MOODY'S
INVESTORS SERVICE

RATING METHODOLOGY

US Gas Prepayment Bonds Methodology

This rating methodology replaces the *Gas Prepayment Bonds* methodology published in March 2017. The primary revisions include the incorporation of potential loss to a transaction given the default of the investment provider into our approach for assessing the risk of long-term investment agreements.

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Introduction

In this rating methodology, we explain our general approach to assessing credit risk for gas prepayment bonds issued in the US, including the qualitative and quantitative factors that are likely to affect rating outcomes in this sector.

We also discuss other rating considerations whose credit importance varies widely among the transactions in the sector or may be important only under certain circumstances or for a subset of transactions. In addition, some of the methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector.[1] Furthermore, since ratings are forward-looking, we often incorporate directional views of risks and mitigants in a qualitative way.

Our presentation of this rating methodology proceeds with (i) the scope of this methodology; (ii) a description of a typical transaction structure; (iii) an overview of our general approach for assessing a transaction; (iv) a description of the typical roles of the parties to a transaction; (v) a description of the structural features that must be present for a transaction to be rated under this methodology; (vi) other rating considerations; (vii) the assignment of instrument-level ratings; (viii) methodology assumptions; and (ix) limitations.

In Appendix A, we provide an example of how a debt service reserve fund or a surety bond is sized to cover a nonpayment by the gas purchaser in the event it does not fulfill its obligation to an issuer. Appendix B explains how we assign a rating cap, if any, on the transaction based on the investment provider's rating.

[1] A link to an index of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

Scope of This Methodology

This methodology applies to natural gas and electricity prepayment bond transactions issued in the US.

Typical Transaction Structure

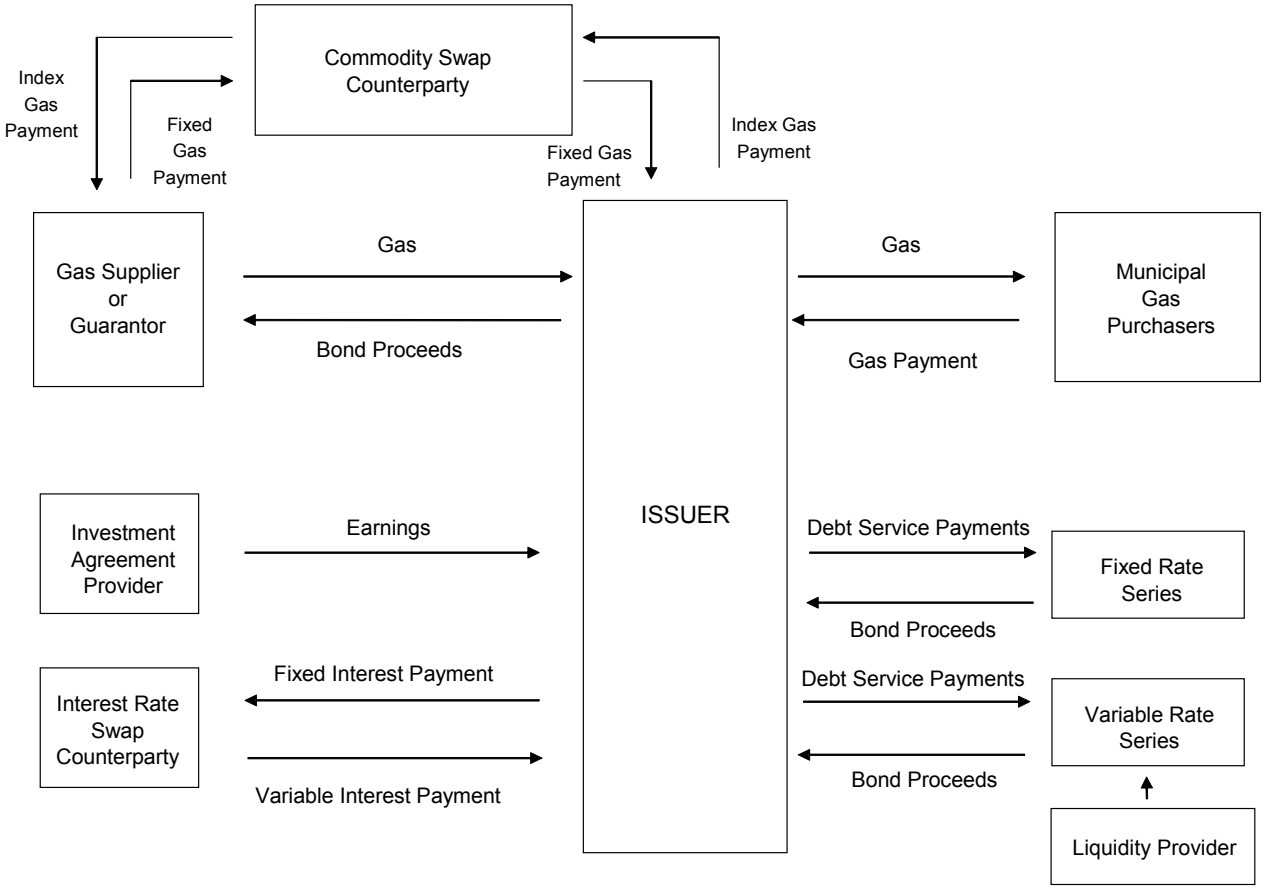
In a typical gas prepayment transaction, a municipal conduit issuer, which is typically a joint power authority or gas district, issues tax-exempt bonds on behalf of municipal gas or electric utilities to prepay future deliveries of natural gas, generally for a 20-30 year period. The issuer transfers the bond proceeds to a gas supplier in exchange for the delivery of gas over the life of the bonds, pursuant to a gas purchase agreement (GPA). The gas supplier is typically a commodity-trading subsidiary of an investment bank. A prepaid GPA is effectively a loan to the gas supplier that is repaid by delivering gas to the issuer.

