

Criteria | Infrastructure | General:

General Project Finance Rating Methodology

December 14, 2022

(Editor's Note: On Dec. 19, 2025, we republished this criteria article to make nonmaterial changes by updating criteria cross-references and the contact list as well as removing references to such changes from the "Revisions And Updates" section.)

OVERVIEW AND SCOPE

This article presents S&P Global Ratings' global criteria for rating project finance transactions. For the credit factors and typical assumptions we use in our analysis of specific project finance sectors, see "[Sector-Specific Project Finance Rating Methodology](#)."

Project finance is a technique used to finance capital-intensive assets. In a project finance transaction, one or more limited-purpose entities (LPEs) collectively undertake the construction and/or operation of assets, mostly in the infrastructure sector. We refer to the underlying business undertaking and the financial structure that supports it as "the project." Other terms are defined in the glossary.

Transactions rated under these criteria share the following characteristics:

- The project's debt is primarily serviced and repaid using the project's cash flows--specifically, the cash flow available for debt service (CFADS), generated by the operation of the project assets. Debtholders have limited or no recourse to the project sponsors or shareholders.
- Debtholders typically have a senior security interest over the project assets and cash flows.
- The cash management structure determines the priority of payments.
- A set of covenants establishes what the project can and cannot do during its life.

The key attributes of the project finance transactions in scope of these criteria are defined in section 2. Some entities share some, but not all, of the project finance characteristics and are rated under different criteria. These include corporates, project developers, structured finance issuers (including corporate securitizations), and public finance issuers.

In addition, for any project that has unsustainable financial commitments or that has financial obligations vulnerable to nonpayment, we use our 'CCC' rating criteria ("[General Criteria: Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings](#)") instead of these criteria.

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METHODOLOGY

Section 1: Project Finance Ratings Framework

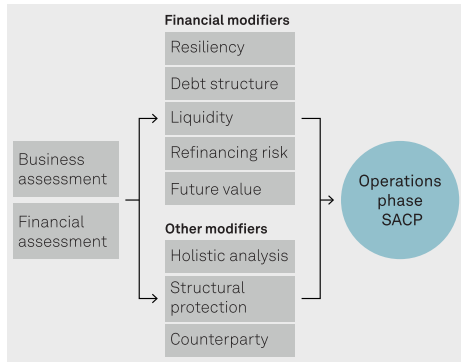
When rating debt issued by a project finance transaction, we first determine whether it has certain minimum structural features. If it does, we assess the project's stand-alone credit profile (SACP) at both the operations and construction phases, and then factor in any parent linkages and external influence to derive the issue credit rating--both for senior and subordinated debt (see chart 1).

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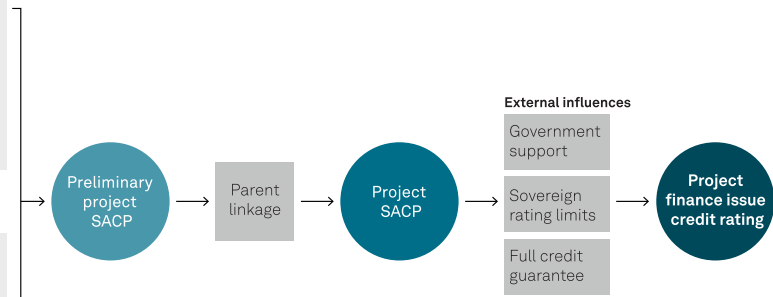
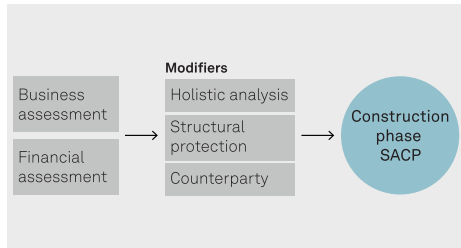
Chart 1

Project Finance Criteria Framework

Operations phase



Construction phase



SACP—Stand-alone credit profile.
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Our rating analysis for project finance transactions under these criteria incorporates an assessment of environmental, social, and governance (ESG) risks if we believe they have the potential to affect the issue credit ratings (see "[Environmental, Social, And Governance Principles In Credit Ratings](#)").

Minimum Structural Features

To be rated under these criteria, we expect a project finance transaction to present a certain set of structural features to both limit the issuer's actions and define the creditors' rights. The latter are defined through covenants and a security package. In certain cases, specifically allowed by the criteria, a transaction that has different attributes may still be rated under this methodology, but the rating will reflect the weakness arising from the absence of certain minimum structural features or the project's unique attributes.

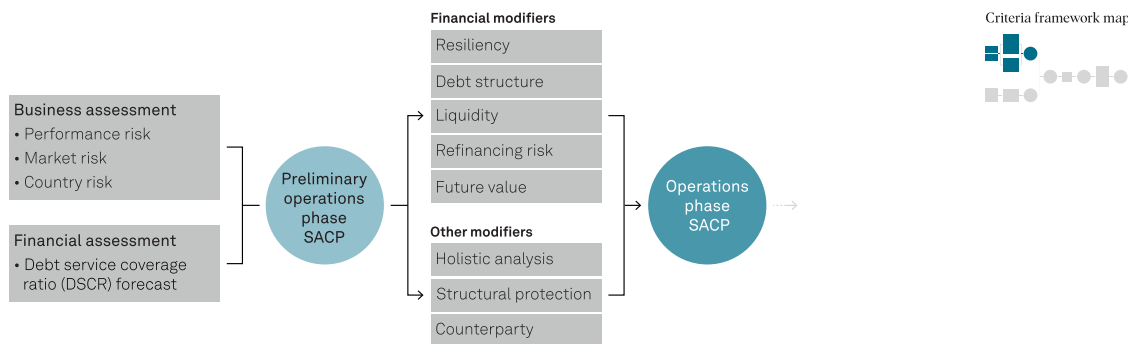
Operations Phase SACP

We assess the project's business and financial risk during the operations phase to evaluate the likelihood that the project will generate sufficient cash flows to meet its financial commitments. We combine those assessments to derive the preliminary operations phase SACP, which we modify to incorporate other factors. These include, for example, the project's resiliency, debt structure, liquidity, refinancing risk, structural features, and counterparty dependencies.

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Chart 2

Operations Phase Stand-Alone Credit Profile



SACP--Stand-alone credit profile.
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The operations phase business assessment (OPBA) reflects our view of the volatility of cash flows. This can result from the project's operating environment, asset type, operational performance, or its exposure to market prices, as well as volume fluctuations. The OPBA blends qualitative analysis and quantitative information, and combines our assessments of performance, market, and country risk. The OPBA ranges from 1 to 12, with 1 indicating the lowest risk.

The operations phase financial assessment is mostly based on quantitative information; in particular, on our forecast of the minimum debt service coverage ratio (DSCR) until the debt is fully repaid. We use the minimum DSCR as a proxy for the project's default risk as it highlights the riskiest period during the operations phase. The DSCR measures the project's expected cash flows against debt service requirements under our base-case scenario during the operations phase.

Table 1 shows how we combine the OPBA and the financial assessment/minimum DSCR to derive the preliminary operations phase SACP.

Table 1

Deriving The Preliminary Operations Phase SACP

	--Minimum DSCR ranges*--				
	aa	a	bbb	bb	b
OPBA					
1-2	=> 1.75	1.75-1.20	1.20-1.10	1.10-1.05	<1.05
3-4	N/A	=> 1.40	1.40-1.175	1.175- 1.10	<1.10
5-6	N/A	=> 1.75	1.75-1.30	1.30-1.15	<1.15
7-8	N/A	=> 2.50	2.50-1.60	1.60-1.35	<1.35
9-10	N/A	=> 5.00	5.00-2.50	2.50-1.50	<1.50
11-12	N/A	N/A	N/A	=>3.00	<3.00

*DSCR ranges include values at the lower bound, but not the upper bound. For example, 1.20x-1.10x includes 1.10x, but excludes 1.20x.
DSCR--Debt service coverage ratio. SACP--Stand-alone credit profile. N/A--Not applicable.

