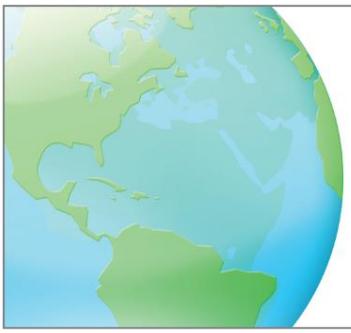

CRA Insights

CRA Charles River Associates

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Capital impact of COVID-19 on electric power sector – Beyond reading tea leaves

Key takeaways

In this paper we summarize insights from the impact of COVID-19 on cost of capital for the power sector based on data analyses and observations of potential outcomes that are not fully evident in the data. We identify four factors that may help finance managers and investors better prepare for the potential impact.

- Empirical data shows a material increase in utility sector expected equity returns driven by higher volatility. The higher volatility is triggered by demand-related factors unique to COVID-19 but may be related to investors pricing in regulatory risk with historically low levels of allowed return on equity (ROE), potential uncertainty in utility rate-base growth, and a heightened focus on affordability. This investor hangover may persist in the near to medium term given uncertainty around demand and rate recovery trends.
- The merchant independent power producer (IPP) segment continues to underperform relative to expected returns. High market risk, slow growth, and poor actual returns have resulted in low market valuations. Given market conditions, firms with quasi-merchant risk exposure are expected to see higher cost of equity and debt values relative to recent historical values. The current higher than average cost of debt for the non-investment grade segment is likely to moderate over time as economic impact from the COVID-19 crisis is corrected.
- The tax equity market could see a contraction as earnings for banks in the tax equity market are affected due to provision for credit losses, particularly for banks with large exposure to the consumer and commercial banking sector. Continued pressure may drive lower expected returns for contracted renewables.[1]
- The implied inflation in TIPS[2] is currently in the 1.5% to 2% range. However, there is the potential for higher inflation once the economy starts to recover (i.e. higher demand) combined with a continued expansionary monetary policy (e.g. low interest rates) and relatively high trade barriers – unless there is a protracted economic recovery (which would result in a low interest rate / low inflation environment).

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1 Tax equity investor interest continues to be high and while banks are generally on a better financial footing relative to the 2008 financial crisis, we see significant provision for credit losses in the banks' financial releases indicating that operating earnings may be lower, affecting the tax capacity. For example, J.P. Morgan, BAML, and Wells Fargo constitute a significant chunk of the US tax equity market. Q1 2020 earnings news releases for these companies indicate that Q1 ROEs fell on average by 10 percentage points across the three companies.

2 Treasury Inflation-Protected Securities are US government-issued treasury bonds indexed to inflation.

Background

The electric power sector is capital intensive and cost of capital is an important driver behind viability of projects for the industry. The COVID-19 pandemic is causing a major economic contraction and creating uncertainty that has the potential to significantly impact cost and availability of financing to the sector, particularly in higher risk segments.

In this paper, we discuss the various financing mechanisms employed by the sector, provide a summary of historical economic and capital market trends, and explore how COVID-19 may impact the financing costs for the sector.

Power sector financing options

The power sector is broadly categorized into two distinct segments, utility and independent power producers (IPP).[3] Each segment has a clear delineation of associated business and financial risks. The utility segment is rate regulated with significant cash flow certainty for investors and low market risk. The utility segment typically borrows against its balance sheet with traditional corporate financing structures. The IPP segment, however, is exposed to more market risk; the degree of risk depends on whether the asset is quasi-merchant (IPP-merchant) or contracted (IPP-contracted), and the duration of the contract. The IPP segment often relies on project financing structures with debt secured against the specific asset and non-recourse to the parent.

Table 1 presents a generalized view of debt and equity financing structures available to utility and IPP assets. Utilities typically rely on corporate bonds for debt financing with loan tenors between 10 and 30 years. The IPP segment is more complex with a variety of debt financing alternatives depending on the risk profile of the asset. Assets with long-term contracts with creditworthy counterparties are typically financed by commercial banks and the private placement, investment-grade bond market. Assets with shorter-term power purchase agreements (PPAs) or hedges are financed by the commercial bank market[4] or Term Loan B market.

