American Public Power Association
Accounting and Finance – Spring Meeting

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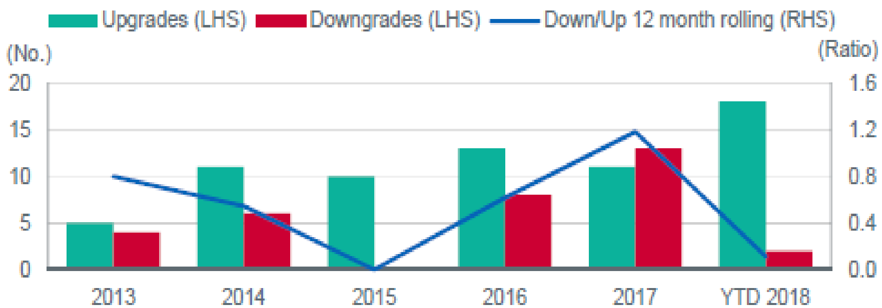
Fitch Ratings

Sector Outlook: Key Issues

Affordability at Prerecession Levels

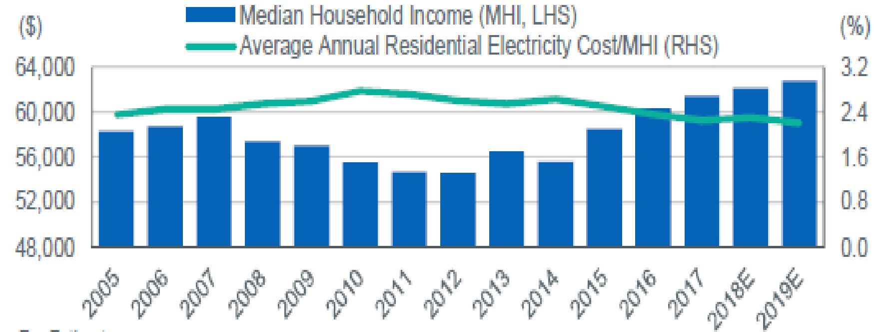
- Strong growth in household income has contributed to affordability that has returned to prerecession levels, easing rate pressure.
- Real household income rose 1.5% to record levels in 2017, after rising by 3.2% in 2016; Continued growth estimated in 2018 (1.2%) given GDP growth of 2.9% and tight labor market.
- Affordability ratio of 2.25% in 2017 and 2.30% estimated in 2018, versus 2.77% in 2010; Improvement has eased rate setting pressures and contributed to stronger financial performance.

Public Power – Rating Changes



Note: Excludes prepaid energy ratings.
Source: Fitch Ratings.

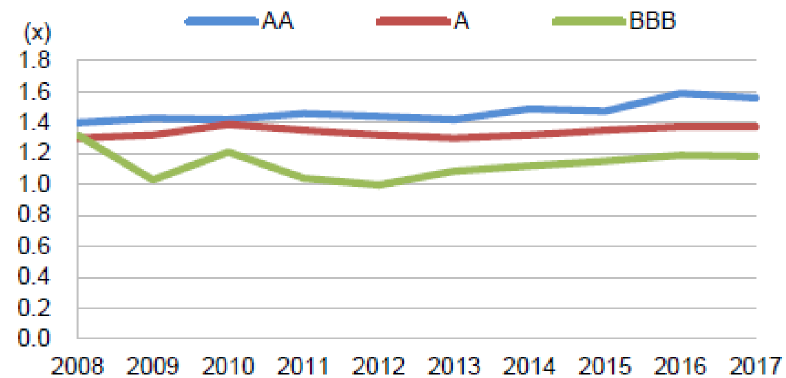
Residential Electric Cost to Median Household Income



E – Estimate.
Source: Fitch Ratings, EIA, IHS Markit, U.S. Census.

Coverage of Full Obligations

Indicates the margin available to meet current debt service and other fixed obligations.



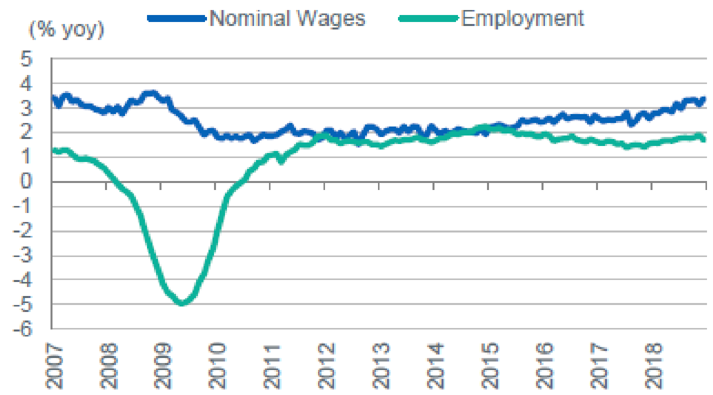
Source: Fitch Ratings.

Sector Outlook: Key Issues

Affordability at Prerecession Levels

- Fitch's forecast is that growth will moderate to 2.3% in 2019 and 1.9% in 2020 on weaker external demand, the incoming data and a small drag on GDP from the government shutdown; Prospect for further tax cuts has evaporated following mid-term elections.
- However, economic momentum still looks resilient supported by robust household income growth, and accelerating wages and job growth.