The following additional financial factors may modify the preliminary operations phase SACP:

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- Resiliency under stress: Greater resiliency may prompt us to revise up the preliminary operations phase SACP by up to three notches; conversely, weak performance under stress may cause us to apply a cap. We measure this by looking at how a project performs in our downside scenario, and the robustness of its median DSCR under the base case.
- Weaknesses in the debt structure: This may cause us to revise down the preliminary operations SACP by one or more notches. Weaknesses include a material dependency on cash flow sweeps to pay down debt, excessive debt leverage, unusually high mandatory amortization payments in later years, or high exposure to inflation rate changes.
- Liquidity position: Liquidity can support or impair a project's risk profile and flexibility to respond to unpredictable events. Based on the coverage of uses by sources of funds, we may revise up or down the preliminary operations phase SACP.
- Refinancing risk: The preliminary operations phase SACP may be capped. For example, this would happen if we forecast that CFADS and unrestricted cash on hand would be insufficient to fully pay down debt by the end of the asset's life, including headroom.
- Future value: If the project has the flexibility to react to unforeseen stresses arising from a longer tail, we may revise up the preliminary operations phase SACP by one notch.

Although it is possible, we do not expect the cumulative effect of these factors to revise up the operations phase SACP by more than one category from the preliminary operations phase SACP.

Table 2

Cumulative Impact Of Modifiers And Caps

	--Preliminary operations phase SACP--			
	'a-' or higher	'bbb+' to 'bbb-'	'bb+' to 'bb-'	'b+' or lower
Resiliency*				
Resiliency assessment				
Very high	+1	+2	+2	+2
High	0	+1	+2	+2
Moderate	Cap at 'bbb' category	0	+1	+2
Modest	Cap at 'bb' category	Cap at 'bb' category	0	+1
Low	Cap at 'b' category	Cap at 'b' category	Cap at 'b' category	0
Median DSCR	0 to +1	0 to +1	0 to +1	0 to +1
Debt structure	0 to -3	0 to -3	0 to -3	0
Liquidity				
Strong	+1	+1	+1	+1
Neutral	0	0	0	0
Less than adequate	At least -1	At least -1	At least -1	At least -1
Refinancing§	Potential cap	Potential cap	Potential cap	Potential cap
Future value	Up to +1	Up to +1	Up to +1	Up to +1

*The resiliency modifier includes the resiliency assessment and the median DSCR. §Caps are applied through an asset life coverage analysis. SACP--Stand-alone credit profile.

Finally:

- Our holistic view of relative creditworthiness during operations may cause us to revise the preliminary operations SACP up or down by one further notch.

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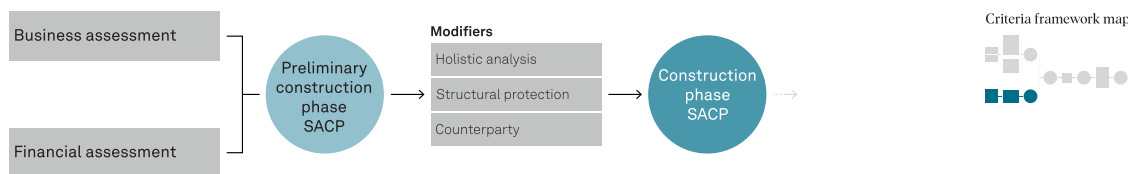
- Potential deficiencies in the security or covenant package or exposure to material counterparties could cause us to cap the operations phase SACP (see sections 5 and 6).

Construction Phase SACP

We rate projects that are still under construction. The construction phase, which lasts from financial close to the start of operations, carries additional risks, which we assess separately from the operations phase. The construction phase SACP indicates the likelihood that the project will be adequately funded through construction, will be completed on time and within budget, and will operate as designed to meet the contracted performance standards (see section 4).

Chart 3

Construction Phase Stand-Alone Credit Profile



SACP—Stand-alone credit profile.
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First, we determine the construction phase's business and financial assessments and combine them to derive the preliminary construction phase SACP. We may then modify this preliminary outcome based on our view of nonfinancial aspects, such as any structural deficiency or any counterparty dependency.

The construction phase business assessment (CPBA) assesses risks associated with the nature and location of the asset being built; the difficulty of the construction; and the contractual risk allocation and experience of the various stakeholders, including management. The CPBA ranges from 1 to 6, with 1 indicating the lowest risk.

The construction phase financial assessment (CPFA) considers whether the amount, availability, and certainty of funding during construction is sufficient to cover construction costs, including likely scenarios of cost overruns and delays. The CPFA ranges from 1 to 6, with 1 indicating the lowest risk (strongest coverage).

Table 3 shows how we combine the CPBA and CPFA to derive the preliminary construction phase SACP.

Table 3

Preliminary Construction Phase SACP

		--Business assessment (CPBA)--					
		1	2	3	4	5	6
Financial assessment (CPFA)							
1	a+	a/a-	a-/bbb+	bbb+	bbb-	bb+	
2	a/a-	a-/bbb+	bbb+/bbb	bbb/bbb-	bb+	bb-	
3	a-/bbb+	bbb	bbb/bbb-	bbb-/bb+	bb	b+	
4	bbb/bbb-	bbb-	bbb-/bb+	bb	bb-	b	
5	bb+	bb	bb	bb-/b+	b+	b	

Preliminary Construction Phase SACP

--Business assessment (CPBA)--						
	1	2	3	4	5	6
6	b-	b-	b-	b-	b-	b-

Note: Section 4 explains how we determine the preliminary construction phase SACP when two outcomes are listed for a given combination of business and financial assessments. SACP--Stand-alone credit profile.

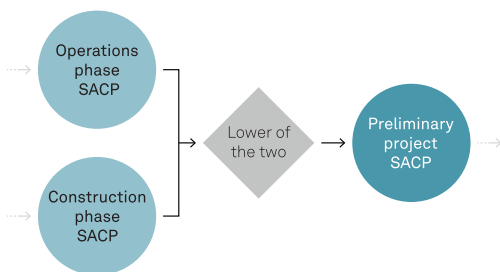
As in the operations phase, we may then modify the preliminary construction phase SACP to incorporate our holistic analysis, our analysis of structural protection, and our assessment of counterparty dependencies.

Preliminary Project SACP

The preliminary project SACP covers the full life of the project and is the lower of the operations and construction phase SACPs. Once construction is completed and all construction-related issues are resolved, the preliminary project SACP mirrors the operations phase SACP. This means that where the construction phase SACP is lower, the preliminary project SACP may be revised up once construction is completed, and the related risks resolved.

Chart 4

Preliminary Project Stand-Alone Credit Profile



Criteria framework map



SACP--Stand-alone credit profile. Copyright © 2022 by Standard & Poor's Financial Services LLC. All rights reserved.

For example, a project with a construction phase SACP of 'bbb' and an operations phase SACP of 'bbb-' would have a preliminary project SACP of 'bbb-', even during its construction phase. A project with a construction phase SACP of 'bb+' and an operations phase SACP of 'bbb-' would have a preliminary project SACP of 'bb+'. After the asset is constructed and signed off, the preliminary project SACP would be revised to 'bbb-'.

Parent Linkage

Having derived the preliminary project SACP, we may then modify it if we consider that the parent company (or companies) could influence the risk of bankruptcy of the project. Depending on how insulated a project is from the bankruptcy risk of its parent, it is classified as delinked from, linked to, or capped by the parent's creditworthiness:

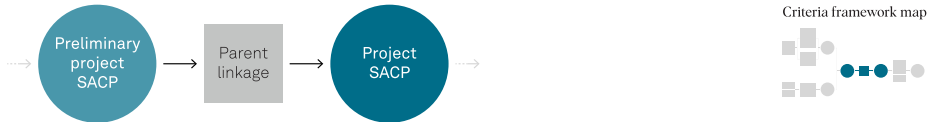
- If a project is delinked, the creditworthiness of the parent does not constrain the project SACP.