The issuer typically sells the gas it purchases under the GPA to municipal gas or electric utilities at a discount to first-of-the-month market prices through individual supply agreements; the utilities' contract price is a monthly index price minus the discount. The municipal gas or electric utility typically purchases the gas for its own use or for distribution within its system.

The issuer depends on payments from a number of different parties to pay principal and interest to bondholders. The transactions are typically structured so that there are sufficient funds on hand for the issuer to make debt service payments regardless of movements in gas prices, provided that all parties to the transaction perform in accordance with the terms of the transaction documents. We typically review cash flow projections of gas prepayment bonds to assess whether the aggregate payments to the issuer from the transaction parties are sufficient to make timely debt service payments. If an issuer does not receive sufficient payment from any one of the transaction parties, and there is no alternative source of available funds to cover the nonpayment, there may not be enough funds to pay debt service.

EXHIBIT 1

Basic Structure of a Gas Prepayment Transaction



Source: Moody's Investors Service

Our Overall Approach to Rating Prepaid Gas Transactions

The credit quality of prepaid gas transactions primarily relies on:

» The credit quality of the underlying parties to the transaction.

» The structural features of the transaction and whether we have sufficient information to rate the transaction.

The Credit Quality of the Underlying Parties to the Transaction

There are many underlying parties to a gas prepayment transaction. The transaction will be able to pay debt service on the bonds only if certain of these entities fulfill their obligations on a timely basis — these are the key credit counterparties. A gas prepayment bond's credit quality reflects the credit quality of the lowest-rated key credit counterparty to the transaction. If a counterparty's obligations are guaranteed by a higher-rated entity, we consider the guarantor's rating.

Typical parties to a gas prepayment transaction include:

- The issuer, which is often a joint power authority or a gas district, acting as a municipal conduit.
- The gas purchaser, which is typically a gas or electric utility – key credit counterparty, unless mitigated through structural features.
- The gas supplier under the gas purchase agreement (GPA) – key credit counterparty.
- The provider of the commodity swap – key credit counterparty unless mitigated through structural features.
- The provider of the guaranteed investment contract (GIC), fixed-rate investment agreement or repurchase agreement[2] – typically a key credit counterparty; however, the rating constraint on the transaction may be up to five alphanumeric notches[3] above the GIC provider's rating[4].
- The provider of an interest rate swap, if any – key credit counterparty for floating-rate transactions.
- The liquidity provider, if any – key credit counterparty for floating-rate transactions.
- The guarantor, if any – key credit party when present.

When a gas prepayment transaction allows for substitution or assignment of any of the key credit counterparties with a minimum rating threshold, that threshold typically serves as a rating cap on the transaction, even when the key credit counterparty is rated above that threshold.

In this section, we describe the typical roles of the underlying parties to a gas prepayment transaction, and we explain when they are a key counterparty as well as the specific instrument-level rating of the counterparty used in our assessment of a transaction's overall credit quality.

The Issuer

The issuer of a gas prepayment transaction is typically a joint power authority, a gas district or another type of municipal entity. The issuer generally acts as a conduit for the transaction; it transfers the bond proceeds to a gas supplier in exchange for the delivery of natural gas over the life of the bonds but provides no funds for debt service payments.

The rating of the issuer is typically not incorporated into the rating of the gas prepayment transaction due to structural features that insulate the transaction from bankruptcy risk of the issuer. For example, the issuer may be a special purpose entity that has no assets or revenue other than what is derived under the transaction agreements.

[2] In this methodology, we use the terms GICs, fixed-rate investment agreements and repurchase agreements interchangeably, and we refer to all of these counterparties as GIC providers. This methodology primarily focuses on GICs, because the issues relating to them are more universal. We generally treat repurchase agreements the same as GICs.

[3] For example, if the GIC provider's rating is Baa1, five notches above that rating would be Aa2.

[4] For more information on our approach to how the GIC rating is incorporated into the transaction rating, please see Appendix B.

The Gas Purchaser

Typically, municipal gas or electric utilities are the ultimate purchasers of the natural gas from the issuer. Each gas purchaser that is party to the transaction enters into a supply agreement with the issuer that details the gas purchaser's payment obligation and its right to receive specified quantities of gas.

Unless the gas purchase agreement includes structural features that mitigate the risk that the gas purchaser does not fulfill its payment obligation to the issuer, or the obligation is supported by an entity with a higher rating,[5] the credit quality of the gas purchaser is incorporated into our assessment of the credit quality of the gas prepayment bonds. In these cases, we use the gas purchaser's enterprise revenue-backed instrument rating or issuer rating for our assessment of the transaction's credit quality.

In some gas prepayment transactions, the gas purchaser's obligation is supported by another party with a higher rating, in which case we consider the supporter's rating. When the obligation is supported by a surety bond provider, we use the provider's Insurance Financial Strength Rating. Where the obligation is supported by a receivables purchase agreement provider or a funding agreement provider, we use the provider's senior unsecured debt rating or issuer rating.

In cases where there are multiple gas purchasers and their obligations are several (rather than joint), we use the lowest rating among the gas purchasers where their obligations are not supported and credit exposures to these entities are not mitigated by structural features.

The Gas Supplier or the Guarantor of the Gas Purchase Agreement

The gas supplier is typically a commodity-trading entity, often the subsidiary of a bank or other financial institution. In some gas prepayment transactions, the parent provides a guaranty of the subsidiary's obligations. We normally use the higher of the gas supplier's or the guarantor's senior unsecured debt rating or issuer rating for our assessment of the transaction's credit quality; however, we also consider how any assignment provisions affect the credit quality of the gas supplier. For example, if the gas supplier is rated higher than the guarantor but has the ability to assign its obligations to an unrated affiliate, we would use the rating of the guarantor.

