MOODY'S
INVESTORS SERVICE

RATING METHODOLOGY

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TABLE OF CONTENTS

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Rating Methodology

US Municipal Joint Action Agencies

This rating methodology replaces the *US Municipal Joint Action Agencies Methodology* published in August 2020. We have reordered and have made editorial updates to various sections of the methodology. These updates do not change our methodological approach.

Scope

This methodology applies to US municipal joint action agencies. JAAs are typically formed by groups of US municipal utilities (participants) and are primarily* engaged in providing energy or related services, such as electric generation, natural gas, electric transmission or telecommunications services, usually to utilities, although some may provide service directly to customers. Participants typically form or join a JAA in order to benefit from economies of scale, cost efficiencies and diversification.

JAA participants share an obligation, through long-term contracts, to pay for a JAA's operating, capital and debt service costs. Some JAAs issue debt for multiple, distinct projects, which are rated individually.

There are two broad types of JAAs, consisting of take-or-pay projects and all-requirement agencies, which are described below. In addition, this methodology applies to municipal community choice aggregators (CCAs), which are not-for-profit entities formed by a municipality or jointly by multiple municipal participants with the goal of giving utility customers a wider choice of power suppliers and to implement strategies such as increased use of renewable energy. This methodology also applies to other types of energy projects with contractual obligations that are substantially similar to those in a JAA. We use a similar approach to rating CCAs that we use for all-requirement agencies, with some small differences in the scorecard for CCAs.

Energy projects that lack the contractual obligations found in JAAs are rated using other methodologies. For example, a power generation project where payments are conditioned on performance, such as required levels of availability, or where there are material limitations on the obligations by its participants to purchase power, would be rated using our methodology that discusses power generation projects.[1]

*The determination of an issuer's primary business is generally based on the preponderance of the issuer's business risks, which are usually proportionate to the issuer's revenues, earnings and cash flows.

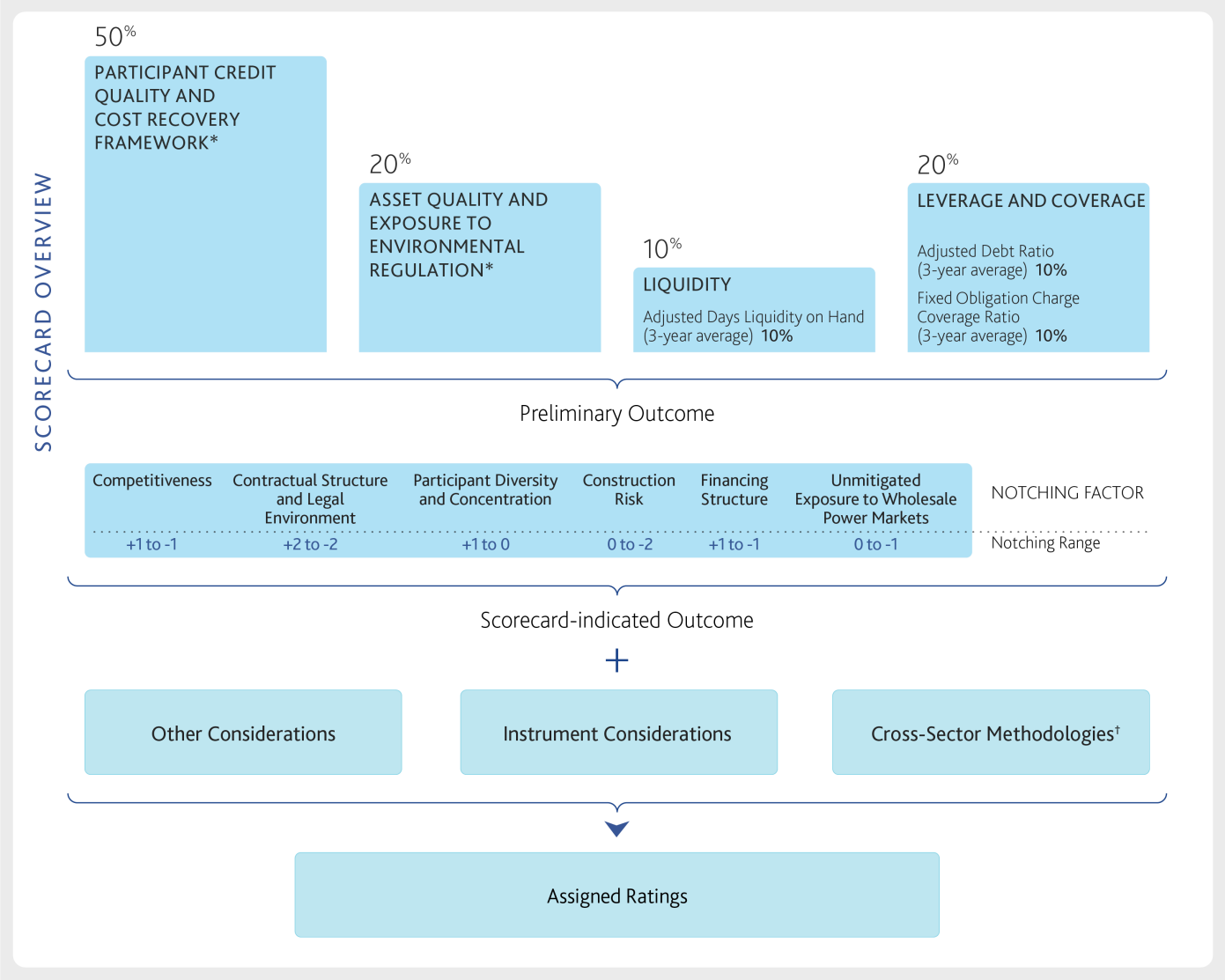
Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of municipal joint action agencies in the US, including the qualitative and quantitative factors that are likely to affect rating outcomes in this sector. We seek to incorporate all material credit considerations in ratings and to take the most forward-looking perspective that visibility into these risks and mitigants permits.

The following schematic illustrates our general framework for the analysis of US municipal joint action agencies, which includes the use of a scorecard.[2] This rating methodology includes two scorecards, one for take-or-pay projects and one for all-requirement agencies.The scorecard-indicated outcome is not expected to match the actual rating for each company. For more information, see the "Other considerations" and "Limitations" sections.

Exhibit 1

Illustration of the US municipal joint action agency take-or-pay methodology framework



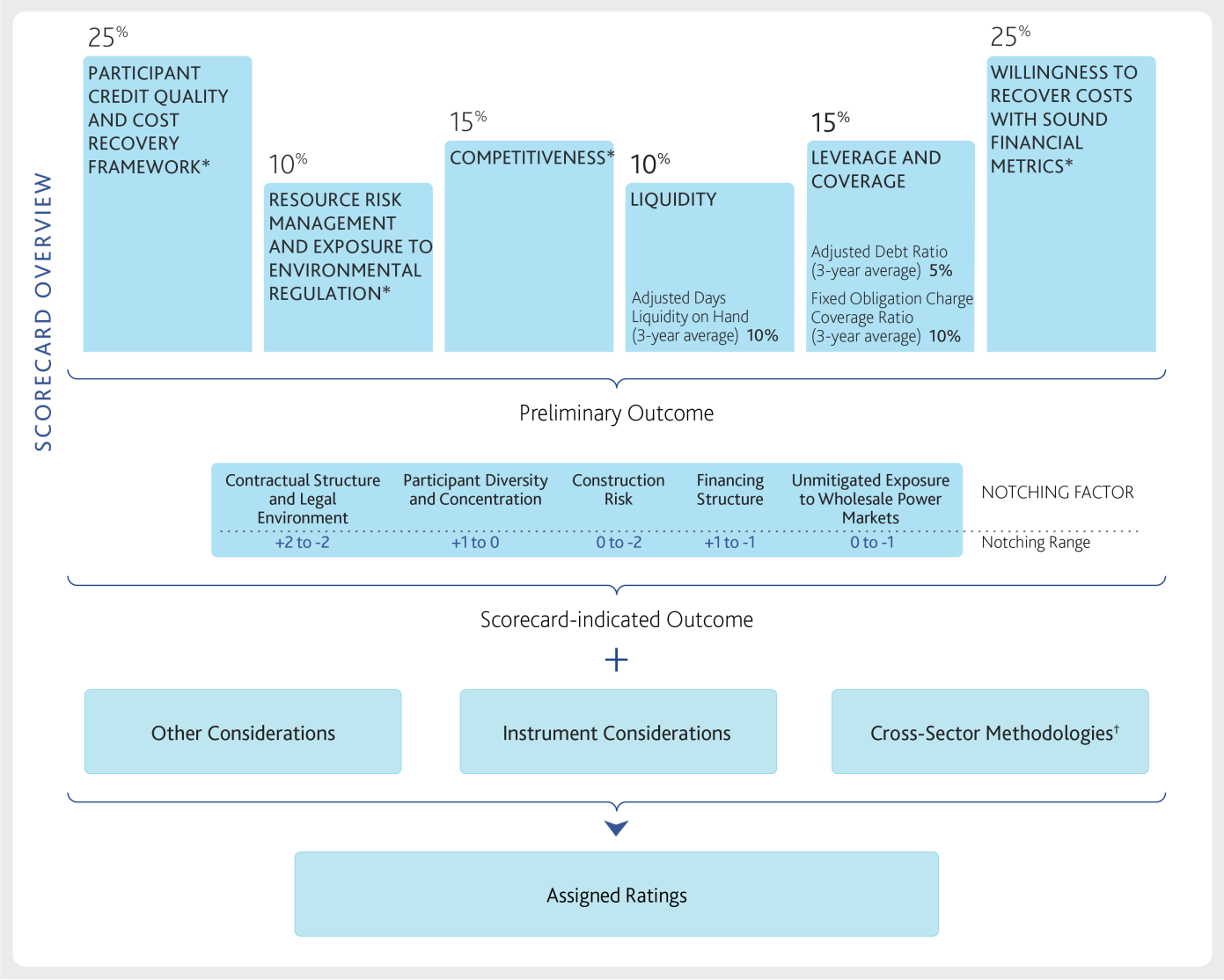
*This factor has no sub-factors.

