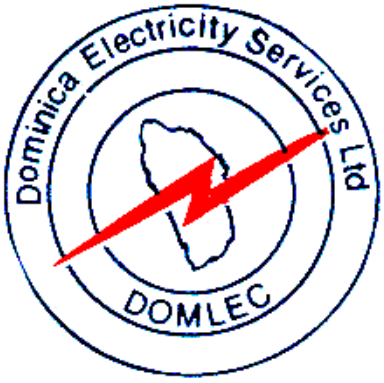


APPLICATION TO THE INDEPENDENT REGULATORY COMMISSION OF DOMINICA FOR APPROVAL OF WEIGHTED AVERAGE COST OF CAPITAL (WACC)

DOMINICA ELECTRICITY SERVICES LIMITED

November 28th 2014

APPLICATION TO THE
INDEPENDENT REGULATORY COMMISSION OF DOMINICA
FOR APPROVAL OF
WEIGHTED AVERAGE COST OF CAPITAL (WACC)

1. Dominica Electricity Services Company Limited ("DOMLEC" or "the Company") is an investor owned utility that at December 31, 2013 was serving 35,518 customers with sales of 89,339,000 kilowatthours and a peak demand of 16,789 kilowatts.

2. The Company is 48% locally owned by some 1561 shareholders, including the Dominica Social Security which owns approximately 21%. Light & Power Holdings Limited (LPH) of Barbados, through its ownership of Dominica Power Holdings Limited, is the majority investor. LPH, a subsidiary of Emera Inc. of Nova Scotia Canada is a public company listed on the Barbados Stock Exchange.

3. DOMLEC operates under the Electricity Supply Act 2006 and two separate 25 year licenses comprising a non-exclusive generation license and an exclusive license for transmission, distribution and supply. The licenses, issued by the Independent Regulatory Commission ("the IRC"), came into force on January 1, 2014.

4. The Transmission, Distribution & Supply Licence, Part VI: Price Controls and Tariffs, Condition 33: Initial Tariff Review states that:

   "DOMLEC shall, within 7 days of the Commencement Date, submit a timetable for the filing of an application to the Commission for a tariff review, and that the date for such a filing shall not exceed 9 months without the approval of the Commission. The application for a tariff review shall be in the format set out in the Commission's Decision Tariff Regime for Dominica Electricity Services Limited - Document Ref 2009/004/D and the tariff review shall be conducted in accordance with the process set out in that Decision."

5. The IRC in its letter dated June 3, 2014 advised the Company as follows:

    1. *That, pursuant to Condition 33 of the Licence, the date for DOMLEC to file for a tariff review is changed from October 1, 2014 to May 1, 2015.*
    2. *That in the meantime, as far as practicable, DOMLEC and the Commission continue to work on DOMLEC's:*
        - *Weighted Average Cost of Capital (WACC);*
        - *DOMLEC's Asset Base to be used in the Tariff Application; and,*
        - *DOMLEC's long and medium term investment plans.*

    These are all to be completed and submitted to public consultations prior to the filing.

6. The Company's management is currently preparing its application to the IRC for a Tariff Review and is mindful of its obligation to meet customer requirements for a safe and reliable electricity supply, the need to have adequate revenue to meet its expenses and finance new plant and equipment, to satisfy lenders of its ability to repay loans, and to maintain the confidence of investors by providing them with a fair and reasonable return.

7. At page 19 of the Commission's Decision Document - Tariff Regime for Dominica Electricity Services Limited - Document Ref 2009/004/D it is stated that DOMLEC, in making its tariff submission, is required to make detailed proposals along with supporting analysis to the Commission on its derivation of the WACC to be applied in its revenue requirements determination. It further states that "*the cost of capital is a weighted average of the cost of debt, preferred equity, and common equity, where the weights are the market-value percentages of debt, preferred equity, and common equity in a firm's capital structure. The overall cost of capital, which is called the firm's "weighted average cost of capital" (WACC), is specified by the following formula:*

$$WACC = wd * kd + wc * ks + wp * kp \quad (1)$$

where,

wd = the fraction of debt in capital structure,
wc = the fraction of equity in capital structure,
wp = the fraction of preferred stock in capital structure,
kd = cost of debt,
ks = cost of equity,
kp = cost of preferred stock."

8. DOMLEC is hereby applying for approval of the Weighted Average Cost of Capital (WACC) prior to the filing for a Tariff Review in compliance with the Commission's Decision Document - Tariff Regime for Dominica Electricity Services Limited - Document Ref 2009/004/D and the requirements of the Commission as set out in its letter of June 3, 2014. This application is accompanied by Schedule D –Rate of Return as required under the said decision document.

RETURN ON EQUITY

Principles of a Fair Rate of Return

9. The rate of return is an essential element in the process of rate regulation and is an important part of overall revenue requirement when applied to a company's rate base. Two US Supreme Court decisions are today accepted by regulatory authorities as having provided the main standards and principles to be used for rate of return determination.

10. The first decision is **Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia** 262 U.S. 679 (1923). In this decision the Court stated:

> *"What annual rate will constitute just compensation depends upon many circumstances and must be determined by exercise of fair and enlightened judgment, having regard to all relevant facts. A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public… The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties."*

In the second case, that of **Federal Power Commission v. Hope Natural Gas Company** 320 U.S. 591 (1942), the Court stated that:

"The return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks"

Both cases are accepted as having established the following general standards for a rate of return, namely, that (a) the return should be sufficient for maintaining financial integrity and capital attraction and (b) a public utility is entitled to a return equal to that of investments of comparable risks.

11. The foregoing accords with the Commission's Decision Document - Tariff Regime for Dominica Electricity Services Limited - Document Ref 2009/004/D which states:

> *"The estimation of return on equity is based on the principle that rational investors will not invest in a particular investment opportunity if the expected return is less than the return expected from alternative investments of comparable risk. Therefore, return on equity is calculated by measuring the expected returns on alternative investments of comparable risk."*

12. Returns that adhere to these principles and standards satisfy the fairness criterion that balances consumer and investor needs, and provide the means for the Company to fulfill its duties to the public. Utility regulation best practice recognizes that inadequate authorized return levels violate these criteria and essentially constitute the confiscation of the capital committed by investors.

Requested Rate of Return on Equity

13. The application for a Tariff Review which is due to be submitted to the Commission by May 1, 2015 will be made against the background of the accepted regulatory principle that investors should be allowed the opportunity to earn a Return on Equity comparable to what they could earn on other investments of similar risk.[1] While the cost rate for debt can be directly observed, the return on equity cannot be so easily discerned, and must therefore be estimated.

[1] Federal Power Commission v. Hope Natural Gas Company (320 U.S. 591, 1944)

14. As part of its preparation for the filing of the Application the Company retained the services of Mr. William A. Vinhage of the consultant firm Vinhage & Associates to undertake a study, the "Determination of Return on Equity (ROE) for Dominica Electricity Services Ltd." ("the Study"), to enable the Company to determine the Rate of Return on Equity for which it should seek the Commission's approval. The Study applies capital valuation methods as set forth by and defined within the longstanding principles of financial economics. A copy of the Study dated October 20, 2014 is included as Appendix A of this application. The Company is relying on the Study by Vinhage & Associates as the main piece of expert evidence to support this aspect of the Company's application.

15. While there are investment opportunities in Dominica, most of these are not exchange-traded financial assets. In addition, the Caribbean equity market is a developing market and, as evidenced by the Eastern Caribbean Stock Exchange (ECSE), is very thinly and intermittently traded. Generally speaking, the ECSE does not yet represent a sufficiently liquid market to readily reveal the underlying value of assets to investors and capital valuation methods cannot be readily applied to Dominica's equity market with a sufficient and full level of confidence to adequately gauge the underlying cost of equity.

16. The Study therefore draws upon the experience of North American capital markets and utilizes formal cost of capital models that are most useful when applied to capital markets that satisfy standards of transaction and information efficiency, and liquidity depth. The Study applies three well-recognized Cost of Capital methods (models), namely: (1) Comparable Earnings Approach, (2) Discounted Cash Flow (DCF), and (3) Capital Asset Pricing Model (CAPM). As stated in the Study, the estimates of rate of return on equity are determined using the more robust and liquid securities markets of the United States adjusted for required yields on risk free long term bonds as well as the risks inherent in operating a small company like DOMLEC on a small island with the characteristics similar to Dominica.

17. The application of the three methods results in a spread of returns for North American utilities. The Study further recommends that, given the small size of the Company in comparison to the North American utilities and the difference between investments in North America and Dominica, an adjustment should be made to reflect the factors that affect the cost of equity including issuance cost, size risk, and sovereignty risk. The Study concludes that, adjusting for these factors results in a Company-specific cost of equity in the range of 13.5% to 15.5%.

Requested Return on Common Equity

18. Based on the Study undertaken by Vinhage & Associates and review of the relevant data contained therein, the Company considers it reasonable to request that the Commission approve a return on common equity of 14.5%. This ROE level is considered reasonable for the capital committed by equity investors and is used in the computation of the WACC.

Preference Shares

19. The Company has not issued any preference shares and as such no cost is attributable to these in the calculation of the WACC.

COST OF DEBT

Company's Cost of Debt

20. The Company's application is based on a cost of 5.75% for the Company's outstanding long-term debt as reported in Note 10 of the company's 2013 audited financial statements which are included as Appendix B. This cost rate is derived from the projected interest on the Company's 13 month average long-term debt, which at December 31, 2014 is projected at EC$ 38,773,805. See Appendix C.

Shareholder Reinvestment & Debt Management

21. The Company maintains a manageable debt load that satisfies its lenders that the Company can meet its commitments. This allows the Company to obtain loans on attractive terms.

22. The debt load has been managed in part by retaining earnings in the business to provide the funds required for the new plant and equipment needed to satisfy customer requirements. In 2013, the Company paid a dividend of EC$2,083,466. This equates to a payout ratio of about 23.6% on Net Income of EC$8,842,367, leaving EC$6,758,901, equal to 76.4% of income, as retained earnings in the Company for reinvestment.

CAPITAL STRUCTURE

Sources of Funds

23. The Company's present sources of funds, used in the Cost-of-Capital computation include debt and shareholder equity.

24. Customer deposits, which are also a source of funds and are held to secure electricity accounts, can be treated in either of two ways – (1) inclusion in the Capital Structure at cost, or (2) subtracted from Rate Base.

    In its Decision Document - Tariff Regime for Dominica Electricity Services Ltd., (Ref: 2009/004/CD-01, page 17, Adjustments), the Commission determined that the latter approach be adopted. The cost of Customer Deposits and amounts thereof are therefore not included in the calculation of WACC.

Debt / Equity Ratio

25. The Debt / Equity (D/E) ratio of the Company has varied over the years, and at December 31, 2013 the Company's capital structure was made up of 35.4% debt and 64.6% equity.

26. The Company will continue to make investments in new plant. The Company has submitted DOMLEC's long and medium term investment plans to the IRC under separate cover.

Proposed Capital Structure for Ratemaking Purposes

27. The Company has used a capital structure of 33.1% debt and 66.9% equity in the calculation of the Weighted Average Cost of Capital. This is the Company's 13 month average capital structure projected as at December 31, 2014. See also Appendix C.

28. By way of comparison it should be noted that, the average level of debt for Caribbean utilities in 2012 was 38.2% Debt[2].

29. As part of this application, the Company is seeking the approval of the Commission for the proposed capital structure of 33.1% debt and 66.9% equity in the determination of the WACC.

[2] CARILEC Benchmark Study Report 2012

WEIGHTED AVERAGE COST OF CAPITAL - RETURN ON RATE BASE

Requested Weighted Average Cost of Capital (WACC)

30. The Company requests that the Commission adopt an overall Weighted Average Cost of Capital (Rate of Return on Rate Base) of 11.6% stated on a regulatory basis, including the weighted combination of the Company's cost rates for debt and a fair rate of return on equity.

31. The Company's request is based on: (1) a 33.1%/66.9% Debt to Equity capital structure, (2) a cost of debt of 5.75%, and (3) a return on equity of 14.5%.

32. The WACC is calculated as shown in **Table 1**.

Table 1

RATE OF RETURN ON RATE BASE /
WEIGHTED AVERAGE COST OF CAPITAL
13 months average projected for December 31, 2014

DOMINICA ELECTRICITY SERVICES LIMTED

WEIGHTED AVERAGE COST OF CAPITAL: CONVENTIONAL CAPITAL STRUCTURE, POLICY-BASED
(PROJECTED)

Capital Component	Implied Balance (EC$)	Capitalization Shares	Cost Rates	Weighted Cost Rates
Long Term Debt	$ 38,773,805	33.1%	5.75%	1.9%
Short Term Debt				
Common Equity	$ 78,354,957	66.9%	14.50%	9.7%
Preference Shares				
Total	$ 117,128,762	100%		11.6%

Caribbean Utility Comparisons

33. Few Caribbean utilities are subject to independent regulation and a wide sample of 'approved' rates of return is generally not available. The following references do provide some guidance in terms of the levels of return on rate base that have been authorised or recommended for the named Caribbean utilities:

a) The Government of the Cayman Islands, under Condition 25 of the license dated April 3, 2008[3] granted to the Caribbean Utility Company Limited, established a Rate Cap and Adjustment Mechanism in which the base range of Return on Rate Base Values was set at between 11% and 13%.

b) The Electricity Supply Act of St. Lucia as amended in 2006[4] sets the Allowable Rate of Return for St. Lucia Electricity Services Limited (LUCELEC) as *"an annual return on average contributed capital based upon a spread of two percentage points and seven percentage points above the cost of the most recent Government of Saint Lucia long term bonds issued on the Regional Government Securities Market (RGSM) of the Eastern Caribbean Central Bank, with the proviso that the minimum rate of return on average contributed capital so calculated shall be ten percentage points."*

c) The Office of Utilities Regulation (OUR) in Jamaica in its decision of 2009 determined that the Jamaica Public Service Company Limited (JPS) cost of equity was 16% and WACC of 11.6% with a capital structure that includes 48% debt[5].

[3] Main Agreement: Caribbean Utilities Company Ltd. and The Governor in Cabinet of the Cayman Islands, April 3, 2008

[4] Laws of St. Lucia, Electricity Supply Act Cap 9.02, Amended No. 12, 2006

[5] Jamaica Office of Utilities Regulation – Jamaica Public Service Company Limited Tariff Review for Period 2009-2014 – Determination Notice dated September 18, 2009

d) The Fair Trading Commission (FTC) in Barbados, in its decision of 2010, approved a WACC of 10% and a capital structure that included 35% debt for The Barbados Light & Power Company. This equated to a Return on Equity of 12.75%.[6]

Realized Return on Rate Base for 2012 and 2013

34. The Rate of Return on Rate Base realized by the Company under existing rates for 2012 was 10.2% and for 2013 was 10.6%. See Appendix D

CONCLUSION

35. The requested Return on Equity ("ROE") of 14.5% was guided by the Study undertaken by Vinhage & Associates. The Study evaluated the cost of capital for alternative equity investments with risks similar to those of the Company, and is based on the 2013 experience of major North American capital markets.

36. The Company's cost of debt is 5.75%.

37. The 13 months average capital structure is 33.1% debt and 66.9% equity.

38. The Company is requesting approval from the IRC that its Weighted Average Cost of Capital (WACC) be set at 11.6%, including the weighted combination of the Company's cost rates for debt and a fair rate of return on equity.

[6] Barbados Fair Trading Commission – Application by The Barbados Light & Power Company Limited for Review of Electricity Rates - Decision and Order dated January 25, 2010

39. If this request is granted, the Company will use the approved Rate of Return on Rate Base (Weighted Average Cost of Capital - WACC) as a component in its Tariff Review filing to calculate its revenue requirement for the 2014 Test Year. It is considered that this will provide the Company with the opportunity to earn the requested rate of return, which the Study has concluded is a fair and reasonable return on rate base.

Dated this 28th day of November, 2014

Bertilia McKenzie
General Manager
Dominica Electricity Services Limited

DETERMINATION OF

RETURN ON EQUITY (ROE) RANGE

FOR

DOMINICA ELECTRICITY SERVICES, LTD

Prepared by Vinhage & Associates

William A. Vinhage
October 20, 2014

Introduction

An important component of a traditional cost of Service tariff filing is the Return of Average Equity (ROE) that is applied to the equity portion of the capital structure. This real cost, in an economic sense, is the return needed to attract equity capital to finance the investments needed to operate and maintain existing assets as well as new investments needed to provide safe and reliable service. Unlike other costs, the cost of equity capital expected by investors cannot be directly measured or observed and must therefore be estimated.

This work paper provides a range of values using the following commonly accepted methodologies:

- Comparable Earnings Approach
- Discounted Cash Flow Analysis (DCF)
- Capital Asset Pricing Model (CAPM)

The estimates are determined using the more robust and liquid securities markets of the United States adjusted for the higher required yields on risk free long term bonds as well as the higher risks inherent in operating a small company like DOMLEC on a small island like Dominica.

Since the Caribbean area stock exchanges and capital markets are insufficiently liquid or large to apply the commonly accepted methods for estimated the applicable ROE discounted cash flow (DCF) and capital asset pricing model (CAPM), a proxy group of 15 companies actively traded on the United States stocks was chosen for the analysis. In addition, a comparable earnings approach is utilized which uses the actual authorized Return on Equity decisions by

regulatory bodies in the United States. Since the regulatory paradigm only produces decisions when a proceeding occurs rather than choosing the same sample cannot be utilized for this approach, alternatively the most recent decisions from US regulatory proceedings in 2012 and 2013 for electric companies were utilized as available.

RISK ADJUSTMENTS

The raw estimates from each the approaches, need to be adjusted to reflect increased borrowing costs of long-term government bonds in Dominica, commonly referred to as the sovereign risk adjustment, as well as the increased risk inherent in operating a much smaller less diversified utility on an island. Each of the ROE estimates were increased by 470 basis points (4.7%) to reflect a 330 basis point sovereign risk adjustment (derived below) as well as a 140 basis point adjustment to reflect the increased risk associated with DOMLEC being a very small island utility with limited opportunity for diversification of resources, customers, *et cetera* to mitigate a host of risks. The size adjustment was based on a review the work of Robert. M Canfield of Christensen Associates (p. 60) in the recent Barbados Light & Power rate proceeding where he estimated an applicable range for small company risk of 120 to 160 basis points. The midpoint of this range, i.e. 140 basis points was utilized for this analysis.

The table below presents a comparison of recent long-term (7-10 year) government bond rates and terms for island nations with currency managed by the Eastern Caribbean Central Bank comparing them to US Government bond rates for the same time periods. Ideally longer-term bonds (i.e. 30 year) would be used for the comparison, but there have been no bond issuances in recent history of greater than 10 years in the region. The last bond issued in

the 7-10 year range in the region was in 2010 by the government of St. Lucia. Additionally, the average US and Dominica inflation rates over the period are utilized to state the yields in real terms prior to taking the difference to derive the 330 basis point sovereign risk adjustment.

RECENT CARRIBEAN & US 7-10 YEAR BOND YIELDS

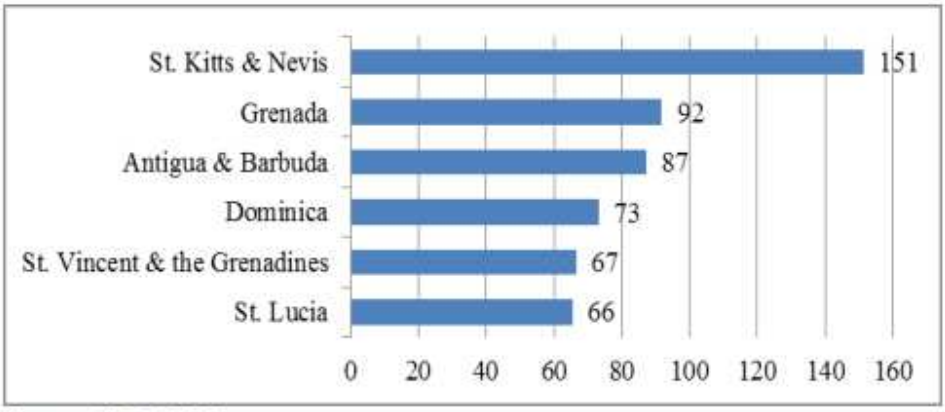
	2002	2003	2004	2005	2006	2007	2008	2009	2010
7-10 Year Bonds									
Antigua and Barbuda					8.00				
St. Lucia			7.00	6.50	7.05	7.54	7.50		7.50
St Vincent and the Grenadines			7.00		7.50	7.50		8.00	
St Kitts and Nevis	7.50								
Carribean Average	7.50		7.00	6.50	7.52	7.52	7.50	8.00	7.50
US Equivalent Yield	5.04		4.15	4.22	4.42	4.76	3.74	2.52	3.73
Overall Carribean Average	7.38								
US Average	4.07								

Average Inflation Rates 2002-2010	
Dominica	2.34
United States	2.33

Inflation Adjusted Yields	
Dominica	5.04
United States	1.74
Est. Risk Adj.	3.30

Ideally, long-term borrowing rates from Dominica would be utilized, but there have not been any long-term bonds issued in recent history. While Dominica has not had any long-term bond issuances, the similarity of the economies, the use of a common currency and the amount of public debt as a percentage of Gross Domestic Product of Dominica compared to other nations in the suggests that the debt costs of this group are a reasonable proxy to use for this study. The percent of public debt related to Gross Domestic Product for 2010 are documented in the graph below.

EASTERN CARIBBEAN CURRENCY UNION COUNTRIES PUBLIC DEBT-TO-GROSS DOMESTIC PRODUCT, END-2010 (%)



Source: CDB; ECCB;

US UTILITY PROXY GROUP

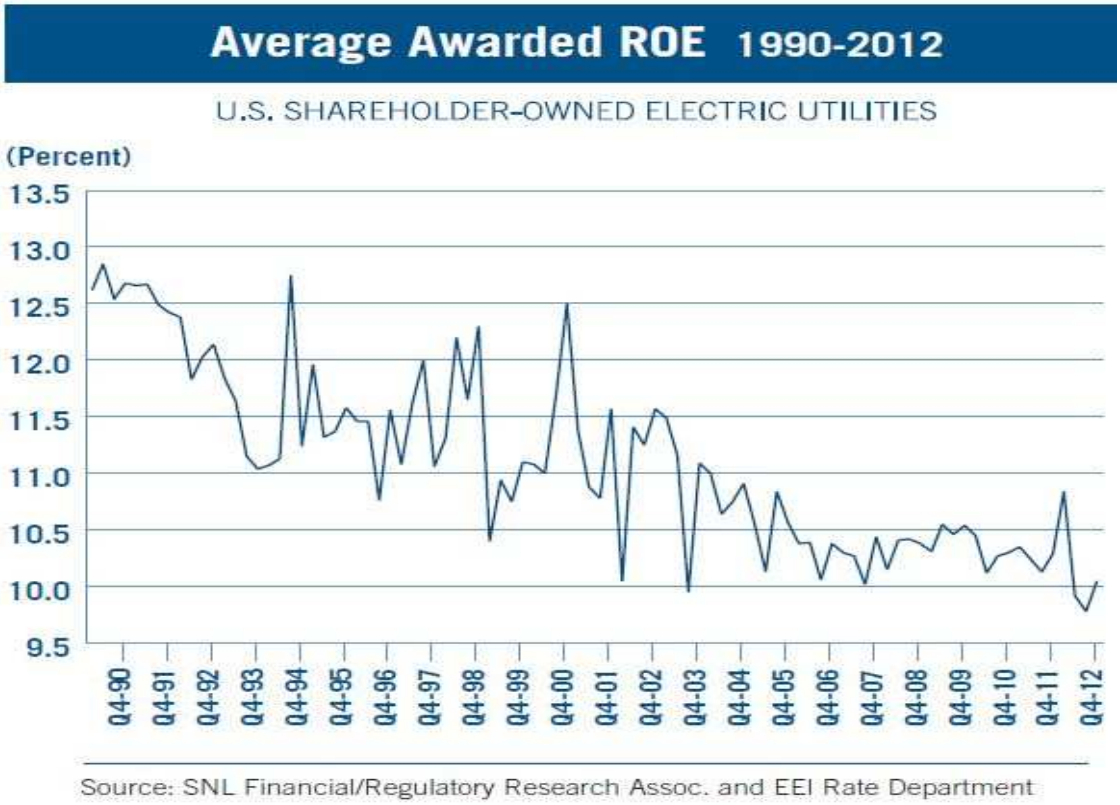
The sample of U.S. Utilities was chosen with the parameters of size and vertical integration in mind. The size of electric utility companies in the US is massive in comparison to DOMLEC; the companies chosen for inclusion were selected to have a market capitalization of less than $8 Billion US which is very small by US standards. In addition the sample was chosen to reflect utilities that are somewhat vertically integrated. With the liberalization of electricity supply in recent years in the US there are unlikely to be any purely vertically integrated utilities, but this sample does reflect companies that still have a significant portion of their supply vertically integrated in the regulated business. The fifteen selected companies are presented in the table below.

#	Name	Symbol
1	Hawaiian Electric...	HE
2	Avista Corp	AVA
3	UIL Holdings Corporation	UIL
4	Westar Energy Inc	WR
5	Otter Tail Corporation	OTTR
6	Pinnacle West Capital...	PNW
7	ALLETE Inc	ALE
8	Great Plains Energy Inc.	GXP
9	Portland General	POR
10	Cleco Corporation	CNL
11	PNM Resources Inc	PNM
12	OGE Energy Corp.	OGE
13	TECO Energy, Inc.	TE
14	Pepco Holdings, Inc.	POM
15	SCANA Corporation	SCG

Comparable Earnings Approach

The comparable earnings method uses actual outcomes from recent regulatory decisions as well as the financial 2013 financial average return on equity as derived from company financial statements for the 15 companies in the sample. With the recent regulatory changes in the US, the formal rate case is not used as frequently as it has been in the past, with the regulatory convention more and more being that of a negotiated settlement between the utility, the regulatory body and interveners representing various customer groups. There are, however, traditional rate cases being heard, just not with the same regularity and frequency.

The trend in awarded ROE decisions in the United States in recent year has been downward. The due to a number of factors including 1) declines in risk-free borrowing rates and decreasing BETA values used in the CAPM and 2) decreasing dividend yields and expected growth rates in Earnings Per Share have muted estimates using the DCF method in recent rate cases. According to the EEI Financial Report and SNL tracking of recent rate decisions the approximate range of recently awarded ROE in recent regulatory commission decisions in the US has been 9.75% to 10.25%. The graph below demonstrates the decreasing trend in awarded ROE decisions by US regulatory bodies.



A survey of the most recent regulatory decisions for electric utilities at the state level (federal cases only regulate transmission rates) finds 6 traditional rate case decisions for 2012-2013 with a very tight grouping of authorized return on equity estimates. As illustrated in the table below, these decisions have ranged from a low of 9.4% to a high of 10.5% with an average of 10.1%. This average is consistent with the average for US Electric companies of 10.1% for 2012, 10.0% for 2013 and 10.2% for 2014 as reported by Concentric Energy Advisors in their recent newsletter, "Authorized Return on Equity for Canadian and U.S. Gas and Electric Utilities", Vol II, May 8, 2014.

Applying the risk adjustment factors derived earlier of 470 basis points this would indicate an applicable return on equity range (±1 standard deviation) for DOMLEC of 14.4% to 15.3% surrounding an average of 14.8%.

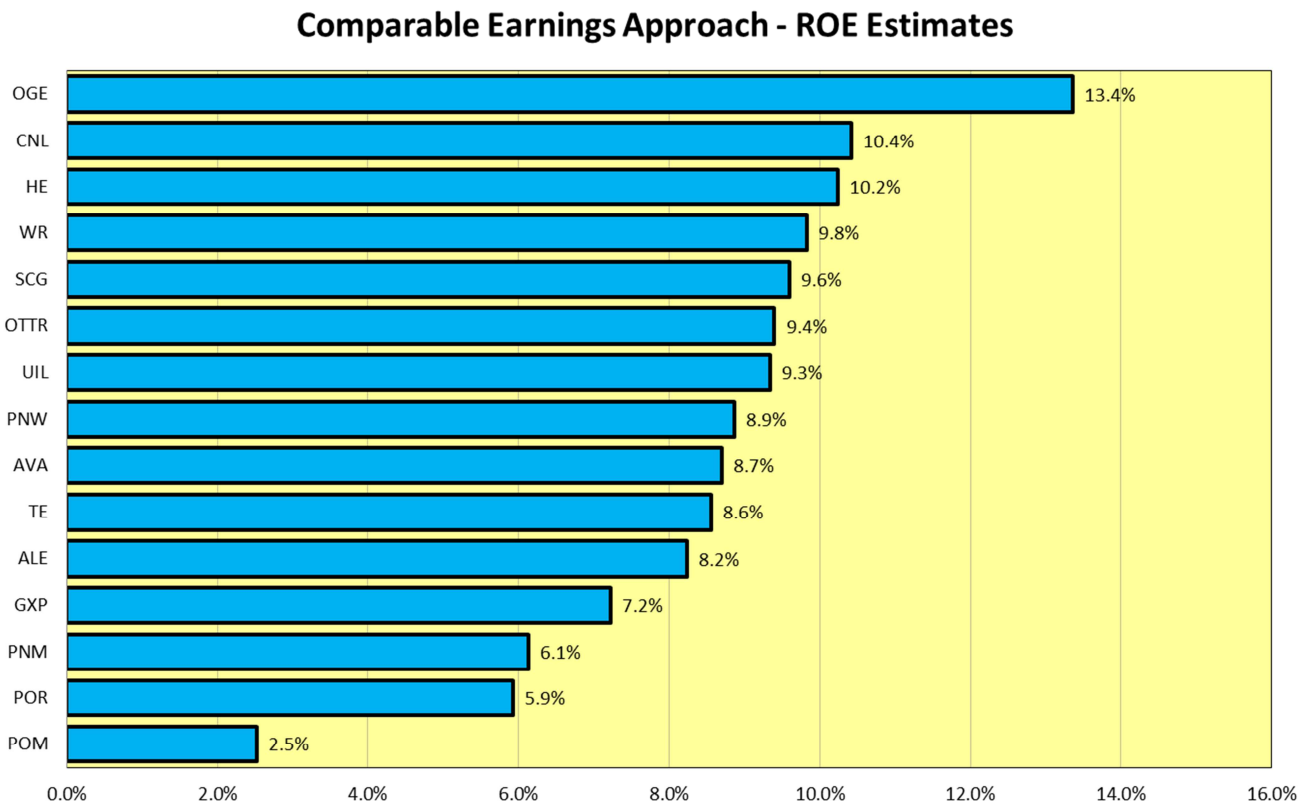
US Electric Utility Authorized Return on Equity

Recent Regulatory Decisions

Company	Jurisdiction	Authorized ROE	Year	Reference
San Diego Gas & Electric	CA	10.3%	Dec-12	CPUC, Dec 26, 2012 Deision 12-12-034, p. 40
Southern California Edison	CA	10.5%	Dec-12	CPUC, Dec 26, 2012 Deision 12-12-034, p. 39
PEPCO	DC	10.0%	Sep-12	DCPSC, Sep 27, 2012, Order No. 16930, Formal Case 1087, p. 61
Florida Power & Light	FL	10.5%	Jan-13	FLPSC, Jan 14, 2013, Order No. PSC-13-0023-S-EI, Docket 120015EI, p.5.
Duke Energy	NC	10.2%	Sep-13	NCUC, Sep 24, 2013, Docket No E-7, Sub. 9311, p.105
PEPCO	MD	9.4%	Jul-13	MDPSC, Jul 12, 2013, Order No. 85724, Case No. 9311, p. 105.
	Average	10.1%		
	+ 1 Std. Dev.	10.6%		
	- 1 Std. Dev.	9.7%		

When using the comparable earning approach, the use of the return on equity as reported on the financial statements is another possible measure to consider when reviewing the data, but it has serious drawbacks. Specifically, the return on equity derived from

accounting data does not reflect the outcome of a regulatory proceeding and thus will not reflect cost adjustments resulting from the regulatory process, will have regulatory lag built into the result, will have the effects extraordinary events and will also include financial results from non-regulated and discontinued operations. In addition, the equity figure used in the calculations are not based on market valuations from investor expectations but accounting based figures based on initial capital issuances and retained earnings. Thus the accounting results are not based on investor valuations will most likely have a high degree of variability as well as a number of biases in them and should only be used as a comparison point. The actual regulatory ROE should be based on comparable earnings based on actual regulatory proceedings and the more traditional DCF and CAPM estimation methods. The risk adjusted 2013 accounting return on average equity results for the proxy group yields an average of 13.3% with a range of 10.9% to 15.6% (± 1 standard deviation). The non-risk adjusted results for the group are presented in the graph below.



Discounted Cash Flow (DCF)

The Discounted Cash Flow (DCF) method estimates the ROE expected by investors based on market outcomes as reflected in the relationship between market prices of stock in relation to actual dividends. The ROE is derived under the theoretical construct that the current stock price is equal to the present value of its future cash flows to owners.

$$P = \sum_{n=0}^{\infty} \frac{D^n}{(1+k)^n}$$

Where P is the stock price, n is the year where n=0 is the current year, D^n is the expected dividend in period n and k is the expected Return on Equity (or discount factor used by investors in their valuation decisions). Application of the model only works in a highly liquid stock market where stock prices are highly variable and the result of market trades of many investors, for this reason the US proxy group of utilities is needed to make the estimate.

Generally the application of this model in regulatory proceedings involves assuming that the growth rate in Dividends in future years is constant, By making this assumption, the ROE can be solved for and is stated with the following equation.

$$k = \frac{D^0}{P^0}(1 + g) + g$$

Where g is an assumed constant growth rate

In order to smooth out any short term market volatility the following assumptions were made in applying the model.

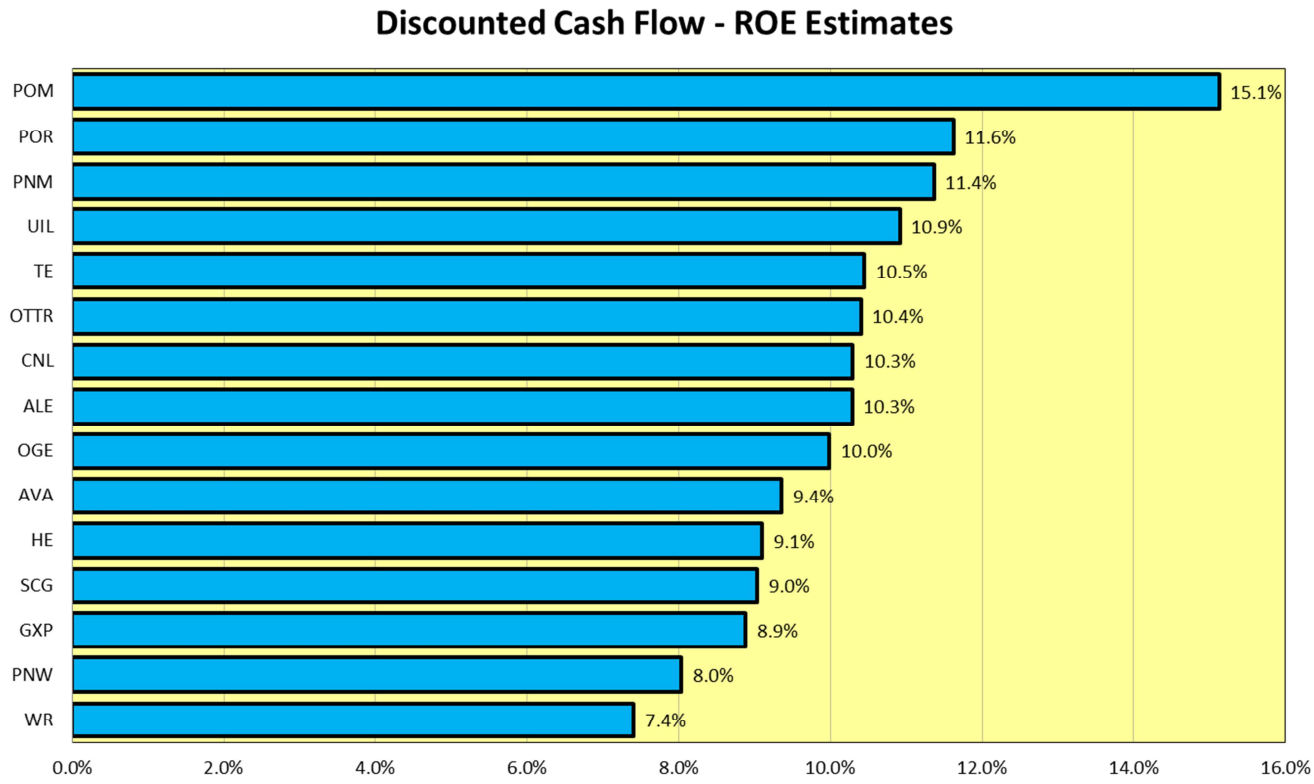
P^0 = average of the 52 week high and low closing stock price as of October 15, 2014

D^0 = current annual dividend amount as of October 15, 2014.

g = the 5 year growth rates in Earnings Per Share (EPS) as forecasted by the investment analysts covering the stock as reported in Yahoo! Finance as of October 15, 2014

Applying these assumptions to the sample of 15 utilities selected results in non-risk adjusted ROEs ranging from 7.4% to 15.1% with an average of 10.1%. The average dividend yield percentage was 4.0% and the average expected growth in EPS was 5.9%. The standard

deviation in the resulting ROE estimates was ±1.8%. The results are summarized in the graph below.



Adjusting the results upward by 470 basis points to reflect the increased cost of government borrowing in the region and the risk differential for operating a smaller less - diversified island utility produces a range (± 1 Standard Deviation) of 13.1% to 16.6% surrounding an overall average to 14.8%.

Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model (CAPM) estimates the ROE using the following equation

$$k = R + \beta P$$

Where:

R = the risk free rate of return (generally the yield on long-term government bonds)

β = the coviarace of a stocks price in relation to the overall stock market (β < 1 indicates the stock is less volatile (i.e.less risky) than the overall stock market, whereas β > 1 indicates the stock in question is more volatile (i.e. more risky) than the overall stock market

P = the average risk premium of investors required to take on the additional risk to own a stock

As with the DCF approach the CAPM approach requires a highly functioning and liquid stock market in order to get the appropriate values. For this reason, the sample of fifteen utility companies was utilized with the following assumptions.

R = 3.55% which is the average value of the monthly yields on 30 Year US Treasury Bonds from Oct 2013 to Sep 2014 as reported by the Federal Reserve Bank(see the table below)

P = 8.0% which is in line with values used in recent regulatory proceedings in the US. This in tandem with the assumed R of 3.55% implies that in the overall average US stock market investors expect to earn an ROE of 11.55%

B = the March 2014 value as reported by Bloomberg for each of the 15 companies in the selected sample.

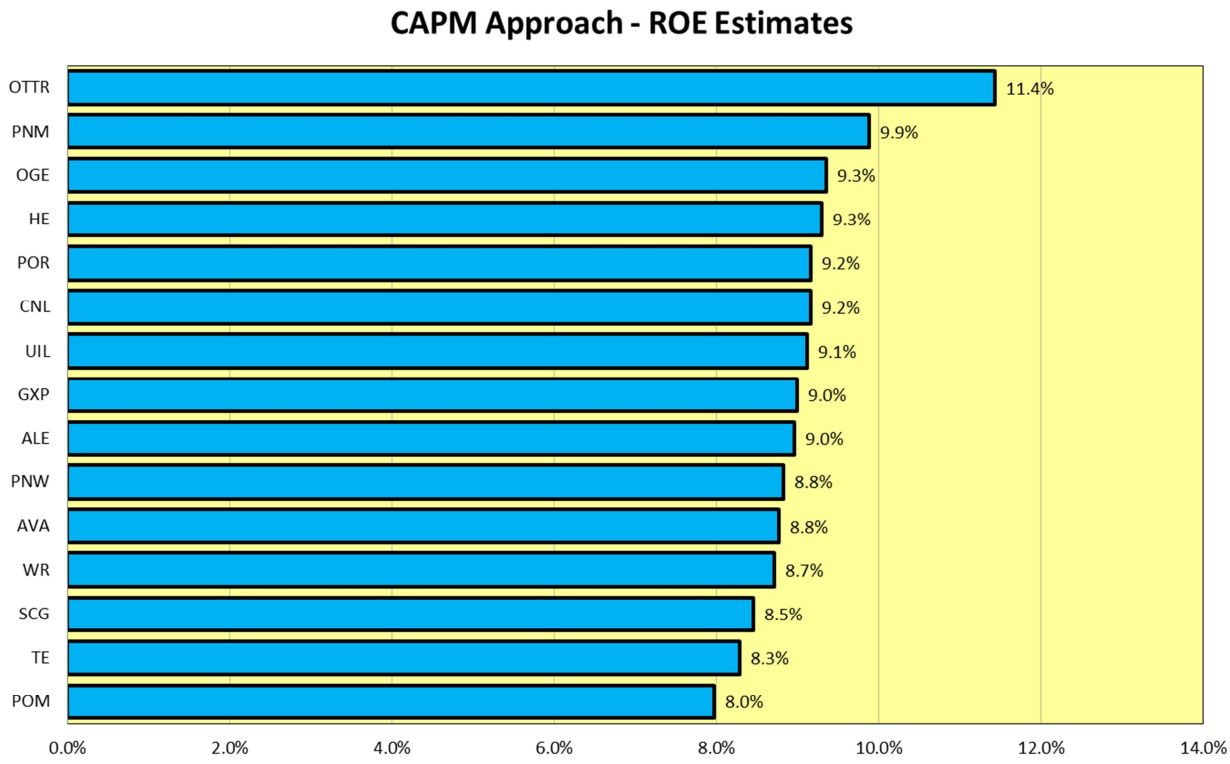
30 Year US Treasury Bonds
Monthly Oct 2013 - Sep 2014

Month	Yield
2013-10	3.68%
2013-11	3.80%
2013-12	3.89%
2014-01	3.77%
2014-02	3.66%
2014-03	3.62%
2014-04	3.52%
2014-05	3.39%
2014-06	3.42%
2014-07	3.33%
2014-08	3.20%
2014-09	3.26%
Average	**3.55%**

Source: US Federal Reserve Bank

http://www.federalreserve.gov/releases/h15/data.htm

Applying these assumptions to the sample of 15 utilities selected results in non-risk adjusted ROEs ranging from 8.0% to 11.4% with an average of 9.1%. The average β was 0.69. The standard deviation in the resulting ROE estimates was ±0.8%. The non-risk adjusted results are summarized in the graph below.