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- If a project is linked, the project SACP can be up to three notches higher than the parent's creditworthiness.
- If a project is capped, the project SACP cannot be higher than the parent's creditworthiness.

Chart 5

Project Stand-Alone Credit Profile



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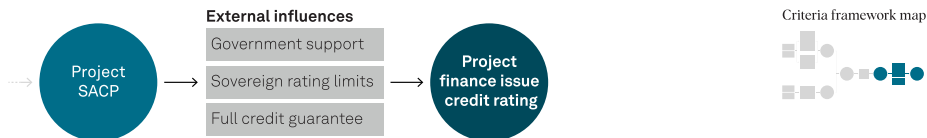
External Influences And Project Finance Issue Credit Rating

To derive the project finance issue credit rating, we then consider any external influence (see chart 6 and section 8), such as:

- Potential extraordinary government support or risk of negative intervention;
- Sovereign-related risks; and
- Full credit guarantees, if present.

Chart 6

Issue Credit Rating



SACP--Stand-alone credit profile.
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Recovery Considerations

We assign recovery ratings to project finance debt when:

- We rate the senior debt at 'BB+' or lower;
- The project operates in a jurisdiction that we classify as being in Group A or Group B, according to "[Methodology: Jurisdiction Ranking Assessments](#)"; and
- If the project defaults, it is expected to restructure or file for bankruptcy.

Our recovery analysis for project finance differs from our "[Recovery Rating Criteria For Speculative-Grade Corporate Issuers](#)" in that the recovery analysis does not affect the issue rating (see section 9).

Rating Other Types Of Project Finance Debt

We make specific provisions for rating different types of project finance debt. For example, as described in section 10, we rate:

- Subordinated debt or debt-like obligations;
- Project finance debt issued by holding companies; or
- Debt that has specific amortization or deferability features.

Section 2: Definition Of A Project Finance Transaction

Project finance is a technique used (by an entity usually referred to as the parent or sponsor) to finance certain capital-intensive assets, mostly in the infrastructure and industrial sectors, such as toll roads, power plants, or ports. Transactions involve one or more LPEs that collectively undertake the construction and/or operations of an asset or set of assets.

A. Attributes Of Project Finance Transactions

To rate a project finance debt issue under these criteria, we expect the transaction to have the following typical key attributes:

- A bankruptcy-remote LPE to build and/or operate the project. The entity's purpose is expected to be limited to activities necessary for the project. This is to reduce the likelihood of claims against the project stemming from actions unrelated to its permitted activities. The LPE is separated from its parent to limit its exposure to the parent's creditworthiness. We view separateness as a continuum and would reflect the degree of separateness in our rating.
- A security package that gives lenders a right to the project's cash flows and assets. This limits the disposal of key assets and reduces the incentive for third parties (including parents) to attempt to file the project for bankruptcy or seize the business. Project assets include physical assets, permits, agreements, accounts, and equity.
- A single asset or a portfolio that has a determinable economic life. This ensures that the limited purpose and bankruptcy-remoteness of the LPE are preserved and makes the cash flow generation that services the debt more visible. Portfolios are typically closed; an open portfolio that may change over time would have to be subject to specific conditions, including eligibility, covenants, or confirmation that project creditworthiness is not impaired, for the associated transaction to be rated under these criteria.
- A covenant package that ensures creditors will not be disadvantaged by the future actions of third parties.
- A cash management structure that includes a waterfall that prioritizes the payment of senior debt service after maintaining ongoing operations, as well as liquidity mechanisms that preserve cash in support of the senior debt service ahead of other project obligations and distributions.
- A controlling stake in the assets via the debt-issuing LPE's majority ownership or shareholder agreement (or, if the issuer does not have a controlling stake, its affirmative vote is required to approve major decisions).

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- Exposure to revenue risk, as well as either construction or operating risk, because the ability to service debt depends on future cash flows generated by the project assets.

B. Variations Of Project Finance Structures

We use this methodology to rate debt issued by projects whose attributes vary from those mentioned above if we consider that the assets and cash flows are sufficiently protected and will be available to service the debt until it is fully repaid. Examples of such variations include situations where:

- Not all project assets are pledged;
- The structural protection has weaknesses;
- The project has some linkage to its parent; or
- There is security that ranks ahead of the senior lenders.

Sections 5 and 7 explain how the methodology addresses these situations.

To be rated under these criteria, we expect the security package to include at least the project accounts and agreements. All else being equal, we assign a lower project SACP if the security package does not include all project assets and cash flows. However, even if not all project assets and cash flows are pledged, we may in some cases consider the security package requirements to be satisfied and would not penalize the rating. Circumstances that qualify include:

- Limitations on the pledging of physical assets. For example, the physical assets cannot be pledged directly under certain government concessions. In such a case, we expect debtholders to (i) be secured by a key project agreement, such as a concession, lease, or joint-venture agreement; and (ii) have step-in rights allowing them to enforce the terms of these agreements should the project default. Alternatively, the pledging of physical assets may be possible, but impractical (for example, registering a mortgage on each property for a pipeline easement that crosses several small properties). In these cases, we expect lenders to have the same rights as the project. If lenders don't have those rights, the project cannot be rated under these criteria.
- Limitations on legal security. The granting of effective security is commonly available in jurisdictions such as the U.K. and the U.S., but is not permitted or enforceable under local law in other jurisdictions on certain types of assets (for example, some pipelines in the Middle East). We would still expect the transaction documentation to provide all security that is permitted under the laws that govern the project.

In addition, we do not penalize the rating on a project that does not pledge all assets if it meets all the following conditions:

- The unsecured asset(s) cannot be pledged as security to third parties;
- The unsecured assets do not jeopardize or weaken the LPE's bankruptcy remoteness;
- The unsecured assets do not affect the operations of other key project assets in any way. That is, all assets required to operate the project and repay the liabilities, or the definable part, are pledged; and
- No third party can seize the unsecured assets.

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Some of the variations on a project finance structure that we expect to rate under these criteria include, but are not limited to:

- Financings that pledge 100% of the cash flows generated by the asset(s) involved in the structure, main agreements, contracts, permits, and physical assets.
- Financings that do not pledge 100% of the cash flows generated by the asset(s), but what is pledged is a definable revenue stream that can be separated from other asset cash flows. For example, an airport project that pledges only one of its cash flow streams, such as its aeronautical revenue, net of operating expenses.
- Financings of projects that have a partial interest/ownership in a physical asset and pledge 100% of their partial ownership. This includes partnership structures that involve two or more sponsors, where the partner retains control of the cash flows relating to its share despite not having 100% ownership; and where documentation or legal opinions confirm that the project's lenders have effective step-in rights, so that the failure to perform of the other party does not prevent the partner from continuing to build or operate the project. Control may be through a majority ownership or other protections, including veto rights, against adverse decisions from the remaining owners. Examples include joint ventures or tenancies in common, where the lenders have a 100% pledge of the portion of the revenue covered under the relevant agreement.
- Financings at a holding level (see section 10). The holding company (holdco) may directly own one or more operating companies structured as projects (opcos) and may have a mix of encumbered and unencumbered assets. Accordingly, these entities service their debt through dividends or a combination of dividends they receive and CFADS (from unencumbered assets).
- Financing structures that have more than one issuer of a debt instrument, where the cash flow from the co-issuers collectively services the rated debt and there is no structural subordination or cash leakage within the structure.

C. Enforceability Of The Security Package

The protections afforded to lenders vary across the different jurisdictions, based on the legal framework. These variations may affect the enforceability of the security package, which is key to our analysis. A perceived weakness in enforceability could cause us not to rate the transaction under these criteria.