† Some of the methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

Source: Moody's Investors Service

Exhibit 2

Illustration of the US municipal joint action agency all-requirement agency methodology framework



*This factor has no sub-factors.

† Some of the methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

Source: Moody's Investors Service

US municipal joint action agencies: Take-or-pay scorecard

For general information about how we use the scorecard and for a discussion of scorecard mechanics, please see the "Using the scorecard to arrive at a scorecard-indicated outcome" section. The scorecard does not include or address every factor that a rating committee may consider in assigning ratings in this sector. Please see the "Other considerations" and "Limitations" sections.

Exhibit 3

US municipal joint action agencies take-or-pay scorecard

	Factor or Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Factor: Participant Credit Quality and Cost Recovery Framework (50%)									
Participant Credit Quality and Cost Recovery Framework	50%	Participant credit quality at cap is Aaa. AND JAA and participant rates are unregulated.	Participant credit quality at cap is Aa. AND JAA and participant rates are unregulated.	Participant credit quality at cap is A. AND JAA and participant rates are unregulated.	Participant credit quality at cap is Baa. OR JAA or majority of participant rates are regulated.	Participant credit quality at cap is Ba. OR Quality of governance or cost recovery is inconsistent.	Participant credit quality at cap is B. OR Consistent record of below-average governance or cost recovery.	Participant credit quality at cap is Caa. OR Consistent record of poor governance or cost recovery.	Participant credit quality at cap is Ca. OR Consistent record of very poor governance or cost recovery.
Factor: Asset Quality and Exposure to Environmental Regulation (20%)									
Asset Quality and Exposure to Environmental Regulation	20%	Diversified portfolio of technologically simple, proven assets, with minimal reinvestment requirements and virtually no moving parts; no exposure to environmental regulation.	Diversified portfolio of technologically simple, proven assets with limited reinvestment requirements and minimal moving parts; very limited exposure to environmental regulation.	Diversified portfolio of largely simple, proven assets across technologies; modest, predictable reinvestment requirements; limited exposure to environmental regulation.	Portfolio or single asset that is commercially proven but somewhat technologically complex; ongoing capital investment requirements; moderate exposure to environmental regulation.	Single asset with some technological complexities and some operating challenges; potentially material maintenance and reinvestment requirements; moderately high exposure to environmental regulation.	Single asset with significant technological complexities or significant operating challenges; major reinvestment requirements; high exposure to environmental regulation.	Single asset with largely unproven technology or poor performance; significant reinvestment requirements; very high exposure to environmental regulation.	Single asset with unproven technology or very poor performance; requires substantial additional investment to operate; compliance with environmental regulation in doubt.
Factor: Liquidity (10%)									
Adjusted Days Liquidity on Hand (3-year average)[*1]	10%	≥ 250	175 - 250	100 - 175	30 - 100	15 - 30	10 - 15	5 - 10	< 5
Factor: Leverage and Coverage (20%)									
Adjusted Debt Ratio (3-year average)[*2]	10%	≤ 25%	25% - 50%	50% - 75%	75% - 150%	150% - 225%	225% - 250%	250% - 275%	> 275%

	Factor or Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Factor: Leverage and Coverage (20%)									
Fixed Obligation Charge Coverage Ratio (3-year average)[*3]	10%	≥ 3x	2.2x - 3x	1.6x - 2.2x	1x - 1.6x	0.9x - 1x	0.75x - 0.9x	0.5x - 0.75x	< 0.5x
Notching factor									
Competitiveness									
+1 to -1 notches									
Contractual Structure and Legal Environment									
+2 to -2 notches									
Participant Diversity and Concentration									
+1 to 0 notches									
Construction Risk									
0 to -2 notches									
Financing Structure									
+1 to -1 notches									
Unmitigated Exposure to Wholesale Power Markets									
0 to -1 notches									

Source: Moody's Investors Service

US municipal joint action agencies: All-requirement agency scorecard

For general information about how we use the scorecard and for a discussion of scorecard mechanics, please see the "Using the scorecard to arrive at a scorecard-indicated outcome" section. The scorecard does not include or address every factor that a rating committee may consider in assigning ratings in this sector. Please see the "Other considerations" and "Limitations" sections.

Exhibit 4

US municipal joint action agencies: All-requirement agency scorecard

	Factor or Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Factor: Participant Credit Quality and Cost Recovery Framework (25%)									
Participant Credit Quality and Cost Recovery Framework	25%	Weighted average Aaa participant credit quality. AND JAA and participant rates are unregulated. For CCAs, robust monopoly position with automatic enrollment of all customers in service area with almost no customer opt-out history and proven unregulated rate setting; very strong customer base and service area economy; municipal participants are of the highest credit quality.	Weighted average Aa participant credit quality. AND JAA and participant rates are unregulated. For CCAs, quasi-monopoly position with automatic enrollment of all customers in service area with narrow and very limited customer opt-out history; proven unregulated rate setting; strong customer base and service area economy; municipal participants have very high credit quality.	Weighted average A participant credit quality. AND JAA and participant rates are unregulated. For CCAs, quasi-monopoly position with automatic enrollment of all customers in service area with limited customer opt-out history; proven unregulated rate setting; above-average customer base and service area economy; municipal participants have high credit quality.	Weighted average Baa participant credit quality. OR JAA or majority of participant rates are regulated. For CCAs, limited monopoly with automatic enrollment of all customers in service area but with some customer opt-out ability; self-regulated rates with limited history; more than 40% of total energy sales to Industrial and large commercial customers; municipal participants have average credit quality; average customer base and service area economy.	Weighted average Ba participant credit quality. OR Quality of governance or cost recovery is inconsistent. For CCAs, regulation of rates by state with some inconsistency or self-regulated rates with very limited history; service area has no automatic inclusion of all customers but competition is limited and customer growth and retention is moderate; more than 60% of total energy sold to Industrial and large commercial customers; municipal participants have below-average credit quality; weak customer base and service area economy.	Weighted average B participant credit quality. OR Consistent record of below-average governance or cost recovery. For CCAs, regulation of rates by state is unpredictable or ability to self-regulate rates is uncertain; no automatic enrollment of customers in service area, which is subject to competition, with weak customer growth and retention; municipal participants have weak credit quality; very weak customer base and service area economy.	Weighted average Caa participant credit quality. OR Consistent record of poor governance or cost recovery. For CCAs, regulation of rates is unpredictable or ability to self-regulate is highly uncertain; service area subject to intense competition, leading to material customer losses; municipal participants have low credit quality; extremely weak customer base or service area economy.	Weighted average Ca participant credit quality. OR Consistent record of very poor governance or cost recovery. For CCAs, regulation of rates is unpredictable, with material legal challenges; service area is subject to intense competition, leading to substantial customer losses; municipal participants have very low credit quality; weakest customer base and service area economy.