US - Wage and Job Growth



Source: Fitch Ratings, BEA, Datastream

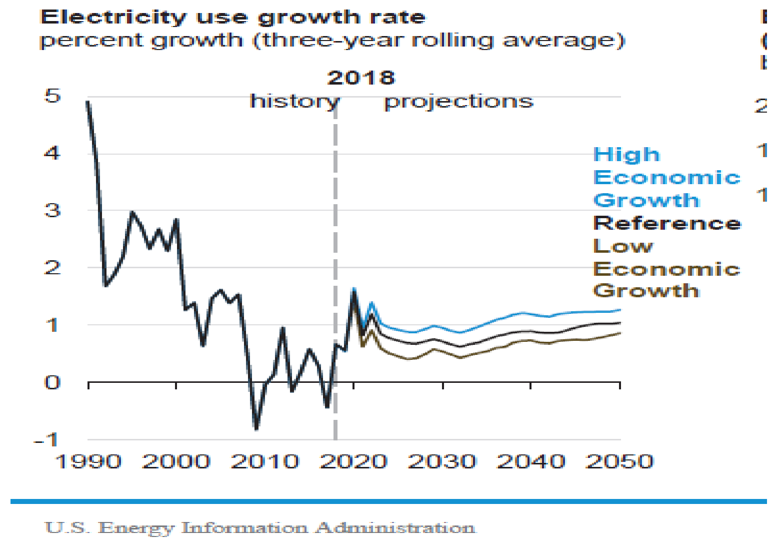
United States – Forecast Summary

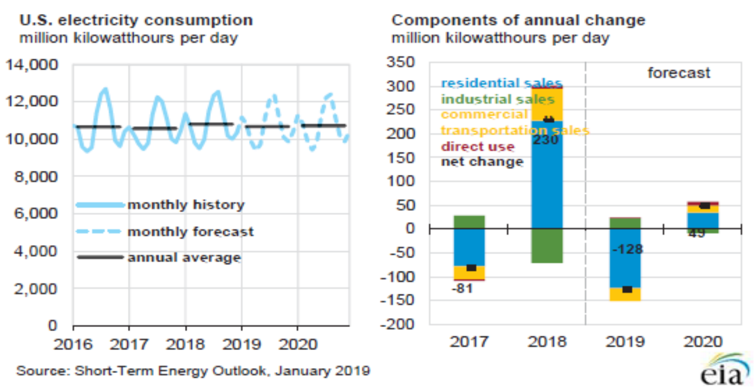
(%)	Ann. Av.2014-18	2017	2018	2019f	2020f
GDP	2.4	2.2	2.9	2.3	1.9
Consumer Spending	2.9	2.5	2.6	2.5	2.2
Fixed Investment	4.3	4.8	5.3	2.8	1.8
Net Trade (contribution pps.)	-0.4	-0.4	-0.3	-0.4	-0.2
CPI Inflation (end-year)	1.5	2.1	1.9	2.2	2.3
Unemployment Rate	4.9	4.4	3.9	3.6	3.6
Policy Interest Rate (end-year)	0.83	1.50	2.50	2.75	3.00
Exchange Rate, USDEUR (end-year)	0.86	0.83	0.87	0.88	0.88

Source: Fitch Ratings

Affordability at Prerecession Levels

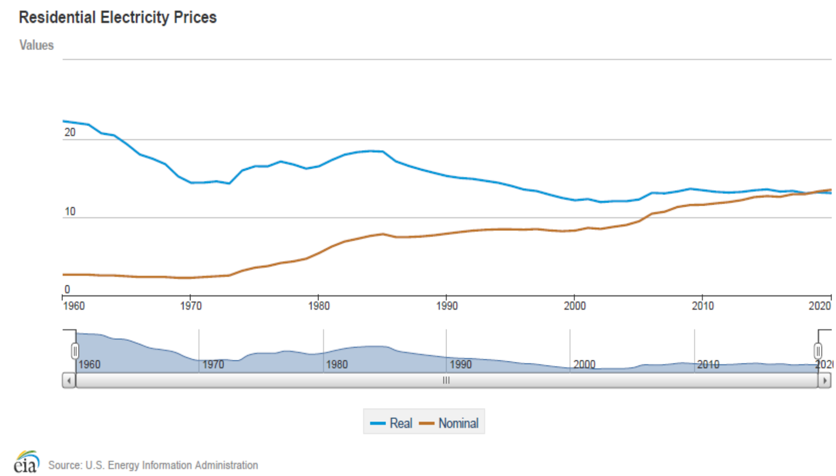
- Lower electric costs tied more to declining consumption than lower electric prices;
- Demand growth rates have slowed as efficient devices and production processes replace less efficient uses and equipment.
- Residential consumption declined approximately 5% 2008-2017;
- Total residential consumption is estimated to have risen approximately 2% in 2018 (after falling 2% in 2017) on normalized weather conditions;
- Retail sales are expected to fall in 2019, led by a 3.1% reduction in residential sales as a result of milder expected summer temperatures.

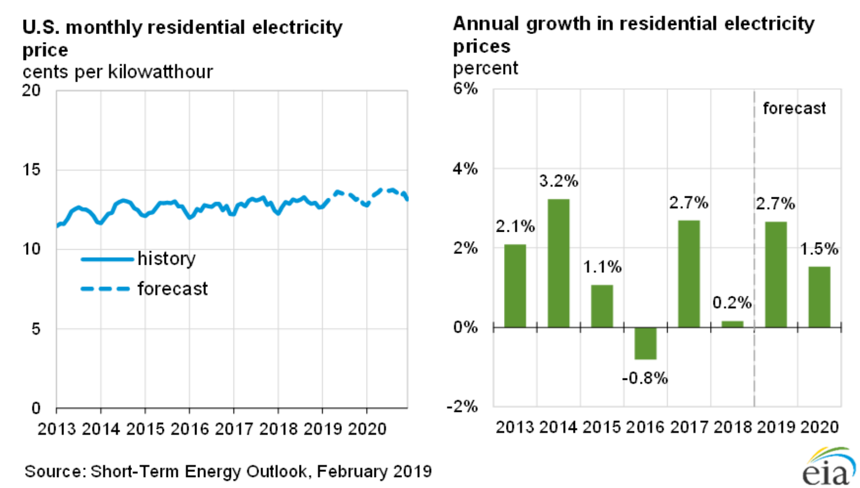




Affordability at Prerecession Levels

- Real prices virtually unchanged since 2010.
- Prices fell in 2018, likely as savings from lower taxes are passed through to users, but modest increases are expected to 2019 and 2020.
- Improved affordability should support rate setting strategies.

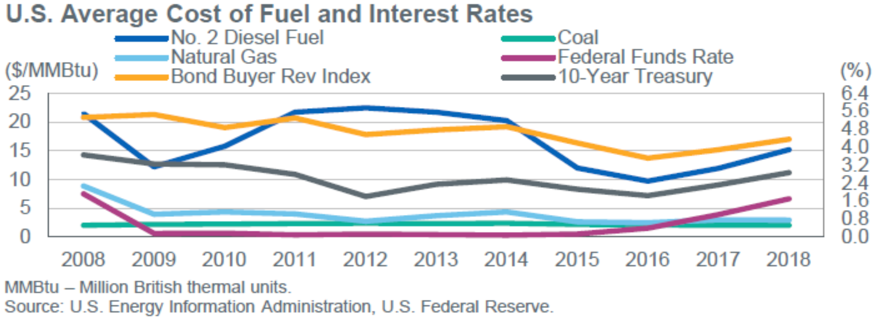




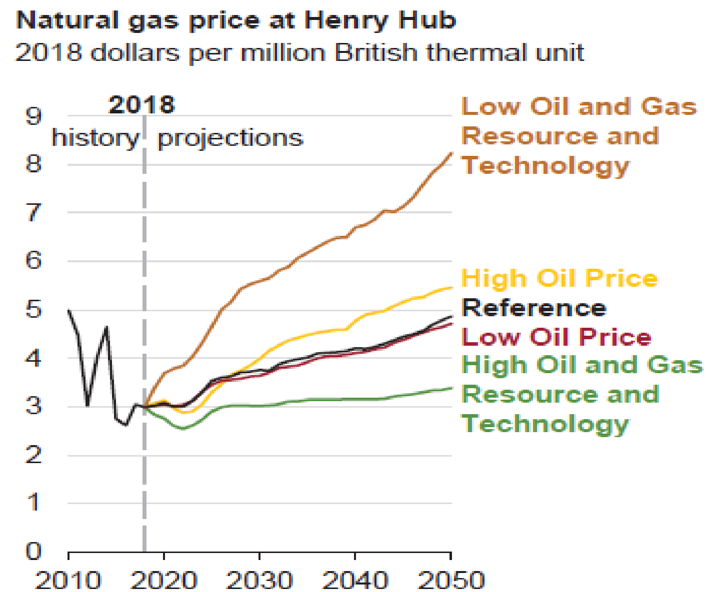
Sector Outlook: Key Issues

Lower Fuel Cost Broadly Positive

- Low fuel costs and energy prices should remain broadly positive through 2019.
- Fitch 2019 base case natural gas price has increased to $3.25/mcf, but the long-term price remains at $3.00/mcf; Continued shale gas production growth.
- AEO 2018 Reference Case forecasts increasing gas prices in mid 2020's through 2030 driven by growing demand in domestic and export markets and production expansion into more expensive-to-produce areas.
- Gas prices highly sensitive to domestic resource and technology assumptions; Low case assumes higher costs for Alaska and Lower 48 reserves and slower technology improvement.
- Given the sector's growing reliance on natural gas generation at ~35% in 2018, a sudden unexpected rise in cost remains a concern.



