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Algonquin Power & Utilities Corp.

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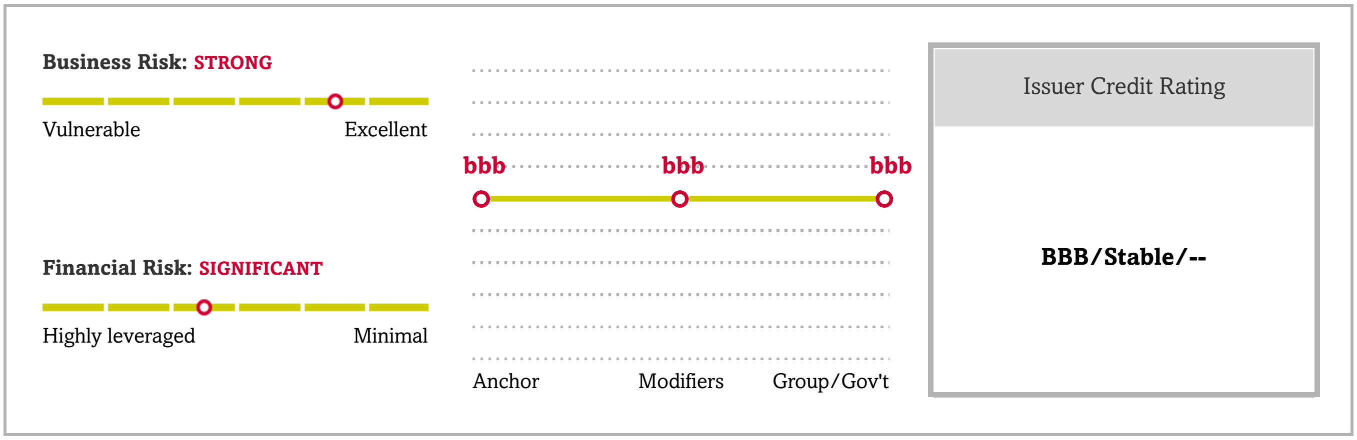
Algonquin Power & Utilities Corp.



Credit Highlights

Overview

Key strengths	Key risks
Low-risk rate-regulated electric, gas and water utility operations.	Non-utility generation is susceptible to market and price risks.
Diverse service territories across Canada and 13 U.S. states.	Limited size of operations with a diversified yet small customer base.
Non-utility generation portfolio, which consists of wind, thermal, and hydro generation with long-term PPA contracts, comprises about 5% of EBITDA.	Financial measures at the lower end of the benchmark range for the financial risk profile.

Algonquin Power & Utilities issued common equity to support financial measures.

In 2018, Algonquin Power & Utilities Corp. (APUC) raised approximately C$616.5 million through common stock issuances and used the proceeds to pay down debt, finance the purchase of an incremental 16.5% interest in Atlantica Yield PLC, and to finance the acquisition of Enbridge Gas New Brunswick Limited Partnership. We expect the company's strategy to issue more equity to pay down long-term debt will modestly strengthen financial measures.

Tuck-in acquisitions will complement the overall growth strategy that, if debt funded, might weaken financial measures.

In August 2017, APUC announced the acquisition of St. Lawrence Gas Co., a rate-regulated gas local distribution company (LDC) serving about 16,000 customers in New York for about $70 million. At the same time, APUC's board of directors approved the acquisition of two water distribution systems serving about 4,000 customers in the City of Perris, Calif. for about $11.5 million. In November 2018, APUC announced the $247 million acquisition of Enbridge Gas New Brunswick, a rate-regulated LDC serving about 12,000 customers. We expect these small tuck-in acquisitions of regulated businesses would modestly improve the overall business risk profile with incremental contributions from generally stable and predictable cash flows. However, if APUC funds these transactions through debt, it could hurt its financial measures.

Equity investments in Atlantica Yield PLC will increase exposure to more risky unregulated operations.

After purchasing an additional $345 million stake in Atlantica Yield PLC in November 2018, APUC's equity investment stands at 41.5%. This is in line with the company's strategy to gain a share in the global clean energy and water infrastructure markets. Although this incremental equity investment increases APUC's non-utility operations, management remains committed to maintaining 70% regulated cash flows through 2020.

Outlook: Stable

The stable outlook reflects S&P Global Ratings' assessment of APUC's stable cash flow from its regulated utilities and contracted unregulated power business, along with its commitment to a balance between debt and equity to fund its acquisition and development activities such that adjusted funds from operations (AFFO) to debt is above 15%.

Downside scenario

We could downgrade APUC within the next 24 months if the company's AFFO to debt were to fall and stay below 14% over the next 24 months. This could happen because of material adverse regulatory decisions, or APUC fails to execute its development projects on time and on budget.

Upside scenario

We could raise the ratings in the next 24 months if we believe that APUC will undertake sustainable, long-term growth or deleveraging that result in AFFO to debt of greater than 23%. Based on our forecast and the company's financial policy, which we do not expect to change, we believe the prospect of an upgrade during our two-year outlook horizon is unlikely.

Our Base-Case Scenario

Assumptions

- Continued cost recovery through approved rate cases and rate riders;
- Capital spending averaging about $800 million per year through 2020;
- Annual dividend payments averaging about $210 million;
- Negative discretionary cash flow, which indicates external funding needs; and
- All debt maturities to be refinanced.

Key Metrics

	2018E	2019E	2020E
Adjusted FFO to debt (%)	13-15	12-14	13-15
Adjusted debt to EBITDA (x)	4.5-5.7	5-6	4.5-5.5
Adjusted FFO cash interest coverage (x)	3.8-4.8	3.8-4.8	3.8-4.8

A--Actual. E--Estimated. FFO--Funds from operations.

Base-case projections

Maintenance of investment-grade capital structure, reflecting APUC's ongoing plans for organic and inorganic growth, using equity issuances, as needed.

Discretionary cash flow to remain negative, reflecting the company's elevated capital-spending program including its investment in Atlantica Yield and focus on shifting toward renewable sources of electricity generation.

Company Description

APUC is a diversified generation transmission and distribution utility with assets across the U.S. and Canada. The company generates and sells electricity through a portfolio of non-regulated renewable and clean-energy power generation facilities. The company also owns and operates a portfolio of regulated electric, natural gas, water distribution, and wastewater collection utility systems.

Business Risk: Strong

Our assessment of APUC's business risk profile reflects its well diversified regulated utility operations combined with the higher risk non-utility generation operations. The regulated business benefits from operations across 13 distinct regulatory environments, albeit concentrated in Missouri (about 55% of rate base). However, offsetting this is 88% of APUC's 764,000 electric, natural gas, and water customers are residential, which provides revenue stability. Also, the non-utility power generation operations benefits from long-term contracts with investor-owned utilities across the U.S. These credit factors are partly offset by its operations being concentrated in Missouri with its modestly restrictive regulatory environment, limited customer base, and higher operating risk associated with power generation.

APUC has about 1,700 megawatts (MW) of generation capacity, about 67% of which is from wind and the rest is from other renewable sources. About 87% of output from the non-utility generation facilities is sold under long-term contractual arrangements, which as of Sept. 30, 2018, have a remaining contract life of about 14 years providing modest stability to cash flows.

Peer comparison

Table 1

Algonquin Power & Utilities Corp. -- Peer Comparison					
Industry Sector: Combo					
	Algonquin Power & Utilities Corp.	**AltaGas Ltd.**	**Exelon Corp.**	**NextEra Energy Inc.**	**Ameren Corp.**
Rating as of Dec. 20, 2018	BBB/Stable/--	BBB/Negative/--	BBB/Positive/A-2	A-/Stable/--	BBB+/Stable/A-2
	--Average of past three fiscal years--				
(Mil. mix currency)	**$**	**C$**	**$**	**$**	**$**
Revenues	1,027.0	2,312.9	29,264.0	16,870.6	6,117.0
EBITDA	400.1	713.4	8,788.8	7,295.9	2,288.2
Funds from operations (FFO)	281.4	483.8	6,926.5	5,930.7	1,887.0

Table 1

Algonquin Power & Utilities Corp. -- Peer Comparison (cont.)					
Net income from cont. oper.	110.8	115.4	2,391.0	3,680.7	585.0
Cash flow from operations	244.3	487.2	7,004.5	5,654.7	2,006.4
Capital expenditures	339.9	528.0	7,374.7	9,495.1	2,083.0
Free operating cash flow	(95.6)	(40.8)	(370.1)	(3,840.4)	(76.6)
Discretionary cash flow	(193.1)	(384.9)	(1,546.5)	(5,579.4)	(494.0)
Cash and short-term investments	71.8	113.2	2,665.0	1,192.3	103.7
Debt	2,678.7	4,679.5	33,866.8	22,450.2	8,497.8
Equity	2,227.6	3,944.5	27,102.0	29,496.0	7,148.7
Adjusted ratios					
EBITDA margin (%)	38.4	30.8	30.0	43.2	37.4
Return on capital (%)	5.0	4.4	6.0	8.3	7.2
EBITDA interest coverage (x)	3.4	3.4	4.8	5.2	5.1
FFO cash int. cov. (X)	3.8	3.9	5.4	6.3	6.3
Debt/EBITDA (x)	6.9	6.6	3.9	3.1	3.7
FFO/debt (%)	11.6	10.3	20.5	26.4	22.2
Cash flow from operations/debt (%)	10.4	10.4	20.7	25.2	23.6
Free operating cash flow/debt (%)	(2.1)	(0.9)	(1.1)	(17.1)	(0.9)
Discretionary cash flow/debt (%)	(6.1)	(8.2)	(4.6)	(24.9)	(5.8)

Source: S&P Global Ratings.

Financial Risk: Significant

Our assessment of APUC's financial risk profile incorporates a base-case scenario that includes AFFO to debt averaging about 14%, near the lower end of the benchmark range of the significant category. We expect the supplemental ratio of AFFO cash interest coverage to be in the 4x-4.5x range, supporting the financial risk profile. In addition, we expect continued capital spending, when combined with APUC's dividend, will result in discretionary cash flow that is negative through the forecast period. The company will therefore require external financing that could include debt issuances. Over the next few years, we expect debt leverage to be relatively aggressive for a regulated utility as indicated by debt to EBITDA averaging about 5x. We base our risk assessment on our medial table benchmarks, which are more moderate when compared to those used for a typical corporate issuer. This reflects the company's steady cash flow and rate-regulated utility operations and effective management of regulatory risk.

Financial summary

Table 2

Algonquin Power & Utilities Corp. -- Financial Summary					
Industry Sector: Combo					
	--Fiscal year ended Dec. 31--				
	2017	2016	2015	2014	2013

Table 2

Algonquin Power & Utilities Corp. -- Financial Summary (cont.)

Rating history	BBB/Stable/--	BBB/Negative/--	BBB/Stable/--	BBB/Stable/--	BBB/Stable/--
(Mil. $)					
Revenues	1,523.8	1,096.0	1,027.9	943.6	675.3
EBITDA	619.6	432.8	359.1	261.9	207.4
Funds from operations (FFO)	442.6	278.7	271.5	185.5	150.5
Net income from continuing operations	149.5	130.9	118.5	77.8	62.3
Cash flow from operations	333.8	282.5	264.0	180.0	101.3
Capital expenditures	569.0	401.3	210.3	427.2	156.7
Free operating cash flow	(235.2)	(118.8)	53.7	(247.3)	(55.3)
Discretionary cash flow	(369.8)	(246.4)	(33.6)	(314.6)	(118.7)
Cash and short-term investments	43.5	110.4	124.4	9.3	13.8
Debt	3,443.6	4,489.0	1,730.2	1,537.3	1,422.2
Equity	3,282.8	2,417.0	2,219.8	1,750.8	1,416.6
Adjusted ratios					
EBITDA margin (%)	40.7	39.5	34.9	27.8	30.7
Return on capital (%)	4.9	4.4	5.4	4.7	4.4
EBITDA interest coverage (x)	3.5	2.8	4.1	3.3	3.4
FFO cash int. cov. (x)	3.6	3.2	4.6	3.8	4.6
Debt/EBITDA (x)	5.6	10.4	4.8	5.9	6.9
FFO/debt (%)	12.9	6.2	15.7	12.1	10.6
Cash flow from operations/debt (%)	9.7	6.3	15.3	11.7	7.1
Free operating cash flow/debt (%)	(6.8)	(2.6)	3.1	(16.1)	(3.9)
Discretionary cash flow/debt (%)	(10.7)	(5.5)	(1.9)	(20.5)	(8.3)

Source: S&P Global Ratings.

Liquidity: Adequate

We assess the company's liquidity as adequate because we believe its liquidity sources are likely to cover uses by more than 1.1x over the next 12 months and meet cash outflows even with a 10% decline in EBITDA. The assessment also reflects the company's generally prudent risk management, sound relationship with banks, and a generally satisfactory standing in credit markets.

Principal Liquidity Sources	Principal Liquidity Uses
• Estimated cash FFO of about $520 million; and • Credit facility availability of $1.125 billion.	• Debt maturities of about $95 million; • Capital spending of about $710 million; • Working capital outflows of about $20 million; and • Dividend payments of about $200 million.

Debt maturities

- 2019:$ 143 million
- 2020:$ 312 million
- 2021:$ 122 million
- 2022:$ 392 million

Covenant Analysis

Compliance expectations

As of Sept. 30, 2018, APUC was in compliance with the financial covenants in its credit facilities and had sufficient cushion. Under our base case scenario, we expect APUC will remain in compliance with the covenants, especially given the stability of the regulated utility operations.

Requirements

As per the covenant requirements, APUC's debt-to-capitalization ratio cannot exceed 65%. The covenant thresholds remain unchanged through the expiration of the credit facilities.

Environmental, Social, And Governance

APUC's utility, Empire District Electric Co., met approximately 58% of its generation needs for 2017 through coal resulting in significant carbon footprint and environmental risks. However, to mitigate the same, APUC has proposed a plan to install 800 MW of wind generation to reduce its exposure to coal-fired generation. Additionally, almost 95% of the non-utility power generation of APUC is from renewable sources of wind, hydro, and solar. It continues to invest in the international renewable energy market through its investments in Atlantic Yield.

As the company takes positive steps to reduce its existing carbon footprints, its customers also benefit from the social initiatives taken in the form of scholarships and rewards to employees. The corporation has a dedicated group responsible for environmental and safety policy training and audits within and outside the company, and ensures that third party audits are conducted for the regularly.

Issue Ratings - Subordination Risk Analysis

Capital structure

APUC has about $3.5 billion of long-term debt, about $25 million of which is priority debt.

Analytical conclusions

The unsecured debt at APUC is rated the same as the issuer credit rating because the company has sufficiently low leverage, limiting the risk of subordination for lenders of unsecured debt.

Preferred stock at APUC is two notches below the issuer credit rating to reflect subordination and deferability.