Adjusting the results upward by 470 basis points to reflect the increased cost of government borrowing in the region and the risk differential for operating a small less diversified island utility increases the overall average to 13.8% with a range (±1 Standard Deviation) of 13.0% to 14.6%.

Summary & Recommendation

The following table summarizes the estimates of ROE using the methods discussed above. In addition, the average and range defined by ± 1 standard deviation is presented for the risk adjusted comparable earnings, discounted cash flow and capital asset pricing model approaches. The selection of the applicable ROE involves a great deal of judgment, the ranges below represent a set of reasonable esti0mate ranges from which to select. The accounting

based ROE ranges were not included in the table as are the least applicable and subject to numerous data anomalies and biases and this should be discounted as secondary to the rate case outcome, discounted cash flow and capital asset pricing model ranges.

Risk Adjusted Estimates By Method	Average	Range (± 1 Std Dev.)
Comp Earnings - Rate Cases (Adj)	14.8%	(14.4% - 15.3%)
DCF (Adj.)	14.8%	(13.1% - 16.6%)
CAPM (Adj.)	13.8%	(13.% - 14.6%)
Average	**14.5%**	**(13.5% - 15.5%)**

APPENDIX

Raw Data Used in Calculations

			Stock Data as of 10/15/2014				Bloomberg	Accounting Data $ Millions		
#	Name	Symbol	52 Week High	52 Week Low	Annual Dividend	Consensus 5 Yr Gr %	Beta Mar 2014	2012 YE Equity	2013 YE Equity	2013 Net Income
1	Hawaiian Electric...	HE	$ 27.92	$ 22.71	$ 1.24	4.00%	0.72	$ 1,511.7	$ 1,644.9	$ 161.5
2	Avista Corp	AVA	$ 34.85	$ 26.46	$ 1.27	5.00%	0.65	$ 1,259.5	$ 1,298.3	$ 111.1
3	UIL Holdings Corporation	UIL	$ 40.68	$ 34.34	$ 1.73	6.03%	0.70	$ 1,116.6	$ 1,353.8	$ 115.3
4	Westar Energy Inc	WR	$ 38.24	$ 30.50	$ 1.40	3.20%	0.65	$ 2,896.1	$ 3,062.8	$ 292.5
5	Otter Tail Corporation	OTTR	$ 31.72	$ 26.53	$ 1.21	6.00%	0.99	$ 537.5	$ 534.8	$ 50.4
6	Pinnacle West Capital...	PNW	$ 58.75	$ 51.15	$ 2.27	3.75%	0.66	$ 3,972.8	$ 5,194.5	$ 406.1
7	ALLETE Inc	ALE	$ 52.73	$ 44.19	$ 1.96	6.00%	0.68	$ 1,201.0	$ 1,342.9	$ 104.7
8	Great Plains Energy Inc.	GXP	$ 27.52	$ 22.35	$ 0.92	5.00%	0.68	$ 3,513.4	$ 3,379.0	$ 248.6
9	Portland General	POR	$ 34.99	$ 28.17	$ 1.12	7.80%	0.70	$ 1,728.0	$ 1,819.0	$ 105.0
10	Cleco Corporation	CNL	$ 59.21	$ 44.70	$ 1.60	7.00%	0.70	$ 1,499.2	$ 1,586.2	$ 160.7
11	PNM Resources Inc	PNM	$ 29.94	$ 22.65	$ 0.74	8.32%	0.79	$ 1,608.2	$ 1,673.6	$ 100.5
12	OGE Energy Corp.	OGE	$ 40.00	$ 32.85	$ 1.00	7.05%	0.73	$ 2,767.2	$ 3,037.1	$ 387.6
13	TECO Energy, Inc.	TE	$ 18.65	$ 16.12	$ 0.88	5.13%	0.59	$ 2,333.7	$ 2,291.8	$ 197.7
14	Pepco Holdings, Inc.	POM	$ 27.92	$ 18.43	$ 1.08	10.00%	0.55	$ 4,315.0	$ 4,414.0	$ 110.0
15	SCANA Corporation	SCG	$ 53.89	$ 45.24	$ 2.10	4.60%	0.61	$ 5,154.0	$ 4,664.0	$ 471.0

REFERENCES

Robert J. Camfield, STUDY OF THE COST OF CAPITAL and RATE OF RETURN RECOMMENDATION offered for the consideration of THE BARBADOS LIGHT & POWER COMPANY LIMITED, May 2008. (Exhibit RC-2 in the 2009 BLP Rate Filing)

Concentric Energy Advisors, "Authorized Return on Equity for Canadian and U.S. Gas and Electric Utilities", Vol II, May 8, 2014.

REFERENCES

Exhibit RC-2

REPORT

STUDY OF THE COST OF CAPITAL
and
RATE OF RETURN RECOMMENDATION

offered for the consideration of:

THE BARBADOS LIGHT & POWER COMPANY LIMITED

prepared by:

Robert J. Camfield

with the assistance of:

Bruce R. Chapman

Michael T. O'Sheasy

Christensen Associates Energy Consulting, LLC

Economic Consulting and Strategy

May 20, 2008

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ECONOMIC CONSULTING AND STRATEGY

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EXECUTIVE SUMMARY

This report ("Report" or "Study") presents our analysis of the *Cost of Capital* for The Barbados Light & Power Company Limited ("BLPC," "Company," or "Barbados Light and Power") and provides recommendations regarding the *Rate of Return* and *Return on Equity*. The report is intended to assist BLPC in its rate review submission to the Fair Trading Commission focused on the required revenue level and retail electricity prices of BLPC.

The report reviews cost of capital principles and theory, discusses the workings of capital markets, and presents the empirical results of cost of capital study. The report concludes with a summary of the study findings, including the rate of return recommendation.

The *Cost of Capital* of BLPC includes the rate of interest on the Company's outstanding long-term debt, and the cost rate of common equity contributed by investors. Together, the debt interest rate and equity return rate yield the overall *Weighted Average Cost of Capital* ("WACC"), stated on a traditional capital structure basis. When the long-term debt and common equity balances are combined with other contributed capital including *Customer Deposits, Accumulated Deferred Income Taxes, Deferred Investment Tax Credits* and the *Manufacturers' Allowance*, the WACC reflects a regulatory capital structure, and can be referred to as the overall *Rate of Return* ("ROR"). Cost of capital and rate of return are an essential part of

regulatory governance. Because a utility's rate base often constitutes a large cumulative investment amount, comparatively small changes or adjustments to the allowed rate of return can translate into a significant change in operating income and revenue level.

The analyses and recommendations of the Cost of Capital study are a result of applying well-recognized principles and methods. In particular, the cost of capital approach used herein adheres closely to Fair Rate of Return Principles and takes account of the business context and capital needs of BLPC in order to continue to serve Barbados with reliable power supply. The application of these principles results in *just and reasonable* electricity prices, where the interests of retail consumers and investors who commit capital for the convenience and necessity of the public are appropriately balanced. The main features of Fair Rate of Return principles include:

1. Returns Equivalent to those Realized On Investments of Comparative Risk: As codified in U.S. Supreme Court decisions, capital commitment by investors for the convenience and necessity of the public is entitled to returns equivalent to those realized on investments of comparable risks.
2. Maintenance of Financial Integrity: The process of regulatory governance, as a practical matter, must result in a flow of revenue sufficient to cover all prudently incurred costs associated with providing utility services and an adequate return on the capital committed by investors. In turn, adequate return on capital preserves and maintains the financial integrity of the Company.
3. Ability to Raise Capital On Fair Terms When Needed: The utility and its investors are entitled to adequate returns on capital so that the utility can raise capital as necessary to provide utility services, on fair and equitable terms and conditions—*i.e.*, an acceptable interest rate level.

The application of Fair Rate of Return principles is amply underscored and provided for in the immediate study and its application. To this end, it is useful to highlight key findings, as incorporated within the overall Rate of Return recommendations, as follows:

- Capital Structure: Adopt a regulatory capital structure that includes 35% debt and 65% equity participation in total capital, *when stated on a traditional basis*. This policy-based capital structure constitutes a significant departure from the Company's observed capital structure for 2007, with equity participation of 78.6%.
- Regulatory Capital Structure: Develop a regulatory capital structure that includes traditional and non-traditional contributed capital. The regulatory capital structure includes balances covering *customer deposits*, and *deferred manufacturers' allowance*.

- Debt Cost Rates: Recognize the long- and (when relevant) short-term debt cost rates that cover the outstanding debt of BLPC.[1] For determining the weighted average cost of capital, interest costs reflect the observed interest rates in the case of a historical test year or expected interest rates in the case of a projected test year.
- Preserve Income Tax Incentives: It is important that regulatory policy adhere to and preserve the investment incentives, including the intended strength of incentives, of the taxing authority. This feature is manifested in the cost rate applied to the balances of manufacturers' allowance included within the regulatory capital structure, where the applicable cost rate is set equal to the WACC of 10.61%, for the traditional capital structure including a policy-based debt/equity ratio of 0.54 (debt level = 35%, equity participation = 65%).
- Return on Equity: Utilize a full complement of cost of capital methods to determine the cost of equity capital for BLPC. Draw upon the experience of capital markets in the U.S., Canada and, if necessary, elsewhere to estimate the cost of capital; and recognize or further investigate the effects of size on the equity cost of capital. The allowed Return on Equity should incorporate sovereignty risk differences between Barbados and established nations with highly developed capital markets.

Overall Rate of Return and Capital Structure

Shown below is the overall target Rate of Return Recommendation for BLPC, for the year 2006.

[1] Because retail prices are set for future timeframes, it may be appropriate to utilize estimated interest rates in the future, as the basis for determining interest rates for debt, particularly for short-term debt. Depending on timeframe and circumstances, the expected value of future interest rates can depart significantly from historical rates. However, the observed interest rates of the Company's debt appear to be a close approximation to future interest costs of outstanding debt over the foreseeable future. Estimates of future interest rates can be obtained by deriving future spot rates from observed forward rates.

RATE OF RETURN RECOMMENDATION:
WEIGHTED AVERAGE COST OF CAPITAL FOR
REGULATORY CAPITAL STRUCTURE, 2007

Capital Component	Balances ($ 000)	Capitalization Shares	Cost Rates	Weighted Cost Rate
Long Term Debt	$188,374	31.32%	5.25%	1.65%
Short-Term Debt	$0	0.00%	0.00%	0.00%
Common Equity	$349,837	58.17%	13.50%	7.85%
Customer Deposits	$20,010	3.33%	6.46%	0.22%
Deferred Investment Tax Credits	$30,099	5.00%	10.61%	0.53%
Deferred Manufacturers' Allowance	$13,052	2.17%	10.61%	0.23%
Total	$601,371	100.00%		10.48%

As can be observed, the regulatory capital structure includes 31.3% debt, 58.2% equity, and non-traditional components totaling 10.5%, including customer deposits, accumulated investment tax credits and manufacturers' allowance. Customer deposits represent 3.3% of contributed capital, with a cost rate of 6.46%, which is the effective rate of interest paid by BLPC to retail deposits retained by the Company. Accumulated investment tax credits make up 5.0%, while balances of deferred manufacturers' allowance occupy 2.2% of the regulatory capital structure. Both carry a cost rate of 10.61% which, as mentioned above, is set at the overall weighted average cost of capital based on a capital structure stated on a policy basis and includes equity participation of 65%.

Long-Term Debt Cost Rate

The Fair Trading Commission should utilize the observed cost rate for the Company's outstanding balance of long-term debt of 5.25%. This cost rate is derived from the actual interest carrying charges on the Company long-term debt, which carried an average balance of $115 million BBD during 2007.

Short-Term Debt Cost Rate

Within the 2006 timeframe, BLPC carried no short-term debt balances. However, as a matter of policy, the cost rate for short-term debt should be set at the prevailing or expected interest rate(s) associated with the Company's balances of short-term debt, which may consist of credit balances owed to equipment vendors, commercial paper,

promissory bank loans, or lines of credit where often the effective interest rate is linked to the well known London InterBank Offer Rates ("LIBOR").

Return on Equity

We recommend a rate of return on equity for BLPC of 13.50%. This result comes about from the application of four methods to estimate the cost of capital for samples of U.S. and Canadian utilities and a sample of low-risk comparatively small-sized U.S. non-utility companies. The results of these four methods are supplemented by consideration of the earnings premium that BLPC may likely require in order to fully satisfy the capital costs on investments of comparable risks. Specifically, the comparatively small size of the Company, as well as its role as the primary supplier of generation and power delivery services to the increasing electricity demand of an island economy, induce providers of funds to require an earnings premium relative to larger firms in continental markets.

We recommend that BLPC ask the Fair Trading Commission, in its deliberation of cost of capital issues, to endorse the broad-based approach to cost of equity estimation applied in this study. Specifically, cost of capital cannot be readily estimated precisely, such that it is best, as a matter of policy, to draw upon several well-recognized cost of capital methods, together referred to as the *Cost of Capital Toolbox*. This approach can cover a range of cost of capital methods including the *Capital Asset Pricing Model, Discounted Cash Flow*, and *Risk Premium Analysis.*[2] The *Cost of Capital Toolbox* also includes *Comparable Earnings*, based upon historical realized returns of comparable-risk companies, where such returns serve as a basis of future earnings performance.

The table below summarizes the estimated cost of common equity for each of the four identified methods, as applied to three U.S. samples of comparable risk utilities and non-utility companies or "peer groups," and to two samples of Canadian utilities listed on the Toronto Stock Exchange ("TSX"). These samples[3] provide a broad base of financial and equity market experience of utilities and comparable low-risk non-utilities that operate on the North American continent. The risk levels of the sample

[2] Other approaches are available including Factor Models and *Arbitrage Pricing Theory* ("APT"), and well-known assessment techniques such as the Sharpe Ratio.

[3] Samples such as these underlie return on equity estimates incorporated into our studies for other clients.

companies are roughly comparable to those of BLPC, although Barbados Light and Power is confronted with unique business circumstances and is also comparatively small with reference to the companies that comprise the five samples.

MARKET-BASED ESTIMATES OF THE COST OF COMMON EQUITY FOR COMPARABLE RISK COMPANIES

SAMPLES:	CANADA		UNITED STATES		
METHODOLOGY	1	2	Mid-Sized Electric Utilities	Gas Distribution Utilities	Low Risk Non-Utility Companies
Discounted Cash Flow					
Single-Stage Model			10.32%	10.86%	
Capital Asset Pricing Model					
Classsical Single-Factor Model	10.39%	10.60%	11.28%	11.32%	10.35%
Risk Premium					
CAPM-based, Size Premia Adjusted			12.07%	12.12%	12.71%
Realized Market Returns					
5- and 10-year Timeframes	13.36%	16.07%	10.41%	9.34%	10.75%

Thus, the range of estimates is 9.34% to 13.36%, excluding the aberrational 16.07% in realized returns for the second Canadian sample, with an average 11.16%. The cost of capital study accounts for BLPC's small size, smaller than virtually all of the firms used in the utility sample groups above, and its location within a sovereign island nation and thus independent of the meshed integrated nature of the continental energy system within which sample utilities operate. The cost of capital and return on equity recommendation incorporates factors that affect the cost of equity, including small size risk, sovereignty risk, and adjustments for quarterly dividends, issuance costs, and differences in equity participation in total capital. In total, these factors amount to a low and high range of 2.05% to 2.71%. Adding these factors to the average of the market cost of equity estimates obtains a range of 13.18% to 13.85% with a mid-point of 13.51%, for the return on equity for BLPC. With this range in mind, and given the challenges in precisely determining an adjustment specific to the Company, we recommend a common equity rate of return of 13.50%. This estimate of cost of equity represents a conservative yet reasonable level of allowed return on the capital committed by equity investors to The Barbados Light and Power Company Limited and to Barbados.

INTRODUCTION

This report develops the rate of return recommendation for submission to the Fair Trading Commission in determining the required revenue level and retail prices for The Barbados Light & Power Company Limited ("BLPC" or "Company"). The recommendation for the rate of return is based on the Company's cost of capital; estimates of which are presented in this report. The report reviews cost of capital principles and theory, discusses the workings of capital markets, and presents the empirical results of the cost of capital study.

The *Cost of Capital* is the composite interest rate of the debt and equity contributed by investors to underwrite a utility's rate base, which includes net depreciated capital, inventory and stores, and working capital. The composite cost of capital is the Weighted Average Cost of Capital ("WACC"). For regulatory purposes the WACC is referred to as the overall *Rate of Return* and is expressed as an annual percentage interest rate applied to the utility rate base, and is set by the regulatory authority. Determining the overall rate of return is very important. Because a utility's rate base often constitutes a large cumulative investment amount, comparatively small changes or adjustments to the allowed rate of return can translate into significant changes in allowed operating income and revenue level.

PART I: FOUNDATIONS FOR THE COST OF CAPITAL

DEFINITIONS

The *Cost of Capital* is the underlying interest rate used by investors to discount the expected benefit flows of capital resources including returns to financial assets,[4] and is sometimes referred to as the rate of discount, or simply the discount rate. The cost of capital is the compensation required by investors for postponing consumption, for

[4] Financial assets are one form of capital. More generally, *Capital* refers to economic resources of a durable nature that contribute to the production of goods and services, or may provide services directly. Capital resources of an economy are readily at hand; examples include manufacturing equipment, software, commercial buildings, residential dwellings, streets and highways, airports and, importantly, the accumulation of skills and knowledge of the workforce. Capital is accumulated savings over time, where savings refers to the proportion of the output of an economy that is not consumed as current goods and services. Essentially, savings is the share of output held back and invested in—*i.e.*, put into—capital resources. The cumulative level of investment over time, covering decades, constitutes the capital stock of an economy and the society that it serves.

expected inflation, and for exposure to capital risks of various dimensions, where such risks are specific to investment vehicles.

The cost of capital is determined by the demand for capital, supply of savings, expectations of inflation, and perceptions of risks harbored by participants in capital markets. The demand for and supply of capital are determined by expectations of future levels of economic activity, while expected inflation is driven largely by monetary policy over the relevant timeframe. Perceptions of risk, in turn, cover many dimensions including uncertain government policy, the effects of natural phenomena such as weather including violent storms, droughts, and floods; and, in some regions of the world, war and civil unrest. The cost of capital—the discount rate stated in nominal terms—increases with rising demand for capital, with expectations of higher rates of inflation, and with heightened perceptions of risk. Arguably, risk is the key contributing factor for the estimation of the cost of capital.

Financial assets include a multitude of debt vehicles, equity, and derivatives, and are tailored to participants of capital markets including household, small business, corporate, and government segments. Participants across these segments—*i.e.*, investors including lenders and holders of common and preferred stock— can supply capital while other participants (such as borrowers and common stock issuing companies) demand capital. Commercial banks, credit unions, finance companies, capital exchanges, and investment banks serve as intermediaries that provide the institutional means that facilitate the interaction and linkage of the supply and demand sides of financial markets. These functions essentially include lending, borrowing, and the issuance of equity vehicles. Banks and credit unions borrow (and store) financial assets that in turn are invested in the form of debt and, to a lesser extent, equity. Household debt vehicles include, for example, personal loans covering appliances, household services, and credit card mechanisms through finance companies and banks, and real estate and so-called home equity loans. Business loans include short-term loans and lines of credit with banks, inventory financing through business wholesalers, and commercial paper of various terms and credit risk ratings. Corporate debt can be in the form of lines of credit with banks, and mortgage and debenture bonds, while government debt can be in the form of revenue bonds of cities, and short- and long-term debt of various terms.

Equity (or, *Common Equity*) refers to net accumulated value of the contributed capital by investors. Generally speaking, equity is in the form of common and preferred stock and includes the accrual of retained earnings, where the investor, through the purchase of stock, assumes a share in the ownership of a corporate entity. In some cases, debt instruments can participate in equity returns and may also have rights of conversion to common stock. Derivatives are financial instruments whose value depends on investor expectations regarding the inherent value of the underlying assets. Derivatives, common forms of which include options and forward contracts, provide a basis for speculation and for hedging of risk associated with the value of the asset.

The cost of capital associated with financial assets is determined by investors and, in the large, by individuals and entities (including government entities) that provide savings and thus the accumulation of capital within the economy. In the case of financial assets, expected benefits are in the form of future cash flows including interest payments, dividend payments, market appreciation, and return of principal. When investors supply funds to entities such as utilities and governments, not only are they postponing consumption—giving up the value obtained from alternative expenditures—they are also exposing funds to the potential devaluation from ongoing inflation as well as to various uncertainties and risk attending future cash flows. Investors are willing to incur these risk factors only if they are adequately compensated. While the market prices of other inputs including labor, materials, and energy can be easily verified, the cost of capital—essentially, the price of capital—is not easily discerned and, all too often, requires estimation through the cautious application of analytical methods. The cost of capital remains positive in the absence of inflation and risks, as savers require compensation for foregoing the right to use the funds saved for consumption of goods and services—essentially, the time value of money.

In addition to the global risks alluded to above (weather, government policy, etc.) dimensions of risk also cover idiosyncratic factors associated with specific capital resources, such as those of individual entities or companies. Accordingly, financial markets will re-price downward the bonds of a private company, should the *current* financial condition of the company suddenly decline. Essentially, the decrease in the

company's current condition reflected as reduced interest coverage—causes the expectation of the future condition of the company also to decline. Expectations of future financial conditions (possible states) of the specific company are idiosyncratic risks. Because cost of capital rises with increased risks, the price of the bonds declines. Bond prices and discount rates, in the form of the net interest rates or bond yields (and yield to maturity), move in opposite directions; bond yields increase as bond prices decline, and decrease as bond prices rise.

FINANCIAL MARKETS

To facilitate the commitment of capital (investment) by savers and their agents to the firm, the firm offers property rights, including bonds or promissory notes to debt holders and shares of stock to equity investors. These property rights define the commercial terms and conditions under which savers and their agents, as investors, commit capital. Property rights are capital (financial) assets, and are generally tradable in organized financial markets or on an *over-the-counter* basis. Financial assets are claims on the income of the firm as compensation for the commitment of capital, and are the financial obligations of the firm. Shares of stock constitute ownership in the firm.

In the case of long-term debt—*i.e.,* mortgage bonds, debentures, and long-term notes—the interest on the principal (face) amount of a bond (debt) or the coupon rate on the share of preferred stock defines the level of compensation. Often, the interest rate is a predefined annual rate that remains fixed over the term of the debt. However, long-term debt instruments can have a number of other provisions that, in essence, provide for more complete contracting by managing risks through risk sharing between the debt holders and the borrower (the firm). These provisions can include: 1) adjustments to the rate of interest to reflect contemporary market conditions *and* rates of inflation, 2) participation in the earnings of the firm, 3) conversion rights, and 4) voting rights in the management of the firm.

In the case of short-term promissory notes, agreements with commercial banks define the mechanism by which interest, stated in dollars, is determined. Often, the commercial terms of promissory notes define interest to be paid monthly on the outstanding daily balance (principal outstanding). The rate of interest applied to the outstanding balance is typically tied (indexed) to the interest rate on obligations of

some widely known financial market—say, the London Interbank Offer Rate (LIBOR) or Fed Funds—which also varies daily or monthly.

Common stock property rights are somewhat different from other financial obligations because, as owners of the firm, the returns to shareholders are residual amounts following the compensation of other resources employed by the firm including debt obligations. Common equity is essentially compensated last, and bears the burden of much of the business, regulatory, and financial risks of the firm. For this reason, common equity is, in virtually all cases, more costly than other forms of financial instruments.

As with many other markets, capital markets have primary and secondary dimensions. Primary markets are the institutions and processes that facilitate the initial sale of the financial obligations of the firm to initial investors, whereas secondary markets are structured market processes that provide the means by which investors can purchase and sell existing rights, including shares of stock and debt obligations. Financial instruments can assume many forms, and debt securities (bonds) and equity shares are actively traded in financial markets, which are generally considered to be highly liquid and competitive. However, to the degree that financial obligations: 1) carry specialized and non-common commercial terms, and 2) secondary—and to a lesser extent, primary—markets are less liquid, holders of such obligations assume higher risks, other factors held constant. This is the case where the pool of buyers and sellers is limited and the volume of transactions is comparatively small. Relatively low levels of liquidity imply higher transaction costs and risks to investors, which translates directly into higher costs of capital to the firm.

Competition is a term that describes some markets, and markets are said to be competitive if certain conditions exist. Markets can be characterized as competitive if they involve: 1) a very large number of buyers and sellers, 2) information relevant to the determination of prices is readily available, complete, and not costly, and 3) transactions costs are low. Because of the workably competitive nature of financial markets, arbitrage opportunities are more or less exhausted. This means that, for both primary and secondary markets, financial property rights trade at levels (prices) such that perceived risks and opportunities for prospective returns to capital are appropriately balanced and approximate those of other investment opportunities.

Thus, above-normal returns, which implicitly include compensation for risks, cannot be seemingly realized by investors over prospective periods in systematic fashion.

Under the assumption of market efficiency, the competition inherent in U.S. and worldwide financial markets implies that the prices of common shares (share prices) and bonds are at a level that reflects the opportunity cost of capital. As an example, assume that the perceived risks attending the returns to common shareholders of Firm A are equivalent to those of Firm B and other firms. If the share prices of Firm A suggest a market return of 10%, while the prices of Firm B and other firms of comparable risks suggest (allow) market returns of 13%, the market price of Firm A will fall to a level that provides a basis for market returns of just 13%, prospectively. A price that allows for a 10% prospective market return is insufficient in the presence of opportunities for a market return of 13% on alternate investments of comparable risk. Essentially, the 13% market rate of return on investment alternatives constitutes the opportunity cost of capital. Most remarkable is the expedience—literally, in minutes for highly liquid financial markets—with which share prices adjust to levels that appropriately balance prospective returns to equilibrium levels *based upon perceptions of risks*. In short, equivalent and comparable risks translate directly into comparable rates of return, which is the cost of capital of common shareholders in—and thus of—the firm.

As mentioned early on, the cost of capital is a function of the demand for and supply of capital, investor expectations of inflation, and investor perceptions of risks. Because the conditions of demand and supply as well as expectations of inflation are more or less common to financial markets at any point in time, financial vehicles are differentiated by risks. Hence, the expected returns and prices of bonds and common shares (normalized for denomination and size) at any point in time are largely if not exclusively differentiated by perceptions of risk.

In summary, whereas the cost of skilled labor, materials and supplies, and fuel used in the process of providing utility services are expressed in money terms, the cost of capital is expressed as an interest rate, typically shown as an annual percentage of investment. This means that the costs of the capital resources employed by BLPC, including generation equipment, power delivery systems such as transformers and lines, meters, trucks and vehicles, computer systems, software, office facilities and

buildings, inventory and stores, and land—essentially, the rate base of BLPC—are reflected as annual carrying charges. The cost of capital for BLPC—or perhaps more accurately, the *cost rate of capital*—is referred to as the *required rate of return* (%) on the capital resources committed by investors to the Company, where capital is valued at either original cost or fair value.[5]

PRINCIPLES UNDERLYING FAIR RATE OF RETURN

Legal guidelines for rate of return utility regulation of the North American Continent have been discussed extensively, and are delineated by key decisions of the legal authorities in the U.S. and Canada. As a point of departure, the statutory principles of rate of return for public utilities rest substantially with two decisions of the Supreme Court of the United States. In the *Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia* case (262 U.S. 679, 1923), the U.S. Supreme Court set forth its view on fair rate of return, as follows:

> …A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market and business conditions generally.

A second landmark decision of U.S. Supreme Court echoed and expanded upon the fair return standard established by the "Bluefield" decision cited above, for capital committed to public utilities. This second decision is the *Federal Power Commission*

[5] For the determination of setting retail utility prices in the U.S. and elsewhere, the regulatory convention is to value the capital of public utilities at original cost.

v. Hope Natural Gas Company case (320 U.S. 391, 1944); a relevant passage of this latter decision is as follows:

> From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock… By that standard the return to the equity owner should be commensurate with return on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and attract capital.

These longstanding decisions provide the recognized framework for the fair rate of return on capital committed by investors to public service. In these decisions, the U.S. Supreme Court codified, in clear and readily understandable terms, a statutory benchmark that serves as the basis to set fair and equitable prices for retail public services such as natural gas, while also providing a fair rate of return on the capital provided by investors. Though they reach back many years, these decisions remain to this day the cornerstone for the determination of rate of return requirements. The challenge for regulators, regulated utilities, and interested parties to regulatory proceedings is to operationalize these principles in contemporary regulatory processes.

As noted by Professor Roger A. Morin in his testimony before the New Hampshire Public Utility Commission:

> Subsequent cases have reaffirmed the standards established by the Bluefield and Hope cases.[6] In the Permian Basin Area Rate Cases (390 U.S., 747, 1968) the U.S. Supreme Court stressed that:
>
> > the court must determine whether the order may reasonably be expected to maintain financial integrity, attract necessary capital, and fairly compensate investors for the risks they have assumed, and yet provide appropriate protection

[6] As discussed in Roger A. Morin, *Regulatory Finance: Utilities' Cost of Capital*, Public Utilities Report Inc., 1994, pp. 10-11, these cases include *Federal Power Commission v. Memphis Light, Gas & Water Division* (411 U.S. 458, 1973), *Permian Basin Area Rate Cases* (390 U.S., 747, 1968), and *Duquesne Light Company et al. v. Barasch et al.* (488 U.S. 299, 1989).

> to the relevant public interests, both existing and foreseeable. The court's responsibility is not to supplant the Commission's balance of these interests with one more nearly to its liking, but instead to assure itself that the Commission has given reasoned consideration to each of the pertinent factors.

Further down this path, the U.S. Supreme Court, in its decision in *Duquesne Light Company et al. v. Barasch et al.* (488 U.S. 299, 1989), explicitly recognized risks associated with changes in regulatory governance. In addition, key decisions in Canada align with the expressed views of the U.S. Supreme Court cited above.[7]

UTILITY REVENUES, WEIGHTED COST OF CAPITAL

Public utilities such as BLPC utilize and employ substantial levels of capital resource inputs to provide delivery services. As mentioned, total net invested capital is the basis for setting regulated prices and is the primary component of a utility's rate base.

In general, the flow of revenues less the costs of non-capital inputs to the firm such as operating expenses provides a level of dollar returns to capital, in the form of operating income. If outcomes match expectations, investors realize returns equivalent to the overall cost of capital. As discussed more fully below, the overall cost of capital, often referred to as the *weighted average cost of capital* ("WACC") and expressed in percentage terms, recognizes and is based on the pool of financing vehicles used by the utility to underwrite the capital that it employs, as reflected as rate base. In summary, the WACC is the composite weighted cost of the financing vehicles including short-term debt, long-term debt such as mortgage bonds, preferred stock, and common stock.[8] These financing vehicles are property rights and

[7] Specifically, the perspectives expressed within selected Canadian decisions including *Northwestern Utilities v. City of Edmonton* (S.C.R. 186, 1929), and *British Columbia Electric Railway Co. v. Public Utilities Commission of British Columbia* (S.C.R. 837, 1960) amply demonstrate a similar line of reasoning and guideline for Canadian regulatory authorities to that of the U.S. Supreme Court decisions, for the setting of the fair rate of return level for utilities. For a more complete discussion of legal guidelines and landmark court decisions, please reference Roger Morin, *Regulatory Finance*, and Charles F. Phillips, *The Regulation of Public Utilities*, 1988.

[8] As mentioned earlier, the capital structure and overall rate of return, for purposes of regulation, can also include customer deposits and, under accrual accounting, balances of various deferred accounting items such as income taxes and investment tax credits.

constitute the financial contracts between savers and the firm, including government entities and private companies.

As mentioned above, utilities must compete with all other entities in the free open market for the input factors (labor, materials, and energy inputs). The prices of these inputs are set in the marketplace,[9] and the costs of these inputs that are incorporated into the total costs and required revenues. Likewise, prices for capital resources such as equipment, facilities, software, inventories, and working capital are also set by markets. Since utilities including BLPC must directly or ultimately attract capital through open financial markets, there exists a market price to pay for the capital they require—in short, the market cost of capital that implicitly exhausts all opportunities for higher returns, given perceived risks.

REGULATION, DEMAND FOR CAPITAL, CAPITAL ATTRACTION

The cost of capital concept may also be interpreted from the perspective of internal investments and the demand for resources. Regulated utilities accommodate the ongoing and steadily rising demand for services, which involves expanding employment of resources, capital in particular. Senior managers of firms, as agents for the ownership or controlling interest of the entity such as shareholders or a local municipality, are responsible for ensuring that the expected internal returns on incremental capital committed by the firm is equivalent to the cost of capital to the firm—*i.e.*, investors' rate of return requirements The adequacy of the internal returns on incremental investment by electric utilities to fund capital at full opportunity costs, however, is highly dependent upon the soundness of the regulatory governance structure to ensure that the utility has the opportunity to obtain sufficient revenues, which in turn provide adequate returns on new capital.

When the rate of return, as set by regulators, leads to inadequate returns to capital or to the expectation that returns to capital are likely to be insufficient, utility managers

[9] The discussion recognizes that entities including utilities may not participate in workably competitive markets for the various inputs that they require. Along this line, however, it is useful to mention that, worldwide, financial markets are generally considered to be relatively competitive, where the notion of competition implies that the actions and behavior by individual market participants including buyers and sellers have, as a general rule, no significant impact on the market clearing prices or the availability and sale of goods and services. Innumerable examples challenging the assumption of workable competition can be cited. Within capital markets, for example, the sudden sale or purchase of large blocks of shares of a specific entity may have significant impact on the market value of shares.

are understandably reluctant to make investments in infrastructure. Indeed, when the expansion of capital resources occurs under a regulatory requirement including the obligation to serve, the absence of adequate returns implicitly constitutes the confiscation of the capital. Under these regulatory conditions, the utility is forced to provide services that involve new investment, even though adequate returns are not obtainable. The result is a failure of capital attraction by the utility, and the confiscation of capital of investors—an outcome that comes about from the inherent efficiency of competitive capital markets.

Investors, investment rating agencies, investment banks, and commercial bank lenders follow regulatory developments. Anticipating a shortfall of the internal returns to capital vis-à-vis rate of return requirements, capital markets bid down the prices of the outstanding securities of the utility. The reduced market capitalization of the utility constitutes, arguably, the confiscation of the existing capital of holders of the utility's securities. Essentially, the utility has failed to (or simply cannot) attract capital on fair terms—terms that do not cause outstanding investors to incur wealth losses.

In summary, the utility and its managers can often find themselves, as a result of service requirements, forced to invest in real physical assets that are uneconomic from the perspective of the firm and its constituent investors, if the return on incremental investments falls short of the cost of capital.[10] The cost of capital is the minimum rate of return that must be earned on physical assets to justify their acquisition, and thus the regulator must be mindful of the allowed rate of return levels and implement regulatory procedures that provide the utility with an acceptable level of opportunity to realize returns, on the margin, that satisfy the cost of capital—*i.e.*, a rate of return equivalent to that realized on investments of comparable risks. In the context of a binding regulatory constraint, and other regulatory requirements such as obligations to serve, it is necessary and sufficient for the required rate of return on incremental investment to adequately satisfy the opportunity cost of funds. The regulator should set the allowed rate of return equal to the cost of capital so that the utility is free to satisfy its capital needs and service customers at fair prices.

[10] The incremental investment is a particular concern to BLPC and other electric utilities in view of aging infrastructure and the on-going replacement of the capital stock, where the incremental cost of the physical resources can be several times greater than the book value of embedded facilities.

The aforementioned principle and accompanying rule can be illustrated by an example. Suppose a utility with a rate base of $60 million financed 50% through debt and 50% through equity. Assume that the cost rate of the outstanding debt capital is 7.25%, and that the rate of return on equity capital is 12.0%, giving a weighted average cost of capital of 9.63 %. Suppose further that the regulator sets the allowed rate of return at 8.00%, rather than 9.63%. To fully service the property right claims of both bondholders and shareholders, revenues over operating costs should amount to $5.8 million annually (*i.e.*, 0.0963 × $60 million). An allowed rate of return of only 6.81% on a rate base of $60 million provides returns to capital equal to just $4.8 million. The returns to capital are sufficient to service the outstanding debt, $2.2 million (*i.e.*, $60 million x 0.50 × 7.25 %). However, bondholders have primary claims to the returns to capital, and shareholders residual claims. Hence, the return available to service equity holders is a mere $2.6 million, allowing for a realized equity rate of return of just 8.8%, a shortfall of 3.2% which translates into a loss to shareholders of $0.98 million.

As a consequence, share prices are significantly bid down, giving rise to a sharp decline in market capitalization of the firm. The result is a significant wealth transfer from shareholders, as investors, to retail consumers. In short, the capital of investors is confiscated via a failed regulatory governance structure. In addition, the regulatory structure, particularly where the utility has binding service requirements and constraints, causes a breach of fairness criteria and leads to a failure of the utility to satisfy capital attraction standards where capital can be raised at fair and equitable terms. Essentially, the higher cost of debt interest charges is a result of the reduced credit standing in view of the lower levels of interest coverage.

It is useful to pursue this line further and consider the counterfactual case. Specifically, if the allowed rate of return is greater than the cost of capital, the capital investments are undertaken and investors' opportunity costs are more than achieved. Any excess earnings over and above those required to service debt capital accrue to equity holders, resulting in a rise in share prices. In this case, the wealth transfer occurs from electricity consumers to shareholders.

The upshot is that, in the absence of other considerations such as the impact of the incentive properties of a chosen regulatory governance structure, investments and

capital expansion are undertaken by the utility without inappropriate and unfair wealth transfers between consumers and shareholders if, and only if, the allowed rate of return is set equal to the cost of capital. In the case of the above example, at an allowed rate of return of 9.63% the expected earnings realized on incremental investments are just sufficient to service both the incremental and outstanding claims of debt and equity holders on the capital returns of the utility, no more, no less. In conclusion, setting the allowed rate of return equal to the cost of capital is the only policy that ensures that necessary investments are made in order to satisfy utility service requirements while also providing fair and equitable returns to investors.

CAPITAL STRUCTURE and WACC for ELECTRIC UTILITIES

Capital Structure refers to the means—*i.e.*, financial vehicles—by which private and public entities underwrite physical capital and other assets. Capital structure can involve several types of vehicles including long- and short-term debt, preferred and preference stock, common equity, and capitalized leases. These traditional types of financial vehicles, for purposes of economic regulation, are often augmented by other sources of funds including customer deposits, and deferred balances for income taxes, investment tax credits and, in the case of BLPC, manufacturer's allowance.

The relevant financial policy issue is the level of financial leverage, measured as the ratio of debt to equity that comprises the capital structure stated on a traditional basis. Because debt is generally less costly than equity, it is appropriate for the firm to underwrite its assets with some degree of financial leverage. The appropriate amount of leverage is a matter of operating and business risk, measured by the expected level and variability (mean and variance) in future operating income. In brief, highly stable flows of operating income (and internal cash), which can be interpreted as the total book returns to capital, provide a basis for the firm to employ higher levels of debt. Higher leverage, however, increases the variability of interest coverage and thus the cost of debt, *and the cost of equity* as a result. Thus, the financial policy issue regarding debt leverage is a matter of determining the level of debt that minimizes the weighted average cost of capital ("WACC"). At low levels of debt, the WACC declines as leverage rises. However, beyond a certain point, the expected level and variability of operating income of the firm relative to equity ownership value begin to rise, causing the WACC to increase. In short, the cost rates of debt and equity are

sensitive to the debt and equity participation levels within total capital. The relevant question, then, is: what is the appropriate and acceptable level of leverage, given the inherent business and operating risks of the firm?

Decades back, it was common for electric utilities to underwrite assets with upwards of 60-65% debt and corresponding levels of equity of 40-35%. Currently, however, both mid-sized and large electric utility companies typically finance assets with participation shares of 48-58% debt, and 52-42% equity. The gradual evolution favoring lower levels of debt financing is in response to, and is in keeping with, changes in the electricity services industry. Several recent changes in the business environment facing electric utilities have precipitated the reduction in debt financing by electric utilities. These are: market restructuring involving competitive entry for generation and other unbundled services; sharp increases in input costs; closer integration of electricity services and energy markets generally, where energy commodities reveal much higher levels of price variation and volatility; less restrictive regulatory governance structure, including price cap regulation and earnings sharing mechanisms; and uncertain future requirements for environmental compliance.

As a general rule, the governing regulatory authority should adopt the observed historical or projected capital structure, including regulatory (non-traditional) components, where such result is well aligned with least-cost principles. However, where the observed capital structure constitutes a clear departure from least cost—with unusually high concentrations of debt or equity participation—it may be appropriate for the authority consider the adoption of a hypothetical or imputed capital structure. In addition, in the case of isolated service providers such as utilities like BLPC that operate island power systems, or where the utility is unusually small sized and is susceptible to unforeseen business events that cannot be readily diversified or insured, it may be appropriate for regulatory authorities and the utility to employ a higher concentration of equity participation.

WORLDWIDE CAPITAL MARKETS

Arguably, the most significant recent development in capital markets is the globalization of capital flows that, to a substantial extent, has been facilitated by the vast expanse of electronic media. Today, BLPC and entities worldwide compete for

capital resources in the face of vastly expanded opportunities for capital as a result of globalization and reduced barriers to capital flows among nations, and markets with increased return opportunities. As an example of the globalization of the capital markets, net private capital (*i.e.*, debt plus equity) flows to developing countries increased from $188 billion in 2000 to $491 billion in 2005 and to $647 billion in 2006.[11] Equity flows in 2006 comprised $419 billion, nearly 75% of total flows, in sharp contrast to the experience of earlier years. As an example, capital flows into developing countries in 1990 were approximately $60 billion for debt, and $40 billion for equity. Equity flows continue to increasingly dominate the share of total flows, in part due to an abatement in official lending flows. For example, during 2006, official lending actually declined while total flows increased by 17% from 2005 levels**.** As the 2006 World Bank Report states:

> Demand for emerging market debt and equities remained strong, spurred by improved fundamentals in many developing countries and investors' search for higher yields in an environment where long-term interest rates remain low in major industrial countries, despite higher short-term interest rates.[12]

This trend continues through 2007 and the current period, and it is useful to mention several key findings of the 2007 world bank report cited above, as follows:

- Inflows of capital of developing countries are an increasingly large share of total world capital flows, and their financial positions have steadily improved since the years of very slow growth of 2001-2002. Specifically, equity inflows to developing countries other than China were $94 billion in 2006, and were $6 billion 2001-2002.
- Developing countries have reduced external debt, lengthened maturities, and bought back outstanding debt, often using expanded currency reserves. Net lending from the Paris Club of creditors declined sharply in 2006.
- Equity firms located in developing nations have undergone a vast expansion of cross listing of their equity shares on world exchange markets in order to build channels for expanding capital needs, even when doing so implies that they need to satisfy higher accounting and financial reporting standards.
- Foreign corporations are increasingly borrowing on international markets as a result of favorable interest rates and declining sovereign risk spreads. Additionally, foreign firms are increasingly utilizing advanced risk management tools in order to hedge currency and commodity risks, necessary

[11] Source, The World Bank, *"Global Development Finance: The Development Potential of Surging Capital Flows – Review, Analysis and Outlook, 2006, and "Global Development Finance, 2007,"* hereafter referred to as the *"World Bank Reports"*).