	Factor or Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Factor: Resource Risk Management and Exposure to Environmental Regulation (10%)									
Resource Risk Management and Exposure to Environmental Regulation	10%	Exceptional energy resource risk management. Less than 10% power market purchases. OR Diverse, proven assets. Single asset or fuel less than 20% of energy resource mix. OR Long-term, competitive supply contract with Aaa rated supplier. No exposure to environmental regulation.	Very strong energy resource risk management. 10%-20% from power market purchases. OR Somewhat diverse, proven assets. Single asset or fuel comprises 20%-40% of the energy resource mix. OR Long-term, competitive supply contract with Aa rated supplier. Limited exposure to environmental regulation.	Strong energy resource risk management. 20%-30% from power market purchases. OR Some proven assets. Single asset or fuel comprises 41%-55% of the energy resource mix. OR Well-managed portfolio of supply contracts with moderately strong suppliers. Manageable exposure to environmental regulation.	Average energy resource risk management. 30%-40% from power market purchases. OR Single asset or fuel provides 56%-75% of the energy resource mix. OR Adequately managed supply portfolio with suppliers of average strength. Moderate exposure to environmental regulation.	Below-average energy resource risk management. 40%-60% from power market purchases. OR Single asset or fuel provides over 76%-100% of the energy resource mix. OR Adequately managed supply portfolio with moderately weak suppliers. Moderately high exposure to environmental regulation.	Relatively weak energy resource risk management. 60%-70% from power market purchases. OR Assets with unproven technology. OR Adequately managed supply portfolio with weak suppliers. High exposure to environmental regulation.	Poor energy resource risk management. 70%-80% from power market purchases. OR Assets with unproven technology or history of problems. OR Poorly managed supply portfolio with very weak suppliers. Very high exposure to environmental regulation.	Very poor energy resource risk management. More than 80% from power market purchases. OR Assets with unproven technology or history of problems. OR Very poorly managed supply portfolio with Ca or lower rated suppliers. Compliance with environmental regulation in doubt.
Factor: Competitiveness (15%)									
Competitiveness	15%	Extremely competitive current and expected rates in the region or compared with neighboring utilities on a consistent basis (e.g., average rates more than 25% below regional average); virtually no material prospective cost pressures that could lead to higher rates.	Very competitive current and expected rates in the region or compared with neighboring utilities on a consistent basis (e.g., average rates range from 10% to 25% below regional average); very low likelihood of material prospective cost pressures that could lead to higher rates.	Competitive current and expected rates in the region or compared with neighboring utilities on a consistent basis (e.g., average rates range from 10% below regional average to 10% above regional average); modest likelihood of material prospective cost pressures that could lead to higher rates.	Current and expected rates in the region or compared with neighboring utilities are sometimes competitive or moderately uncompetitive (e.g., average rates range from 10% to 30% above regional average); high likelihood of material prospective cost pressures that could lead to higher rates.	Uncompetitive current or expected rates in the region or compared with neighboring utilities on a consistent basis (e.g., average rates range from 30% to 50% above regional average); or high likelihood of imminent, material prospective cost pressures that could lead to higher rates.	Very uncompetitive current or expected rates in the region or compared with neighboring utilities on a consistent basis (e.g., average rates range from 50% to 70% above regional average); or very high likelihood of imminent, material prospective cost pressures that could lead to higher rates.	Extremely uncompetitive current or expected rates in the region or compared with neighboring utilities on a consistent basis (e.g., average rates range from 70% to 90% above regional average); or extremely high likelihood of imminent, material prospective cost pressures that could lead to higher rates.	Irreparably uncompetitive current or expected rates in the region or compared with neighboring utilities on a consistent basis (e.g., average rates more than 90% above regional average); or currently in a period of persistent cost pressures that are causing material rate increases.

	Factor or Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Factor: Liquidity (10%)									
Adjusted Days Liquidity on Hand (3-year average)[*4]	10%	JAA: ≥ 250 CCA: ≥ 300	JAA: 150 - 250 CCA: 200 - 300	JAA: 90 - 150 CCA: 120 - 200	JAA: 45 - 90 CCA: 90 - 120	JAA: 30 - 45 CCA: 60 - 90	JAA: 20 - 30 CCA: 30 - 60	JAA: 10 - 20 CCA: 15 - 30	JAA: < 10 CCA: < 15
Factor: Leverage and Coverage (15%)									
Adjusted Debt Ratio (3-year average)[*5]	5%	≤ 50%	50% - 70%	70% - 100%	100% - 150%	150% - 200%	200% - 250%	250% - 275%	> 275%
Fixed Obligation Charge Coverage Ratio (3-year average)[*6]	10%	≥ 2x	1.4x - 2x	1.2x - 1.4x	1.1x - 1.2x	1x - 1.1x	0.75x - 1x	0.5x - 0.75x	< 0.5x
Factor: Willingness to Recover Costs with Sound Financial Metrics (25%)									
Willingness to Recover Costs with Sound Financial Metrics	25%	Strong rate-setting record. Rates likely to result in maintenance of financial metrics consistent with the Aaa category.	Above-average rate-setting record. Rates likely to result in maintenance of financial metrics consistent with the Aa category.	Adequate rate-setting record. Rates likely to result in maintenance of financial metrics consistent with the A category.	Below-average rate-setting record. Rates likely to result in maintenance of financial metrics consistent with the Baa category.	Rate-setting record that is well below average. Rates likely to result in maintenance of financial metrics consistent with the Ba category.	Weak rate-setting record. Rates likely to result in maintenance of financial metrics consistent with the B category.	Very weak rate-setting record. Rates likely to result in maintenance of financial metrics consistent with the Caa category.	Insufficient rate-setting and history of lack of cost recovery.

Notching factor
Contractual Structure and Legal Environment
+2 to -2 notches
Participant Diversity and Concentration
+1 to 0 notches
Construction Risk
0 to -2 notches
Financing Structure
+1 to -1 notches
Unmitigated Exposure to Wholesale Power Markets
0 to -1 notches

[1] For the linear scoring scale, the Aaa endpoint value is 400. A value of 400 or better equates to a numeric score of 0.5. The Ca endpoint value is zero. A value of zero equates to a numeric score of 20.5.
[2] For the linear scoring scale, when total capital assets (net of accumulated depreciation) plus net working capital is positive, the Aaa endpoint value is 0%. A value of 0% or better equates to a numeric score of 0.5. The Ca endpoint value is 300%. A value of 300% or worse equates to a numeric score of 20.5. When total capital assets (net of accumulated depreciation) plus net working capital is negative or zero and total debt (net of debt service funds and debt service reserve funds) plus ANPL is positive, the numeric score is 20.5. When total capital assets (net of accumulated depreciation) plus net working capital is negative or zero and total debt (net of debt service funds and debt service reserve funds) plus ANPL is negative or zero, the numeric score is 0.5.
[3] For the linear scoring scale, the Aaa endpoint value 3.5x. A value of 3.5x or better equates to a numeric score of 0.5. The Ca endpoint value is 0x. A value of 0x or worse equates to a numeric score of 20.5.
[4] For the linear scoring scale for all-requirement agencies, the Aaa endpoint value is 400. A value of 400 or better equates to a numeric score of 0.5. The Ca endpoint value is zero. A value of zero equates to a numeric score of 20.5. For the linear scoring scale for CCAs, the Aaa endpoint value is 450. A value of 450 or better equates to a numeric score of 0.5. The Ca endpoint value is zero. A value of zero equates to a numeric score of 20.5.
[5] For the linear scoring scale, when total capital assets (net of accumulated depreciation) plus net working capital is positive, the Aaa endpoint value is 0%. A value of 0% or better equates to a numeric score of 0.5. The Ca endpoint value is 300%. A value of 300% or worse equates to a numeric score of 20.5. When total capital assets (net of accumulated depreciation) plus net working capital is negative or zero and total debt (net of debt service funds and debt service reserve funds) plus ANPL is positive, the numeric score is 20.5. When total capital assets (net of accumulated depreciation) plus net working capital is negative or zero and total debt (net of debt service funds and debt service reserve funds) plus ANPL is negative or zero, the numeric score is 0.5.
[6] For the linear scoring scale, the Aaa endpoint value 2.5x. A value of 2.5x or better equates to a numeric score of 0.5. The Ca endpoint value is 0x. A value of 0x or worse equates to a numeric score of 20.5.
Source: Moody's Investors Service

Sector overview

Take-or-pay projects

A JAA that operates as a take-or-pay project typically includes a contract that extends at least to debt maturity, has a defined asset or group of assets that produce or deliver energy, and has a fixed share for each participant. A typical take-or-pay contract requires participants to pay their respective share of all costs regardless of whether any energy is produced or delivered. A take-or-pay JAA project has no firm obligation to deliver any energy resource to its participants. Neither participants nor their shares typically change in a take-or-pay JAA project. In rare circumstances, a participant may be allowed to leave, although it would likely be required to continue to pay its share of the JAA's outstanding debt, either directly or by the assumption of the obligation by another purchaser acceptable to all of the JAA's participants.

All-requirement agencies

A JAA operating as an all-requirement agency generally has an obligation to meet all of its participants' energy resource needs, and participants pay for energy delivered. An all-requirement agency's energy resource portfolio typically consists of a changing mixture of supply contracts and physical assets to match participants' energy resource requirements. Additionally, a participant's share of a JAA can change depending on its energy resource needs relative to other members. Participants may be allowed to join an operating all-requirement agency, and in some cases may be allowed to leave it, although they would likely be required to pay a termination fee or fulfill their share of the obligations that the JAA incurred prior to the participants' exit.

Discussion of the scorecard factors

In this section, we explain our general approach for scoring each scorecard factor or sub-factor, and we describe why they are meaningful as credit indicators.

Factor: Participant Credit Quality and Cost Recovery Framework (Take-or-Pay Projects – 50% weight, All-Requirement Agencies – 25% weight)

Why it matters

Participant credit quality is an important indicator of the credit strength of a JAA and the ability of a JAA's members to fulfill contractual obligations. Under a JAA take-or-pay contract, participants must pay for all costs, including operating expenses, capital expenditures and debt service requirements. Under an all-requirements contract, the JAA can set rates at a level that results in full cost recovery. Cost recovery framework is an important indicator of a JAA's authority to establish rates for participants at a level that allows it to meet operating expenses and pay debt service.

Participant Credit Quality

Participant credit quality has relatively greater importance for take-or-pay projects than for all-requirement agencies given the narrower business profile and stronger contract terms of take-or-pay projects. Because of the importance of participant credit quality, a typical JAA's rating is generally capped to no more than two notches higher than the weighted average participant credit quality because the participants are the primary source of cash flow. If the weighted average participant credit quality is Baa or below, the JAA's rating is likely to be capped at two notches above the weakest participants' credit quality for all requirement agencies or at the weakest participants' credit quality for a take-or- pay project (as described below).

Cost Recovery Framework and Governance

The extent of rate regulation is an important indicator of a JAA's ability to recover costs in a timely manner. External regulation of rates can impede a JAA's ability to increase revenue sufficiently to match expenses. JAA governance is also an important element of the cost recovery framework because poor governance may result in participants challenging their contractual obligations, which can disrupt timely cash flow and cost recovery for the JAA.