Reconciliation

Table 3

Reconciliation Of Algonquin Power & Utilities Corp. Reported Amounts With Standard & Poor's Adjusted Amounts (Mil. $)

	--Fiscal year ended Dec. 31, 2017--								
Algonquin Power & Utilities Corp. reported amounts									
	Debt	**Shareholders' equity**	**EBITDA**	**Operating income**	**Interest expense**	**EBITDA**	**Cash flow from operations**	**Dividends paid**	**Capital expenditures**
Reported	3080.5	2731.3	624.9	368.2	155.8	624.9	329.3	138.7	565.1
S&P Global Ratings adjustments									
Interest expense (reported)	--	--	--	--	--	(155.8)	--	--	--
Interest income (reported)	--	--	--	--	--	9.2	--	--	--
Current tax expense (reported)	--	--	--	--	--	(7.5)	--	--	--
Operating leases	91.6	--	7.5	5.8	5.8	1.6	1.6	--	--
Intermediate hybrids reported as equity	92.7	(92.7)	--	--	4.2	(4.2)	(4.2)	(4.2)	--
Postretirement benefit obligations/deferred compensation	131.4	--	7.6	7.6	13.8	(6.5)	1.0	--	--
Surplus cash	(32.6)	--	--	--	--	--	--	--	--
Capitalized interest	--	--	--	--	5.6	(5.6)	(5.6)	--	(5.6)
Share-based compensation expense	--	--	8.3	--	--	8.3	--	--	--
Dividends received from equity investments	--	--	2.4	--	--	2.4	--	--	--
Power purchase agreements	74.8	--	14.8	5.2	5.2	9.5	9.5	--	9.5
Asset retirement obligations	34.9	--	2.0	2.0	2.0	(0.0)	2.2	--	--
Non-operating income (expense)	--	--	--	9.2	--	--	--	--	--
Non-controlling Interest/Minority interest	--	644.2	--	--	--	--	--	--	--
Debt - Contingent considerations	18.9	--	--	--	--	--	--	--	--
Debt - Fair value adjustments	(48.6)	--	--	--	--	--	--	--	--
EBITDA - Foreign Exchange gain/(loss)	--	--	0.3	0.3	--	0.3	--	--	--

Table 3

Reconciliation Of Algonquin Power & Utilities Corp. Reported Amounts With Standard & Poor's Adjusted Amounts (Mil. $) (cont.)

EBITDA - Derivatives	--	--	(0.6)	(0.6)	--	(0.6)	--	--	--
EBITDA - Other	--	--	(47.7)	(47.7)	--	(47.7)	--	--	--
Interest expense - Other	--	--	--	--	(14.1)	14.1	--	--	--
Total adjustments	363.1	551.5	(5.4)	(18.0)	22.6	(182.3)	4.5	(4.2)	3.9
S&P Global Ratings adjusted amounts									
	Debt	**Equity**	**EBITDA**	**EBIT**	**Interest expense**	**Funds from operations**	**Cash flow from operations**	**Dividends paid**	**Capital expenditures**
Adjusted	3443.6	3282.8	619.6	350.1	178.4	442.6	333.8	134.6	569.0

Source: S&P Global Ratings.

Ratings Score Snapshot

Issuer Credit Rating

BBB/Stable/--

Business risk: Strong

- **Country risk:** Very low
- **Industry risk:** Low
- **Competitive position:** Strong

Financial risk: Significant

- **Cash flow/Leverage:** Significant

Anchor: bbb

Modifiers

- **Diversification/Portfolio effect:** Neutral
- **Capital structure:** Neutral
- **Financial policy:** Neutral
- **Liquidity:** Adequate
- **Management and governance:** Satisfactory
- **Comparable rating analysis:** Neutral

Stand-alone credit profile : bbb

- **Group credit profile:** bbb

Related Criteria

- Criteria - Corporates - General: Reflecting Subordination Risk In Corporate Issue Ratings, March 28, 2018
- General Criteria: Methodology For Linking Long-Term And Short-Term Ratings, April 7, 2017
- Criteria | Corporates | General: Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers, Dec. 16, 2014
- Criteria - Corporates - Industrials: Key Credit Factors For The Unregulated Power And Gas Industry, March 28, 2014
- Criteria | Corporates | General: Corporate Methodology: Ratios And Adjustments, Nov. 19, 2013
- General Criteria: Group Rating Methodology, Nov. 19, 2013
- General Criteria: Methodology: Industry Risk, Nov. 19, 2013
- Criteria - Corporates - General: Corporate Methodology, Nov. 19, 2013
- General Criteria: Country Risk Assessment Methodology And Assumptions, Nov. 19, 2013
- General Criteria: Methodology: Management And Governance Credit Factors For Corporate Entities And Insurers, Nov. 13, 2012
- General Criteria: Use Of CreditWatch And Outlooks, Sept. 14, 2009
- Criteria - Insurance - General: Hybrid Capital Handbook: September 2008 Edition, Sept. 15, 2008

Business And Financial Risk Matrix

	Financial Risk Profile					
Business Risk Profile	Minimal	Modest	Intermediate	**Significant**	Aggressive	Highly leveraged
Excellent	aaa/aa+	aa	a+/a	a-	bbb	bbb-/bb+
Strong	aa/aa-	a+/a	a-/bbb+	**bbb**	bb+	bb
Satisfactory	a/a-	bbb+	bbb/bbb-	bbb-/bb+	bb	b+
Fair	bbb/bbb-	bbb-	bb+	bb	bb-	b
Weak	bb+	bb+	bb	bb-	b+	b/b-
Vulnerable	bb-	bb-	bb-/b+	b+	b	b-

Ratings Detail (As Of January 2, 2019)

Algonquin Power & Utilities Corp.	
Issuer Credit Rating	BBB/Stable/--
Preferred Stock	
Canada National Scale Preferred Share	P-3(High)
Preferred Stock	BB+
Subordinated	BB+
Issuer Credit Ratings History	
06-Feb-2017	BBB/Stable/--
09-Feb-2016	BBB/Negative/--

Ratings Detail (As Of January 2, 2019) (cont.)	
11-Oct-2013	BBB/Stable/--
Related Entities	
Algonquin Power Co.	
Issuer Credit Rating	BBB/Stable/--
Senior Unsecured	BBB

*Unless otherwise noted, all ratings in this report are global scale ratings. S&P Global Ratings' credit ratings on the global scale are comparable across countries. S&P Global Ratings' credit ratings on a national scale are relative to obligors or obligations within that specific country. Issue and debt ratings could include debt guaranteed by another entity, and rated debt that an entity guarantees.

Rating Report

Algonquin Power Co.

DBRS

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Insight beyond the rating.

Ratings

Debt	Rating	Rating Action	Trend
Issuer Rating	BBB	Upgraded	Stable
Senior Unsecured Debentures	BBB	Upgraded	Stable

Rating Update

On January 16, 2019, DBRS Limited (DBRS) upgraded the Issuer Rating and the Senior Unsecured Debentures rating of Algonquin Power Co. (APCo, the Issuer or the Company) (operating as Liberty Power Co.) to BBB from BBB (low), both with Stable trends. The Issuer is wholly owned by Algonquin Power & Utilities Corp. (APUC). The upgrades reflect the following factors: (1) The Company has increased its operational size and scale over the years and has maintained a solid business risk profile with a growing power generation portfolio, which has a weighted-average contract length of 14 years (approximately 86% of the output being under long-term contracts and hedges; (2) APCo has improved its credit metrics to support the BBB ratings; and (3) the elimination of the uncertainty at the parent level following the acquisition of The Empire District Electric Company (Empire) by Liberty Utilities Co in 2017. The Stable trends incorporate the resiliency in credit metrics over the medium term, given the Company's current capital expenditure program and financing strategy.

APCo's credit metrics improved notably from 2017 levels and support the BBB rating, reflecting solid performance from the existing generating portfolio and incremental cash flow from newly completed power projects in 2018 (Amherst Island Wind and Great Bay Solar). The cash flow-to-debt level (pro forma for 2018), although modestly volatile due largely to the timing of project completion and weather conditions, moved in the BBB range and is expected to improve over the medium term, as new projects are becoming operational. APCo's ability to finance its future projects has improved significantly over the past few years, reflecting a much larger size and operational scale and its parent's stronger financial flexibility.

APCo continues to expand its generation portfolio by building new projects, which are all expected to have either power contracts or long-term financial hedges with a duration between 10 and 15 years. Capital expenditures for 2019 are expected to be in the $350 million to $400 million range. Financing is expected mostly through equity contribution from APUC and non-controlling interest partners, while debt financing is expected to be modest (debt-to-capital is expected to remain below 35%). Credit metrics in 2019 and over the medium term are expected to either remain stable or improve further from the 2018 level, as incremental cash flow will be contributed from new projects coming online over this period. DBRS believes that the Issuer has project development expertise to mitigate project cost overruns and delays. However, should current credit metrics weaken materially due to cost overruns or significantly higher debt leverage or operational disruptions, it could result in a negative rating action.

Financial Information

	9M to Sept. 30		12M to Sept. 30	For the year ended		
APCo Consolidated	**2018**	**2017**	**2018**	**2017**	**2016**	**2015**
Cash flow/debt	20.0%	11.0%	20.7%	16.5%	18.8%	26.2%
EBITDA interest coverage (adjusted for leases)	4.35	3.76	4.01	3.63	5.66	4.94
Debt/capital (adjusted for leases)	28.9%	45.0%	28.9%	32.4%	35.1%	31.8%

Issuer Description

APCo is a power generation company with a focus on renewable and clean energy. The Company's assets and operations are located in Canada and the United States. APCo is a wholly owned subsidiary of APUC, a diversified power and regulated utilities company publicly traded on the Toronto Stock Exchange and the New York Stock Exchange.

Rating Considerations

Strengths	Challenges

1. Long-term contracts/strong counterparties

Most of APCo's EBITDA comes from hydroelectric, wind and solar facilities. Approximately 86% of generation output is sold under long-term hedges and long-term power contracts (PPAs) with solid credit counterparties. The weighted-average (WA) remaining contract life is approximately 14 years, which significantly reduces the volatility of cash flow. Solid credit counterparties minimize default risk.

2. Diversified and large asset portfolio

APCo's assets are diversified across renewable resource regions and generation types, which reduces the Company's exposure to a specific wind resource, water flow or other renewable resource variability. The operating portfolio consists of 1.6 gigawatts (GW) capacity with 16 hydroelectric facilities (120 megawatts (MW)), 12 wind facilities (1,127 MW), four solar facilities (115 MW) and three thermal facilities (259 MW) throughout Canada and the United States. The full-year 2018 operating cash flow is expected to be spread between United States and Canada at the ratio of 52% and 48%, respectively.

3. Strong operational expertise/low technology risk/low maintenance capex

The Company has long-term operating and maintenance (O&M) agreements with wind turbine manufacturers and a strong in-house technical service group that oversees and maintains all facilities. The Company's maintenance capex is low and is projected to be approximately $20 million to $30 million over the next few years, reflecting the fact that approximately 95% of generation comes from hydro, wind and solar facilities with low maintenance costs.

4. Significant increase in size and scale/financing ability

APCo has significantly increased its size and operational scale over the past few years through building new projects. EBITDA has doubled since 2013, and its installed generating capacity increased to approximately 1.6 GW in 2018 compared with approximately 968 MW in 2013. In addition, its parent's liquidity and financial flexibility also substantially increased following the acquisition of Empire. As at September 30, 2018, APUC's consolidated assets were approximately $9.0 billion (CAD 3.5 billion at the end of 2013) with approximately 70% of the assets being in the low-risk, stable cash flow regulated utilities (approximately 50% in 2013).

1. Significant capex

APCo has a large capex program as it continues to grow its renewable generating portfolio. Capex is expected to be high for next three years because four projects with the total capacity of 214 MW are scheduled to be commissioned in 2019/2020. Heavy capex in a particular year can temporarily place the Issuer's credit metrics under pressure. The high capex also exposes APCo to construction risk and funding challenges. However, DBRS notes that this risk is mitigated by the Company's expertise in project development.

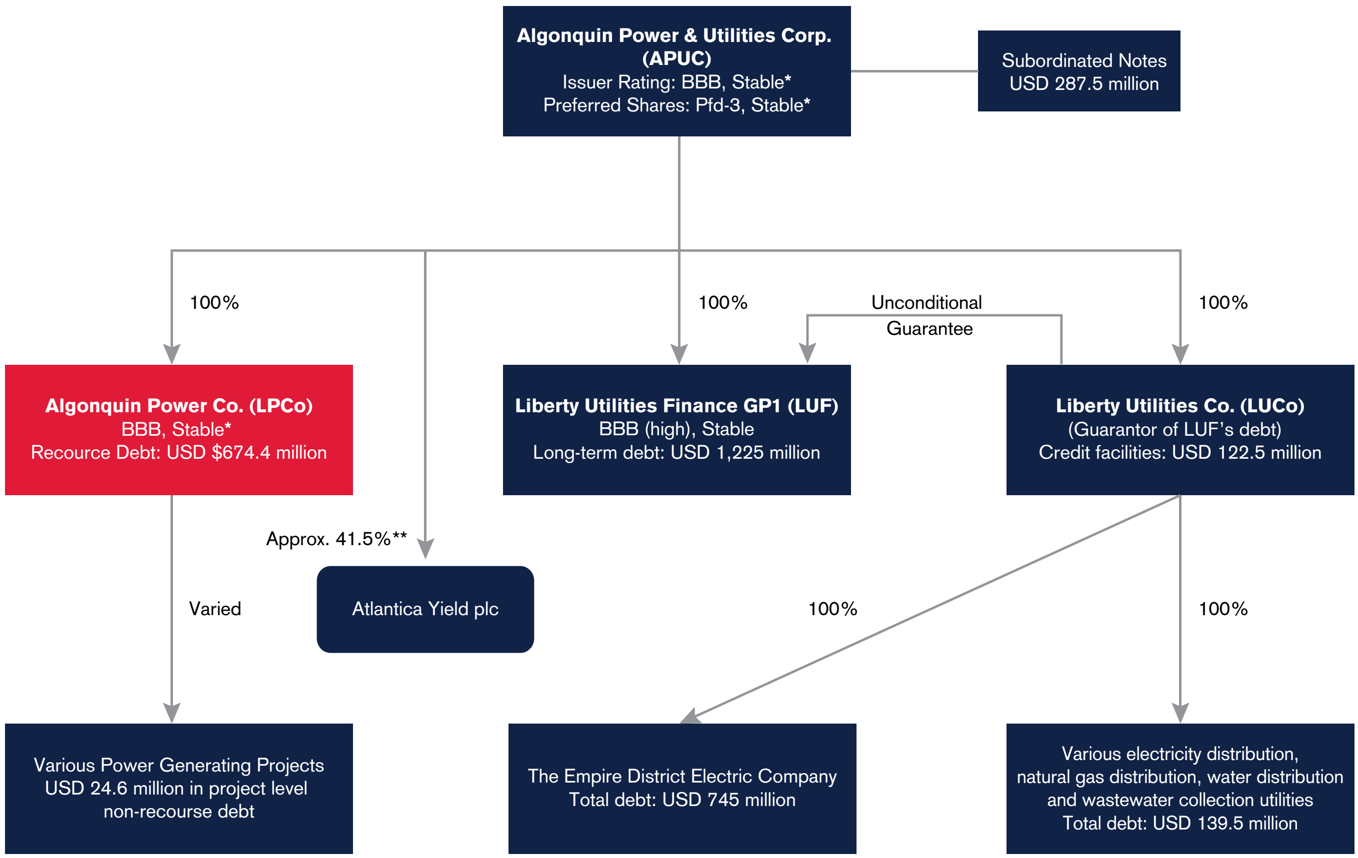
2. Volume risk

APCo's generation output, which is one of the key drivers of its earnings and cash flow, is very sensitive to inherent variability in wind, insolation and hydrological conditions. As a result, adverse wind conditions or low water flows would negatively affect APCo's credit metrics.

3. Operational risk

The Company faces operational risk with respect to unplanned outages. Unplanned or prolonged planned outages could significantly reduce generation output and could render the Company's inability to meet its PPA commitments. DBRS notes that APCo has good operational expertise and support from manufacturers to mitigate this risk.

Organizational Chart (as at September 30, 2018)



* APCo and APUC's credit ratings were upgraded by DBRS on January 16, 2019 and January 25,2019 respectively.
** APUC increased its interest from approx. 25% to approx. 41.5% in Atlantica in Q4 2018.

APUC (the parent) currently has no senior debt. There is no pressure on distributions from APCo. The distribution policy is flexible and is designed to ensure APCo's smooth financing and debt leverage below 35%.

On a consolidated basis, APUC's consolidated assets grew substantially to approximately $9.0 billion as at September 30, 2018 (approximately CAD 3.5 billion as at December 31, 2013). Approximately 70% of APUC's consolidated assets are at the regulated utility subsidiaries.