[12] The World Bank Report, 2006, p. 18.

> as commodity exports, particularly oil and other natural resources, have assumed a much higher share on a value basis of total exports of developing countries.

The development of global capital markets parallels expanded development of economic activity. Indeed, world GDP expanded 5.3% in 2006. Participating in high levels of economic growth are nations in the South American and Caribbean region, which experienced 4.7% and 5.6% expansion of real activity in 2005 and 2006, respectively, with continued growth of 4.3% projected for the 2007-2009 timeframe.[13]

The development of global financial markets parallels and contributes to expanding economic activity. Global markets and the resulting capital flows are much more integrated now than in previous eras and, as a result, investors have a substantially larger set of opportunities to place capital, including investments in utilities in other energy markets and other regulatory jurisdictions. The emergence and development of robust global capital markets over the past decade, in particular since 2001-2002, has placed BLPC and other utilities within the Caribbean region in the position of competing for capital with developed and other developing countries, as well as the complete gamut of industries seeking capital resources. The global nature of capital affects utilities and is relevant for both debt and equity funding.

Global capital markets today are driven to a substantial extent by institutional investors. Institutions are likely to seek to remain fully invested and seek out "undervalued" assets. Finally, strategic institutional investors, like pension funds, life insurance companies, and sovereign wealth funds are growing in importance in worldwide financial markets. The increasing sophistication of these institutional investors means that they are able to differentiate between country- and company-specific investment opportunities. This translates into investment behavior that pays close attention to the risk profiles of opportunities that they face, including utilities and other energy market equities, when making decisions about strategic placement of funds.

In short, the clear implication is that BLPC and other entities large and small must compete for funds globally. Globalization of capital flows is no doubt manifested in multiple dimensions. For our immediate purposes, however, one salient point matters

[13] World Bank Report, 2007.

most: the prospects of future returns and capital risks associated with a capital position in BLPC, as gauged by the holders (investors) of capital, are *benchmarked* with respect to the expected returns obtainable from alterative investment opportunities of comparable risks elsewhere. The universe of opportunities is large, and one can expect that investment opportunities are fairly gauged in terms of risks and potential returns.

SOVEREIGNTY RISKS

Sovereignty risk refers to the risk differences among comparable types of financial assets, including government and corporate bonds and common stocks, according to the country of origin of the asset. Sovereignty risks are evidenced by observed risk premia among financial assets across countries, and are most relevant for developing nations and regions where risk differences with respect to developed economies reflect the inherent level of uncertainty and risks of emerging economies. Emerging markets are typically less developed and complete, are notably more vulnerable to currency risks, and are much less capable of diversifying exports and the effects of widely varying world commodity prices. Similarly, the financial assets sourced in emerging markets are less liquid and may not reflect full information reporting standards. Finally, investors in emerging markets are likely to have less complete information and knowledge regarding the full extent of risks, including political and more general institutional intricacies. Moreover, some regions experience periodic and chronic levels of civil unrest and warfare. Observed market yields suggest, then, that so-called sovereignty risks are real. The relevant question is how best to gauge the risk premia associated with the financial assets of emerging economies, where the focus is common equity.

Under conditions in which the underlying assets are traded within sufficiently competitive and liquid markets, the well known tools of capital valuation, including CAPM and Discounted Cash Flow, provide a basis to develop estimates of the cost of capital. In the case of emerging markets, however, financial markets are often incompletely developed. The market size (capitalization) of debt obligations and common stocks traded on the exchanges of emerging markets are typically of small scale; the number of listings are often few, and trading activity is thin and often intermittent. In short, the relevant valuation tools, as developed by and actively

exploited within the financial markets of the developed economies of the West and the Far East, are not easily applied. Consequently, several sensible though *ad hoc* approaches for determination of sovereignty risks have been and are applied in lieu of formal valuation methods, at least as applied to the within-nation exchange experience. These methods include:

Nation-Specific Equity Market Risk Premia: Using a worldwide equity market index such as Morgan Stanley Capital Index (MSCI) and estimated risk premia, develop CAPM or APT multifactor[14] estimates of the cost of capital specific to the equity markets of the nation of interest.

Observed Risk Premia of Government Debt: This second approach reviews historical bond yields and short-term interest rate differentials of the outstanding debt obligations of sovereign nations. Under this approach, bond yield differences stated in real terms, constitute risk premia, and represent common risk differences that are then applied, in common, to the financial assets sourced to the public and private entities of the nation of interest.

Credit Scores Differences: Entities that provide financial services such as *Institutional Investor* periodically conduct surveys of traders involved in the assessment of capital risks. Through these surveys, a consensus risk assessment and associated credit rating is developed. In turn, the composite credit rating is used as a basis to explain real debt costs and historical market returns. The resulting model provides a basis to estimate risk premia, given the observed credit rating scores obtained from the surveys. The credit scores of global credit rating agencies can be correlated with observed real interest rates.

Relative Risks of Equity Market Returns: Indexes of historical market returns for exchanges of emerging nations are formulated. The statistical variance of the index (market returns) serves as the appropriate risk metric. The variance (or standard deviation) of market returns of the emerging market exchanges is then normalized with respect to the index of a major equity market exchange, such as the S&P500.

[14] APT refers to *Arbitrage Pricing Theory*. Originally formulated by Stephen Ross in 1980, APT and multi-factor models are often viewed as extensions of the CAPM framework, within which CAPM Beta constitutes a one-factor approach. Multi-factor models such as the Fama-French 3-factor model have been shown to better explain historical market returns than the now classic CAPM framework.

The result is a relative value of the average equity market for various emerging markets, where the values vary around (are somewhat above) unity. The final step is to multiply the observed equity risk premia for the major exchange by the calculated values of relative statistical variances for the emerging markets. These adjusted equity premia are then coupled with low-risk sovereign debt yields for the markets of interest.

In short, there are several plausible ways to potentially address the question of the existence and magnitude of sovereignty risks. While all four approaches are seemingly viable, some methods are likely to provide more reliable estimates of true underlying country risks than others.[15]

METHODOLOGY: ESTIMATION OF THE COST OF EQUITY

It is useful to reiterate three essential points that we elaborated upon above. First, the cost of equity of the firm—and of investors in the firm—is a function of perceptions of risk, the demand for and supply of capital, and expectations of inflation. Second, the cost of common equity of the firm is equal to the opportunity cost of capital incurred by common shareholders of the firm contemporaneously, though the experience of long-term history guides the assessment of opportunity costs. Third, the cost of equity of the firm is equal to the expected market rate of return on alternative investments of comparable risks available to shareholders—*i.e.,* the opportunity cost of capital—within a contemporary timeframe.

For two fundamental reasons, the determination of the opportunity cost rate for equity capital is both challenging and somewhat removed from the analytical procedures used to determine the cost of debt. In the case of debt, both the market price and future expected cash flow returns associated with debt securities are generally observable, by inspection. Thus, the net expected yield to maturity, which reflects the opportunity cost of capital to holders of debt, can be determined directly. This *is* the market rate of return, *ex ante*. For purposes of determining the overall utility rate of return, however, the cost rate of long-term debt is that which is set at the time of debt issuance in primary financial markets.

[15] In particular, the nation-specific equity market risk premia approach appears to provide counterintuitive and inconsistent results for some emerging markets and regions.

In contrast, expectations of investors about the prospective cash flows and market returns on common equity cannot be observed directly, and must be inferred using estimation procedures. In addition, the allowed equity rate of return is typically set according to the current and expected cost of capital, though much of the equity investment was committed in many years past. That is, the cost of equity may change over time significantly—and rapidly—as market conditions change even though the original equity contribution to total invested capital, measured as book value, typically remains unchanged.

In summary, the cost of common equity can only be discerned through the proper and careful application of well-established methods that provide the cornerstone for modern finance theory. While the methods employed herein are well-established, the procedures to determine the cost of equity capital require estimation of key parameters.

The return on equity recommendation on equity for the Company is based on the equity cost of capital, as determined through the application of four estimation methods. The methods include variants of the constant growth *Discounted Cash Flow* model ("DCF"), and the *Capital Asset Pricing Model* ("CAPM"). These classical approaches are commonly recognized within modern finance theory and are readily utilized for purposes of capital valuation. These two formal models of the cost of capital are augmented by an assessment of *Realized Market Returns* for utility and non-utility companies of comparable risks, and estimates of cost of capital, as inferred through the *Risk-Premium* methodology. While other technical methods are available—notably, multi-factor models—the four approaches utilized in the Cost of Capital Study are widely accepted and used for purposes of capital valuation. Each of the methods is discussed below.

Discounted Cash Flow. The constant growth Discounted Cash Flow model was originally developed by Myron Gordon in 1957, and was advanced actively during the early 1960s. In its classical (one-stage) form, the derived DCF model defines the cost of capital as the sum of the adjusted dividend yield, and expectations of future growth in cash flows to investors including dividends and future appreciation in share prices. The classical DCF model is as follows:

$$k_{e,j} = D_{0,j}(1+E(g_j))/P_{0,j} + E(g_j)$$

with,

$k_{e,j}$ = cost of equity capital, asset j

$D_{0,j}$ = current dividends per common share, asset j

$E(g_j)$ = expected growth in future cash flow returns to investors in asset j

$P_{0,j}$ = current price per common share, asset j

The one-stage form of the DCF approach is an elegant and intuitively tractable model with two terms, a mathematical result derived from the constant growth present value model. A cursory review of historical returns on equities suggests that, to a substantial extent, differences in the observed internal returns to capital, as well as expectations of future returns as expressed by security analysts, contribute to realized market appreciation as well as total returns to capital. It is plausible that the *expected path* of future returns harbored by investors may assume a pattern of non-constant growth. This means that, at least under some market conditions, the constant growth form of discounted cash flow may not represent investor expectations of growth with sufficient accuracy. Arguably, other forms of DCF may serve as better approximations of investor expectations.

A plausible approach to better model expectations of varying growth might be with stochastic models, where the path of returns and growth is a function of time, with a random component. However, stochastic models introduce considerable complexity. As a first-order approximation to stochastic processes, multiple-step constant growth models known as multi-stage DCF can serve nicely. Essentially, multi-stage DCF is a variation of present value theory which postulates that future returns assume a pattern of several growth steps or stages. While any number of stages of constant growth is possible, two or three stages are typically applied. In stylized fashion, the Three-Stage DCF model is shown below:

$$P_{0,j} = (1+g_j)/(k_{e,j}-g_j)\{D_{0,j}(1 - F^5_j) + D_{5,j}(F^5_j - F^{10}_j) + D_{10,j}(F^{10}_j)\}$$

with,

$k_{e,j}$ = cost of equity capital, asset j

$D_{t,j}$ = current and future dividends per common share, asset j

$E(g_j)$ = expected growth in future cash flow returns to investors in asset j

$P_{0,j}$ = current price per common share, asset j

$F_j = (1+E(g_j))/(1+k_{e,j})$

As shown in the above formulation for the Three-Stage DCF, discounted prospective cash flows are represented by three terms that incorporate the factor "F," each of which is differentiated by expected growth (*E(g)*). In the Three-Stage approach—should we say multi-stage approach—investor expectations of future growth are differentiated among time frames. Unlike the single-stage DCF approach, the estimated cost of equity capital solution to the multi-stage model (the discount rate *k*) is obtained through a mathematical search procedure that iteratively searches for the discount rate that balances the left- and right-hand-sides of the equation. Appendix I provides a step-by-step derivation of the classical and multi-stage discounted cash flow models shown above.

Capital Asset Pricing Model. The CAPM was developed by William Sharpe (1961) and John Lintner (1964). CAPM was derived from mean-variation analysis and, in particular, portfolio selection developed by H. Markowitz (1952). The derived CAPM shows how the valuation of a financial asset (price) is based upon two components: risk-free returns and an *adjusted risk-based return.* Surrogates for risk-free returns can be observed directly in capital markets, and include market returns on short- and intermediate-term debt. Some applications of CAPM, long-term debt. As a general rule, the cost rates for and market returns of government debt obligations are accepted as "riskless assets" and thus serve as appropriate proxies for risk free yields.

The adjusted risk-based return is based upon three factors: 1) the covariation of the returns to the asset and that of markets for risky assets, 2) the statistical variance of returns of the market for risky assets, and 3) the *difference* between expected overall returns on risky assets, and risk-free returns. The third parameter is referred to as the excess return, and is equal to the difference between the overall returns to risky assets for the market as a whole, and the risk-free return rate. The CAPM is shown below:

$$k_{e,j} = r_f + B_{jm}*(r_m - r_f) \qquad \text{with, } B_{jm} = \sigma_{jm}/\sigma_m^2$$

with,

$k_{e,j}$ = cost of equity capital for risky asset *j,* stated in percentage terms

r_f = risk-free rate of return

B_{jm} = ratio of the covariation between risky asset *j* and the market as a whole, σ_{jm}, and the variance of market returns, σ_m^2

r_m = expected rate of return on equity markets, as a whole

Appendix II derives the Capital Asset Pricing Model, as shown above. The derivation is developed by David Luenberger.[16] The efficient market hypothesis plays an essential role in the determination of the cost of capital. Specifically, the working assumption, which is largely though not completely borne out by empirical analysis, is that capital markets are fairly efficient. This means that the supply and demand for risky financial assets, as reflected in bid and asked prices to buy and sell shares, result in financial assets being traded at price levels where *rates of return above the cost of capital cannot be systematically realized*. Above-normal returns—returns above the cost of capital—are realized only randomly. Essentially, the opportunities to systematically realize returns above the underlying cost of capital are exhausted by the competitive market process.

Estimating the cost of capital, though not trivial, can be fairly straightforward, and the four approaches employed in the immediate Study—DCF, CAPM, Historical Market Returns, and Risk Premium—provide a useful analytical framework from which the cost of equity can be inferred. The risks to investors in various sectors of the energy services industry cannot ever be known directly; risks and hence the implied cost of capital can only be inferred. Specifically, the determination of useful estimates of the cost of common equity capital within each method requires a discerning application of theory through careful analysis, such as that presented herein. In particular, the determination of the cost of equity capital faces two overarching challenges, as follows:

(i) The selected and applied methods herein are inherently forward looking, where future expectations are gauged from history. Hence, the results are highly dependent upon useful estimates of investor expectations about future market performance. However, future expectations are drawn from history and underlying relationships among historical information data. Arguably, all that we know—indeed, all knowledge—is based on observed facts (historical data) and perceptions of relationships among data; and,

(ii) Key underlying assumptions include efficient markets and rational behavior of investors such that all opportunities for above- and below-normal returns to capital are exhausted on an expected value basis. In short, capital

[16] David Luenberger, *Investment Science*, 1997.

markets value financial assets at the implied opportunity costs of capital, given investor perceptions of risk.

It is useful to mention that the notion of *risky assets* can apply to any real or financial asset wherein the prospective returns from holding the asset are uncertain. Risky assets include commodity contracts, financial property rights, financial derivatives, and real assets such as power delivery and generation facilities of electric utilities. Risk assessment and option theory, moreover, can be applied to the analysis of unbundled services, such as electricity transmission development plans. Within the context of this discussion, however, risky assets refers to financial obligations of firms—common stock—and asset values refers to prices of common stock as observed on major stock exchanges.

Measurements of *Realized Market Returns* and risk metrics are increasingly used as a basis to assess plausible returns in the future. As discussed, efficient markets suggest that *all* financial assets are priced at levels such that the *expected* future returns of individual assets are equivalent to the underlying opportunity cost. Thus, if historical returns guide expectations of future returns, historical returns provide a useful benchmark and, within reasonable bounds, reflect the opportunity cost of capital. In this respect, the *Realized Market Returns* methodology can be viewed as a market-based approach of Comparable Earnings, and thus fully satisfies the *Bluefield* and *Hope* criteria. More specifically, realized market return for a period is defined as:

$$\boldsymbol{R_{j,\,t-t\text{-}1} = (P_{j,\,t} + D_{j,\,t-t\text{-}1} - P_{j,\,t\text{-}1})/P_{j,\,t\text{-}1}}$$

with,

$R_{j,\,t-t\text{-}1}$ = market return realized within the interval $t - t\text{-}1$, for financial asset j

$D_{j,\,t-t\text{-}1}$ = dividends paid during the interval $t - t\text{-}1$, for financial asset j

$P_{j,\,t,\,t\text{-}1}$ = market value of financial asset j, at t and $t\text{-}1$

The key to successfully applying this third approach is identification and measurement of historical returns in a manner that reasonably reflects expectations of investors about the future outlook.

The *Risk Premium* methodology is based on ordering of types of financial assets according to yields—and thus risks—as observed historically. This ordering according to risks is a natural and inevitable result of competitive financial markets.

Essentially, because risk is costly, higher costs must be offset by higher returns. While the Risk Premium appraoch is not based upon a conceptual model and derived form, the application utilizes CAPM. The analysis of the risk premia among classes of risky assets provides a means to infer the underlying opportunity cost of capital. The underlying concept of the risk premium approach is that *differences* in perceptions of risks among financial assets such as equities and debt are revealed in differences between the historical market returns. The historical differences between equity and debt returns—*i.e.,* risk premia—can thus serve as estimates of required compensation for risk assumed by investors over future timeframes. The approach begins with expected inflation, and then takes account of the expected cost of short- and imtermediate-term debt, equity risk premia, risk differences between equity markets as a whole and utilities as measured by CAPM beta, and size-related risk premia where appropriate. While risk premium models can assume various forms, the immediate application of the Risk Premium approach is codified as follows:

$$k_{e,j} = r^{st}_{f} + rp_{int-st} + rp_{m-nit} + rp^{CAPM}{}_{y-m} + rp^{s}{}_{j}$$

with,

$k_{e,j}$ = cost of equity capital for risky asset j, stated in percentage terms

r^{st}_{f} = risk-free rate of return, for a short-term asset

rp_{int-st} = risk premium for intermediate-term asset *int* with respect to a short-term asset

rp_{m-int} = risk premium for equity market m with respect to an intermediate-term asset

$rp^{CAPM}{}_{y-m}$ = risk premium for industry y with respect to equity market m, where y refers to the relevant industry sample

$rp^{s}{}_{j}$ = size-based risk premium for risky asset j[17]

Application of the Risk Premium approach contains two potential pitfalls, as follows:

- the opportunity cost of common equity capital, stated in nominal terms, is sensitive to the demand for and supply of capital;
- risk premia among debt and equity instruments are also quite sensitive to expected inflation. Thus, Risk Premium analysis must account for expected inflation in the future. That is, the underlying rate of inflation and conditions

[17] Size-related risk premia are, as a general rule, relevant within the context of the Capital Asset Pricing Model. Specifically, the CAPM-based estimates of market returns appear to systematically understate the cost of equity capital for small-sized stocks. Size-related risk premia may not be relevant or appropriate in other model contexts.

of the historical period over which risk premia are estimated must match those of the expected conditions of the relevant period over which the common equity recommendation is being applied, and over which retail electricity prices are being set.

PART II: ANALYSIS OF COST OF CAPITAL

BUSINESS and FINANCIAL RISKS: BARBADOS LIGHT & POWER

Setting forth recommendations regarding the appropriate rate of return is not a mechanical model-driven result obtained in isolation. An understanding of business context to gauge capital risks is essential. Risk assessment should take account of the generic risks attending entities involved in energy markets and electricity service providers, as well as idiosyncratic risks associated with specific business context. Accordingly, analysis of the cost of capital, for purposes of setting the rate of return, should be fully informed and sensitive to the facts defining the relevant generic risks and the idiosyncratic risk profile of BLPC.

Generic business risks attending the cost of capital for electricity service providers are strongly interdependent and will be briefly mentioned. In the contemporary environment, electric utilities face rapidly rising costs at a time of general tightening of the supply-demand balance, ongoing advances in electricity demand, and rapidly heightened requirements for environmental compliance. Increased upward cost pressures, in turn, precipitate increased resistance to price increases and scrutiny by stakeholder groups of the prudency of utility resource decisions and the reasonableness of cost levels. Rising cost pressures are a particular concern for the Company in view of the surge in prices for primary fuels, driven in part by the sharp decline in the U.S. currency with respect to other major international currencies.

All too often, cost pressures from the perspective of investors and utility managers arise as a result of issues of timeliness of rate relief, and less than full recognition by regulators of legitimate costs. The end result is a shortfall of revenue with respect to cost levels, manifest as increased variation in operating income, lower interest coverage on debt, and earnings that may not cover investors' cost of capital.

BLPC is a comparatively small, full service integrated electric utility. On the basis of size alone, BLPC carries an element of risk additional to that of larger utilities

delivering the same full range of services. As discussed below at considerable length, empirical evidence suggests that, within the context of diversifiable financial risks defined by the CAPM framework, the cost of capital rises with small size. Essentially, all other factors constant, small capitalization equities have higher non-diversifiable risks than larger companies. Additionally, investors may harbor higher risks because of uncertainty of market valuation attributable to limited information.

As an island power system, the Company and its investors are exposed to special dimensions of risks relative to utilities in larger economies. Island electric power systems implicitly harbor higher operating risks. Specifically, BLPC cannot immediately draw upon neighboring power systems in the case of a major equipment failure for either high voltage transmission or for generation reserves. Accordingly, the Company must carry fairly high levels of reserves for generation services. Furthermore, small-sized electric systems enmeshed within larger continental power systems and markets can diversify generation operational risks and costs by carrying a comparatively large number of small-scale ownership shares in multiple facilities. In comparison, BLPC's physical stock of generation resources is relatively indivisible. Capital indivisibility of generation adds to operational risks in obvious ways. In addition, however, capital indivisibility implies that generation additions, which come about frequently in view of the fairly high rates of growth of Barbados' electricity demand, are brought to commercial operation in rather lumpy increments.

In the case of power delivery, the Company is not embedded in highly integrated meshed power systems of the major continents; other factors constant, the implicit level of reserves within power delivery for BLPC must be at higher levels with respect to its counterparts in Continental power systems. Moreover, BLPC is unilaterally exposed to the damaging impacts of large storm systems that, from time to time, can threaten Barbados and the Company's power delivery systems. While the Company is partially insured for these events of major magnitude, the possibility of such events precipitates technical and institutional uncertainty that translates into risk regarding the continuity of revenue and the future returns to capital. Similarly, fuel supplies for BLPC cannot be readily diversified across fuel types, multiple sources, and transportation modes, as they can for continental systems.

In summary, then, one must conclude that, from the perspective of investors, the Company is not readily able to diversify capital risks to the same degree as other utilities.

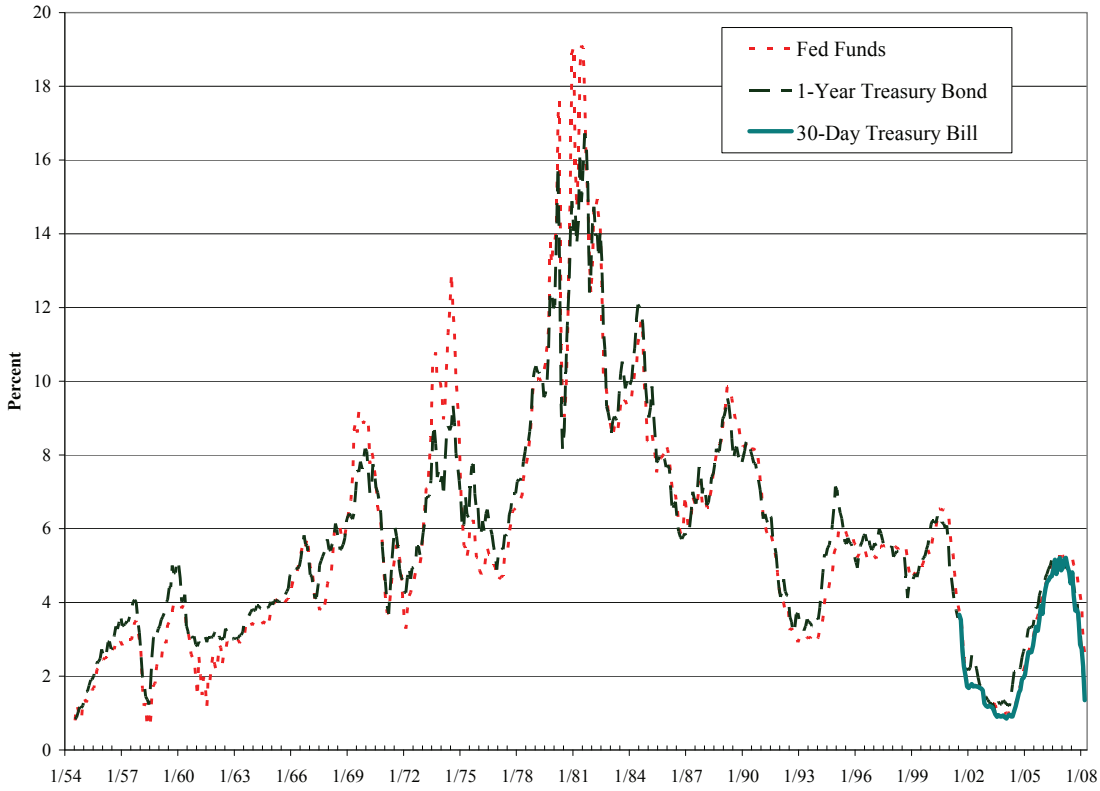
INTEREST RATES TRENDS

As mentioned earlier, long-term interest rates follow current and expected inflation to a substantial extent, whereas short-term interest rates are sensitive to both inflation and monetary policy geared to preserving real economic growth and stability. Indeed, a major international development during the mid-1990s has been much more disciplined money supply that has obtained a corresponding decline in worldwide inflation. Because less inflation is needed to compensate for the loss in purchasing power resulting from the escalation in money supply, interest rates have declined significantly.

In any case, it is useful to review the interest rate experience over both the long-term history and contemporary timeframes. Shown below are selected short- and long-term interest rates for the periods 1954 forward and 2000-2007. Short-term rates are represented by U.S. Fed Funds interest rates, and the yields for 30-Day treasury Bills and 1-Year Treasury Bills; and long-term rates are represented by the yields for AAA-rated corporate bonds, BAA-rated corporate bonds, 5-year U.S. Treasury Bonds, and 10-year Treasury Bonds.[18]

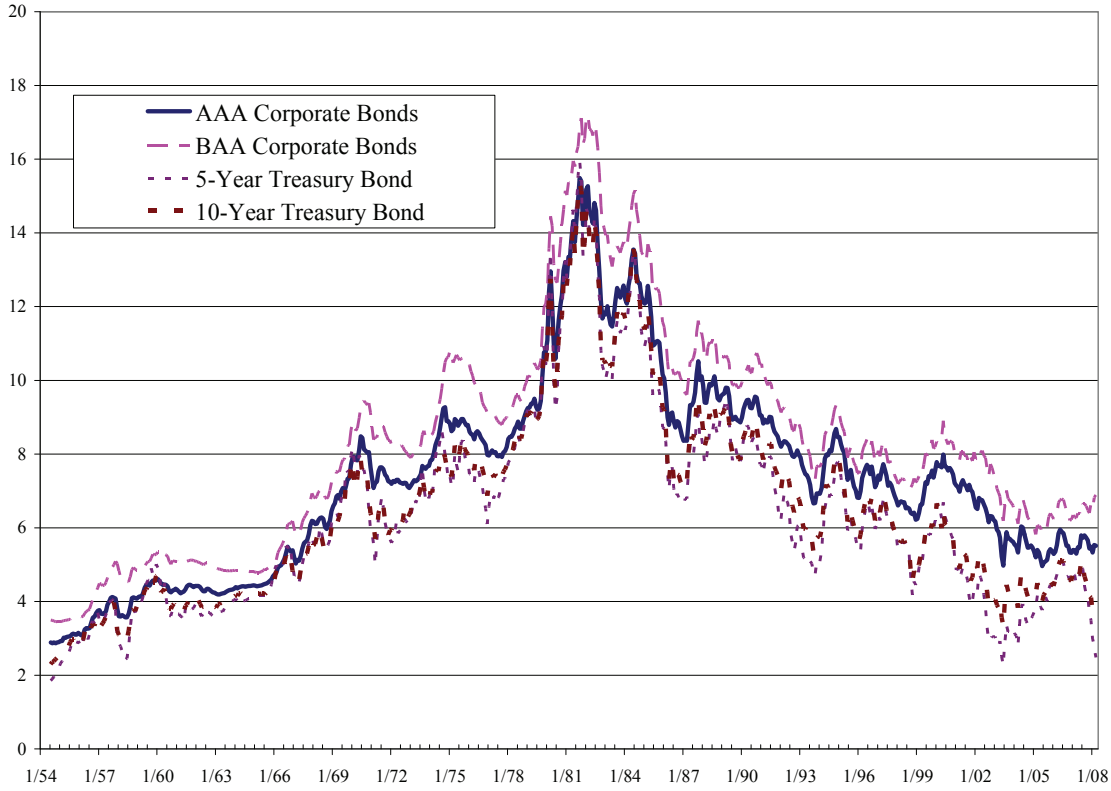
[18] There is a wide range of debt mediums—and thus interest rates—across U.S. financial markets, including prime rate commercial bank loans, rated and non-rated commercial paper, constant maturity U.S. Treasury bills and bonds, Fed Funds and London Interbank Offer Rate loans of various durations, corporate bonds including debenture and mortgage debt, municipal bonds, home mortgages including variable and fixed-rate loan vehicles, and a range of securitized debt referred to a structured finance.

SHORT-TERM U.S. INTEREST RATES, 1954 - 2007



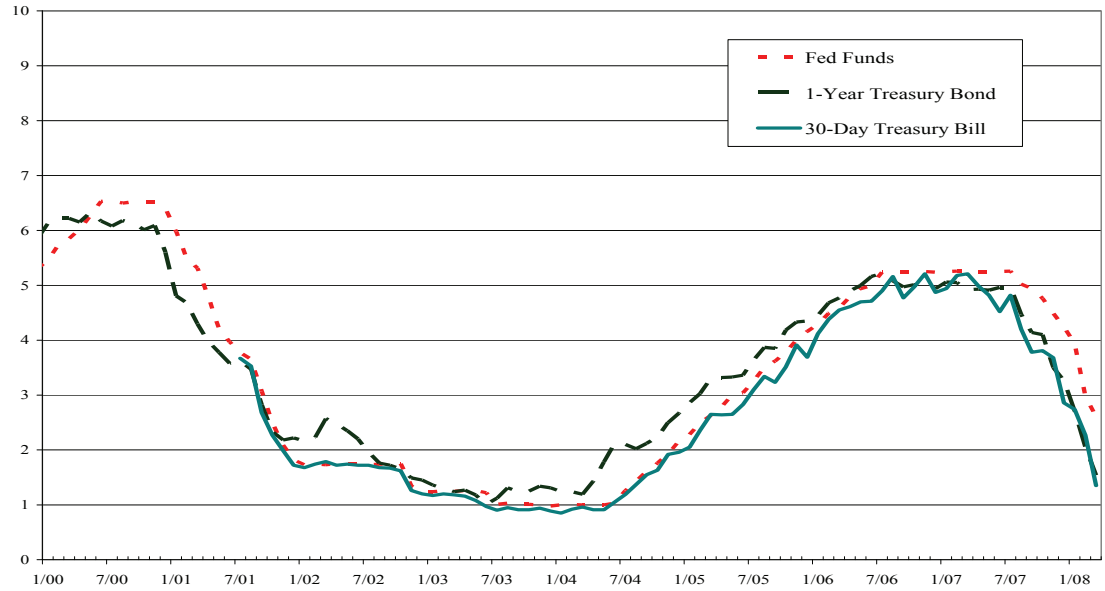
The remarkably low short-term interest rates at the beginning of the period, the mid-1950s, were a direct result of very low inflation. As can be observed, short-term interest rates prior to the early 1970s resided below 6% except for the notable but short-lived excursion of 1969-70. In the 1970s and continuing through the recession of 1990-91, the U.S. experienced substantially higher short-term rates, typically in the range of 8-10%, with the exception of the 1979-1983 timeframe, where short-term interest rates ran briefly above 16% during an environment of highly restrictive monetary policy geared to reduce the high inflation of the period. Not surprisingly, this era of U.S. monetary history was also an era of much higher inflation, particularly during the very late 1970s-1985, with gradual declines thereafter. From 1991 forward, however, short-term interest rates receded back to sub-6% levels.

LONG-TERM U.S. INTEREST RATES, 1954 - 2007



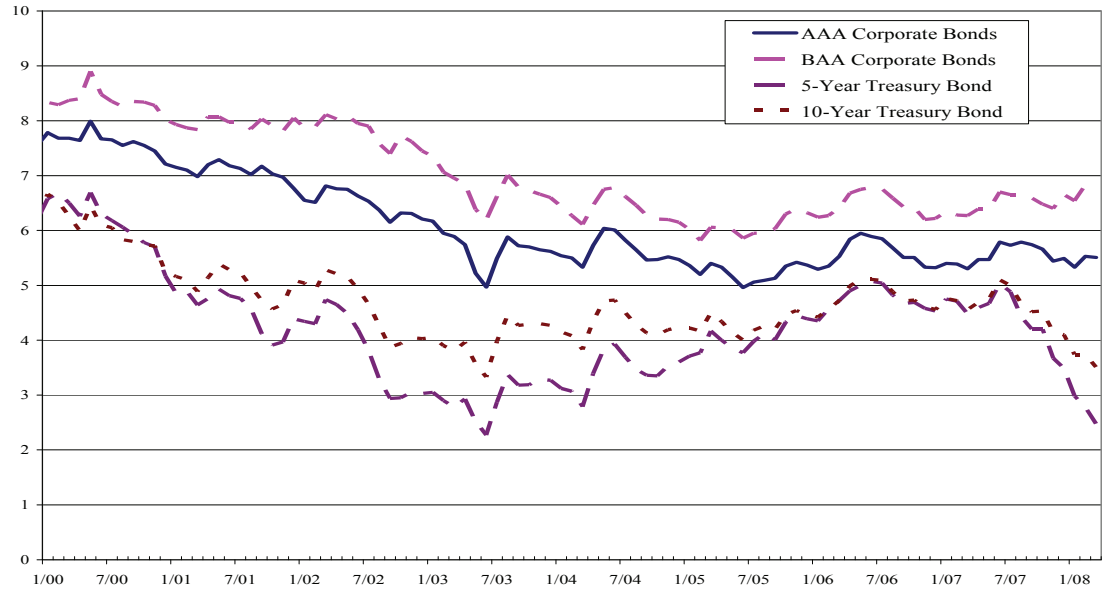
The pattern of long-term interest rates largely parallels that of short-term rates, as discussed above and shown in the previous graph. Not surprisingly, the interest rates on corporate debt consistently reside above those of U.S. Treasury debt. Most interesting, however, is the spread between corporate and treasury debt. The interest rate differences between corporate and treasury debt have increased significantly during the post-1991 period when compared to the period of comparable rates of inflation, 1954-1969.

SHORT-TERM U.S. INTEREST RATES, 2000 - 2007



Turning to the more contemporary period, two features are noteworthy. First, short-term interest rates, driven by expansionary monetary policy, dropped to unprecedented low rates of less than 2%, and remained at that level for the period 2002-2004. Second, beginning in late 2007, short-term rates declined precipitously, again driven by an accommodative monetary policy quickly implemented in response to the sudden decline the level of economic activity.

LONG-TERM U.S. INTEREST RATES, 2000 - 2007



The essential feature of long-term interest rates currently is the increase in the interest rate spread between corporate and U.S. treasury securities, particular for BAA bonds.

Whereas long-term treasury yields, following short-term interest rates, have declined by 1.5-2.5 percentage points since July 2007, corporate interest rates show little movement. Moreover, corporate BAA debt yields have risen, despite the general decline in interest rates, as a result of higher perceived default risks. No doubt, the relevant development occurring just recently within the U.S. and, to a lesser extent in international debt markets, is the sharply higher default risks associated with the structured financial vehicles (asset-based financing) of various types.

In the case of Canada, growth in real economic activity and productivity has assumed a general upward path since about 1991, commensurate with a gradual move favoring economic liberalization in the form of privatization and mitigation of regulatory burdens. In particular, the Bank of Canada has implemented more disciplined monetary policy that, in general, have resulted in reduced levels of inflation and corresponding decreases in short- and long-term interest rates, as revealed in the following table.[19]

CANADIAN TREASURY YIELDS (%)

Year	3-Month Bills	2-Year Bonds	10-Year Bonds
1982	13.7	12.9	13.7
1990	12.8	11.4	10.8
1991	8.7	8.8	9.4
1995	6.9	7.2	8.1
2000	5.5	5.9	5.9
2005	2.7	3.2	4.1

OVERALL EQUITY MARKET RETURNS AND RISK PREMIA

Market rates of return and equity risk premia are positively related to productivity and general economic performance. The economies of North America are fairly well positioned to realize and sustain substantial if not high rates of growth in productivity and real output, along with near full employment and modest inflation over the

[19] The historical interest rates shown for 2000 and 2005 confirm the risk-free Canadian cost rate of 4.64% (monthly, 2002-2006) utilized in the CAPM analysis for the Canadian samples 1 and 2, as discussed below.

foreseeable long-term future.[20] Investors generally share this consensus view and, accordingly, the analysis herein draws upon realized overall market rates of return and interest rates as representative surrogates for the near-term future, and over which retail prices are likely to be in place. The average percentage return for U.S. equity markets overall, as gauged by the S&P 500 index, was 12.8% from 1970 through 2006,[21] which is the period of representative levels productivity growth in view of future potential. The 12.8% overall market return level over 1970-2006 is used as the expected level of future returns to equity markets within the CAPM analysis for U.S. markets, with commensurate levels of market risk premia of 8.07%. Moreover, this longer-term experience is consistent with contemporary productivity levels and realized returns to equity markets. For the U.S. economy, the average rate of observed productivity growth for the period 1970 forward resides well within the range identified above, and covers a very slow-growth period—the late 1970s to early 1980s—and the high productivity growth of 1995 through 2003. Productivity growth appears in have receded somewhat in recent years from the exceptional levels obtained during '95-'03 timeframe. Given the relationship between market returns and productivity and other conducive factors, and because overall productivity growth over this timeframe is a reasonably close match to the expected range of productivity in the future (see Martin Baily, Dale Jorgenson) investors have reason to expect annual level of overall market returns to approach 11.5 to 13.0%. For U.S. equity markets, realized market returns for the period 1970 – 2006 comport well with realized market returns over extended periods, as shown below, with little change in sight.

[20] Generally speaking, Canadian productivity will likely remain slightly less than that of the U.S.

[21] Contemporary high rates of productivity growth were obtained through the widespread adoption of information technologies including computers, common communication and software platforms that facilitated efficient information transfer.

Total Market Returns through 2006		
Number of Years	Initial Year	Realized Historical Annual Return (%)
81	1926	12.30
70	1937	12.30
60	1947	13.20
50	1957	11.90
40	1967	12.30
30	1977	13.60
20	1987	13.00
10	1997	12.00
Average, '67-'07		12.7
Average, '77-'07		12.9

Similar reasoning—namely, the causal link of productivity growth to overall equity market returns and risk premia—leads to a Canadian risk premium of 6.63% over the relevant timeframe, 1991-2006. As alluded to in the above discussion, these levels of risk premia are consistent with the level of contemporary productivity growth and cost of capital for Canada[22], particularly when coupled to comparatively low levels of inflation and disciplined monetary policy—key contributing factors to realized equity market returns.

However, overall economic performance and long-term growth can be attenuated by events of a transitory nature and by various long-term processes that can contribute to capital risks such as the costs to maintain environmental quality, or world-wide cultural friction. An immediate example is the decline in credit market liquidity observed in recent weeks. Finally, it is important to mention the impact of government fiscal policy and global demand for capital on interest rates. As mentioned, the cost of capital is a function of the demand for and supply of funds, and we expect U.S. and world demand for capital to remain at high levels, thus placing steady upward pressure on interest rates. As a result, long-term interest rates are likely to remain at or near current levels, which are close to historical experience despite recent declines in short-term interest rates.

[22] This 16-year period experienced a market rate of return of 11.26%, which closely approximates the observed realized returns of 11.34% for the 2002-2006.

SELECTING COMPARABLE RISK COMPANIES: COST OF EQUITY

As defined by the "Bluefield" and "Hope" decisions of the U.S. Supreme Court, a public utility (to paraphrase), is entitled to a rate of return on shareholder capital committed for the convenience and necessity of the public equivalent to that realized by companies in other businesses of comparable risk. Thus, the task at hand is comparability: to identify the relevant markets, and to then select companies of comparable business, regulatory, and financial risks to those of BLPC. Estimates of the cost of equity are obtained by applying the cost of equity methods to the sample companies, with trading experience on the major exchanges of the North American Continent.

For several reasons, the study cannot readily draw upon, at a technical level, the capital market experience of utilities and companies in the Caribbean for purposes of capital valuation. The Caribbean exchange-traded capital markets, which effectively consist of the Exchanges for Barbados and for Trinidad and Tobago, have comparatively low levels of liquidity with shallow trading activity from which to estimate prospective market returns and risk premia. Second, the exchange listings contain few market-traded infrastructure entities from which to assemble a comparable risk utility sample – which is necessary in order to ensure that the study results conform to the Fair Rate of Return principles defined above. Third, the common stock trading experience of the Caribbean Exchanges is unusually thin, which would impose special analytical procedures on the study.