MMBtu – Million British thermal units.
Source: U.S. Energy Information Administration, U.S. Federal Reserve.

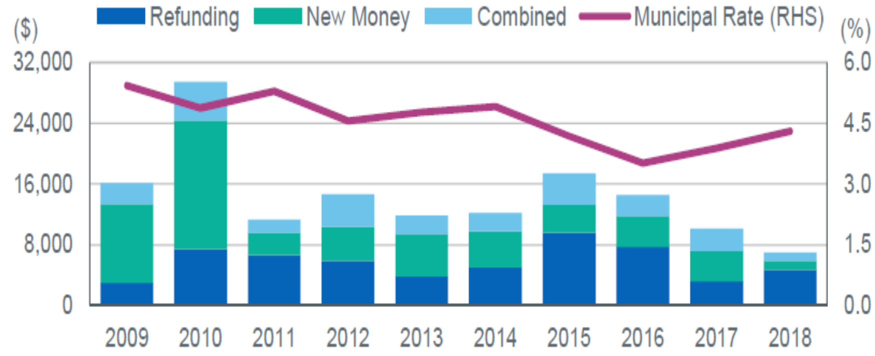


Source: EIA 2019 AEO

Low Interest Rates Positive; Upward Pressure Eases

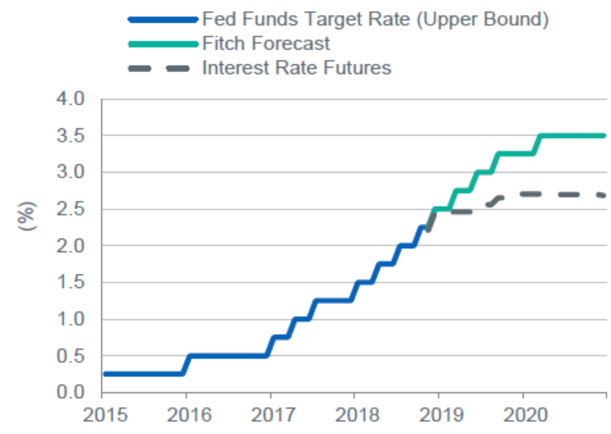
- Low interest rates and robust access to the capital markets have been positive.
- Replacement and refunding of debt has reduce revenue requirements; Over 70% of 2017-2018 electric power debt earmarked for refunding;
- Fitch has revised its forecast for further rate increases; the Fed is now expected to raise interest rates gradually to 3.0% (vs. 3.5%) by the end of 2020, and 10-year U.S. Treasury yields to reach 3.7% (vs. 4.1%) over the same period.
- Higher short-term rates should not pose a material risk to issuers; 96% of debt issued 2009-2018 was fixed rate; Low percentage of short-term debt and unhedged variable rate exposure (4.9%); 58% of issuers have no variable rate exposure.
- Higher long-term rates may limit headroom created in recent years and could result in upward pressure on rates.

Municipal Bond Issuance – Electric Power Sector



Source: Fitch Ratings, The Bond Buyer.

Fed Funds Rate



Source: Bloomberg, CBOT, Fitch Ratings

Proposed Environmental Regulations Manageable; Carbon Pressures Remain

- The EPA's proposed Affordable Clean Energy (ACE) rule would replace the 2015 Clean Power Plan (CPP), which EPA has proposed to repeal.
- The ACE rule is expected to reduce carbon emissions in 2025 by between 13 and 30 million short tons, but provides a more manageable framework and relaxed timetable for compliance than the CPP.
- The new rule could provide some flexibility and near-term benefit for coal-dominant utilities as they pursue economic dispatch of resources, but benefits are expected to be short-lived.
- Legacy regulations related to the disposal of coal combustions residuals, mercury and air toxins, and effluent guidelines will continue to frustrate economics for coal-fired generation.
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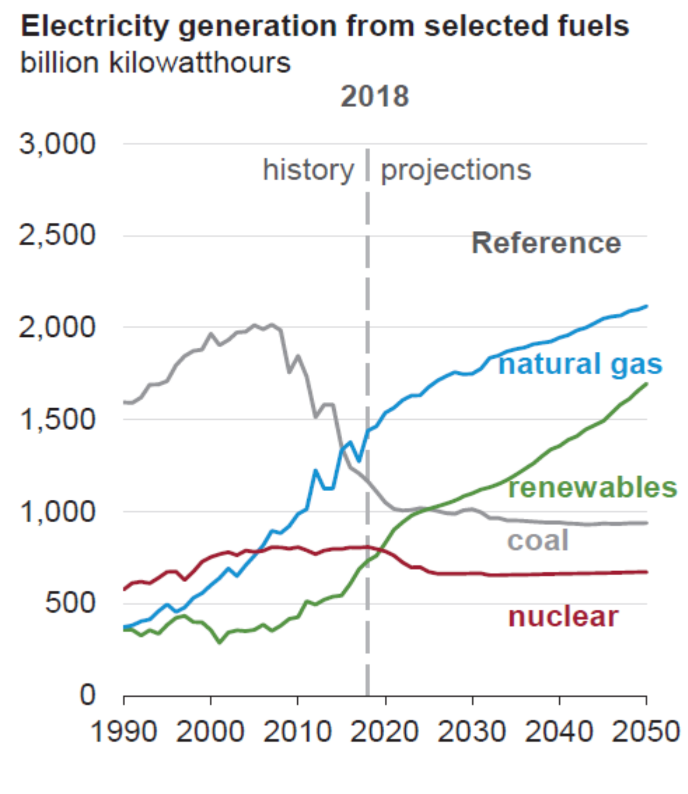
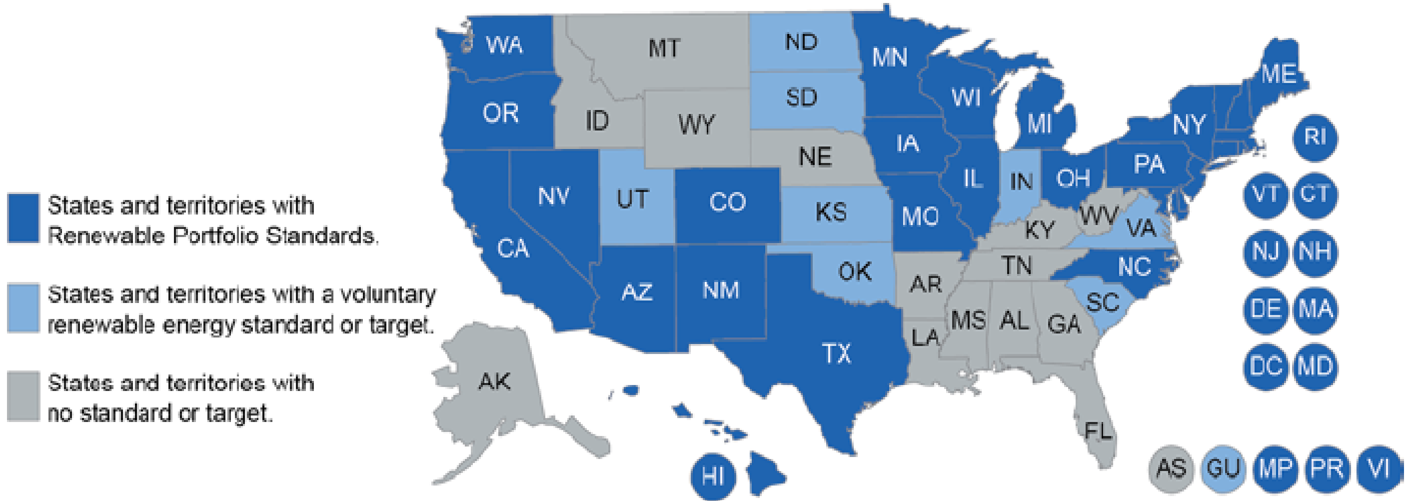