How we assess it for the scorecard

Scoring for this factor is based on two sub-factors: Participant Credit Quality; and Cost Recovery Framework and Governance.

PARTICIPANT CREDIT QUALITY:

Weighted Average Credit Quality

We consider the weighted average credit rating of the participants in a JAA. We arrive at a weighted average credit rating by multiplying each participant's percentage share in the JAA by the expected loss indicated by the participant's credit rating (or equivalent) based on Moody's 10-year expected loss tables,[3] and then by summing the results. This weighted average expected loss is then mapped back to a rating equivalent based on Moody's 10-year idealized expected loss tables. Cutoff points between alphanumeric equivalents are based on the geometric mean of their expected loss.

Rating Input and Evaluating Credit Quality in the Absence of a Rating

If the participant has an electric system revenue bond rating, we use it as the credit rating input.

If the participant does not have an electric system revenue bond rating but the general obligation (GO) of the municipality that owns the utility is rated, we typically use the municipality's GO rating as a starting point and make a downward notching adjustment. The downward adjustment is typically one notch, or two notches in cases where the GO rating includes structural enhancements (e.g., an effective lockbox). Where we consider that the utility has heightened enterprise risk, we may use a rating equivalent that is two or more notches below the GO rating.

If the municipality is not rated and the participant's share in the JAA is more than 5% we may assign a credit estimate.[4]

If the municipality is unrated and the participant's share in the JAA is less than 5%, we may use a scorecard-generated, unpublished, point-in-time estimate of approximate credit quality, called a Q-score, to assess the municipality's credit quality. For the calculation of the weighted average credit quality, we make at least a one notch downward adjustment to the Q-score to reflect the limited and primarily historical information used in the assessment. In cases where the Q-score is used and the participant's share is 3% or greater, we make at least a two notch downward adjustment.

If the municipality is unrated and we do not have sufficient information to assess the credit quality of the municipality, we use an assumed rating of Ba2.

Capping Based on Weakest Participants' Credit Quality – Take-or-Pay

For take-or-pay projects, we generally cap the score for participant credit quality at the lower of (i) the weighted average participant credit quality; or (ii) two notches above the bottom (weakest) quintile participant credit quality. We typically consider the bottom quintile participant credit quality to be at the level of the participant with the highest credit quality (as described above) among the group that represents the lowest 20% of the pool's credit quality by combined proportionate share of the JAA obligation. Effectively, we sum the participation share of each participant in order, ranked from lowest to highest credit quality, until we reach 20%. The lowest quintile credit quality is the credit quality of the first participant whose share causes the sum to reach or exceed 20%. Normally, this is the participant that straddles the boundary between the credit quality of the top 80% and the bottom 20% of the pool. For example, if the weighted average participant credit quality is Aa2 but the credit quality of the participant at or straddling the lowest quintile is A3, the JAA is likely to be scored at A1 for this factor.

We use this threshold because the typical 25% step-up provision in a take-or-pay contract means that participants with a combined share of 20% or less can default before increased revenue from the remaining participants becomes insufficient to cover operating and debt expenses. A step-up provision requires participants to increase their respective share to cover that of defaulted or exiting members.

The limit of two notches above the lowest quintile participant's credit quality for take-or-pay projects reflects the higher default probability of a JAA with participants of low credit quality, which may not be fully apparent in the weighted average.

If the step-up provision is lower than 25%, we may consider a different threshold. For example, a take-or-pay project with a 15% step up would allow for participants with an aggregate 13% share to default before the step-up obligation of non-defaulting members would be insufficient to cover the defaulters' obligations. Thus, in this example, we would factor in the credit quality of a participant at

or straddling the boundary between the lower 13th percentile and upper 87th percentile of all participants ranked by credit quality, and the factor score would typically be capped at two notches above this level of credit quality.

Effect of Credit Quality Score on Other Factors – Take-or-Pay Only

The relative importance of participant credit quality for take-or-pay projects is also reflected in the scoring for the other factors. For these factors, we take the higher of either (i) the factor score or; (ii) the score for the Participant Credit Quality and Cost Recovery Framework factor. If we score the Participant Credit Quality and Cost Recovery Framework factor higher than the baseline factor or sub-factor assessments of the other factors for a take-or-pay project, participant credit quality effectively represents 100% of the weight in the scorecard before notching factors.

However, if a baseline factor assessment is at Ba or lower, we use the baseline factor assessment even if the Participant Credit Quality and Cost Recovery Framework factor receives a higher score. This approach reflects our view that speculative grade characteristics, such as poor asset quality or uncompetitive costs, increase the probability that participants will challenge their obligations to the take-or-pay contract.

For example, if we score the Participant Credit Quality and Cost Recovery Framework factor at A2 in a take-or-pay project, and the project has a 1.1x fixed obligation charge coverage ratio, which typically results in a baseline sub-factor assessment of Baa for this sub-factor, the final scoring for this sub-factor is typically an A2. For the same project, if the fixed obligation charge coverage ratio is 0.95x, the final scoring for this sub-factor is typically a Ba.

Considering Weakest Participants' Credit Quality in All-Requirement JAAs

For all-requirement agencies, we do not explicitly incorporate the weakest participant's credit quality in this factor score, because participants' proportionate share of the JAA obligation can change over time, driven by changing resource requirements or the entry or exit of participants. However, where there is a substantial differential between the bottom quintile participant credit quality and the weighted average, we may consider a lower cap for the score. Many all-requirement agency contracts do not cap non-defaulting member step-up obligations, so stronger participants may be asked to increase their payments if a participant fails to pay. Additionally, most all-requirement agency contracts allow a JAA to raise rates to recover costs, including raising rates as a result of a defaulting member. If an all-requirement agency does not have the authority to recover a defaulted participant's share of the JAA costs through rate increases, we may place greater weight on the weakest participant's credit quality in scoring for this factor.

COST RECOVERY FRAMEWORK:

In assessing a JAA's cost recovery framework, we typically consider if a JAA or its participants are rate regulated by a third party (as opposed to unregulated or self-regulated by the entity's governing body, e.g., board of directors) and the extent of any regulation. For example, if a JAA or a majority of its participants are fully rate regulated, the JAA may receive a lower score than would be indicated based on participant credit quality.

We typically consider other cost recovery framework and governance issues that may result in extensive delays to rate changes, insufficient recovery of costs, member challenges to contractual obligations, or other outcomes. For example, we may score a JAA with participants that are challenging their contractual obligations as B or below, even if the participant credit quality is higher than B.[5]

In assessing a CCA's cost recovery framework, we typically consider the strength of the CCA's monopoly on service, including whether it includes automatic enrollment of customers and their ability to opt out, as well as the extent of any rate regulation, the strength of the service area economy, and the credit quality of its municipal participants.

Factor: Asset Quality and Exposure to Environmental Regulation (Take-or-Pay Projects - 20% weight) or Resource Risk Management and Exposure to Environmental Regulation (All-Requirement Agencies - 10% weight)

Why it matters

Asset quality and resource risk management are important because they directly affect the quality of service. Exposure to environmental regulation is also important because it can result in significant additional capital costs that are likely to be passed on to participants through increased rates. Participant support for the JAA, which is largely based on customer satisfaction and the

cost of service, can result in greater participant willingness to meet the revenue requirements that help the JAA maintain its financial condition.

Assets that use simple, proven technology and that require minimal reinvestment, such as transmission lines, typically pose less risk to a JAA's operations than assets that use more complex technology. While essentially all power generation entails more technological complexity than transmission, some types, such as nuclear power plants, are highly complex from a technical and operational perspective. Other types of plants may require significant reinvestment due to evolving environmental regulation, such as coal-fired power plants facing stringent emission standards.

Poorly operating JAA assets, poor resource risk management or the cost of compliance with environmental regulation can increase all-in costs for the energy resource while also potentially inducing participants to seek alternative energy resources outside of the JAA. A JAA's inability to deliver its resource at competitive rates may cause participants to challenge their contractual obligations.

All-requirement agencies typically meet their participants' resource requirements through a combination of owned assets and contractual agreements with energy suppliers. An all-requirement agency's broad energy resource risk management is a stronger indicator of credit quality than asset quality alone.

How we assess it for the scorecard

Scoring for this factor is based on our assessment of asset quality and exposure to environmental regulation (take-or-pay projects), or resource risk management and exposure to environmental regulation (all-requirement agencies).

ASSET QUALITY AND EXPOSURE TO ENVIRONMENTAL REGULATION:

In assessing asset quality for take-or-pay projects, we consider the diversity of the project's energy assets, its technological complexity, the quality of the project operator and the project's exposure to environmental compliance costs. We consider whether a take-or-pay project consists of a single asset or whether it benefits from the operational diversity of having multiple assets. For example, having more power plants can reduce the potential impact of an outage at any one plant.

Take-or-pay projects scored in the Aaa and Aa categories generally have simple, proven assets with few (if any) moving components, such as electric transmission lines, and have limited or no exposure to environmental regulation. A take-or-pay JAA scored in the A category would typically have a diverse portfolio of assets with strong operating performance that covers a range of proven technologies and would typically have manageable exposure to environmental regulation. Where the take-or pay JAA has a portfolio with limited diversification or a single asset, such as a gas-fired power plant with a good operating track record and moderate exposure to environmental regulation, it is typically scored in the Baa category. Assets that would typically be in the Ba or B categories could include those with operating challenges or projects that require sizable new investment to meet environmental compliance rules. A take-or-pay JAA with a poor operating history or new unproven technology would typically score in the Caa or Ca categories.