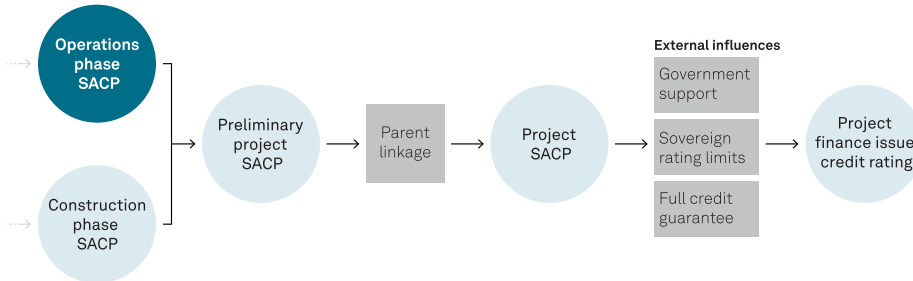
The factors that inform our view of the enforceability of the security package include:

- The existence of legal precedents and the specific jurisdiction's record of upholding the contractual rights of senior creditors in a predictable and consistent manner;
- The expected timing of enforcement; and
- The jurisdiction's bankruptcy and liquidation mechanisms. We may supplement our understanding of these factors by consulting internal or external legal advisors.

Section 3: Determining The Operations Phase SACP

Chart 7

Determining The Operations Phase Stand-Alone Credit Profile



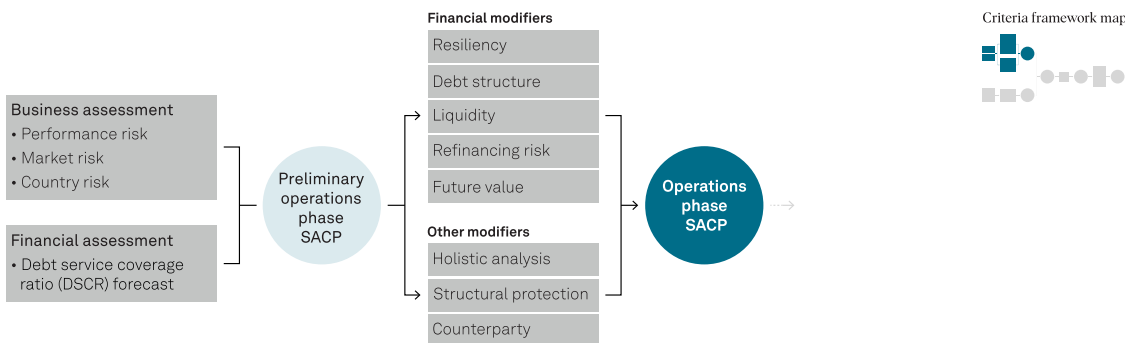
SACP--Stand-alone credit profile.
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The operations phase SACP reflects our assessment of the likelihood that a project will generate sufficient cash flows to meet its financial commitments during the operations phase. The operations phase starts when construction of the asset is completed or, if there is no construction phase, at financial close. It continues until the end of the project's life or until full repayment of the project's debt. For debt structures that have bullet or balloon maturities, we model a refinancing scenario over an assumed debt amortization period, beyond the scheduled bullet debt maturities, through the end of the project's life.

Projects can have distinct phases during operations, for example, initial ramp-up, stabilization and, ultimately, an end-of-life phase. We analyze each phase separately if credit quality differs materially between the phases. The operations phase SACP reflects the credit quality of the weakest phase.

Chart 8

Operations Phase Stand-Alone Credit Profile Framework



SACP--Stand-alone credit profile.
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In rare cases, a project may transfer all performance and market risks to a counterparty, so that it receives its forecast cash flow irrespective of its operational performance or market conditions. In these cases, if we determine that the risk transfer is adequate, the contractual cash flows are sufficient for full and timely repayment of the project debt, and termination provisions are appropriately restricted, we do not assess the project's operations phase SACP. Instead, the project SACP is the lower of (i) the construction phase SACP, if applicable, and (ii) the

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counterparty dependency assessment on the entity absorbing all performance and market risks (CDA; see section 6) after considering our structural protection analysis, other counterparty dependencies not already considered, and parent linkages.

Deriving The Operations Phase SACP

Step 1: Determine the operations phase business assessment, which captures the risk that a project's cash flows may vary from those expected while the debt is outstanding, based on operating performance, exposure to market conditions, and country risk.

Step 2: Determine the operations phase financial assessment by running a base-case scenario of the project's forecast cash flows and debt service requirements and establishing the forecast minimum DSCR through the operations phase.

Step 3: Combine both assessments to determine the preliminary operations phase SACP.

Step 4: Apply modifiers or caps to incorporate our assessments of the project's degree of resiliency under stress, debt structure, liquidity position, refinancing risk (when applicable), and future value.

Step 5: Derive the operations phase SACP by incorporating our holistic analysis, structural protection analysis, and counterparty considerations.

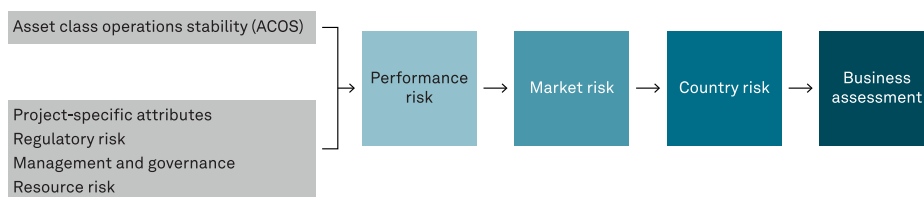
Step 1: Operations Phase Business Assessment

The OPBA ranges from 1 to 12, with 1 indicating the lowest risk. It is derived from our assessment of the risks that typically affect the variability and size of a project's cash flows. These are:

- Performance risk;
- Market risk, when relevant; and
- Country risk.

Chart 9

Operations Phase Business Assessment (OPBA)



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A. Performance Risk

Our performance risk assessment is based on the project's ability to deliver products and services reliably, and to meet performance standards consistently, as required under the transaction agreements.

It is assessed by first assigning the project's asset class operations stability (ACOS), which ranges from 1 to 10, with 1 indicating the lowest risk. The ACOS reflects the risk that a project's cash

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flows will differ from expectations because it is unable to provide services or products, based on the complexity of the activities in which it engages.

We then analyze how the ACOS may be influenced, positively or negatively, by factors such as project-specific contractual terms, regulatory risk, management and governance, and resource risk. The resulting performance risk assessment can be no lower than 1 and no higher than 12, with 1 indicating the lowest risk.

Asset class operations stability

The stability of operations depends on the asset type and how difficult it is to operate and maintain the asset while avoiding operational breakdowns. The ACOS is a key building block in the determination of the OPBA and, ultimately, the operations phase SACP. The assessment captures the relative complexity of the asset type and associated maintenance challenges. These underpin our view of cash flow variability and the project's ability to meet performance expectations. Chart 10 shows the typical attributes of the ACOS for each asset class, focusing on the type and complexity of activities the project is engaged in, the expected operating performance, and the related predictability of cash flows.