U.S. Energy Information Administration

…but Carbon Pressures Remain

- State level renewable mandates, as well as mounting pressure from consumers, local governments and investors alike are expected to affect resource planning for years to come.
- Twenty states and territories have adopted renewable standards or goal that apply to public power and cooperative utilities.

Renewable Portfolio Standards or Voluntary Targets

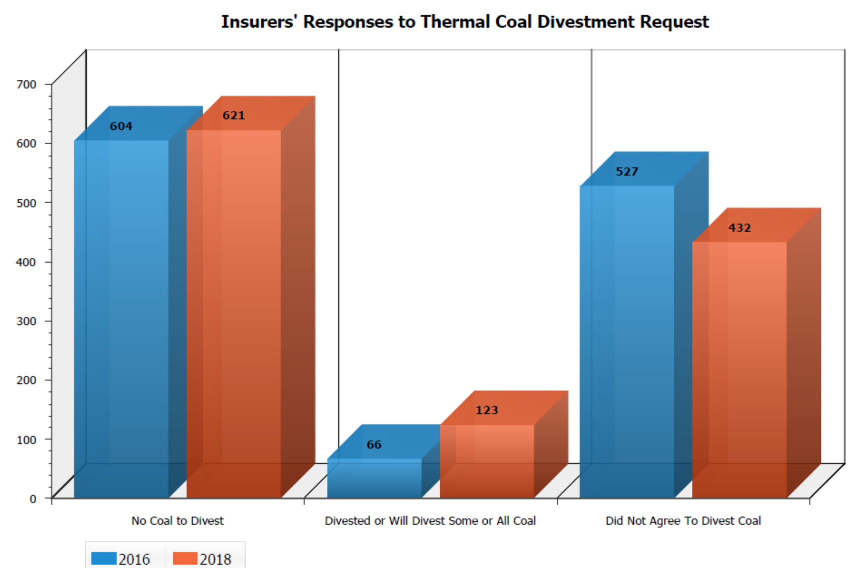


Source: National Conference of State Legislatures.

…but Carbon Pressures Remain

- State-led initiatives, together with proposals and policies aimed at limiting investment in thermal coal, are likely to drive issuers toward strategies promoting reduced emissions.
- 421 global investors representing $32 trillion in assets have urged all governments to implement actions needed to achieve the Paris Agreement goals.
- The California Department of Insurance Climate Risk Initiative continues to assign high risk to investment in thermal coal and request voluntary divestment.
- Proliferation could significantly reduce liquidity or force consideration of premature retirement, resulting in financial strain and downward rating pressure.

Source: The Investor Agenda



Source: California Dept. of Insurance

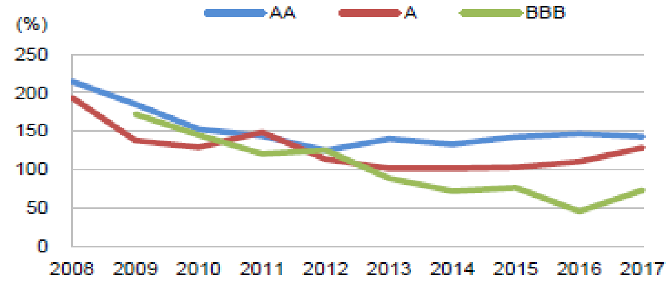
Sector Outlook: Key Issues

Subdued Rates of Capital Investing

- Rate of capital investment for public power issuers remained low in 2017, sustaining a trend begun earlier this decade.
- Since 2010, the median ratio of capital investment to depreciation has steadily declined from 166% to 123%.
- ‘A’ rated wholesale systems reported a median capex/depreciation ratio of less than 100% for the second year in a row.

Retail Electric Trends

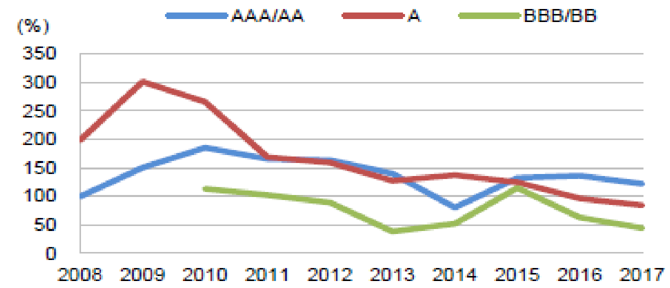
Capex/Depreciation and Amortization
Indicates whether annual capital spending keeps pace with depreciation.



Source: Fitch Ratings.

Wholesale Electric Trends

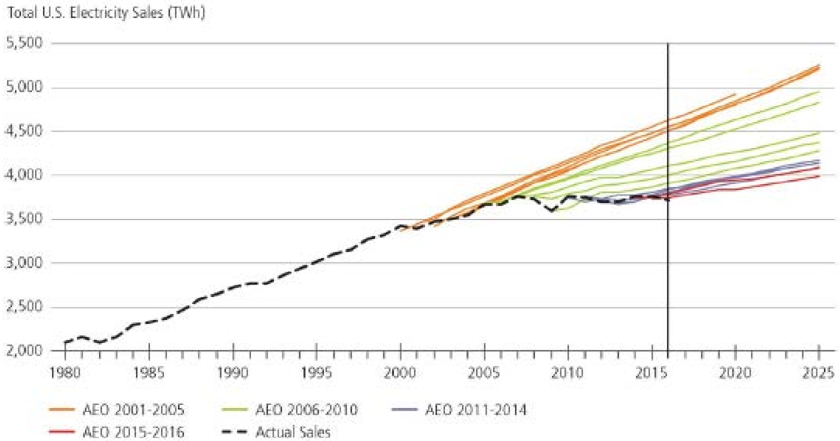
Capex/Depreciation and Amortization
Indicates whether annual capital spending keeps pace with depreciation.