Earnings and Outlook

APCo Consolidated	9M to Sept. 30		12M to Sept. 30	For the year ended		
(USD millions where applicable)	2018	2017	2018	2017*	2016*	2015*
Revenues	182	163	250	231	201	191
Net Revenue	**161**	**149**	**223**	**212**	**185**	**169**
EBITDA	**94**	**88**	**135**	**128**	**115**	**105**
Adjusted EBITDA 1	**101**	**92**	**143**	**134**	**118**	**109**
Depreciation and amortization	(60)	(56)	(83)	(79)	(60)	(53)
EBIT	**41**	**36**	**60**	**55**	**58**	**56**
Net interest expense	(24)	(25)	(33)	(35)	(20)	(23)
Other income (expense)	2	1	2	1	1	10
EBT	**19**	**12**	**29**	**21**	**39**	**44**
Income tax	(19)	(1)	(6)	12	(11)	(13)
Net effect of NCI 2	92	32	101	41	29	24
Consolidated income	**92**	**43**	**123**	**74**	**57**	**55**
Non-recurring items	(1)	(1)	(1)	(1)	7	(0)
Net income	**91**	**42**	**123**	**73**	**63**	**55**

* Reported in CAD and converted to USD using exchange rate for balance sheet prevailing at the balance sheet date and average rate for the period for cashflow and income statement.
1 Includes dividend/distribution and investment income and production-based distributions from Non-Controlling Interest (NCI).
2 Includes HLBV income that represents the value of net tax attributes earned in the period from electricity generated by certain of its U.S. wind power and U.S. solar generation facilities.

Summary

- **Overall:** EBITDA has increased consistently over the past several years as a result of a large generation portfolio as new projects are being completed. Existing projects have generated relatively stable EBITDA, reflecting the nature of long-term contracts. In 2018, approximately 86% of generation output was sold under long-term contracts.
- **Q3 2018:** EBITDA increased in nine months ended September 30, 2018, from the same period in 2017, largely reflecting (1) an increase in the capacity revenue at the Windsor Locks Thermal Facility; (2) full-year contribution from the Deerfield Wind Facility (commercial operation date March 2017); and (3) commencement of operations at Great Bay Solar (commercial operation date March 2018). The increase in the EBITDA was partially offset by lower productions in the few hydro and U.S. wind facilities.

Outlook

- A modest increase in EBITDA is expected in 2019, reflecting (1) a full-year contribution of Great Bay Solar in 2018 and (2) new projects (Great Bay Solar Phase 2 and Val-Éo Wind joint venture) expected to achieve commercial operations in the year.

Financial Profile

APCo Consolidated	9M to Sept. 30		12M to Sept. 30	For the year ended		
(USD millions where applicable)	2018	2017	2018	2017*	2016*	2015*
Cash flow from operations	88	75	122	109	102	104
Capital expenditures	(80)	(134)	(109)	(163)	(107)	(44)
Distributions to NCI	(8)	(3)	(9)	(4)	(4)	(3)
Distributions 1	(78)	(494)	(67)	(483)	(84)	(69)
Free cash flow (bef. work. cap.)	**(76)**	**(555)**	**(62)**	**(541)**	**(93)**	**(12)**
Changes in non-cash work. cap. items	(21)	(29)	(17)	(25)	24	(30)
Net free cash flow	**(97)**	**(585)**	**(79)**	**(566)**	**(69)**	**(42)**
Acquisitions & long-term investments	(86)	(58)	(112)	(84)	(338)	(102)
Other investment activities	0	0	0	0	0	0
Cash contributions from NCI	0	187	38	225	2	12
Net change in equity	91	368	264	541	241	200
Net change in debt	111	91	(116)	(136)	129	(50)
Other financing activities	(17)	(9)	6	14	(10)	44
Change in cash	2	(6)	1	(6)	(44)	61
Total debt	699	934	699	689	571	423
Cash flow/Total debt	19.2%	10.7%	19.9%	15.8%	17.9%	24.5%
Cash flow/Recourse debt	20.0%	11.0%	20.7%	16.5%	18.8%	26.2%
EBITDA interest coverage (times)	4.35	3.76	4.01	3.63	5.66	4.94
EBIT interest coverage (times)	1.87	1.56	1.75	1.55	2.86	2.60
Debt/Capital	28.9%	45.0%	28.9%	32.4%	35.1%	31.8%
Debt/EBITDA (times)	5.57	8.00	5.18	5.36	4.98	4.02

* Reported in CAD and converted to USD using exchange rate for balance sheet prevailing at the balance sheet date and average rate for the period for cashflow and income statement.
1 In 2017: includes one-time distribution to APUC as a return of equity injection earlier in the year.

Summary

- APCo's key credit metrics for the last 12 months ended September 30, 2018, improved from the 2017 level, reflecting (1) an increase in incremental cash flow generated from new projects coming online during this period; and (2) the Company's financing strategy to maintain the debt leverage target of below 35%.
- Cash flow-to-debt ratio around 20% and the debt-to-capital below 35% are solidly supportive of the BBB rating. EBITDA interest coverage of 4.00 times is at the low end of DBRS's BBB rating range. However, taken together, these credit metrics are consistent with the BBB rating.
- Note: APUC injected substantial equity in 2017 to fund the Company's capex; most of equity contribution was repaid later in the year to APUC through distributions.

Outlook

- Credit metrics for 2019 and over the medium term are expected to either remain stable or improve modestly, reflecting higher cash flow as a result of a full-year contribution from projects commissioned in 2018.
- Capex is expected to largely follow the project construction schedules. DBRS expects capex to be between $350 million and $400 million in 2019 because of the large portfolio of development projects (see projects). Most of the funding is expected to be through equity from the parent and non-controlling interest partners and a modest debt amount.

Long-Term Debt Maturities and Liquidity

Liquidity Profile

(USD millions – As at September 30, 2018)	Amount	LOCs	Drawn	Available	Maturity
Cash and cash equivalents	18.6	-	-	18.6	-
Revolving credit facility [1]	700.0	118.1	178.5	403.4	October 6, 2023
Total	**718.6**	**118.1**	**178.5**	**422.0**	

1 Includes $200 million uncommitted stand alone letter of credit facility.

Debt Maturities

(USD millions)	2019	2020	2021	2022	2023	Thereafter	Total
Principal payments [1]	2.2	2.0	117.4	156.1	2.5	220.1	500.2
% of Total	0.4%	0.4%	23.5%	31.2%	0.5%	44.0%	100.0%

1 Excluding credit facilities.

Long-Term Consolidated Debt Outstanding

(As at September 30, 2018)	Carrying Value USD Million	% of Consolidated	Maturity
Algonquin Power Co. Revolving Credit Facility	178.5	22%	6-Oct-23
Uncommitted Letter of credit facility	118.7	14%	
Algonquin Power Co. Senior Unsecured Notes	500.2	61%	Various - See below
Non-recourse Project Debt	24.6	3%	Various
Total Debt	**822.0**	**100%**	

Algonquin Power Co.	Face Value (CAD million)	Rate	Maturity
4.82% Senior Unsecured Notes	150.0	4.82%	15-Feb-21
4.65% Senior Unsecured Notes	200.0	4.65%	15-Feb-22
4.09% Senior Unsecured Debentures	300.0	4.09%	17-Feb-27
Total	**650.0**		

- On August 1, 2018, APCo's revolving credit facility maturity date was extended to October 6, 2023.
- DBRS expects future development over the medium term to continue to be partially and temporarily funded with the credit facility during construction. The drawn amounts will be periodically repaid with tax equity financing, equity injection by the parent and refinanced with longer-term bond financing that matches the long-term nature of the asset.
- Non-recourse debt at the project level, secured by the respective assets, was modest compared with total debt. Project debt ranks ahead of the Senior Unsecured Debentures with respect to the project asset that the debt is secured on. The amount of non-recourse debt is expected to remain a small percentage of the Company's overall funding strategy.
- Debt maturities over the next three years are modest.

Operational and Contractual Information

- At end of the 2018, approximately 95% of revenues came from renewable assets. This is expected to increase as more renewable assets come online. The additional contribution from renewables compared with traditional fuels limits APCo's exposure to fuel pricing risk. DBRS expects revenues from renewables to continue to increase as new renewable assets are completed or acquired.
- DBRS notes that production is diversified across 35 different projects, while cash flow for 2018 is expected to be spread between United States and Canada at a ratio of 52% and 48%, respectively.
- Approximately 86% of contracted output is sold under long-term contracts with mostly solid credit counterparties.
- APCo has long-term O&M agreements with wind turbine manufacturers for all wind assets with respect to maintenance and warranties. Technology used in wind and solar is relatively well proven, resulting in minimal technology risk.
- The Company has a reasonable annual capex program to maintain and improve operating assets and has an in-house technical service group to oversee and maintain all facilities.
- There have been no reports of major outages by the Company over the past several years.

Major Projects

Projects Recently Completed	Location	Size (MW)	Commercial Operation
Amherst Island Wind Project	Ontario	75	2018
Great bay Solar	Maryland	75	2018
Projects in Construction*			
Val Eo Wind Project Phase I	Quebec	24	2019
Great Bay Solar Project Phase II	Maryland	45	2019
Projects in Development*			
Sandy Ridge Wind Phase II	Pennsylvania	65	2020
Broad Mountain Wind	Pennsylvania	80	2020
Walker Ridge Wind	California	144	2021
Shady Oaks Wind Phase II	Illinois	100	2021
Blue Hill Wind	Saskatchewan	177	2022
Broad Mountain Wind Phase II	Pennsylvania	120	2022

* Expected to have long-term contract/financial hedges.

- ***Amherst Island Wind Project:*** The 75 MW wind project is located in Ontario and was completed Q2 2018.
- ***Great Bay Solar Project:*** Phase I is the 75 MW Solar project is located in Somerset County, Maryland which was completed Q1 2018. Phase II is under construction.
- ***Val-Éo Wind Project Phase I:*** The 24 MW project is located in Saint-Gédéon de Grandmont, Québec, and has a long-term PPA with Hydro-Québec. The project will be developed in two phases: Phase I is expected to be completed in 2019 and will comprise six 4.0 MW wind turbines, with power sold pursuant to a long-term contract with Hydro-Québec. Phase II will include an additional 101 MW and will be constructed following the evaluation of the wind resource at the site.
- ***Sandy Ridge Wind Phase II:*** The 65 MW wind project will have thirteen 4.2 MW and three 2.6 MW Siemens turbines. It is an expansion of an operational facility which APCo.
- ***Broad Mountain Wind:*** The 80 MW wind project is located in Pennsylvania and will have sixteen 4.2 MW and five 2.6 MW Siemens turbines. Commercial operation is expected to start in 2020. Phase II of the project is 120 MW and is expected to be in operation in 2022.
- ***Walker Ridge Wind:*** The 144 MW wind project is located in California.
- ***Shady Oaks Wind Phase II:*** The 100 MW wind project is located in Illinois.
- ***Blue Hill Wind:*** The 177 MW wind project is located in Saskatchewan, and all power will be sold to Saskatchewan Power Corporation (rated AA, Stable by DBRS) under a long-term contract that was signed in 2016. The project has received all provincial and municipal permits. This project will have forty-nine 3.6 MW Vestas turbines.

Consolidated Balance Sheet and Financial Ratios

Algonquin Power Co. Consolidated

Balance Sheet (USD millions)	Sept. 30 2018	Dec 31 2017	Dec 31 2016*		Sept. 30 2018	Dec 31 2017	Dec 31 2016*
Assets				**Liabilities & Equity**			
Cash & equivalents	19	17	22	S.T. borrowings	174	39	181
Accounts receivable	57	47	65	Accounts payable	3	18	46
Inventories	0	0	0	Current portion L.T.D.	2	2	2
Other current assets	14	20	17	Other current liab.	45	125	116
Total Current Assets	**89**	**84**	**104**	**Total Current Liab.**	**225**	**184**	**344**
				Long-term debt	523	648	388
Net fixed assets	2,182	2,247	1,830	Deferred income taxes	64	46	54
Future income tax assets	0	0	0	Other L.T. liab.	106	100	116
Goodwill & intangibles	34	33	30	Minority interest	526	612	434
Investments & others	216	120	133	Shareholders' equity	1,077	894	760
Total Assets	**2,521**	**2,484**	**2,097**	**Total Liab. & SE**	**2,521**	**2,484**	**2,097**

APCo Consolidated	9M to Sept. 30 2018	9M to Sept. 30 2017	12M to Sept. 30 2018	For the year ended 2017*	For the year ended 2016*	For the year ended 2015*
Balance Sheet and Liquidity Capital Ratios						
Current ratio (times)	0.40	0.20	0.40	0.46	0.30	0.97
Debt/Capital	27.8%	44.3%	27.8%	31.4%	34.1%	30.9%
Debt-to-capital (adjusted for leases)	28.9%	45.0%	28.9%	32.4%	35.1%	31.8%
Cash flow/Debt	19.2%	10.7%	19.9%	15.8%	17.9%	24.5%
Cash flow/Recourse debt	20.0%	11.0%	20.7%	16.5%	18.8%	26.3%
Cash flow/Debt (adjusted for leases)	20.1%	11.6%	20.5%	16.5%	19.0%	26.1%
Dividends/cash flow	97.6%	681.2%	62.8%	457.9%	87.0%	70.6%
Debt/EBITDA	4.56	7.60	4.29	5.12	4.82	3.88
Coverage Ratios (times)						
EBITDA interest coverage (adjusted for leases)	4.35	3.76	4.01	3.63	5.66	4.95
EBIT interest coverage (adjusted for leases)	1.87	1.56	1.75	1.55	2.86	2.62
EBITDA interest coverage	4.56	3.90	4.12	3.72	6.02	5.14
EBIT interest coverage	1.86	1.53	1.73	1.52	2.95	2.66
Profitability Ratios						
EBITDA margin	51.8%	53.7%	54.0%	55.5%	57.2%	54.9%
EBIT margin	22.6%	22.1%	24.1%	23.8%	28.9%	29.4%
Pre-tax profit margin	10.6%	7.3%	11.5%	9.3%	19.5%	22.8%

* Reported in CAD and converted to USD using exchange rate for balance sheet prevailing at the balance sheet date and average rate for the period for cashflow and income statement.

Rating History

	Current	2018	2017	2016	2015	2014	2013
Issuer Rating	BBB	BBB (low)	BBB (low)	BBB (low)	BBB (low)	BBB (low)	NR
Senior Unsecured Debentures	BBB	BBB (low)	BBB (low)	BBB (low)	BBB (low)	BBB (low)	BBB (low)

Previous Action

- "DBRS Upgrades Algonquin Power Co.'s Issuer Rating and Senior Unsecured Debentures to BBB, Stable Trends," January 16, 2019.

Previous Report

- Algonquin Power Co.: Rating Report, January 29, 2018.

Notes:
All figures are in U.S. dollars unless otherwise noted.

For the definition of Issuer Rating, please refer to Rating Definitions under Rating Policy on www.dbrs.com.

Generally, Issuer Ratings apply to all senior unsecured obligations of an applicable issuer, except when an issuer has a significant or unique level of secured debt.

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Attachment JRW-3

Liberty Utilities Corp. (Granite State Electric)
Recommended Cost of Capital

Capital Source	Capitalization Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	**50.00%**	**5.97%**	**2.99%**
Common Equity	**50.00%**	**8.25%**	**4.13%**
Total Capitalization	**100.00%**		**7.11%**

* Capital Structure Ratios are developed in Attachment JRW-5.