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Chart 10

Asset Class Operations Stability Assessment

ACOS		
	Attributes	Examples
Less complex ↓ More complex	<p>1-2</p> <p>Simple facilities (e.g., buildings) and maintenance and facilities management services.</p> <p>Predictable and well-defined life cycle requirements in terms of asset life and replacement cost, indicating a lower risk of underperformance.</p>	<p>1. Projects involving assets that are simple to operate and have limited service and maintenance requirements such as schools, offices, stadiums, and roads.</p> <p>2. More complex systems that require maintenance or have more stringent operating requirements such as multistorey office blocks and hotels, most hospitals, managed lanes, and photovoltaic solar projects (with or without battery storage).</p>
	<p>3-4</p> <p>More challenging buildings and maintenance and facilities management services.</p> <p>Requirement for specialized maintenance skills or staff management.</p> <p>Simple mechanical or chemical manufacturing processes involved.</p> <p>Complex logistics activities due to their large scale or scope of operations.</p> <p>Unexpected operating underperformance and potentially greater cash flow variability.</p>	<p>3. Hospitals that have more complex operations and maintenance, bridges and tunnels that have more complicated maintenance requirements, simple ports, oil and gas pipelines, residential solar, stand-alone battery storage, hydrogen storage, and most transmission lines.</p> <p>4. Simple industrial projects such as small-scale ethanol production, limited scale manufacturing of simple products such as cement, onshore wind projects (with or without battery storage), or ports that have complex activities such as high-volume container lifting, dry and liquid product storage, and intermodal rail take-away services.</p>
	<p>5-6</p> <p>Moderately complex mechanical or electrical engineering-based assets involving relatively straightforward mechanical or chemical processes.</p> <p>Operations and maintenance generally require advanced skills.</p> <p>Additional sophistication of the assets and interlinkages typically lead to greater risk of operational underperformance and potential cash flow loss.</p>	<p>5. Liquefied natural gas (LNG) plants, offshore wind, simple oil refineries or chemical processing plants, and relatively simple power generation facilities (for example, natural gas or hydro).</p> <p>6. Moderately complex refineries and processing plants, more complex power generation facilities (for example, supercritical coal plants), and open cut operations.</p>
	<p>7-8</p> <p>Mechanical or electrical engineering-based assets that have complex process interactions where maintenance is highly specialized and logistical failures could be material.</p> <p>The higher level of mechanical or electrical sophistication and interactions result in greater potential for outages and delays, which increases potential for cash flow volatility.</p>	<p>7. Underground mines and moderately complex chemical plants.</p> <p>8. Nuclear power generation facilities and complex chemical plants, particularly those manufacturing very hazardous or toxic products.</p>
	<p>9-10</p> <p>Relatively uncommon assessment.</p> <p>High risk of unavailability compared with base-case production estimates. Often, there is limited historical performance data on which to base forecasts of unavailability.</p>	<p>9. Unusually complex mechanical-, chemical-, or electrical-based assets that have multifaceted industrial designs.</p> <p>10. New asset classes without industry data that supports firm conclusions on long-term performance, new nuclear power generation design, technologies lacking history or untested, complex carbon capture technologies.</p>

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In the case of a project that derives revenue from more than one asset or revenue stream, we use a weighted average of the ACOS, based on the contribution of each asset to CFADS. If we think the weighted-average measure does not adequately capture the portfolio's risks, however, we may increase the weighted-average ACOS by one, to reflect higher risk. In addition, if the highest-risk asset is critical to the project as a whole, and the failure of that asset could drive down the

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project's overall performance, or if the assets are correlated such that the highest-risk asset could affect the predictability of cash flows of the whole portfolio, we would weak-link the ACOS for the project to the ACOS for the highest-risk asset.

Project-specific attributes and performance standards

Certain project-specific attributes may affect the project's expected performance, when considered individually and in aggregate. The effect could be positive, negative, or neutral. These attributes address operating risks linked to technology and maintenance, as well as the risk that project performance may not meet minimum contractual standards. We modify the ACOS to incorporate how these attributes raise or lower the risk of cash flow variability. The six attributes are:

- Performance redundancy;
- Operating leverage;
- Operations and maintenance (O&M) management;
- Technological performance;
- Performance standards; and
- Other operational risk factors.

The effect of these attributes will generally be neutral. A positive assessment (to decrease the ACOS) and a negative assessment (to increase the ACOS) will indicate that we expect the project to materially outperform or underperform against expectations, forecasts, or industry benchmarks. We combine our assessments for each of the six attributes to derive a single adjustment to the ACOS. Therefore, for example, two attributes could, when considered together, cause us to modify the ACOS by one, even if each attribute individually would not result in an adjustment.

We limit the adjustment to the ACOS to an increase of three, or a decrease of two for more complex projects. We consider that additional attributes can only lessen the fundamental complexity of the asset to a certain extent. That is, a complex oil refinery will still retain a higher degree of complexity than a toll road, for example. Thus, where the ACOS is 4 or higher, the maximum improvement (decrease) is two. Where the ACOS is 3 or lower, the maximum improvement (decrease) is one.

We define the different attributes and their effect on performance risk as follows:

- **Performance redundancy:** This means that several independent assets or production processes exist and enhance the project's ability to perform according to expectations. We assess this attribute as positive if the redundancy reduces the risk of failure or service interruption. Conversely, this attribute is negative if the project lacks industry-standard redundancy measures. For example, a project that has multiple separate power generation facilities or several independent LNG liquefaction facilities would receive a positive performance redundancy assessment, while a single-asset project that has no operational redundancy, such as a transmission line, could be given a negative assessment. Most projects have industry-standard redundancies in place, we expect the attribute to be mostly neutral.
- **Operating leverage:** This is a measure of the sensitivity of CFADS to changes in revenue. For example, a project that has a high ratio of fixed operating expenses and maintenance capital spending (capex) to revenue, compared with the industry average, will generally exhibit higher sensitivity of CFADS to changes in revenue and, as a consequence, receive a negative

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assessment. By contrast, CFADS would decline more slowly under adverse conditions at a project that has a lower proportion of fixed operating expenses and maintenance spending to revenue, compared with the industry average, and such a project would therefore receive a positive assessment. Positive examples include a high-efficiency power plant that has a low heat rate or a toll road that has low operating costs and revenue derived from traffic.

- **O&M management:** This evaluates whether a project may face operating challenges due to the O&M provider's skill and experience level. Our assessment is informed by inputs from independent technical experts and our own experience with the contractor and the asset class. In most cases, we expect that O&M management will be neutral. However, we may consider this attribute negative if we question the O&M provider's ability to meet performance requirements due to its limited experience with the technology, design, or location of the project.
- **Technological performance:** This attribute measures the extent to which a project may face operating challenges that prevent it from generating the cash required to meet its operating and financial obligations, because of the technology employed. In most cases, we expect technological performance to be neutral. However, we may consider this attribute negative if the technology has yet to be proven or is being applied in a novel way that has a limited track record.
- **Performance standards:** This attribute incorporates the likelihood that the project will meet its minimum performance requirements, as specified in the various project contracts, and how that affects revenue. Projects may incur penalties for underperformance that can vary from a gradual reduction in revenue to outright contract termination. Conversely, outperformance may bring bonuses or other incentives. In addition, contracts vary in how demanding they are compared with market standards and relative to the asset's expected performance. We may assess this attribute as positive if the project exceeds the minimum standards or negative if it falls short of them. In the rare cases where we anticipate that the project will incur performance penalties or could face termination, we may cap the OPBA at 11 or 12.
- **Other operational risk factors:** These include variations from a project's expected long-term operating performance caused by labor inefficiency or the unexpected frequency, duration, or magnitude of major maintenance costs. Our assessment may also include ESG factors that may make a project unusually strong or weak compared with similar projects. This attribute may be neutral at the onset of operations but be revised to negative during surveillance to signal unexpected operating events or ESG considerations that lead us to revise our base-case expectations.

Regulatory risk

In rare cases, we may modify the ACOS negatively if we believe the project is exposed to regulatory risk that is otherwise not captured in our analysis and that could raise uncertainties or weaken a project's operations and its cash flow predictability, compared with our base-case expectations.

We may raise the ACOS by one, when, for example:

- The project is exposed to unexpected changes in regulation;
- The evolution of regulation is uncertain, and may lead to more cash flow volatility; or
- The project is exposed to potential disputes with the authority or counterparties if there are regulatory changes and the dispute could affect the rating.

Management and governance risk

Again, we may modify the ACOS if we have concerns regarding management's ability to actively manage risks and react to unexpected operational issues. Excluding financial sponsor-controlled transactions, a negative assessment is expected to apply to only a small proportion of projects. We capture O&M management risks in project specifics.