The nature of the equity investor also changes depending on the investment risk, with tax equity investors active in the renewable development space and revenues secured against available federal renewable tax credits.

Table 1: Financing sources and characteristics

	Project Debt			Corporate Debt	Tax Equity	Sponsor Equity
	Commercial Bank	Bond	Term Loan B			
Asset Type	Renewables	Renewables	Thermal plants	Balance-sheet financed-utility or IPP asset	Renewables with ITC and PTC incentives	All
Type of Investors	US, EU, and Asian commercial banks	Insurance companies	Institutional	Institutional	Financial/Corporate with tax appetite	Institutional and Individuals
Applicable Segment	Long term PPA with strong counterparty		Short term PPA or hedged asset	Investor Owned Utilities	Mostly contracted asset or regulated utilities	All
Target Rating	Investment grade quality	Minimum BBB-	B and BB	All grades	Investment grade off-taker	N/A
Pricing (pre-COVID-19)	Variable Rate: L + 250 bps	Fixed Rate	Variable Rate: L + 450 bps	Fixed Rate based on credit rating	11-14% IRR by flip date	Wind/Solar: 6-7%; Utilities: 9-10%; IPPs: 12-14%
Tenor	Up to 15 years	Length of PPA	Up to 7 years	10-30 years	Target IRR reached in 10 years (PTC) or 6-7 years (ITC)	N/A

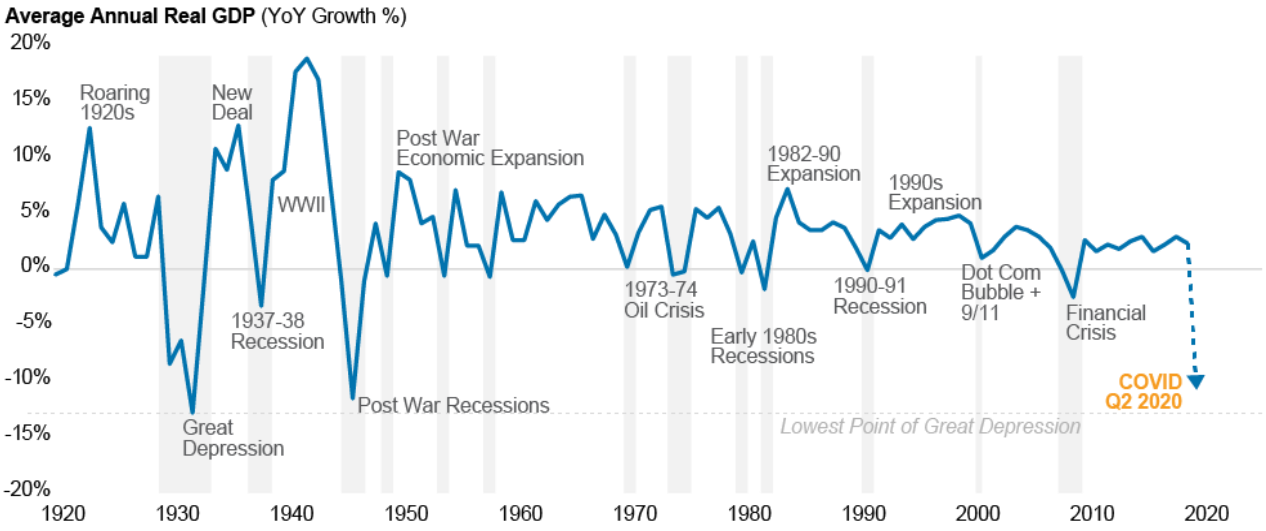
[3] We refer to IPP as any company or asset that is outside of the rate regulation prevalent in the United States.

[4] This is a recent trend. Typically, the commercial bank market funds assets with long-term contracts with creditworthy counterparties.