Attachment JRW-4
Liberty Utilities Corp. (Granite State Electric)
Summary Financial Statistics for Proxy Group

Electric Proxy Group

Company	Revenue ($mil)	Reg Elec	($mil)	($mil)	Credit Rating	Term Rating	Interest	Primary Service Area	Equity Ratio	Equity	Book Ratio
ALLETE, Inc. (NYSE-ALE)	$1,498.6	73%	$3,904.4	$3,993.8	BBB+	Baa1	3.34	MN, WI	59.2%	8.2%	1.85
Alliant Energy Corporation (NYSE-LNT)	$3,534.5	86%	$12,462.4	$10,172.3	A-	Baa1	3.31	WI,IA,IL,MN	44.6%	11.4%	2.13
Ameren Corporation (NYSE-AEE)	$6,291.0	85%	$22,810.0	$16,366.8	BBB+	Baa1	3.64	IL,MO	46.2%	10.9%	2.11
American Electric Power Co. (NYSE-AEP)	$16,195.7	86%	$55,099.1	$37,379.9	A-	Baa1	2.99	10 States	42.7%	10.3%	1.96
AVANGRID, Inc. (NYSE-AGR)	$6,291.0	60%	$22,810.0	$16,366.8	BBB+	Baa1	3.53	NY,CT,ME	70.8%	3.9%	1.06
Avista Corp (NYSE-AVA)	$1,396.9	72%	$4,648.9	$2,881.1	BBB	Baa2	2.61	WA,OR,AK,ID	45.7%	7.8%	1.62
CMS Energy Corporation (NYSE-CMS)	$6,873.0	68%	$18,126.0	$13,966.2	BBB+	Baa1	2.67	MI	28.9%	14.2%	2.91
Consolidated Edison, Inc. (NYSE-ED)	$12,337.0	71%	$41,749.0	$25,673.3	A-	A3	3.03	NY,PA	44.8%	8.6%	1.52
Duke Energy Corporation (NYSE-DUK)	$24,521.0	92%	$91,694.0	$63,736.1	A-	Baa1	2.47	NC,OH,FL,SC,KY	43.1%	6.2%	1.45
Edison International (NYSE-EIX)	$12,657.0	100%	$41,348.0	$18,107.4	BBB	Baa3	(0.48)	CA	45.1%	-2.4%	1.43
Evergy (NYSE:EVRG)	$4,275.9	100%	$18,782.5	$14,840.0	A-	Baa1	3.11	KS,MO	54.2%	7.9%	1.49
Eversource Energy (NYSE-ES)	$8,448.2	88%	$25,610.4	$21,470.9	A-	Baa1	3.67	CT,NH,MA	46.7%	9.2%	1.87
Hawaiian Electric Industries (NYSE-HE)	$2,860.8	89%	$4,830.1	$4,060.1	BBB-	Baa2	3.87	HI	51.2%	9.6%	1.88
IDACORP, Inc. (NYSE-IDA)	$1,370.8	100%	$4,395.7	$8,562.5	BBB	Baa1	3.85	ID	56.4%	9.8%	3.60
MGE Energy, Inc. (NYSE-MGEE)	$559.8	74%	$1,509.4	$2,303.7	AA-	Aa2	7.69	WI	61.5%	10.6%	2.82
NextEra Energy, Inc. (NYSE-NEE)	$16,727.0	70%	$70,334.0	$83,224.6	A-	Baa1	5.87	FL	49.8%	17.3%	2.22
NorthWestern Corporation (NYSE-NWE)	$1,192.0	79%	$4,521.3	$2,991.2	BBB	NA	2.94	MT,SD,NE	47.8%	10.5%	1.54
Otter Tail Corporation (NDQ-OTTR)	$916.4	51%	$1,581.1	$1,975.3	BBB	Baa2	4.19	OK,AR	54.5%	11.6%	2.71
PNM Resources, Inc. (NYSE-PNM)	$1,436.6	100%	$5,234.6	$3,360.4	BBB+	Baa3	1.73	NM,TX	37.6%	5.8%	1.92
Pinnacle West Capital Corp. (NYSE-PNW)	$3,691.2	100%	$14,029.6	$16,260.8	A-	A3	4.04	AZ	50.6%	10.1%	3.04
Portland General Electric Company (NYSE-POR)	$1,991.0	100%	$6,887.0	$4,287.2	BBB+	A3	2.85	OR	50.3%	8.6%	1.71
PPL Corporation (NYSE-PPL)	$7,785.0	100%	$34,458.0	$20,457.2	A-	Baa2	3.37	PA,KY	34.6%	16.3%	1.75
Southern Company (NYSE-SO)	$23,495.0	79%	$80,797.0	$48,493.6	A-	NA	2.49	GA,FL,NJ,IL,VA,TN,MS	38.3%	8.4%	1.67
Unitil Corp. (AMEX-UTL)	$444.1	51%	$1,036.8	$753.4	BBB+	Baa2	2.73	NH,MA	41.5%	9.6%	2.14
WEC Energy Group (NYSE-WEC)	$7,679.5	60%	$22,000.9	$22,541.0	A-	Baa1	3.76	WI,IL,MN,MI	45.3%	3.3%	2.30
Xcel Energy Inc. (NYSE-XEL)	$11,537.0	85%	$36,944.0	$25,972.7	A-	Baa1	3.21	MN,WI,ND,SD,MI	41.5%	10.7%	2.13
Mean	$7,154.1	81%	$24,907.9	$18,853.8	BBB+	Baa1	3.33		47.4%	9.2%	2.03
Median	$5,283.5	85%	$18,454.3	$15,550.4	BBB+	Baa1	3.26		46.0%	9.6%	1.90

Data Source: Company 2018 SEC 10-K filings; *Value Line Investment Survey* , 2019. Regulated electric revenues - Attachment JC-3.

Attachment JRW-4

Liberty Utilities Corp. (Granite State Electric)
***Value Line* Risk Metrics**

Panel A
Electric Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
ALLETE, Inc. (NYSE-ALE)	0.65	A	2	85	95
Alliant Energy Corporation (NYSE-LNT)	0.60	A	2	85	95
Ameren Corporation (NYSE-AEE)	0.55	A	2	80	100
American Electric Power Co. (NYSE-AEP)	0.55	A+	1	85	100
AVANGRID, Inc. (NYSE-AGR)	0.40	B++	2	NMF	95
Avista Corp (NYSE-AVA)	0.60	A	2	70	90
CMS Energy Corporation (NYSE-CMS)	0.55	B++	2	85	100
Consolidated Edison, Inc. (NYSE-ED)	0.45	A+	1	100	100
Duke Energy Corporation (NYSE-DUK)	0.50	A	2	90	100
Edison International (NYSE-EIX)	0.60	B+	3	15	85
Evergy (NYSE:EVRG)	NMF	B++	2	NMF	NMF
Eversource Energy (NYSE-ES)	0.55	A	1	95	100
Hawaiian Electric Industries (NYSE-HE)	0.55	A	2	60	100
IDACORP, Inc. (NYSE-IDA)	0.55	A	2	95	95
MGE Energy, Inc. (NYSE-MGEE)	0.55	A	1	90	85
NextEra Energy, Inc. (NYSE-NEE)	0.55	A+	1	70	100
NorthWestern Corporation (NYSE-NWE)	0.60	B++	2	85	95
Otter Tail Corporation (NDQ-OTTR)	0.65	A	2	65	90
Pinnacle West Capital Corp. (NYSE-PNW)	0.55	A+	1	95	100
PNM Resources, Inc. (NYSE-PNM)	0.60	B+	3	75	85
Portland General Electric Company (NYSE-POR)	0.60	B++	2	85	95
PPL Corporation (NYSE-PPL)	0.70	B++	2	70	95
Southern Company (NYSE-SO)	0.50	A	2	85	100
Unitil Corp. (AMEX-UTL)	0.50	B+	2	85	95
WEC Energy Group (NYSE-WEC)	0.50	A+	1	90	100
Xcel Energy Inc. (NYSE-XEL)	0.50	A+	1	100	100
Mean	0.56	A	1.8	81	96

Data Source: *Value Line Investment Survey*, 2019.

Value Line Risk Metrics

Beta

A relative measure of the historical sensitivity of a stock's price to overall fluctuations in the New York Stock Exchange Composite Index. A beta of 1.50 indicates a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Index. The ‘‘coefficient’’ is derived from a regression analysis of the relationship between weekly percentage changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. Betas are adjusted for their long-term tendency to converge toward 1.00.

Financial Strength

A relative measure of the companies reviewed by *Value Line* . The relative ratings range from A++ (strongest) down to C (weakest).

Safety Rank

A measurement of potential risk associated with individual common stocks. The Safety Rank is computed by averaging two other *Value Line* indexes the Price Stability Index and the Financial strength Rating. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit their purchases to equities ranked 1 (Highest) and 2 (Above Average) for Safety. .

Earnings Predictability

A measure of the reliability of an earnings forecast. Earnings Predictability is based upon the stability of year-to-year comparisons, with recent years being weighted more heavily than earlier ones. The most reliable forecasts tend to be those with the highest rating (100); the least reliable, the lowest (5). The earnings stability is derived from the standard deviation of percentage changes in quarterly earnings over an eight-year period. Special adjustments are made for comparisons around zero and from plus to minus.

Stock Price Stability

A measure of the stability of a stock's price. It includes sensitivity to the market (see Beta as well as the stock's inherent volatility. *Value Line's* Stability ratings range from 1 (highest) to 5 (lowest).

Source: *Value Line Investment Analyzer* .

Attachment JRW-5

Liberty Utilities Corp. (Granite State Electric)
Capital Structure Ratios and Debt Cost Rates

Panel A - Liberty Utilities Corp. (Granite State Electric) Proposed Capital Structure and Debt Cost Rate

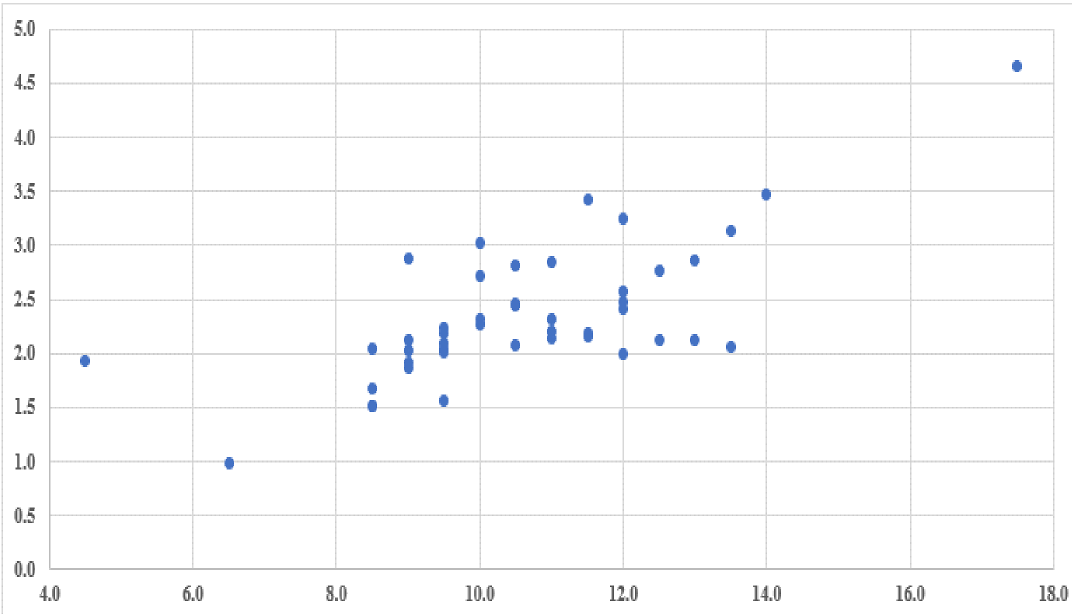
	Percent of Total	Cost
Long-Term Debt	45.00%	5.97%
Common Equity	55.00%	
Total Capital	100.00%	

Panel B - Staff's Proposed Capital Structure Ratios and Debt Cost Rate

	Percent of Total	Cost
Long-Term Debt	50.00%	5.97%
Common Equity	50.00%	
Total Capital	100.00%	

Attachment JRW-6
Electric Utilities and Gas Distribution Companies

Market-to-Book



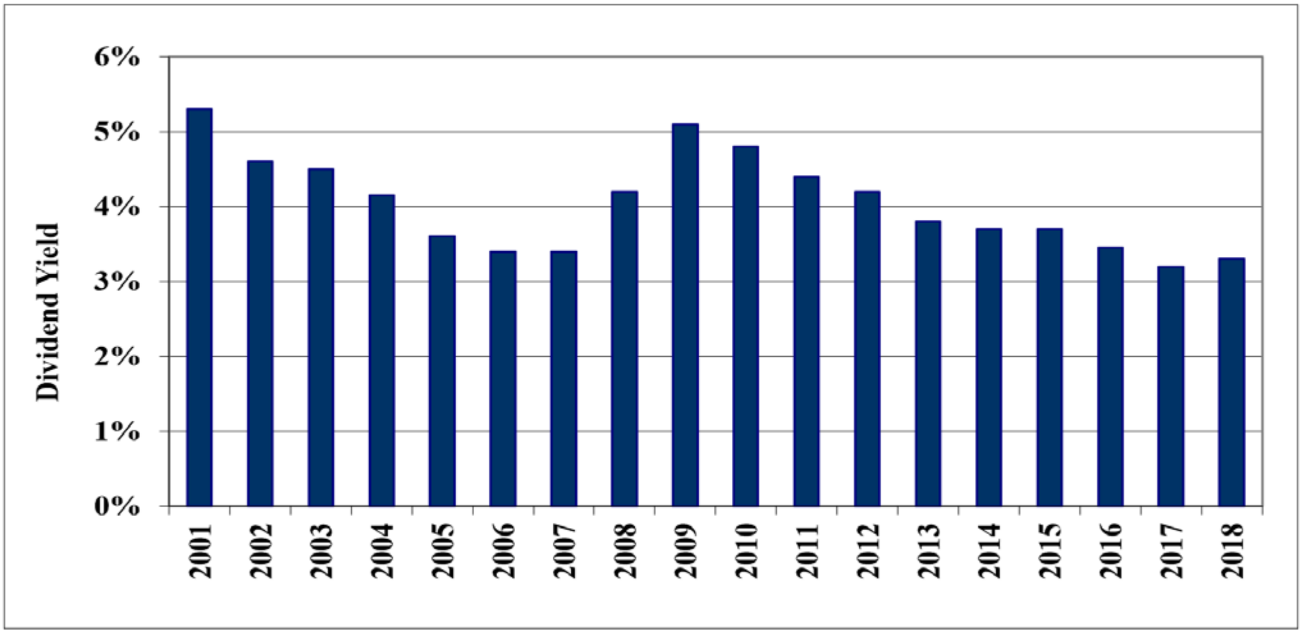
Expected Return on Equity
R-Square = .50, N=43