Source: Fitch Ratings.

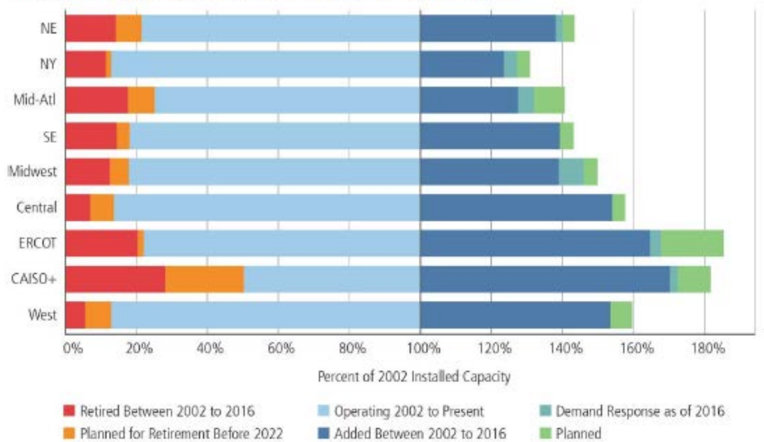
Subdued Rates of Capital Investing

- Low growth in electric consumption, particularly for residential users, has obviated the need for new generation build.
- Investment throughout the broader utility sector has continued, driven in part by tax credits and other incentives, offsetting retirements of coal and natural gas capacity.
- Renewal and replacement investment remains steady for public power utilities, and investment in transmission has grown.



Source: EIA; DOE

Figure 3.5. Operating Generation Capacity, Additions, Retirements, and Announced Retirements by Region for All Generation Types, January 2002–December 2022[29]

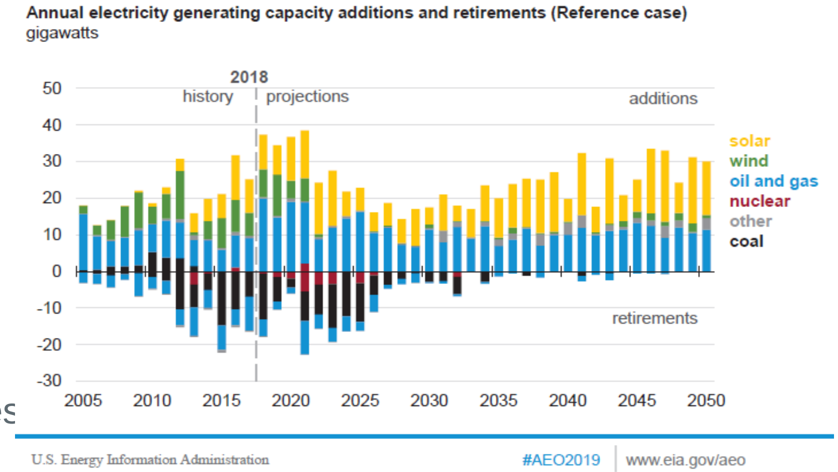


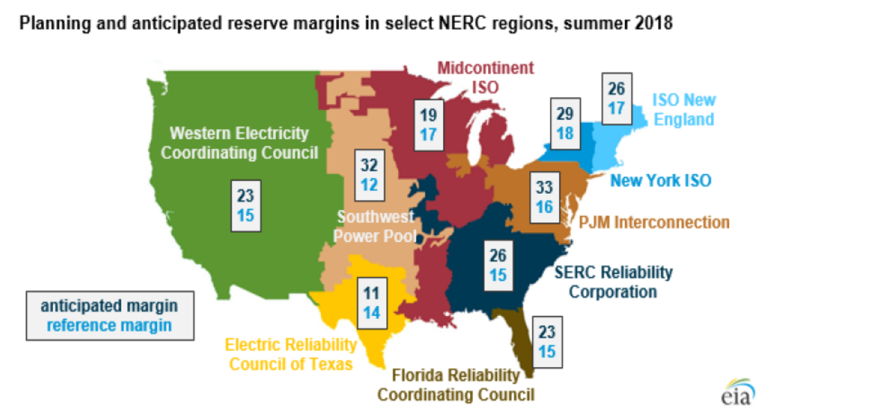
Source: EIA; DOE

Sector Outlook: Key Issues

Subdued Rates of Capital Investing

- Fitch expects the rate of investment to remain depressed over the near term.
- EIA forecasts electric power generating net capacity will increase by 5.5% during 2018-2022, reversing an expected decline of 2.9% during 2017–2021.
- New capacity additions of wind and solar resources will exceed 53 GW or 47% of new additions.
- Tax credits and incentives will continue to make renewable resource purchase agreements attractive for not-for-profit utilities further limiting investment.
- Virtually no additional coal or nuclear resources are anticipated.
- Regional excess capacity should remain robust; All NERC regions expected to maintain reserve margins above resource adequacy targets, but signs of weakness appearing.





Source: U.S. Energy Information Administration, based on North American Electric Reliability Corporation *2018 Summer Reliability Assessment*

FITCH: TEXAS POWER CLOSURES MAY MEAN HIGHER WHOLESALE PRICES

Subdued Rates of Capital Investing

- Lower capital spending should support sector credit quality.
- Systems debt-funding capex should clearly benefit from lower debt levels.
- The effect on credit quality will depend on alternative use of excess cash.
- Credit effect for systems funding capex with funds from operations will depend on alternative use of cash.
- Using funds to bolster reserves and reduce outstanding debt would be viewed as more supportive of credit quality than if funds are returned to end users through a reduction in rates.

FitchRatings

Peer Group Median Analysis

Based on the peer group selected in the Peer Group Selector sheet, this section offers historical medians for a chosen metric ca representation of a specific metric, select it in one of the dropdowns underneath.

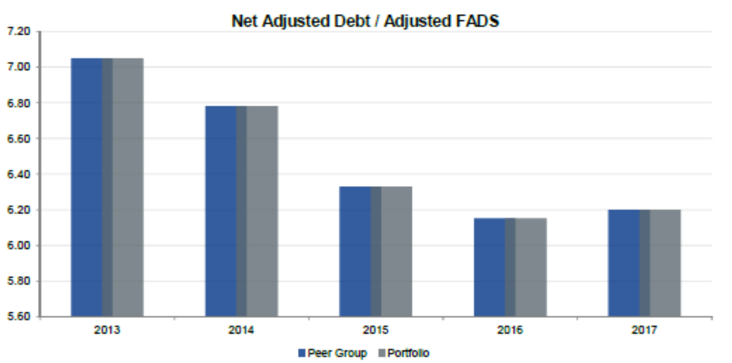
Medians Summary

Peer Group Medians	2013	2014	2015	2016	2017
Coverage of Full Obligations (x)	1.27	1.28	1.29	1.37	1.38
Days Cash and Investments on Hand	132	123	132	151	171
Days Liquidity on Hand	200	196	212	237	255
Net Adjusted Debt / Adjusted FADS	7.1	6.8	6.3	6.2	6.2
Equity / Capitalization (%)	38.1	39.2	38.9	39.4	41.1
Debt / Electric Customers ($)	3,651	3,657	3,680	4,044	3,808

