the BL&P on the development of the Application and offered its support for the fuel hedging programme.

Mr. Andrew Hart

40. Mr. Hart's submissions dealt with basis risk, plant efficiency, administrative cost and the proposed hedging strategy.

41. Mr. Hart suggested that high levels of system losses and auxiliary consumption could have negative impacts on the FCA. He contended that the methodology for calculating these should be stated up front and queried whether these figures were verified by an external representative. Similar queries were presented with regard to energy generated and fuel cost.

42. Mr. Hart raised the issue of basis risk and opined that it would be better to change the physical contract to one in which the oil is priced based on Platts Gulf Coast[2] 3% quote and conduct the hedging process based on the same quote.

43. Mr. Hart noted that the administrative costs were high and sought further information on its breakdown.

44. Interrogatories presented by Mr. Hart focused on the FCA methodology and verification of the FCA inputs.

45. He also sought further clarification on the hedge strategy and its policy framework.

The Commission

46. In addition to the issues raised by the intervenors, the Commission requested further information on the breakdown of the administrative costs, as well as more detailed, quantitative analysis related to the hedge strategy. The Commission also sought clarification on the proposed overall programme and the ability of the BL&P to meet the varied reporting requirements.

[2] S&P Global Platts is an independent provider of information and benchmark prices for the commodities and energy markets.

47. Multiple intervenors raised the issues of plant and fuel efficiency, auxiliary consumption, system losses, power plant thermal efficiency and diversification of the fuel mix.

The BL&P

48. The BL&P provided responses to the interrogatories. This information was then used to further analyse the Application.

49. The BL&P acknowledged that no quantitative assessment of the risk tolerance of customers was done.

50. The BL&P submitted an illustrative hedge scenario for the period January 2015 to July 2016 which showed the volatility in oil prices that would have been experienced if a hedge had been implemented.

51. The BL&P also provided quotations related to the proposed hedge administrators, under confidential cover.

52. Historical data relating to the system losses and auxiliary losses was also provided. These figures, together with those related to energy generated, are routinely provided to the Commission for review and evaluation.

53. The BL&P noted that it would work with its contracted hedge administrator to address the issues associated with its hedging policy. These issues are varied and include basis risk, time period of the hedge, volumes to be hedged, price levels of hedge, hedge effectiveness and governance.

54. The BL&P noted that the possibility of a change in fuel used would be incorporated in the hedging and risk management strategy. It also suggested that its decision to hedge 80% of HFO, increasing to 90% over time, was its version of a staged approach to hedging.

55. The BL&P also acknowledged the importance of high fuel efficiency and low plant heat rates and averred that the management of these can be done in conjunction with the implementation of a hedge strategy.

SECTION 6 ANALYSIS

6.1 REVIEW OF THE OIL MARKET

56. Energy markets are unpredictable. However, history has shown that the movement of oil prices is cyclical. Often, periods of relative stability are followed by an event which triggers a sudden and significant movement in price. An example of this was seen where high oil prices, during the period 2006 to 2013, were followed by a sudden and sustained drop in oil prices.

57. Furthermore, the price of oil is impacted by various factors, including: the influence and decisions of the Organization of Petroleum Exporting Countries (OPEC); fluctuations of demand by the world's largest economies; political instability in producing countries; the effect of Russia (non-member of OPEC and major player in the oil market as the world's second largest producer); alternative methods of oil extraction (fracking[3] in Canada and the USA); and climatic conditions and speculation. Increased volatility implies an increased probability of price spikes and, given the sensitivity of prices to changing market conditions, the perception that oil price uncertainty has increased in recent months and price spikes are more likely seems well justified. It was reported that at a meeting on December 10, 2016, non-OPEC countries agreed to cut their oil production in order to contract oil supplies. This will likely result in increased oil prices in the short to medium term.