We may raise the ACOS by one, indicating greater uncertainty linked to management and governance risk when, for example:

- The management team has a limited or poor track record of operating the project or similar projects, and we consider this could increase the risks to the transaction;
- The management team has been unable to change a bank account provider or modify contracts as needed;
- We have concerns about the quality, transparency, or timeliness of information disclosure; or
- The project is controlled by one or more financial sponsors where decision-making prioritizes the interests of equity over debt.

Resource risk

Some projects could experience a shortfall in production or service provision stemming from a lack of resources of sufficient quality and or quantity. Resources include raw materials, as well as natural resources, such as wind availability and solar irradiation. We assess resource risk as not applicable, low, medium, high, or very high, reflecting our view of the potential impact on the project's stability. As a result, we may raise the ACOS as shown in table 4.

Some projects allocate resource risk to third parties by making contractual arrangements under which the counterparty covers input supply, quality, and delivery risk. If the contracts effectively shield the project from resource risk, then we assess the resource risk as low or not applicable, in which case we make no adjustment.

Table 4

Resource Risk Adjustment

Assessment	Characteristics	Impact on the ACOS
Low or not applicable	Resources of expected quality and quantity are predicted to be available at all times, based on contracts or redundant connectivity to deep and mature supply markets. Essentially, there is zero risk that the supply would be affected by force majeure events along any part of the delivery chain.	No change
Medium	Resource availability and quality are expected to be high, based on: (i) contracts with credible counterparties that have limited force majeure risk through the supply chain; (ii) connectivity to deep and mature supply markets with limited risk that the supply would be affected by force majeure events along any part of the delivery chain; or (iii) high confidence in resource estimation over the debt tenor.	+1

Resource Risk Adjustment

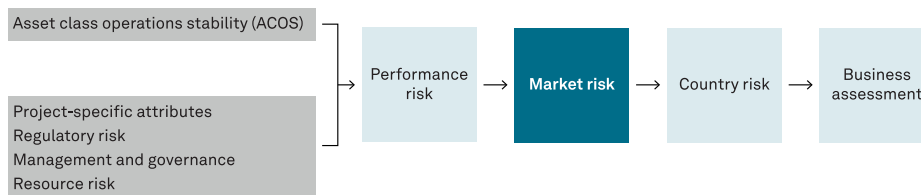
Assessment	Characteristics	Impact on the ACOS
High	Resources may not be available at all times in the expected volume or quality, and the risks have not been adequately transferred to a qualified third party via contracts. For renewable energy projects, there is moderate confidence in how accurately resource needs have been estimated over the debt tenor. When potential volume variances are estimated at 10%-20% in the long term, or 20%-30% in the short term, we would typically raise the ACOS by 2; when volume variances are estimated at 20%-30% in the long term, or 30%-40% in the short term, we would typically raise the ACOS by 3.	+2 to +3
Very high	Resources supply is uncertain, based on the lack of contracts, weak supply infrastructure, or exposure to frequent force majeure conditions. There is low confidence in the accuracy of resource estimates. Volume variance can be significant.	At least +4, usually resulting in an OPBA of 11 or 12

ACOS--Asset class operations stability. OPBA--Operations phase business assessment.

B. Market Risk

Chart 11

Incorporating Market Risk



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In determining the OPBA, we also consider the project's exposure to market conditions, arising from its exposure to price and/or volume fluctuations, and its competitive position compared with the industry average.

Market exposure

This measures the extent to which a project's forecast operating performance and cash flows are affected by price changes, volume fluctuations, or both. How market exposure affects a project's cash flow stability is key to determining the OPBA, because a project that is exposed to market fluctuations is typically riskier than one where the cash flows are not affected by price or volume changes. As part of our analysis, we look at whether contracts may transfer, mitigate, or eliminate the exposure, depending on their form, terms, and conditions.

To measure the degree of market exposure, we analyze the expected volatility of a project's CFADS by comparing CFADS in our projected base case and our market exposure case. When calculating the projected decline in CFADS to derive our market exposure assessments, as per table 5, we generally calculate the average CFADS variation to the base case over the stress period. We may, however, use the peak variation rather than the average if we believe that this more accurately reflects the exposure. For example, the peak variation may be appropriate when

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a price hedge expires during the stress period and there is a significant difference between the average and peak CFADS variation.

Where the impact is less than 5%, market exposure is assessed as not applicable; these projects are typically availability based and are not exposed to market fluctuations. Table 5 shows how we use the projected decline in CFADS to assess market exposure as low (1 or 2), medium (2 or 3), high (3 or 4), or very high (5). For example, we would consider a project to have very high market exposure if CFADS declines by 50% or more from our base case when stressed for market risk.

Table 5

Market Exposure Assessment

Projected decline in CFADS from the base case to the market exposure case (%)	Assessment	Typical examples
<5	Not applicable (0)	Availability or fixed-price projects
5-15	Low (1-2)	Mature operating toll road with traffic risk; projects that predominately receive contracted revenue and may have a modest level of price or volume exposure
15-30	Medium (2-3)	Certain volume-sensitive stadiums
30-50	High (3-4)	Merchant power plants or gas processing plants that have contracts covering a portion of expected sales
>50	Very high (5)	Projects that are fully exposed to volatile commodity prices, such as mines, oil refineries, and merchant power plants in volatile markets

Note: When two market risk assessment outcomes are listed in a given cell, a project's relative positioning within the market exposure range determines the outcome when the market exposure is medium or high. When the market exposure assessment is low, we determine the outcome based on the strength of the business relative to peers. CFADS--Cash flow available for debt service.

Base case: The base case is our expected scenario for the project's financial performance over its life. The scenario is based on our expectation of a project's performance, combined with its predicted operational, financial, economic, industry, and project-specific conditions, including country risk. When building our base case, we use historical data to derive percentage change movements in the relevant variables (volumes; prices; and macroeconomic variables, including foreign exchange rates and credit spreads) in each year over the term of the project's funding, if we consider the past as likely to be reasonably representative of future performance. We adjust our assumptions relative to historical conditions if we consider these to have been relatively benign or abnormally stressful. We also make use of S&P Global Ratings' forecasts.

If a project is exposed to foreign exchange risk--for example, revenue or costs are in two or more currencies--we develop a forward foreign exchange curve as part of our base-case forecast. To do that, we typically use historical data to derive percentage change movements, generally daily, over a period commensurate with the frequency of debt service payment and covering the term of the project's life. However, we also take into account any relevant data, trend, or statistical anomalies. This means that if we conclude that historical data is not necessarily a good proxy for future currency exchange variations, we will use our judgment to determine the expected path of such variables.

For most project finance transactions, foreign exchange risk is typically small and relates to a specific cost denominated in a different currency. A full mismatch between cash flows and debt is rare, and, when it occurs, it is typically mitigated by hedging or other mechanisms.

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The base case also factors in contracts that effectively mitigate market exposure for their stated minimum duration. Where the project or debt tenor outlasts that of its contracts, we assume that these contracts expire and that, thereafter, the project will face prevailing market conditions in terms of commodity prices, ability to place the product, etc. In some cases, the project has the unilateral right to extend the contract at the same price and volumes. If we anticipate that it would extend the contract, we incorporate the longer contract tenor into our base case.

Market exposure case: The market exposure case reflects our expectations for project performance under stressed market conditions. We model it as follows:

- We typically determine the market exposure case based on historical data by applying the worst conditions observed during the latest representative economic cycles.
- We assume that the market exposure scenario commences during the most vulnerable phase of a project's life, when it is most vulnerable to payment default. This usually coincides with the project's weakest forecast DSCRs. Exceptions include projects that have short-term maturities, where the market exposure scenario could commence immediately.
- We contemplate what structural changes in the market could lead us to expect different outcomes from history.
- We also consider sector-specific guidelines, as detailed in "[Sector-Specific Project Finance Rating Methodology](#)."