Historical context and capital markets perspective

On a global scale, the current recession is expected to be the deepest economic downturn in nearly a century based on the recent International Monetary Fund (IMF) projection of -4.9% GDP growth in 2020.[5] In the US, the economy has contracted by 9.5% in Q2 2020 relative to 2019.[6] As seen in Figure 1, this is on track to being the largest GDP growth reduction since World War II and far more impactful than the 2008 financial crisis.

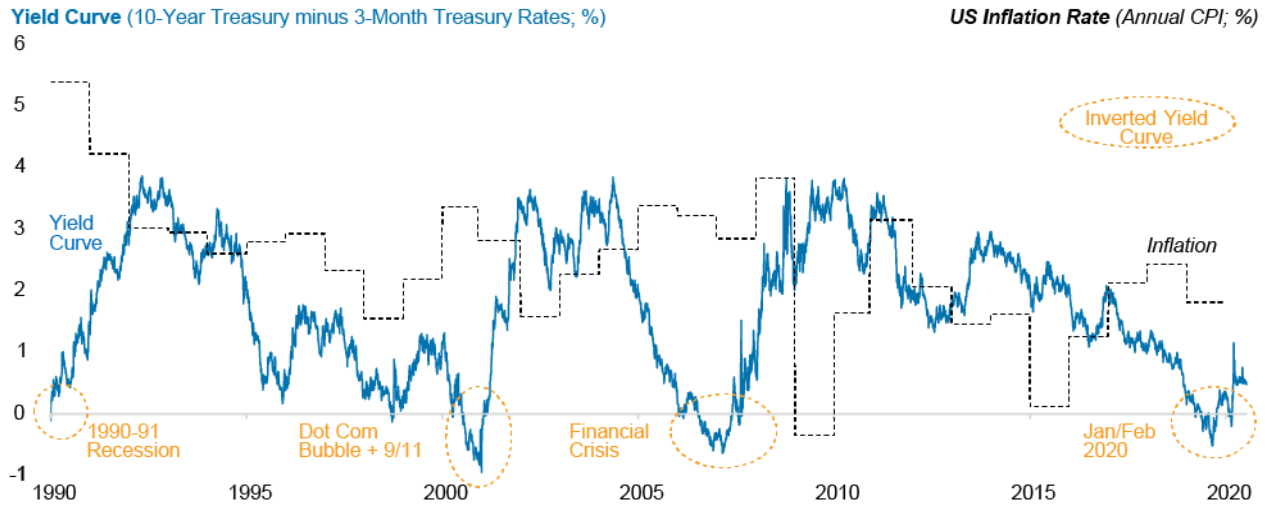
Figure 1: Historical context of COVID-19 – Major US economic recessions and expansions



Source: BEA, FRED, Statista, CRA analysis

There were warning signs of an impending recession as early as January 2020, as indicated by the inverted yield curve (see Figure 2). An inverted yield curve occurs when the yields on bonds with shorter duration (3-month treasuries) are higher than bonds with a longer duration (10-year treasuries). This typically happens when investors are bearish on the short-term economy and demand higher yields for short-term investments.

Figure 2: Inverted yield curve – Foreshadowing of recessions



Source: US Treasury, FRED, CRA analysis

5 International Monetary Fund, World Economic Outlook Update, "A Crisis Like No Other, An Uncertain Recovery," June 2020, at https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEOUpdateJune2020.

6 U.S. Bureau of Economic Analysis, Real Gross Domestic Product [A191RO1Q156NBEA], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/A191RO1Q156NBEA, August 14, 2020