58. The estimated, annualised volatility of the key fuel imports into Barbados range from 29.54% to 37.57% for fuel oil for the year 2016, with high volatility expected until the end of the year. This could result in an annualised variation in the FCA of 33.52%[4], a high figure which has the potential to adversely impact the operating cost of every sector of the economy - an economy that has been in recession since 2008 and is said to be more than 95% dependent on oil imports.

59. The BL&P has suggested that the proposed fuel hedging programme is expected to provide customers with greater price certainty, price stability and predictability in

[3] Fracking is the process of injecting liquid at high pressure into subterranean rocks, boreholes, etc., so as to force open existing fissures and extract oil or gas.
[4] Division of Energy and Telecommunications, "*Affidavit of Bryan Haynes*," August 4, 2016.

their budgets. It further purported that, based on its annual customer surveys, the aforementioned benefits are valued by customers. Consideration, therefore, has been given to the determination of how these could be addressed.

6.2 HEDGING

What is Hedging?

60. Financial instruments are often used to manage risks that companies encounter. A hedge, which is one such financial instrument, is an investment that is designed to reduce the risk of adverse price movements in a market. Derivatives are securities that move in value in relation to one or more underlying assets. Their value is based on an agreed-upon, underlying financial asset, index or security. Derivatives are therefore often used in hedging and speculating, as they facilitate the management of price risk. The definition of some of the different types of derivatives commonly employed are as follows:

- **Option:** a contract which provides the contract buyer with the right, but not the obligation, to purchase (call) or sell (put) a particular amount of a specific commodity (or the financial equivalent thereof), on or before a specific date or period of time.

- **Swap**: refers to an exchange of one financial instrument for another between parties concerned.

- **Futures**: are financial contracts which obligate the buyer to purchase an asset or the seller to sell an asset, such as a physical commodity or a financial instrument, at a predetermined future date and price.

- **Forward contract:** an informal agreement, traded through a broker-dealer network, to buy and sell specified assets, at a specified price at a certain future date.

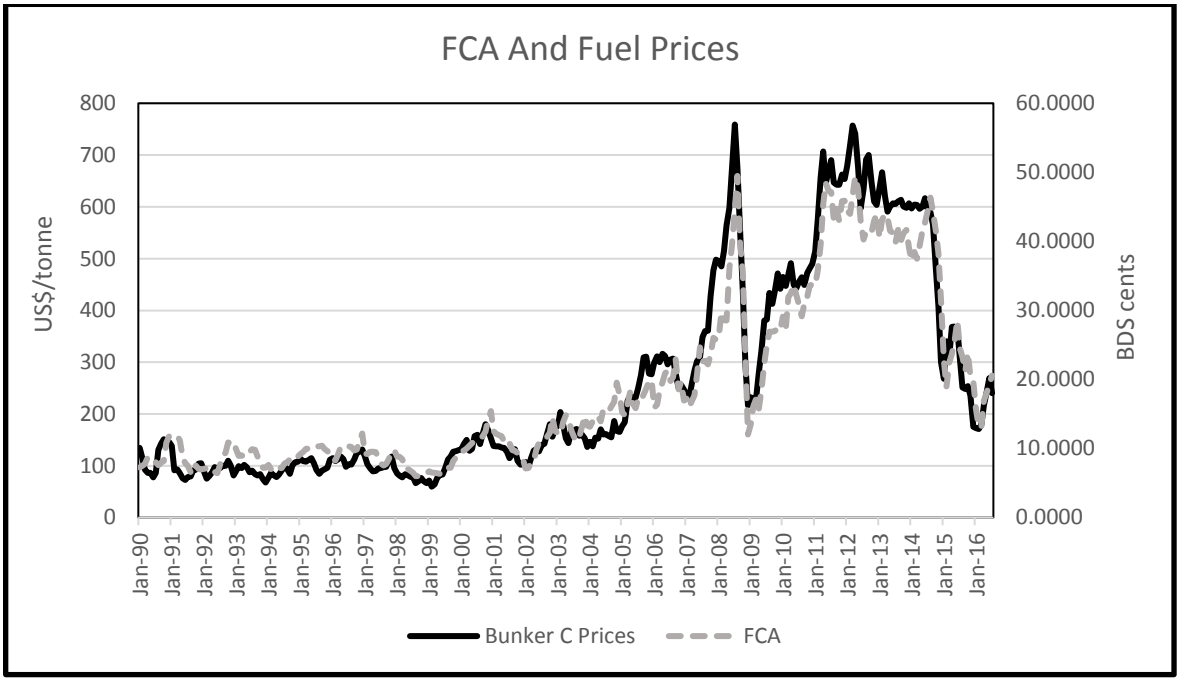
- **Collar:** the combination of buying a put option (floor) and selling a call option, the combination of which results in both a floor and a ceiling.