For certain projects, there may be limited historical data to inform our base-case and market exposure scenarios. In these cases, we supplement our knowledge of the sector or industry by means of discussions with an independent expert, and may consult internal or external experts or resources in the process of developing our scenarios. If we are not satisfied with the supporting information that underpins the conclusions of the independent expert, we could apply more conservative assumptions and estimates.

We typically apply a stress for up to five years, but may vary the duration of the stress to recognize the mean-reverting nature of markets. For example, the stress could be as short as two years for commodity projects, if there is no history of downsides being sustained for longer periods and no structural change to suggest that it will be different in the future. We may also incorporate multiple stress periods during the market exposure scenario, simulating the business cycles relevant to that specific market and our analysis of cyclicity. Additional guidelines on that tenor of the market exposure period, as it applies to various sectors, is detailed in the "[Sector-Specific Project Finance Rating Methodology](#)." For an asset outside these sectors, we apply this methodology.

Using the sector and industry variables detailed in the Appendix to determine applicable interest rates and credit spreads assumptions

We first develop a forward curve for the local risk-free rate in both the base and downside cases. We then add a credit spread which varies depending on the project's expected preliminary operations phase SACP category, as determined under table 8. If, by applying the corresponding spread, the preliminary operations phase SACP category changes, we will recalculate our scenarios using the credit spread for the new corresponding category under table 27. For the downside case, we adjust the base case risk-free curve by adding 100-300 basis points (bps) to establish a downside case risk-free curve, and then add the corresponding spread in table 27.

When applying table 27, we choose a value within the range based on the relative strength of the project in the category, its expected access to credit markets, and, if applicable, the timing of the

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relevant refinancing. In general, we assume a larger spread further into the future to account for higher uncertainty.

For example, we may apply a 200-bps spread in the base case for a 'BBB' project with a refinancing in one year, and a 300-bps spread for a similar 'BBB' deal that has a refinancing in 15 years. For the downside case for the same deal, we first adjust the risk-free curve by 100 bps-300 bps to get a downside risk-free curve. We then may apply a credit spread of 350 bps on top of this downside risk-free curve for the deal refinancing in one year and a spread of 450 bps for the deal refinancing in 15 years.

Competitive position

To derive the market risk assessment, we modify up or down from the market exposure assessment according to the project's competitive position. Within each asset class, the strength of a project's competitive position will affect how likely it is to achieve strong and sustainable profitability metrics and endure through adverse industry and market conditions.

We assess competitive position as either strong, neutral, or weak. Typically, a strong assessment reduces the market exposure score by one, a neutral assessment will have no impact, and a weak assessment raises the market exposure score by one. This gives a minimum market risk score of zero and a maximum of five. However, we may use our judgment to reflect certain particular situations. For example, if a project with a nonapplicable market exposure has a weak competitive position, we may still assign a market risk of 1. Likewise, we do not believe a strong competitive position can fully counterbalance market risk and bring the score to zero.

Factors that affect our view of competitive position include the project's:

- Market position, compared with industry averages;
- Supply and demand dynamics;
- Organic growth drivers;
- Sensitivity to pricing; and
- Geographic location, if it affects barriers to entry compared with peers'.

We provide specific guidelines to assess the competitive position for the most common sectors in "[Sector-Specific Project Finance Rating Methodology](#)." For an asset outside these sectors, we apply this methodology.

C. Preliminary Operations Phase Business Assessment

The preliminary OPBA is a function of the performance and market risks, combined as shown in table 6.

Table 6

Preliminary Operations Phase Business Assessment

	--Market risk--					
	0	1	2	3	4	5
Performance risk						
1	1	3	5	7	9	11
2	2	3	5	7	9	11

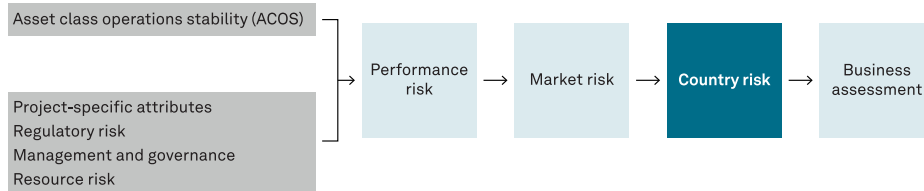
Preliminary Operations Phase Business Assessment

--Market risk--						
	0	1	2	3	4	5
3	3	4	6	8	10	11
4	4	5	6	8	10	11
5	5	6	7	9	10	11
6	6	7	8	9	10	11
7	7	8	9	10	10	12
8	8	8	9	10	11	12
9	9	10	10	11	12	12
10	10	10	11	11	12	12
11	11	11	12	12	12	12
12	12	12	12	12	12	12

D. Country Risk

Chart 12

Incorporating Country Risk



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We incorporate our assessment of country risk, which considers country-specific risk factors, such as economic, institutional and governance effectiveness, financial system, and payment culture/rule-of-law risks. Our country risk assessment ranges from 1 to 6 (strongest to weakest; as described in "[General Criteria: Country Risk Assessment Methodology And Assumptions](#)"). Country risk assessments of 4, 5, or 6 depress the preliminary OPBA, while assessments of 1, 2, and 3 are neutral (see table 7).

We could consider country risks mitigated if, for example, the project has transferred economic and market risks to a counterparty, or to a lesser extent if it has taken out political risk insurance. When we think the mitigation is effective, we view country risk as neutral to the transaction.

Projects that have cross-border assets Project finance transactions that have assets in more than one country are relatively rare because transactions are generally structured to encompass a single asset or a discrete set of assets in one country. For a transaction that has cross-border assets, we base our country risk assessment on the country where the project generates the largest proportion of its CFADS, or where the highest proportion of its cash-generating assets are located. If we have determined that specific risks related to one country could affect the project's operations in another country, we may use a weak-link approach--meaning we apply the worst country risk assessment--even if the country generates a relatively small portion of overall CFADS.

E. Determining The Operations Phase Business Assessment

Finally, we combine the preliminary OPBA with the country risk to arrive at the final operations phase business assessment as per table 7.

Table 7

Operations Phase Business Assessment

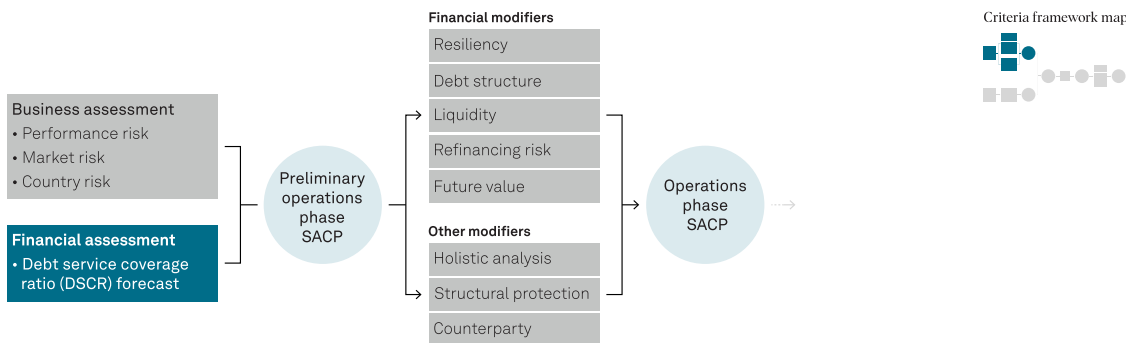
	--Country risk--			
	1-3 (4-6 if mitigated)	4	5	6
Preliminary OPBA				
1	1	2	4	6
2	2	2	4	7
3	3	3	4	8
4	4	4	5	9
5	5	5	6	10
6	6	6	7	11
7	7	7	8	11
8	8	8	9	11
9	9	9	10	12
10	10	10	11	12
11	11	11	12	12
12	12	12	12	12

OPBA--Operations phase business assessment.