Accordingly, the study approach is to estimate the cost of equity for samples of utilities with equities that trade on the major exchanges of North America (U.S. and Canada), and to adjust the cost estimates for utilities of the Continent for the risk premium (cost rate difference) between Barbados and the Continent. An empirical estimate of the risk premium, which can be referred to as sovereignty risk, is detailed below in the section entitled *Cost of Equity Capital and Sovereignty Risk*. However, the sovereignty risk premium can also be gauged by comparing the expected real risk-free interest rate (rate of return) on the debt of the Central Banks of Barbados and the U.S., as shown in the following table.

RISK PREMIUM, BARBADOS (BB) WITH RESPECT TO U.S.

2005 Issues, Central Bank of Barbados		
Bond Issue Date	Bond Maturity Date	Coupon Interest Rate (%)
14-Feb	31-Mar-11	5.00
27-Jun	30-Jun-25	7.25
1-Sep	31-Mar-07	5.25
26-Sep	30-Sep-17	7.00
28-Nov	30-Sep-14	7.25
28-Dec	31-Dec-25	7.25
Risk Premium, Barbados with Respect to U.S.		
Interest Rates of BB Issues Maturing Beyond 2011		7.19%
2005 Inflation Rate, Barbados		3.86%
Implied Real Risk-Free Interest Rate, Barbados		3.32%
Interest Rate, U.S. 20-Year Bonds		4.65%
Expected Inflation, U.S.*		2.68%
Real Risk-Free Interest Rate (TIPS), U.S.		1.97%
Risk Premium, BB with respect to U.S.		1.36%

2008 Secondary Market Yields, Central Bank of Barbados		
Bond Issue Date	Bond Maturity Date	Expected Yield to Maturity (%)
Jun, '94 - Oct, '03	Oct, '18 - Oct, '20	6.75
Oct, '02 - Dec, '05	Oct, '22 - Mar, '30	7.46
Risk Premium, Barbados with Respect to U.S.		
Interest Rates of BB Issues Maturing Beyond 2017		7.10%
2007 Inflation, Proxy for Prospective Rate, Barbados		3.90%
Implied Real Risk-Free Interest Rate, Barbados		3.20%
Interest Rate, U.S. 20-Year Bonds		4.54%
Expected Inflation, U.S.*		2.54%
Real Risk-Free Interest Rate (TIPS), U.S.		2.00%
Risk Premium, BB with respect to U.S.		1.21%

* Difference Between U.S. 20-Year Constant Maturities and TIPS (Treasury Inflation Protected Securities) Interest Rates

The top half of the table provides an estimate of the risk premium for Barbados based on primary market issues by the Central Bank of Barbados in 2005, while the bottom

half uses yields on secondary market values to provide an update for conditions in 2008. (There are insufficient primary issues in 2008 for an exact replication of the top half of the table.) The risk premium for Barbados appears to be reasonably stable, at 1.36% in 2005 and 1.21% in 2008.

Nonetheless, the study draws on the universe of equities of the U.S. and Canadian capital markets as a starting point from which to select comparable risk utilities and companies. Once selected, we then estimate the cost of common equity for the sample(s) of comparable companies. A key distinction regarding comparability is market size. As recent empirical evidence convincingly demonstrates that, predominantly because of information inefficiencies and uncertainty, the cost of capital rises as firm size declines all other factors held constant.

For the samples of U.S. companies, we have drawn heavily—though not exclusively—from a set of data and information sources including Value Line data banks, Ibbotson Associates (Morningstar), and the web-based services of Yahoo Finance, UBS Financial Services, and Zacks Financial Services. With few exceptions, the equity shares of the sample are traded on the New York Stock Exchange and the NASDAQ exchange originating from the over-the-counter trading procedures put in place by the National Association of Securities Dealers in years past. For these equity listings, a wide range of financial data, business descriptions and classifications, historical price experience, and various diagnostic statistics of interest are reported. The sample of Canadian companies is drawn from utility companies listed on the Toronto Stock Exchange, referred to as TSX.[23]

From the U.S. market portfolio we proceed to develop two utility company samples and a comparable risk non-utility sample. The first sample, Mid-Sized Electric

[23] The equity listings of NYSE, NASDAQ, and TSX very clearly do not constitute the full set of investment possibilities. Indeed, some 75 stock exchanges currently exist worldwide. Arguably, some combination of the Morgan Stanley Capital Markets (MSCI) plus exchange indexes of the North American equity markets is a more complete representation, when assessing the performance of equity markets at a summary level, which is necessary in the case of CAPM, Risk Premium, and also Arbitrage Pricing Theory-based methods. However, the North American equity markets, as represented by the many listings on these three exchanges, are highly liquid. Accordingly, movements and performance of the indexes for the North American markets closely parallel movements of other world indexes, though differences are observed as a result of currency exchange rate movements, unanticipated random social and physical events within regions, and significant changes in expectations of economic performance. In addition, the North American markets, unlike worldwide exchanges, carry equity listings for numerous utility companies.

Utilities (U.S. sample 1) is limited to retail electricity service providers that have modest yet significant levels of market participation and, with the exception of size-related capital risks, are of comparable risk to that of BLPC. The second U.S. utility sample is referred to as the Moderate-Sized U.S. Gas Distribution Utilities (U.S. sample 2), and is composed of retail natural gas service providers. Our studies demonstrate that, as a practical matter, the level of capital risks and thus the opportunity cost of capital for the two samples, electric utilities and natural gas utilities, is comparable. For purposes of determining the equity rate of return requirements of BLPC, the study also draws a third U.S. sample, referred to as Comparable Risk Non-Utility Companies (U.S. sample 3). Our methods tend to demonstrate that, particularly within contemporary capital markets with high levels of international capital flows, comparable risk is the predominant selection criterion. Line of business appears to have only a modest level of relevance to cost of capital, once the comparable risk criteria are satisfied. Thus, samples can be drawn from a broad range of business fields, generally speaking.

The determination of the first sample, the mid-sized electric utilities, involves two steps. The first step is to conduct an initial screen according to the predefined selection criteria. As mentioned, these criteria are as follows:

- *Liquidity*: companies that are of modest size but yet have sufficient market presence and participation to ensure sufficient market activity and transaction volume;
- *Business Line*: companies whose primary business line is retail electricity services; and,
- *Reasonably consistent financial performance*.

To determine U.S. sample 1, the study begins with 42 modest-sized entities within the U.S. electric utility and electric energy companies. For cost of capital analysis, twenty electric utility companies are selected from this initial set, where the criteria for selection are completeness and consistency of reported financial information and

market data, and also electric utility services as the primary business line.[24] Some of these 20 electric companies have involvement in non-electric retail business lines including natural gas. It is virtually impossible these days to assemble a sample of companies that are exclusively in the retail electric business – sometimes referred to as a *pure play*. However, the U.S. electric utility sample is composed of entities that have a dominant share of business activity within electric power generation and delivery. This new diversity should not matter, at least on the surface, if the sample is determined on a basis of comparable risks. Indeed, endeavors to diversify risk over alternative business lines tend to reduce variation in earnings, variation in internal cash flow, and variation in market returns, thus reducing overall investment risk and the cost of capital.

From this set of 20 companies, eleven electric utilities are selected according to comparable risk criteria including. The second selection step in determining the electric utility sample applies risk criteria. These criteria include four dimensions, or metrics:

- *Equity Participation in Total Capital*;
- *Coefficient of Variation in Earnings* per share over five and ten years;
- *CAPM Beta* which, as discussed above, is the ratio of the covariation of the market returns of a specific stock of a company and the market as a whole, and the statistical variance of the returns of the market; and,
- *Variation in Market Returns*, which is measured as the coefficient of variation of monthly market prices—essentially, an index of volatility in market value (market capitalization).

Those eleven electric utility companies with risk metrics that generally fall within one standard deviation of the average for the sample of electric utilities as first drawn or are reasonably close to the metrics for BLPC are retained in U.S. sample one (mid-sized U.S. electric utilities). It is these utility companies that, by this arguably objective approach, satisfy the criteria of comparable risks and thus the U.S. Supreme Court guidelines regarding fair rate of return contained within the Bluefield

[24] The increased openness of U.S. electricity markets in recent years, including market entry as well as relaxation of financial restrictions, has resulted in an expanded range of business activity. Today, entities within the electricity services industry are, for example, involved in oil and gas exploration (MDU Resources), real estate (Pinnacle West), and significant non-electricity energy services (Integrys Energy). Arguably, Integrys Energy should be listed with the U.S. natural gas industry as it has substantial natural gas pipeline and distribution business lines in addition to two electric utility subsidiaries including Wisconsin Public Service ("WPS") and Upper Peninsula Power (UP Power).

Waterworks and Hope decisions. Tables at the end of Appendix III document the screening process.

The market capitalization of these companies, measured by common shares outstanding and market prices during 2006, ranges from $82 million for Florida Public Utilities Company to about $4.1 billion for SCANA (South Carolina Electric and Gas), stated in USD. The non-weighted average size of U.S. sample 1, the electric utilities, is about $1.8 billion USD.[25] CAPM Betas, arguably the most significant measure of capital risk, are shown in Appendix III in the adjusted form for 2006 and for 2002-2005 on average. In particular, CAPM Betas have risen over time, suggesting significantly increased capital risks associated with energy markets, including electric service providers.

The mean-variation *theory* on which the Capital Asset Pricing Model is based suggests that risk metrics other than CAPM Beta do not matter for the determination of portfolios that efficiently trade off risks and potential future return levels. However, empirical *evidence* suggests that: a) internal financial metrics such as items 1-3 above are also utilized by investors to value equities, and b) CAPM theory (as with other capital market theories) does not necessarily explain historical market returns particularly well. Thus, it appears that, to a substantial degree, information other than CAPM Beta is also relevant to investors in the valuation of equities.

Turning to the moderate-sized U.S. gas distribution utilities (U.S. sample 2) and the comparable risk non-utility companies (U.S. sample 3), the selection process proceeds in similar fashion using criteria equivalent to those employed to determine the U.S. mid-sized electric utility sample (U.S. sample 1). That is, a sample is first drawn on the bases of market liquidity and business line. The selected natural gas utilities and estimates of cost of equity for them are shown on Appendix IV. The initial set of natural gas utilities includes 27 entities that range from $55 million to 2.8 billion USD equity market capitalization in late 2007. From this initial draw,[26] 11 entities are initially selected and, through the application of the risk screen, 8 entities are

[25] Not shown but available are the compiled profiles of the sample utilities and non-utility companies, including brief reviews of the business, operating revenues, assets, and operating margins.

[26] The U.S. natural gas industry includes many regional and national distributors of liquid propane and specialty industrial gas products and services, such as Penn Octane Corporation, Suburban Propane Partners, and Continental Fuels Inc.

ultimately selected for use in the immediate cost of capital study. As with the U.S. electric utilities sample, these companies, although of comparatively modest scale by U.S. benchmarks, are all significantly larger than BLPC, which implies that BLPC has higher capital costs, holding other factors constant. In view of BLPC's business context, the Company appropriately underwrites its assets with higher equity participation than its U.S. counterparts.

The sample of comparable risk non-utility companies is drawn from U.S. non-utility economic sectors. The initial selection criteria were equity market capitalization of less than $750 million USD, equity participation in total capital of less than 0.80, CAPM Beta range of 0.40-1.00, and public domain financial data for ten years. These criteria resulted in the selection of 84 entities from well over 3,000 U.S. exchange-listed firms, where the selected firms include food markets, pipe manufacturing, financial services, health services, and a military equipment manufacturer. The application of a random selection procedure culled 27 entities[27] from the set of 84, and ultimately provided 24 entities ranging from $70 to $575 million USD equity market capitalization. The second selection screen—equity participation, CAPM beta, variation in market returns, and variation in earnings per share (internal business risk)—obtain 20 companies that together constitute the comparable risk non-utilities (U.S. sample 3). Appendix V presents the full data set for these companies.

While the U.S. sample 3 companies have similar overall risk levels to that of the U.S. electric and gas utilities, differences exist across the three samples for individual risk criteria. For example, the non-utility companies have, on average, equity participation of 70%, CAPM beta of 0.72, variation in annual market returns of 5.94%, and coefficient of variation (CV) in earnings per share of 0.37 and 0.45 for 5- and 10-years, respectively. The corresponding values for the electric utility samples are 49% equity participation, CAPM beta of 0.80, 4.00% variation in market returns, and CV in earnings per share ranging from 0.16 to 0.19. The "Selection Screen 2" Tables of Appendices V and III, respectively, present the full results.

[27] It should be mentioned that incomplete or anomalous financial data, as reported, caused some randomly selected entities to be substituted with other entities from a nearby location within the total list of 84 entities.

The Canadian utilities, including samples 1 and 2, cover Toronto Stock Exchange-listed entities that are classified by the Exchange as utilities. The utility category covers private companies that provide a fairly broad range of infrastructure services including telecommunications, rail transportation, renewable energy, natural gas distribution, power generation, and gas transmission services, in addition to conventional integrated electricity services. Implicitly, this broad range of business and market context appears to imply, for some entities within the category, higher business and operational risks than typical U.S. electric and gas utilities. Accordingly, special caution is used in sample selection. Because of the limits in readily available financial information[28], and because the TSX-listed utility entities are comparatively few, the analysis of the Canadian utilities proceeds differently and is less comprehensive than the analysis performed for U.S. samples 1-3. Moreover, the formal selection procedures discussed above are unfortunately not directly applicable to Canada because of the small number of entities listed as utilities.

While some 22 companies are listed as utilities on TSX, half fall out of the selection process because of high-risk business context, uncertain financial performance, or because of high financial market risks, (as measured by CAPM beta). Examples of TSX-listed utilities excluded from the cost of capital study are Great Lakes Hydro (sudden, large decline in earnings), Algonquin Power Income Fund (specialized interest in renewable resources), EPCOR Power equity (holds EPCOR Power; negative earnings), Tellus Corporation (very high CAPM beta), Boralex Inc. (very high CAPM beta; power generation including hydro, wind, biomass, and natural gas cogeneration), ALTEK Power (independent power producer listed on TSX Venture), and Sierra Geothermal.

The result of the selection process is 11 Canadian utilities. Canadian sample 1 consists of conventional electric and gas utilities, whereas Canadian sample 2 consists

[28] Financial data reported by U.S. companies listed on the major U.S. equity markets including NYSE and NASDAQ are reported by the listed entities to the Securities and Exchange Commission ("SEC"). By law, the SEC imposes highly specific financial reporting standards. These data, in turn, are compiled by several financial services companies including Compustat, Value Line, Bloomberg, and others. Thus, compiled financial and equity market information can be readily obtained in non-compiled form directly from the SEC or in a compiled form from services such as these. This is not the case for Canadian companies. While compiled financial information is available through SEDAR, such data are much less complete, thus burdening valuation studies such as this with obtaining financial data in non-compiled form from the web sites of the entities of interest, and by other means.

of longstanding and consistently performing utility entities of moderate market risks in pipeline, rail transport, power generation, and telecommunication business lines. Unfortunately, the entities are comparatively large on average, and vary greatly in equity market capitalization. Specifically, the average size of Canadian sample 1 is $6.0 billion CND with a corresponding range of $15.7 to 1.7 billion, whereas the average size of Canadian sample 2 is $4.7 billion CND with a range from $65.5 million to $19.9 billion. The comparatively large size of the Canadian utilities makes the point of the necessity of incorporating size-related risk premia within the immediate cost of equity study.

In summary, the estimate of the cost of equity capital of this study involves five samples, including the three U.S. samples—the mid-sized U.S. electric utilities (U.S. sample 1), U.S. gas distribution utilities (U.S. sample 2), and comparable risk non-utility companies (U.S. sample 3); and the two samples of the Canadian utilities (CN samples 1 and 2). The estimate of the cost of capital, and thus the recommended return on common equity, is reflected as an interest rate that, by objective criteria of comparable risks, is the opportunity cost of capital incurred by the common shareholders of BLPC.

Market Liquidity is a necessary selection criterion, as stated above. The selection process results in generally smaller-sized electric and gas utilities that have sufficient liquidity. However, the selected utility companies are substantially larger than BLPC as a general rule. Because the cost of equity capital appears to increase progressively with smaller size, other factors constant, the implication is that the cost of equity capital, as estimated for the two samples, may not fully capture the inherent capital risks incurred by investors of BLPC. The topic of size-related risk premia is discussed more fully in the following section.

EMPIRICAL FINDINGS, COST OF EQUITY

This section presents the results of the analysis of the cost of equity capital appropriate for the determination of the return on equity for BLPC. The first step is to apply the four methods to estimation of cost for the comparable risk peer groups of BLPC. However, it is difficult to create a peer group for BLPC due to its small size relative to other companies. Because evidence suggests that the cost of capital rises

progressively with smaller-sized entities,[29] the cost of equity estimates derived from the analysis of the peer groups will be systematically low. Also, the estimation procedures, including the selection of the comparable risk peer groups, do not explicitly take account of business context differences—in particular, the isolation associated with the Company's island power system. This analysis explicitly estimates the likely range of sovereignty risk, which is incorporated into the cost of equity capital recommendation.

Peer Group Estimates of the Cost of Equity

The analysis draws on recent and long-term historical experience as the basis to determine the cost of equity capital, which incorporates capital risks and future prospects for capital returns. While estimates of the cost of capital are inherently forward looking, the process of estimation draws upon historical assessments of risk and the future prospects for market returns—essentially, the realized returns to investors and savers, as holders of property rights claims to capital in the form of financial assets. The tables below summarize the analysis conducted using the four approaches for the U.S. and Canadian[30] utilities and U.S. comparable risk non-utility companies. Details appear in Appendices III-VI at the end of the report.

[29] Size-related risk premia, within the context of CAPM analysis, are reflected in higher levels of CAPM Beta with progressively smaller entities. This empirical result is expected. However, it appears that CAPM Beta for smaller capitalization entities, though higher, systematically understates realized historical returns. This second component of the size premium is explicitly recognized in the Risk Premium cost of equity approach used in this study.

[30] The study does not apply the discounted cash flow ("DCF") methodology to the two samples of Canadian utilities because of the limits of reported financial data for a sufficiently long historical period. DCF is also not applied to the U.S. comparable risk non-utility sample because of non-applicability, in view of the sparse dividend experience of the sample, which is non uncommon for non-utility companies.

DISCOUNTED CASH FLOW ANALYSIS: U.S. Utilities

Mid-Sized Electric Utilities (U.S. sample 1)		
Estimated Cost of Equity (%)	**Dividend Yield (%)**	**Expected Growth In Cash Flows (%)**
10.32	4.66	5.66
Gas Distribution Utilities (U.S. sample 2)		
Estimated Cost of Equity (%)	**Dividend Yield (%)**	**Expected Growth In Cash Flows (%)**
10.86	3.38	7.49

CAPM ANALYSIS: Canadian, U.S. Utilities and Non-Utility Companies

Peer Group Samples	Estimated Cost of Equity (%)	Estimated Future Risk Free Rate (%)	CAPM Beta	Estimated Overall Market Risk Premia (%)
Canadian Utility Sample 1	10.39	4.64	0.87	6.63
Canadian Utility Sample 2	10.60	4.64	0.90	6.63
U.S. Mid-Sized Electric Utilities (U.S. sample 1)	11.28	4.73	0.81	8.07
U.S. Natural Gas Distribution Utilities (U.S. sample 2)	11.32	4.73	0.82	8.07
U.S. Comparable Risk Non-Utility Companies (U.S. sample 3)	10.35	4.73	0.70	8.07

COMPARABLE EARNINGS[31] (Historical Market Returns_)

Peer Group Samples	Realized Returns (%)
Canadian TSX Listed Utilities (sample 1)	13.36
Canadian TSX Listed Utilities (sample 2)	16.07
Mid-Sized Electric Utilities (U.S. sample 1)	10.41
Gas Distribution Utilities (U.S. sample 2)	9.34
Comparable Risk Non-Utility Companies (U.S. sample 3)	10.75

RISK PREMIUM ANALYSIS: U.S. Utilities and Non-Utility Companies

Peer Group Samples	Estimated Cost of Equity (%)
Mid-Sized Electric Utilities (U.S. sample 1)	12.07
Gas Distribution Utilities (U.S. sample 2)	12.12
Comparable Risk Non-Utility Companies (U.S. sample 3)	12.71

The estimates of cost of equity capital using single-stage DCF analysis for each of U.S. samples 1 and 2 are quite similar: 10.32% for the sample of U.S. mid-sized electric utilities and 10.86% for the sample of U.S. moderate-sized gas distribution utilities.[32] The dividend yields of the DCF analysis utilize the stated dividend rates observed during early- to mid-2007, and stock prices sampled during April-May of 2007. The DCF cost of equity results for the electric utilities reflect the slowdown in earnings and cash flow growth during 2005 and continuing in 2006, which is largely a result of rising input costs, particularly for new investment, that is not being recovered in current rates. Expected growth relies on the historical experience for both internal cash flow and earnings per share.

[31] *Comparable Earnings* in the context of market-based assessment of realized returns is referred to as *Historical Market Returns* elsewhere in the report including the Appendices.

[32] The three-stage DCF model results are similar in magnitude and are thus not reported.

The *CAPM* cost of capital results utilize estimated betas for two samples of Canadian utilities, which are based on the period 2002 forward and estimated monthly.[33] In the case of the samples of U.S. companies, including utilities and non-utilities, the CAPM analyses are based on and utilize Valueline estimates of CAPM betas, which are estimated on a weekly frequency over a 60-month period. Both the Canadian and U.S. CAPM analyses incorporate the Blume adjustment for long-run central tendency of betas to evolve toward unity.[34] All U.S. samples draw upon more contemporary betas, as estimated over the 60-month period ending in 2006, as it appears that the underlying market risks of electric and gas utilities have risen somewhat in the contemporary period. In addition, betas are also shown as for a five-year average of rolling averages for successive five-year periods ending 2002 (1998-2002); 2003 (1999-2003); and so forth. The CAPM analysis of the non-utility U.S. companies also utilize betas for the period ending 2006, in view of the significant difference in the typical 2006-ending beta value with reference to the rolling average.

As can be seen in the attached Appendices, the forward-looking risk-free or riskless cost rates used within the CAPM framework are not consistently drawn. In the case of the Canadian CAPM analysis of the cost of equity, the risk-free rate is set at the observed yields for the benchmark 10-year issues on Canadian government bonds for the period 2002-2006 of 4.64%. This recent, historically observed value[35] closely conforms to the recorded yields for the benchmark 10-year Canadian government bonds for mid-2007, 4.60%, which is the timeframe in which the cost of equity capital is estimated.

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[33] The analysis that obtains CAPM Betas for the Canadian utilities utilizes monthly yields on intermediate-term Canadian government debt as the surrogate for the risk-free rate. These yields are used for the determination of the historical risk premia for estimation of CAPM Betas. However, these yields are only an approximation to the market returns on risk-free asset which, to be precise, include both the flow of interest income as well as *ex post* market appreciation (or loss should bond prices decline over the course of the month).

[34] The so-called Blume methodology derives from the work of Marshall Blume, as first presented in the article, "On the Assessment of Risk," *Journal of Finance*, Vol. 26, 1971. The alternative approach to adjust the estimated raw Betas is the so-called Vasicek technique, as proposed by O.A. Vasicek in "A Note on Using Cross-Sectional Information in Bayesian Estimation of Security Betas," *Journal of Finance,* vol. 28, 1973. Generally speaking, the Vasicek approach is considered the preferred methodology though considerable information is required for implementation. Commercial financial services including Bloomberg, Compustat and Valueline, utilize the Blume approach, whereas Ibbotson Associates employs the Vasicek correction method.

[35] It is useful to note that the yields on Canadian long-term debt declined dramatically in 2002 from the previous two years (5.84% for 2000 and 10.88% for 2001).

For the U.S.-based analysis, the study also utilizes 10-year yields on U.S. government bonds recorded for recent years (2000–2006). For intermediate term bonds, the monthly average yields over these contemporary years, 4.73%, appear to match fairly well with investor expectations during mid-year 2007, with observed 10-year yields of 5.00% and 5.10% for June and July, respectively. Accordingly, this value (4.73%) serves well as a historically-based risk-free cost rate for the CAPM analysis for the three U.S. samples. Nonetheless, this bond yield level resides at about 85 basis points above current 10-year government bond yields, in view of the recent sharp decline in interest rates since December 2007. For reference, the 2006 inflation-indexed U.S. long-term government bond yield resides at 2.53%, suggesting an expected 2.5% rate of overall price inflation (5.00% or 5.10% minus 2.53%) for the U.S., which is best captured historically by the chain-weighted gross domestic product (GDP) price deflator.

When applied to the Canadian and U.S. samples, the CAPM analysis obtains similar results, with the cost of equity estimates ranging from 10.35% for the Comparable Risk Non-Utilities (U.S. sample 3) to 11.32% for the U.S gas distribution utilities (U.S. sample 2. The corresponding CAPM results for the Canadian samples 1 and 2 are 10.39% and 10.60%, respectively.

The *Comparable Earnings* (Historical Returns) approach of our overall framework for estimation of cost of equity capital is in keeping with a market-based analysis. As a matter of interpretation, the Comparable Earnings approach, otherwise known as Historical Market Returns, provides the only relevant basis for determining the realized returns to capital. To a substantial extent, history is the basis upon which investors form expectations. In fact, the historical market returns interpretation of the Comparable Earnings basis is well founded by empirical evidence of capital market experience. For this reason, we draw upon the historical market returns realized by the four samples of Canadian and U.S. utilities as well as the U.S. comparable risk non-utility companies (U.S. sample 3). The realized market returns generally conform to the forward-looking estimates of cost of capital, including DCF, CAPM, and Risk Premium, where the reported realized returns range from 9.34% for Moderate-Sized U.S. Gas Distribution Utilities (U.S. sample 2) to 13.36% for Canadian sample 1. The realized historical returns for Canadian sample 2 appear to

be unusually high (16.07%) and may overstate the cost of equity capital if accepted in isolation of the valuation results for the other methods and samples. Accordingly, the cost of capital study results reported here do not incorporate Canadian sample 2 realized historical returns. These results do not require explanation, though we wish to mention that the historical returns shown in the Appendices incorporate the combined impact of realized dividends as well market appreciation.

Finally, we wish to note that the interpretation of Comparable Earnings as either book returns to capital or authorized returns, as is so often the case, constitutes a clear example of circular reasoning, where regulators set authorized returns on a basis of book returns set by others. This results in book returns potentially departing from the underlying cost of capital by substantial margins. Thus, we suggest that the Fair Trading Commission, in its deliberation of return on equity employ reasonable caution in referring to realized book returns on equity as surrogates for estimates of the cost of equity, for the determination of the rate-of-return level for BLPC.

The *Risk Premium* approach to valuation draws upon observed historical risk premia across realized market returns for classes of debt and equity vehicles. Risk premia can be calculated in many ways. The analyses, here, draw upon the risk premia reported and published by Ibbotson Associates. The analyses suggest that efficient capital markets demand substantially higher market rates of return on equity vis-à-vis debt of various terms. Specifically, equity risk premia are reported with respect to short-, intermediate-, and long-term government debt. We summarize risk premia in selected pages of Appendices III-V.

Cost of Equity Capital and Firm Size

It is worth noting that extensive analysis of realized returns within U.S. equity markets reveals that progressively higher equity risk premia—and, thus, cost of capital—attend small-sized companies, particularly for micro-sized companies like BLPC. For this reason, our estimated cost of capital results and rate of return recommendations are conservative and, in fact, may understate the underlying cost of capital for BLPC.

Risk premia associated with small size, sometimes referred to as small capitalization risk premia, reflect intuition, well established principles that serve as the foundation

of finance theory, and the observed realities of capital markets. First, ordinary common sense would lead one to recognize that small entities face higher business risks than large entities. Higher risks attending small size come about from the principle of large numbers. Specifically, the financial impacts of random business events, which occur over the course of business enterprise, cannot be diversified by small entities as well as by large entities. Essentially, the impacts of business events within larger enterprises get absorbed within a pool of other events, both positive and negative, with the result that such events are substantially muted in their total impacts on the financial results of the enterprise.

The intuitive idea of diversification of business activity is reflected in portfolio theory. In this regard, the larger entity can be viewed as, essentially, a larger portfolio of individual business activities with the attending diversification effects, providing that individual business activities have less than perfect correlation.

Capital markets reveal that, among other factors, the variability of the returns to capital, reflected as operating income, will typically be higher for smaller entities than larger entities. Second, historical market returns for entities with smaller market capitalization will have higher variation than for entities with higher capitalization levels. Within the context of CAPM theory, the core of modern finance theory, the relevant and well known measure of risk is the covariation of market returns of individual equities with the market as a whole, normalized by the variance of the overall market, referred to as CAPM Beta. Insofar as this notion of risk—*i.e.*, systematic risk—is the only relevant measure of risk given optimal portfolio theory, competitive capital markets would ensure that equities are priced at levels such that the realized market returns of individual equities would be ordered according to CAPM Betas.

Essentially, CAPM theory would then suggest that, to the degree that the higher risks of small capitalization entities can be diversified—*i.e.*, are non-systematic—CAPM Betas would still reflect the most relevant risks. To the degree that higher risks of small capitalization entities cannot be fully diversified—*i.e.*, are systematic—higher risks are reflected in higher CAPM Betas.

Empirical evidence suggests that while CAPM Betas are typically higher for smaller-sized equities, CAPM Betas do not fully explain the higher realized market returns of small capitalization entities. Indeed, a substantial body of evidence suggests that CAPM underestimates—and thus understates—historical market returns of small firms. In one interpretation, the difference between the realized market returns of small capitalization firms and the estimated market returns under CAPM constitutes the small-capitalization risk premium. A second interpretation is that, after accounting for various factors, it appears that size, as reflected in capitalization, is inversely related to historical market returns and that the relationship is systematic – both repeatable and non-random. The magnitude of small capitalization risk premium is large, as best demonstrated by the published analytical work of Ibbotson Associates, Eugene Fama and Kenneth French, Banz, Kaplan, and Roger Ibbotson. In the latest published work, the analyses of Ibbotson Associates[36] demonstrate that for entities organized into deciles according to capitalization, as a measure of size, size-related risk premia not captured by CAPM Beta assume the magnitudes presented in the table below.

SIZE-RELATED RISK PREMIA IN EXCESS OF CAPM[37]

Size Decile	Size-Related Risk Premium (%)
1	-0.36
2	0.65
3	0.81
4	1.03
5	1.45
6	1.67
7	1.62
8	2.28
9	2.70
10	6.27

[36] *SBBI Valuation Edition Yearbook* by Ibbotson Associates, 2007.

[37] The deciles organize equities into capitalization groups, where the largest entities are within Decile 1, and the smallest entities are within Decile 10.

It is useful to mention that, as reported, Decile 9 includes entities with market capitalization of $265.1-$586.4 million, while Decile 10 includes entities with market capitalization of $1.1-265.0 million. Recent studies by Ibbotson Associates have further segmented Decile 10 into larger and smaller entities, with results that confirm the pattern shown above, with the smaller group of entities within Decile 10 demonstrating very high size-related premia not captured within CAPM Beta. Excess market return (and cost of equity capital) not captured by CAPM—*i.e.*, size-related risk premium—appears to rise with progressively smaller sized entities. In addition, size premia are specific to industry and, generally speaking, we can infer that the size premium for electric utilities is somewhat smaller than for other industries. For the U.S. samples 1 and 2, industry-specific size-related risk premia are utilized in the study, though the industries are rather broadly defined.

CAPM theory, when used in isolation from other valuation methods, can be challenged for a number of reasons that warrant consideration for purposes of setting the rate of return for BLPC. In terms of size-related risk premia, the reasons for the understatement of market returns by CAPM for small-sized entities are perhaps not widely understood at this time. Our general view, however, is that, for small entities, the cost of acquiring information regarding the prospects for future returns and assessment of risks is unusually high. Because the acquisition of information is costly, less information and knowledge within the investment community about small entities is available. Hence, investors with positions in small entities inherently incur higher risks. For small-sized entities, higher returns are thus the compensation for the assumption of higher risks. It is useful to emphasize that CAPM over long timeframes does reveal higher risk premia and cost rates for smaller entities. However, and as discussed here evidence also suggests that CAPM systematically understates risk premia, and thus the cost of capital, attending comparatively small sized equity listings. The study's Risk Premium analysis, which is based on the CAPM framework and explicitly incorporates sized-related risk premia not captured by CAPM Beta, is incorporated into the analysis for the three U.S. samples, and finds that the cost of equity capital ranges from 12.07% to 12.71%. The size premium not captured by CAPM included within this range is estimated at a level of 1.20-1.60% for both the U.S. electric utilities (U.S. sample 1) and U.S. gas utilities (U.S. sample

2), and 1.90-3.90% for comparable risk non-utility companies (U.S. sample 3).[38] Size-related premia have been extensively studied, for U.S. equity markets, and have also been shown to be present within equity market experience, internationally.

Cost of Equity Capital and Sovereignty Risk

The estimates for the cost of equity above do not incorporate any allowance for sovereignty risks. As we have discussed, sovereignty risk refers to risk differences of financial assets sourced across various sovereign countries. Such risks are relevant to the outstanding debt of public and private entities and common stocks that are traded either on exchanges of emerging economies. Sovereignty risks are also relevant to over-the-counter traded securities. To better understand and estimate country risks, the study employs two general methods, referred to as *Credit Score Differences* and *Relative Risks of Equity Market Returns*. The first approach, *Credit Score Differences*, utilizes the surveys of securities traders involved in the assessment of financial markets of global capital markets. The second approach, *Relative Risks of Equity Market Returns* is based on the relative risks (statistical variance or standard deviation) of historical market returns for exchanges of emerging nations, with respect to exchange indexes of developed markets such as the U.S. NYSE Composite or S&P500 equity market indexes.

The *Credit Score Differences* utilizes the 2007 survey of credit scores conducted by *Institutional Investor*,[39] where the survey-based study results in credit scores of countries, with 174 countries included in the survey.[40] The approach estimates the statistical relationship between observed real interest rates among countries and the survey-based credit scores. Once estimated, the statistical relationship is then used as the basis to estimate the likely difference in short-term real interest rates (risk premium) that results from credit score differences, where the U.S. or a group of developed countries with high credit ratings serve as the benchmark.

[38] For the industry segment grouping that includes electric utilities, Ibbotson Associates reports a size premium of 3.20% for small entities relative to large. However, this level incorporates a premium that is captured by CAPM Beta although the effects are very small. Second, this size premium level is for a fairly heterogeneous industry group.

[39] Institutional Investor conducts its survey semi-annually.

[40] A similar approach would be to utilize the credit ratings assigned by risk assessment and credit rating service entities, such as Moody's, S&P, and Fitch. The credit ratings would need to assigned numeric values that are then used as the basis to gauge real interest rate differences.

The credit rating scores range up to a potential score of 100. Worldwide, Switzerland earns the highest survey-based credit score of 96.40, with the lowest score of 4.70 assigned to Somalia. The *Institutional Investor* survey-based credit scores are shown below for selected countries, including Barbados and several neighboring countries.

The study covers all sovereignties for which positive real short-term interest rates are reported. Of this sample of 73 countries, the statistical analysis is conducted on credit score and interest rate data for 55 counties with credit scores no less than 40.00, with Nigeria having the lowest included credit score. The analysis is conducted using two sets of data, including 1) individual country credit scores and real short-term interest rates, and 2) 10-observation averages of credit scores and interest rates. The analysis results suggest that short-term real interest rates rise by 4.1 to 4.8 basis points for each 1.0 point decline in credit score. With the U.S. serving as the benchmark low credit risk country (credit score 94.10), the estimated sovereignty risk premium for Barbados is from 1.25% to 1.48%. Using the average credit scores for selected Caribbean neighbors of Barbados including Bahamas, Trinidad & Tobago, and Jamaica, the analysis obtains an implied level of sovereignty risk premium for the group ranging from 1.45% to 1.72%.

The *Relative Risks of Market Returns* analysis is based on annual market indexes for three Caribbean stock exchanges including those for Barbados, Trinidad & Tobago, and Jamaica. Of the Caribbean exchanges, the Barbados Stock Exchange has the longest history, with its composite index reaching back to 1989. The index for the Trinidad and Tobago stock exchange is available from 1997, while the index for the Jamaican Stock Exchange is available from 2001. The S&P 500 index is used as the benchmark exchange index in view of its market capitalization and because of its wide recognition as an overall indicator of market performance. The analysis calculates annual market returns for the stock market indexes (without recognition of dividends), and the statistical variance of market returns, as shown below.

(see following page)

ANNUAL MARKET RETURNS FOR CARIBBEAN STOCK EXCHANGES[41]

Year	Barbados Stock Exchange	Jamaican Stock Exchange	Trinidad & Tobago Stock Exchange	S&P 500 Index
1990	-13.24%			-6.56%
1991	1.58%			26.31%
1992	-15.37%			4.46%
1993	19.92%			7.06%
1994	6.28%			-1.54%
1995	-5.38%			34.11%
1996	-0.03%			20.26%
1997	50.52%			31.01%
1998	47.58%		23.86%	26.67%
1999	-8.37%		-4.32%	19.53%
2000	-14.23%		5.76%	-10.14%
2001	-6.25%		-1.66%	-13.04%
2002	10.55%	34.21%	25.65%	-23.37%
2003	29.04%	48.88%	27.23%	26.38%
2004	26.36%	66.68%	54.82%	8.99%
2005	5.83%	-7.23%	-0.68%	3.00%
2006	-6.77%	-3.67%	-9.20%	13.62%
Cumulative Realized Historical Returns	5.82%	24.38%	11.90%	8.52%
STATISTICAL VARIATION IN MARKET RETURNS				
1990 - 2006	20.57%			16.94%
1998 - 2006			20.84%	18.0%
2002 - 2006		32.46%		18.4%

As expected, the Caribbean exchanges reveal substantially higher risks (variation of realized returns) than U.S. equity markets, as represented by the S&P 500 index.

Estimates of sovereignty risks constitute real capital cost differences, and are implicitly present in the differences in *ex ante* equity market returns between the Caribbean region and U.S. markets, as reflected in, for example, the S&P 500 index. On average, risk premia with respect to intermediate term debt for the S&P 500 index

[41] While the Jamaican Stock Exchange is shown above, the study does not utilize experience from the Jamaican exchange because of insufficient history from which to estimate relative risks.

have ranged from 5.5% to over 8.0% for the period 1970 forward. Using values of 6.0% and 8.0%, the incremental risk premium associated with the Barbados Stock Exchange is equal to (20.57%/16.94% -1)*(6.0 to 8.0)%, or 1.12% to 1.72%. Incorporating the experience of the Trinidad & Tobago Stock Exchange into the analysis yields a similar level of 1.29%-1.49%.

In summary, the Credit Score Differences and Relative Risks of Equity Market Returns obtain a sovereignty risk premium for Barbados ranging from 1.12% to 1.72%, with an average value of 1.43%.[42]

Analysis Summary

The cost of equity studies described above draw upon the cost of capital tool box and provide reliable and well-grouped estimates for return on equity. The cost of equity estimates result from the application of the valuation methods to two Canadian utility samples and three U.S. samples including two groups of utilities and a group of comparable risk non-utility companies. The results range from 8.65% to 11.51%, notwithstanding the exceptionally high Historical Market Returns (Comparable Earnings) realized for the Canadian utilities, sample 2.

These comparable risk peer group estimates of the cost of equity likely understate BLPC's cost of equity for several reasons. It is essential that several factors not incorporated directly into the cost of equity capital studies, as reviewed above, be presented and fully accounted for, as follows:

- *Issuance Costs*: The analyses do not incorporate issuance costs which, for very small entities, are likely to be upwards of 7.00-9.00% of the realized proceeds from the sale of equity securities in order to cover registration fees, audit fees, and the charges for underwriting and marketing the securities. Recognition of issuance costs typically translates into approximately 30-40 basis points. Only a portion of the incremental equity capital of Barbados Light and Power is likely to be obtained from external sources[43]—*i.e.*, through the sale of new shares—which implies that, to determine the opportunity cost

[42] Also, this estimated range of the level of sovereignty risk is paralleled by the difference between the real risk-free interest rates of Central Bank debt of Barbados and the U.S., as presented earlier within the Report.

[43] The remainder of new equity capital of the firm is raised internally, and shows up in the ongoing accrual of retained earnings.

of equity, the effective adjustment for issuance costs is less. This is because issuance costs are applicable only to the share of incremental capital raised externally. Three basis points (0.03%) are incorporated into the return on equity recommendation.

- *Isolation Associated With An Island System*: As the report discusses, the Barbados Light and Power Company serves an island economy and is thus not part of the larger integrated systems of the major continent. Accordingly, BLPC is exposed to an unusual business context resulting in inherently higher operating risks than the risks of continental firms making up the peer group of comparable risk entities for which the cost of equity estimates are determined. No specific cost rate adjustment is incorporated into the return on equity recommendation for isolation.

- *Size-Related Risk Premium*: Size premia for very small entities are explicitly captured only within the Risk Premium cost of equity capital methodology, as applied to the U.S. sample companies. While, in the absence of further research, we cannot be sure, it is likely that the cost of equity for BLPC is somewhat understated for this reason. As reported, the size-related risk premium appears to be in the range of 1.20-1.60% for comparable risk utilities, and noticeably higher for non-utility companies. In conservative fashion, a range of size premia of 1.20% (low) and 1.60% (high) is applied to the market-based estimates of the cost of equity.[44]

- *Sovereignty Risks*: Because the technical estimates of the cost of equity capital are obtained from samples drawn from North America, such estimates do not incorporate sovereignty risks specific to Barbados or its neighbors in the Caribbean region. Based on two methods used in the study—including Credit Score Analysis and Relative Risks of Market Returns—country risks are likely to range from 1.12% to 1.72%, with an average of 1.43%.

- *High Equity Participation*: The weighted average cost of capital incorporates fairly high equity participation of 65%, when compared to the sample of

[44] The adjustment is factored appropriately in order to not "double count" the size-related risk premium, which is explicitly incorporated with the Risk Premium analysis.

comparable risk U.S. electric and gas distribution utilities. BLPC's comparatively high equity share is necessary in view of business context, an isolated island system facing substantial capital expenditures. Nonetheless, because increased equity share in total capital reduces capital risks, other factors constant, the Company's high equity participation translates into a downward adjustment to the cost of equity. A downward adjustment of 51 basis points is incorporated in the study results.[45]

- *Quarterly Payment of Dividends*: Where relevant, the quarterly payment of dividends typically yields an upward adjustment of 20-30 basis points. The cost rate adjustment for quarterly payments is 25 basis points.