61. Swaps, futures, options and collars may all be used as part of a hedge programme. A physical hedge involves the delivery of the underlying asset, in this case, fuel commodity. Swaps and options are financial hedges; there is no expected exchange of fuel involved in these transactions. The BL&P proposes to use financial hedges.

Why Hedge?

62. Figure 1 depicts the historical FCA, along with Bunker C oil prices, for the period January 1990 to July 2016. This chart highlights two issues which the proposed hedging programme would seek to resolve – high volatility and extreme peaks in fuel prices, which are reflected below with the sharp peaks in the FCA.

Figure 1 - Historic FCA and Fuel Prices



63. Hedging could address both of these consumer concerns. In the case of price stability, the volatility of the price of oil, through the "pass through" mechanism, directly affects consumers in their day-to-day budgeting. Therefore, it is expected that consumers would prefer a more stable cost for electricity. In times of rising oil prices, hedging could provide some protection against high oil prices.

64. Hedging losses are a potential outcome of a hedging programme. However, these generally occur in times of falling oil prices. Consumers derive greater value from upside cost mitigation than from hedge losses, as sharp oil price increases tend to require them to make difficult adjustments relative to prior expectations. Hedge losses, however, while still an undesirable reality, occur in declining markets when the net costs are more favourable than prior expectations.

65. This statement is not meant to undervalue the hardship that is experienced when the consumer is required to pay prices that are artificially high due to hedging. Rather, it seeks to put into context the relative inconvenience experienced with unfavourable outcomes. As such, research has shown that the protection gained from high oil prices through a hedging programme provides some compensation for the inflated oil prices that the consumer pays during an era of falling oil prices[5].

Advantages and Disadvantages of Hedging

66. As with any strategy, there are advantages and disadvantages, some of which are outlined as follows:

Advantages

- Currently, local consumers enjoy low FCA rates, which is reflective of low oil prices; expectations are that prices will rise in the short to medium term. A properly executed hedge should protect the customer from very significant fluctuations in the FCA, should the price of oil increase sharply.
- An effective hedge strategy also offers a proactive approach for budget protection.

Disadvantages

- A poorly executed or ill-timed hedge could result in an FCA that is significantly higher than the FCA that would have been experienced if the utility had not hedged. This is shown in the illustrative scenario of Figure 2 at page 22 herein.

[5] Michael Gettings, "Natural Gas Utility Hedging Practices and Regulatory Oversight: *An Inquiry into Local Natural Gas Distribution Companies' Hedging Practices and Transaction Reporting,*" accessed August 17, 2016, *https://www.utc.wa.gov/132019.*

- Costs would be incurred to implement and administer a hedging programme, which, at the lowest level, would increase the FCA rates, even if only minimally.

Hedge Strategy Simulation

67. Table 1 shows the simulated results of the impact of a swap-based strategy, using the historical Spot Price of the New York Harbor No. 6 diesel for illustrative purposes. This simulation supports the notion that the use of a hedge strategy could reduce the volatility in the price of fuel, thus achieving the primary objective of the BL&P. The simulated volatility of the fuel purchase price would be reduced from 42% to 22% over the period indicated.