Additionally, we typically consider the resource operator's ability to ensure cost-effective and reliable operations. We typically review statistics such as availability factor (percentage of time a unit is operational); capacity factor (percentage of rated capacity the generation unit runs); and heat rates (efficiency of a generator to convert fuel into electrical energy) for power generation assets.

For a take-or-pay project whose baseline asset quality is at Baa or higher, the scoring for this factor is the higher of (i) the score assessed for the Participant Credit Quality and Cost Recovery Framework factor; or (ii) the baseline factor assessment. This reflects our view that strong asset quality reduces the likelihood that JAA participants may challenge their obligations. If asset quality is at least moderately strong (i.e., in the Baa category or better), a take-or-pay project with stronger participant credit quality mitigates somewhat weaker asset quality.

RESOURCE RISK MANAGEMENT AND EXPOSURE TO ENVIRONMENTAL REGULATION:

In assessing this factor for all-requirement agencies, we typically consider a JAA's overall energy resource supply mix, asset quality, energy resource supply contract terms and counterparties, exposure to environmental compliance costs, and the JAA's strategic plans to ensure an affordable and reliable energy resource for participants.

We also typically consider whether the diversity of a JAA's energy resource mix enhances the JAA's flexibility to manage resource demand and limit its exposure to volatile commodity and energy market prices, disruptions in the delivery of a resource or increased costs associated with a particular energy asset, such as the cost of environmental compliance.

Where an all-requirement agency relies heavily on energy from third-party resource suppliers through contracts, we typically consider the diversity and credit quality of the energy resource suppliers, typically as reflected in their ratings. Where the supplier is unrated, we may assign a credit estimate. In cases where the contract with the supplier could be easily replaced on similar commercial terms or if the JAA's exposure to the supplier is modest due to a diverse supply portfolio, we may consider that the credit quality of the supplier is not material to the analysis. We also typically consider key terms of the supply contracts, such as maturity, payment provisions and the amount of the contracted resource.

For all-requirement agencies, the score for this factor is typically based on the weakest element in the JAA's resource risk management. For example, if a JAA has a single asset, or the concentration of the type of fuel it provides ranges from 56% to 75% but it purchases 10% of its fuel on the wholesale market, or it faces moderate environmental regulation, the JAA is likely to receive a score in the Baa category for this factor because the asset or fuel concentration, or costs related to compliance with environmental rules is the dominant risk.

Factor: Competitiveness (All-Requirement Agencies - 15% weight)

Why it matters

The competitiveness of a JAA's energy resource is an important indicator of its ability to attract and retain participants. A JAA with more competitive energy prices or a strong monopoly position has greater flexibility to raise rates compared with one whose rates are already high or that faces significant competition.

How we assess it for the scorecard

In assessing cost competitiveness, we consider an all-requirement agency's rates relative to those charged by comparable energy resource providers in the region on a historical and forward-looking basis, typically over a three-year period. For power all-requirement agencies, we consider rates charged by other power all-requirement agencies, generation and transmission (G&T) cooperatives or other comparable energy service providers. To the extent wholesale energy market information or peer rate data is unavailable, we may assess JAA participants' retail rates against regional competitors as an indirect measure of the JAA's competitiveness because energy costs typically represent a sizable component of retail rates.

Competitiveness may effectively receive a greater weight in our analysis if it is scored Ba or lower.

Factor: Liquidity (Take-or-Pay Projects – 10% weight, All-Requirement Agencies –10% weight)

Why it matters

Liquidity is an important indicator of a JAA's ability to manage business risks, maintain financial operations and pay debt service. Strong liquidity enables a JAA to better withstand unexpected events, such as outages and commodity price volatility as well as economic downturns, deterioration in participant credit quality and disputes among participants. Liquidity also provides a JAA with time to phase in rate changes when needed.

The all-requirement agencies scorecard has different thresholds for adjusted days liquidity on hand for CCAs, reflecting somewhat higher volatility and seasonality for CCA cash flows than for all-requirement agencies.

This factor comprises one sub-factor:

Adjusted Days Liquidity on Hand

Adjusted days liquidity on hand is an important indicator of a JAA's ability to meet day-to-day operating cash flow requirements and to have access to cash for unforeseen events.

How we assess it for the scorecard

Scoring for this factor is based on one sub-factor: Adjusted Days Liquidity on Hand.

ADJUSTED DAYS LIQUIDITY ON HAND:

The numerator is a JAA's unrestricted cash and investments and eligible bank lines of credit multiplied by 365 (the number of days in a year), and the denominator is the JAA's annual operating and maintenance expenses, less depreciation and amortization costs. In considering this metric on a historical basis, we typically use a three-year average of the annual ratios for the three most recent fiscal years.

In assessing the eligibility of a JAA's bank credit line, we typically consider the tenor of the agreement and restrictions or covenants that can affect the bank line's availability during unexpected market events or JAA credit stress. We typically exclude bank lines from counterparties with weak credit quality, or when the bank lines expire in less than a year, from the numerator of the ratio. We may include bank lines that expire in less than a year where renewal or replacement is likely.

We also typically review a JAA's bank line documentation to identify any language that may potentially block a borrower's access to credit, including any material adverse change (MAC) clauses. A MAC clause is a legal provision within a credit agreement that gives lenders the right to refuse to fund a commitment should the borrower experience sufficiently adverse business or economic developments. Adverse conditions may include many undefined points that a bank may cite to delay or avoid a funding requirement. We include a bank credit line in our assessment only if we consider that its terms contain no material restrictions on the line's availability during a potential draw on the facility.

If a take-or-pay project's baseline liquidity assessment scores Baa or higher, the final score for that sub-factor is the higher of (i) the score used in the Participant Credit Quality and Cost Recovery Framework factor or; (ii) the baseline sub-factor score. This reflects our view that stronger Participant Credit Quality and Cost Recovery Framework factor scores are generally more important than financial metrics, unless those metrics are quite weak.

Factor: Leverage and Coverage (Take-or-Pay Projects – 20% weight, All-Requirement Agencies – 15% weight)

Why it matters

Leverage and coverage measures are important indicators of a JAA's ability to pay debt service. High leverage or low coverage may pressure a JAA to make more frequent and larger rate increases in order to meet debt obligations while maintaining sufficient operating and capital funding.

The difference in financial metric thresholds for take-or-pay projects and all-requirement agencies reflects the different business risks that these JAAs undertake.

This factor comprises two sub-factors:

Adjusted Debt Ratio

The ratio of debt to assets is an important measure of a JAA's balance sheet leverage.

Fixed Obligation Charge Coverage Ratio

The coverage of debt by net revenue is an important indicator of a JAA's ability to pay interest and other fixed charges from its operating cash flow.

How we assess it for the scorecard

Scoring for this factor is based on two sub-factors: Adjusted Debt Ratio; and Fixed Obligation Charge Coverage Ratio.

If we assess a take-or-pay project's baseline sub-factor assessment at Baa or higher, the final score for that sub-factor is the higher of (i) the score used in the Participant Credit Quality and Cost Recovery Framework factor; or (ii) the baseline sub-factor assessment. This reflects our view that stronger Participant Credit Quality and Cost Recovery Framework factor scores are generally more important than financial metrics, unless those metrics are quite weak.

ADJUSTED DEBT RATIO:

The numerator is total debt (net of debt service funds and debt service reserve funds) plus the adjusted net pension liability (ANPL),[6] and the denominator is total capital assets (net of accumulated depreciation) plus net working capital. We use a three-year average of the annual ratios for the most recent three fiscal years.

FIXED OBLIGATION CHARGE COVERAGE RATIO:

The numerator is gross revenue minus operating expenses (excluding depreciation, amortization and the debt portion of the take-or-pay contractual payment, when applicable). Operating expenses are adjusted to exclude non-cash pensions and other post-employment benefit (OPEB) expenses. The denominator is debt service on all JAA debt plus the debt portion of the take-or-pay contractual payment, where applicable. In considering this metric on a historical basis, we typically use a three year average of the annual ratios for the most recent three fiscal years.

We reclassify the debt portion of the take-or-pay contractual payment from an operating expense to a debt expense to better compare a JAA that finances its generation assets on its balance sheet with one that finances its assets off balance sheet through a separate take-or-pay project.

We may apply adjustments to the fixed obligation charge coverage ratio calculation for accounting adjustments, timing of payments or other technical issues that could obscure an accurate assessment of coverage. For example, we adjust debt service to include interest on bank loans and capital lease obligations.

Factor: Willingness to Recover Costs with Sound Financial Metrics (All-Requirement Agencies - 25% weight)

Why it matters

An all-requirement agency's willingness to recover costs through sufficient and timely rate increases provides important indications of its ability to maintain its financial strength and pay debt service.

We consider this factor only for all-requirement agencies, whose business models are typically broader and more complex than those of take-or-pay projects and whose contractual relationships with participants are typically on a take-and-pay basis, with participants paying the rates set by the JAA for energy delivered.