The cost of equity study suggests that the return on equity averages 11.16%, with a range from 9.34 to 13.36%, as far as the market-based cost estimates are concerned. [46] (As mentioned above, the study declines to include the extreme value of 16.07% realized historical returns for Canadian sample 2.)

Taking full account of the above adjustment factors suggests, moreover, that the cost of equity capital for BLPC resides at a level well above the market cost estimates that are obtained from the five North American samples. These adjustment factors, moreover, are additive. Taking a conservative view of the adjustment factors through recognition of lower estimated values for size premia and sovereignty risks results in a minimum adjustment of 2.05%. Alternatively, utilizing the upper level risk premium estimates for size and sovereignty risks lead to an adjustment level of 2.71%. This range of adjustment can be viewed as upper and lower bounds—2.05% and 2.71%, respectively. Applying these adjustment factors to the estimate of 11.16% for the market cost of equity for North American utilities obtains an adjusted cost of equity for the Company of 13.18% to 13.85%, with 13.51% the average.

[45] The adjustment amount, in basis points, is related to the sensitivity of the cost of common equity, as a matter of assumption, to the impact of an increase in equity share on the volatility in earnings and cash flow per share equity returns. However, the adjustment does not account for the samples of companies used in the study, including Canadian samples 1 and 2 and the U.S. non-utility company sample (sample 3), which have equity participation of 70%, thus more closely approximating that of BLPC.

[46] This value is obtained by calculating the average of the cost of equity estimates that result from the four methodologies. In addition, the average of all the individual market cost of equity estimates (excluding the 16.07% for Canadian sample 2) is virtually identical (11.13%).

Accordingly, we recommend that The Barbados Light & Power Company Limited adopt, in its filing before the Fair Trading Commission, 13.50% for Return on Equity.

WACC and RATE OF RETURN: BARBADOS LIGHT AND POWER

As mentioned, the weighted average cost of capital incorporating the weighted cost rates for both traditional components and non-traditional elements[47] is the basis for determination of the overall rate of return. For the development of the WACC and the overall rate of return, an appropriate starting point is the observed capital structure stated on a traditional basis. For the test period 2007, BLPC underwrites its assets with the following capital structure, shown with capitalization shares and corresponding cost rates:

WEIGHTED AVERAGE COST OF CAPITAL FOR CONVENTIONAL CAPITAL STRUCTURE
Based on Total 2007 Balances

Capital Component	Observed Balances ($ 000)	Capitalization Shares	Cost Rates	Weighted Cost Rate
Long Term Debt	$115,406	21.44%	5.25%	1.13%
Short-Term Debt	$0	0.00%	0.00%	0.00%
Common Equity	$422,804	78.56%	13.50%	10.61%
Total	$538,210	100.00%		11.73%

As can be seen, the Company is financing assets with an unusually high concentration of equity participation, resulting in a weighted average cost of capital (overall rate of return), not including income tax effects, of over ten percent. Viewed in the context of the capital structure experience of the industry, the Company's high equity participation may cause the Company's WACC to depart from a least-cost level, although the Company's unusual business context provides reason for equity to remain at a fairly intensive level and above that of the electric power industry as a whole. Accordingly, we recommend that the Company, within its upcoming submission before the Fair Trading Commission, utilize a capital structure that departs from BLPC's observed capital structure. Specifically, we recommend consideration

[47] Traditional financing vehicles include long- and short-term debt, preferred and preference stock, and common equity. Non-traditional elements include customer deposits, deferred balances of income taxes, investment tax credits and, for Barbados, the manufacturers' allowance.

of a policy-based imputed capital structure that contains 65% equity participation. The WACC associated with this policy-based capital structure is shown below:

WEIGHTED AVERAGE COST OF CAPITAL FOR POLICY-BASED (IMPUTED) CONVENTIONAL CAPITAL STRUCTURE
Based on Total 2007 Balances

Capital Component	Implied Balances ($ 000)	Capitalization Shares	Cost Rates	Weighted Cost Rate
Long Term Debt	$188,374	35.00%	5.25%	1.84%
Short-Term Debt	$0	0.00%	0.00%	0.00%
Common Equity	$349,837	65.00%	13.50%	8.78%
Total	$538,210	100.00%		10.61%

As can be seen, reducing equity participation from 79% to 65% lowers the weighted average cost of capital by over 110 basis points. The imputed capital structure shown above significantly reduces equity participation, while also sustaining sufficient equity and debt-equity balance. This result, we believe, is consistent with the least cost financing mix for the Company's capital resources given its inherent business context and risks, while also providing BLPC with a satisfactory level of interest coverage.

The proposed approach is in keeping with the capital attraction and financial integrity concepts of fair rate of return principles. The 65% participation of equity is plentiful—a level that is above that of most mid-sized and large electric utilities in the U.S., though a number of registered Canadian utilities tend to utilize equity participation levels that are equivalent to or above those of their U.S. counterparts. This level of equity participation is adequate and desirable, when viewed from the Company's unusual business context and small size.

The policy-based traditional capital structure with 65% equity participation provides the basis for the regulatory capital structure that, as mentioned, incorporates both traditional and non-traditional capital components, as follows:

RATE OF RETURN RECOMMENDATION:
WEIGHTED AVERAGE COST OF CAPITAL FOR
REGULATORY CAPITAL STRUCTURE
Based on Total 2007 Balances

Capital Component	Balances ($ 000)	Capitalization Shares	Cost Rates	Weighted Cost Rate
Long Term Debt	$188,374	31.32%	5.25%	1.65%
Short-Term Debt	$0	0.00%	0.00%	0.00%
Common Equity	$349,837	58.17%	13.50%	7.85%
Customer Deposits	$20,010	3.33%	6.46%	0.22%
Deferred Investment Tax Credits	$30,099	5.00%	10.61%	0.53%
Deferred Manufacturers' Allowance	$13,052	2.17%	10.61%	0.23%
Total	$601,371	100.00%		10.48%

The inclusion of non-traditional elements such as the manufacturers' allowance, when "costed" at the policy-based WACC level, results in an overall cost of capital that is slightly lower, 10.48%, whereas the policy-based WACC is 10.61%. We recommend that BLPC adopt a WACC (and overall rate of return recommendation) of 10.48% within its upcoming submission in the current regulatory proceeding to the Fair Trading Commission, for the purpose of setting retail prices for electricity services.

REFERENCES

Artzner, P., F. Delbaen, J-M. Eber, and D. Heath, "Coherent Measures of Risk," (1999), *Mathematical Finance*, 9: 203-228.

Ball, R., (1978), "Anomalies in Relationship between Securities and Yield and Yield Surrogates," *Journal of Financial Economics,* 6: 103–166.

Banz, R., (1981), "The Relationship between Returns and Market Value of Common Stocks," *Journal of Financial Economics,* 9: 3–18.

Bartholdy, J. and Riding, A., (1994), "Thin Trading and the Estimation of Betas: The Efficacy of Alternative Techniques," *Journal of Financial Research*, 17(2): 241-253.

Basu, S., (1977), "Investment Performance of Common Stocks in Relation to Their Price Earnings Ratios: A Test of Efficient Market Hypothesis," *Journal of Finance,* 32: 663-682.

Bhandari, L. C., (1988), "Debt/Equity Ratio and Expected Common Stock Returns: Empirical Evidence," *Journal of Finance,* 43: 507–528.

Black, F., (1972), "Capital Market Equilibrium with Restricted Borrowing," *Journal of Business,* 45: 444–455.

Black, F., and M. S. Scholes, (1974), "The Effect of Dividend Yield and Dividend Policy on Common Stocks Prices and Returns," *Journal of Financial Economics,* 1: 1–21.

Black, F., M. C. Jensen, and M. S. Scholes, (1972), "The Capital Asset Pricing Model: Some Empirical Tests," in M. C. Jensen (ed.) *Studies in the Theory of Capital Markets.* New York: Praeger: 79–121.

Blume, M. E., and L. Friend, (1973) "A New Look at the Capital Asset Pricing Model," *Journal of Finance 2*8:19-33

Bodurtha, J. N. and N. C. Mark, (1991), "Testing the CAPM with Time Varying Risk and Return," *Journal of Finance,* 66(4): 1485–1505.

Bolder, D.J., G. Johnson, and A. Metzler, (2004), "An Empirical Analysis of the Canadian Term Structure of Zero-Coupon Interest Rates," Working Paper 2004-48, Bank of Canada.

Bollerslev, T., (1988), "On the Correlation Structure of Generalised Autoregressive Conditional Hetroscedastic Process," *Journal of Time Series Analysis* 9: 121–131.

Bollerslev, T., R. F. Engle, and J. M. Woolridge, (1988), "Modelling Asset Pricing Model with Time Varying Covariance," *Journal of Political Economy,* 96:1 116–131.

Boabang, F., (1996), "An Adjustment Procedure for Predicting Betas when Thin Trading is Present: Canadian Evidence," *Journal of Business Finance and Accounting*, 23(9/10): 1333-1355.

Bowie, D.C. and D.J. Bradfield, (1998), "Robust Estimation of Beta Coefficients: Evidence from a Small Stock Market," *Journal of Business Finance and Accounting*, 25(3/4): 439-454.

Bartholdy, J. and A. Riding, (1994), 'Thin Trading and the Estimation of Betas: The Efficacy of Alternative Techniques', *Journal of Financial Research*, 17(2): 241-253.

Blume, M.E., (1975), "Betas and their regression tendencies," *Journal of Finance, 30*, 785-799.

Chan, K. C., and N. Chen, (1991), "Structural and Return Characteristics of Small and Large Firms," *Journal of Finance*, 46: 1467–1484.

Chan, L.K.C. and J. Lakonishok, (1992), "Robust Measurement of Beta Risk," *Journal of Financial and Quantitative Analysis*, 27: 265-282.

Chen, N., R. Roll, and S. A. Ross, (1986), "Economic Forces and Stock Market," *Journal of Business,* 59: 383–403.

Congressional Research Service, "CRS Report for Congress: United States-Canada Trade and Economic Relationship: Prospects and Challenges," Updated March 29, 2006.

Douglas, G. W., (1968), "Risk in the Equity Market: Application of Market Efficiency," *Yale Economic Essays,* 9: 3–45.

Draper, P. and K. Paudyal, (1995), "Empirical Irregularities in the Estimation of Beta: The Impact of Alternative Estimation Assumptions and Procedures," *Journal of Business Finance and Accounting,* 22(1): 157-177.

Electricity Distributors Association and Christensen Associates Energy Consulting LLC, "Comments on Draft Staff Report: Cost of Capital and 2nd Generation Incentive Regulation for Ontario's Electricity Distributors," submitted to Ontario Energy Board, July 5, 2006.

Engle, R. F., D. M. Lillen, and R. F. Robins, (1987), "Estimating Time Varying Risk Return in the Term Structure: The ARCH-M Model," *Econometrica,* 55:381–407.

Engle, R. F., and T. Bollerslev, (1986), "Modelling the Persistence of Conditional Variance," *Econometric Review,* 5(1): 1–50.

Fama, E. F., (1965), "The Behaviour of Stock Market Prices," *Journal of Business,* 38: 34–10.

Fama, E. F., (1968), "Risk, Return and Equilibrium: Some Clarifying Comments," *Journal of Finance,* 23: 29–40.

Fama, E. F., (1970), "Efficient Capital Markets: A Review of Theory and Imperial Work," *Journal of Finance,* 25: 383–417.

Fama, E. F., (1976), *Foundation of Finance.* New York: Basic Books.

Fama, E. F., and K.R. French, (1992), "The Cross Section of Expected Stock Returns," *Journal of Finance,* 47: 427–465.

Fama, E. F., (1999), "Efficient Capital Markets," *Journal of Finance,* 66(6): 1575–1616.

Fama, E. F., L. Fisher, M. C. Jensen, and R. Roll, (1969), "The Adjustment of Stock Price to New Information," *International Economic Review,* 10: 1–21.

Fama, E. F., and K. R. French (1988) Permanent and Temporary Component of Stock Prices. *Journal of Political Economy* 96: 246–273.

Fama, Eugene F., and K. R. French, (1988a), "Dividend Yield and Expected Stock Returns," *Journal of Financial Economics,* 22: 3–25.

Fama, E., and J.D. MacBeth, (1973),"Risk, Return, and Equilibrium: Empirical Tests," *Journal of Political Economy*, Vol. 38, 607-636.

French, K. R., W. Schwert, and R. Stambaugh, (1987) "Expected Stock Return and Volatility," *Journal of Financial Growth* 19: 3-30.

Gibbons, Michael R. (1982) "Multivariate Tests of Financial Models: A New Approach," *Journal of Financial Economics* 10: 3–27.

Harvey, Campbell R., (1989), "Time Varying Conditional Covariance Tests of Asset Pricing Models," *Journal of Financial Economics* 24: 289–317.

Huberman, G., (1982), "Arbitrage Pricing Theory, A Simple Approach," *Journal of Economic Theory* 28: 183–98.

Jensen, M. C., (1969), "Risk, the Pricing of Capital Assets and the Evaluation of Investment Portfolios," *Journal of Business* 42: 167–247.

Kandell, S. and R.F. Stambaugh, (1995), "Portfolio Inefficiency and the Cross Section of Expected Return," *Journal of Finance.*50, 157-184.

Koenker, R. W. and G. Bassett, Jr, (1978) "Regression Quantiles," *Econometrica*, 46(1): 33-50.

Kolbe, A.L. and W.B. Tye, (1992),"The Fair Allowed Rate of Return with Regulatory Risk," *Research in Law and Economics*, JAI Press Inc.: 129-169.

Lam, K.S.K., (1999), "Some Evidence on the Distribution of Beta in Hong Kong," *Applied Financial Economics*, 10: 251-262.

Lally, M., (1998), "An Examination of Blume and Vasicek Betas," *Financial Review*, 33: 183-198.

Lazar, F. and E. Prisman, "Calculating the Cost of Capital for LDCs in Ontario," June 14, 2006.

Lintner, J., (1965) "The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets," *Review of Economics and Statistics*, Vol. 47: 13-37;

Luenberger, D., *Investment Science*, Oxford University Press, New York, 1997.

MacKinlay, A. C., (1987), "On the Multivariate Tests of the CAPM," *Journal of Financial Economics,* 18: 341–371.

Markowitz, H., "Portfolio Selection," *Journal of Finance*, Vol. 7, 1952, 77-91.

Markowitz, H., (1959), *Portfolio Selection: Efficient Diversification of Investments.* New York: Wiley.

Markowitz, H., and M. Scholes, (1978), "Dividends and Taxes," *Journal of Financial Economics,* 6: 333–364.

Merton, R. C., (1973), "An Intertemporal Asset Pricing Model," *Econometrica* 41: 867–887.

Morin, Roger A., (1994), *Regulatory Finance: Utilities' Cost of Capital*, Public Utilities Report Inc.

Murray, L., (1995), "An Examination of Beta Estimation using Daily Irish Data," *Journal of Business Finance and Accounting*, 22(6): 893-905.

Ng, L., (1991), "Tests of CAPM with Time Varying Covariance: A Multivariate GARCH Approach," *Journal of Finance*, 46(4): 1507–1521.

Ng, V. K., R. F. Engle, and M. Rothschild, (1992), "A Multi Dynamic Sector Model for Stock Returns," *Journal of Econometrics*, 52: 245–66.

Ontario Energy Board, "Draft Staff Report: Proposals for Cost of Capital and 2nd Generation Incentive Regulation for Ontario's Electricity Distributors," June 19, 2006.

Reiganum, M. R., (1981), "Misspecification of Capital Asset Pricing," *Journal of Financial Economics,* 9: 19–46.

Reiganum, M. R., (1981a), "The Arbitrage Pricing Theory: Some Empirical Results," *Journal of Finance,* 36: 313–21.

Roll, R. W., (1977), "A Critique of Asset Pricing Theory's Tests, Part 1: On Past and Potential Testability of the Theory," *Journal of Financial Economics* 4: 129–176.

Roll, R. W., (1981), "A Possible Explanation of Small Firm Size Effect," *Journal of Finance,* 36: 879–888.

Roll, R. W., and B. S. Solnik, (1977), "A Pure Foreign Exchange Asset Pricing Model," *Journal of International Economics*, 7: 161-179.

Roll, R. and S. Ross, (1985), "An Empirical Investigation of the Arbitrage Pricing Theory," *The Journal of Finance*: 1073-1103.

Roll, R. W., and S. A. Ross, (1994), "On the Cross Sectional Relation between Expected Returns and Betas," *Journal of Financial Economics*, 119(1): 101–121.

Ross, S. A., (1976), "An Arbitrage Theory of Capital Asset Pricing," *Journal of Economic Theory*, 13: 341–360.

Sauer, A., and A. Murphy, (1992), "An Empirical Comparison of Alternative Models of Capital Asset Pricing in Germany," *Journal of Banking and Finance* 16, 183-196.

Scholes, M. and J. Williams, (1977), "Estimating Betas from Non-synchronous Data," *Journal of Financial Economics*, 5: 309-328.

Shanken, J., (1982), "The Arbitrage Pricing Theory: Is it Testable?" *Journal of Finance,* 40: 1129–1148.

Shanken, J., (1985), "Multivariate Tests of the Zero-beta CAPM," *Journal of Financial Economics* 14: 327–348.

Shanken, J., (1992), "On the Estimation of Beta Pricing Models," *Review of Financial Studies* 5: 1–33.

Sharpe, W., (1964), "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk," *Journal of Finance*, 19: 425-442.

Stambaugh, R. F., (1982), "On the Exclusion of Assets from Tests of the Two Parameter Model," *Journal of Financial Economics*, 10: 235–268.

Vasicek, O., (1973), "A Note on using Cross-sectional Information in Bayesian Estimation on Security Betas," *Journal of Finance*, 28(5): 1233-1239.

Von Neuman, J., and O. Morgenstern, (1953), *Theory of Games and Economic Behaviour*, 3rd ed., Princeton: Princeton University Press.

The World Bank, “Global Development Finance,” 2006 and 2007.

TECHNICAL APPENDICES

APPENDIX I

PRESENT VALUE OF INVESTMENT AND DERIVATION OF THE CONSTANT GROWTH AND MULTI-STAGE DISCOUNTED CASH FLOW MODEL (DCF)

Present Value Theory

As wages are the compensation to labor, interest is the compensation or return to savings and capital. Savings is the share of current income held back to be consumed in later periods. A unit of current consumption has greater value than an equivalent amount of consumption later. Hence, savings must obtain greater consumption later, in order to compensate for its reduced (discounted) value.

The inducement to save is interest; essentially, the accrual of interest on savings offsets the reduction in value of later consumption vis-à-vis current consumption. Without the expectation of interest, savings would be largely exhausted as consumption in the current period. Savings are invested and, over time, give rise to and constitute the accumulation of capital. Savings realize the market rate of interest. Savings and investment—and thus the accumulation of capital—rise as expected interest increases.

Returns to savings, investment, and capital can be viewed as cash flow returns, and can be stated as an annual percentage amount. Cash flows in subsequent periods forego the interest that would have accrued on earlier cash flows. Because of foregone interest, later cash flows are worth less than those of earlier periods by the amount of interest that would have been realized on the earlier flows.

Cash flows over time can be ordered with a discounting procedure commonly known as present value. Present value revalues future cash flows according to the accrual of interest that would have been realized, had they occurred in the present. Specifically, the cash flow within a time step is discounted by a factor equal to the inverse of one plus the market rate of interest, k, compounded by time – $(1/(1+k))^t$. The present value procedure can be shown more formally as:

$$PV = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \cdots + \frac{CF_n}{(1+k)^n} \quad (1)$$

or,

$$\sum_{t=1}^{n} \frac{CF_t}{(1+k)^t} \quad (2)$$

where,

PV = present value

CF_t = cash flow in time t

k = market cost (rate) of interest.

Hence, $1/(1+k)^t$ is the discount factor by which the cash flows at time t are reduced.

Present value analysis equates cash flows at different points in time to the present, and constitutes a fundamental principle of financial and investment analysis. Essentially, present value normalizes the cash flows at the market rate of discount.

Consider a cash flow occurring at time, *t=0.* Since the cash flow occurs in the present and, unlike the subsequent cash flows shown in (3), below, no interest is foregone and thus it is not discounted:

$$NPV = CF_o + \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \cdots + \frac{CF_n}{(1+k)^n}. \quad (3)$$

Presume that a savings agent, a household, invests savings. The purchase of an investment or financial asset such as securities or other liquid assets by the agent constitutes a negative cash flow – an outflow of money. It is the expectation of positive cash flows later that induces the purchase. Positive cash flows prospectively, as expected, tend to balance the negative cash outflow associated with the purchase of the asset. All negative and positive cash flows are contained in net present value, as shown in (4) below:

$$NPV = -CF_o + \sum_{t=1}^{n} \frac{CF_t}{(1+k)^t} \quad (4)$$

where,

$NPV =$ net present value – *i.e.,* the net of all positive and negative cash flows

If net present value (*NPV*) is positive, the investment action is "economic" in the sense that the expected positive cash flows, discounted at the market cost of capital, are greater than—or at least equivalent to—the purchase price of the asset, the negative flow.

Competitive capital markets—or the processes of market competition—seek to discover and exhaust all opportunities for positive and negative present values. That is, the *expected* NPV of investment opportunities approximates zero, given the implicit rate of discount harbored by investors. Essentially, the market value of assets is driven to its competitive level prospectively because of arbitrage inherent to competitive markets. Market forces bid prices up in the presence of expected positive returns (NPV), or bid prices down if negative returns are expected. The discounted positive cash flows equate to and balance the purchase cost of the asset, as shown in (5), below:

$$CF_o = \sum_{t-1}^{n} \frac{CF_t}{(1+k)^t}. \quad (5)$$

In market equilibrium, then:

$$P_o = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \cdots + \frac{CF_n}{(1+k)^n} \quad (6)$$

$$P_o = \sum_{t=1}^{n} \frac{CF_t}{(1+k)^t} \quad (7)$$

where,

P_o = market price at time $t=0$.

The market cost of capital implicitly incorporates investor's perceptions of risk and expectations about inflation over the life of future cash flows. It is straightforward to solve for the market cost of capital, k, as we are confronted with one equation and one unknown value. For example, to solve for the internal rate of cost of a debt obligation of a borrowing firm, such as bond, simply determine the internal rate of discount that equates the positive cash flow occurring at time zero, CF_o, and the negative flows, $-\Sigma CF_t$, which represent the annual interest cost and retirement of the principle. The discounted negative cash flows from the perspective of the borrowing firm can be shown as $-\Sigma CF_t/(1+k)^t$. The analysis problem for lenders is precisely the same except that the signs attending the cash flows are reversed. Hence, the rate of discount is both the opportunity cost of capital to investors, given market arbitrage, and the cost of capital to the borrowing firm.

Constant Growth Discounted Cash Flow

For equity capital, investors' expected earnings reflect expectations of future cash flows associated with shares of stock, and thus determine the stock price currently. Assume that investors expect earnings, E_t, and dividends, D_t, to grow at some constant rate, g, over the future, such that:

$$E_t = (1+g)E_{t-1} \qquad (8)$$

$$E_1 = (1+g)E_o$$

$$E_2 = (1+g)E_1 = (1+g)^2 E_o$$

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$$En = (1+g)^n E_o .$$

Dividends of course are a function of earnings and therefore represent, along with price appreciation, the discounted cash flows. Dividends can thus be shown similarly to that of earnings, as below:

$$D_t = (1+g)D_{t-1} \qquad (9)$$

i.e., $D_1 = (1+g)D_o$

$$D_2 = (1+g)D_1 = (1+g)^2 D_o$$

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$$D_n(1+g)^n D_o .$$

Further, assume that dividends, D_t, are a fixed share, m, of earnings, E_t, such that:

$$D_t = mE_t \qquad \text{and,} \qquad D_t / E_t = m .$$

(10)

From equation (8), then:

$$D_t = m(1+g)E_{t-1}$$

(11)

and, $D_n = m(1+g)^n E_o$.

Restating equation (7) to represent dividends as a fixed share of earnings which are paid out, provides:

$$P_o = \sum_{t=1}^{n} \frac{mE_t}{(1+k)^t}$$

(12)

$$= \frac{mE_1}{(1+k)^1} + \frac{mE_2}{(1+k)^2} + \frac{mE_3}{(1+k)^3} + \cdots + \frac{mE_n}{(1+k)^n}.$$

Observation will disclose that in fact the payout ratio is volatile and tends to offset the volatility in earnings so that dividend growth (realized cash flows) is smoothed.

Equation (12) can be restated to read:

$$P_o = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \cdots + \frac{D_n}{(1+k)^n}$$

(13)

$$= \sum_{t=1}^{n} \frac{D_t}{(1+k)^t}.$$

The relationship between D_{t-1} and D_t is simply $(1+g)$, which is also the relationship between E_{t-1} and E_t defined in (8). And, with an assumed constant payout ratio or share of earnings, the following is obtained:

$$P_o = \frac{D_o(1+g)}{(1+k)} + \frac{D_o(1+g)^2}{(1+k)^2} + \frac{D_o(1+g)^3}{(1+k)^3} + \cdots + \frac{D_o(1+g)^n}{(1+k)^n}$$

(14)

$$= \sum_{t=1}^{n} \frac{D_o(1+g)^t}{(1+k)^t}.$$

Now, assume an infinite time horizon:

$$P_o = \frac{D_o(1+g)}{(1+k)} + \frac{D_o(1+g)^2}{(1+k)^2} + \frac{D_o(1+g)^3}{(1+k)^3} + \cdots + \frac{D_o(1+g)^\infty}{(1+k)^\infty}.$$

(15)

Equation (15) above is simply a geometric series with a growth and discounting parameter, *(1+g)/(1+k),* that defines the relative value of any two sequential terms.[48] Therefore, (15) may be expressed as:

$$P_o = \frac{D_o(1+g)}{(1+k)}\left[\frac{1-[(1+g)/(1+k)]^{\infty}}{1-(1+g)/(1+k)}\right].$$

(16)

And since $[(1+g)/(1+k)]^{\infty}$ is zero,[49] and $(1-(1+g)/(1+k))$ is equal to $(k-g)/(1+k)$, the following form can be obtained:

$$P_o = D_o(1+g)/(k-g).$$

(17)

Multiplying through by $(k-g)$ and $1/P_o$, and rearranging gives:

$$k = D_o(1+g)/P_o + g.$$

(18)

This is the derived form of the constant growth Discounted Cash Flow model.

In addition, the assumption of an infinite time horizon can be relaxed. Assume that the investor has a finite time horizon, *n,* with a salvage value equal to P_n and a constant price-earnings ratio. Equation (14) is then restated as:

$$P_o = \sum_{t=1}^{n} \frac{D_o(1+g)^t}{(1+k)^t} + \frac{P_n}{(1+k)^n}.$$

(19)

Since $P_o/E_o = P_n/E_n$, $P_n = P_o(1+g)^n$. Thus, (19) can be restated as:

$$P_o = \sum_{t=1}^{n} \frac{D_o(1+g)^t}{(1+k)^t} + \frac{P_o(1+g)^n}{(1+k)^n}.$$

(20)

The first term on the right may be restated as described above, and incorporated into (20), shown below:

$$P_o = \frac{D_o(1+g)}{(k-g)}\left[1-(1+g)^n/(1+k)^n\right] + P_o(1+g)^n/(1+k)^n.$$

(21)

---

[48] With $(1+g) = d$, and $(1+k) = r$, a series of the form:

$$\sum_{t=1}^{n} a(d/r)^t = a\sum_{t=1}^{n}(d/r)^t.$$

This may be alternately expressed as:

$$a\frac{d}{r}[(1-(d/r)^n)/(1-(d/r))].$$

[49] If $k>g$

Rearranging and simplifying terms obtains:

$$P_o - P_o(1+g)^n/(1+k)^n = \frac{D_o(1+g)}{(k-g)}[1-(1+g)^n/(1+k)^n]$$

(22)

or,

$$P_o[1-(1+g)^n/(1+k)^n] = \frac{D_o(1+g)}{(k-g)}[1-(1+g)^n/(1+k)^n] .$$

Now, dividing both sides by $[1-(1+g)^n/(1+k)^n]$ gives an equivalent result to (16):

$$P_o = D_o(1+g)/(k-g) .$$

(23)

Rearranging terms provides:

$$k = D_o(1+g)/P_o + g .$$

(24)

Thus, the constant growth form of Discounted Cash Flow is derived for a finite time horizon.

Multi-Stage DCF

The model of constant growth over the future holding period may not be a fully satisfactory representation of investor expectations under some market conditions. The constant growth form can be generalized to a varying growth path or growth with stochastic elements. Such approach increases complexity.

As a practical matter, a useful extension of the constant growth model known as multi-stage DCF can be easily developed. Arguably, multi-stage DCF presents a platform for a more accurate representation of expectations of growth harbored by investors. A derived form of the multi-stage form is developed below:

Multi-stage DCF can be shown as a restatement of Equation 14 with three patterns or rates of growth applicable to specific forward timeframes or stages:

$$P_o = \sum_{t=1}^{5}\frac{D_o(1+g_1)^t}{(1+k)^t} + \sum_{t=1}^{5}\frac{D_5(1+g_2)^t}{(1+k)^t}(1/(1+k)^5) + \sum_{t=1}^{\infty}\frac{D_{10}(1+g_3)^t}{(1+k)^t}(1/(1+k)^{10})$$

.

(25)

Each stage can be shown in a simplified form. We begin by separating out the first stage, S_1 – *i.e.,* the first rhs term with growth = g_1 – as follows:

$$S_1 = \sum_{t=1}^{5}\frac{D_o(1+g_1)^t}{(1+k)^t} .$$

(26)

Pulling out the initial rate of dividends, D_0, from the sum,

$$S_1 = D_o \sum_{t=1}^{5} \frac{(1+g_1)^t}{(1+k)^t}.$$

Presenting the ratio of the growth and discount factors as a single term, $F = \frac{(1+g_1)}{(1+k)}$,

and incorporating F into the sum, $S_1 = D_o \sum_{t}^{5} F^t$.

The sum can then be expanded as follows:

$$S_1 = D_o\left(F^1 + F^2 + \cdots + F^5\right).$$

(27)

Defining a new term equal to unity, $\frac{(1-F)}{(1-F)}$, and including the term into the rhs of Equation 27:

$$S_1 = D_o\left(F^1 + F^2 + \cdots + F^5\right)\left(\frac{(1-F)}{(1-F)}\right), \text{ and then expanding,}$$

$$S_1 = D_o\left((F^1 + F^2 + \cdots + F^5) - (F^2 + F^3 + \cdots + F^6)\right)/(1-F).$$

(28)

Canceling terms of Equation 28 provides, $S_1 = D_o(F^1 - F^6)/(1-F)$, and then collecting common terms gives a simplified result, as follows:

$$S_1 = D_o F^1 (1-F^5)/(1-F).$$

(29)

Expanding F in Equation 28 provides,

$$S_1 = D_o\left(\frac{(1+g_1)}{(1+k)}\right)\left(1-\left(\frac{(1+g_1)}{(1+k)}\right)^5\right)/\left(\frac{(1+k)-(1+g_1)}{(1+k)}\right).$$

Finally, canceling terms to simplify Equation 29 provides the result,

$$S_1 = D_o(1+g_1)\left(1-\left(\frac{(1+g_1)}{(1+k)}\right)^5\right)/(k-g_1).$$

(30)

The above result for Stage 1 can be stated as follows,

$$S_1 = D_o\left(\frac{(1+g_1)}{(k-g_1)}\right)\left(1-\left(\frac{(1+g_1)}{(1+k)}\right)^5\right).$$

(31)

Note that this outcome for Stage 1 is identical to Equation 22, above.

Stage 2 of Equation 24 is:

$$S_2 = \sum_{t=1}^{5} \frac{D_5(1+g_2)^t}{(1+k)^t}(1/(1+k)^5).$$

The derived form of Stages 2 and 3 are obtained through application of the same procedures as above, and need not be reviewed. The derived result for Stage 2 is as follows:

$$S_2 = D_5\left(\frac{(1+g_2)}{(k-g_2)}\right)\left(1-\left(\frac{(1+g_2)}{(1+k)}\right)^5\right)(1/(1+k)^5).$$

(32)

Stage 3 of Equation 25 is:

$$S_3 = \sum_{t=1}^{\infty} \frac{D_{10}(1+g_3)^t}{(1+k)^t}(1/(1+k)^{10}).$$

Similarly, the derived form of Stage 3 is:

$$S_3 = D_{10}\left(\frac{(1+g_3)}{(k-g_3)}\right)\left(1-\left(\frac{(1+g_3)}{(1+k)}\right)^{\infty}\right)(1/(1+k)^{10}).$$

(33)

Note that in Stage 3, the second term in the second bracket of the rhs vanishes as a result of, by assumption, $k>g$.

APPENDIX II

Capital Asset Pricing Model (CAPM)[50]

The Sharpe-Lintner Capital Asset Pricing Model (CAPM)—William Sharpe (1964) and John Lintner (1966)—is an extension of the one-period, mean-variance portfolio model of Markowitz (1959) and Tobin (1958), which in turn is built on the expected utility model of von Neumann and Morgenstern (1953). The Markowitz mean-variance analysis is concerned with how the investor should allocate wealth among the various assets available in the market, given that the investor is a one-period utility maximizer.

The derived CAPM shows how the valuation of a financial asset (price) is based upon two components: risk free returns and an *adjusted risk-based return.* Surrogates for risk free returns can be observed directly in capital markets, and include market returns on short- and intermediate-term debt. As a general rule, the cost rates and market returns on government debt obligations serve as appropriate surrogates.

The CAPM defines the market rate of return of asset *j* as a combination of the risk free return, R_f , and the product of a risk factor and the excess return above the risk free return, $\beta_{jm}(R_m - R_f)$. Excess return is determined as the difference between the return of the market as a whole, R_m, and the risk free return. The relevant risk factor is the well known market beta, which is defined as, the covariation of the market return of individual assets and equity markets as a whole

$$\beta_{jm} = \sigma_{jm}/\sigma^2_m \tag{1}$$

Start with an investment amount*, I*, where the share, α, is invested in asset *j*, and the share $(1 - \alpha)$ is invested in the market portfolio, *m*. The rate of return on the portfolio is,

$$R_\alpha = \alpha R_j + (1 - \alpha)R_m \tag{2}$$

The measure of variation I the portfolio returns is defined as,

$$\sigma_\alpha = [\alpha^2\sigma_j^2 + 2\alpha(1 - \alpha)\sigma_{jm} + (1 - \alpha)^2\sigma_m^2]^{(1/2)}. \tag{3}$$

If the portfolio share coefficient, α, is equal to zero, then the return on the portfolio is equal to R_m. This return point within rate of return – risk space is equivalent to the tangency point of market portfolio with the well-known market line.

Taking the relevant derivatives,

$$dR_\alpha/d\alpha = R_j - R_m \tag{4}$$

[50] As derived by and shown in *Investment Science*, by David Luenberger, 1998.

$$\sigma_\alpha / d\alpha = [\alpha\sigma_j^2 + (1 - 2\alpha)\sigma_{jm} + (\alpha - 1)\sigma_m^2] / \sigma_\alpha . \quad (5)$$

For $\alpha=0$, the solution to (5) is,

$$\sigma_\alpha / d\alpha = (\sigma_{jm} - \sigma_m^2) / \sigma_m . \quad (6)$$

Defining a key relationship:

$$dR_\alpha / d\sigma_\alpha = (dR_\alpha / d\alpha) / (d\sigma_\alpha / d\alpha). \quad (7)$$

For $\alpha=0$, the above result obtains,

$$dR_\alpha / d\sigma_\alpha = (R_j - R_m)\sigma_m / (\sigma_{jm} - \sigma_m^2). \quad (8)$$

The result in (8) defines a rate of change with respect to σ_α, which must be equivalent to the slope of the capital market line. Therefore,

$$(R_j - R_m)\sigma_m / (\sigma_{jm} - \sigma_m^2) = (R_m - R_f) / \sigma_m . \quad (9)$$

Now solving for R_j obtains the capital asset pricing model, stated in its well-known form,

$$R_j = R_f + [(R_m - R_j) / \sigma_m^2]\sigma_{jm} = R_f + \beta_{jm}(R_m - R_f) \quad (10)$$

where β_{jm} is defined as above.

In summary, the CAPM can be shown in the context of the general and well known formulation (as model (referred to in footnote 27 of the report text), where the expected rate of return is a function of risk:

$$R_j = f[E(F)] = R_f + \beta(R_m - R_f).$$

In this formulation, R_j and $f(E(F))$ are shown to be equivalent. As denoted in (3), R_f is the risk-free rate of return, R_M is the market rate of return and $(R_m - R_f)$ is the market price of risk, making β the risk premium attached to holding asset j in the (market) portfolio. The essential issue, then, is whether or not the relevant risk parameter (β) adequately captures all risks, as perceived by investors. As discussed below, recent empirical evidence suggests that it may not.

Issues Associated with CAPM

The results of the early studies of CAPM have suggested that a significant positive relationship existed between realized return and systematic risk, as measured by β, and that the relationship between risk and return appeared to be linear. However, the prediction of Sharpe-Lintner version of the model—that a portfolio or asset uncorrelated with the market should have an expected return equal to the risk-free rate of interest—have not done well. Evidence has suggested that the average return on "zero-beta" portfolios are higher than the risk-free rate.

The first tests of CAPM on individual stocks, within the context of the excess return form, appear to have been conducted by Lintner (1965) and Douglas (1968), who

found that the estimated intercept is significantly different from the risk-free rate r_f and the estimate of β is statistically significant but takes a small value and the residual risk has effect on security returns. Thus, their results appear to contradict the CAPM model. However, the Douglas and Lintner studies appear to suffer from various statistical weaknesses that might explain their anomalous results. The measurement error that might be present in estimated betas in their studies could be explained by the fact that the assumptions of the regression model are not satisfied in practice.[51]

With regard to the test of CAPM in terms of stock portfolios, one classic test was performed by Fama and MacBeth (1973), who used a combined time series-cross sectional estimation to investigate whether the risk premia of the factors are non-zero. Their results showed that the beta coefficient was statistically insignificant and remained small for many sub-periods. In addition, the estimated intercept term was significantly greater than the risk-free rate, once again implying that the predictions of the CAPM might not hold.

Black, Jensen, and Scholes (1972) (Black *et al*) tested CAPM by using time series regression analysis. The results again showed that the intercept term is significantly different from zero and is time varying. They found that when $\beta > 1$, the intercept is negative and conversely when $\beta < 1$, the intercept is positive. Thus the findings of Black *et al* suggest the predictions of CAPM are not supported empirically. Stambaugh (1982) employed a slightly different methodology to test CAPM and found support for Black's version but not for the Sharpe-Lintner version. Gibbons (1982) has used a similar method as the one used by Stambaugh but instead was led to reject both standard and zero-beta CAPM formulations.

One of the principal arguments against the one-factor CAPM that uses only the market to explain excess returns is that it fails to capture the impact of other economic factors that influence investors' expected return (i.e., risk premium). Thus, another avenue of attack on the Sharpe-Lintner-Black CAPM formulations includes studies that have identified variables other than market β to explain a cross-section of expected returns. For example, Basu (1977) showed that the earnings-to-price (E/P) ratio has marginal explanatory power after controlling for β and expected returns appear to be positively related to E/P. Banz (1981) found that a stock's size (i.e., price times share) could help explain expected returns, which means that in the Sharpe-Lintner-Black framework, allowing for market β, expected returns on small stocks are too low and expected returns on large stocks are too high. Bhandari (1988) found that leverage is positively related to expected stock returns, and Fama and French (1992) found that higher book-to-market ratios are associated with higher expected returns in their tests that also include market β.

These anomalies of the Sharpe-Lintner-Black CAPM formulations are stylized facts that can be explained by a multifactor asset pricing model, of the type considered by Merton (1973) and Ross (1976). For example, Ball (1978) argued that E/P is a catch-all proxy for omitted factors in asset pricing tests and one can expect it to have explanatory power when an asset pricing model is expanded to include multiple factors but all relevant factors are not included in the estimated model. Chan and

[51] The violations of the standard model assumptions are that the error terms are not normally distributed, not independently distributed and may be correlated with the excess market return (i.e., the explanatory variable in the regression) perhaps due to omitted variables.

Chen (1991) argued that the "stock size" effect is due to the fact that small stocks include depressed firms whose performance is sensitive to business conditions.[52] Fama and French (1992) have shown that since leverage and book-to-market equity are also largely driven by market value of equity, they may also be used as proxies for risk factors that are related to market judgments about the relative prospects of firms. One can expect when asset pricing models allow for multiple factors and, at least in theory, when all relevant factors are included in the asset pricing tests, the anomalies found in earlier work would be resolved.

An alternative approach, as shown in Chen, Roll, and Ross (1986), is to look for economic variables that are correlated with stock returns and then to test whether the loading of these economic factors describe the cross section of expected returns. This approach provides insight into how the factors relate to uncertainties about consumption and portfolio opportunities that are of concern to an investor. They examined a range of business condition variables that might be related to return because they are related to shocks to expected future cash flows or discount rates. The most powerful variables are the growth rate of industrial production and the difference between the return on long-term, low-grade corporate bonds and long-term government bonds. The unexpected inflation rate and the difference between the return on long and short government bonds are found to be less significant.

Merton (1973) has constructed a generalized inter-temporal asset pricing model in which factors other than market uncertainty are priced. In Merton's formulation, individuals are solving a lifetime consumption decision in a multi-period setting. He has shown that expected return on assets depends not only on the covariance of the asset with the market but also with the covariance of the asset with changes in the investment opportunity set. Therefore, Merton's formulation can be interpreted as another form of arbitrage pricing theory model. Fama and French (1992) demonstrated that two variables—size and book-to-market-equity—combine to capture the cross-sectional variation in average stock return associated with market beta, size, leverage, book-to-market ratio, and earning-to-price ratio.