Metric Selection

Net Adjusted Debt / Adjusted FADS

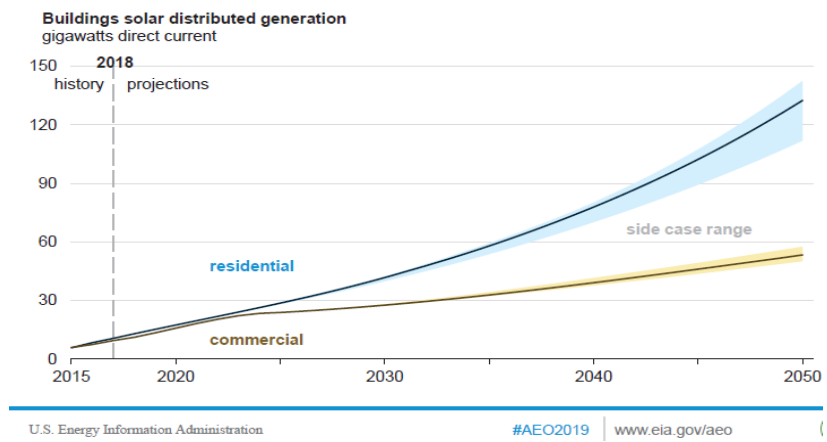
Metric:

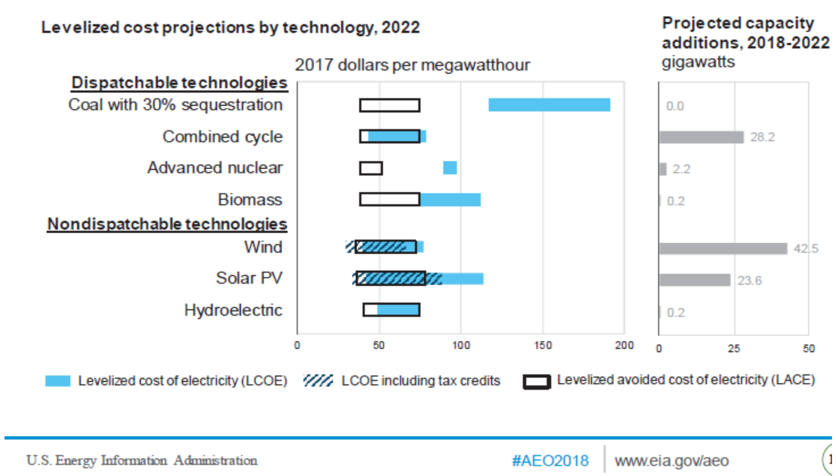


Sector Outlook: Key Issues

Growing Challenges to Traditional Utility Model

- Customers are increasingly demanding more options to buy renewable energy; tax subsidies, falling costs and customer preferences are driving increased distributed generation.
- Distributed PV competes against higher retail electricity prices, which do not necessarily reflect time-of-day or seasonal variation in cost.
- Not a key rating driver in the near term, given a low base, but a worrisome long-term trend for utilities.
- Development of affordable storage solution could spark customer defections over the longer term further upending the traditional utility model.
- Trend requires rate design solutions to minimize revenue loss and cross subsidization; Constructive net metering supportive.

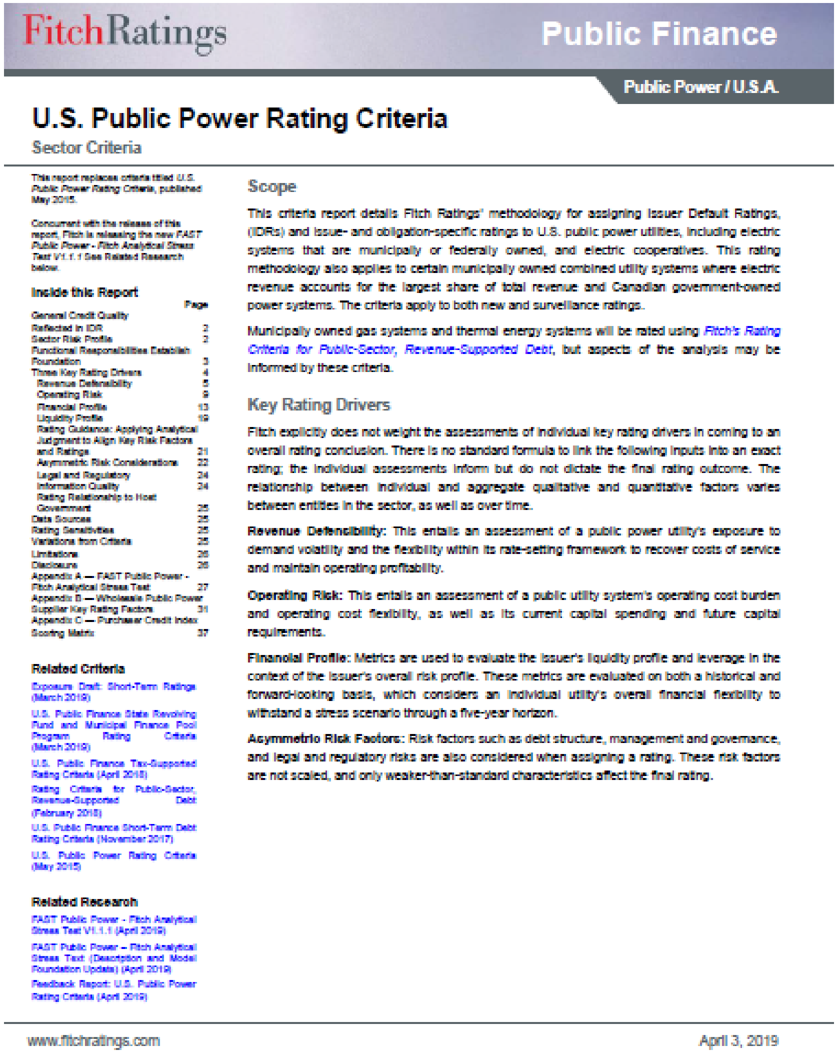




APPENDIX

Fitch Releases Revised Public Power Rating Criteria

- **Comprehensive review and assessment of obligor creditworthiness**
  - Revenue Defensibility
    - Revenue Source Characteristics
    - Rate Flexibility
    - Purchaser Credit Quality
  - Operating Risk
    - Operating Cost Burden
    - Operating Cost Flexibility
    - Capital Planning and Management
  - Financial Profile
    - Leverage Profile
    - Liquidity Profile
  - Asymmetric Risk Factors
    - Management and Governance



FitchRatings — Public Finance

Public Power / U.S.A.

U.S. Public Power Rating Criteria

Sector Criteria

This report replaces criteria titled *U.S. Public Power Rating Criteria*, published May 2015.

Concurrent with the release of this report, Fitch is releasing the new *FAST Public Power - Fitch Analytical Stress Test V1.1.1* See Related Research below.