The Commodity Swap Counterparty

Gas prepayment bond issuers usually enter into commodity swap agreements with a counterparty to mitigate the revenue volatility caused by fluctuations in commodity prices (this may be referred to as a front-end commodity swap). In a commodity swap agreement, the counterparty makes fixed payments to the issuer and receives variable payments in return based on the market price of gas. In some cases, the counterparty is unrated but has a rated guarantor.

When the commodity swap counterparty is unaffiliated with the gas supplier or guarantor, we use the Counterparty Risk Assessment (CR Assessment) for our assessment of the transaction's credit quality.[6] When the commodity swap counterparty is affiliated with the gas supplier or guarantor, we use the counterparty's senior unsecured debt rating or issuer rating.

[5] Please see our cross-sector rating methodology that discusses credit substitution. A link to an index of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

[6] For more information about CR Assessments, please see *Rating Symbols and Definitions*. A link can be found in the "Moody's Related Publications" section.

The Investment Agreement Provider

For most gas prepayment transactions, the structural framework requires that debt service account, debt service reserve account and other accounts be invested, and the most commonly used long-term investment agreements are GICs, fixed-rate investment agreement or repurchase agreements with a guaranteed investment rate. These investments provide a predetermined, guaranteed long-term fixed rate of return on funds invested with financial institutions, such as banks or insurance companies.

For GICs, we use the investment provider's Insurance Financial Strength Rating when the provider is an insurance company. When the GIC provider is a bank, we use the bank's deposit rating. For repurchase agreements, we use the provider's Counterparty Risk Rating.[7]

For gas prepayment transactions that use long-term investment agreements, the transaction cannot be rated higher than five alphanumeric notches above the rating of the investment provider. We conduct a scenario analysis to assess the expected loss to gas prepayment bonds in the event that the investment provider defaults on its obligation. For details on our approach, please see Appendix B.

The Liquidity Facility Provider

A variable-rate gas prepayment transaction that includes optional and mandatory tenders is typically supported by a liquidity facility that covers the purchase price of the bonds upon a failed remarketing. The liquidity facility provided to support gas prepayment bonds typically does not expire until the bonds mature. This eliminates the possibility of a mandatory tender of the bonds after the expiration of the liquidity facility. Substitution or assignment of a liquidity facility typically results in a mandatory tender of the bonds, payable by the liquidity provider. There does not need to be a mandatory tender upon substitution, however, if the transaction documents mandate confirmation of the short-term rating prior to the substitution becoming effective. In addition, if the liquidity provider can automatically terminate or suspend its obligations under the liquidity facility, the likelihood of such events occurring is an important consideration in the analysis to arrive at the short-term rating assigned to the bonds. Typically, any automatic termination events are linked to risks that are reflected in the transaction's long-term rating, such as (i) bankruptcy of the gas supplier or gas supply guarantor; or (ii) nonpayment of principal or interest on the bonds. Termination of the liquidity provider's obligation to fund under the liquidity facility that can occur with notice typically leads to a mandatory tender of the bonds prior to the termination date.

» Transactions issued with an index or fixed term rate for an initial period, for example of five to seven years, are subject to mandatory tender at the end of the term. These transactions will either have a liquidity facility to cover the mandatory tender, or will result in a mandatory redemption upon a failed remarketing. Such mandatory redemption would be paid pursuant to an automatic termination of the GPA.

[7] If the obligations of the GIC provider are backed by a letter of credit (LOC) issued by an independent financial institution, we use the higher of the GIC provider's rating and the LOC provider's Counterparty Risk Assessment.

» The short-term rating of the liquidity provider for a variable-rate demand bond is incorporated into the short-term rating of the gas prepayment transaction.[8] In index-rate transactions where a liquidity provider covers the purchase price obligation in the event of a failed remarketing at the end of an interest period, the liquidity provider is a key credit counterparty and its long-term rating is incorporated into the long-term rating of the transaction.

The Interest Rate Swap Counterparty

Some gas prepayment transactions pay bond interest based on a variable rate with optional and mandatory tenders, or on an index rate that resets on a regular basis. Issuers of variable-rate or index-rate gas prepayment bonds often enter into interest rate swap agreements to swap the fixed payment received under the commodity swap into a floating-rate payment to pay the floating-rate debt service.

When the interest rate swap counterparty is unaffiliated with the gas supplier or guarantor, we use the counterparty's CR Assessment for our analysis of the transaction's credit quality. When the interest rate swap counterparty is affiliated with the gas supplier or guarantor, we use the counterparty's senior unsecured rating or issuer rating.

Guarantees of Transaction Counterparties

Many gas prepayment transactions include a guaranty of the gas supplier's obligations under the GPA provided by its parent company, usually an investment bank. The guaranty typically covers all ongoing payments due under the GPA as well as the termination payment. In addition, guarantees are sometimes used to support payments under interest rate swaps, commodity swaps, guaranteed investment agreements or receivables purchase agreements. We consider provisions that allow the gas supplier's credit quality to be substituted by the guarantor.[9]

In addition, the transaction documents must clearly state how the issuer, or trustee on the issuer's behalf, would access the guaranty.

The Structural Features of the Transaction

Gas prepayment transactions are typically structured such that there is very little excess cash flow to pay debt service and little if any credit enhancement. As a result, delays in receiving payments can cause a default, and any reductions in cash flows can cause material losses to creditors.

In this section, we describe transaction risks that are not related to the credit quality of the underlying parties, and some examples of structural features that can mitigate these risks. We also discuss some structural features that must be present for a transaction to be rated under this methodology. Structural weaknesses can add risks that may not be addressed by the other rating factors in this methodology and may introduce risk scenarios that are difficult to predict. For example, certain structural weaknesses may introduce a risk that fluctuations in market prices for natural gas or market rates of interest could have a significant impact on default risk.