In addition to the theoretical problems associated with the application of the CAPM to estimating risk premia, there are also statistical issues to be addressed. The problems of estimating and forecasting systematic risk, (i.e., beta) in the CAPM have been studied by several authors such as Lam (1999), Lally (1998), Bowie and Bradfield (1998), Boabang (1996), Draper and Paudyal (1995), Murray (1995), and Bartholdy and Riding (1994). The classical estimator for β is the well-known ordinary least squares (OLS) estimator, but several authors have shown that this estimator suffers from several deficiencies. For example, it has a mean reversion tendency, it is inefficient when return distributions are non-normal, and has significant bias problems when shares are thinly traded.

Several alternatives to OLS have been proposed in the literature. Included among these are Vasicek (1973) and Blume (1973) who both proposed estimators to improve the mean reversion tendency of the OLS estimator of β, Chan and Lakonishok (1992) proposed robust estimators to ensure more efficient estimation of β, and Scholes and

[52] The presence of depressed firms or firms highly sensitive to the business cycle introduces what is known as a martingale effect in expected returns.

Williams (1977) proposed estimators to deal with the bias problem when shares are infrequently traded. A host of empirical studies have been carried out in order to evaluate the performance of the estimators under various conditions including studies by Draper and Paudyal (1995), Murray (1995), Boabang (1996), and Lally (1998). Of the above-mentioned estimators, the Vasicek-estimator and the robust estimators seem to perform well over a wide range of empirical studies.

APPENDIX III

ESTIMATES OF COST OF EQUITY: U.S. ELECTRIC UTILITIES (U.S. sample 1)

CAPITAL ASSET PRICING MODEL

Electric Utilities		Adjusted CAPM Beta		Unadjusted Beta, as Inferred	
Company	Ticker	2006	5 Year Average, 2006 Ending	2006	5 Year Average, 2006 Ending
Hawaiian Elec.	HE	0.70	0.63	0.55	0.45
Empire Dist. Elec.	EDE	0.85	0.65	0.78	0.48
MGE Energy	MGEE	0.85	0.61	0.78	0.42
Otter Tail Corp.	OTTR	0.75	0.58	0.63	0.37
CH Energy Group	CHG	0.85	0.76	0.78	0.64
Energy East Corp.	EAS	0.85	0.77	0.78	0.66
Florida Public Utilities	FPU	0.55	0.60	0.33	0.40
SCANA Corp.	SCG	0.75	0.55	0.63	0.33
UIL Holdings	UIL	0.90	0.75	0.85	0.63
G't Plains Energy	GXP	0.85	0.78	0.78	0.67
Vectren Corp.	VVC	0.90	0.77	0.85	0.66
Average		0.80	0.64	0.65	0.47
Standard Deviation		0.10	0.08	0.16	0.12
Weighted Average:		0.81	0.68	0.72	0.53

MARKET INPUTS: AVERAGE YIELDS & OVERALL RETURNS

	1-Year Gov't Debt Interest Rates (%)	10-Year Gov't Debt Interest Rates (%)	1- to 10-Year Spread in Debt Rates (%)	S&P500 Total Return (%)	Chain-Weighted Rates of Inflation (%)
1950s	2.62	3.22	0.60		2.60
1960s	4.40	4.67	0.28		2.62
1970s	7.00	7.50	0.50	7.92	6.82
1980s	9.74	10.60	0.85	18.23	4.44
1990s	5.36	6.66	1.30	18.99	2.14
2000s	3.32	4.73	1.41	2.45	1.83
60s, 70s, 90s	5.58	6.28	0.74		
Overall	5.40	6.23	0.83	12.80	3.57

VARIATION IN YIELDS AND RETURNS (%)

	1-Year	10-Year	1- to 10-Year Spread	S&P500 Total Return
1950s	1.07	0.63	0.51	
1960s	1.32	0.91	0.46	
1970s	1.75	0.99	1.02	20.36
1980s	2.70	2.16	1.02	13.07
1990s	1.21	1.00	0.96	14.16
2000s	1.75	0.67	1.23	17.73
60s, 70s, 90s	1.43	0.97	0.81	
Overall	1.96	1.53	0.87	16.33

CAPM ESTIMATES: MID-SIZED ELECTRIC UTILITIES

	Equity Capital, Unadjusted	Risk-Free Rate	Market Beta, Adjusted	Expected Market Return	Risk Free Rate
Low	9.36%	3.96%	0.79	10.84%	3.96%
High	13.25%	5.49%	0.84	14.76%	5.49%
Weighted Average	11.28%	4.73%	0.81	12.80%	4.73%
		U.S. Equity Market Risk Premia:		8.07%	

ESTIMATES OF COST OF EQUITY: U.S. ELECTRIC UTILITIES (U.S. sample 1)

DISCOUNTED CASH FLOW

Electric Utility	Ticker	Dividend Per Share	Effective Year Forward Dividend Rate	Average Market Price Per Share, April - May '07	Adjusted Dividend Yield	Expected Growth	Single Stage DCF Estimates of Cost of Equity Capital
Hawaiian Elec.	HE	1.24	$1.26	$25.25	4.99%	3.18%	8.17%
Empire Dist. Elec.	EDE	1.28	$1.31	$23.98	5.45%	4.25%	9.71%
MGE Energy	MGEE	1.41	$1.45	$34.84	4.16%	5.40%	9.55%
Otter Tail Corp.	OTTR	1.17	$1.22	$33.31	3.65%	7.75%	11.40%
CH Energy Group	CHG	2.16	$2.17	$47.67	4.55%	0.93%	5.48%
Energy East Corp.	EAS	1.21	$1.22	$24.20	5.04%	1.43%	6.47%
Florida Public Utilities	FPU	0.43	$0.45	$12.60	3.55%	7.97%	11.52%
SCANA Corp.	SCG	1.56	$1.62	$42.96	3.76%	7.12%	10.88%
UIL Holdings	UIL	1.73	$1.74	$33.48	5.19%	0.68%	5.87%
G't Plains Energy	GXP	1.66	$1.74	$31.66	5.49%	9.57%	15.07%
Vectren Corp.	VVC	1.27	$1.34	$28.86	4.66%	11.66%	16.31%

DCF ESTIMATES, MID-SIZED ELECTRIC UTILITIES

	Adjusted Dividend Yield	Expected Growth	Unadjusted Cost Rate
Average	4.59%	5.45%	10.04%
S. D.	0.72%	3.68%	3.52%
Range			
Low	4.23%	3.61%	8.28%
High	4.95%	7.29%	11.80%
Weighted Average	4.66%	5.66%	10.32%

ESTIMATES OF COST OF EQUITY: U.S. ELECTRIC UTILITIES (U.S. sample 1)

HISTORICAL MARKET RETURNS, AVERAGE PER ANNUM

Company	1998 - 2002	1998 - 2003	1998 - 2004	1998 - 2005	1998 - 2006
Hawaiian Elec.	11.23%	10.19%	12.46%	11.78%	11.14%
Empire Dist. Elec.	8.32%	9.05%	9.29%	9.59%	9.11%
MGE Energy	12.59%	13.21%	12.83%	13.08%	11.29%
Otter Tail Corp.	16.90%	13.65%	11.84%	11.58%	11.53%
CH Energy Group	13.70%	10.72%	10.74%	10.03%	10.03%
Energy East Corp.	19.66%	17.09%	17.80%	16.92%	14.83%
Florida Public Utilities	17.71%	17.34%	17.85%	17.59%	16.00%
SCANA Corp.	9.47%	8.96%	9.39%	10.39%	10.97%
UIL Holdings	15.32%	10.58%	14.28%	13.93%	14.62%
G't Plains Energy	1.78%	6.49%	8.08%	7.52%	7.00%
Vectren Corp.	13.21%	9.38%	10.30%	11.11%	9.95%
Average	12.72%	11.51%	12.26%	12.14%	11.50%
Weighted Average	12.02%	11.00%	11.91%	11.86%	11.24%
			Across Years,	**Average:**	12.03%
				Weighted:	11.61%

HISTORICAL MARKET RETURNS, 5-YEAR AVERAGES

Company	1998 - 2002	1999 - 2003	2000 - 2004	2002 - 2005	2003 - 2006
Hawaiian Elec.	11.23%	8.99%	15.39%	16.55%	13.28%
Empire Dist. Elec.	8.32%	5.46%	3.58%	5.37%	8.59%
MGE Energy	12.59%	12.56%	14.95%	17.77%	11.34%
Otter Tail Corp.	16.90%	12.73%	10.20%	9.76%	5.37%
CH Energy Group	13.70%	6.79%	9.55%	11.58%	7.91%
Energy East Corp.	19.66%	3.92%	4.27%	9.44%	9.36%
Florida Public Utilities	17.71%	12.62%	11.62%	16.03%	15.32%
SCANA Corp.	9.47%	6.01%	8.21%	6.37%	12.22%
UIL Holdings	15.32%	1.20%	8.24%	9.52%	11.29%
G't Plains Energy	1.78%	6.04%	11.42%	10.72%	10.06%
Vectren Corp.	13.21%	9.38%	10.30%	11.11%	9.33%
Average	12.72%	7.79%	9.79%	11.29%	10.37%
Weighted Average	12.02%	6.72%	9.21%	10.26%	10.47%
			Across Years,	**Average:**	10.39%
				Weighted:	9.74%

HISTORICAL MARKET RETURNS, CUMULATIVE

Company	1998 - 2002	1998 - 2003	1998 - 2004	1998 - 2005	1998 - 2006
Hawaiian Elec.	10.62%	9.65%	11.86%	11.25%	10.65%
Empire Dist. Elec.	7.47%	8.32%	8.67%	9.03%	8.61%
MGE Energy	12.01%	12.71%	12.41%	12.71%	10.83%
Otter Tail Corp.	16.59%	13.14%	11.32%	11.12%	11.13%
CH Energy Group	12.67%	9.67%	9.84%	9.23%	9.32%
Energy East Corp.	15.50%	13.54%	14.72%	14.21%	12.31%
Florida Public Utilities	16.57%	16.39%	17.03%	16.87%	15.27%
SCANA Corp.	8.42%	8.08%	8.63%	9.69%	10.33%
UIL Holdings	13.61%	8.64%	12.24%	12.15%	13.01%
G't Plains Energy	1.53%	5.81%	7.41%	6.93%	6.47%
Vectren Corp.	5.09%	4.52%	5.70%	6.74%	6.45%
Average	10.91%	10.04%	10.89%	10.90%	10.40%
Weighted Average	9.75%	9.20%	10.25%	10.36%	9.91%
			Across Years,	**Average:**	10.63%
				Weighted:	9.89%

ESTIMATES OF COST OF EQUITY: U.S. ELECTRIC UTILITIES (U.S. sample 1)

RISK PREMIUM

Timeframes	S&P 500 minus Intermediate Term Debt		S&P 500 minus Short Term Debt		GDP Inflation
	Average Per Annum	Geometric	Average Per Annum	Geometric	
1950s	18.2%	16.6%	19.0%	17.4%	2.6%
1960s	4.2%	3.2%	4.8%	3.8%	2.6%
1970s	0.4%	-1.3%	1.2%	-0.7%	6.8%
1980s	8.2%	7.4%	9.3%	8.4%	4.4%
1990s	12.7%	11.8%	14.1%	13.2%	2.1%
2000s	-1.7%	0.0%	-0.6%	0.0%	1.8%
1950-Forward	7.5%				
Average, 50s-90s	8.7%	7.5%	9.7%	8.4%	3.7%
'50s, '60s, '80s, '90s	10.8%	9.8%	11.8%	10.7%	2.5%
'70s, '80s	4.3%	3.0%	5.2%	3.9%	5.6%
2000s	-1.7%	0.0%	-0.6%	0.0%	1.8%

Timeframes	Mid-Cap Size Premia, Differences From Market Index		Small-Cap Size Premia, Differences From Market Index		Micro-Cap Size Premia, Differences From Market Returns		1-Year Treasury Yields	1-Year 10-Year Spread
	Average	S.D	Average	S.D.	Average	S.D.		
1950s	1.8%	2.1%	2.3%	2.9%	3.6%	4.3%	2.6%	0.6%
1960s	3.0%	3.3%	4.5%	6.5%	8.3%	10.7%	4.4%	0.3%
1970s	3.4%	5.5%	4.6%	9.8%	5.6%	13.8%	7.0%	0.5%
1980s	2.2%	4.2%	3.6%	8.0%	2.4%	11.3%	9.7%	0.9%
1990s	-1.0%	4.2%	-1.6%	5.3%	-1.5%	8.1%	5.4%	1.3%
2000s	3.2%	5.3%	5.9%	6.9%	11.3%	11.2%	3.3%	1.4%
Average, 50s-90s	1.9%	3.8%	2.7%	6.5%	3.7%	11.0%	6.6%	0.7%
'50s, '60s, '80s, '90s	1.5%	3.4%	2.2%	5.7%	3.5%	7.7%	4.1%	0.7%
'70s, '80s	2.8%	4.8%	4.1%	8.9%	4.0%	12.5%	8.4%	0.7%
2000s	3.2%	5.3%	5.9%	6.9%	11.3%	11.2%	3.3%	1.4%
S. D. Across Decades	1.6%		2.6%		4.5%		2.6%	0.5%

Equity Market Return		
Cost Rate Components	Market Return Requirements	
	Lower Bound	Upper Bound
1-Year Treasuries	2.0%	4.6%
1-Yr - 10-Yr Spread	1.2%	1.6%
Equity - T. Debt Risk Premia	7.5%	
Expected Overall Market Return	11.4%	13.0%

Cost Rate Adjustments, Small-Sized Equities		
Adjustment Component	Lower Bound	Upper Bound
Diversifiable Risks	-1.6%	-1.3%
Small Capitalization Equities	1.2%	1.6%

Cost of Capital, Small-Size	
	Lower Bound
w/o issuance Costs	10.97%
Average:	12.07%

ESTIMATES OF COST OF EQUITY: U.S. ELECTRIC UTILITIES (U.S. sample 1)

SELECTION SCREEN 1

Company	Ticker	06 Market Cap ($M)	2006 Year End Beta	Average Beta 2002-2005	Standard Deviation, Beta 2002-2006	2006 Stock Price	2006 Financial Results: Revenues (M$)	Operating Margins (M$)	Total Assets (M$)	Assets/ Revenue
Black Hills	BKH	1,163	1.10	0.94	0.11	34.85	657	37.56	2,245	3.42
Hawaiian Elec.	HE	2,203	0.70	0.65	0.07	27.04	2,461	15.90	9,891	4.02
PNM Resources	PNM	2,053	0.95	0.86	0.12	26.79	2,472	16.01	6,166	2.49
Cleco Corp.	CNL	1,356	1.35	1.09	0.15	23.55	1,001	19.33	2,461	2.46
Empire Dist. Elec.	EDE	679	0.85	0.69	0.09	22.44	413	32.60	1,316	3.18
MGE Energy	MGEE	686	0.85	0.64	0.09	32.70	508	21.74	982	1.94
OGE Energy	OGE	3,055	0.75	0.70	0.07	33.50	4,006	15.33	4,902	1.22
Otter Tail Corp.	OTTR	865	0.75	0.58	0.05	29.32	1,105	13.37	1,259	1.14
Cen. Vermont Pub. Serv.	CV	210	0.85	0.54	0.11	20.77	326	14.37	501	1.54
CH Energy Group	CHG	771	0.85	0.79	0.06	48.94	993	11.17	1,461	1.47
Energy East Corp.	EAS	3,592	0.85	0.80	0.08	24.28	5,231	21.44	11,562	2.21
Florida Public Utilities	FPU	82	0.55	0.60	0.06	13.58	134	15.55	181	1.35
NSTAR	NST	3,279	0.75	0.71	0.06	30.70	3,578	23.96	7,769	2.17
SCANA Corp.	SCG	4,094	0.75	0.58	0.10	36.23	3,885	22.96	8,996	2.32
UIL Holdings	UIL	866	0.90	0.79	0.10	34.83	846	17.02	1,631	1.93
UNITIL Corp.	UTL	140	0.45	0.41	0.03	24.84	261	17.42	483	1.85
G't Plains Energy	GXP	2,382	0.85	0.81	0.09	29.64	2,675	15.69	4,336	1.62
DPL Inc.	DPL	3,066	0.90	0.90	0.07	27.13	1,394	30.97	3,612	2.59
Vectren Corp.	VVC	2,073	0.90	0.79	0.05	27.24	2,042	19.03	4,092	2.00
Pinnacle West Capital	PNW	4,338	1.00	0.86	0.12	43.40	3,402	29.27	11,456	3.37
Average		1,848	0.85	0.74	0.08		1,869	20.53	4,265	2.21
Standard Deviation			0.19	0.16						0.79

ESTIMATES OF COST OF EQUITY: U.S. ELECTRIC UTILITIES (U.S. sample 1)

SELECTION SCREEN 2

		Equity Participation in Total Capital					Measures of Market Risk				Measures of Business and Financial Risk			
											Variation in Earnings per share	CV in Earnings per Share	Variation in Earnings per share	CV in Earnings per Share
Company	Ticker	1997	2001	2004	2006	Average	2006 Beta	Average Beta, 2002 - 2005	S.D., CAPM Beta	Annual Variation In Market Return (%)	5 Year	5 Year	10 Year	10 Year
Black Hills	BKH	56%	55%	50%	56%	54%	1.10	0.94	0.11	6.27	0.25	0.12	0.56	0.27
Hawaiian Elec.	HE	44%	42%	51%	49%	46%	0.70	0.65	0.07	3.96	0.13	0.09	0.12	0.08
PNM Resources	PNM	53%	51%	52%	49%	51%	0.95	0.86	0.12	5.54	0.27	0.20	0.44	0.29
Cleco Corp.	CNL	49%	42%	53%	58%	51%	1.35	1.09	0.15	3.20	0.10	0.07	0.16	0.12
Empire Dist. Elec.	EDE	49%	43%	49%	50%	48%	0.85	0.69	0.09	2.05	0.24	0.21	0.29	0.25
MGE Energy	MGEE	58%	58%	63%	61%	60%	0.85	0.64	0.09	5.74	0.18	0.10	0.20	0.12
OGE Energy	OGE	52%	41%	47%	54%	49%	0.75	0.70	0.07	4.22	0.37	0.20	0.32	0.18
Otter Tail Corp.	OTTR	48%	53%	61%	64%	57%	0.75	0.58	0.05	4.62	0.14	0.09	0.18	0.12
Cen. Vermont Pub. Serv.	CV	58%	48%	60%	57%	56%	0.85	0.54	0.11	4.05	0.63	0.54	0.54	0.50
CH Energy Group	CHG	53%	65%	59%	59%	59%	0.85	0.79	0.06	5.22	0.28	0.11	0.29	0.10
Energy East Corp.	EAS	53%	38%	41%	43%	44%	0.85	0.80	0.08	3.93	0.14	0.09	0.26	0.15
Florida Public Utilities	FPU	52%	36%	45%	48%	45%	0.55	0.60	0.06	2.78	0.13	0.22	0.10	0.18
NSTAR	NST	46%	39%	40%	40%	41%	0.75	0.71	0.06	4.59	0.09	0.05	0.20	0.12
SCANA Corp.	SCG	48%	55%	42%	43%	47%	0.75	0.58	0.10	3.98	0.23	0.10	0.35	0.16
UIL Holdings	UIL	38%	50%	53%	53%	48%	0.90	0.79	0.10	4.16	0.29	0.19	0.46	0.24
UNITIL Corp.	UTL	50%	40%	45%	41%	44%	0.45	0.41	0.03	2.00	0.14	0.10	0.17	0.11
G't Plains Energy	GXP	43%	45%	53%	67%	52%	0.85	0.81	0.09	2.79	0.32	0.15	0.37	0.19
DPL Inc.	DPL	56%	24%	33%	31%	36%	0.90	0.90	0.07	4.30	0.41	0.36	0.34	0.27
Vectren Corp.	VVC	N/A	46%	52%	49%	49%	0.90	0.79	0.05	2.63	0.16	0.10	0.24	0.17
Pinnacle West Capital	PNW	46%	48%	53%	52%	50%	1.00	0.86	0.12	4.05	0.34	0.13	0.45	0.16
Average		50%	46%	50%	51%	49%	85%	74%	8%	4.00	24%	16%	30%	19%
Standard Deviation						6%	0.19	0.16	0.03	1.17	0.13	0.11	0.14	0.10

APPENDIX IV

ESTIMATES OF COST OF EQUITY: U.S. GAS UTILITIES (U.S. sample 2)

CAPITAL ASSET PRICING MODEL

Electric Utilities		Adjusted CAPM Beta		Unadjusted Beta, as Inferred	
Company	Ticker	2006	5 Year Average, 2006 Ending	2006	5 Year Average, 2006 Ending
Atmos Energy	ATO	0.80	0.67	0.70	0.51
EnergySouth Inc	ENSI	0.65	0.53	0.48	0.30
Laclede Group	LG	0.90	0.71	0.85	0.57
New Jersey Resource	NJR	0.80	0.71	0.70	0.57
Northwest Nat. Gas	NWN	0.80	0.66	0.70	0.49
Piedmont Natural Gas	PNY	0.80	0.73	0.70	0.60
Southwest Gas	SWX	0.85	0.76	0.78	0.64
WGL Holdings Inc.	WGL	0.85	0.73	0.78	0.60
Average		0.81	0.67	0.69	0.50
Standard Deviation		0.07	0.07	0.12	0.11
Weighted Average:		0.82	0.70	0.73	0.56

MARKET INPUTS: AVERAGE YIELDS AND OVERALL RETURNS

	1-Year Gov't Debt Interest Rates (%)	10-Year Gov't Debt Interest Rates (%)	1- to 10-Year Spread in Debt Rates (%)	S&P500 Total Return (%)	Chain-Weighted Rates of Inflation (%)
1950s	2.62	3.22	0.60		2.60
1960s	4.40	4.67	0.28		2.62
1970s	7.00	7.50	0.50	7.92	6.82
1980s	9.74	10.60	0.85	18.23	4.44
1990s	5.36	6.66	1.30	18.99	2.14
2000s	3.32	4.73	1.41	2.45	1.83
60s, 70s, 90s	5.58	6.28	0.74		
Overall	5.40	6.23	0.83	12.80	3.57

VARIATION IN YIELDS AND RETURNS (%)

	1-Year	10-Year	1- to 10-Year Spread	S&P500 Total Return
1950s	1.07	0.63	0.51	
1960s	1.32	0.91	0.46	
1970s	1.75	0.99	1.02	20.36
1980s	2.70	2.16	1.02	13.07
1990s	1.21	1.00	0.96	14.16
2000s	1.75	0.67	1.23	17.73
60s, 70s, 90s	1.43	0.97	0.81	
Overall	1.96	1.53	0.87	16.33

CAPM ESTIMATES: MOEST-SIZED GAS DISTRIBUTION UTILITIES

	of Equity Capital ,	Risk-Free Rate	Market Beta, Adjusted	Expected Market Return	Risk Free Rate
Low	9.46%	3.96%	0.80	10.84%	3.96%
High	13.23%	5.49%	0.84	14.76%	5.49%
Weighted Average	11.32%	4.73%	0.82	12.80%	4.73%

U.S. Equity Market Risk Premia: 8.07%

ESTIMATES OF COST OF EQUITY: U.S. GAS UTILITIES (U.S. sample 2)

DISCOUNTED CASH FLOW

Electric Utility	Ticker	Dividend Per Share	Effective Year Forward Dividend Rate	Average Market Price Per Share, April - May '07	Adjusted Dividend Yield	Expected Growth	Single Stage DCF Estimates of Cost of Equity Capital
Atmos Energy	ATO	1.28	$1.33	$40.67	3.26%	7.09%	10.34%
EnergySouth Inc	ENSI	0.96	$1.00	$44.11	2.28%	9.37%	11.65%
Laclede Group	LG	1.45	$1.48	$31.28	4.72%	3.54%	8.26%
New Jersey Resources	NJR	1.52	$1.59	$54.24	2.94%	9.64%	12.58%
Northwest Nat. Gas	NWN	1.44	$1.51	$50.32	3.00%	9.61%	12.61%
Piedmont Natural Gas	PNY	0.99	$1.03	$26.47	3.88%	7.29%	11.17%
Southwest Gas	SWX	0.86	$0.90	$37.92	2.37%	8.58%	10.94%
WGL Holdings Inc.	WGL	1.35	$1.39	$34.56	4.02%	5.59%	9.61%

DCF ESTIMATES, MID-SIZED ELECTRIC UTILITIES

	Adjusted Dividend Yield	Expected Growth	Unadjusted Cost Rate
Average	3.31%	7.59%	10.90%
S. D.	0.85%	2.18%	1.48%
Range			
Low	2.88%	6.50%	10.15%
High	3.73%	8.68%	11.64%
Weighted Average	3.38%	7.49%	10.86%

ESTIMATES OF COST OF EQUITY: U.S. GAS UTILITIES (U.S. sample 2)

HISTORICAL MARKET RETURNS, AVERAGE PER ANNUM

Company	1998 - 2002	1998 - 2003	1998 - 2004	1998 - 2005	1998 - 2006
Atmos Energy	4.49%	5.38%	6.67%	7.73%	7.15%
EnergySouth Inc	12.79%	12.83%	15.75%	15.87%	15.62%
Laclede Group	6.74%	7.37%	9.34%	9.74%	9.66%
New Jersey Resources	13.86%	13.63%	14.62%	15.00%	13.86%
Northwest Nat. Gas	7.47%	6.91%	8.31%	9.74%	9.51%
Piedmont Natural Gas	12.45%	12.18%	13.07%	13.50%	12.92%
Southwest Gas	9.99%	7.92%	8.67%	9.13%	10.95%
WGL Holdings Inc.	7.39%	6.47%	7.72%	8.75%	7.78%
Average	9.40%	9.09%	10.52%	11.19%	10.93%
Weighted Average	8.92%	8.62%	9.82%	10.57%	10.25%
			Across Years,	**Average:**	10.22%
				Weighted:	9.63%

HISTORICAL MARKET RETURNS, 5-YEAR AVERAGES

Company	1998 - 2002	1999 - 2003	2000 - 2004	2002 - 2005	2003 - 2006
Atmos Energy	4.49%	2.00%	5.25%	12.89%	8.66%
EnergySouth Inc	12.79%	9.55%	17.65%	21.48%	20.77%
Laclede Group	6.74%	6.40%	10.56%	14.34%	11.98%
New Jersey Resources	13.86%	11.51%	13.47%	15.20%	14.13%
Northwest Nat. Gas	7.47%	5.84%	10.23%	15.20%	13.60%
Piedmont Natural Gas	12.45%	8.03%	10.36%	15.31%	12.42%
Southwest Gas	9.99%	5.18%	2.48%	9.86%	11.56%
WGL Holdings Inc.	7.39%	4.11%	7.07%	8.77%	6.66%
Average	9.40%	6.58%	9.63%	14.13%	12.47%
Weighted Average	8.92%	5.89%	8.28%	13.16%	11.14%
			Across Years,	**Average:**	10.44%
				Weighted:	9.48%

HISTORICAL MARKET RETURNS, CUMULATIVE

Company	1998 - 2002	1998 - 2003	1998 - 2004	1998 - 2005	1998 - 2006
Atmos Energy	2.98%	4.09%	5.51%	6.67%	6.20%
EnergySouth Inc	11.76%	11.97%	14.79%	15.03%	14.87%
Laclede Group	6.32%	7.01%	8.93%	9.38%	9.34%
New Jersey Resources	13.73%	13.52%	14.50%	14.89%	13.71%
Northwest Nat. Gas	6.94%	6.46%	7.87%	9.29%	9.10%
Piedmont Natural Gas	11.56%	11.43%	12.40%	12.91%	12.38%
Southwest Gas	8.23%	6.38%	7.32%	7.94%	9.76%
WGL Holdings Inc.	7.18%	6.28%	7.51%	8.53%	7.56%
Average	8.59%	8.39%	9.85%	10.58%	10.37%
Weighted Average	8.03%	7.86%	9.12%	9.93%	9.65%
			Across Years,	**Average:**	9.56%
				Weighted:	8.92%

ESTIMATES OF COST OF EQUITY: U.S. GAS UTILITIES (U.S. sample 2)

RISK PREMIUM

Timeframes	S&P 500 minus Intermediate Term Debt		S&P 500 minus Short Term Debt		GDP Inflation
	Average Per Annum	Geometric	Average Per Annum	Geometric	
1950s	18.2%	16.6%	19.0%	17.4%	2.6%
1960s	4.2%	3.2%	4.8%	3.8%	2.6%
1970s	0.4%	-1.3%	1.2%	-0.7%	6.8%
1980s	8.2%	7.4%	9.3%	8.4%	4.4%
1990s	12.7%	11.8%	14.1%	13.2%	2.1%
2000s	-1.7%	0.0%	-0.6%	0.0%	1.8%
1950-Forward	7.5%				
Average, 50s-90s	8.7%	7.5%	9.7%	8.4%	3.7%
'50s, '60s, '80s, '90s	10.8%	9.8%	11.8%	10.7%	2.5%
'70s, '80s	4.3%	3.0%	5.2%	3.9%	5.6%
2000s	-1.7%	0.0%	-0.6%	0.0%	1.8%

Timeframes	Mid-Cap Size Premia, Differences From Market Index		Small-Cap Size Premia, Differences From Market Index		Micro-Cap Size Premia, Differences From Market Returns		1-Year Treasury Yields	1-Year 10-Year Spread
	Average	S.D	Average	S.D.	Average	S.D.		
1950s	1.8%	2.1%	2.3%	2.9%	3.6%	4.3%	2.6%	0.6%
1960s	3.0%	3.3%	4.5%	6.5%	8.3%	10.7%	4.4%	0.3%
1970s	3.4%	5.5%	4.6%	9.8%	5.6%	13.8%	7.0%	0.5%
1980s	2.2%	4.2%	3.6%	8.0%	2.4%	11.3%	9.7%	0.9%
1990s	-1.0%	4.2%	-1.6%	5.3%	-1.5%	8.1%	5.4%	1.3%
2000s	3.2%	5.3%	5.9%	6.9%	11.3%	11.2%	3.3%	1.4%
Average, 50s-90s	1.9%	3.8%	2.7%	6.5%	3.7%	11.0%	6.6%	0.7%
'50s, '60s, '80s, '90s	1.5%	3.4%	2.2%	5.7%	3.5%	7.7%	4.1%	0.7%
'70s, '80s	2.8%	4.8%	4.1%	8.9%	4.0%	12.5%	8.4%	0.7%
2000s	3.2%	5.3%	5.9%	6.9%	11.3%	11.2%	3.3%	1.4%
S. D. Across Decades	1.6%		2.6%		4.5%		2.6%	0.5%

Equity Market Return			Cost Rate Adjustments, Small-Sized Equities			Cost of Capital, Small-Sized Equities		
Cost Rate Components	Market Return Requirements		Adjustment Component	Lower Bound	Upper Bound		Lower Bound	Upper Bound
	Lower Bound	Upper Bound						
1-Year Treasuries	2.0%	4.6%	Diversifiable Risks	-1.6%	-1.3%	w/o issuance Costs	11.02%	13.21%
1-Yr - 10-Yr Spread	1.2%	1.6%	Small Capitalization Risk Premia	1.2%	1.6%	Average:	12.12%	
Equity - T. Debt Risk Premia	7.5%							
Expected Overall Market Return	11.4%	13.0%						

ESTIMATES OF COST OF EQUITY: U.S. GAS UTILITIES (U.S. sample 2)

SELECTION SCREEN 1

Company	Ticker	06 Market Cap ($M)	2006 Year End Beta	Average Beta 2002-2005	Standard Deviation, Beta 2002-2006	2006 Stock Price	2006 Financial Results			
							Revenues (M$)	Operating Margins (M$)	Total Assets (M$)	Assets/ Revenue
AGL Resources	ATG	2,849	0.85	0.84	0.09	36.67	2,621	25.41	6,147	2.35
Atmos Energy	ATO	2,211	0.80	0.69	0.05	27.05	6,152	12.73	5,720	0.93
EnergySouth Inc	ENSI	244	0.65	0.54	0.05	30.65	136	36.62	263	1.93
Laclede Group	LG	688	0.90	0.74	0.09	32.23	1,998	6.72	1,570	0.79
New Jersey Resources	NJR	1,247	0.80	0.73	0.06	45.13	3,300	5.49	2,399	0.73
Nicor Inc.	GAS	1,931	1.05	1.06	0.11	43.00	2,960	15.02	4,090	1.38
Northwest Nat. Gas	NWN	1,015	0.80	0.68	0.06	37.25	1,013	20.13	1,957	1.93
Piedmont Natural Gas	PNY	1,837	0.80	0.75	0.04	24.62	1,925	14.08	2,734	1.42
South Jersey Inds.	SJI	856	0.70	0.59	0.09	29.17	931	18.96	1,573	1.69
Southwest Gas	SWX	1,318	0.85	0.78	0.06	31.56	2,025	18.67	3,485	1.72
WGL Holdings Inc.	WGL	1,466	0.85	0.75	0.07	29.99	2,638	11.20	2,791	1.06
Average		1,424	0.82	0.74	0.07	33.39	2,336	16.82	2,975	1.45
Standard Deviation			0.10	0.14						0.53

ESTIMATES OF COST OF EQUITY: U.S. GAS UTILITIES (U.S. sample 2)

SELECTION SCREEN 2

		Equity Participation in Total Capital					Measures of Market Risk				Measures of Business and Financial Risk			
											Variation in Earnings per share	CV in Earnings per Share	Variation in Earnings per share	CV in Earnings per Share
Company	Ticker	1997	2001	2004	2006	Average	2006 Beta	Average Beta, 2002 - 2005	S.D., CAPM Beta	Annual Variation In Market Return (%)	5 Year	5 Year	10 Year	10 Year
AGL Resources	ATG	49%	39%	46%	50%	46%	0.85	0.84	0.09	6.87	0.35	0.15	0.59	0.33
Atmos Energy	ATO	52%	46%	57%	43%	49%	0.80	0.69	0.05	2.86	0.20	0.12	0.36	0.24
EnergySouth Inc	ENSI	46%	44%	53%	61%	51%	0.65	0.54	0.05	6.58	0.18	0.11	0.27	0.20
Laclede Group	LG	62%	50%	48%	50%	53%	0.90	0.74	0.09	3.80	0.42	0.23	0.33	0.20
New Jersey Resources	NJR	49%	50%	60%	65%	56%	0.80	0.73	0.06	8.75	0.27	0.11	0.48	0.23
Nicor Inc.	GAS	57%	62%	60%	64%	61%	1.05	1.06	0.11	2.88	0.37	0.15	0.33	0.13
Northwest Nat. Gas	NWN	49%	53%	54%	54%	52%	0.80	0.68	0.06	4.98	0.29	0.15	0.34	0.19
Piedmont Natural Gas	PNY	52%	52%	56%	52%	53%	0.80	0.75	0.04	3.88	0.16	0.13	0.16	0.15
South Jersey Inds.	SJI	36%	36%	51%	55%	45%	0.70	0.59	0.09	6.26	0.48	0.29	0.52	0.40
Southwest Gas	SWX	32%	40%	36%	39%	37%	0.85	0.78	0.06	3.82	0.37	0.26	0.35	0.26
WGL Holdings Inc.	WGL	56%	56%	57%	60%	57%	0.85	0.75	0.07	2.32	0.44	0.23	0.34	0.19
Average		49%	48%	53%	54%	51%	0.82	0.74	0.07	4.82	0.32	0.18	0.37	0.23
Standard Deviation						7%	0.10	0.14	0.02	2.04	0.11	0.06	0.12	0.08

APPENDIX V

ESTIMATES OF COST EQUITY: U.S. Non-Utilities (U.S. sample 3)

CAPITAL ASSET PRICING MODEL

Electric Utilities		Adjusted CAPM Beta		Unadjusted Beta, as Inferred	
Company	Ticker	2006	5 Year Average, 2006 Ending	2006	5 Year Average, 2006 Ending
Great Southern Bancorp	GSBC	0.75	0.52	0.63	0.28
Steinway Musical	LVB	0.90	0.69	0.85	0.54
U S Lime & Minerals	USLM	0.70	0.56	0.55	0.34
Winmark Corp	WINA	0.60	0.63	0.40	0.45
CPI Corp.	CPY	0.85	0.72	0.78	0.58
Indep Bank Corp/MI	IBCP	0.80	0.64	0.70	0.46
Patriot Transportation Holdin	PATR	0.50	0.53	0.25	0.30
Vitran Corporation Inc	VTN.TO	0.70	0.66	0.55	0.49
Supreme Inds Inc.	STS	0.65	0.77	0.48	0.66
Farmers Capital Bank Corp.	FFKT	0.65	0.63	0.48	0.45
Alamo Group	ALG	0.65	0.54	0.48	0.31
Northwest Pipe Co	NWPX	0.75	0.52	0.63	0.28
Oil-Dri Corp of Amer	ODC	0.55	0.51	0.33	0.27
Samuel Manu-Tech Inc.	SMT.TO	0.60	0.59	0.40	0.39
Meadowbrook Ins Grou	MIG	0.60	0.80	0.40	0.70
Frisch's Restaurants	FRS	0.60	0.57	0.40	0.36
Sunlink Health Sys	SSY	0.80	0.59	0.70	0.39
Old Second Bancorp	OSBC	0.75	0.55	0.63	0.33
Village Super Market 'A'	VLGEA	0.60	0.62	0.40	0.43
Utah Medical Prods.	UTMD	0.55	0.59	0.33	0.39
Average		0.72	0.61	0.59	0.42
Standard Deviation		0.13	0.08	0.21	0.12
Weighted Average:		0.70	0.61	0.55	0.42

MARKET INPUTS: AVERAGE YIELDS AND OVERALL RETURNS

	1-Year Gov't Debt Interest Rates (%)	10-Year Gov't Debt Interest Rates (%)	1- to 10-Year Spread in Debt Rates (%)	S&P500 Total Return (%)	Chain-Weighted Rates of Inflation (%)
1950s	2.62	3.22	0.60		2.60
1960s	4.40	4.67	0.28		2.62
1970s	7.00	7.50	0.50	7.92	6.82
1980s	9.74	10.60	0.85	18.23	4.44
1990s	5.36	6.66	1.30	18.99	2.14
2000s	3.32	4.73	1.41	2.45	1.83
60s, 70s, 90s	5.58	6.28	0.74		
Overall	5.40	6.23	0.83	12.80	3.57

VARIATION IN YIELDS AND RETURNS (%)

	1-Year	10-Year	1- to 10-Year Spread	S&P500 Total Return
1950s	1.07	0.63	0.51	
1960s	1.32	0.91	0.46	
1970s	1.75	0.99	1.02	20.36
1980s	2.70	2.16	1.02	13.07
1990s	1.21	1.00	0.96	14.16
2000s	1.75	0.67	1.23	17.73
60s, 70s, 90s	1.43	0.97	0.81	
Overall	1.96	1.53	0.87	16.33

CAPM ESTIMATES: COMPARABLE RISK NON-UTILITY COMPANIES

Market Cost of Equity Capital, Unadjusted		Risk-Free Rate	Market Beta, Adjusted	Expected Market Return	Risk Free Rate
Low	10.09%	4.73%	0.66	12.80%	4.73%
High	10.60%	4.73%	0.73	12.80%	4.73%
Weighted Average	10.35%	4.73%	0.70	12.80%	4.73%

U.S. Equity Market Risk Premia: 8.07%

ESTIMATES OF COST EQUITY: U.S. Non-Utilities (U.S. sample 3)

HISTORICAL MARKET RETURNS, AVERAGE PER ANNUM

Company	1998 - 2002	1998 - 2003	1998 - 2004	1998 - 2005	1998 - 2006
Great Southern Bancorp	22.59%	21.38%	25.40%	23.30%	19.89%
Steinway Musical	0.35%	-1.62%	9.63%	7.54%	7.18%
U S Lime & Minerals	-9.17%	-7.42%	9.72%	23.61%	26.27%
Winmark Corp	5.33%	11.66%	18.76%	14.92%	14.32%
CPI Corp.	-1.98%	0.60%	-0.40%	1.83%	12.64%
Indep Bank Corp/MI	23.72%	25.05%	22.75%	21.52%	18.74%
Patriot Transportation Holdin	3.08%	2.99%	6.14%	12.05%	15.81%
Vitran Corporation Inc	6.06%	19.14%	26.53%	23.04%	21.82%
Supreme Inds Inc.	2.79%	1.83%	6.17%	7.79%	6.70%
Farmers Capital Bank Corp.	12.95%	10.78%	10.58%	9.23%	8.36%
Alamo Group	-0.39%	-1.31%	4.30%	6.67%	6.41%
Northwest Pipe Co	-1.68%	-5.09%	-0.96%	5.76%	6.68%
Oil-Dri Corp of Amer	-8.37%	-3.43%	6.59%	7.64%	8.11%
Samuel Manu-Tech Inc.	-8.62%	-6.21%	-0.78%	3.17%	5.12%
Meadowbrook Ins Grou	-30.56%	-22.06%	-11.08%	-8.59%	-1.02%
Frisch's Restaurants	7.84%	9.49%	13.84%	12.06%	10.24%
Sunlink Health Sys	0.00%	0.00%	0.00%	0.00%	0.00%
Old Second Bancorp	18.93%	19.58%	21.13%	20.43%	18.33%
Village Super Market 'A'	27.34%	21.35%	21.94%	23.42%	26.19%
Utah Medical Prods.	15.40%	18.67%	17.57%	16.06%	18.34%
Average	4.28%	5.77%	10.39%	11.57%	12.51%
Weighted Average	6.32%	7.81%	11.93%	12.94%	13.48%
			Across Years,	**Average:**	8.90%
				Weighted:	10.50%

ESTIMATES OF COST EQUITY: U.S. Non-Utilities (U.S. sample 3)