Inside this Report

Related Criteria

Exposure Draft: Short-Term Ratings (March 2019)

U.S. Public Finance State Revolving Fund and Municipal Finance Pool Program Rating Criteria (March 2019)

U.S. Public Finance Tax-Supported Rating Criteria (April 2018)

Rating Criteria for Public-Sector, Revenue-Supported Debt (February 2018)

U.S. Public Finance Short-Term Debt Rating Criteria (November 2017)

U.S. Public Power Rating Criteria (May 2015)

Related Research

FAST Public Power - Fitch Analytical Stress Test V1.1.1 (April 2019)

FAST Public Power – Fitch Analytical Stress Test (Description and Model Foundation Update) (April 2019)

Feedback Report: U.S. Public Power Rating Criteria (April 2019)

Scope

This criteria report details Fitch Ratings' methodology for assigning Issuer Default Ratings, (IDRs) and issue- and obligation-specific ratings to U.S. public power utilities, including electric systems that are municipally or federally owned, and electric cooperatives. This rating methodology also applies to certain municipally owned combined utility systems where electric revenue accounts for the largest share of total revenue and Canadian government-owned power systems. The criteria apply to both new and surveillance ratings.

Municipally owned gas systems and thermal energy systems will be rated using *Fitch's Rating Criteria for Public-Sector, Revenue-Supported Debt*, but aspects of the analysis may be informed by these criteria.

Key Rating Drivers

Fitch explicitly does not weight the assessments of individual key rating drivers in coming to an overall rating conclusion. There is no standard formula to link the following inputs into an exact rating; the individual assessments inform but do not dictate the final rating outcome. The relationship between individual and aggregate qualitative and quantitative factors varies between entities in the sector, as well as over time.

Revenue Defensibility: This entails an assessment of a public power utility's exposure to demand volatility and the flexibility within its rate-setting framework to recover costs of service and maintain operating profitability.

Operating Risk: This entails an assessment of a public utility system's operating cost burden and operating cost flexibility, as well as its current capital spending and future capital requirements.

Financial Profile: Metrics are used to evaluate the issuer's liquidity profile and leverage in the context of the issuer's overall risk profile. These metrics are evaluated on both a historical and forward-looking basis, which considers an individual utility's overall financial flexibility to withstand a stress scenario through a five-year horizon.

Asymmetric Risk Factors: Risk factors such as debt structure, management and governance, and legal and regulatory risks are also considered when assigning a rating. These risk factors are not scaled, and only weaker-than-standard characteristics affect the final rating.

www.fitchratings.com April 3, 2019

Fitch Releases Revised Public Power Rating Criteria

Key Rating Factors — Retail Public Power Systems

Revenue Defensibility	aa	a	bbb	bb
Revenue Source Characteristics	Nearly all revenue is derived from services or business lines exhibiting monopoly characteristics. Reliance on revenue from competitive sources is insignificant.	A significant portion of total revenue is derived from services or business lines exhibiting monopoly characteristics. Reliance on revenue from competitive sources is manageable.	A majority of total revenue is derived from services or business lines exhibiting monopoly characteristics. Reliance on revenue from competitive sources is meaningful.	Less than 50% of total revenue is derived from services or business lines exhibiting monopoly characteristics. Reliance on revenue from competitive sources is significant.
Service Area Characteristics	Very favorable demographic trends characterized by strong customer growth, above-average income levels and low unemployment rates.	Favorable demographic trends characterized by average customer growth, with average income levels or average unemployment rates.	Stable demographic trends characterized by little or no customer growth, and below-average income and above-average unemployment rates.	Weak demographic trends characterized by a declining customer base, well below average wealth levels and high unemployment.
Rate Flexibility	Independent legal ability to increase service rates without external approval.	Legal ability to increase service rates is subject to approval of external authorities. History and expectation of operating and capital costs being recovered on a timely basis is strong.	Legal ability to increase service rates is subject to approval of external authorities. History and expectation that operating and capital costs may not be recovered on a full or timely basis.	Legal ability to increase service rates is subject to approval of external authorities. History and expectation that operating and capital cost recovery will be neither full nor timely.
	Average retail rates are solidly below the state average.	Average retail rates reasonably approximate the state average.	Average retail rates are solidly above the state average.	Average retail rates are well above the state average.
	Electric cost affordability is very high.	Electric cost affordability is high.	Electric cost affordability is midrange.	Electric cost affordability is low.
Asymmetric Rating Factor Considerations	The analysis of an issuer's revenue defensibility also considers the effect of customer concentration, customer mix, industry concentration, wholesale contract structure and counterparty risk on the utility's revenue defensibility.			
Operating Risk				
Operating Cost Burden	Very low operating cost burden.	Low operating cost burden.	Midrange operating cost burden.	High operating cost burden.
Operating Cost Flexibility (Asymmetric Risk Factor)	The analysis of an issuer's operating cost flexibility is an asymmetric risk factor, where weaker elements can constrain the overall assessment of operating risk. Fitch will consider available reserve margin, regional energy markets, fuel concentration, asset concentration, environmental standards, regulatory restrictions and contract structure.			
Capex Requirements	Moderate lifecycle investment needs supported by adequate historical and manageable planned capital investment.	Elevated lifecycle investment needs and supported by adequate historical and manageable planned capital investment.	High lifecycle investment needs that are sufficiently addressed by planned capital investment.	High lifecycle investment needs insufficiently addressed by planned capital investment.
Other Asymmetric Rating Factor Consideration	Resource management, project completion risk and counterparty risks can also constrain the assessment.			
Financial Profile				
Leverage Profile	Refer to the *Rating Positioning* table on page 21.	Refer to the *Rating Positioning* table on page 21.	Refer to the *Rating Positioning* table on page 21.	Refer to the *Rating Positioning* table on page 21.
Liquidity Profile	Liquidity profile is based on coverage of full obligations and liquidity cushion. A weaker liquidity profile can constrain the financial profile assessment.			

Key Rating Factors — Wholesale Public Power Suppliers

Revenue Defensibility	aa	a	bbb	bb
Revenue Source Characteristics	Required revenues are derived from unconditional wholesale contracts that provide for full cost recovery, and the unlimited reallocation of costs among contracted purchasers.	Required revenues are derived from unconditional wholesale contracts that provide for full cost recovery, but include limited reallocation of costs among contracted purchasers.	Required revenues are derived from wholesale contracts that may include some degree of conditionality or no reallocation of costs among contracted purchasers.	Not applicable.
Rate Flexibility	Independent legal ability to increase service rates without external approval.	Legal ability to increase service rates is subject to approval of external authorities. History and expectation of operating and capital costs being recovered on a timely basis is strong.	Legal ability to increase service rates is subject to approval of external authorities. History and expectation that operating and capital costs may not be recovered on a full or timely basis.	Legal ability to increase service rates is subject to approval of external authorities. History and expectation that operating and capital cost recovery will be neither full nor timely.
Purchaser Credit Quality (PCQ)	Very strong purchaser credit quality.	Strong purchaser credit quality.	Midrange purchaser credit quality.	Weak purchaser credit quality.
Asymmetric Rating Factor Considerations	The analysis of revenue defensibility also considers the term, tenor and conditionality of relevant supply contracts, and any reliance on non-utility revenue.			
Operating Risk				
Operating Cost Burden	Very low operating cost burden.	Low operating cost burden.	Midrange operating cost burden.	High operating cost burden.
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Fitch Releases Revised Public Power Rating Criteria