[8] Please see our cross-sector rating methodology that discusses the assignment of short-term ratings and our rating methodology that discusses the assignment of short-term ratings to variable rate instruments supported by conditional liquidity facilities. A link to an index of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

[9] Please see our cross-sector rating methodology that discusses credit substitution. A link to an index of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

The Organizational Structure of the Issuer

As a conduit or other type of special purpose entity, the issuer normally has no assets or revenue outside of the transaction to pay the bonds, and its activities are usually very limited by the transaction documents. If the issuer enters voluntary or involuntary bankruptcy proceedings, an automatic stay could be placed on the funds and accounts of the bond transaction, preventing the payment of debt service and leading to a default.

In assessing the bankruptcy risk of the issuer, we review its organizational structure and whether it includes features that mitigate the risk of a voluntary or involuntary bankruptcy filing. If we assess that the risk of a bankruptcy filing is mitigated, the issuer is not a key credit counterparty. If we find that the risk of a bankruptcy filing is not mitigated, the issuer is a key credit counterparty, and the rating of the issuer is incorporated. For more information about special purpose entity issuers, please see our methodology that discusses bankruptcy remoteness criteria for special purpose entities in global structured finance transactions.[10] For municipal conduit issuers, bankruptcy remoteness is typically a settled issue in the marketplace, so we generally do not incorporate the rating of the related state or municipality in the rating of the transaction. However, if we consider that the organizational structure, separateness from the related state or municipality and the effectiveness of the segregation of funds do not sufficiently mitigate bankruptcy risk, we incorporate the rating of the related state or municipality.

Structural Features of the Transaction That Can Mitigate Gas Purchaser Nonpayment

When the transaction contains provisions that sufficiently mitigate the risk to the issuer of a gas purchaser failing to fulfill its payment obligation, the credit quality of the gas purchaser is not incorporated into our assessment of the credit quality of the transaction. In other transactions, the gas purchaser's rating is incorporated into the bond rating.

In a typical gas prepayment transaction, gas is delivered monthly and paid by the purchaser the following month. To fully mitigate the risk of nonpayment such that the gas purchaser's rating is not considered, there must be remedies that cover nonpayment for both the gas that has been billed for the prior month as well as for the gas delivered and not yet billed in the current month.[11] Typical structural features that can mitigate gas purchaser nonpayment include:

- A receivables purchase agreement. The risk of nonpayment may be mitigated by a receivables purchase agreement or funding agreement in which the gas supplier or another rated entity agrees to remedy a nonpayment by purchasing the receivable for the unpaid gas from the issuer and making payments on the gas purchaser's behalf; or

- A reserve fund. A reserve fund generally covers the gas purchaser's payment to the issuer, and would be drawn upon by the trustee for debt service payment in the event of nonpayment by a gas purchaser. A reserve can be funded with a portion of initial bond proceeds, or the reserve can be in the form of surety bonds issued by financial guarantors. Where a surety bond is present, the

[10] A link to an index of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

[11] Please see Appendix A for an example of how the debt service reserve fund or the surety bond is sized to cover debt service payments in the event a utility does not fulfill its obligation to an issuer.

rating of the surety bond provider is incorporated into our assessment of the credit quality of the transaction. If the surety bond provider is not rated, we ascribe no value to the reserve fund.

In order for the gas purchaser's rating not to be incorporated into the bond rating, there is also a permanent remedy. Following a nonpayment by a gas purchaser, the gas supply agreement is either suspended or terminated and either of the following two permanent remedies ensure the continuance of debt payments:

» **Agreement to remarket gas.** The termination of the supply agreement for the nonpaying gas purchaser results in the obligation of the gas supplier to remarket the quantity of gas under the terminated supply agreement. The gas supplier would be obligated to make a minimum payment equal to the contract price beginning in the month following nonpayment by the gas purchaser; or

» **Lump sum payment and bond redemption.** The gas supplier or guarantor undertakes to make a lump sum payment such that the termination of the supply agreement for the gas purchaser leads to a partial termination payment under the GPA and a redemption of a portion of the bonds outstanding equivalent to the gas purchaser's share of the transaction.

The Structural Features of the Gas Purchase Agreement

We consider whether the gas purchase agreement contains the following provisions regarding the gas supplier's delivery and payment obligations to the issuer. For a gas prepayment transaction to be rated under this methodology, the GPA must include these provisions:

» An obligation to deliver a set quantity of gas on a daily basis to specified delivery points.

» A payment obligation to the issuer if the supplier is unable to deliver gas for reasons other than a force majeure (the floor on this payment is a guaranteed minimum to allow the transaction cash flow to remain sufficient to cover debt service).

» A payment obligation to the issuer if a force majeure affects either the gas supplier's ability to deliver gas or the gas purchaser's ability to receive gas (the floor on this payment is a guaranteed minimum to allow the transaction cash flow to remain sufficient to cover debt service).

Termination of the GPA

For a gas prepayment transaction to be rated under this methodology, when the commodity swap or interest rate swap includes non-credit-related termination events[12] that impede cash flow, the GPA[13] must include termination provisions. Non-credit-related events may include misrepresentations, breach of agreement or merger without assumption. Where the swap termination is due to nonpayment or a bankruptcy filing and does not result in automatic termination of the GPA, the transaction is rated under this methodology because these risks are reflected in our credit assessment of either the swap counterparty (or the back-end swap where applicable) or the transaction.[14]

Under the provisions of a typical GPA, some events result in automatic termination, while others provide optional termination at either the request of the issuer or the gas supplier. When swap

[12] These termination events could apply to any party to these agreements.

[13] If this risk is not covered in the GPA, it must be covered in other structural features of the transaction. For example, an issuer can mitigate the risk of a default under a swap agreement for a merger without assumption if the issuer covenants not to allow such an event to occur.

[14] While the issuer is a party to the swap, issuer bankruptcy is addressed above in the Organizational Structure of the Issuer section, and issuer nonpayment risk is reflected in overall transaction rating.

terminations are optional at the direction of the issuer for a default related to the counterparty, in order for a transaction to be rated under this methodology, the governing bond document must include a commitment from the issuer to exercise its right to terminate the GPA on the swap termination date.