HISTORICAL MARKET RETURNS, 5-YEAR AVERAGES

Company	1998 - 2002	1999 - 2003	2000 - 2004	2002 - 2005	2003 - 2006
Great Southern Bancorp	22.59%	17.52%	26.20%	32.82%	21.74%
Steinway Musical	0.35%	-7.82%	10.92%	12.88%	14.98%
U S Lime & Minerals	-9.17%	-8.72%	14.13%	39.91%	53.68%
Winmark Corp	5.33%	11.69%	31.29%	36.97%	30.92%
CPI Corp.	-1.98%	-3.03%	-7.48%	-0.78%	22.03%
Indep Bank Corp/MI	23.72%	22.64%	29.70%	33.21%	17.26%
Patriot Transportation Holdin	3.08%	-1.86%	7.90%	21.25%	33.81%
Vitran Corporation Inc	6.06%	17.08%	30.05%	35.90%	43.57%
Supreme Inds Inc.	2.79%	-6.83%	2.24%	13.73%	17.82%
Farmers Capital Bank Corp.	12.95%	1.11%	3.58%	4.37%	2.61%
Alamo Group	-0.39%	0.94%	16.58%	14.70%	12.32%
Northwest Pipe Co	-1.68%	-5.94%	3.78%	18.18%	17.88%
Oil-Dri Corp of Amer	-8.37%	-5.33%	9.51%	16.26%	24.01%
Samuel Manu-Tech Inc.	-8.62%	-7.40%	6.00%	15.89%	22.85%
Meadowbrook Ins Grou	-30.56%	-28.63%	-7.25%	6.12%	23.86%
Frisch's Restaurants	7.84%	11.45%	23.99%	24.34%	17.63%
Sunlink Health Sys	0.00%	0.00%	0.00%	0.00%	0.00%
Old Second Bancorp	18.93%	19.94%	26.76%	32.88%	24.43%
Village Super Market 'A'	27.34%	20.81%	20.49%	28.81%	37.12%
Utah Medical Prods.	15.40%	26.80%	29.46%	29.59%	27.57%
Average	4.28%	3.72%	13.89%	20.85%	23.30%
Weighted Average	6.32%	5.47%	15.62%	22.67%	23.37%

Across Years,	**Average:**	13.21%
	Weighted:	14.69%

ESTIMATES OF COST EQUITY: U.S. Non-Utilities (U.S. sample 3)

HISTORICAL MARKET RETURNS, CUMULATIVE

Company	1998 - 2002	1998 - 2003	1998 - 2004	1998 - 2005	1998 - 2006
Great Southern Bancorp	18.94%	18.33%	22.35%	20.55%	17.06%
Steinway Musical	-1.18%	-2.97%	5.74%	4.05%	4.07%
U S Lime & Minerals	-9.50%	-7.78%	3.90%	14.17%	17.47%
Winmark Corp	-2.14%	4.28%	10.99%	7.82%	8.01%
CPI Corp.	-3.21%	-0.60%	-1.45%	0.73%	8.65%
Indep Bank Corp/MI	18.26%	20.40%	18.69%	17.96%	15.36%
Patriot Transportation Holdin	-0.14%	0.30%	3.51%	8.73%	12.34%
Vitran Corporation Inc	1.27%	11.92%	18.89%	16.15%	15.69%
Supreme Inds Inc.	-2.95%	-2.96%	1.43%	3.48%	2.86%
Farmers Capital Bank Corp.	10.84%	8.94%	9.00%	7.81%	7.07%
Alamo Group	-3.85%	-4.20%	0.93%	3.48%	3.57%
Northwest Pipe Co	-3.39%	-6.80%	-2.94%	2.72%	3.93%
Oil-Dri Corp of Amer	-9.31%	-4.81%	3.12%	4.54%	5.33%
Samuel Manu-Tech Inc.	-10.78%	-8.21%	-3.34%	0.39%	2.47%
Meadowbrook Ins Grou	-34.62%	-27.61%	-19.31%	-16.23%	-10.02%
Frisch's Restaurants	5.65%	7.58%	11.70%	10.11%	8.41%
Sunlink Health Sys	0.00%	0.00%	0.00%	0.00%	0.00%
Old Second Bancorp	16.03%	17.14%	18.96%	18.52%	16.49%
Village Super Market 'A'	23.69%	17.60%	18.70%	20.49%	23.30%
Utah Medical Prods.	11.91%	15.47%	14.81%	13.60%	15.96%
Average	1.28%	2.80%	6.78%	7.95%	8.90%
Weighted Average	3.13%	4.68%	8.29%	9.33%	9.87%
			Across Years,	**Average:**	5.54%
				Weighted:	7.06%

ESTIMATES OF COST EQUITY: U.S. Non-Utilities (U.S. sample 3)

RISK PREMIUM

Timeframes	S&P 500 minus Intermediate Term Debt		S&P 500 minus Short Term Debt		GDP Inflation
	Average Per Annum	Geometric	Average Per Annum	Geometric	
1950s	18.2%	16.6%	19.0%	17.4%	2.6%
1960s	4.2%	3.2%	4.8%	3.8%	2.6%
1970s	0.4%	-1.3%	1.2%	-0.7%	6.8%
1980s	8.2%	7.4%	9.3%	8.4%	4.4%
1990s	12.7%	11.8%	14.1%	13.2%	2.1%
2000s	-1.7%	0.0%	-0.6%	0.0%	1.8%
1950-Forward	7.5%				
Average, 50s-90s	8.7%	7.5%	9.7%	8.4%	3.7%
'50s, '60s, '80s, '90s	10.8%	9.8%	11.8%	10.7%	2.5%
'70s, '80s	4.3%	3.0%	5.2%	3.9%	5.6%
2000s	-1.7%	0.0%	-0.6%	0.0%	1.8%

Timeframes	Mid-Cap Size Premia, Differences From Market Index		Small-Cap Size Premia, Differences From Market Index		Micro-Cap Size Premia, Differences From Market Returns		1-Year Treasury Yields	1-Year 10-Year Spread
	Average	S.D	Average	S.D.	Average	S.D.		
1950s	1.8%	2.1%	2.3%	2.9%	3.6%	4.3%	2.6%	0.6%
1960s	3.0%	3.3%	4.5%	6.5%	8.3%	10.7%	4.4%	0.3%
1970s	3.4%	5.5%	4.6%	9.8%	5.6%	13.8%	7.0%	0.5%
1980s	2.2%	4.2%	3.6%	8.0%	2.4%	11.3%	9.7%	0.9%
1990s	-1.0%	4.2%	-1.6%	5.3%	-1.5%	8.1%	5.4%	1.3%
2000s	3.2%	5.3%	5.9%	6.9%	11.3%	11.2%	3.3%	1.4%
Average, 50s-90s	1.9%	3.8%	2.7%	6.5%	3.7%	11.0%	6.6%	0.7%
'50s, '60s, '80s, '90s	1.5%	3.4%	2.2%	5.7%	3.5%	7.7%	4.1%	0.7%
'70s, '80s	2.8%	4.8%	4.1%	8.9%	4.0%	12.5%	8.4%	0.7%
2000s	3.2%	5.3%	5.9%	6.9%	11.3%	11.2%	3.3%	1.4%
S. D. Across Decades	1.6%		2.6%		4.5%		2.6%	0.5%

Equity Market Return			Cost Rate Adjustments, Small-Sized Equities			Cost of Capital, Small-Sized Equities		
Cost Rate Components	Market Return Requirements		Adjustment Component	Lower Bound	Upper Bound		Lower Bound	Upper Bound
	Lower Bound	Upper Bound						
1-Year Treasuries	2.0%	4.6%	Diversifiable Risks	-2.7%	-2.2%	w/o issuance Costs	10.69%	14.73%
1-Yr - 10-Yr Spread	1.2%	1.6%	Small Capitalization Equities	1.9%	3.9%	Average:	12.71%	
Equity - T. Debt Risk Premia	7.5%							
Expected Overall Market Return	11.4%	13.0%						

ESTIMATES OF COST EQUITY: U.S. Non-Utilities (U.S. sample 3)

SELECTION SCREEN 1

Company	Ticker	06 Market Cap ($M)	2006 Year End Beta	Average Beta 2002-2005	Standard Deviation, Beta 2002-2006	2006 Stock Price	2006 Financial Results			
							Revenues (M$)	Operating Margins (M$)	Total Assets (M$)	Assets/ Revenue
Merchants Bancshares Inc.	MBVT	141	0.60	0.61	0.05	23.98			1,137	
Great Southern Bancorp	GSBC	389	0.75	0.53	0.10	28.43			2,240	
Steinway Musical	LVB	243	0.90	0.68	0.03	29.00	385	7.66	447	1.16
U S Lime & Minerals	USLM	188	0.70	0.58	0.05	30.24	119	26.26	154	1.30
NewBridge Bancorp	NBBC	146	0.80	0.76	0.09	17.35			988	
Winmark Corp	WINA	131	0.60	0.61	0.07	23.13	27	20.33	38	1.37
CPI Corp.	CPY	216	0.85	0.73	0.03	33.90	294	15.05	90	0.31
Indep Bank Corp/MI	IBCP	575	0.80	0.65	0.04	25.16			3,430	
Patriot Transportation Holdin	PATR	215	0.50	0.53	0.06	71.54	147	20.74	219	1.49
Vitran Corporation Inc	VTN.TO	297	0.70	0.69	0.09	22.15	514	7.80	358	0.70
Supreme Inds Inc.	STS	89	0.65	0.76	0.03	6.99	341	3.93	142	0.42
Farmers Capital Bank Corp.	FFKT	257	0.65	0.63	0.03	32.62			1,824	
Alamo Group	ALG	218	0.65	0.54	0.05	22.33	456	7.06	327	0.72
Northwest Pipe Co	NWPX	256	0.75	0.53	0.06	28.78	347	9.55	424	1.22
Oil-Dri Corp of Amer	ODC	101	0.55	0.51	0.03	14.89	205	7.58	140	0.68
Samuel Manu-Tech Inc.	SMT.TO	418	0.60	0.56	0.09	13.04	905	10.54	570	0.63
Meadowbrook Ins Grou	MIG	254	0.60	0.81	0.11	8.73			969	
Frisch's Restaurants	FRS	120	0.60	0.58	0.03	23.75	291	31.59	175	0.60
Sunlink Health Sys	SSY	70	0.80	0.64	0.14	9.52	136	20.75	74	0.55
NAPCO Security Systems Inc.	NSSC	153	0.80	0.48	0.05	7.66	70	15.41	72	1.03
Old Second Bancorp	OSBC	403	0.75	0.56	0.06	30.67			2,459	
Village Super Market 'A'	VLGEA	189	0.60	0.63	0.05	29.25	1,017	4.03	271	0.27
Utah Medical Prods.	UTMD	125	0.55	0.58	0.03	31.63	29	39.88	44	1.54
SL Inds. Inc.	SLI	93	0.95	0.84	0.03	16.55	177	7.73	107	0.60
Average		220	0.70	0.62	0.06		321	15	696	0.86
Standard Deviation			0.12	0.10						0.42

ESTIMATES OF COST EQUITY: U.S. Non-Utilities (U.S. sample 3)

SELECTION SCREEN 2

		Equity Participation in Total Capital					Measures of Market Risk				Measures of Business and Financial Risk			
Company	Ticker	1997	2001	2004	2006	Average	2006 Beta	Average Beta, 2002 - 2005	S.D., CAPM Beta	Annual Variation In Market Returns (%)	Variation in Earnings per share 5 Year	CV in Earnings per Share 5 Year	Variation in Earnings per share 10 Year	CV in Earnings per Share 10 Year
Merchants Bancshares Inc.	MBVT	89%	97%	48%	42%	69%	0.60	0.61	0.05	5.18	0.10	0.06	0.22	0.13
Great Southern Bancorp	GSBC	28%	24%	36%	46%	33%	0.75	0.53	0.10	8.93	0.25	0.14	0.53	0.38
Steinway Musical	LVB	40%	37%	41%	48%	42%	0.90	0.68	0.03	5.12	0.80	0.64	0.61	0.41
U S Lime & Minerals	USLM	92%	49%	54%	55%	62%	0.70	0.58	0.05	8.39	0.74	0.71	0.63	0.82
NewBridge Bancorp	NBBC	100%	56%	49%	55%	65%	0.80	0.76	0.09	2.05	0.19	0.19	0.13	0.13
Winmark Corp	WINA	80%	98%	100%	56%	84%	0.60	0.61	0.07	6.86	0.13	0.23	0.16	0.30
CPI Corp.	CPY	63%	57%	57%	57%	59%	0.85	0.73	0.03	5.94	0.86	0.70	0.71	0.58
Indep Bank Corp/MI	IBCP	26%	36%	57%	61%	45%	0.80	0.65	0.04	7.56	0.22	0.13	0.53	0.44
Patriot Transportation Holdin	PATR	68%	61%	70%	66%	66%	0.50	0.53	0.06	16.26	0.54	0.27	0.63	0.39
Vitran Corporation Inc	VTN.TO	48%	55%	91%	65%	65%	0.70	0.69	0.09	6.81	0.20	0.16	0.34	0.35
Supreme Inds Inc.	STS	72%	81%	70%	66%	72%	0.65	0.76	0.03	1.58	0.13	0.31	0.17	0.32
Farmers Capital Bank Corp.	FFKT	97%	92%	71%	67%	82%	0.65	0.63	0.03	3.52	0.20	0.10	0.15	0.08
Alamo Group	ALG	79%	77%	90%	70%	79%	0.65	0.54	0.05	4.18	0.29	0.28	0.27	0.26
Northwest Pipe Co	NWPX	64%	67%	71%	72%	68%	0.75	0.53	0.06	5.36	0.61	0.40	0.44	0.27
Oil-Dri Corp of Amer	ODC	82%	68%	76%	70%	74%	0.55	0.51	0.03	3.10	0.30	0.51	0.40	0.68
Samuel Manu-Tech Inc.	SMT.TO	53%	58%	86%	77%	68%	0.60	0.56	0.09	3.02	0.60	0.48	0.51	0.50
Meadowbrook Ins Grou	MIG	100%	59%	83%	78%	80%	0.60	0.81	0.11	8.71	0.26	0.56	1.01	
Frisch's Restaurants	FRS	N/A	67%	67%	75%	75%	0.60	0.58	0.03	6.13	0.47	0.23	0.69	0.47
Sunlink Health Sys	SSY	77%	24%	79%	80%	65%	0.80	0.64	0.14	2.60	0.28	0.96	0.60	
NAPCO Security Systems Inc.	NSSC	70%	60%	86%	92%	77%	0.80	0.48	0.05	2.23	0.12	0.65	0.10	0.75
Old Second Bancorp	OSBC	100%	79%	81%	83%	86%	0.75	0.56	0.06	9.05	0.28	0.16	0.54	0.43
Village Super Market 'A'	VLGEA	70%	66%	80%	85%	75%	0.60	0.63	0.05	7.74	0.32	0.15	0.73	0.46
Utah Medical Prods.	UTMD	80%	88%	100%	89%	89%	0.55	0.58	0.03	8.84	0.35	0.20	0.60	0.47
SL Inds. Inc.	SLI	98%	97%	96%	72%	91%	0.95	0.84	0.03	3.34	0.49	0.56	0.73	1.21
Average		73%	65%	72%	68%	70%	0.70	0.62	0.06	5.94	0.36	0.37	0.48	0.45
Standard deviation						14%	0.12	0.10	0.03	3.28	0.22	0.24	0.24	0.25

APPENDIX VI

ESTIMATES OF COST OF EQUITY: Canadian Utility Companies (CN sample 1)

CAPITAL ASSET PRICING MODEL

TSX LISTED UTILITIES (Sample 1)

Company Name	Ticker	CAPM Beta, 2002 - 2006	
		Adjusted	Unadjusted
Canadian Utilities	CU	0.86	0.72
Enbridge Inc.	ENB	0.82	0.67
Gax Metro	GZM	0.94	0.84
Fortis Inc.	FTS	0.82	0.67
Transalta Power	TPW	0.93	0.84
Emera Inc.	EMA	0.84	0.71
Average		0.87	0.74
Standard Deviation		0.05	0.08
Weighted Average:		0.85	

AVERAGE YIELDS AND OVERALL MARKET RETURNS

	1-Year Gov't Debt Interest Rates	10-Year Gov't Debt Interest Rates	30-Year Gov't Debt Interest Rates	TSX Total Return	Variation in Monthly TSX Returns (S.D.)
2000	5.75%	5.84%	5.12%	11.59%	6.16%
2001	7.05%	10.88%	10.82%	-17.62%	5.93%
2002	3.01%	5.37%	5.55%	-14.24%	3.93%
2003	2.95%	4.90%	5.28%	26.68%	2.63%
2004	2.48%	4.66%	5.14%	8.04%	2.36%
2005	3.00%	4.08%	4.35%	27.09%	3.64%
2006	3.87%	4.17%	4.06%	9.15%	2.68%
Average	4.01%	5.70%	5.76%	7.24%	3.90%
Average,'02-'06	3.06%	4.64%	4.88%	11.34%	2.83%

VARIATION IN YIELDS AND RETURNS, OVER YEARS

	1-Year	10-Year	30-Year	TSX Returns Return
Standard Deviation	1.72%	2.37%	2.29%	17.68%

CANADIAN UTILITY COMPANIES (Sample 1)

CAPM ESTIMATES OF COST OF EQUITY CAPITAL

Market Cost of Equity Capital, Unadjusted		Risk-Free Rate	Market Beta, Adjusted	Expected Market Return	Risk Free Rate
Low	9.10%	4.16%	0.86	9.92%	4.16%
High	12.47%	5.11%	0.88	13.48%	5.11%
Average	10.39%	4.64%	0.87	11.26%	4.64%

Canadian Equity Market Risk Premia, '91 - '06: 6.63%

CAPITAL ASSET PRICING MODEL

TSX LISTED UTILITIES (Sample 2)

Company Name	Ticker	CAPM Beta, 2002 - 2006	
		Adjusted	Unadjusted
Pacific Northern Gas	PNG	0.91	0.81
Maxim Power Corp	MXG	0.99	0.79
Canadian Hydro	KHD	0.91	0.80
Manitoba Telecom	MBT	0.87	0.74
TransCanada Pipelines	TRP	0.82	0.67
Average		0.90	0.76
Standard Deviation		0.06	0.06
Weighted Average:		0.830	

AVERAGE YIELDS AND OVERALL MARKET RETURNS

Year	1-Year Gov't Debt Interest Rates	10-Year Gov't Debt Interest Rates	30-Year Gov't Debt Interest Rates	TSX Total Return	Variation in Monthly TSX Returns (S.D.)
2000	5.75%	5.84%	5.12%	11.59%	6.16%
2001	7.05%	10.88%	10.82%	-17.62%	5.93%
2002	3.01%	5.37%	5.55%	-14.24%	3.93%
2003	2.95%	4.90%	5.28%	26.68%	2.63%
2004	2.48%	4.66%	5.14%	8.04%	2.36%
2005	3.00%	4.08%	4.35%	27.09%	3.64%
2006	3.87%	4.17%	4.06%	9.15%	
Average	4.01%	5.70%	5.76%	7.24%	4.11%
Average,'02-'06	3.06%	4.64%	4.88%	11.34%	2.88%

VARIATION IN YIELDS AND RETURNS, OVER YEARS

	1-Year	10-Year	30-Year	TSX Returns Return
Standard Deviation	1.72%	2.37%	2.29%	17.68%

CANADIAN UTILITY COMPANIES (Sample 2)

CAPM ESTIMATES OF COST OF EQUITY CAPITAL

Market Cost of Equity Capital, Unadjusted		Risk-Free Rate	Market Beta, Adjusted	Expected Market Return	Risk Free Rate
Low	9.27%	4.16%	0.89	9.92%	4.16%
High	12.76%	5.11%	0.91	13.48%	5.11%
Weighted Average	10.60%	4.64%	0.90	11.26%	4.64%

Canadian Equity Market Risk Premia, '91 - '06: 6.63%

ESTIMATES OF COST OF EQUITY: Canadian Utility Companies (CN samples 1&2)

HISTORICAL MARKET RETURNS

CANADIAN UTILITIES (Sample 1)

Company	2002	2003	2004	2005	2006
Canadian Utilities	2.94%	15.03%	8.23%	50.58%	11.54%
Enbridge Inc.	-1.83%	28.04%	15.18%	25.51%	14.41%
Gax Metro	7.64%	21.01%	5.63%	-5.44%	-14.29%
Fortis Inc.	11.78%	14.20%	22.12%	42.79%	25.28%
Transalta Power	-20.79%	11.17%	3.33%	47.54%	9.24%
Emera Inc.	-2.90%	12.57%	12.80%	15.09%	12.32%
Average	-0.53%	17.00%	11.21%	29.34%	9.75%
				Average Across Years:	13.36%

CANADIAN UTILITIES (Sample 2)

Company	2002	2003	2004	2005	2006
Pacific Northern Gas	0.00%	0.00%	0.00%	-2.75%	-3.56%
Maxim Power Corp	-34.29%	82.61%	-11.90%	97.30%	-7.12%
Canadian Hydro Developers	9.27%	-1.79%	54.09%	71.98%	2.06%
Manitoba Telecom Services	2.16%	25.68%	15.74%	-12.69%	21.68%
TransCanada Pipelines	15.34%	24.17%	11.38%	27.54%	14.94%
Average	-1.50%	26.13%	13.86%	36.28%	5.60%
				Average Across Years:	16.07%

CONCENTRIC ENERGY ADVISORS

Authorized Return on Equity for Canadian and U.S. Gas and Electric Utilities

Volume II, May 8, 2014

Concentric Energy Advisors, Inc. (Concentric) is pleased to publish the second edition of this newsletter. It summarizes authorized returns on common equity (ROEs) and common equity ratios for Canadian gas and electric distributors, Canadian electric transmission companies, U.S. gas and electric distributors, and select bond yields. Regulators, stakeholders, and analysts in Canada routinely consider allowed returns in other Canadian jurisdictions, and increasingly consider the comparability of Canadian and U.S. utilities when assessing the cost of capital. This newsletter seeks to assist with these inter-jurisdictional comparisons.

This newsletter and supporting database contain the authorized ROEs and common equity ratios for over 40 Canadian electric and gas utilities. For comparison purposes, the newsletter also presents the average and median authorized ROEs and common equity ratios for U.S. gas and electric distributors, as reported by SNL Financial's Regulatory Research Associates.

Concentric observes that the gap between authorized ROEs for Canadian and U.S. gas distributors continues to narrow, from 100 basis points in 2000 to 77 basis points in 2013 and to 35 basis points through the first three months of 2014. In 2013, the median authorized ROE for Canadian gas distributors was 8.93 percent, while the median for U.S. gas distributors was 9.70 percent. The difference also narrowed for electric distributors, but not to the same extent, where a larger gap between Canadian and U.S. distributors remains, 125 basis points in 2013 and 111 basis points in 2014. Concentric notes that gas ROEs are higher than their electric counterparts in Canada, while the opposite is true in the U.S.

Concentric attributes the closure of the gap between Canadian and U.S. authorized ROEs to the resetting and replacement of automatic formulas widely used in Canada to re-based ROE's and revised formulas or periodically litigated ROEs.

While authorized ROEs have converged in the two countries, the authorized common equity ratios have not. In 2013, the median common equity ratio for Canadian gas distributors was 40.5 percent while the same figure in the U.S. was 50.4 percent, comparable to the difference for electric distributors.

In this update, Concentric has added the allowed returns and equity ratios for Canadian electric transmission companies. Median ROEs are identical to those allowed for Canadian electric distributors, but 111–125 basis points below U.S. electric distributors over the 2013–2014 period. Allowed equity ratios for Canadian electric transmission companies are 3.0 percent lower than their electric distribution counterparts, and 13.0 percent below U.S. distributors.

Canadian utility regulators have issued several important ROE decisions since the first edition of this newsletter in October 2013. For example, in British Columbia, the BCUC set the allowed ROE and deemed equity ratio for the benchmark utility (FortisBC Energy Inc.) in May 2013 and for all other gas and electric utilities in the province in March 2014. The BCUC also decided to return to a formula (subject to government bond yields rising above a specified level). In Québec, the Régie revised the base allowed ROE for Hydro-Québec Distribution and Hydro-Québec TransÉnergie in March 2014 which had previously been set by a formula in place for more than a decade. The Régie further determined that an adjustment formula was not warranted at this time.

In Alberta, the AUC accepted evidence in a generic cost of capital proceeding in January 2014, with hearings scheduled for June and a decision is expected in the fourth quarter of 2014. The AUC will also rule on whether it is appropriate to return to an ROE formula, which was suspended in Alberta in 2009. In Ontario, the Ontario Energy Board's revised ROE formula established in December 1999 remains in effect, but will be subject to its first regular review in 2014. Union Gas recently settled its incentive rate plan, locking in the Board approved 2013 ROE of 8.93 percent for the five-year life of the plan.

Government and corporate bond yields are often considered when setting authorized ROEs for utilities. As shown in the chart on page 3, after declining for many years, the long-term government bond yields (considered the risk-free rate of return) in both Canada and the U.S. have been increasing since July 2012. While government bond yields play an important role in determining the authorized ROE for utilities, changes in government bond yields do not imply a one-for-one change in the cost of equity for utilities. The relationship between government bond yields and the equity risk premium (the spread between government bond yields and the cost of equity) has historically exhibited an inverse relationship.

Going forward, Concentric anticipates that improving economic conditions and the withdrawal of accommodative monetary policy in both Canada and the U.S. will continue to exert upward pressure on the cost of capital for utilities over the next several years.

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CONCENTRIC ENERGY ADVISORS

Authorized Return on Equity for Canadian and U.S. Gas and Electric Utilities [1]

	Return on Common Equity (%)			Common Equity Ratio (%)		
	2012	2013	2014	2012	2013	2014
Canadian Gas Distributors [2]						
AltaGas Utilities Inc. [3]	8.75	8.75	8.75	43.00	43.00	43.00
ATCO Gas [3]	8.75	8.75	8.75	39.00	39.00	39.00
Centra Gas Manitoba Inc.	N/A	N/A	N/A	30.00	30.00	30.00
Enbridge Gas Distribution Inc. [4]	8.39	8.93	9.36	36.00	36.00	36.00
Enbridge Gas New Brunswick	10.90	10.90	10.90	45.00	45.00	45.00
FortisBC Energy Inc.	9.50	8.75	8.75	40.00	38.50	38.50
FortisBC Energy (Vancouver Island) Inc.	10.00	9.25	9.25	40.00	41.50	41.50
FortisBC Energy (Whistler) Inc.	10.00	9.50	9.50	40.00	41.50	41.50
Gaz Métro Limited Partnership	8.90	8.90	8.90	38.50	38.50	38.50
Gazifère Inc.	8.29	7.82	9.10	40.00	40.00	40.00
Heritage Gas Limited	11.00	11.00	11.00	45.00	45.00	45.00
Pacific Northern Gas Ltd.	10.15	9.50	9.50	45.00	46.50	46.50
Pacific Northern Gas (N.E.) Ltd. (Fort St. John/Dawson Creek)	9.90	9.25	9.25	40.00	41.00	41.00
Pacific Northern Gas (N.E.) Ltd. (Tumbler Ridge)	10.15	9.50	9.50	40.00	46.50	46.50
SaskEnergy Inc.	8.75	8.75	8.75	37.00	37.00	37.00
Union Gas Limited [4]	8.54	8.93	8.93	36.00	36.00	36.00
Average	9.46	9.23	9.37	39.66	40.31	40.31
Median	9.50	8.93	9.25	40.00	40.50	40.50

	Return on Common Equity (%)			Common Equity Ratio (%)		
	2012	2013	2014	2012	2013	2014
Canadian Electric Distributors [2]						
ATCO Electric Ltd. [3]	8.75	8.75	8.75	39.00	39.00	39.00
ENMAX Power Corporation [3]	8.75	8.75	8.75	41.00	41.00	41.00
EPCOR Distribution Inc. [3]	8.75	8.75	8.75	41.00	41.00	41.00
FortisAlberta Inc. [3]	8.75	8.75	8.75	41.00	41.00	41.00
FortisBC Inc.	9.90	9.15	9.15	40.00	40.00	40.00
Hydro-Québec Distribution	6.37	6.19	8.20	35.00	35.00	35.00
Manitoba Hydro	N/A	N/A	N/A	25.00	25.00	25.00
Maritime Electric Company Limited	9.75	9.75	9.75	41.70	43.50	43.10
Newfoundland and Labrador Hydro	4.47	4.47	Pending	20.00	20.00	Pending
Newfoundland Power Inc.	8.80	8.80	8.80	45.00	45.00	45.00
Nova Scotia Power Inc.	9.20	9.00	9.00	37.50	37.50	37.50
Ontario's Electric Distributors [4]	9.12	8.98	9.36	40.00	40.00	40.00
Saskatchewan Power Corporation	7.40	8.50	8.50	40.00	40.00	40.00
Average	8.33	8.32	8.89	37.40	37.54	38.97
Median	8.75	8.75	8.75	40.00	40.00	40.00

[1] Data for an expanded group of Canadian gas transmission companies is contained in the Concentric Energy Advisors Return on Equity Database.

[2] Allowed in rates for the corresponding year; where the year overlaps, the rate/ratio shown prevails for the majority of the year. Sources: Regulatory decisions and documents; annual information forms; annual reports.

[3] The Alberta Utilities Commission opened a Generic Cost of Capital proceeding in 2013 to review the current allowed ROE for regulated gas and electric utilities in Alberta.

[4] Rates effective May 1 under the Board's formula. The ROE proposed for 2014 by Enbridge in its five-year incentive rate filing, July 3, 2013, EB-2012-0459, is 9.27%. Union's 2014 ROE per settlement agreement in its five-year plan. Beginning in 2014, the Ontario Energy Board intends to update cost of capital parameters for setting rates in cost of service applications only once per year.

* N/A indicates the data is not available.

	Return on Common Equity (%)			Common Equity Ratio (%)		
	2012	2013	2014	2012	2013	2014
Canadian Electric Transmission Companies [1]						
AltaLink Management Ltd.	8.75	8.75	8.75	37.00	37.00	37.00
ATCO Electric Ltd. [2]	8.75	8.75	8.75	37.00	37.00	37.00
ENMAX Power Corporation [2]	8.75	8.75	8.75	37.00	37.00	37.00
EPCOR Transmission Inc. [2]	8.75	8.75	8.75	37.00	37.00	37.00
Hydro One Networks Inc.	9.42	8.93	9.36	40.00	40.00	40.00
Hydro-Québec TransÉnergie	6.39	6.41	8.20	30.00	30.00	30.00
Average	8.47	8.39	8.76	36.33	36.33	36.33
Median	8.75	8.75	8.75	37.00	37.00	37.00

	Return on Common Equity (%)			Common Equity Ratio (%)		
	2012	2013	2014	2012	2013	2014
U.S. Gas Distributors [3]						
Average of all Rate Cases Decided in the Year	9.94	9.68	9.54	51.13	50.60	51.14
Median of all Rate Cases Decided in the Year	10.00	9.70	9.60	51.47	50.38	52.30
U.S. Electric Distributors [3]						
Average of all Rate Cases Decided in the Year	10.17	10.02	10.23	50.59	49.25	51.08
Median of all Rate Cases Decided in the Year	10.08	9.90	9.86	51.72	50.84	50.00

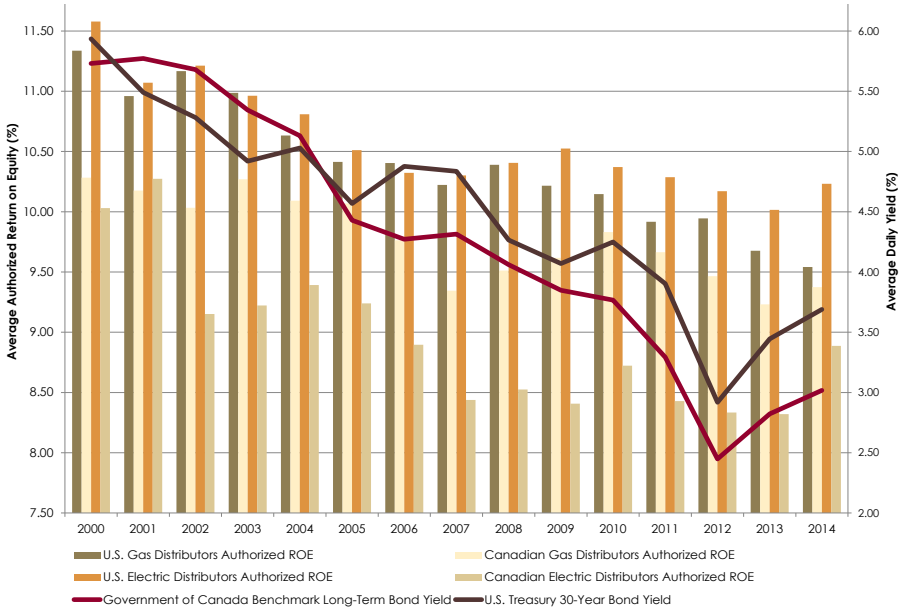
Economic Indicators (% Yields) [4]	2012	2013	2014
Government of Canada Benchmark Long-Term Bond Yield	2.45	2.82	3.02
U.S. Treasury 30-Year Bond Yield	2.92	3.45	3.68
Bloomberg Fair Value Canada A-rated Utility Bond Yield	3.91	4.24	4.36
Moody's A-rated Utility Bond Index (U.S.)	4.13	4.48	4.56

Presented by Concentric Energy Advisors, Inc. For more information regarding this data, please contact:

Jim Coyne
Senior Vice President
Concentric Energy Advisors, Inc.
jcoyne@ceadvisors.com
508.263.6255
www.ceadvisors.com

John Trogonoski
Senior Project Manager
Concentric Energy Advisors, Inc.
jtrogonoski@ceadvisors.com
508.263.6258
www.ceadvisors.com

Nathaniel Standish
Project Manager
Concentric Energy Advisors, Inc.
nstandish@ceadvisors.com
508.263.6259
www.ceadvisors.com



[1] Allowed in rates for the corresponding year; where the year overlaps, the rate/ratio shown prevails for the majority of the year. Sources: Regulatory decisions and documents; annual information forms; annual reports.

[2] The Alberta Utilities Commission opened a Generic Cost of Capital proceeding in 2013 to review the current allowed ROE for regulated gas and electric utilities in Alberta.

[3] Source: SNL Financial LC's Regulatory Research Associates Division. Data for 2014 includes decisions through March 31, 2014.

[4] Average daily yield. Source: Bloomberg Finance L.P. Data for 2014 through March 31, 2014.

Dominica Electricity Services Limited

Financial Statements

For the year ended December 31, 2013
(Expressed in Eastern Caribbean Dollars)

Ernst & Young
P.O Box 261,
Bridgetown, BB11000
Barbados W.I.

Street Address
Worthing,
Christ Church,
BB15008
Barbados, W.I.

Tel: 246 430 3900
Fax: 246 426 9551
246 426 0472
246 435 2079
246 430 3879

www.ey.com

Independent Auditors' Report

To the Shareholders of Dominica Electricity Services Limited

We have audited the accompanying financial statements of **Dominica Electricity Services Limited** which comprise the statement of financial position as at December 31, 2013 and the statements of comprehensive income, changes in equity and cash flows for the year then ended and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements
Management is responsible for the preparation and fair presentation of these financial statements in accordance with International Financial Reporting Standards and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility
Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with International Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements 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 entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion
In our opinion, the financial statements present fairly, in all material respects, the financial position of **Dominica Electricity Services Limited** as at December 31, 2013, and its financial performance and its cash flows for the year then ended in accordance with International Financial Reporting Standards.

Other matter
The financial statements of **Dominica Electricity Services Limited** for the year ended 31 December 2012 were audited by another auditor who expressed an unqualified opinion on those financial statements on March 21, 2013.

CHARTERED ACCOUNTANTS
Bridgetown
March 24, 2014

Dominica Electricity Services Limited

Statement of Financial Position

As at December 31, 2013

(expressed in Eastern Caribbean dollars)

	2013 $	2012 $
Assets		
Current assets		
Cash and cash equivalents (Note 5)	6,579,947	1,948,772
Trade and other receivables (Note 6)	16,583,503	19,227,193
Inventories (Note 7)	10,813,881	12,081,511
	33,977,331	33,257,476
Capital work-in-progress (Note 8)	448,645	460,879
Property, plant and equipment (Note 9)	126,542,073	124,877,129
Total assets	160,968,049	158,595,484
Liabilities		
Current liabilities		
Borrowings (Note 10)	4,539,667	5,359,107
Trade and other payables (Note 11)	12,170,968	13,568,049
Due to related party (Note 12)	-	90,120
Income tax payable	940,604	873,162
	17,651,239	19,890,438
Borrowings (Note 10)	36,485,708	41,038,732
Deferred tax liabilities (Note 13)	19,214,446	17,313,615
Other non-current liabilities (Note 14)	12,075,657	11,436,796
Capital grants (Note 15)	521,702	655,507
Total liabilities	85,948,752	90,335,088
Equity		
Share capital (Note 16)	10,417,328	10,417,328
Retained earnings	64,601,969	57,843,068
Total equity	75,019,297	68,260,396
Total liabilities and equity	160,968,049	158,595,484

Approved by the Board of Directors on March 24, 2014

Director

Director

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

Dominica Electricity Services Limited

Statement of Comprehensive Income

For the year ended December 31, 2013

(expressed in Eastern Caribbean dollars)

	2013 $	2012 $
Revenue		
Energy sales	60,830,368	61,593,011
Fuel surcharge (Note 20)	37,473,942	44,260,626
Other revenue	619,966	1,500,883
	98,924,276	107,354,520
Direct expenses		
Fuel cost (Notes 18 and 20)	43,436,628	51,660,677
Operating costs (Note 18)	15,135,189	13,107,007
Depreciation (Notes 9 and 18)	8,388,831	10,821,809
Maintenance (Note 18)	7,901,348	8,262,621
	74,861,996	83,852,114
Gross profit	24,062,280	23,502,406
Administrative expenses	(9,150,725)	(7,949,385)
Other income/(expenses) net (Note 21)	393,117	(797,728)
Operating profit	15,304,672	14,755,293
Finance costs (Note 22)	(2,601,741)	(2,944,975)
Profit before income tax	12,702,931	11,810,318
Income tax (Note 23)	(3,860,564)	(3,607,522)
Net income being comprehensive income for the year	8,842,367	8,202,796
Earnings per share attributable to the equity holders of the Company during the year (Note 24) **- basic and diluted**	0.85	0.79

The accompanying notes form an integral part of these financial statements

Dominica Electricity Services Limited

Statement of Changes in Equity

For the year ended December 31, 2013

(expressed in Eastern Caribbean dollars)

	Share capital $ (Note 16)	Retained earnings $	Total equity $
Balance at January 1, 2012	10,417,328	51,723,738	62,141,066
Net income being comprehensive income for the year	-	8,202,796	8,202,796
Transactions with owners Dividends (Note 17)	-	(2,083,466)	(2,083,466)
Balance at December 31, 2012	**10,417,328**	**57,843,068**	**68,260,396**
Net income being comprehensive income for the year	-	8,842,367	8,842,367
Transactions with owners Dividends (Note 17)	-	(2,083,466)	(2,083,466)
Balance at December 31, 2013	**10,417,328**	**64,601,969**	**75,019,297**

The accompanying notes form an integral part of these financial statements

Dominica Electricity Services Limited

Statement of Cash Flows

For the year ended December 31, 2013

(expressed in Eastern Caribbean dollars)

	2013 $	2012 $
Cash flows from operating activities		
Profit before income tax	**12,702,931**	11,810,318
Adjustments for:		
Depreciation	**8,388,831**	10,821,809
Finance costs	**2,601,741**	2,944,975
Loss on disposal of plant and equipment (Note 21)	**213,884**	1,334,138
Provision for inventory obsolescence (Note 7)	**(239,384)**	33,098
Amortisation of deferred revenue (Note 21)	**(443,648)**	(397,305)
Capital work in progress written off (Note 8)	**81,873**	7,303
Amortisation of capital grants (Notes 15 and 21)	**(133,805)**	(133,801)
Unrealised foreign exchange gains	**(10,015)**	(8,389)
Operating profit before working capital changes	**23,162,408**	26,412,146
Decrease/(increase) in trade and other receivables	**2,643,689**	(3,458,831)
Decrease in inventories	**1,507,014**	4,443,543
(Decrease)/increase in trade and other payables	**(1,387,069)**	1,730,768
(Decrease) in due to related party	**(90,120)**	(58,432)
Cash generated from operations	**25,835,922**	29,069,194
Finance costs paid	**(2,601,741)**	(2,944,975)
Income tax paid	**(1,892,291)**	(3,277,053)
Net cash provided by operating activities	**21,341,890**	22,847,166
Cash flows from investing activities		
Additions to capital work-in-progress (Note 8)	**(456,046)**	(1,302,693)
Purchase of property, plant and equipment (Note 9)	**(9,921,750)**	(12,400,511)
Proceeds on disposal of property, plant and equipment	**40,500**	12,500
Net cash used in investing activities	**(10,337,296)**	(13,690,704)
Cash flows from financing activities		
Proceeds from borrowings	**-**	2,000,000
Repayment of borrowings	**(5,372,465)**	(6,940,624)
Dividends paid (Note 17)	**(2,083,466)**	(2,083,466)
Increase in other non-current liabilities	**1,082,512**	861,696
Net cash used in financing activities	**(6,373,419)**	(6,162,394)
Net increase in cash and cash equivalents	**4,631,175**	2,994,068
Cash and cash equivalents, beginning of year	**1,948,772**	(1,045,296)
Cash and cash equivalents, end of year (Note 5)	**6,579,947**	1,948,772

The accompanying notes form an integral part of these financial statements

(expressed in Eastern Caribbean dollars)

1. General information

Dominica Electricity Services Limited (the Company) was incorporated as a public limited liability company in the Commonwealth of Dominica on April 30, 1975. The Company operates in a fully liberalised sector under the Electricity Supply Act of 2006. Under the Act an Independent Regulatory Commission is vested with broad regulatory oversight over all aspects of the energy sector. The Company's operations are regulated by this Commission. The principal activity of the Company includes the generation, distribution and transmission of electricity.

The Company is listed on the Eastern Caribbean Securities Exchange and falls under the jurisdiction of the Eastern Caribbean Regulatory Commission.

On April 10, 2013, Dominica Power Holdings Limited a wholly owned subsidiary of the Light & Power Holdings Limited Group acquired 52% of the ordinary share capital of the Company from Dominica Private Power Ltd.

The Dominica Social Security owns 21% of the ordinary share capital while 27% is held by the general public.

The registered office and principal place of business of the Company is located at 18 Castle Street, Roseau, Commonwealth of Dominica.

The reporting date is December 31, 2013.

2. Summary of significant accounting policies

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

2.1 Basis of preparation

The financial statements of Dominica Electricity Services Limited have been prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB) and under the historical cost convention.