Attachment JRW-7
Long-Term 'A' Rated Public Utility Bonds

Data Source: Mergent Bond Record

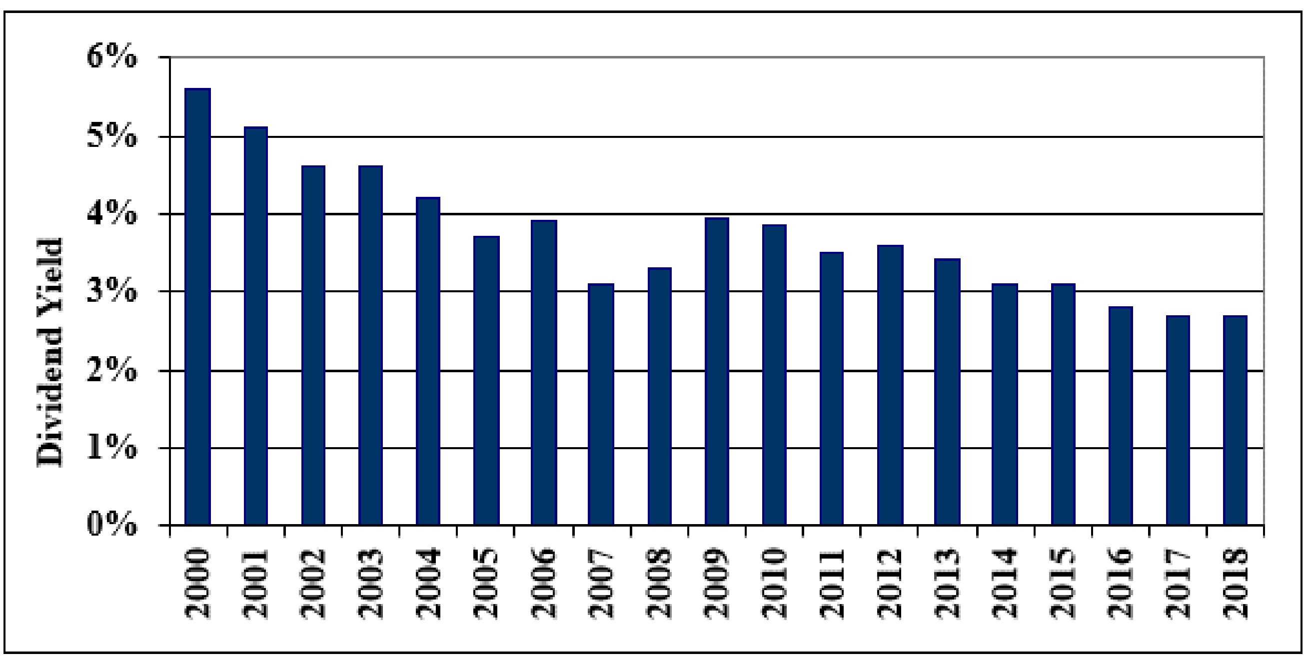
Attachment JRW-7

Panel A
Electric Utility Average Dividend Yield



Data Source: ***Value Line Investment Survey.***

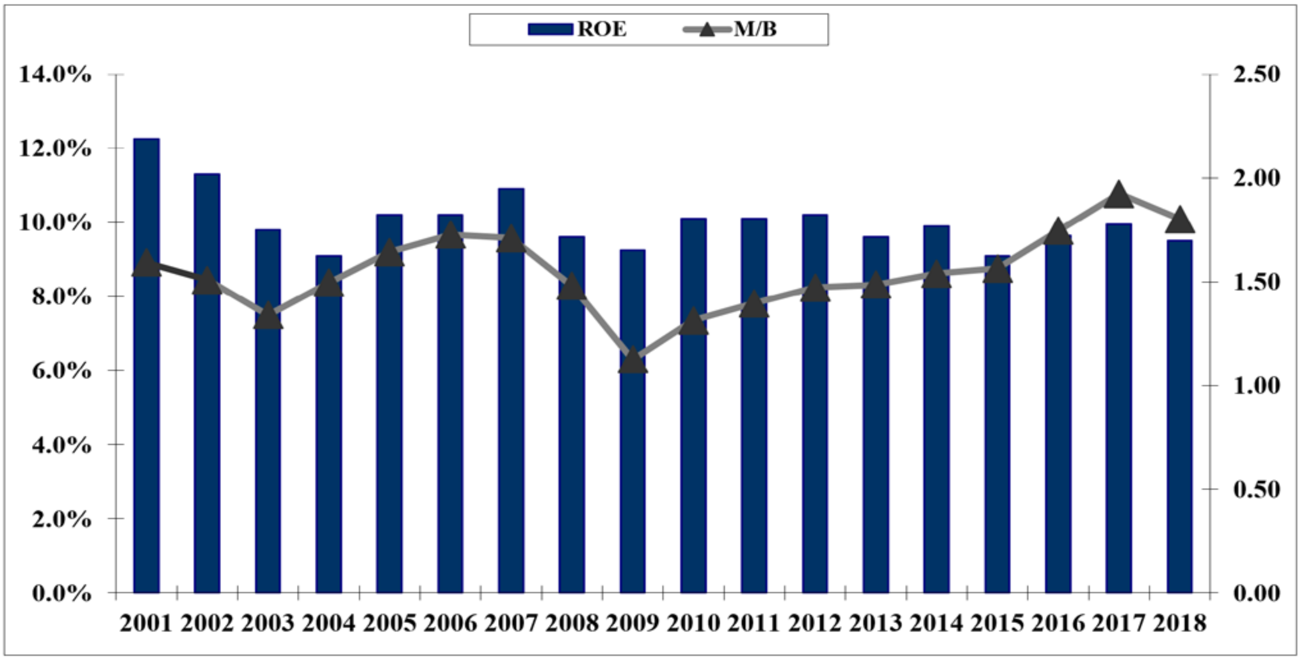
Panel B
Gas Distribution Company Average Dividend Yield



Data Source: ***Value Line Investment Survey.***

Attachment JRW-7

Electric Utility Average Return on Equity and Market-to-Book Ratios



Data Source: ***Value Line Investment Survey.***

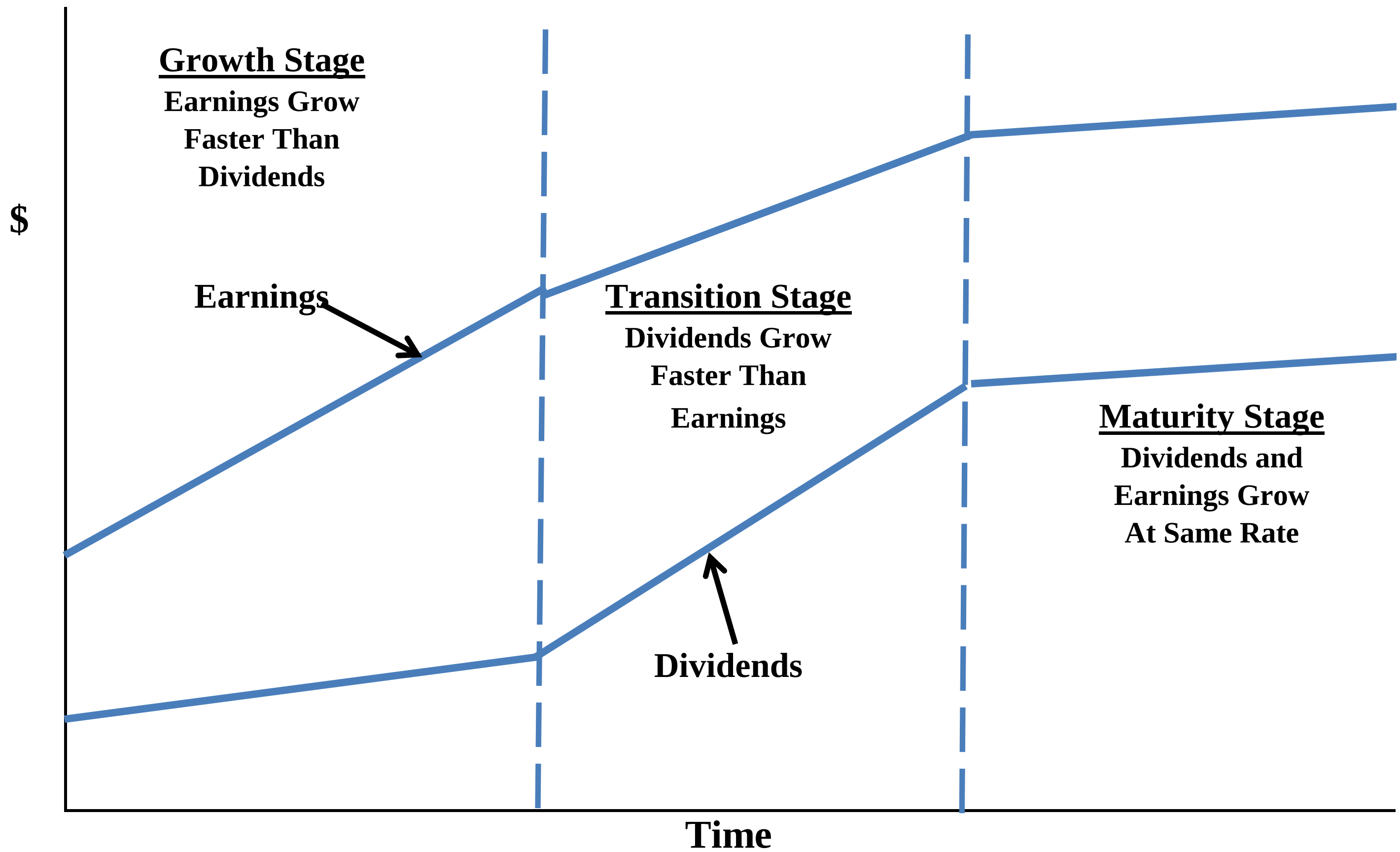
Attachment JRW-7
Industry Average Betas*
Value Line Investment Survey* Betas*
22-Jan-19

Rank	Industry	Beta	Rank	Industry	Beta	Rank	Industry	Beta
1	Petroleum (Producing)	1.71	34	Telecom. Equipment	1.15	67	Medical Services	1.01
2	Metals & Mining (Div.)	1.64	35	Internet	1.15	68	Recreation	1.01
3	Natural Gas (Div.)	1.63	36	Financial Svcs. (Div.)	1.15	69	IT Services	1.01
4	Oilfield Svcs/Equip.	1.61	37	Retail (Hardlines)	1.14	70	Med Supp Non-Invasive	0.99
5	Maritime	1.51	38	Semiconductor Equip	1.14	71	Telecom. Services	0.99
6	Steel	1.49	39	Entertainment Tech	1.13	72	Retail Store	0.98
7	Oil/Gas Distribution	1.40	40	Publishing	1.13	73	Pharmacy Services	0.98
8	Metal Fabricating	1.37	41	Computer Software	1.13	74	Information Services	0.97
9	Chemical (Specialty)	1.34	42	Paper/Forest Products	1.13	75	Investment Co.(Foreign)	0.96
10	Chemical (Diversified)	1.33	43	Precision Instrument	1.12	76	Healthcare Information	0.96
11	Pipeline MLPs	1.33	44	Public/Private Equity	1.12	77	Funeral Services	0.95
12	Heavy Truck & Equip	1.31	45	Retail Automotive	1.12	78	Med Supp Invasive	0.95
13	Chemical (Basic)	1.30	46	Power	1.12	79	Reinsurance	0.92
14	Building Materials	1.30	47	Wireless Networking	1.12	80	Environmental	0.91
15	Petroleum (Integrated)	1.30	48	Retail Building Supply	1.11	81	Cable TV	0.90
16	Homebuilding	1.28	49	Bank (Midwest)	1.11	82	Insurance (Prop/Cas.)	0.90
17	Railroad	1.27	50	Packaging & Container	1.11	83	Thrift	0.89
18	Auto Parts	1.27	51	Furn/Home Furnishings	1.11	84	Restaurant	0.88
19	Biotechnology	1.27	52	Human Resources	1.10	85	Tobacco	0.88
20	Engineering & Const	1.25	53	Drug	1.10	86	Household Products	0.86
21	Office Equip/Supplies	1.24	54	Advertising	1.10	87	Investment Co.	0.85
22	Hotel/Gaming	1.24	55	Shoe	1.09	88	Beverage	0.83
23	Automotive	1.24	56	Bank	1.09	89	Food Processing	0.82
24	Insurance (Life)	1.24	57	Newspaper	1.08	90	R.E.I.T.	0.82
25	Semiconductor	1.21	58	Toiletries/Cosmetics	1.08	91	Precious Metals	0.82
26	Machinery	1.20	59	Entertainment	1.07	92	Retail/Wholesale Food	0.80
27	Air Transport	1.20	60	Telecom. Utility	1.07	93	Water Utility	0.70
28	Electrical Equipment	1.20	61	Foreign Electronics	1.07	94	Natural Gas Utility	0.67
29	Electronics	1.20	62	Aerospace/Defense	1.05	95	Electric Util. (Central)	0.63
30	Trucking	1.19	63	Industrial Services	1.05	96	Electric Utility (West)	0.62
31	E-Commerce	1.18	64	Apparel	1.05	97	Electric Utility (East)	0.55
32	Computers/Peripherals	1.16	65	Educational Services	1.03			
33	Diversified Co.	1.16	66	Retail (Softlines)	1.02		Mean	1.10

* Industry averages for 97 industries using *Value Line*'s database of 1,710 companies.

** *Value Line* computes betas using monthly returns regressed against the New York Stock Exchange Index for five years. These betas are then adjusted as follows: *VL* Beta = [{(2/3) * Regressed Beta} + {(1/3) * (1.0)}] to account to tendency for Betas to regress toward average of 1.0. See M. Blume, "On the Assessment of Risk," *Journal of Finance*, March 1971.

Attachment JRW-8
DCF Model



Attachment JRW-9

Liberty Utilities Corp. (Granite State Electric)
Discounted Cash Flow Analysis

Electric Proxy Group

Dividend Yield*	2.90%
Adjustment Factor	1.02625
Adjusted Dividend Yield	2.98%
Growth Rate**	5.25%
Equity Cost Rate	8.25%

* Page 2 of Attachment JRW-9
** Based on data provided on pages 3, 4, 5, and 6 of Attachment JRW-9

Attachment JRW-9

Liberty Utilities Corp. (Granite State Electric)
Monthly Dividend Yields

Panel A
Electric Proxy Group

Company	Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
ALLETE, Inc. (NYSE-ALE)	$2.35	2.7%	2.7%	2.8%
Alliant Energy Corporation (NYSE-LNT)	$1.42	2.7%	2.7%	2.9%
Ameren Corporation (NYSE-AEE)	$1.98	2.5%	2.6%	2.6%
American Electric Power Co. (NYSE-AEP)	$2.80	3.0%	3.1%	3.2%
AVANGRID, Inc. (NYSE-AGR)	$1.76	3.5%	3.5%	3.5%
Avista Corp (NYSE-AVA)	$1.55	3.2%	3.3%	3.5%
CMS Energy Corporation (NYSE-CMS)	$1.53	2.4%	2.5%	2.6%
Consolidated Edison, Inc. (NYSE-ED)	$2.96	3.2%	3.3%	3.4%
Duke Energy Corporation (NYSE-DUK)	$3.78	4.0%	4.1%	4.2%
Edison International (NYSE-EIX)	$2.45	3.4%	3.4%	3.7%
Evergy (NYSE:EVRG)	$1.90	2.9%	3.0%	3.1%
Eversource Energy (NYSE-ES)	$2.14	2.5%	2.6%	2.8%
Hawaiian Electric Industries (NYSE-HE)	$1.28	2.8%	2.9%	3.0%
IDACORP, Inc. (NYSE-IDA)	$2.68	2.4%	2.5%	2.6%
MGE Energy, Inc. (NYSE-MGEE)	$1.41	1.8%	1.9%	2.0%
NextEra Energy, Inc. (NYSE-NEE)	$5.00	2.2%	2.3%	2.4%
NorthWestern Corporation (NYSE-NWE)	$2.30	3.1%	3.2%	3.2%
Otter Tail Corporation (NDQ-OTTR)	$1.40	2.6%	2.6%	2.7%
Pinnacle West Capital Corp. (NYSE-PNW)	$3.13	3.3%	3.3%	3.3%
PNM Resources, Inc. (NYSE-PNM)	$1.16	2.2%	2.3%	2.4%
Portland General Electric Company (NYSE-POR)	$1.54	2.7%	2.8%	2.8%
PPL Corporation (NYSE-PPL)	$1.65	5.2%	5.4%	5.3%
Southern Company (NYSE-SO)	$2.48	4.0%	4.2%	4.4%
Unitil Corp. (AMEX-UTL)	$2.36	2.5%	2.6%	2.8%
WEC Energy Group (NYSE-WEC)	$1.48	2.4%	2.4%	2.5%
Xcel Energy Inc. (NYSE-XEL)	$1.62	2.5%	2.6%	2.7%
Mean		2.9%	3.0%	3.1%
Median		2.7%	2.7%	2.9%

Data Source: http://quote.yahoo.com, November 6, 2019.