Termination Payment

Upon the termination of a GPA, the gas supplier usually owes a termination payment to the trustee, effectively reimbursing the issuer for the unused portion of the prepayment. In order for a gas prepayment transaction to be rated under this methodology, the GPA must describe the timing and size of the termination payment. In addition, this payment, in combination with the amounts on deposit with the trustee, must be sufficient to cover the redemption payments and the GPA termination must trigger a final redemption payment to bondholders.

Structural Features of the Investment Agreement

A payment default or bankruptcy of the investment provider can affect a gas prepayment transaction in two ways: (i) the loss of the principal invested, which is essential to the payment of the debt; and (ii) the potential for insufficient funds for the payment of debt service if cash flow relies on earnings associated with the investment agreement.

Many investment agreements provide for the posting of collateral by an investment provider if its rating falls below preset levels. We typically do not consider collateral posted under these agreements as enhancing the likelihood of payment of the earnings or repayment of the principal investment, because the collateral may be subject to the automatic stay provisions in the event the investment provider files for bankruptcy.

We typically review the investment agreements to assess whether their assignment or substitution provisions introduce risks related to a change in the counterparty or the rate of return. Typically, an assignment or substitution is restricted by the transaction terms. In cases where assignments or substitutions are permitted, the following provisions must typically be present for a transaction to be rated under this methodology: (i) the issuer consents; (ii) the replacement investment provider has the same or higher rating as the assignor, or its rating is sufficient so that the current rating on the transaction is not reduced or withdrawn; and (iii) the assignment will not trigger any provisions in other transaction documents that could affect the transaction's credit profile. In the absence of these or similarly protective provisions, we may not be able to rate the gas prepayment transaction.

Where cash flows rely on earnings from the investment agreement, the transaction must include the following provisions to be rated under this methodology:

» Prohibition of termination of the agreement without a replacement.

» Requirement that any replacement agreement provides the same or better rate of return.

» Specific instructions for the trustee to continually invest available funds in the agreement.

The Structural Features of the Commodity Swap Agreement

We generally consider whether the commodity swap agreement contains provisions that introduce risks unrelated to the credit profile of the commodity swap provider. For a gas prepayment transaction to be rated under this methodology, the commodity swap agreement must include the following provisions, or other similarly protective provisions:

» The gas purchaser's payments to the issuer under the supply agreement match the issuer's payments to the counterparty under the commodity swap agreement. The payments in both agreements vary based on the same monthly index price (no basis risk). The counterparty's payments to the issuer match the fixed payments due to bondholders (or to the interest rate swap provider, if party to the transaction).

» The transaction terms sufficiently mitigate the risk of a payment gap in the commodity swap arrangements in the event of a swap termination.

The structural framework of gas prepayment bonds typically allows for commodity swaps to be assigned to an alternate swap counterparty or be substituted. To be rated under this methodology, a transaction where the commodity swap provider is a key credit counterparty must include provisions related to assignment and substitution that are structured so that the current rating on the transaction is not reduced or withdrawn.

Structural Features That Can Mitigate the Credit Quality of the Commodity Swap Counterparty

The credit quality of the commodity swap counterparty is typically not incorporated into the rating of the transaction when the transaction documents provide another source of payment in the event the commodity swap counterparty fails to fulfill its obligations or files for bankruptcy.

In some transactions, the risk of nonpayment by the counterparty on a front-end commodity swap has been covered with a corresponding back-end commodity swap. In these transactions, the gas supplier has entered into a separate commodity swap with the commodity swap counterparty. Payments by the gas supplier as back-end commodity swap provider to the commodity swap counterparty under this back-end commodity swap are equal to payments owed to the issuer by the commodity swap counterparty on the front-end commodity swap. Under this scenario, the rating of the front-end commodity swap counterparty[15] is not incorporated into the rating for the transaction if the structural framework includes the following provisions:

» All payments made by the gas supplier under the back-end commodity swap are deposited monthly with a custodian under a custodial agreement.

» If the commodity swap counterparty fails to make a required payment under the front-end commodity swap, the custodian is required to deliver to the trustee the funds provided by the gas supplier under the back-end commodity swap. Such funds provided under the back-end commodity swap are applied by the trustee in the same manner as payments made by the front-end commodity swap counterparty.

» In cases where there is a lag between the termination of the front-end commodity swap and the termination of the GPA (for example, to allow for replacement of the swap), the back-end swap

[15] For clarity, the rating of the back-end commodity swap provider is incorporated in the transaction rating in these cases.

must continue to make payments until the earlier of (i) the effectiveness of any replacement front-end swap agreement and (ii) the termination of the GPA and the redemption of the bonds in full.

The Structural Features of the Interest Rate Swap Agreement

The fixed payments resulting from the commodity swap are typically structured to match debt service when the bonds are issued with a fixed rate of interest. In order for a variable-rate gas prepayment transaction to be rated under this methodology, the structure must include an interest rate swap to mitigate risks related to rising interest rates. In these cases, the issuer makes the fixed payment to the interest rate swap counterparty and receives a variable-rate payment equal to the variable interest rate due on the bonds.

Our approach to assessing defaults and terminations under interest rate swaps is similar to our approach to assessing defaults and terminations under commodity swaps. In addition, we typically apply the same considerations described under the commodity swap section concerning assignment and substitution.

When an interest rate swap is terminated in a high interest rate environment, the revenue from gas purchaser payments or from the commodity swap payment may not be sufficient to cover the unhedged variable-rate interest payment. In the event the interest rate swap can be terminated and there is a lag until the redemption of the bonds, the structural framework must include one of the following provisions:

» The termination payment under the GPA covers the final payment of the bond regardless of an increase in the interest rate that may occur between the swap termination and the redemption date.

» The terminating interest rate swap makes a wind-down payment up to the redemption date even though the redemption date occurs after the termination of the interest rate swap.

» The interest rate swap does not terminate until the redemption date of the bonds, therefore obligating the swap counterparty to make payments until the redemption date.