Service Area Characteristics

Metrics to Support Assessment			
(%)	Stronger	Midrange	Weaker
Median Household Income/ U.S Average Median Household Income	> 125	75–125	< 75
Unemployment Ratio/U.S Unemployment Ratio	< 75	75–125	> 125
Five-Year Average Annual Customer Growth Rate	> 1.5	0.0–1.5	< 0.0
Residential Revenue/Total Revenue	> 55	35–55	< 35

- Systems that exhibit characteristics that are all considered midrange, or exhibit an equal number of stronger and weaker characteristics, are considered to be consistent with an ‘a’ assessment; systems that exhibit a greater number of stronger characteristics than weaker characteristics are considered to be consistent with an ‘aa’ assessment; systems that exhibit one or two more weaker characteristics than stronger characteristic would be assessed as ‘bbb’ and ‘bb’, respectively.

Rate Competitiveness

Metric to Support Assessment

- Utility systems with retail rates less than 90% of the state average have rate competitiveness consistent with an ‘aa’ factor assessment; between 90% and 120%, ‘a’; between 121% and 150%, ‘bbb’; and greater than 150%, ‘bb’. However, systems where rate affordability exceeds 3% cannot be assessed higher than ‘a’.

Net Margin and Cash Cushion

Metrics to Support Assessment

- Fitch calculates the net margin and cash cushion as: (net margins + unrestricted cash and investments) / (average daily cash operating expenses).
- Utility systems that have a net margin and cash cushion of 170 days or more have an ‘aa’ factor assessment; between 70 days and 169 days, ‘a’; between 30 days and 69 days, ‘bbb’; and less than 30 days, ‘bb’. However, systems with debt/FADS in excess of 7.0x cannot be assessed higher than ‘a’.

FADS – Funds available for debt service.

- Fitch Ratings: U.S. Public Power Rating Criteria

Rating Positioning

Revenue Defensibility Assessment	Operating Risk Assessment	Financial Profile Assessment Leverage (Net Adjusted Debt/Adjusted FADS) (x) aa	a	bbb	bb
aa	aa	< 10	10–12	12–15	> 15
aa	a	< 8	8–10	10–15	> 15
a	aa	< 8	8–10	10–15	> 15
aa	bbb	< 7	7–9	9–13	> 13
a	a/bbb	< 6	6–8	8–12	> 12
aa	bb	< 5	5–7	7-11	> 11
bbb	aa/a	< 4	4–6	6–10	> 10
a	bb	< 4	4–6	6–10	> 10
bbb	bbb	< 0	0–4	4–6	> 6
bbb	bb	< 0	0–2	2–4	> 4
bb	a/aa	—	< 1	1-3	> 3
bb	bbb	—	< 0	0–2	> 2
bb	bb	—	< (3)	(3)–0	> 0
Suggested Analytical Outcome		**AA**	**A**	**BBB**	**BB**

FADS – Funds available for debt service.

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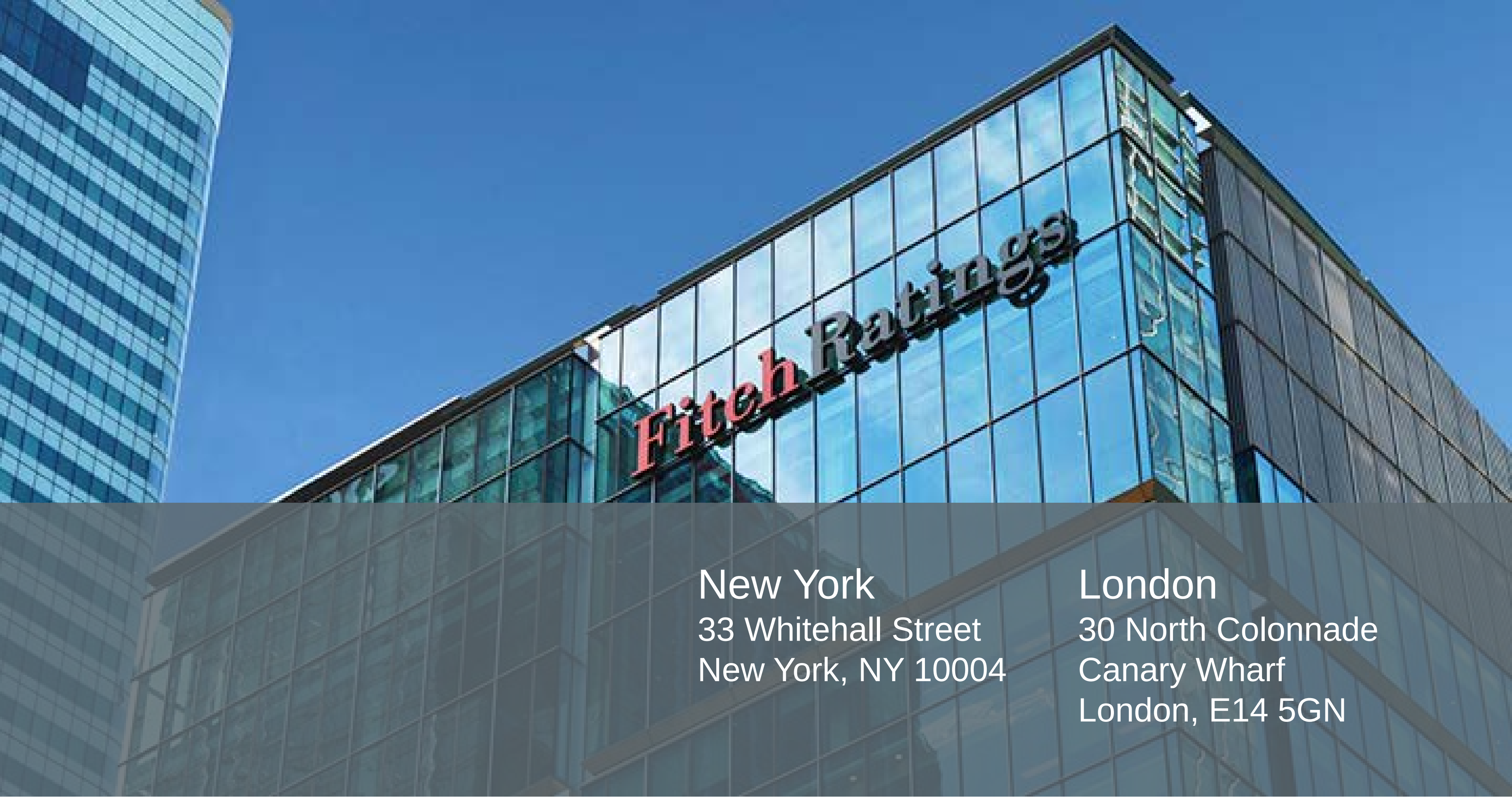

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