Attachment JRW-9

Liberty Utilities Corp. (Granite State Electric)
DCF Equity Cost Growth Rate Measures
***Value Line* Historic Growth Rates**

Panel A
Electric Proxy Group

	Value Line Historic Growth					
Company	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
ALLETE, Inc. (NYSE-ALE)	1.0	3.0	5.5	4.0	3.0	5.5
Alliant Energy Corporation (NYSE-LNT)	4.5	7.5	4.0	4.5	7.0	4.5
Ameren Corporation (NYSE-AEE)	0.5	-3.5	-0.5	4.5	2.5	0.5
American Electric Power Co. (NYSE-AEP)	3.0	4.5	4.0	5.0	5.0	3.5
AVANGRID, Inc. (NYSE-AGR)						
Avista Corp (NYSE-AVA)	5.5	8.5	4.0	5.0	4.5	4.5
CMS Energy Corporation (NYSE-CMS)	10.0	21.5	4.5	7.0	7.0	5.5
Consolidated Edison, Inc. (NYSE-ED)	2.5	2.0	4.0	2.0	2.5	4.0
Duke Energy Corporation (NYSE-DUK)	2.5	7.0	1.0	0.5	3.0	1.5
Edison International (NYSE-EIX)	-3.5	6.5	3.0	-9.0	11.0	3.0
Evergy (NYSE-EVRG)						
Eversource Energy (NYSE-ES)	8.0	9.5	6.5	7.0	8.0	5.0
Hawaiian Electric Industries (NYSE-HE)	5.0		3.0	4.0		3.5
IDACORP, Inc. (NYSE-IDA)	7.0	6.5	5.5	4.0	10.0	5.0
MGE Energy, Inc. (NYSE-MGEE)	4.5	3.0	5.5	3.5	4.0	6.0
Nextera Energy, Inc. (NYSE-NEE)	6.0	9.0	8.5	6.0	10.5	9.5
NorthWestern Corporation (NYSE-NWE)	8.5	5.0	5.5	7.0	7.0	8.0
Otter Tail Corporation (NDQ-OTTR)	2.0	1.0		14.0	1.5	3.5
Pinnacle West Capital Corp. (NYSE-PNW)	4.5	2.5	2.5	5.0	3.0	4.5
PNM Resources, Inc. (NYSE-PNM)	7.0	2.5		6.0	11.0	1.0
Portland General Electric Company (NYSE-POR)	3.5	4.5	2.5	4.0	4.5	3.5
PPL Corporation (NYSE-PPL)		2.5	1.0	-0.5	2.0	-4.0
Southern Company (NYSE-SO)	3.0	3.5	4.0	2.5	3.5	3.0
Unitil Corp. (AMEX-UTL)				6.5	1.0	4.0
WEC Energy Group (NYSE-WEC)	8.5	15.5	8.5	6.0	11.0	10.5
Xcel Energy Inc. (NYSE-XEL)	5.5	4.5	4.5	5.0	6.0	4.5
Mean	4.5	5.8	4.1	4.3	5.6	4.2
Median	4.5	4.5	4.0	4.8	4.5	4.3
Data Source: *Value Line Investment Survey.*	Average of Median Figures =			4.4		

Attachment JRW-9

Liberty Utilities Corp. (Granite State Electric)
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Panel A
Electric Proxy Group

	Value Line			*Value Line*		
	Projected Growth			Sustainable Growth		
Company	Est'd. '16-'18 to '22-'24			Return on	Retention	Internal
	Earnings	Dividends	Book Value	Equity	Rate	Growth
ALLETE, Inc. (NYSE-ALE)	6.0	5.0	3.5	9.5%	37.0%	3.5%
Alliant Energy Corporation (NYSE-LNT)	6.5	5.5	7.5	10.0%	38.0%	3.8%
Ameren Corporation (NYSE-AEE)	6.5	6.0	5.0	10.5%	39.0%	4.1%
American Electric Power Co. (NYSE-AEP)	4.0	5.5	4.0	10.5%	29.0%	3.0%
AVANGRID, Inc. (NYSE-AGR)	8.5	3.0	1.0	6.6%	30.0%	2.0%
Avista Corp (NYSE-AVA)	3.5	4.0	3.5	8.0%	29.0%	2.3%
CMS Energy Corporation (NYSE-CMS)	7.0	7.0	7.5	14.0%	41.0%	5.7%
Consolidated Edison, Inc. (NYSE-ED)	3.0	3.5	3.5	8.5%	33.0%	2.8%
Duke Energy Corporation (NYSE-DUK)	6.0	2.5	2.5	8.5%	30.0%	2.6%
Edison International (NYSE-EIX)	NMF	3.5	5.5	11.0%	47.0%	5.2%
Evergy (NYSE-EVRG)	NMF	NMF	NMF	8.5%	31.0%	2.6%
Eversource Energy (NYSE-ES)	5.5	5.5	4.5	9.0%	38.0%	3.4%
Hawaiian Electric Industries (NYSE-HE)	2.5	3.0	4.0	9.5%	34.0%	3.2%
IDACORP, Inc. (NYSE-IDA)	3.5	7.0	4.0	9.5%	37.0%	3.5%
MGE Energy, Inc. (NYSE-MGEE)	6.0	5.0	5.5	10.5%	48.0%	5.0%
Nextera Energy, Inc. (NYSE-NEE)	10.5	10.0	7.5	12.5%	40.0%	5.0%
NorthWestern Corporation (NYSE-NWE)	3.0	4.5	3.5	9.0%	34.0%	3.1%
Otter Tail Corporation (NDQ-OTTR)	5.0	4.0	4.5	11.0%	34.0%	3.7%
Pinnacle West Capital Corp. (NYSE-PNW)	5.0	6.0	3.5	10.5%	34.0%	3.6%
PNM Resources, Inc. (NYSE-PNM)	7.0	7.0	4.0	9.5%	42.0%	4.0%
Portland General Electric Company (NYSE-POR)	4.5	6.5	3.0	9.0%	34.0%	3.1%
PPL Corporation (NYSE-PPL)	1.5	2.0	5.5	13.0%	36.0%	4.7%
Southern Company (NYSE-SO)	3.5	3.0	3.5	12.5%	27.0%	3.4%
Unitil Corp. (AMEX-UTL)	4.4			9.4%	34.0%	3.2%
WEC Energy Group (NYSE-WEC)	6.0	6.0	3.5	12.0%	33.0%	4.0%
Xcel Energy Inc. (NYSE-XEL)	5.5	6.0	5.0	11.0%	38.0%	4.2%
Mean	5.2	5.0	4.4	10.1%	35.7%	3.6%
Median	5.3	5.3	4.0	9.8%	34.0%	3.5%
Average of Median Figures =		4.8			Median =	3.5%

*** 'Est'd. '16-'17 to '22-'24' is the estimated growth rate from the base period 2016 to 2018 until the future period 2022 to 2024.**

Data Source: *Value Line Investment Survey*.

Attachment JRW-9

Liberty Utilities Corp. (Granite State Electric)
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel A
Electric Proxy Group

Company	Yahoo	Zacks	Mean
ALLETE, Inc. (NYSE-ALE)	7.0%	7.2%	7.1%
Alliant Energy Corporation (NYSE-LNT)	5.2%	5.6%	5.4%
Ameren Corporation (NYSE-AEE)	4.7%	6.4%	5.6%
American Electric Power Co. (NYSE-AEP)	5.9%	5.7%	5.8%
AVANGRID, Inc. (NYSE-AGR)	6.2%	7.4%	6.8%
Avista Corp (NYSE-AVA)	3.3%	3.3%	3.3%
CMS Energy Corporation (NYSE-CMS)	7.5%	6.4%	7.0%
Consolidated Edison, Inc. (NYSE-ED)	2.8%	2.0%	2.4%
Duke Energy Corporation (NYSE-DUK)	4.1%	4.9%	4.5%
Edison International (NYSE-EIX)	3.9%	5.3%	4.6%
Evergy (NYSE:EVRG)	6.7%	6.6%	6.6%
Eversource Energy (NYSE-ES)	5.6%	5.6%	5.6%
Hawaiian Electric Industries (NYSE-HE)	3.4%	4.2%	3.8%
IDACORP, Inc. (NYSE-IDA)	2.5%	3.9%	3.2%
MGE Energy, Inc. (NYSE-MGEE)	4.0%	N/A	4.0%
NextEra Energy, Inc. (NYSE-NEE)	8.0%	8.0%	8.0%
NorthWestern Corporation (NYSE-NWE)	3.2%	2.7%	2.9%
Otter Tail Corporation (NDQ-OTTR)	9.0%	7.0%	8.0%
Pinnacle West Capital Corp. (NYSE-PNW)	5.1%	6.1%	5.6%
PNM Resources, Inc. (NYSE-PNM)	6.4%	5.6%	6.0%
Portland General Electric Company (NYSE-POR)	4.1%	4.5%	4.3%
PPL Corporation (NYSE-PPL)	0.5%	N/A	0.5%
Southern Company (NYSE-SO)	1.6%	4.5%	3.0%
Unitil Corp. (AMEX-UTL)	4.2%	4.4%	4.3%
WEC Energy Group (NYSE-WEC)	6.1%	6.2%	6.1%
Xcel Energy Inc. (NYSE-XEL)	5.2%	5.4%	5.3%
Mean	4.8%	5.4%	5.0%
Median	4.9%	5.6%	5.3%

Data Sources: www.zacks.com, http://quote.yahoo.com, November 6, 2019.

Attachment JRW-9

Liberty Utilities Corp. (Granite State Electric)
DCF Growth Rate Indicators

Electric Proxy Group

Growth Rate Indicator	Electric Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	4.4%
Projected *Value Line* Growth in EPS, DPS, and BVPS	4.8%
Sustainable Growth ROE * Retention Rate	3.5%
Projected EPS Growth from Yahoo, Zacks, and Reuters - Mean/Median	5.0%/5.3%

Attachment JRW-10

Liberty Utilities Corp. (Granite State Electric)
Capital Asset Pricing Model

Electric Proxy Group

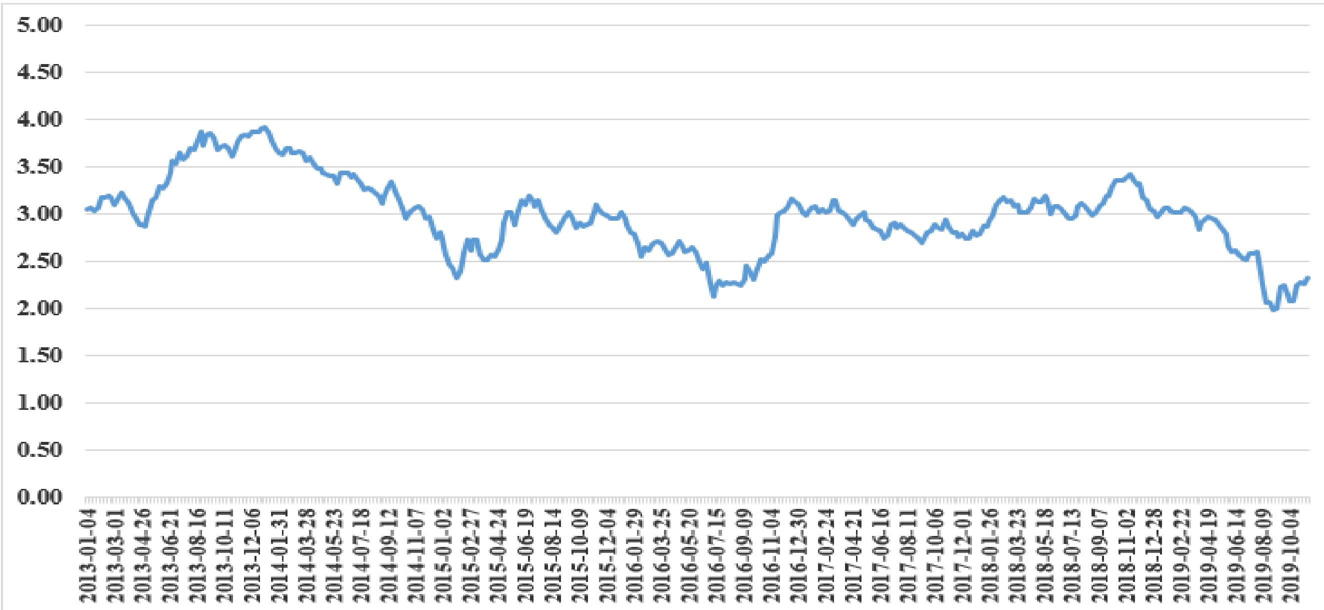
Risk-Free Interest Rate	**3.75%**
Beta*	**0.55**
Ex Ante Equity Risk Premium**	**5.75%**
CAPM Cost of Equity	**6.9%**

* See page 3 of Attachment JRW-10

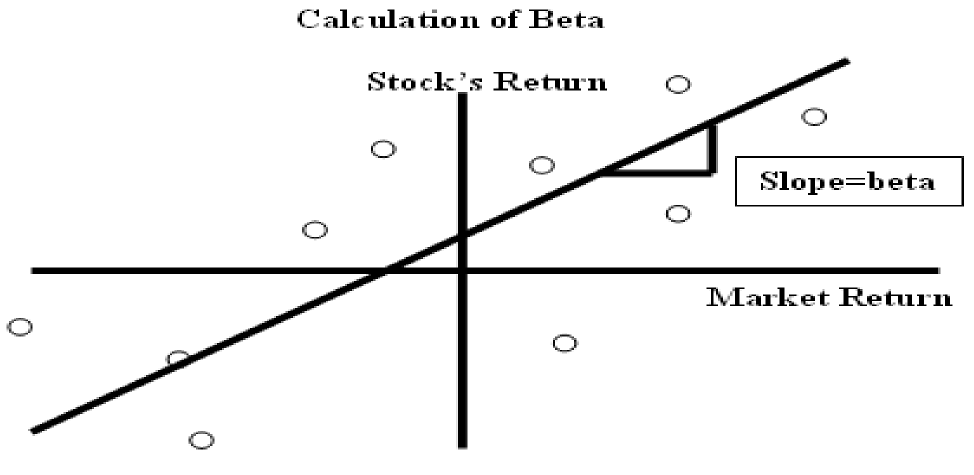
** See pages 5 and 6 of Attachment JRW-10

Attachment JRW-10

Thirty-Year U.S. Treasury Yields
2013-2019



Source: Federal Reserve Bank of St. Louis, FRED Database.



Electric Proxy Group

Company	Beta
ALLETE, Inc. (NYSE-ALE)	0.65
Alliant Energy Corporation (NYSE-LNT)	0.60
Ameren Corporation (NYSE-AEE)	0.55
American Electric Power Co. (NYSE-AEP)	0.55
AVANGRID, Inc. (NYSE-AGR)	0.40
Avista Corp (NYSE-AVA)	0.60
CMS Energy Corporation (NYSE-CMS)	0.55
Consolidated Edison, Inc. (NYSE-ED)	0.45
Duke Energy Corporation (NYSE-DUK)	0.50
Edison International (NYSE-EIX)	0.60
Evergy (NYSE:EVRG)	NMF
Eversource Energy (NYSE-ES)	0.55
Hawaiian Electric Industries (NYSE-HE)	0.55
IDACORP, Inc. (NYSE-IDA)	0.55
MGE Energy, Inc. (NYSE-MGEE)	0.55
NextEra Energy, Inc. (NYSE-NEE)	0.55
NorthWestern Corporation (NYSE-NWE)	0.60
Otter Tail Corporation (NDQ-OTTR)	0.65
Pinnacle West Capital Corp. (NYSE-PNW)	0.55
PNM Resources, Inc. (NYSE-PNM)	0.60
Portland General Electric Company (NYSE-POR)	0.60
PPL Corporation (NYSE-PPL)	0.70
Southern Company (NYSE-SO)	0.50
Unitil Corp. (AMEX-UTL)	0.50
WEC Energy Group (NYSE-WEC)	0.50
Xcel Energy Inc. (NYSE-XEL)	0.50
Mean	0.56
Median	0.55

Data Source: *Value Line Investment Survey*, 2019.