Miscellaneous Document Features

The Trustee

The indenture for a gas prepayment transaction eligible for a rating typically contains provisions for a fiduciary, such as a trustee, to perform all non-discretionary duties and actions, carried out without the fiduciary seeking indemnification or having a prior lien on funds in the transaction. The documents typically include provisions that a trustee is in place throughout the life of the transaction and that no resignation or removal shall take place unless a successor trustee is in place. We typically consider trust companies or banks with trust powers as qualified trustees for any gas prepayment transactions.

Defaults and Remedies

The default section of an indenture for a gas prepayment transaction typically includes a list of applicable events of default and remedies for such defaults. Since these transactions rely on the ongoing cash flows from the sale of the prepaid gas and other contractual payments to make debt service, acceleration of the debt would likely result in a payment default. We typically consider transactions to be eligible for a rating under this methodology if they contain provisions that stipulate

that defaults leading to the acceleration of debt are limited to nonpayment of principal or interest, or limited to those that require 100% bondholder consent.

Other Rating Considerations

Ratings may include additional considerations, usually because the consideration's credit importance varies widely among the transactions in the sector or because the considerations may be important only under certain circumstances or for a subset of transactions. Such factors include financial controls and the quality of financial reporting; legal structure; assessments of transaction governance as well as environmental and social considerations; and possible government interference in some countries. Regulatory, litigation, liquidity and technology as well as macroeconomic trends also affect ratings.

Following are some examples of additional considerations that may be reflected in our ratings.

Changes in Regulations and Tax Laws

Changes in regulations, tax law or tax enforcement, particularly if sudden, could have a material impact on the workability and effectiveness of structures for gas prepayment bonds that would change our overall assessment of the credit and structural risk in these transactions.

Changes in Typical Deal Structure

While gas prepayment bonds have typically been structured in a relatively similar pattern in recent years, transactions could include different structural features or a combination of features that would affect our analysis and ratings. Structures may also change in response to changes in regulations and tax laws. In assessing the impact that different structural features may have on default probabilities and loss given default, typical considerations would likely include the way that the structures allocate risk, their impact on the rights and obligations of transaction parties, the willingness of third parties to provide credit enhancement to such structures, and our confidence level in how such structures would fare in stress and distress scenarios, which may be informed by legal opinions or other third-party opinions or assurances.

Environmental, Social and Governance Issues

ESG considerations may affect the ratings of counterparties to a gas prepayment transaction as well as the underlying value of the commodity to the purchasers. We also consider how the issuer's governance affects creditors. For information about our approach to assessing environmental, social and governance (ESG) issues, see our methodology that discusses our general principles for assessing ESG.

Assigning Instrument-Level Ratings

After considering the credit quality of the underlying parties to the transaction, the credit quality of the GIC or repurchase agreement provider, the structural features of the transaction, other rating considerations and relevant cross-sector methodologies, we typically assign a senior instrument-level rating. In cases of multiple debt classes, individual debt instrument ratings may be notched down from the senior instrument-level rating.

Assumptions

Key rating assumptions that apply in this sector include our view that sovereign credit risk is strongly correlated with that of other domestic issuers, that legal priority of claim affects average recovery on different classes of debt sufficiently to generally warrant differences in ratings for different debt classes of the same issuer, and the assumption that access to liquidity is a strong driver of credit risk.

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.

Limitations

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

This methodology document does not include an exhaustive description of all factors that we may consider in assigning ratings in this sector. Transactions in the sector may face new risks or new combinations of risks, and new strategies or structural features may be developed 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.

The factors discussed in the "Other Rating Considerations" section may be important for ratings, and their relative importance may also vary from issuer to issuer. In addition, certain broad methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector.

Ratings reflect our expectations for a transaction's future performance; however, as the forward horizon lengthens, uncertainty increases and the utility of precise estimates, as factor inputs or in other rating considerations, typically diminishes. In any case, predicting the future is subject to substantial uncertainty.

Appendix A: An Illustration of How a Reserve Fund or Surety Bond May Be Sized to Cover a Nonpayment by a Gas Purchaser

A debt service reserve fund or a surety bond may be used to cover debt service payments in the period from the date a gas purchaser misses a payment to the date the bonds are redeemed or the date the gas supplier becomes obligated to remarket and pay for the gas. The reserve fund or surety bond permits the transaction cash flows to continue from the point of nonpayment until the remedy.

In the examples below, the supply agreement is either suspended or terminated by the issuer effective at the end of the month when a nonpayment by a gas purchaser occurs. Thus the reserve fund or surety bond is sized for the two consecutive months of highest gas volumes. Any contractually permitted delay in the suspension or termination of the gas supply agreement could increase the number of months needed for coverage. The examples below illustrate how a debt service reserve fund or surety bond may be sized to cover debt service payments for two months:

» Debt service reserve funds are used to pay debt service on the bonds when there is insufficient revenue to the issuer due to nonpayment for delivered gas. The amount of gas delivered in the two months with the highest consecutive gas delivery volume multiplied by the fixed payment per unit received from the commodity swap provider is equivalent to the maximum potential debt service needed to cover the transaction cash flows lost due to participant nonpayment. Therefore, under this scenario, a reserve fund sized to cover the two months of debt service with the highest possible payments would permit the transaction to continue with sufficient cash flow until the gas supply agreement is terminated.

» When the transaction uses a surety bond to support participant nonpayment, the sizing of the surety bond depends upon what the surety is specifically covering.

  - If a claim on a surety bond is drawn first to pay debt service on the bonds (and any payment owed on an interest rate swap), a surety bond sized for the highest two consecutive debt service payments over the life of the bonds would be sufficient. In this scenario, the commodity swap provider would be subordinate in the waterfall of payments under the bond documents. The sizing of the policy would be sufficient to pay the bonds regardless of the price of gas because it needs to cover only the fixed payment received from the commodity swap provider, not the variable payment paid to the commodity swap provider.