How we assess it for the scorecard

In assessing this factor, we typically consider the JAA governing board's rate-setting process for its timeliness and effectiveness in setting rates and charges that are required to recover operating and capital costs, provide sufficient revenue for the fixed obligation charge coverage ratio and maintain sound liquidity on a prospective basis, including the effect on metrics and liquidity of the JAA's capital program. We also typically consider the board's demonstrated record of willingness to increase rates and the typical time it takes to implement new rates and collect the additional revenue.

Additionally, we typically consider the likelihood that the JAA's rate-setting process and history of rate increases indicate that it is likely to maintain its financial operations at current levels. The score for this factor may be somewhat higher than indicated by the financial metrics themselves where (i) the JAA has a track record of consistently meeting management's financial targets; or (ii) the JAA and participants have demonstrated their commitment and ability to maintain the JAA's financial stability and resiliency, for example, by instituting an automatic monthly adjustment at both the JAA and its participants for changes in energy resource costs or by ensuring that the JAA increases its liquidity in advance of a construction project to mitigate incremental construction risk.

Notching factors

Our assessment of notching factors may result in either upward or downward adjustments to the preliminary outcome that results from the weighted factors: Participant Credit Quality and Cost Recovery Framework; Asset Quality and Exposure to Environmental Regulation; Resource Risk Management and Exposure to Environmental Regulation; Competitiveness (for all-requirement agencies); Liquidity; Leverage and Coverage; and Willingness to Recover Costs with Sound Financial Metrics (for all-requirement agencies).. Adjustments may be made in half-notch increments, based on the notching factors listed in the table below.

In aggregate, the notching factors can result in a total of up to five upward notches for take-or-pay projects and up to four upward notches for all-requirement agencies. Notching factors can also result in up to seven downward notches for take-or-pay projects and

six downward notches for all-requirement agencies from the preliminary outcome to arrive at the scorecard-indicated outcome. In cases where we consider that the credit weakness or credit strength represented by a notching factor, or by these factors in aggregate, is greater than the scorecard range, we incorporate this view into the issuer's rating, which may be different from the scorecard-indicated outcome.

Exhibit 5

Notching factor	Notching range
Competitiveness (take-or-pay projects)	+1 to -1
Contractual Structure and Legal Environment	+2 to -2
Participant Diversity and Concentration	+1 to 0
Construction Risk	0 to -2
Financing Structure	+1 to -1
Unmitigated Exposure to Wholesale Power Markets	0 to -1

Source: Moody's Investors Service

Competitiveness (Take-or-Pay Projects)

Why it matters

A take-or-pay JAA's cost competitiveness is an important indicator of its ability to attract and retain participants. Most take-or-pay JAAs face moderate competition that may impede their ability to increase rates. Occasionally, a take-or-pay JAA may face significantly more or less competition than its peers. A JAA with considerably more competitive energy prices or a strong monopoly position has greater flexibility to raise rates compared with one whose rates are already much higher than peers.

How we assess it for the scorecard

In assessing cost competitiveness, we consider the rates paid by a take-or-pay project's participants. Where reliable, equivalent data is available, we consider the project's rates relative to those charged by comparable energy resource providers in the region on a historic basis, typically over a three-year period, and on a forward-looking basis. For assets with a monopoly position, we consider the underlying strength of the monopoly and how this may change over time, the essentiality of the project to participants over the long term and the potential for material changes in the project's economic value to participants.

Contractual Structure and Legal Environment

Why it matters

The contractual structure and legal environment of a JAA are important because they provide the framework under which a JAA recovers its costs from participants. For example, an all-requirement agency contract may have strong provisions to recover participant costs, similar to those in a take-or-pay contract. A JAA project may also benefit from a larger organization, which may provide additional liquidity and oversight. Conversely, a JAA's contracts may have weak features, such as a lack of a participant step-up provision, or there may be other limitations, such as a state-mandated cap on rate increases, e.g., based on inflation.

How we assess it for the scorecard

We typically assess the provisions of a JAA's contracts that allow it to recover costs as well as its legal ability to do so under state or local laws. This notching factor may result in an upward or downward adjustment of up to one notch to the preliminary outcome.

Considerations that could result in an adjustment of up to two upward notches include a court-validated offtake contract that incorporates a general obligation pledge of the municipal city in addition to the participant municipal utility's revenues or an all-requirement contract with exceptionally strong provisions, such as take-or-pay features.

Considerations that could result in an adjustment of up to two downward notches include (i) weak contractual features such as a lack of a participant step-up or similar feature in a multi-party contract; (ii) a limitation in the offtake contract that reduces the effectiveness of a cost pass-through mechanism, such as an inflation-indexed annual payment cap; or (iii) a situation where a JAA has an undivided ownership interest in a project with co-owners that are of significantly weaker credit quality. For take-or-pay projects, the flexibility to add assets by increasing leverage or to partially or fully commingle funds with other businesses may result in downward notching.

Participant Diversity and Concentration

Why it matters

A diverse participant pool with a low concentration of participants is an important indicator of a JAA's revenue stability. High participant diversity and low concentration mitigate the effects of a participant default or exit. For participants in a more diverse pool, the cost of fulfilling their step-up obligations to a JAA if a participant defaults is likely to be lower than for participants in a less diverse pool. Thus, participants in a more diverse pool are more likely to meet step-up obligations if they arise.

How we assess it for the scorecard

In assessing participant diversity and concentration, we consider three equally weighted notching sub-factors: the total number of participants, the aggregate share of participants with less than 2% share of the JAA and the aggregate share of the five largest participants. This notching factor generally results in an upward adjustment of one notch to the preliminary outcome for a JAA where the sub-factor scores are mostly in the strong category or a half notch where the average of the sub-factor scores is in the medium category.

Exhibit 6

Notching Factor: Participant Diversity and Concentration				
Participant Diversity and Concentration	**Weight**	**Strong**	**Medium**	**Low**
Total Number of Participants	1/3	More than 30	20 to 30	Less than 20
Aggregate Share of Small Participants (participants with 2% or less share of a JAA)	1/3	Greater than 20%	10% to 20%	Less than 10%
Aggregate Share of Five Largest Participants	1/3	Less than 35%	35% to 55%	More than 55%

Source: Moody's Investors Service

Construction Risk

Why it matters

Construction risk is an important indicator of a JAA's ability to complete its project on schedule and on budget. Construction delays and cost overruns can result in the need for additional debt financing, increasing financial pressure on the project to recover costs, including debt service. In cases where the JAA fails to complete an expensive construction project, it faces an even greater financial burden that may incentivize participants to leave the JAA or challenge their obligations.

How we assess it for the scorecard

In our assessment of construction risk, we typically review third-party feasibility studies and independent engineers' reports. We typically consider the contractor's experience and financial strength, the JAA's management of comparable construction projects, including its track record with the contractor, and the overall project construction risks. Overall construction risk varies based on the size and complexity of the project. For example, power projects range from simple cycle gas turbines to nuclear power plants.

We also generally consider typical construction risk mitigants, such as engineering, procurement and construction contracts that set a fixed price and completion date for the project and contain a provision to pay liquidated damages in case contract terms are not fulfilled. Performance and payment bonds or a letter of credit backing a contractor's obligations may be an important consideration, especially for contractors with moderate-to-low credit quality. This notching factor may result in a downward adjustment of up to two notches to the preliminary outcome for a JAA project with significant construction risk.

Financing Structure

Why it matters

A JAA's financing structure provides important indications of its exposure to and management's tolerance for risk. A lack of standard bondholder protections in transaction documents, such as a fully funded debt service reserve sized to one year of maximum annual debt service, exposes investors to increased risks. A debt service reserve fund helps mitigate the potential for payment delays under a JAA's contractual arrangements and business risks related to the asset concentration that is typical for a JAA project. A meaningful rate covenant in the transaction documents, i.e., one that requires the JAA to set rates at a level to meet a minimum net revenue coverage level, is another common bondholder protection.

Non-standard debt structures add financial complexity and may expose the JAA to large, unexpected drains on liquidity that hamper the JAA's ability to meet its obligations. Some examples include non-amortizing debt or back-loaded amortization schedules, variable rate debt and interest rate swaps (which may hedge interest rate risk but expose the JAA to cash collateral calls).

How we assess it for the scorecard

We consider financing structures that may impair the JAA's ability to recover costs. This notching factor may result in a downward adjustment of up to one notch to the preliminary outcome. In unusual cases, the financing structure may provide better financial protections than is typical, which may lead to an upward adjustment of up to one notch.

In cases where the structure does not include a debt service reserve fund, where the debt service reserve fund covers less than six months of debt service, or where the reserve is in the form of a letter of credit or surety bond provided by a low-rated or unrated financial institution, we typically apply a full downward notch. We typically make a half notch downward adjustment where the debt service reserve fund covers six months of debt service but less than 12 months.

We may not notch down where the JAA has a sufficient level of other liquidity beyond normal working capital requirements. We assess the JAA's internal and external liquidity as sufficient if total internal and external liquidity plus any debt service reserve is enough to cover annual debt service and also provides for 30 days of unrestricted liquidity on hand.

Other structural elements that may result in downward notching include lack of a sum-sufficient rate covenant (typically leading to a full downward notch), a non-amortizing debt structure, exposure to variable debt and interest rate swaps, requirements to post collateral related to hedging agreements, or counterparty termination rights in the event the JAA's credit ratings fall below a certain level. Diminished internal or external liquidity, for example as a result of volatility in credit markets may also result in downward notching.