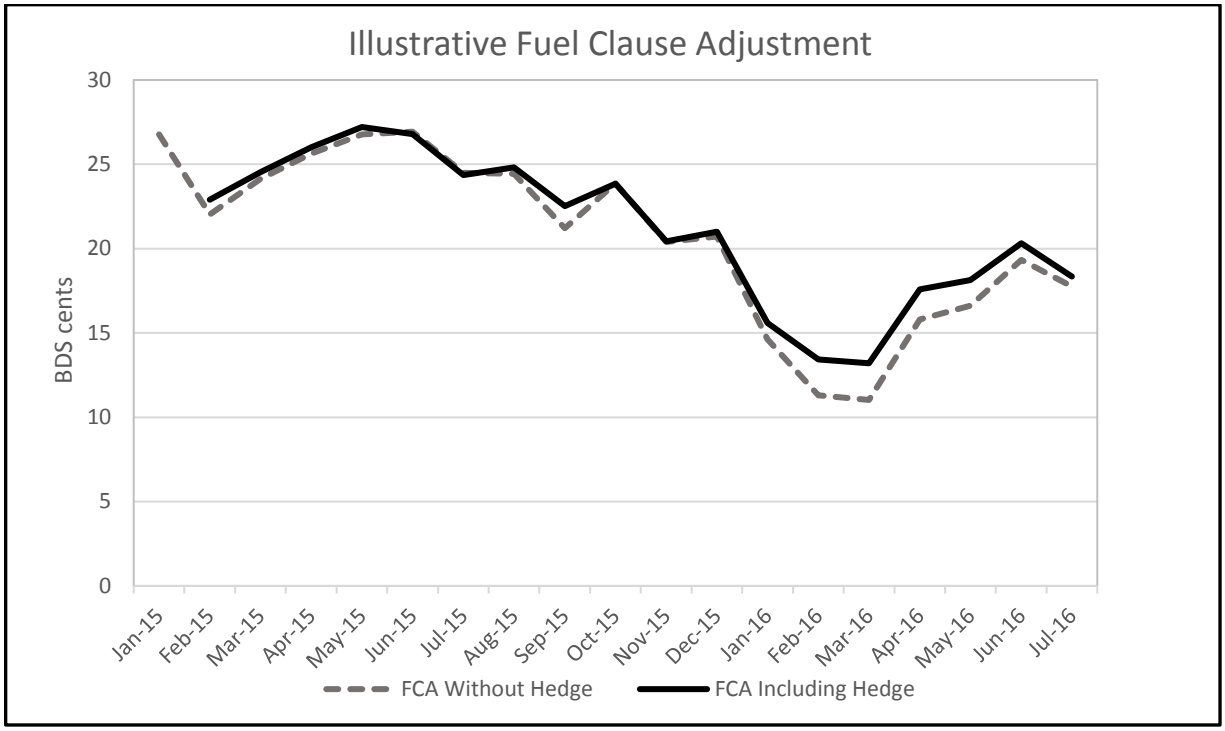
Table 1 - Simulated Hedge Results

Month	Historical Returns	NYH FO[6] No. 6 Spot Price (US$/bbl)	Spot Price Variability	Hedge Price (US$/bbl)	New Hedge Price (80% Hedge)	New Hedge Price Variability
Jan-15	0.79	42.97	21%	50	48.99	
Feb-15	1.10	47.29	10%	50	49.85	1.8%
Mar-15	1.00	47.29	0%	50	49.85	0.0%
Apr-15	0.99	46.79	1%	50	49.75	0.2%
May-15	1.11	51.83	11%	50	50.76	2.0%
Jun-15	1.00	51.79	0%	50	50.75	0.0%
Jul-15	0.91	47.12	9%	50	49.82	1.8%
Aug-15	0.82	38.56	18%	50	48.1	3.4%
Sep-15	0.93	35.78	7%	35	35.07	27.1%
Oct-15	0.98	35.11	2%	35	34.93	0.4%
Nov-15	0.94	33.05	6%	35	34.52	1.2%
Dec-15	0.80	26.59	20%	35	33.23	3.7%
Jan-16	0.79	20.96	21%	39	35.34	6.4%
Feb-16	1.01	21.17	1%	39	35.39	0.1%
Mar-16	1.11	23.44	11%	39	35.84	1.3%
Apr-16	1.10	25.87	10%	39	36.33	1.4%
May-16	1.18	30.41	18%	39	37.23	2.5%
Jun-16	1.13	34.38	13%	39	38.03	2.1%
Jul-16	1.00	34.37	0%	39	38.03	0.0%
Average		**36.57**	**9%**		**41.67**	**3.1%**
Volatility			**42%**			**22%**

68. Consideration, however, must also be given to the impact of the hedging gains and losses on the FCA. Figure 2 on page 22 shows the comparison of Barbados' realised FCA with and without the impact of the hedge, for the same January 2015 to July 2016 period. For 15 out of the 19 months tested, the FCA with the hedge was higher than the FCA without the hedge.

[6] NYH FO – New York Harbor Fuel Oil

Figure 2 - Simulated FCA - Hedged vs Unhedged



69. The biggest increase in the FCA would have been experienced in March 2016, an increase of 1.97%, or BDS 2.18 cents/kWh. Of note is that this increase would have occurred when the cost of fuel was at the lowest level in recent history, with a spot price of US $23.44 per barrel. This would have been a time of low electricity bills, with or without a hedge in place. Overall, reduced volatility in fuel price would have been achieved with a hedge loss of BDS$9.9 million for the period January 2015 to July 2016 and an FCA that would have been, on average, higher than if there was no hedge.

6.3 *Issues*

Consumer Risk Preferences