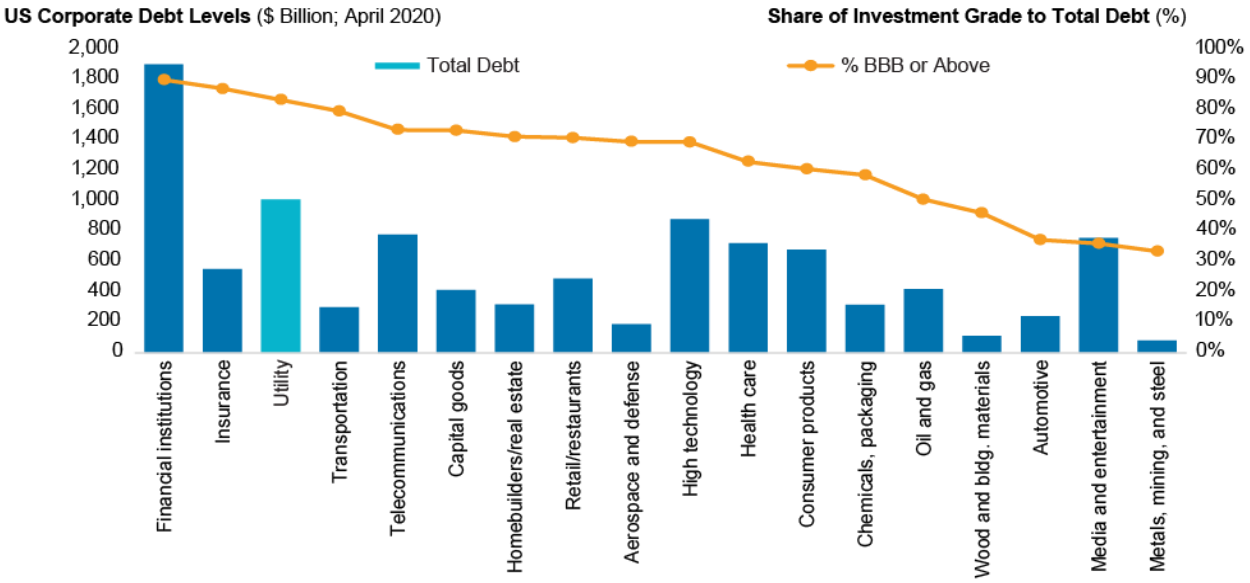
The US government responded to the COVID-19 contraction with a $2 trillion economic stabilization and stimulus package in March 2020 – with further packages under discussion as of publication date. Given the scale of these expansionary monetary policies and a recent shift in the Federal Reserve policy to keep rates low to incentivize job creation even if it poses higher inflation risks,[7] Fed fund rates are likely to remain near zero (0.08% as of 06/20)[8] for the foreseeable future (similar to the 2009-17 post financial crisis era).

Currently, several factors have offset the inflationary pressure from the sharp increases in money supply that include a large drop in consumer demand driven by COVID-19 related restrictions, increased savings rate, and historically low energy prices (i.e. natural gas, oil, and electricity). Inflation has actually declined in 2020 relative to 2019 – according to the US Bureau of Labor Statistics, the US had a 0.6% increase in the 12 month consumer price index[9] in June 2020 compared with 1.8% for the same period in 2019.

Once economic activity starts to recover, rising consumer demand may result in increasing energy prices as oil and gas production capacity ramps back up to meet the growing demand. If there is a strong recovery, a combination of rising energy prices, growing consumer demand, and continued low interest rates (unless the Fed reverses its recent policy change) could result in inflation above the current 2% Fed target. However, if there is a more protracted recovery, Fed fund rates will very likely remain at near-zero levels while the weaker demand may not be sufficient to induce higher inflation despite expansionary monetary policies.

As financial performance is affected across the economy and more companies take on new debt, the total corporate debt for the US has surpassed $10 trillion as of April 2020. Corporate debt has grown at an average annual rate of 5% between 2016 and 2020, but grew at twice that rate in the first four months of 2020. More worrisome is that nearly all the new debt taken on by corporations between January and April of 2020 was rated below BBB (or non-investment grade).[10]

Figure 3: Utility debt levels compared with all US corporate debt



Source: S&P Global, CRA analysis

7 Nick Timiraos, "Fed approves shift of inflation goals, ushering in longer era of low rates," *Wall Street Journal*, August 27, 2020, at https://www.wsj.com/articles/feds-powell-headlines-virtual-jackson-hole-economic-conference-11598486400.