Attachment JRW-10
Risk Premium Approaches

	Historical Ex Post Returns	**Surveys**	**Expected Return Models and Market Data**
Means of Assessing The Market Risk Premium	Historical Average Stock Minus Bond Returns	Surveys of CFOs, Financial Forecasters, Companies, Analysts on Expected Returns and Market Risk Premiums	Use Market Prices and Market Fundamentals (such as Growth Rates) to Compute Expected Returns and Market Risk Premiums
Problems/Debated Issues	Time Variation in Required Returns, Measurement and Time Period Issues, and Biases such as Market and Company Survivorship Bias	Questions Regarding Survey Histories, Responses, and Representativeness Surveys may be Subject to Biases, such as Extrapolation	Assumptions Regarding Expectations, Especially Growth

Source: Adapted from Antti Ilmanen, Expected Returns on Stocks and Bonds," *Journal of Portfolio Management* , (Winter 2003).

Attachment JRW-10

Capital Asset Pricing Model
Market Risk Premium

Summary of Market Risk Premium Studies

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2019	1928-2018	Historical Stock Returns - Bond Returns	Arithmetic				6.26%	
					Geometric				4.66%	
	Dimson, Marsh, Staunton Credit Suisse Repo	2019	1900-2018	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
					Geometric					
	Bate	2008	1900-2007	Historical Stock Returns - Bond Returns	Geometric				4.50%	
	Shiller	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				7.00%	
					Geometric				5.50%	
	Siegel	2005	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				6.10%	
					Geometric				4.60%	
	Dimson, Marsh, and Staunton	2006	1900-2005	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
	Goyal & Welch	2006	1872-2004	Historical Stock Returns - Bond Returns					4.77%	
	Median									5.50%
Ex Ante Models (Puzzle Research)										
	Claus Thomas	2001	1985-1998	Abnormal Earnings Model					3.00%	
	Arnott and Bernstein	2002	1810-2001	Fundamentals - Div Yld + Growth					2.40%	
	Constantinides	2002	1872-2000	Historical Returns & Fundamentals - P/D & P/E					6.90%	
	Cornell	1999	1926-1997	Historical Returns & Fundamental GDP/Earnings		3.50%	5.50%	4.50%	4.50%	
	Easton, Taylor, et al	2002	1981-1998	Residual Income Model					5.30%	
	Fama French	2002	1951-2000	Fundamental DCF with EPS and DPS Growth		2.55%	4.32%		3.44%	
	Harris & Marston	2001	1982-1998	Fundamental DCF with Analysts' EPS Growth					7.14%	
	McKinsey	2002	1962-2002	Fundamental (P/E, D/P, & Earnings Growth)		3.50%	4.00%		3.75%	
	Siegel	2005	1802-2001	Historical Earnings Yield	Geometric				2.50%	
	Grabowski	2006	1926-2005	Historical and Projected		3.50%	6.00%	4.75%	4.75%	
	Maheu & McCurdy	2006	1885-2003	Historical Excess Returns, Structural Breaks,		4.02%	5.10%	4.56%	4.56%	
	Bostock	2004	1960-2002	Bond Yields, Credit Risk, and Income Volatility		3.90%	1.30%	2.60%	2.60%	
	Bakshi & Chen	2005	1982-1998	Fundamentals - Interest Rates					7.31%	
	Donaldson, Kamstra, & Kramer	2006	1952-2004	Fundamental, Dividend yld., Returns,, & Volatility		3.00%	4.00%	3.50%	3.50%	
	Campbell	2008	1982-2007	Historical & Projections (D/P & Earnings Growth)		4.10%	5.40%		4.75%	
	Best & Byrne	2001	Projection	Fundamentals - Div Yld + Growth					2.00%	
	Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
	DeLong & Magin	2008	Projection	Earnings Yield - TIPS					3.22%	
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Duff & Phelps	2019	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.50%	
	Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
	American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
	Market Risk Premia	2019	Projection	Fundamental Economic and Market Factors					4.29%	
	KPMG	2019	Projection	Fundamental Economic and Market Factors					5.75%	
	Damodaran	2019	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					5.09%	
	Social Security									
	Office of Chief Actuary		1900-1995							
	John Campbell	2001	1860-2000	Historical & Projections (D/P & Earnings Growth)	Arithmetic	3.00%	4.00%	3.50%	3.50%	
			Projected for 75 Years		Geometric	1.50%	2.50%	2.00%	2.00%	
	Peter Diamond	2001	Projected for 75 Years	Fundamentals (D/P, GDP Growth)		3.00%	4.80%	3.90%	3.90%	
	John Shoven	2001	Projected for 75 Years	Fundamentals (D/P, P/E, GDP Growth)		3.00%	3.50%	3.25%	3.25%	
	Median									4.29%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2019	10-Year Projection	About 20 Financial Forecastsers					1.85%	
	Duke - CFO Magazine Survey	2019	10-Year Projection	Approximately 200 CFOs					4.62%	
	Welch - Academics	2008	30-Year Projection	Random Academics		5.00%	5.74%	5.37%	5.37%	
	Fernandez - Academics, Analysts, and Compan	2019	Long-Term	Survey of Academics, Analysts, and Companies					5.60%	
	Median									5.37%
Building Block										
	Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
					Geometric			4.20%		
	Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection)	Geometric				4.00%	
	Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
	Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**4.80%**
Median										**4.83%**

Attachment JRW-10

Capital Asset Pricing Model
Market Risk Premium

Summary of 2010-19 Market Risk Premium Studies

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Average
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2019	1928-2018	Historical Stock Returns - Bond Returns	Arithmetic				6.26%	
					Geometric				4.66%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2019	1900-2018	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
					Geometric					
	Median									5.36%
Ex Ante Models (Puzzle Research)										
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Duff & Phelps	2019	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.50%	
	Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
	American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
	Market Risk Premia	2019	Projection	Fundamental Economic and Market Factors					4.29%	
	KPMG	2019	Projection	Fundamental Economic and Market Factors					5.75%	
	Damodaran	2019	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					5.09%	
	Median									5.50%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2019	10-Year Projection	About 20 Financial Forecastsers					1.85%	
	Duke - CFO Magazine Survey	2019	10-Year Projection	Approximately 200 CFOs					4.62%	
	Fernandez - Academics, Analysts, and Companies	2019	Long-Term	Survey of Academics, Analysts, and Companies					5.60%	
	Median									5.11%
Building Block										
	Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
					Geometric			4.20%		
	Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection)	Geometric				4.00%	
	Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
	Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**5.01%**
Median										**5.24%**

Duff & Phelps Risk-Free Interest Rates and Equity Risk Premium Estimates

Duff & Phelps Recommended U.S. Equity Risk Premium (ERP) and Corresponding Risk-free Rates (R_f); January 2008–Present

For additional information, please visit www.duffandphelps.com/CostofCapital

Date	Risk-free Rate (R_f)	R_f (%)	Duff & Phelps Recommended ERP (%)	What Changed
Current Guidance: December 31, 2018 – UNTIL FURTHER NOTICE	**Normalized 20-year U.S. Treasury yield**	**3.50**	**5.50**	**ERP**
September 5, 2017 – December 30, 2018	Normalized 20-year U.S. Treasury yield	3.50	5.00	ERP
November 15, 2016 – September 4, 2017	Normalized 20-year U.S. Treasury yield	3.50	5.50	R_f
January 31, 2016 – November 14, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.50	ERP
December 31, 2015	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2014	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.00	
February 28, 2013 – January 30, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.00	ERP
December 31, 2012	Normalized 20-year U.S. Treasury yield	4.00	5.50	
January 15, 2012 – February 27, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.50	ERP
December 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	6.00	
September 30, 2011 – January 14, 2012	Normalized 20-year U.S. Treasury yield	4.00	6.00	ERP
July 1 2011 – September 29, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
June 1, 2011 – June 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	R_f
May 1, 2011 – May 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
December 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2010 – April 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	R_f
June 1, 2010 – November 30, 2010	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
December 31, 2009	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2009 – May 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	ERP
June 1, 2009 – November 30, 2009	Spot 20-year U.S. Treasury yield	Spot	6.00	R_f
December 31, 2008	Normalized 20-year U.S. Treasury yield	4.50	6.00	
November 1, 2008 – May 31, 2009	Normalized 20-year U.S. Treasury yield	4.50	6.00	R_f
October 27, 2008 – October 31, 2008	Spot 20-year U.S. Treasury yield	Spot	6.00	ERP
January 1, 2008 – October 26, 2008	Spot 20-year U.S. Treasury yield	Spot	5.00	Initialized

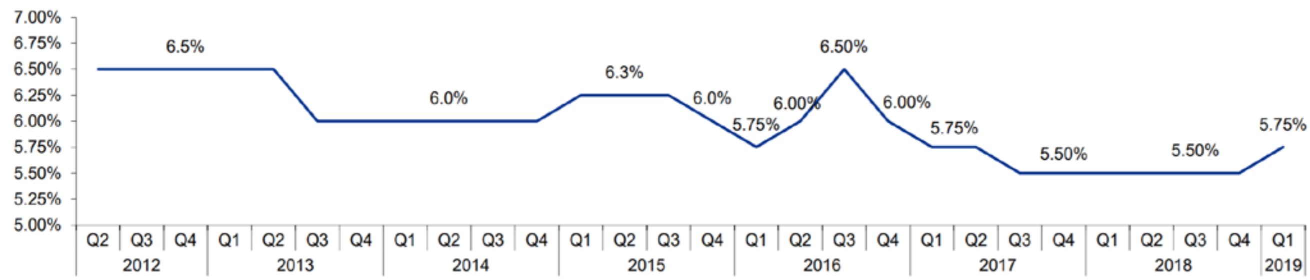
"Normalized" in this context means that in months where the risk-free rate is deemed to be abnormally low, a proxy for a longer-term sustainable risk-free rate is used.

Source: https://www.duffandphelps.com/-/media/assets/pdfs/publications/valuation/coc/erp-risk-free-rates-jan-2008-present.ashx?la=en

Panel A
KPMG Market Risk Premium Recommendation

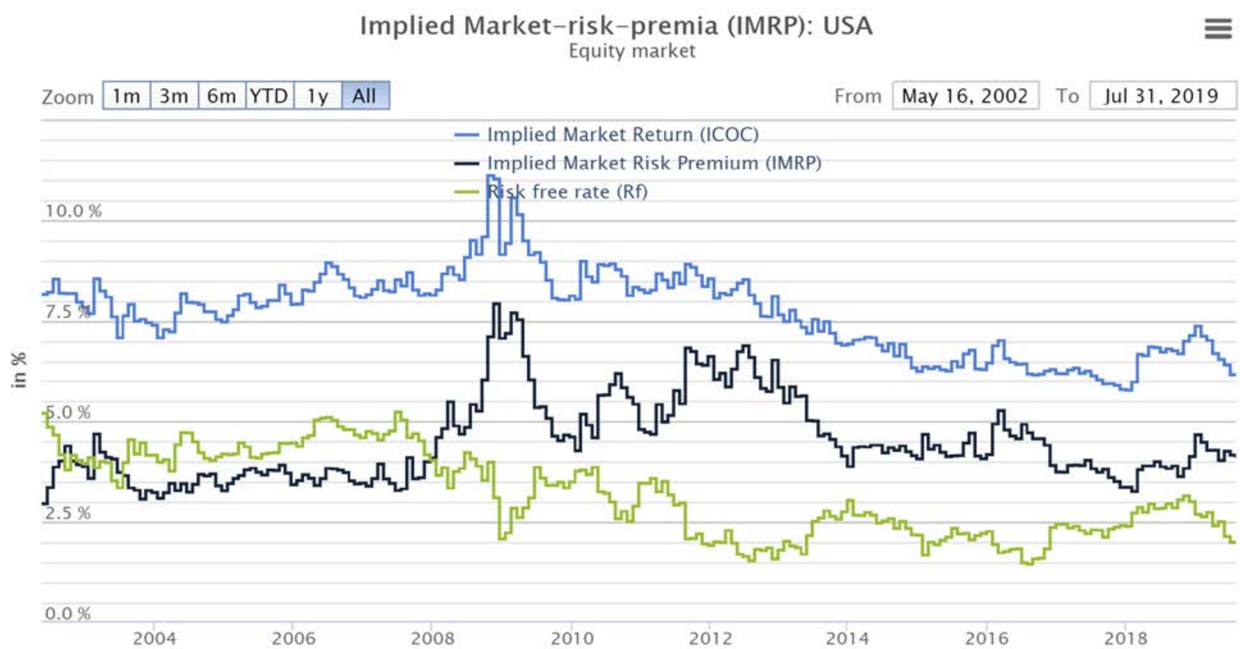
Historic MRP estimates

Please find an overview of the historic MRP estimates by KPMG in the graph below.



Source: https://assets.kpmg/content/dam/kpmg/nl/pdf/2019/advisory/equity-market-risk-premium-research-summary-31032019.pdf

Panel B
Market-Risk-Premia.com Implied Market Risk Premium
31-Jul-19



Market
Return
6.12%
Risk
Premium
4.10%
Risk-Free
Rate
2.02%

Source: http://www.market-risk-premia.com/us.html

Liberty Utilities Corp. (Granite State Electric) Rate of Return Recommendation

Capital Source	Capitalization Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.00%	5.97%	2.69%
Common Equity	55.00%	10.00%	5.50%
Total Capitalization	100.00%		8.19%

Constant Growth DCF - Earnings Growth			
Mean	Low ROE	Mean ROE	High ROE
30-Day Average	8.03%	8.82%	9.75%
90-Day Average	8.10%	8.89%	9.83%
180-Day Average	8.15%	8.93%	9.87%
Average	8.09%	8.88%	9.82%

Multi-Stage Growth DCF			
30-Day Average	8.84%	9.02%	9.24%
90-Day Average	8.91%	9.09%	9.32%
180-Day Average	8.96%	9.14%	9.37%
Average	8.91%	9.08%	9.31%

CAPM	
	ROE
CAPM	10.66%

Flotation Cost Adjustment	0.10%

Zone of Reasonableness			
Method	Low ROE	Mean ROE	High ROE
Constant Growth DCF	8.09%	8.88%	9.82%
Multi-Stage DCF	8.91%	9.08%	9.31%
CAPM	10.66%	10.66%	10.66%
Mean	9.22%	9.54%	9.93%
With Flotation Costs	9.32%	9.64%	10.03%