Unmitigated Exposure to Wholesale Power Markets

Why it matters

Unmitigated exposure to wholesale power markets is an important indicator of a JAA's financial stability and its ability to recover costs. Unmitigated exposure to wholesale power markets can expose a JAA to rapid price fluctuations, which can result in volatility to a JAA's cash flow and the rates that participants pay. This notching factor typically affects all-requirement agencies that have material excess energy resource supply or that were established to supply the energy resource on a wholesale basis. Some all-requirement agencies seek to use margins from selling excess power into wholesale energy markets to limit the rise in rates charged to participants. Take-or-pay projects are typically not exposed to wholesale power markets, but a take-or-pay project could have wholesale exposure indirectly through its participants.

How we assess it for the scorecard

We typically consider the overall exposure the JAA has to the wholesale power markets and the tools it uses to mitigate that exposure. For example, a JAA may enter into wholesale power contracts with strong counterparties, maintain sufficient liquidity to withstand a period of lower wholesale margins and maintain a timely and transparent rate-setting process. This notching factor may result in a downward adjustment of one notch to the preliminary outcome if a JAA has significant unmitigated exposure to the wholesale power markets.

Other considerations

Ratings may reflect consideration of additional factors that are not in the scorecard, usually because the factor's credit importance varies widely among the issuers in the sector or because the factor may be important only under certain circumstances or for a subset of issuers. Such factors include financial controls and the quality of financial reporting; legal structure; the quality and experience of management; assessments of governance as well as environmental and social considerations; exposure to uncertain licensing regimes; and possible government interference in some jurisdictions. Regulatory, litigation, liquidity, technology and reputational risk as well as changes to consumer and business spending patterns, competitor strategies and macroeconomic trends also affect ratings.

Following are some examples of additional considerations that may be reflected in our ratings and that may cause ratings to be different from scorecard-indicated outcomes.

Regulatory Considerations

Issuers in the JAA sector are subject to varying degrees of regulatory oversight. Effects of these regulations may entail limitations on operations, higher costs, and higher potential for technology disruptions and demand substitution. Regional differences in regulation, implementation or enforcement may advantage or disadvantage particular issuers.

Our view of future regulations plays an important role in our expectations of future financial metrics as well as our confidence level in the ability of an issuer to generate sufficient cash flows relative to its debt burden over the medium and longer term. Regulatory considerations also play a role in our assessment of an issuer's cost recovery framework, competitiveness and willingness to recover costs with sound financial metrics. In some circumstances, regulatory considerations may also be a rating factor outside the scorecard, for instance when regulatory change is swift.

Environmental, Social and Governance Considerations

Environmental, social and governance (ESG) considerations may affect the ratings of issuers in the JAA sector. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.[7]

Environmental regulations are incorporated into the scoring of the Asset Quality and Exposure to Environmental Regulation and Resource Risk Management and Exposure to Environmental Regulation factors, and governance is incorporated into the scoring of the Participant Credit Quality and Cost Recovery Framework and Willingness to Recover Costs with Sound Financial Metrics factors. However, strengths and weaknesses related to ESG may also be considered outside of the scorecard.

There is a wide regional variation in fuel mix in this sector, and some JAAs have a very material exposure to risks related to coal-fired generation and to the credit effects of carbon regulation. JAAs are also exposed, to a lesser extent, to other fossil fuels. JAAs are subject to changes in the federal regulatory landscape, including changes in enforcement policies resulting from successive presidential administrations, and from state-level regulations, including changes in renewable energy standards. Market dynamics and technology risks also play a role in our assessment of a JAA's carbon transition risks. JAAs have a long track record in handling evolving and stringent environmental regulations, and they typically have a strong ability to pass through costs to participants, including fuel and purchased power, costs of investments (including for environmental remediation), and plant abandonment costs. For the majority of JAAs that are not subject to rate regulation, their willingness to raise rates and any resultant affordability issues for participants are the main concerns. Where JAAs or their participants are regulated, they may be subject to oversight regarding tariffs and investment decisions, and they may face pressures to limit rate shocks for end-use customers. Most thermal generation requires large amounts of water for cooling and is thus also exposed to water regulations and shortages.

Social considerations, such as occupational and community-related health and safety, may affect JAAs. Governance issues may also affect JAAs or their participants.

Other Pension-related Considerations

In addition to including pension liabilities in calculating or estimating certain scorecard metrics, we may incorporate pension-related considerations into our analysis in other ways.

For example, we may estimate the pension contribution necessary to prevent unfunded pension liabilities from growing, year over year, in nominal dollars, if all actuarial assumptions are met. This estimate, which we refer to as the tread water indicator, can provide an important indication of the strength or weakness of a utility's pension contributions relative to reported plan funding needs. For scorecard metrics that include cash pension contributions, we may consider how an alternate version of the metric using the tread water indicator would affect the scorecard-indicated outcome.

In addition, we may consider the impact of the long-term liabilities of other post-employment benefits (OPEB) by imputing a debt equivalent to assess how it would affect scorecard metrics.[8]

We may also consider the tread water indicator or OPEB liabilities as part of our qualitative analysis, including for peer comparisons.

Financial Controls

We rely on the accuracy of audited financial statements to assign and monitor ratings in this sector. The quality of financial statements may be influenced by internal controls, including the proper tone at the top, centralized operations, and consistency in accounting

policies and procedures. Auditors' reports on the effectiveness of internal controls, auditors' comments in financial reports and unusual restatements of financial statements or delays in regulatory filings may indicate weaknesses in internal controls.

Management Strategy

The quality of management is an important factor supporting a JAA's credit strength. Assessing the execution of business plans over time can be helpful in assessing management's business strategies, policies and philosophies and in evaluating management performance relative to performance of competitors and our projections. Management's track record of adhering to stated plans, commitments and guidelines provides insight into management's likely future performance, including in stressed situations.

Liquidity

Liquidity is an important rating consideration for all JAAs, although it may not have a substantial impact in discriminating between two issuers with a similar credit profile. Liquidity can be particularly important for JAAs in highly seasonal operating environments where working capital needs must be considered, and ratings can be heavily affected by extremely weak liquidity. We form an opinion on likely near-term liquidity requirements from the perspective of both sources and uses of cash. Useful information about general principles of liquidity assessment can be found in our liquidity cross-sector methodology.[9] While liquidity is specifically considered in the scorecard for JAAs, when it is very weak, the impact it has on ratings may be much greater than the standard scorecard weight would imply.

Additional Metrics

The metrics included in the scorecard are those that are generally most important in assigning ratings to issuers in this industry; however, we may use additional metrics to inform our analysis of specific companies. These additional metrics may be important to our forward view of metrics that are in the scorecard or other rating factors. For example, we may consider operational metrics, such as forced outage rates, and trends in maintenance costs.

Event Risk

We also recognize the possibility that an unexpected event could cause a sudden and sharp decline in an issuer's fundamental creditworthiness, which may cause actual ratings to be lower than the scorecard-indicated outcome. Event risks — which are varied and can range from sudden regulatory changes or liabilities from an accident — can overwhelm even a stable, well-funded issuer. Some other types of event risks include geopolitical conflicts, pandemics, natural disasters or terrorism that cause a disruption in service and significant cyber-crime events.

Seasonality

Seasonality is an important driver of customer demand and can cause swings in cash balances and working capital positions for issuers. Higher volatility creates less room for errors in meeting customer demand or operational execution.

Using the scorecard to arrive at a scorecard-indicated outcome

1. Measurement or estimation of factors in the scorecard

In the "Discussion of the scorecard factors" section, we explain our analytical approach for scoring each scorecard factor or sub-factor,[10] and we describe why they are meaningful as credit indicators.

The information used in assessing the sub-factors is generally found in or calculated from information in the issuer's financial statements or regulatory filings, derived from other observations or estimated by Moody's analysts. We may also incorporate non-public information.

Our ratings are forward-looking and reflect our expectations for future financial and operating performance. However, historical results are helpful in understanding patterns and trends of a company's performance as well as for peer comparisons. Financial metrics, unless otherwise indicated, are typically calculated based on a three year average. However, the factors in the scorecard can be assessed using various time periods. For example, rating committees may find it analytically useful to examine the most recent one year historical period and expected future performance for shorter or longer periods. We use three-year average results to assess financial metrics in order to mitigate one-time factors that might skew results.

The quantitative credit metrics used in this methodology may also incorporate analytical adjustments that are specific to a particular JAA financing.

2. Mapping scorecard factors to a numeric score

After estimating or calculating each sub-factor, the outcomes for each of the sub-factors are mapped to either an alphanumeric Moody's rating category (Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3 or Ca) or a broad alpha category (Aaa, Aa, A, Baa, Ba, B, Caa or Ca) and to a numeric score.

Qualitative sub-factors are scored based on the description by broad rating category in the scorecard. The numeric value of each alpha score is based on the scale below.

Exhibit 7

Aaa	Aa	A	Baa	Ba	B	Caa	Ca
1	3	6	9	12	15	18	20

Source: Moody's Investors Service

For the scoring of participant credit quality, we use the interpolated numeric value that corresponds to the applicable participant credit quality. For example, participant credit quality of A1 would be scored at the interpolated numeric score of 5.