70. From the consumer's perspective, increasing price volatility presents the possibility that monthly utility bills would be very unpredictable. Through the FCA mechanism, price volatility is passed on to the ratepayer and moderated by the use of smoothing[7] by the BL&P. Standard economic theory suggests that the average household customer the world over is risk averse[8]. The BL&P contended that consumers prefer

[7] Smoothing dampens the price spikes and falls by spreading the cost over a period of time.
[8] Robin Bade and Michael Parkin, Foundations of Microeconomics, Addison Wesley, 2001.

lower volatility, a sentiment which has been reportedly expressed by a small segment (commercial customers) of Barbadian ratepayers[9]. Based on that extrapolation, the BL&P has suggested that the average residential customer (representative of the largest customer class) is willing to incur an expense for the purpose of avoiding highly volatile bills. This assumption, as it relates to the Barbadian customer, has however not been supported by empirical evidence.

The Commission's Comment

71. **The BL&P has not provided sufficient evidence to show that a significant number of its customer base is willing to pay the price for reduced volatility, which could result in higher electricity cost.**

Risk

72. An economically effective hedge programme should mitigate high cost exposures and constrain exposure to potential hedge losses. When a utility considers its risk mitigation strategies, the one that produces a cost mitigation tolerance with the smallest hedge loss exposure would be considered economically superior.

73. There are significant risks associated with the strategy of fuel hedging. These risks are reflected in the losses and gains which various companies have experienced. The utility and airline industries have used hedging with varying levels of success.

74. The Caribbean Utilities Company Ltd. of Grand Cayman has in place a Fuel Price Volatility Programme approved by the Electricity Regulatory Authority of the Cayman Islands. This programme allows the company to utilise hedging through the purchase of call options[10]. Its hedge programme resulted in gains of US$247,000 and US$208,000 in 2014 and 2015 respectively[11], during a period of moderate volatility followed by declining oil prices.