8 Federal Bank of St Louis, at https://fred.stlouisfed.org/series/FEDFUNDS.

9 US Bureau of Labor Statistics, "Consumer Price Index Summary," press release, July 14, 2020, at https://www.bls.gov/news.release /cpi.nr0.htm.

10 Nick W. Kraemer, Evan M. Gunter, Jon Palmer, Abhik Debnath, "Credit Trends: Global Corporate Debt Market: State Of Play In 2020," June 25, 2020, S&P Global Ratings, at https://www.spglobal.com/ratings/en /research/articles/200625-credit-trends-global-corporate-debt-market-state-of-play-in-2020-11546901.

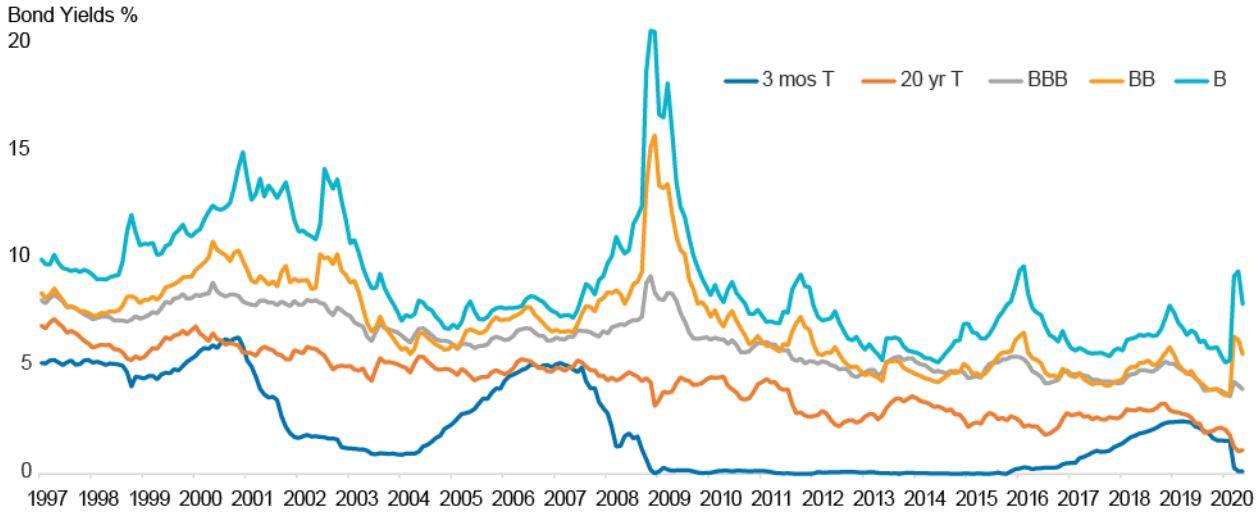
Traditionally, investors perceive utilities as safer investments during downturns and, as shown in Figure 3, have the highest ratio of investment grade debt to total debt of all non-financial industries. That said, utility credit ratings have gradually declined over the last two decades and may worsen if regulatory risk is not managed, e.g. declining allowed rates of return, regulatory lag, and inability to obtain full cost recovery for losses during downturn.

Perspectives on historical financing costs for the power sector

Debt costs

Figure 4 shows the historical debt costs for key debt index securities representing the power sector between January 1997 and May 2020. The cost of debt is directly observable from the yield spread and the nominal risk-free rate.[11] We observe that debt costs have increased significantly in response to the COVID-19 crisis, particularly for the IPP segment, with materially higher yield spreads partially offset by lower long-term interest rates. Overall debt rates remain low relative to the 2007-2008 financial crisis due to intervention by the Federal Reserve System and continued monetary policy actions during the COVID-19 crisis.