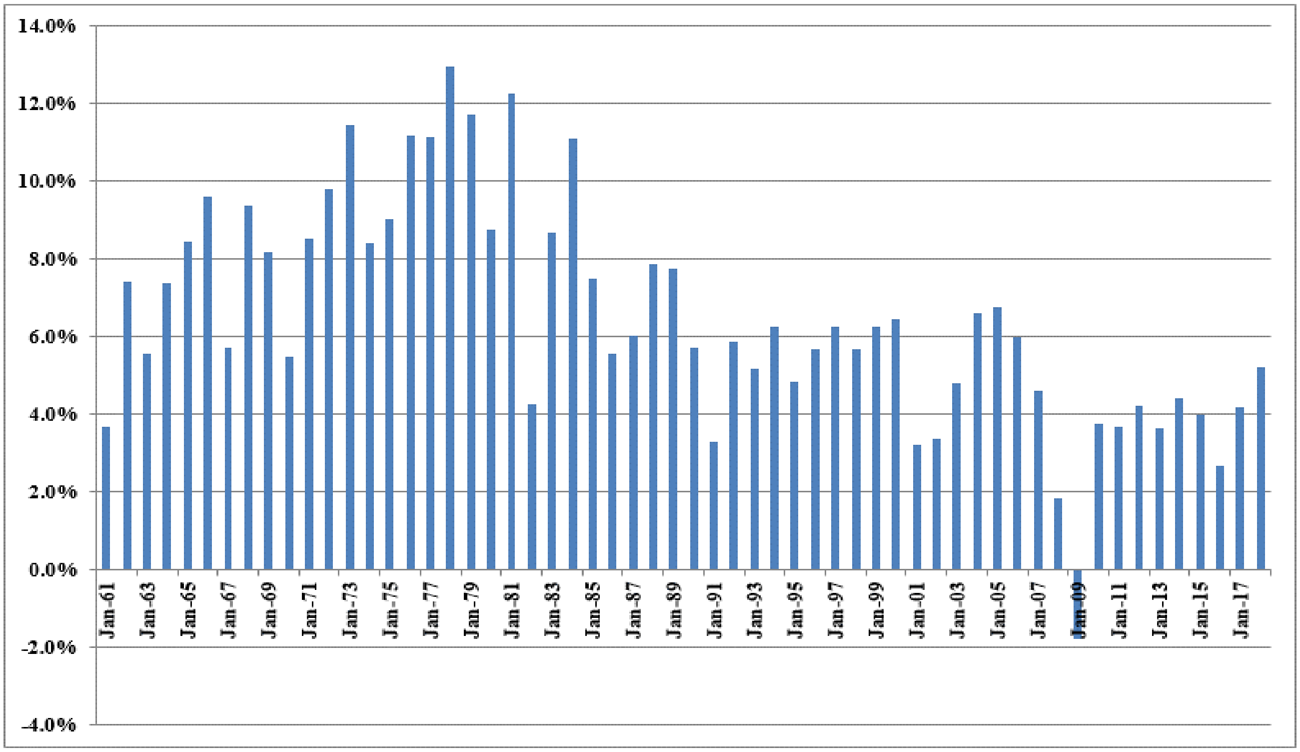
Growth Rates
GDP, S&P 500 Price, EPS, and DPS

		GDP	S&P 500	S&P 500 EPS	S&P 500 DPS	
	1960	542.38	58.11	3.10	1.98	
1	1961	562.21	71.55	3.37	2.04	
2	1962	603.92	63.10	3.67	2.15	
3	1963	637.45	75.02	4.13	2.35	
4	1964	684.46	84.75	4.76	2.58	
5	1965	742.29	92.43	5.30	2.83	
6	1966	813.41	80.33	5.41	2.88	
7	1967	859.96	96.47	5.46	2.98	
8	1968	940.65	103.86	5.72	3.04	
9	1969	1017.62	92.06	6.10	3.24	
10	1970	1073.30	92.15	5.51	3.19	
11	1971	1164.85	102.09	5.57	3.16	
12	1972	1279.11	118.05	6.17	3.19	
13	1973	1425.38	97.55	7.96	3.61	
14	1974	1545.24	68.56	9.35	3.72	
15	1975	1684.90	90.19	7.71	3.73	
16	1976	1873.41	107.46	9.75	4.22	
17	1977	2081.83	95.10	10.87	4.86	
18	1978	2351.60	96.11	11.64	5.18	
19	1979	2627.33	107.94	14.55	5.97	
20	1980	2857.31	135.76	14.99	6.44	
21	1981	3207.04	122.55	15.18	6.83	
22	1982	3343.79	140.64	13.82	6.93	
23	1983	3634.04	164.93	13.29	7.12	
24	1984	4037.61	167.24	16.84	7.83	
25	1985	4338.98	211.28	15.68	8.20	
26	1986	4579.63	242.17	14.43	8.19	
27	1987	4855.22	247.08	16.04	9.17	
28	1988	5236.44	277.72	24.12	10.22	
29	1989	5641.58	353.40	24.32	11.73	
30	1990	5963.14	330.22	22.65	12.35	
31	1991	6158.13	417.09	19.30	12.97	
32	1992	6520.33	435.71	20.87	12.64	
33	1993	6858.56	466.45	26.90	12.69	
34	1994	7287.24	459.27	31.75	13.36	
35	1995	7639.75	615.93	37.70	14.17	
36	1996	8073.12	740.74	40.63	14.89	
37	1997	8577.55	970.43	44.09	15.52	
38	1998	9062.82	1229.23	44.27	16.20	
39	1999	9630.66	1469.25	51.68	16.71	
40	2000	10252.35	1320.28	56.13	16.27	
41	2001	10581.82	1148.09	38.85	15.74	
42	2002	10936.42	879.82	46.04	16.08	
43	2003	11458.25	1111.91	54.69	17.88	
44	2004	12213.73	1211.92	67.68	19.41	
45	2005	13036.64	1248.29	76.45	22.38	
46	2006	13814.61	1418.30	87.72	25.05	
47	2007	14451.86	1468.36	82.54	27.73	
48	2008	14712.85	903.25	65.39	28.05	
49	2009	14448.93	1115.10	59.65	22.31	
50	2010	14992.05	1257.64	83.66	23.12	
51	2011	15542.58	1257.60	97.05	26.02	
52	2012	16197.01	1426.19	102.47	30.44	
53	2013	16784.85	1848.36	107.45	36.28	
54	2014	17521.75	2058.90	113.01	39.44	
55	2015	18219.30	2043.94	106.32	43.16	
56	2016	18707.19	2238.83	108.86	45.03	
57	2017	19485.39	2673.61	124.94	49.73	
58	2018	20500.64	2506.85	148.34	53.61	**Average**
	Growth Rates	**6.46**	**6.71**	**6.89**	**5.85**	**6.48**

A -http://research.stlouisfed.org/fred2/series/GDPA/downloaddata

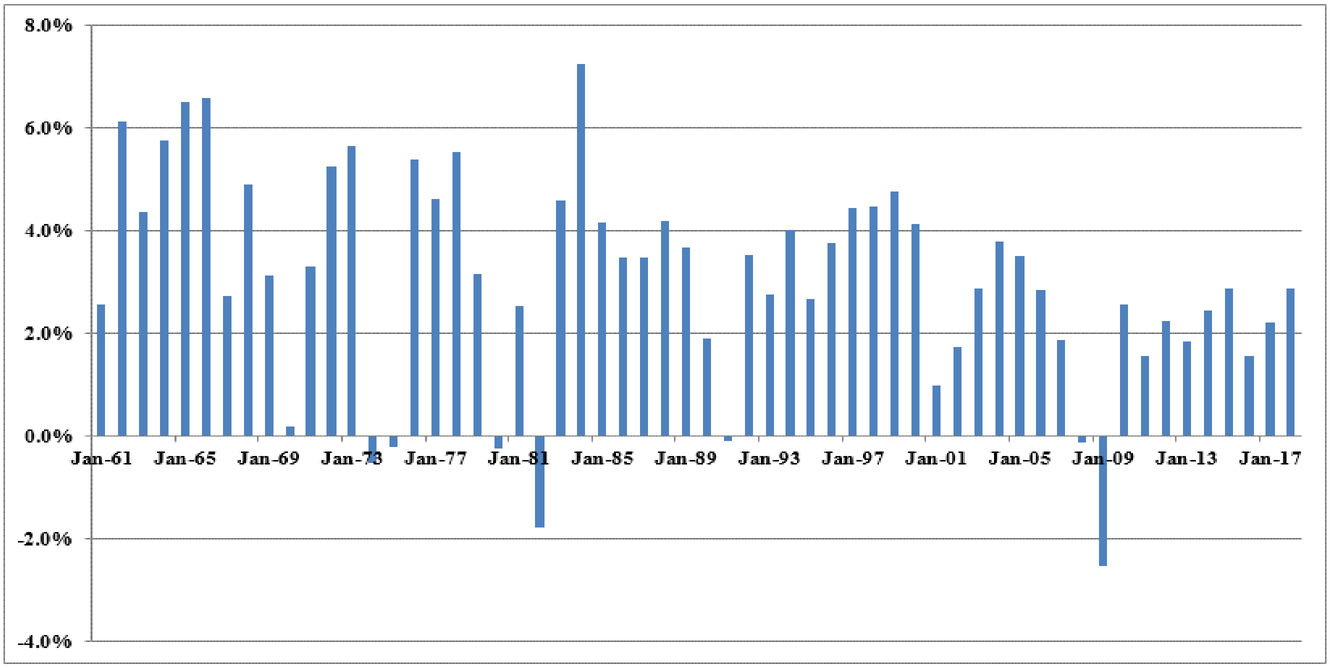
, EPS and DPS - http://pages.stern.nyu.edu/~adamodar/

Nominal GDP Growth Rates
Annual Growth Rates - 1961-2018



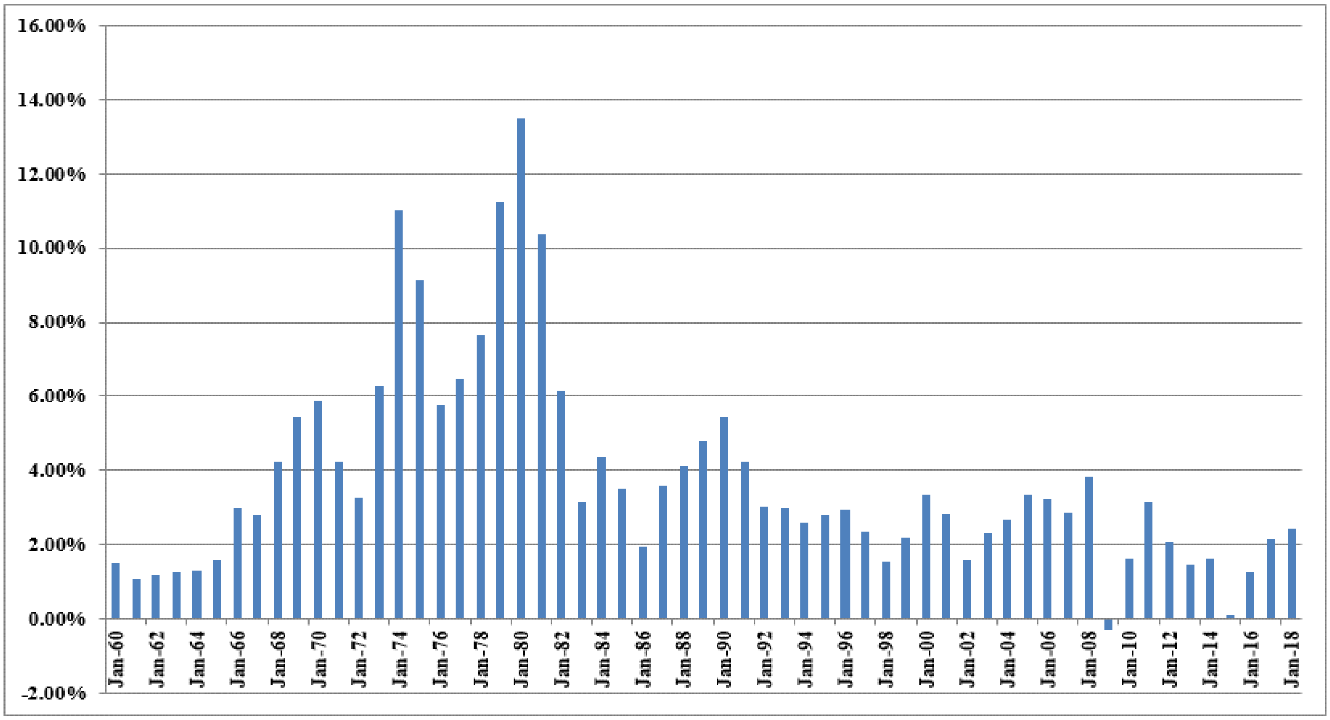
Data Sources: GDPA -https://fred.stlouisfed.org/series/GDPA

Annual Real GDP Growth Rates
1961-2018



Data Sources: GDPC1 - https://fred.stlouisfed.org/series/GDPCA

Annual Inflation Rates
1961-2018



Data Sources: CPIAUCSL - https://fred.stlouisfed.org/series/CPIAUCSL

Panel A
Historic GDP Growth Rates

10-Year Average		**3.37%**
20-Year Average		**4.17%**
30-Year Average		**4.65%**
40-Year Average		**5.56%**
50-Year Average		**6.36%**

Calculated using GDP data on Page 1 of Attachment JRW-90

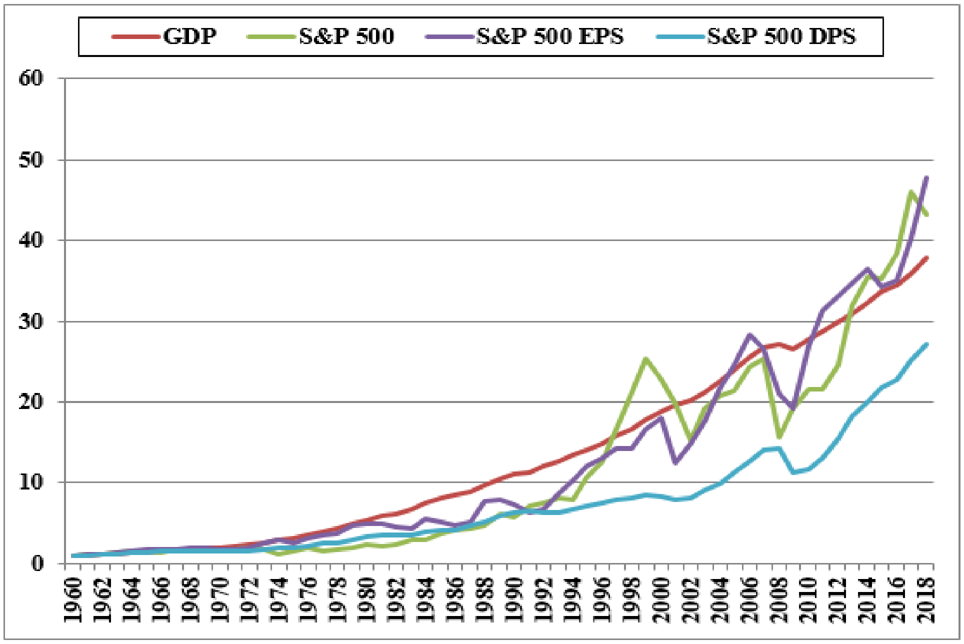
Panel B
Projected GDP Growth Rates

	Time Frame	**Projected Nominal GDP Growth Rate**
Congressional Budget Office	**2019-2049**	**4.40%**
Survey of Financial Forecasters	**Ten Year**	**4.25%**
Social Security Administration	**2018-2095**	**4.35%**
Energy Information Administration	**2018-2050**	**4.20%**

Sources:

Congressional Budget Office,The *2019 Long-Term Budget Outlook* , June 15, 2019.
https://www.cbo.gov/system/files/2019-06/55331-LTBO-2.pdf
U.S. Energy Information Administration, *Annual Energy Outlook 2019* , Table: Macroeconomic Indicators,
https://www.eia.gov/outlooks/aeo/pdf/appa.pdf
Social Security Administration, 2019 Annual Report of the Board of Trustees of the Old-Age,
Survivors, and Disability Insurance (OASDI) Program, Table VI.G4, p. 211(June 15, 2019),
https://www.ssa.gov/oact/TR/2019/VI_G2_OASDHI_GDP.html#200732
in projected GDP from $21,485 trillion in 2019 to $546,331 trillion in 2095.
https://www.philadelphiafed.org/-/media/research-and-data/real-time-center/survey-of-professional-forecasters/2019/s

Long-Term Growth of GDP, S&P 500, S&P 500 EPS, and S&P 500 DPS



	GDP	S&P 500	S&P 500 EPS	S&P 500 DPS
Growth Rates	6.47	6.95	6.70	5.82