[9] Barbados Light & Power Company Limited, "*Affidavit of Adrian Carter*," August 19, 2016, 3.
[10] A call option is the right to buy an asset at an agreed price on or before a particular date.
[11] "Caribbean Utilities Company Ltd 2015 Annual Report," accessed August 27, 2016, https://www.cuc-cayman.com/annual-reports.

75. In comparison, in 2013, LUCELEC reported a gain of EC$5.5 million as a result of its fuel hedge programme; the following year however, the company experienced a loss of EC$39.8 million[12] on this programme. These gains and losses would have been passed on to the customer. Whilst large losses were experienced by the utility, it achieved the objective of reduced volatility in its fuel costs, with month to month volatility of 5%. The year 2013 also featured high volatility in oil prices.

76. In the United States, utility companies have also reportedly experienced some degree of losses related to their hedge programmes[13]. Table 2 illustrates the extent of such losses, with Florida Power & Light and Duke Energy Florida having accumulated losses of US$4BN and US$1.48BN, respectively, from 2002 to 2015.

Table 2: Hedge Gains/Losses - US Utility Companies

UTILITY	2002-2015 (LOSSES)
Florida Power & Light	($4BN)
Duke Energy Florida	($1.48BN)
Tampa Electric	($421 MM)
Gulf Power	($171MM)

77. The airline industry has also reportedly used fuel hedging extensively (for example American Airlines, Delta Airlines Inc. and United Continental Holdings Inc.) with some degree of success, but more recently with significant losses[14].

78. While oil prices were rising, hedging was a successful strategy for the airlines, allowing them to reduce their exposure to higher fuel costs. However, the speed of

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[12] LUCELEC, "St. Lucia Electricity Services Annual Report 2014," accessed August 24, 2016, https://www.lucelec.com/sites/default/files/annual reports/LUCELEC%20Interactive%202014%20Annual%20Report%202.pdf

[13]Robert Walton, "Dive Brief: *Florida utilities propose cuts to fuel hedging after $6B in losses*," accessed August 22, 2016, http://www.utilitydive.com/news/florida-utilities-propose-cuts-to-gas-hedging-after-6b-in-losses/418166/

[14] Susan Carey, "Airlines Pull Back on Hedging Fuel Costs: *Reappraisal of costly strategy comes after some carriers get burned by low oil prices*," accessed August 12, 2016, http://www.wsj.com/articles/airlines-pull-back-on-hedging-fuel-costs-1458514901

BN denotes Billion

MM denotes Million

the 58% fall in oil prices since mid-2014 caught the industry by surprise and resulted in substantial losses (Table 3).

Table 3 - Hedge Losses - US Airlines

AIRLINE	USA RANK BY TRAFFIC	2015 (LOSSES)	NOTE
American Airlines	1	N/A	Ceased Hedging in 2014
Delta Airlines Inc.	2	(US$2.3BN)	
United Continental Holdings Inc.	3	(US$960MM)	

79. American Airlines ceased hedging in 2014 and was able to enjoy cheaper fuel costs than its competitors. It should also be noted that Southwest Airlines has historically seen positive results from its hedging programme; the company saw a US$1.3 billion hedge gain in 2008. Over the next few years, however, the company routinely lost money on its hedges. While the company is expected to lose US$2 billion this year on its hedges, the company still believes that it saved US$2 billion off its fuel bill between 2001 and 2015[15].

80. Another requirement for the establishment of a hedge is the BL&P's posting of initial and maintenance margins related to the associated financial transactions with a counterparty. The size of the margins would depend on the volumes of the fuel hedged and the movement of futures prices once the hedge has been executed. In general, this raises the issue of counterparty risk, which is the failure of a counterparty to meet its financial obligations to the "hedging party".