Figure 4: Utility and IPP sector representative bond yields



Source: CRA analysis based on Federal Reserve Bank of St. Louis data

Equity costs

Asset pricing models show how the quantitative cost of equity capital to the power sector has been impacted by the COVID-19 crisis. A well-known approach of determining that cost is the capital asset pricing model (CAPM).[12] CAPM relies on historically traded stock prices to capture equity risk and typically uses a five-year estimation period to mitigate the impacts of short-term stock price volatility. In addition to the estimated market betas,[13] CAPM relies on assumptions around market risk premium and the risk-free rate which is a function of projected inflation.

To identify comparable companies (comps) for each segment, we relied on public and licensed data sources. The utility comps were selected based on the Edison Electric Institute's list of highly regulated utilities. For the IPP-contracted segment, the chosen comps are publicly traded yieldcos in the renewable energy space.

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11 To show the historical debt costs for each segment, an investment grade bond rating of BBB is assumed consistent with the average credit rating of a publicly traded investor-owned utility. For the IPP segment, two bond proxies are selected: a high yield bond for the Term Loan B market (BB to B rated) representing thermal assets with material merchant exposure and a low investment to non-investment rating (BBB- to BB) representing the contracted renewables (IPP-contracted) segment.

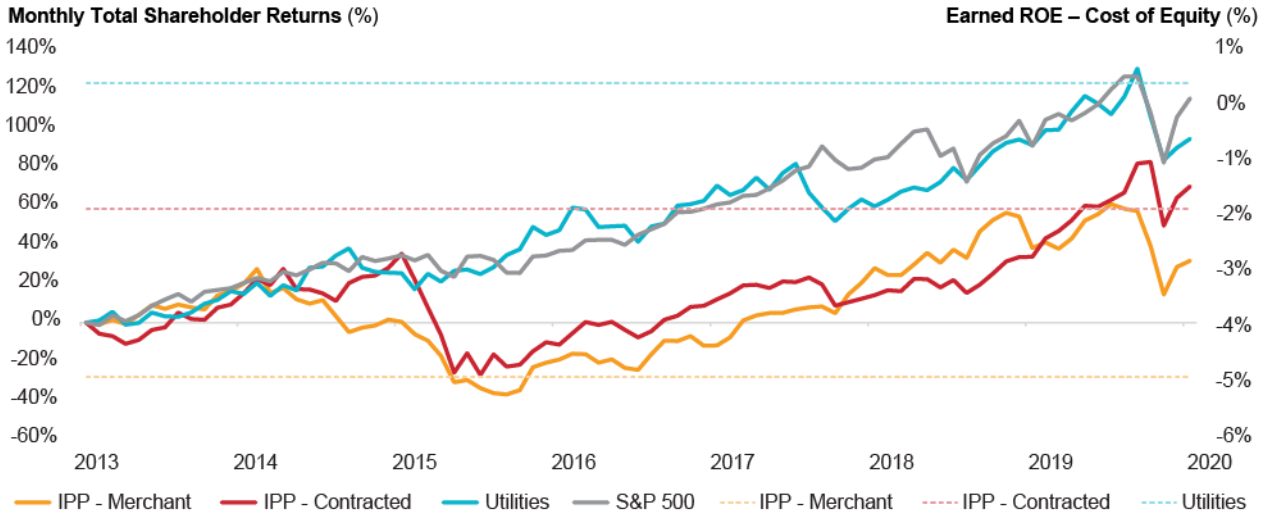
12 Other approaches such as discounted cash flow (DCF) and Fama-French factor models have not been considered in this paper.

13 Market beta is a measure of volatility (or systemic risk) of a security (or portfolio) relative to the broader market.

The IPP-merchant segment was more challenging with pure-play comps more limited.[14] The chosen comps are companies with varying degrees of merchant risk exposure with asset plays in administrative capacity markets, competitive retail businesses, regulated utilities, and contracted renewable assets.

Unlike debt costs, equity cost is not directly observable, but empirical data suggests that IPPs have higher market risk as evidenced by expected cost of equity. Moreover, the spread between the cost of equity and the actual return on equity is a good proxy for value creation. As shown in Figure 5, the IPP-merchant segment earned significantly less than its cost of equity relative to the IPP-contracted and utility segment. This value destruction is also captured in the total shareholder returns for each segment with the merchant segment significantly underperforming other segments.