  - If a claim on a surety bond is applied first to pay the commodity swap, the size of the surety bond must be sufficient to cover fluctuations in gas prices. In this instance, we review the 10-year history of gas prices at the relevant delivery points in the transaction. We generally consider a surety bond sufficient to provide transaction cash flow in the event of participant nonpayment when it is sized to the greater of: (i) a price per one million British thermal units (MMBtu) that is at least three standard deviations higher than the mean; or (ii) two times the highest price over the same 10-year period. When a surety is sized in this manner, we typically review natural gas prices for the relevant delivery point annually to assess whether the surety remains sufficiently sized to support the transaction.

» Some transaction structures use a receivables purchase agreement, which is typically issued by the gas supplier and guaranteed by the same party guaranteeing the GPA. The receivables purchase agreement obligates the guarantor to make payments on behalf of the nonpaying participant in a

timely manner, which allows the amount of the participant cash flows to continue to be paid to the issuer without interruption. In some instances, the guarantor can elect between (i) making the payment under the receivables purchase agreement; and (ii) terminating the gas purchase agreement. If the gas supplier elects to terminate the gas purchase agreement, a termination payment is owed by the supplier, and the bonds are redeemed with the termination payment and other available funds as outlined under the gas purchase agreement and indenture. These agreements are typically sized in the same manner as the debt service reserve fund described above.

Appendix B: Scenario Analysis for Debt Service or Reserve Fund GICs[16]

For gas prepayment transactions that use GICs for debt service or reserve funds, the rating of the transaction is capped at no more than five alphanumeric notches[17] above the rating of the GIC provider. In order to assess whether the rating cap for the transaction is fewer than five notches above the GIC provider's rating, we perform a scenario analysis to assess what the impact on cash flow would be if a GIC provider fails to meet its obligations.

We perform a scenario analysis assuming the GIC provider's failure occurs in the current year, a separate scenario analysis assuming GIC failure occurs in the following year and so on for each subsequent year through the life of the bonds. We analyze GIC provider failure in each year because the projected loss to the transaction may vary depending on the point in the life cycle of the bonds the failure of the GIC provider occurs.

The rating cap is determined by assessing the GIC provider default scenario with the highest projected loss to bondholders, combined with the rating of the GIC provider.

Assumptions

We apply the following assumptions to our GIC default scenario analysis:

» A loss of 55% of GIC principal at the time of default.

» Replacement of the GIC with one providing a 0% rate of return.

» GIC provider default occurs midway through the accumulation of revenue for a debt service cycle (e.g., at three months for typical semi-annual payment terms).

Calculating Expected Loss

For each GIC default scenario, we calculate the value of the loss to the transaction based on the amount of the debt service and reserve funds as well as the net present value of the loss, discounted at the weighted average bond coupon rate. We multiply the net present value of the loss by the probability of default associated with the GIC provider's rating, based on Moody's 10-year idealized default probability tables.[18] This calculation provides an expected loss to the transaction for each GIC default scenario, which is then mapped back to a rating equivalent based on Moody's 10-year idealized expected loss tables.[19] The lowest resultant rating equivalent among all of the GIC default scenarios is the basis for determining the rating cap for the transaction.

16 In this Appendix, we refer to all fixed-rate investment products as GICs and to all investment providers as GIC providers.

17 For example, if the GIC provider's rating is Baa1, five notches above that rating would be Aa2.

18 *Rating Symbols and Definitions* contains 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.

19 Cutoff points between alpha-numeric equivalents are based on the geo mean of their expected losses.

Assigning the Rating Cap

In all cases, for gas prepayment transactions that use GICs for debt service or reserve funds, the rating cap is set at the lower of (i) five notches above the GIC provider's rating (the Standard Cap) and (ii) either the lowest resultant rating equivalent among all of the GIC default scenarios or, in some circumstances, one notch above that lowest rating equivalent (the Expected Loss Cap).

Where expected loss associated with a GIC default is sufficiently constant over time that the rating equivalent among all of the GIC default scenarios is the same, this rating equivalent is the Expected Loss Cap.

In cases where the rating equivalent associated with the expected loss among the GIC default scenario changes over time, the Expected Loss Cap is set either at the rating equivalent of the scenario with the highest expected loss or one notch higher than that level, depending on when the highest expected loss occurs and the percentage of the debt service that is funded from the GIC over the next three years of the transaction.

If the GIC default scenario with the largest expected loss occurs well in the future, setting the Expected Loss Cap at the rating associated with the highest expected loss could overstate the risk of GIC default. For example, a GIC default in the current year may result in an expected loss to the transaction associated with an A1 Expected Loss Cap. Over time, the expected loss to the transaction may grow as its dependence on funds from the GIC grows, such that in year 15, the expected loss to the transaction is associated with a Baa1 rating cap. The risk of GIC provider failure to the overall transaction is therefore lower in years one through 14, during which time the GIC provider's credit profile could improve. Thus, a Baa1 rating cap could be too conservative. In this case, as the transaction becomes more dependent on GIC interest income and reserve transfers, the loss due to a GIC provider default would increase if the GIC provider's rating stays the same or goes down. In a scenario where expected loss will decrease over time, maintaining the Expected Loss Cap at the current level could also be too conservative.

In order to reflect the credit risk to the transaction when expected loss from a GIC provider default increases over time, we usually set the Expected Loss Cap one notch above the rating equivalent associated with the largest expected loss over the remaining life of the transaction. However, we usually set the Expected Loss Cap at the rating equivalent associated with the largest expected loss when the largest expected loss will occur in the next three years of the transaction[20] and in cases where the funds from the GIC (principal and accumulated interest) cover, on average, 30% or more of debt service payments over the next three years (typically, six semi-annual payment periods).