81. These examples all highlight the significant risks associated with hedging.

The Commission's Comment

82. **While hedging has proved to be beneficial in reducing volatility, it also comes with significant risks. Additionally, despite this ability to reduce volatility, the**

[15] Ibid.

existence of a hedge programme could result in higher overall costs of electricity. This exposes the BL&P to potentially incurring accumulated losses which ultimately would be passed on to the customer in the form of higher bills.

Transparency

83. The selection of a strategy must also consider the implementation costs and management effort. Therefore, the minimisation of volatility must be weighed against the cost of implementing a programme. This is especially important, as these gains/losses and administrative costs are expected to be passed on to the customer.

84. The issue of administrative costs was one that was highlighted by several intervenors. There were concerns that the annual figure of BDS$600,000 was too high and that there was a lack of transparency in the BL&P's proposal to utilise Emera Energy Services, an affiliate company. The BL&P responded by providing confidential quotations from 3 other prospective hedge administrators. An examination of the information provided revealed that Emera Energy Services had provided a competitive quotation, based on the range of services offered. Additionally, Emera Energy Services demonstrated that it has the transactional experience.

The Commission's Comment

85. **The BL&P provided some evidence to support its choice of hedge administrator. However, it did not provide a clear governance structure that enabled the Commission to determine that there would be sufficient transparency and accountability in the operation of the hedge programme. In addition, the BL&P did not submit a hedging policy that allowed the Commission to assess its prudence in managing the programme.**

6.4 *TECHNICAL CONSIDERATIONS*

86. The Commission recognises that further to the variability of fossil fuel cost, the quantum of fuel that is required for electricity generation is also a concern. Optimising fuel consumption would be of benefit to all end users. This could be

achieved by improving the BL&P's overall plant efficiency. The Commission will therefore enhance its regulatory reporting requirements to facilitate improved monitoring of the BL&P's plant Supply Side Management[16] strategy.

Plant Efficiency

87. As seen in Equation 1 on page 6 herein, the inputs of the original FCA formula are fuel cost, energy generation, auxiliary consumption losses and system losses. The potential impact of these technical inputs on the determination of the FCA was also considered. Arising from this assessment were the following key technical issues:

- Auxiliary consumption losses;
- System losses;
- Fuel efficiency management;
- Thermal efficiency management; and
- Diversification of Fuel Mix.

Auxiliary Consumption Losses

88. Auxiliary equipment is essential to the electricity generation process. Ideally, plant electricity consumption should be kept to a minimum. However, given the dynamics of electricity production, monitoring, reporting and mitigation could be an effective strategy to ensure that auxiliary losses are minimised, such that the potential to reduce the FCA and the final electricity cost to consumers could be realised.

Systems Losses

89. System losses are an inherent feature in the generation, transmission and distribution of electricity. It arises from the variance of electricity purchased and sold, expressed as a percentage of purchases. Additionally, system losses comprise of technical and commercial aspects which result from line losses and non-revenue electricity. Its magnitude is a measure of system efficiency and revenue losses. Leveraging on technology upgrades in the transmission and distribution network could significantly

[16] Supply Side Management refers to activities taken to ensure that generation, transmission and distribution are efficiently executed.

improve metering and revenue collection. The longer the transmission line, the greater the line losses. Distributed renewable energy (RE) generation buffers this effect, as electricity is consumed very close to the source.

Fuel Efficiency Management

90. Improving the fuel efficiency of the plant also has merit due to the fact that more than 80% of the gross generation is produced from HFO, with the BL&P proposing to hedge up to 90%. This has direct implications for reducing the BL&P's fuel bill. Such a programme could reduce the amount of fuel required in electricity production, provided that the electricity generating equipment exhibit high efficiency levels.