Figure 5: Utility and IPP sector capital market performance



Source: Capital IQ, CRA analysis

COVID-19 and cost of capital observations

Table 2 shows the cost of capital impacts for the various segments as of June 2020 relative to the December 2019 period. The investor return expectations (cost of equity) for the utility segment show a significant shift as a result of the COVID-19 crisis with a 125 bps increase in the cost of equity. The cost of debt is relatively stable with an increase in yield spread mitigated by a lower long-term government bond yield. While utility market risk historically has been mitigated through several regulatory mechanisms including reserve set asides, decoupling, and securitization mechanisms, empirical data shows heightened market risk for utilities in the near to medium term.

For contracted renewables, return expectations have proven to be relatively unaffected by the COVID-19 crisis although there is potential for returns to contract over the next couple of years if tax equity becomes more limited. Historically we have observed strong liquidity and competition for capital in the renewables segment and resulting lower expected returns for project sponsors relative to estimates from capital asset pricing models.[15] This is due to abundant capital available to fund renewable projects and a willingness to accept lower returns due to the oft-cited "halo effect" of renewables. Sponsors and lenders are willing to do the deals at competitive rates as it helps satisfy environmental, social, governance (ESG) and other corporate goals set by their boards and investment committees.

[14] This is partly due to fewer publicly traded companies in this space as a result of mergers with other publicly traded firms or acquisition activity with IPPs going private. Further, many of the remaining publicly traded companies have adopted a "back to basics" strategy with fewer and fewer companies taking on pure merchant risk.

[15] The IPP-contracted segment (proxy for renewable development segment) saw levered sponsor equity returns as low as 6-7% pre-COVID-19.

For the IPP-merchant class, we observe significantly higher cost of capital impacts. The segment has higher market risk exposure with shorter-term contracts (longer merchant tail) and companies with competitive retail electric businesses. As expected, there is an increase in both cost of equity and the debt costs tied to the high yield bond market. The cost of debt impact is particularly high with more than 200 bps increase relative to pre-crisis levels. While we expect the recent trends to moderate as the industry recovers, there will be a heightened sense of risk for this segment in the near term depending on the speed of recovery.

Table 2: COVID-19 impact on cost of capital – Change between December 2019 and June 2020

+: Increase -: Decrease	Utilities	IPP – Contracted	IPP – Merchant
Levered beta	+0.32	+0.20	+0.23
Risk Free Rate (bps)	-104	-104	-104
Yield Spread (bps)	+111	+192	+314
Cost of Debt (bps)	+7	+88	+210
Cost of Equity (bps)	+126	+38	+56
WACC (bps)	+60	+57	+133

Source: Capital IQ, CRA analysis

Final considerations for sector participants

The US power sector is highly complex with parts of the country under rate regulation environments and other parts with varying levels of wholesale market and retail restructuring. Events such as the COVID-19 crisis and the 2008 financial crisis often lead to large disruptions in capital markets and can affect each segment differently.

However, companies can develop useful cost of capital insights with a robust analytical approach, coupled with intuition around future developments. This can be accomplished by breaking up the sector into logical segments along the risk spectrum, identifying reasonable comparable companies to assess competitive positioning, and using empirical data to tease out the business and financial risk.

It is anyone's guess how the COVID-19 crisis will play out over the coming months. The one thing that appears likely is that it will have a material impact on utilities. A better understanding of the potential impact for cost of capital will place finance managers in a better position to prepare for the tough road ahead.

About CRA's Energy Practice

Charles River Associates is a leading global consulting firm that offers strategic, economic, and financial expertise to major corporations and other businesses around the world. CRA's Energy Practice provides services to a wide range of industry clients, including utilities, ISOs, RTOs, large customers, and investors. The Energy Practice has offices in Boston, New York City, Washington, DC, Toronto, and London. Learn more at **www.crai.com/energy**.

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