The preparation of 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. The areas involving a higher degree of judgement or complexity or areas where assumptions and estimates are significant to the financial statements are disclosed in Note 4.

(expressed in Eastern Caribbean dollars)

2. Summary of significant accounting policies*…continued*

Changes in accounting policy and disclosures

New and amended standards adopted by the Company

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, 2013. The adoption of the revised standard did not have a significant change on the financial statements of the Company.

- **IAS 1, 'Financial Statement Presentation' - Clarification of the requirement for comparative information (Amendment).** These amendments clarify the difference between voluntary additional comparative information and the minimum required comparative information. An entity must include comparative information in the related notes to the financial statements when it voluntarily provides comparative information beyond the minimum required comparative period. The amendments clarify that the opening statement of financial position, presented as a result of retrospective restatement or reclassification of items in financial statements does not have to be accompanied by comparative information in the related notes. As a result, the Company has not included comparative information in respect of the opening statement of financial position as at 1 January 2012. The amendments affect presentation only and have no impact on the Company's financial position or performance.

- **IAS 19, '*Employee Benefits* (Amendment)'** amended June 2011. The IASB has issued numerous amendments to IAS 19. These range from fundamental changes such as removing the corridor mechanism and the concept of expected returns on plan assets to simple clarifications and re-wording. The amendment becomes effective for annual periods beginning on or after January 1, 2013 and will have no impact on the financial statements.

- **IFRS 13, 'Fair Value Measurement'** issued in May 2011. The standard establishes a single source of guidance under IFRS for all fair value measurements. IFRS 13 does not change when an entity is required to use fair value, but rather provides guidance on how to measure fair value under IFRS when fair value is required or permitted. IFRS 13 requires prospective application from January 1, 2013. In addition, specific transitional provisions were given to entities such that they need not apply the disclosure requirements set out in the standard in comparative periods before the initial application of the Standard. As a result, the Company has not made any new disclosures for the 2012 comparative period. Other than the additional disclosures, the application of IFRS 13 has not had any material impact on the amounts recognised in the financial statements.

(expressed in Eastern Caribbean dollars)

2. Summary of significant accounting policies …*continued*

2.1.1 Changes in accounting policy and disclosures …*continued*

a) New and amended standards and interpretations adopted by the Company*…continued*

- **IAS 16, Property, Plant and Equipment (amendment) – Servicing Equipment**. The amendment requires entities to capitalize major spare parts and standby equipment when an entity expects to use them during more than one period or if spare parts and equipment can be used only in connection with an item of property, plant and equipment. The amendment was effective for annual periods beginning on or after January 1, 2013.

  The amendment has resulted in the reclassification of major generation spares from inventory to property plant and equipment. The adjustment to the property plant and equipment was an increase of $179,033 (2012 - $3,437,555 million). The corresponding decrease was to inventory. The balance sheet and the statement of cash flows as at December 31, 2012 were restated to reflect the impact of the reclassification. There was no impact on the 2012 statement of income.

b) New and amended standards, and interpretations mandatory for the first time for the financial year beginning January 1, 2013 but not currently relevant to the Company (although they may affect the accounting for future transactions and events)

- **IAS 27, '*Separate Financial Statements* (as revised in 2011)'** issued in May 2011. As a consequence of the new IFRS 10 and IFRS 12, what remains of IAS 27 is limited to accounting for subsidiaries, jointly controlled entities, and associates in separate financial statements. The amendment has no effect on the Company's financial position, performance or disclosures.

- **IAS 28, '*Investments in Associates and Joint Ventures* (as revised in 2011)'** issued in May 2011. As a consequence of the new IFRS 11 and IFRS 12, IAS 28 has been renamed IAS 28 *Investments in Associates and Joint Ventures,* and describes the application of the equity method to investments in joint ventures in addition to associates. The amendment was effective for annual periods beginning on or after January 1, 2013 and has no effect on the Company's financial position, performance or disclosures.

- **IFRS 1, *'Government Loans- Amendment to IFRS 1,'*** effective January 1, 2013. The amendment has added an exception to the retrospective application of IFRS 9 Financial instruments (or IAS 39 Financial Instruments: Recognition and Measurement, as applicable) and IAS 20 Accounting for Governments Grants and Disclosure of Government Assistance. These amendments require first-time adopters to apply the requirements of IAS 20 prospectively to Government loans existing at the date of transition to IFRS. However, entities may choose to apply the requirements of IFRS 9 (or IAS 39, as applicable) and to Government loans retrospectively if the information needed to do so had been obtained at the time of initially accounting for that loan. The amendment was effective for annual periods beginning on or after January 1, 2013 and has no effect on the Company's financial position, performance or disclosures.

(expressed in Eastern Caribbean dollars)

2. Summary of significant accounting policies …*continued*

2.1.1 Changes in accounting policy and disclosures …*continued*

b) New and amended standards, and interpretations mandatory for the first time for the financial year beginning January 1, 2013 but not currently relevant to the Company (although they may affect the accounting for future transactions and events) …*continued*

- **IFRS 7, '*Disclosures - Offsetting Financial Assets and Financial Liabilities*'** issued December 2011. The amendments to IFRS 7 require an entity to disclose information about rights of set-off and related arrangements. The new disclosures are required for all recognized financial instruments that are set-off in accordance with IAS 32 Financial Instruments: Presentation. The disclosures also apply to recognized financial instruments that are subject to an enforceable master netting arrangement or 'similar agreement', irrespective of whether they are set off in accordance with IAS 32. As the Company does not have any off-setting arrangements in place, the application of the amendment did not have a material impact on the disclosures or on the amounts recognized in the financial statements.

- **IFRS 10, 'Consolidated Financial Statements'** IFRS 10 establishes principles for the presentation and preparation of consolidated financial statements when an entity controls one or more other entities. IFRS 10 replaces the consolidation requirements in SIC-12 Consolidation—Special Purpose Entities and IAS 27 Consolidated and Separate Financial Statements. IFRS 10 builds on existing principles by identifying the concept of control as the determining factor in whether an entity should be included within the consolidated financial statements of the parent company. The standard provides additional guidance to assist in the determination of control where this is difficult to assess. The standard is effective for annual periods beginning on or after January 1, 2013. The new standard and its amendments have had no effect on the Company's financial position, performance or disclosures.

- **IFRS 11, 'Joint Arrangements'**. IFRS 11 provides for a more realistic reflection of joint arrangements by focusing on the rights and obligations of the arrangement, rather than its legal form. The standard addresses inconsistencies in the reporting of joint arrangements by requiring a single method to account for interests in jointly controlled entities. The standard is not expected to have an effect on the Company's non-consolidated financial statements. The standard is effective for annual periods beginning on or after January 1, 2013. The new standard and its amendments have had no effect on the Company's financial position, performance or disclosures.

(expressed in Eastern Caribbean dollars)

2. Summary of significant accounting policies …*continued*

2.1.1 Changes in accounting policy and disclosures …*continued*

b) New and amended standards, and interpretations mandatory for the first time for the financial year beginning January 1, 2013 but not currently relevant to the Company (although they may affect the accounting for future transactions and events) …*continued*

- **IFRS 12, 'Disclosure of Interests in Other Entities'**. IFRS 12 is a new and comprehensive standard on disclosure requirements for all forms of interests in other entities, including subsidiaries, joint arrangements, associates and unconsolidated structured entities. The new standard and its amendments have had no effect on the Company's financial position, performance or disclosures.

- **IFRIC 20, *'Stripping costs in the production phase of a surface mine'***. This interpretation sets out the accounting for overburden waste removal (stripping) costs in the production phase of a surface mine. The interpretation may require mining entities reporting under IFRS to write off stripping assets to opening retained earnings if the assets cannot be attributed to an identifiable component of an ore body. The new standard and its amendments has no effect on the Company's financial position, performance or disclosures.

c) New standards, amendments and interpretations issued but not effective for the financial year beginning January 1, 2013 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:-

- **IAS 27, 'Separate Financial Statements', amended in October 2012**. The amendment to the standard is to establish a definition of an investment entity and to clarify the application of the Standard for investment entities. The amendment becomes effective for annual periods beginning on or after January 1, 2014. It is not anticipated that the standard will have an impact on the financial statements.

- **IAS 32, *'Offsetting Financial Assets and Financial Liabilities'***, effective January 1, 2014. These amendments clarify the meaning of "currently has the enforceable right to set-off" by stating that right of set-off must not only be legally enforceable in the normal course of business, but must also be enforceable in the event of default and the event of bankruptcy or insolvency of all of the counterparties to the contract, including the reporting entity itself. The amendments also clarify that rights of set-off must not be contingent on a future event. The amendments also clarify the application of the IAS 32 offsetting criteria to settlement systems (such as central clearing house systems) which apply gross settlement mechanisms that are not simultaneous. It is not anticipated that the standard will have a significant impact on the financial statements.

(expressed in Eastern Caribbean dollars)

2. Summary of significant accounting policies *…continued*

2.1.1 Changes in accounting policy and disclosures *…continued*

c) New standards, amendments and interpretations issued but not effective for the financial year beginning January 1, 2012 and not early adopted *…continued*

- **IAS 36, 'Impairment of Assets',** effective January 1, 2014. The overall effect of the amendment is to reduce the circumstances in which the recoverable amount of assets or cash-generating units is required to be disclosed, clarify the disclosures required, and to introduce an explicit requirement to disclose the discount rate used in recognizing or reversing impairment losses where recoverable amount is based on fair value less costs of disposal and is determined using a present value technique. It is not anticipated that the standard will have a significant impact on the financial statements.

- **IAS 39, 'Financial Instruments: Recognition and Measurement** amended', effective January 1, 2014. The amendment clarifies that there is no need to discontinue hedge accounting if a hedging derivative is novated, provided the following criteria are met. Novation must happen as a consequence of laws or regulations or the introduction of laws or regulations. Following the novation, a central counterparty would become the new counterparty to each of the original parties to the derivative and any changes to the hedging instrument are limited to those that are necessary to effect such a replacement of the counterparty.

- **IFRS 9, *'Financial instruments'***, issued in November 2009. This standard is the first step in the process to replace IAS 39, 'Financial Instruments: Recognition and Measurement'. IFRS 9 introduces new requirements for classifying and measuring financial assets and is likely to affect the Company's accounting for its financial assets. The standard is not applicable until January 1, 2015 but is available for early adoption. The Company is yet fully to assess IFRS 9's impact. However, initial indications are that it may affect the Company's accounting for its debt available-for-sale financial assets, as IFRS 9 only permits the recognition of fair value gains and losses in other comprehensive income if they relate to equity investments that are not held for trading.

2.2 Foreign currency translation

Functional and presentation currency
Items included in the financial statements are measured using the currency of the primary economic environment in which the entity operates ('the functional currency'). The financial statements are presented in Eastern Caribbean dollars, which is also the functional and presentation currency.

Transactions and balances
Foreign currency transactions are translated into functional 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 statement of comprehensive income.

(expressed in Eastern Caribbean dollars)

2. Summary of significant accounting policies …*continued*

2.3 Cash and cash equivalents

Cash and cash equivalents include cash in hand, deposits held at call with banks, other short-term highly liquid investments with original maturities of three months or less, and bank overdraft.

2.4 Trade receivables

Trade receivables are amounts due from customers for electricity. They are recognised initially at fair value and are subsequently measured at amortised cost less provision for impairment and discounts. A provision for impairment of trade receivables is established when there is objective evidence that the Company will not be able to collect all amounts due according to the original terms of receivables. The amount of the provision is recognised in the income statement. When a trade receivable is uncollectible it is written off against income. Subsequent recoveries of amounts previously written off are credited to the statement of comprehensive income.

2.5 Inventories

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

2.6 Property, plant and equipment and intangible assets

Land and buildings comprise mainly generation plants and offices. Property, plant and equipment are stated at historical cost less accumulated depreciation. Historical cost includes 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 the construction which is directly attributable to the acquisition or construction of a qualifying asset.

In certain specified circumstances, consumers requiring line extensions are required to contribute the estimated capital cost of the extension. These contributions are recorded as deferred revenue and the actual cost incurred is capitalised in property, plant and equipment.

Subsequent costs are included in the asset's carrying amount 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 statement of comprehensive income during the financial period in which they are incurred.

Land is not depreciated. No depreciation is provided on work-in-progress until the assets involved have been completed and are put into use. Depreciation on other assets is calculated using the straight-line method to allocate their cost to their residual lives over their estimated useful lives, as follows:

Buildings, headworks and pipelines	2.0%-2.9%
Generator transmission and distribution	2.25%-16.67%
Motor vehicles	12.5%-16.67%
Furniture and fittings	10.0%-25.0%

(expressed in Eastern Caribbean dollars)

2. Summary of significant accounting policies…*continued*

2.6 Property, plant and equipment and intangible assets…*continued*

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

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

Gains and losses on disposals are determined by comparing proceeds with carrying amount. These are included in the statement of comprehensive income.

Interest costs on borrowings to finance the construction of property, plant and equipment are capitalised during the period of time that is required to complete and prepare the asset for its intended use.

Intangible assets, comprising computer software, are stated at cost, less amortisation and impairment losses.

2.7 Impairment of non-financial assets

Assets that have an indefinite useful life are not subject to amortisation and are tested annually for impairment. 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 the 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 (cash-generating units).

2.8 Trade payables

Trade payables are obligations to pay for goods or services that have been acquired in the ordinary course of business from suppliers. Accounts payable are classified as current liabilities if payment is due within one year or less. If not, they are presented as non-current liabilities.

Trade payables are recognised initially at fair value and subsequently measured at amortised cost.

2.9 Borrowings and borrowing costs

Borrowings are recognised initially at fair value, net of transaction costs incurred. Borrowings are subsequently stated at amortised cost; any difference between the proceeds (net of transaction costs) and the redemption value is recognised in the 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 an unconditional right to defer settlement of the liability for at least 12 months after the reporting date. Interest costs on borrowings to finance the construction of property, plant and equipment are capitalised during the period of time that is required to complete and prepare the asset for its intended use. Other borrowing costs are expensed.

(expressed in Eastern Caribbean dollars)

2. Summary of significant accounting policies…*continued*

2.10 Income taxes

(a) Current tax

The current income tax expense is calculated on the basis of tax laws enacted or substantively enacted at the reporting date where the Company operates and generates taxable income. Management periodically evaluates positions taken in tax returns with respect to situations in which the applicable tax regulation is subject to interpretation and establishes provisions where appropriate on the basis of amounts expected to be paid to the tax authorities.

(b) Deferred tax

Deferred income tax is recognised, using the liability method, on temporary differences arising between the tax base of assets and liabilities and their carrying amounts in the financial statements.

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

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

2.11 Consumers' deposits

Commercial customers are normally required to provide security for payment. Given the long term nature of the customer relationship, customer deposits are shown in the statement of financial position 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.

2.12 Leases

Leases in which a significant portion of the risks and rewards of ownership are retained by the lessor are classified as operating leases. Payments made under operating leases are charged to the statement of comprehensive income on a straight-line basis over the period of the lease.

2.13 Capital grants

Capital grants represent the fair value of fixed assets donated to the Company. The amount is amortised over the estimated useful lives of the respective assets.

2.14 Share capital

Ordinary shares are classified as equity.

2.15 Dividends

Dividends on ordinary shares are recorded in the Company's financial statements in the same period that the dividends are approved by the Company's shareholders.

(expressed in Eastern Caribbean dollars)

2. Summary of significant accounting policies…*continued*

2.16 Revenue and expense recognition

Revenue derived from the sale of electricity is taken to income on a bills-rendered basis, adjusted for unbilled revenues. Revenue is recognized as follows:

(a) Sale of energy

The Company records revenue, as billed to its customers. The Company also estimates and recognizes any unbilled revenue at the end of each month. In addition to the normal tariff rates charged for energy sales, a fuel surcharge is calculated. The surcharge is recovered by applying the month's surcharge rate to units billed in the following month.

(b) Interest income

Interest income is recognised on an accrual basis using the effective interest rate method.

(c) Other income

Other income is recorded on an accrual basis.

(d) Costs and expenses

Costs and expenses are recognised as incurred.

2.17 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 or companies that directly or indirectly control or are controlled by or under common control with the Company are also considered related parties.

(expressed in Eastern Caribbean dollars)

2. Summary of significant accounting policies…*continued*

2.18 Employee benefits

(a) *Pension*

The Company contributes to a defined contribution plan for all employees subscribing to the Plan. The assets of the Plan are held separately. The pension plan is funded by payments from participating employees and the Company. The Company has no legal or constructive obligations to pay further contributions if the fund does not hold sufficient assets to pay all employees the benefits relating to employee services in the current and prior periods.

(b) Termination benefits

Termination benefits are payable when employment is terminated prior to the normal retirement date, or whenever an employee accepts voluntary redundancy in exchange for these benefits. The Company recognises termination benefits when it is demonstrably committed to either terminating the employment of current employees according to a detailed formal plan without the possibility of withdrawal or providing termination benefits as a result of an offer made to encourage voluntary redundancy.

2.19 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.

2.20 Contingent liabilities

Contingent liabilities are not recognised in the financial statements but are disclosed unless the possibility of the outflow of resources embodying the economic benefits is remote. A contingent asset is not recognised in the financial statements but disclosed when an inflow of economic benefits is probable.

2.21 Subsequent events

Post year-end events that provide additional information about the Company's position at the reporting date (adjusting events) are reflected in the Company's financial statements. Post year-end events that are not adjusting events are disclosed when material to the financial statements, if any.

(expressed in Eastern Caribbean dollars)

3. Financial risk management

3.1 Financial risk factors

The Company's activities expose it to a variety of financial risks: market risks (including foreign exchange, price risk and cash flow interest rate risk) credit risk and liquidity risk. The Company's overall risk management programme focuses on the unpredictability of the financial markets and seeks to minimise potential adverse effects on the Company's financial performance. Risk management is carried out by the Finance department. The Board of Directors is involved in the Company's overall risk management providing guidance on matters such as market risk, credit risk and liquidity risk.

(a) Market risk

(i) Foreign exchange risk

This is the potential adverse impact on the Company's earnings and economic value due to movements in exchange rates. The Company trades internationally and is exposed to foreign exchange risk arising from various currency exposures, primarily with respect to the United States dollars, Euros and the Great Britain Pound (GBP). The exchange rate of the Eastern Caribbean dollar (EC$) to the United States dollar (US$) has been formally pegged at EC$2.70 = US$1.00 since July 1976.

Management has established a policy requiring the Company to manage its foreign exchange risk against their functional currency. To manage their foreign exchange risk arising from future commercial transactions and recognised assets and liabilities, the Company attempts to enter into transactions that are based largely in United States dollars.

At December 31, 2013, if the currency had weakened/strengthened by 10% against the Euro and GBP with all other variables held constant, pre-tax profit for the year would have been $384 (2012 - $4,742) lower/ higher, mainly as a result of foreign exchange gains/losses on translation of Pounds Sterling and Euro denominated trade payables.

(ii) Cash flow interest rate risk

As the Company has no significant interest-bearing assets, the Company's income and operating cash flows are substantially independent of changes in market interest rates.

The Company's interest rate risk arises from long-term borrowings and consumer deposits. Borrowings and deposits issued at variable rates expose the Company to cash flow interest rate risk. Similarly, such facilities issued at fixed rates expose the Company to fair value interest rate risk (Note 10).

(iii) Price risk

Price risk arises primarily from exposure to equity securities. As the Company holds no such instruments, it has no price risk exposure at December 31, 2013.

(b) 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 held with financial institutions, as well as credit exposure to customers, including receivables and committed transactions. The Company's bank deposits are placed with financial institutions which have developed a good reputation over the years. Deposits are required from commercial customers upon application for a new service. The Company assesses the credit quality of its receivables by taking into account the individual customer's rating, past experience and other factors. Individual risk limits are set based on management credit policies.

(expressed in Eastern Caribbean dollars)

3. Financial risk management …*continued*

Financial risk factors…*continued*

(b) **Credit risk** …*continued*

Management performs periodic credit evaluations of its customers' financial condition and monitors credit limits regularly. Management does not believe that significant credit risk exists at December 31, 2013. The maximum credit risk exposure is as follows:

	2013 $	2012 $
Cash and cash equivalents	6,579,947	1,948,772
Trade and other receivables	16,583,503	19,227,193
	23,163,450	21,175,965

(c) 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 5), 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 Company's finance department monitors the Company's liquidity requirement to ensure it has sufficient cash.

(expressed in Eastern Caribbean dollars)

3. Financial risk management …*continued*

Financial risk factors…*continued*

(c) Liquidity risk …*continued*

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

	Less than 1 year $	Between 1 and 2 years $	Between 1 and 2 years	Over 5 years $	Total $
At December 31, 2013					
Liabilities					
Borrowings	6,780,000	6,780,000	20,340,000	16,646,756	50,546,756
Trade and other payables	12,170,968	-	-	-	12,170,968
Consumers' deposits	-	-	-	3,712,253	3,712,253
Total liabilities	18,950,968	6,780,000	20,340,000	20,359,009	66,429,977
At December 31, 2012					
Liabilities					
Borrowings	7,858,861	6,780,000	20,340,000	23,446,635	58,425,496
Trade payables	13,568,049	-	-	-	13,568,049
Due to a related party	90,120	-	-	-	90,120
Consumers' deposits	-	-	-	3,712,251	3,712,251
Total liabilities	21,517,030	6,780,000	20,340,000	27,158,886	75,795,916

(expressed in Eastern Caribbean dollars)

3. Financial risk management…*continued*

Financial risk factors…*continued*

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 arranged a catastrophe standby facility with a financial institution to cover the Transmission and Distribution assets.

e) Capital risk management

The Company's objectives when managing capital are to safeguard the Company's ability to continue as a going concern in order to provide returns for shareholders and benefits for other stakeholders and to maintain optimal capital to reduce the cost of capital. In order to maintain or adjust the capital structure, the Company may adjust the amount of dividends paid to shareholders, issue new shares or sell assets to reduce debt.

The Company monitors capital on the basis of the gearing ratio. This ratio is calculated as net debt divided by total capital. Net debt is calculated as total borrowings (including 'current and non-current borrowings' as shown in the statement of financial position) less cash and cash equivalents. Total capital is calculated as 'equity' as shown in the statement of financial position plus net debt.

The gearing ratios at December 31, 2013 and 2012 were are follows:

	2013 $	2012 $
Total borrowings (Note 10)	41,025,375	46,397,839
Less: cash (Note 5)	(6,579,947)	(1,948,772)
Net debt	34,445,428	44,449,067
Total equity	75,019,297	68,260,396
Total capital	109,464,725	112,709,463
Gearing ratio	31%	39%

3.2 Fair value estimation

Fair value amounts represent estimates the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

The carrying values of cash and cash equivalents, trade and other receivables, trade and other payables, and due to related party approximate their fair values due to the short-term maturity of these items.

The fair values of borrowings for disclosure purposes are estimated by discounting the future contractual cash flows at the current market rate that is available to the Company in respect of similar financial instruments.

(expressed in Eastern Caribbean dollars)

4. Critical accounting estimates and judgements

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.

Other than in the establishment of routine provisions against trade receivables, inventories and current provisions for liabilities and other changes, no significant estimates or judgements have been required in applying accounting policies that may have a material impact on the Company's reported assets, liabilities, revenues and expenses.

4.1 Change in accounting estimate

During 2013 a depreciation rate study was conducted. A depreciation rate study reviews and analyses the average service life and remaining lives of property plant and equipment with due consideration given to physical, functional, and economic factors as well as prior practices.

As a result of the study some changes were recommended to the previous depreciation rates used by the Company and approved for use in its financial statements as at December 31, 2013. The new rates as per the study are set out in section 2.6. As required by International Accounting Standard 8 – Accounting policies, Changes in Accounting Policies & Errors, the change in rates was applied prospectively from 2013. The impact of the rate change on the statement of income for year ended December 31, 2013 was EC$2.6 million. It is expected that the impact will be consistent in future periods.

5. Cash and cash equivalents

For the purpose of the statement of cash flow, cash and cash equivalents.

	2013 $	2012 $
Cash at bank	6,579,947	1,948,772

(expressed in Eastern Caribbean dollars)

6. Trade and other receivables

	2013 $	2012 $
Government	3,559,899	2,482,185
Other	9,354,858	11,121,865
Trade receivables, gross	12,914,757	13,604,050
Provision for impairment of trade receivables	(1,323,866)	(144,793)
Trade receivables, net	11,590,891	13,459,257
Accrued income	1,049,127	936,239
	12,640,018	14,395,496
Other receivables	3,704,491	4,826,868
Provision for impairment of other receivables	(362,922)	(21,171)
Other receivables, net	3,341,569	4,805,697
Prepayments	601,916	26,000
	16,583,503	19,227,193

The fair values of trade and other receivables approximate their carrying values.

As of December 31, 2013, trade receivables of $9,434,444 (2012 - $11,104,770) were fully performing. These relate to a number of independent customers for whom there is no recent history of default.

Trade receivables that are categorized as active and are less than 60 days past due are not considered impaired. As of December 31, 2013, trade receivables of $2,107,599 (2012 - $2,308,304) were past due but not impaired. The ageing analysis of these trade receivables is as follows:

	2013 $	2012 $
61 - 90 days	1,606,119	571,420
91 + days	501,480	1,736,884
	2,107,599	2,308,304

(expressed in Eastern Caribbean dollars)

6. Trade and other receivables…*continued*

As of December 31, 2013, trade receivables of $1,372,714 (2012 - $190,976) were impaired and partially provided for. The amount of the provision was $1,323,865 as of December 31, 2013 (2012 - $144,793). The individually impaired receivables mainly relate to customers who are in unexpectedly difficult economic situations. It was assessed that a portion of the receivables is expected to be recovered. The ageing of these receivables is as follows:

	2013 $	2012 $
Up to 12 months	48,849	60,647
Over 12 months	1,275,017	130,329
	1,323,866	190,976
Total trade receivables, gross	12,914,757	13,604,050

The carrying amounts of the Company's trade and other receivables are all denominated in Eastern Caribbean dollars.

Movements on the Company's provision for impairment of trade and other receivables are as follows:

	2013 $	2012 $
At beginning of year	165,964	160,302
Bad debt expenses (Note 18)	1,518,780	91,717
Written off during the year	2,043	(86,055)
At end of year	1,686,787	165,964

The creation and release of provision amounts for impaired receivables have been included in 'Operating costs' in the statement of comprehensive income amounts (Note 18). Amounts charged to the allowance account are generally written off when there is no expectation of recovering additional cash.

The maximum exposure to credit risk at the reporting date is the carrying values which approximates the fair value of each class of receivable mentioned above. The Company holds cash deposits as partial security for its receivables.

(expressed in Eastern Caribbean dollars)

7. Inventories

	2013 $	2012 $
Network spares	7,088,298	8,097,325
Generation spares	3,386,698	3,683,502
Fuel	576,419	639,333
Other	417,391	555,660
	11,468,806	12,975,820
Provision for impairment of inventories	(654,925)	(894,309)
Inventories, net	10,813,881	12,081,511

Movements on the Company's provision for impairment of inventories are as follows:

	2013 $	2012 $
At beginning of year	894,309	861,551
Provision/(Recovered) for inventory obsolescence (Note 18)	(239,384)	33,098
Written off during the year	-	(340)
At end of year	654,925	894,309

8. Capital work-in-progress

	2013 $	2012 $
At beginning of year	460,879	930,807
Additions	456,046	1,302,693
Transferred to property, plant and equipment (Note 9)	(386,410)	(1,765,318)
Written-off	(81,870)	(7,303)
At end of year	448,645	460,879

(expressed in Eastern Caribbean dollars)

9. Property, plant and equipment

	Land and Buildings $	Generation, Transmission and Distribution $	Motor Vehicles $	Furniture and Fittings $	Total $
Year ended December 31, 2012					
Opening net book amount	30,438,021	89,347,233	1,542,309	1,552,185	122,879,748
Additions for the year	113,861	11,358,566	374,195	553,889	12,400,511
Transfer from capital work-in-progress	142,746	1,554,311	-	68,261	1,765,318
Disposals	-	(1,904,227)	(43,000)	-	(1,947,227)
Disposals on accumulated Depreciation	-	557,589	42,999	-	600,588
Depreciation	(1,618,450)	(8,026,363)	(473,245)	(703,751)	(10,821,809)
Closing net book amount	29,076,178	92,887,109	1,443,258	1,470,584	124,877,129
At December 31, 2012					
Cost or valuation	61,936,703	180,159,036	4,676,749	7,433,249	254,205,737
Accumulated depreciation	(32,860,525)	(87,271,927)	(3,233,491)	(5,962,665)	(129,328,608)
Net book amount	29,076,178	92,887,109	1,443,258	1,470,584	124,877,129
Year ended December 31, 2013					
Opening net book amount	29,076,178	92,887,109	1,443,258	1,470,584	124,877,129
Additions for the year	515,645	8,724,507	228,000	453,598	9,921,750
Transfer from capital work-in-progress	286,551	54,354	-	45,505	386,410
Disposals	-	(318,747)	(161,370)	-	(480,117)
Disposals on accumulated Depreciation	-	64,365	161,367	-	225,732
Depreciation	(1,172,204)	(6,454,573)	(347,692)	(414,362)	(8,388,831)
Closing net book amount	28,706,170	94,957,015	1,323,563	1,555,325	126,542,073
At December 31, 2013					
Cost or valuation	62,738,899	188,619,150	4,743,379	7,932,352	264,033,780
Accumulated depreciation	(34,032,729)	(93,662,135)	(3,419,816)	(6,377,027)	(137,491,707)
Net book amount	28,706,170	94,957,015	1,323,563	1,555,325	126,542,073

(expressed in Eastern Caribbean dollars)

9. Property, plant and equipment…*continued*

The Company carries insurance coverage on its main assets on a group basis with two neighbouring islands' electric utility companies. The liability for the Company is limited to $150,000,000 for all property including Transmission and Distribution assets within 1,000ft from the generating plant. Transmission and Distribution assets over 1,000ft from the generating plant are not covered for wind and wind related perils. A catastrophe standby facility of $10,000,000 was arranged with a financial institution to cover the Transmission and Distribution assets.

Depreciation expense charged to direct expenses and administrative expenses amounted to $7,974,469 (2012 - $10,118,058) and $414,362 (2012 - $703,751), respectively.

No interest was capitalised during 2013 and 2012.

10. Borrowings

	2013 $	2012 $
Current		
Bank borrowings	4,539,667	5,359,107
	4,539,667	5,359,107
Non-current		
Bank borrowings	36,485,708	41,038,732
Total borrowings	41,025,375	46,397,839

Interest expense on bank borrowings amounted to $2,500,300 (2012 - $2,839,375), while interest on bank overdraft amounted to $0.00 (2012 - $1,324) (Note 22).

The weighted average effective interest rates at the balance sheet date were as follows:

	2013 %	2012 %
Bank borrowings	**5.75**	5.75

(expressed in Eastern Caribbean dollars)

10. Borrowings…*continued*

Maturity of non-current borrowings:

	2013 $	2012 $
Between 1 and 2 years	4,807,688	4,538,969
Between 2 and 5 years	16,188,460	15,283,532
Over 5 years	15,489,560	21,216,231
	36,485,708	41,038,732

The bank borrowings are secured by hypothecary obligations and mortgage debentures creating fixed charges over certain specific immovable properties of the Company.

The carrying amounts and fair values of the non-current borrowings are as follows:

	Carrying amount		Fair value	
			2013 $	2012 $
Bank borrowings	36,485,708	41,038,732	36,499,992	39,138,579

The fair values of the non-current borrowings are based on cash flows discounted using a rate based on the government bond rate of 7% (2012 - 7.0%)

The carrying amounts of short-term borrowings approximate their fair value.

The carrying amounts of the Company's borrowings are denominated in the following currencies:

	2013 $	2012 $
Eastern Caribbean dollars	41,025,375	46,397,839

As at December 31, 2013 the Company has unused credit facilities of $30,000,000 (2012 - $28,921,139).

(expressed in Eastern Caribbean dollars)

10. Borrowings…*continued*

In accordance with the Mortgage Debenture securing the borrowings, the Company is required to maintain a debt to effective equity ratio that does not exceed 80/20 and a debt service ratio of not less than 1.2. The company complied with the requirement under the debenture in 2013 and 2012.

The debt to effective equity ratio is calculated as the total debt less deferred taxes divided by equity while the debt service ratio is calculated as earnings before interest, taxes and depreciation divided by the current portion of long-term debt and interest expenses.

	2013 $	2012 $
Total liabilities	85,948,753	90,335,088
Less deferred tax liability	(19,214,446)	(17,313,615)
	66,734,307	73,021,473
Total equity	75,019,297	68,260,396
Debt effective equity ratio	47/53	52/48

The debt service ratios at December 31, 2013 and December 31, 2012 were as follows:

	2013 $	2012 $
Earnings before interest, taxes and depreciation	23,693,503	25,577,102
Bank borrowings – current	4,539,667	5,359,107
Interest charges	2,500,300	2,840,699
	7,039,967	8,199,806
Debt service ratio	3.37	3.12

11. Trade and other payables

	2013 $	2012 $
Trade creditors	8,748,051	10,242,526
Accruals	2,899,222	2,815,412
Other	523,695	510,111
	12,170,968	13,568,049

(expressed in Eastern Caribbean dollars)

12. Related party balances and transactions

In the normal course of business, the Company transacts with companies and individuals which are considered related parties.

Key related parties and relationships are as follows:

Related parties	**Relationship**
Emera Inc.	Ultimate parent company
Light & Power Holdings Limited	Indirect parent company
Light & Power Caribbean Holdings Limited	Indirect Parent company
Dominica Power Holdings Limited	Parent company
The Barbados Light & Power Company Limited	Related Party
Dominica Social Security	Non-controlling Shareholder
WRB Enterprises	Parent company up to April 9, 2013

Transactions with these parties during the year were as follows:

	2013 **$**	**2012** **$**
Management fees:		
WRB Enterprises Inc.	339,612	339,612
Director expenses, internal auditor costs, technical consultancies, feasibility studies and regulatory expenses: - WRB Enterprises	136,626	615,617
Directors expenses – Light & Power Caribbean Holdings Limited	12,103	-

Transactions with related parties were carried out on commercial terms and conditions.

Key management compensation
Key management comprises senior management of the Company.

Compensation for these individuals was as follows:

	2013 **$**	**2012** **$**
Salaries and other short-term employee benefits	1,572,325	1,489,935
Post-employment benefits	83,979	86,287
	1,656,304	1,576,222

(expressed in Eastern Caribbean dollars)

13. Deferred tax liabilities

Deferred tax liabilities are calculated on all temporary differences under the liability method using a principal tax rate of 30%. The movement on deferred tax liabilities is as follows:

	2013 $	2012 $
At beginning of year	17,313,615	16,596,696
Statement of comprehensive income charge (Note 23)	1,900,831	716,919
At end of year	19,214,446	17,313,615

The deferred tax liabilities pertain to temporary differences on the following:

	2013 $	2012 $
Accelerated capital allowance	64,569,855	58,367,555
Capital grants	(521,702)	(655,507)
	64,048,153	57,712,048

Accelerated capital allowances noted above have no expiry dates.

14. Other non-current liabilities

	2013 $	2012 $
Deferred revenue	8,358,469	7,738,659
Consumers' deposits	3,712,252	3,692,796
Retirement benefit plan	4,936	5,341
	12,075,657	11,436,796

Deferred revenue
Deferred revenue represents payments made by customers towards the cost of capital works to be undertaken by the Company in order for the customers to receive electricity. When the asset is completed and transferred to property, plant and equipment, the deferred revenue will be amortised in accordance with the depreciation rate of the asset.

Consumers' deposits
Consumers requesting energy connections are required to pay a deposit, which is refundable when service is no longer required. Interest accrues on these deposits at a rate of 3% per annum. Interest of $101,441 (2012 - $104,276) was charged against income (Note 22).

(expressed in Eastern Caribbean dollars)

15. Capital grants

	2013 $	2012 $
At beginning of year	655,507	789,308
Amortisation (Note 21)	(133,805)	(133,801)
At end of year	521,702	655,507

16. Share capital

	2013 $	2012 $
Authorised:		
Ordinary shares at no par value	15,000,000	15,000,000
Issued and fully paid:		
10,417,328	10,417,328	10,417,328

17. Dividends

The Company paid dividends of $2,083,466 (2012 - $2,083,466) to ordinary shareholders in respect of the year ended December 31, 2013.

Dividend per share is shown below and is computed by dividing the dividends declared and paid by the total number of outstanding shares.

	2013 $	2012 $
Dividends declared and paid	2,083,466	2,083,466
Weighted average number of ordinary shares issued	10,417,328	10,417,328
Dividend per share	0.200	0.200

(expressed in Eastern Caribbean dollars)

18. Expenses by nature

	2013 $	2012 $
Fuel costs (Note 20)	43,436,628	51,660,677
Employee benefit expenses (Note 19)	14,898,516	14,444,300
Depreciation (Note 9)	8,388,831	10,821,809
Equipment and line repairs and maintenance	6,581,448	6,419,543
Legal and professional	2,321,726	1,601,094
Insurance	2,097,570	2,097,285
Office expenses	1,103,339	1,017,067
Travel expenses	855,969	863,859
Commercial expenses	163,387	211,129
Communication	459,625	486,948
Public relations	442,175	467,617
Security	523,022	472,282
Bank and credit card charges	458,156	476,065
Bad debt expenses (Note 6)	1,518,780	91,717
Hurricane restoration costs	174,900	55,254
Provision for inventory obsolescence (Note 7)	(239,384)	33,098
Power purchased	101,642	115,746
Audit fees/expenses	258,025	174,385
Directors fees	81,600	76,500
Other expenses	386,766	215,124
Total direct and administrative expenses	84,012,721	91,801,499

19. Employee benefit expenses

	2013 $	2012 $
Salaries and wages	11,769,754	11,374,723
Other staff costs	3,128,762	3,069,577
	14,898,516	14,444,300

20. Fuel cost

	2013 $	2012 $
Fuel cost at base price	6,360,604	7,457,141
Fuel surcharge	37,076,024	44,203,536
Total fuel cost (Note 18)	43,436,628	51,660,677
Fuel surcharge recovery	(37,473,942)	(44,260,626)
Net fuel cost	5,962,686	7,400,051

(expressed in Eastern Caribbean dollars)

21. Other income/(expenses), net

	2013 $	2012 $
Loss on disposal of plant and equipment	(213,884)	(1,334,138)
Amortisation of capital grants (Note 15)	133,805	133,801
Amortisation of deferred revenue	443,648	397,305
Foreign exchange gains/(losses) – net	29,548	5,304
	393,117	(797,728)

22. Finance costs

Finance costs comprise the following:

	2013 $	2012 $
Loan interest charges (Note 10)	2,500,300	2,839,375
Other interest charges (Note 14)	101,441	104,276
Overdraft charges (Note 10)	-	1,324
	2,601,741	2,944,975

23. Taxation

	2013 $	2012 $
Taxation		
Current	1,958,128	2,881,463
Under-accrual of prior year's income tax	1,605	9,140
Deferred charge (Note 13)	1,900,831	716,919
	3,860,564	3,607,522

Tax on the Company's net income before tax differs from the theoretical amount that would arise using the statutory tax rate of 30% as follows:

	2013 $	2012 $
Profit before income tax	12,702,930	11,810,318
Tax calculated at the rate of 30%	3,810,879	3,543,095
Income not subject to taxation	(40,142)	(40,140)
Expenses not deductible for tax purposes	92,548	93,370
Adjustment on deferred income tax	(4,326)	2,057
Under-accrual of prior year's income tax	1,605	9,140
Tax charge	3,860,564	3,607,522

(expressed in Eastern Caribbean dollars)

24. Earnings per share

	2013 $	2012 $
Net income for year	8,842,367	8,202,796
Weighted average number of ordinary shares issued	10,417,328	10,417,328
Basic and fully diluted earnings per share	0.85	0.79

Earnings per share have been computed by dividing profit for the year by the average number of issued ordinary shares.

25. Commitments

The Company has committed to purchase products and services in the amount of $1,136,276 and $1,497,904 from a number of companies as at December 31, 2013 and 2012, respectively.

26. Contingent liabilities

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

DOMINICA ELECTRICITY SERVICES LIMITED

13 Month Average Debt & Equity

	Actuals									Forecast				13 Month	Debt/Equity
Month	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	**Average**	**Ratio**
Debt	41,025,374	40,660,789	40,288,017	39,907,133	39,537,022	39,158,874	38,785,108	38,403,407	38,025,952	37,646,461	37,259,379	36,876,338	36,485,616	**38,773,805**	**33.1%**
Equity	75,019,297	75,635,198	76,122,471	76,112,190	75,804,000	76,821,889	78,338,384	79,611,885	80,547,495	81,081,713	81,676,716	80,819,152	81,024,053	**78,354,957**	**66.9%**

Dominica Electricity Services Ltd
Rate of Return on Rate Base realized

	2012	2013
Plant in Service	254,205,737	264,033,780
Accumulatd Depreciation	(129,328,608)	(137,491,707)
Net Plant in Service	124,877,129	126,542,073
CWIP	460,879	448,645
Working Capital Allowance (from Below)	15,746,388	14,837,289
Other Rate Base Items (from below)	(21,661,918)	(23,448,400)
Total Rate Base	119,422,478	118,379,607
Average Rate Base	**121,220,776**	**118,901,042**
Net Income	8,202,796	8,842,367
plus tax-effected interest expense (from below)	4,207,107	3,716,773
Earnings Applicable to Rate Base	**12,409,903**	**12,559,140**
Return on Average Rate Base	**10.2%**	**10.6%**

Inventories	12,081,511	10,813,881
Working Cash - 12.5% (i.e. 45 day lag) of Op. Exp. excluding Fuel, Dep & Tax	3,664,877	4,023,408
Working Capital Allowance	**15,746,388**	**14,837,289**
Operating Expense Excluding Fuel, Depreciation & Taxes	29,319,013	32,187,262
Other Rate Base Items		
Customer Deposits	(3,692,796)	(3,712,252)
Capital Grants	(655,507)	(521,702)
Deferred Income Tax Liability	(17,313,615)	(19,214,446)
Total Other Rate Base Items	**(21,661,918)**	**(23,448,400)**
Interest Expense	2,944,975	2,601,741
Pre-Tax Interest (x 1/(1-0.3))	4,207,107	3,716,773