Thermal Efficiency Management

91. Efficient electricity generation relies on the nexus between fuel efficiency and thermal plant efficiency. The latter refers to the useful energy output for a given amount of heat energy input. Hence, waste heat utilisation opportunities which may exist in the electricity process could also enhance the efficiency profile of power plants. Similarly, plant heat rates, which refers to the amount of heat input required to produce a unit of electrical energy, provides a good measure of energy efficiency; a low value heat rate is an indication of high-energy efficiency. The contrary suggests an unfavourable condition which, if untreated, would result in excessive fuel use and cost which is passed on to consumers. Hence, a comprehensive maintenance program could complement efficient electricity production.

Diversification of Fuel Mix

92. Over the past six years, Government and the BL&P, through the latter's Renewable Energy Rider (RER) programme, have sought to promote the diversification of fuel mix in electricity generation. The current RE penetration is approximately 22MW, which represents about 8% of the installed capacity. Although this RE footprint may seem small, it has already reduced the island's fuel bill and if expanded has the potential to reduce it further. RE may be considered a substantial hedge against fossil fuels given that it could reduce the amount of fossil fuel required for electricity production. Additionally, if valued on a "resource cost" basis it will be at a fixed and

stable rate thus increasingly reduce the volatility of the FCA as the share of RE increases.

93. The direct implications of an extended RE portfolio include:
    - Reduced overall line losses;
    - Fossil fuel generating plant load reduction;
    - Enhanced maintenance planning and scheduling;
    - Decreased fossil fuel plant downtime;
    - Increased reserve margin; and
    - Improved reliability of electricity.

The Commission's Comment

94. **FCA optimisation could be advantageous to both the customer and the power producer. Ongoing analysis of the electricity service components (Generation, Transmission and Distribution), when executed in tandem with the appropriate mitigation strategies, acts to minimise the cost of electricity to end consumers.**

SECTION 7 THE DETERMINATION

95. The risks associated with fuel hedging are grounded in the ability of the hedger to guarantee the achievement of the objectives that were established at the outset of the programme and the incidence of substantial financial loss. Both would present a burden to the consumers of Barbados, as the FCA is a "pass through" charge. Furthermore, these losses would be in addition to the upfront administrative costs which would also be borne by the consumer.

96. While research illustrates that the implementation of a hedging strategy could reduce the volatility of fuel prices, this potential reduction is often accompanied by a high risk of hedge losses. As shown herein, this has been the experience of some regional utility companies, as well as some of the larger players within the airline industry. In both industries, hedge losses have accumulated over a number of years. Furthermore, the use of hedging is not expected to materially reduce the cost of fuel overtime.

97. Also of concern to the Commission is the failure of the BL&P to include vital evidence to support its Application, specifically the omission of proof that the average Barbadian consumer would be willing to bear the costs associated with a reduction in volatility.

98. According to its Application, the intention of the BL&P was to reduce the volatility of fuel prices for the consumer by applying the results and costs of fuel hedging to the FCA. However, while there is sufficient historical data to demonstrate how this may be achieved, the BL&P did not provide sufficient evidence to show how it would accomplish this objective and reduce any negative impact on the consumer.

99. The Commission also considered that the Application raised the issue of efficiency optimisation. Research suggests that a robust, preventative maintenance programme, which accounts for planned, scheduled and forced outages, could control the cost consumers pay for electricity[17]. The Commission has found that

[17] George .J. Anders, "Probability Concepts in Electric Power Systems," John Wiley and Sons, Hoboken, 1990.

the BL&P has not addressed this option as a complement to a fuel hedging programme.

100. The Commission is conscious of the risks associated with fuel hedging and does not agree that the BL&P should be allowed to pass the cost of hedging and associated gains or losses onto the consumers of Barbados.

The Commission's Decision

The BL&P's Application to apply the results and costs of fuel hedging to the FCA is hereby denied for the reasons stated herein.

Dated this 28th day of December 2016

Original signed by
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Jefferson Cumberbatch
Chairman

Original signed by
……
Monique Taitt
Commissioner

Original signed by
……..
Dawood Pandor
Commissioner

Original signed by
…….
Philmore Alleyne
Commissioner