In order to reflect the credit risk to the transaction when expected loss from a GIC provider default will decrease meaningfully over the medium term, we usually set the Expected Loss Cap one notch above the rating equivalent associated with a GIC provider default in the current year. A meaningful decrease over the medium term means that the rating level associated with the expected loss from a GIC provider default goes up by at least one notch over the next three years of the transaction. However, if funds from the GIC (principal and accumulated interest) cover, on average, 30% or more of debt service payments over the next three years (typically, six semi-annual payment periods), the Expected Loss Cap is usually set at the rating associated with the current year expected loss.

[20] In cases where the rating level associated with the largest expected loss only pertains to a relatively short period of time, for example the last year or two of the transaction, we may not lower the rating cap, which may remain at one notch above the rating level associated with the largest expected loss.

In addition to considering the expected loss analysis, in cases of very high exposure to the GIC provider, we may cap the rating of the transaction at the GIC provider's rating. Generally, we would apply this cap when 55% of the debt service payments over the remaining life of the transaction come from funds held with the GIC provider, but we would typically also consider any variability of the dependence on the GIC provider during the remaining life of the transaction as well as the absolute number of remaining debt service payments.

Example: Expected Loss Increases Throughout the Transaction; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Remains Below 30%

In this example, the rating equivalent associated with the largest expected loss due to a GIC provider default is A2, which occurs during years 27 through 30 of the transaction. In all periods, the dependence on GIC funds to cover the next three years of debt service payments remains below 30%. The cap would remain at A1 throughout the life of the transaction, until year 26, when the expected loss in a GIC provider default over the next three years of the transaction is A2. During year 26, the Expected Loss Rating Cap would typically go down to A2.

Example: Expected Loss Increases Throughout the Transaction; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Rises to 30% or Above

This scenario is the same as the example above except that, starting in year 10, 30% or more of debt service payments over the next three years would be paid with funds from the GIC. In year nine the rating cap would typically be lowered to A2. If the dependence on GIC funds were over 55% during years 28 through 30, in year 26 or 27 we would also consider whether the cap should be lowered to the rating of the GIC provider.[21]

Example: Expected Loss Declines Throughout the Transaction; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Remains Below 30%

In this example, the rating equivalent associated with the largest expected loss due to a GIC provider default is A2, which occurs during years one through five of the transaction, after which the rating equivalent is A1 in years six through 15 and Aa3 in years 16 through 30. In all periods, the dependence on GIC funds to cover the next three years of debt service payments remains below 30%. In this case, the Expected Loss Cap would remain at A2 during years one and two of the transaction. During year three, the Expected Loss Cap would typically be raised, since the rating equivalent associated with the expected loss due to a GIC provider default in the next three years would go up to A1. During year 13, the Expected Loss Cap would typically be raised again, since the rating equivalent associated with the expected loss due to a GIC provider default in the next three years would go up to Aa3. Thereafter, it would normally remain constant.

Example: Expected Loss Declines Throughout the Transaction; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Rises to 30% or Above

This scenario is the same as the example immediately above except that 30% or more of debt service payments during years three through five of the transaction would be paid with funds from the GIC. The Expected Loss Cap would remain at A2 until such time as the expected loss associated with the

[21] In the examples that follow, we would also consider whether very high dependence on the GIC provider would cause the rating cap to be lowered to the GIC provider's rating.

GIC provider default scenario were equivalent to an A1 or higher for the current year and the succeeding three years.

Example: Expected Loss Grows and Then Declines; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Remains Below 30%

In this example, the rating equivalent associated with the expected loss to the transaction due to a GIC provider default starts at A2 and grows during years one through seven of the transaction, at which point, the rating equivalent associated with a GIC provider default is Baa3 for years eight through 10. For years 11 through 20 the rating equivalent associated with a GIC provider default is Baa2, and thereafter it is Baa1. In all periods, the dependence on GIC funds to cover the next three years of debt service payments remains below 30%. In this case, the Expected Loss Cap would typically remain at Baa2 for the first 17 years of the transaction. During year 18, the Expected Loss Cap would normally be raised, since the rating equivalent associated with the expected loss due to a GIC provider default rating cap in the next three years would go up to Baa1.

Example: Expected Loss Grows and Then Declines; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Rises to 30% or Above

This scenario is the same as the example immediately above except that 30% or more of debt service payments during years 18 through 20 of the transaction would be paid with funds from the GIC. The Expected Loss Cap would remain at Baa2 until such time as the expected loss associated with the GIC provider default scenario were equivalent to Baa1 or higher for the current year and the succeeding three years.

Example: Expected Loss Declines and Then Grows; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Remains Below 30%

In this example, the rating equivalent associated with the largest expected loss to the transaction due to GIC provider default starts at a Baa2 equivalent and declines steadily during years one through 15 of the transaction: Baa1 in years four through six, A3 in years seven through nine, A2 in years 10 through 12 and A1 in years 13 through 15. During years 16 through 30, the expected loss due to a GIC provider default grows slowly and reaches a rating equivalent of A3 only in year 30. In all periods, the dependence on GIC funds to cover the next three years of debt service payments remains below 30%. In this case, the Expected Loss Cap would typically start at Baa1 and would typically be raised to A3 during year four and to A2 during year seven, where it would typically remain for the life of the transaction.

Example: Expected Loss Declines and Then Grows; GIC Provider's Rating Remains Constant; Dependence on GIC Funds Rises to 30% or Above

This scenario is the same as the example immediately above except that, starting in year 21, 30% or more of debt service payments over the next three years would be paid with funds from the GIC. In this case, the Expected Loss Cap would typically start at Baa1 and would typically be raised to A3 during year four and to A2 during year seven, where it would typically remain until year 20, at which time the Expected Loss Cap would typically be lowered to A3.

Reassessing the Rating Cap

We reassess the rating cap upon a change in the rating of the GIC provider. In addition, we typically reassess the cap upon any of the following:

» A material change in future cash flows due to prepayments.

» Termination of the GIC.

» Replacement of the GIC provider with another provider, unless the rating of the provider and the terms of the GIC are identical.

Moody's Related Publications

Credit ratings are primarily determined by 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. An index 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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