Quantitative factors are scored on a linear continuum. For each metric, the scorecard shows the range by alpha category. We use the scale below and linear interpolation to convert the metric, based on its placement within the scorecard range, to a numeric score, which may be a fraction. As a purely theoretical example, if there were a ratio of revenue to interest for which the Baa range was 50x to 100x, then the numeric score for an issuer with revenue/interest of 99x, relatively strong within this range, would score closer to 7.5, and an issuer with revenue/interest of 51x, relatively weak within this range, would score closer to 10.5. In the text or table footnotes, we define the endpoints of the line (i.e., the value of the metric that constitutes the lowest possible numeric score, and the value that constitutes the highest possible numeric score).

Exhibit 8

Aaa	Aa	A	Baa	Ba	B	Caa	Ca
0.5-1.5	1.5-4.5	4.5-7.5	7.5-10.5	10.5-13.5	13.5-16.5	16.5-19.5	19.5-20.5

Source: Moody's Investors Service

The scorecard for take-or-pay projects includes a mechanism to adjust scores for the Asset Quality and Exposure to Environmental Regulation and Liquidity factors, and the Adjusted Debt Ratio and Fixed Obligation Charge Coverage Ratio sub-factors, to the higher of the alpha score for the baseline assessment for these factors and sub-factors and the alphanumeric score for the Participant Credit Quality and Cost Recovery Framework factor. This mechanism makes this adjustment only when the score inputs for these factors and sub-factors are Baa or higher. For example, if we score Participant Credit Quality and Cost Recovery Framework at A1, which maps to a numeric value of 5, and our baseline factor assessment for Asset Quality and Exposure to Environmental Regulation is Baa, which maps to a numeric value of 9, the scorecard adjusts the Asset Quality and Exposure to Environmental Regulation factor score to A1 and maps to a numeric value of 5. If we score the Participant Credit Quality and Cost Recovery Framework factor at Baa1, which maps to a numeric value of 8, and our baseline factor assessment for the Asset Quality and Exposure to Environmental Regulation factor is Baa, which maps to a numeric value of 9, the scorecard adjusts the factor score to Baa1 and maps to a numeric value of 8.

3. Determining the overall scorecard-indicated outcome

The numeric score for each weighted sub-factor (or each weighted factor, when the factor has no sub-factors) is multiplied by the weight for that sub-factor (or factor), with the results then summed to produce an aggregate numeric score before notching factors (the preliminary outcome). We then consider whether the preliminary outcome that results from the weighted factors should be notched upward or downward[11] in order to arrive at an aggregate numeric score after notching factors, based on Competitiveness (for take-or-pay projects), Contractual Structure and Legal Environment, Participant Diversity and Concentration, Construction Risk, Financing Structure and Unmitigated Exposure to Wholesale Power Markets. In aggregate, the notching factors can result in a total of up to five upward notches for take-or-pay projects and up to four upward notches for all-requirement agencies. Notching factors can

also result in up to seven downward notches for take-or-pay projects and six downward notches for all-requirement agencies from the preliminary outcome to arrive at the scorecard-indicated outcome.

The aggregate numeric score before and after notching factors is mapped to an alphanumeric. For example, an issuer with an aggregate numeric score before notching factors of 11.7 would have a Ba2 preliminary outcome, based on the ranges in the table below. If the combined notching factors totaled two upward notches, the aggregate numeric score after notching factors would be 9.7, which would map to a Baa3 scorecard-indicated outcome.

Exhibit 9

Scorecard-indicated outcome

Scorecard-indicated outcome	Aggregate numeric score
Aaa	x ≤ 1.5
Aa1	1.5 < x ≤ 2.5
Aa2	2.5 < x ≤ 3.5
Aa3	3.5 < x ≤ 4.5
A1	4.5 < x ≤ 5.5
A2	5.5 < x ≤ 6.5
A3	6.5 < x ≤ 7.5
Baa1	7.5 < x ≤ 8.5
Baa2	8.5 < x ≤ 9.5
Baa3	9.5 < x ≤ 10.5
Ba1	10.5 < x ≤ 11.5
Ba2	11.5 < x ≤ 12.5
Ba3	12.5 < x ≤ 13.5
B1	13.5 < x ≤ 14.5
B2	14.5 < x ≤ 15.5
B3	15.5 < x ≤ 16.5
Caa1	16.5 < x ≤ 17.5
Caa2	17.5 < x ≤ 18.5
Caa3	18.5 < x ≤ 19.5
Ca	19.5 < x ≤ 20.5
C	x > 20.5

Source: Moody's Investors Service

In general, the scorecard-indicated outcome is oriented to a debt instrument with a senior pledge on JAA revenue.

Assigning issuer-level and instrument-level ratings

After considering the scorecard-indicated outcome, other rating considerations and relevant cross-sector methodologies, we typically assign an instrument-level rating. We may also assign an issuer rating.

Occasionally, a JAA may issue a debt series with different liens, which may be notched down from the senior instrument-level rating. Senior debt has a first lien on revenue and subordinate debt has a junior lien; a JAA could also issue an additional series of debt with a third or lower lien. We assess the effect of subordination starting from an analysis of the fixed obligation charge coverage for all debt classes. We then consider the fixed obligation charge coverage of individual debt classes (senior and subordinate). In considering this ratio for subordinate liens, we subtract the debt service on each prior lien from both the numerator and denominator. We may notch subordinate debt down by one notch or more per debt class if our analysis shows material increased risk of loss upon default to debt with subordinate liens.

Key rating assumptions

For information about key rating assumptions that apply to methodologies generally, please see *Rating Symbols and Definitions*.[12]

Limitations

In the preceding sections, we have discussed the scorecard factors and many of the other rating considerations that may be important in assigning ratings. In this section, we discuss limitations that pertain to the scorecard and to the overall rating methodology.

Limitations of the scorecard

There are various reasons why scorecard-indicated outcomes may not map closely to actual ratings.

The scorecard in this rating methodology is a relatively simple reference toolthat can be used in most cases to approximate credit profiles of issuers in this sector and to explain, in summary form, many of the factors that are generally most important in assigning ratings to these issuers. Credit loss and recovery considerations, which are typically more important as an issuer gets closer to default, may not be fully captured in the scorecard. The scorecard is also limited by its upper and lower bounds, causing scorecard-indicated outcomes to be less likely to align with ratings for issuers at the upper and lower ends of the rating scale.

The weights for each sub-factor and factor in the scorecard represent an approximation of their importance for rating decisions across the sector, but the actual importance of a particular factor may vary substantially based on an individual company's circumstances.

Factors that are outside the scorecard, including those discussed above in the "Other considerations" section, may be important for ratings, and their relative importance may also vary from company to company. In addition, certain broad methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector.[13] Examples of such considerations include the following: how sovereign credit quality affects non-sovereign issuers and the assessment of credit support from other entities.

We may use the scorecard over various historical or forward-looking time periods. Furthermore, in our ratings we often incorporate directional views of risks and mitigants in a qualitative way.

General limitations of the methodology

This methodology document does not include an exhaustive description of all factors that we may consider in assigning ratings in this sector. Issuers in the sector may face new risks or new combinations of risks, and they may develop new strategies to mitigate risk. We seek to incorporate all material credit considerations in ratings and to take the most forward-looking perspective that visibility into these risks and mitigants permits.

Ratings reflect our expectations for an issuer's future performance; however, as the forward horizon lengthens, uncertainty increases and the utility of precise estimates, as scorecard inputs or in other considerations, typically diminishes. Our forward-looking opinions are based on assumptions that may prove, in hindsight, to have been incorrect. Reasons for this could include unanticipated changes in any of the following: the macroeconomic environment, general financial market conditions, industry competition, disruptive technology, or regulatory and legal actions. In any case, predicting the future is subject to substantial uncertainty.

Moody's related publications

Credit ratings are primarily determined through the application of sector credit rating methodologies. Certain broad methodological considerations (described in one or more cross-sector rating methodologies) may also be relevant to the determination of credit ratings of issuers and instruments. A list of sector and cross-sector credit rating methodologies can be found here.

For data summarizing the historical robustness and predictive power of credit ratings, please click here.

For further information, please refer to *Rating Symbols and Definitions*, which is available here.

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Endnotes

1 A link to a list of our sector methodologies can be found in the "Moody's related publications" section.

2 In our methodologies and research, the terms "scorecard" and "grid" are used interchangeably.

3 Please see *Rating Symbols and Definitions* for a link to a table of expected default and loss rates. Please see the "Moody's related publications" section for a link to that publication.

4 Please see our cross-sector methodology that describes our approach to the use of credit estimates in rated transactions. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

5 There have been notable defaults by JAAs as a result of contractual disputes, including Washington Public Power Supply System's (WPPSS) Projects 4 and 5 defaults that resulted from members challenging their contractual obligations.

6 For an explanation of our adjustments related to pensions, please see our methodology that discusses adjusting reported pension data for public entities such as states and local governments. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

7 A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

8 Please see our methodology that discusses our adjustments to reported pension data for US state and local governments, which provides more information about the tread water indicator. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

9 A link to a list of our cross-sector methodologies can be found in the "Moody's related publications" section.

10 When a factor comprises sub-factors, we score at the sub-factor level. Some factors do not have sub-factors, in which case we score at the factor level.

11 Numerically, a downward notch adds 1 to the score, and an upward notch subtracts 1 from the score.

12 A link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

13 A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the issuer/deal page on https://ratings.moodys.com for the most updated credit rating action information and rating history.

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