Step 2: Operations Phase Financial Assessment

Chart 13

Operations Phase Financial Assessment



SACP--Stand-alone credit profile.
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This assessment evaluates whether the project generates sufficient cash flows to meet its financial commitments during the operations phase. To determine the financial assessment, we

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run a base-case forecast of the project's cash flows and debt service requirements, and calculate the minimum DSCR until the debt is fully repaid. For each debt servicing period, we divide CFADS by the scheduled debt service to calculate the DSCR. These terms are defined in our glossary.

A. Cash Flow Available For Debt Service

CFADS for a period is calculated as operating revenue minus operating and maintenance expenses. As an operating cash flow concept, CFADS excludes any cash balances that a project could draw on to service debt, such as the debt service reserve fund or maintenance reserve fund, or cash balances that are not required to be kept in the structure. In limited circumstances, we may include cash released from dedicated reserves in our calculation of CFADS, provided that:

- The reserve was specifically set up to mitigate a particular weakness or risk, and the release is mandatory and irrevocable under the project documents.
- The mechanism that determines how and when the reserve is disbursed, how much is disbursed, and the allowed purposes of any disbursement is clearly documented.
- The reserve is fully funded at financial close. If it is only partially funded, we give credit only to the portion that is funded at the time of our analysis.

When the reserve is depleted under our base case, we do not consider such funds under our downside analysis.

CFADS for a holdco includes CFADS from its unencumbered opcos and distributions received from its encumbered opcos.

B. Debt Service

Debt service for a period is calculated as cash interest expense plus scheduled principal due in that period (including payments linked to financial leases, swaps, and letters of credit [LOCs], if applicable).

We generally assume that a project's revolving credit facilities (RCFs) and any discrete debt baskets permitted under the financing documents (that is, the ability to issue additional debt up to a specified amount) are fully drawn (please refer to the section on additional debt). The principal and interest payments that would be due under these facilities are also included in debt service.

For LOCs contracted by the LPE, under the base case, we typically include the costs generated by their actual use. As such, we include interest on the amount effectively drawn, and the commitment fee. If our base-case scenario does not contemplate a drawdown of the LOC, we only include the commitment fee. Under our downside scenario, we will assume that the LOC is fully drawn on day one and include the commitment fee and drawn fee when calculating debt service. If the LOC funds a debt service reserve account (DSRA), or if under our base case and downside scenario, we believe it can be called by a third party, we will assume that the LOC is fully drawn and include in debt service any related fee or interest in both the base case and downside case.

C. Calculating The Minimum Debt Service Coverage Ratio

We typically calculate the DSCR on a rolling-12-months basis at each payment date, as long as our base-case forecasts demonstrate that any potential cash shortfall due to intrayear volatility is compensated for by the liquidity reserves and lock-up tests in place. If the reserves and lockups are insufficient to cover a potential intrayear cash shortfall, we capture this exposure in our liquidity analysis. In exceptional cases, where we do not consider that the liquidity analysis fully captures the risks, we use the periodic DSCR, rather than the rolling-12-months DSCR. If a project has stable cash flow, limited intraperiod volatility, and a smooth debt service profile, we may calculate the rolling-12-months DSCR annually. In addition, when the financial covenants under the project documentation are based on the periodic DSCR, we would also use the periodic DSCR.

On a given scheduled debt servicing calculation period, the forecast minimum DSCR may be abnormally low, so that it does not accurately reflect the project's default risk. We may exclude a period's DSCR from the minimum DSCR calculation under our base case, in limited circumstances, provided that:

- The period is affected by a temporary one-off event (lasting no more than 24 months) that is highly unlikely to repeat itself in the relevant operating phase;
- The low DSCR will not trigger any breach of financial covenants or an event of default under the transaction documents;
- The project has sufficient liquidity that can be used to cover shortfalls during the period, even under stressed conditions. We do not include reserves that have a specific purpose and can't be used fungibly in this calculation; and
- Within 24 months, the forecast average DSCR reverts to our base-case forecast, such that the preliminary operations phase SACP is unchanged.

We analyze the exclusion of periods for each tranche of debt, separately. This implies that, if we exclude a period for the senior tranche, we reinstate it for the subordinated tranche and analyze the latter separately.

We consider an event to be temporary if it lasts no longer than 24 months--in other words, the DSCR should revert to a level commensurate with its preliminary operations phase SACP within that 24-month period. For projects that have a short remaining life, we may specify a shorter period.

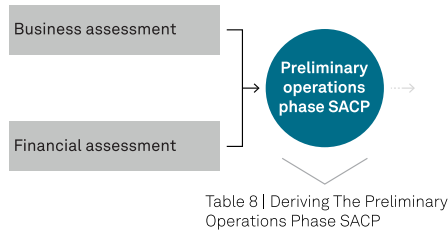
We may also consider excluding the DSCR corresponding to the final scheduled debt servicing period in both our base-case and downside case if, in both scenarios:

- The project does not default and principal is fully repaid; and
- We expect that reserves will be fully funded when the final scheduled period begins, and that they are sufficient to cover the final principal and interest payments. The transaction documents should specify that reserves need to be available and will be used to satisfy the final payment, and that they will not be used for other purpose.

Step 3: Preliminary Operations Phase SACP

Chart 14

Preliminary Operations Phase Stand-Alone Credit Profile



SACP--Stand-alone credit profile.
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We determine the preliminary operations phase SACP by combining the OPBA and the forecast minimum DSCR (see table 8). The minimum DSCR represents the weakest point of the operations phase, that is, when the project is most likely to default or breach a covenant. For projects that are subject to refinancing risk, we also forecast DSCRs after the original debt's maturity date, until all debt has been fully repaid, and use the lower of the minimum DSCR during the initial loan period and the postrefinancing period to determine the preliminary operations phase SACP.

Table 8

Deriving The Preliminary Operations Phase SACP

	--Minimum DSCR ranges*--				
	aa	a	bbb	bb	b
OPBA					
1-2	=> 1.75	1.75-1.20	1.20-1.10	1.10-1.05	<1.05
3-4	N/A	=> 1.40	1.40-1.175	1.175- 1.10	<1.10
5-6	N/A	=> 1.75	1.75-1.30	1.30-1.15	<1.15
7-8	N/A	=> 2.50	2.50-1.60	1.60-1.35	<1.35
9-10	N/A	=> 5.00	5.00-2.50	2.50-1.50	<1.50
11-12	N/A	N/A	N/A	=>3.00	<3.00

*DSCR ranges include values at the lower bound, but not the upper bound. For example, 1.20x-1.10x includes 1.10x, but excludes 1.20x. SACP--Stand-alone credit profile. N/A--Not applicable. DSCR--Debt service coverage ratio.

Where the minimum DSCR sits within the range for the corresponding OPBA in table 8, it can affect the resulting preliminary operations phase SACP. We would add a plus (+) or minus (-) sign to the preliminary operations phase SACP to indicate that the minimum DSCR lies toward one of the endpoints in the range. For example, a project that has an OPBA of 8 and a forecast minimum DSCR of 2.40x would likely be assigned a preliminary operations phase SACP of 'bbb+' because the minimum DSCR is at the upper end of the 1.60x-2.50x range. A second project that also has an OPBA of 8, but a forecast minimum DSCR of 1.80x, at the lower end of the range, would likely be assigned a preliminary operations phase SACP of 'bbb-'.

In addition, we may choose not to revise the preliminary operations phase SACP if, during ongoing surveillance of an existing project, the minimum DSCR temporarily increases or decreases by a marginal amount and this does not trigger a covenant breach. By temporary, we mean that we

forecast that the minimum DSCR will revert to the range in the following period. For example, a transmission line project that has an OPBA of 3 receives availability payments adjusted by inflation, and posts a minimum DSCR of 1.2x. If we anticipate that the DSCR would be about 1.17x in the following period because of a change in our inflation assumptions, but would revert to 1.2x for the next period, we might not change the preliminary operations phase SACP.

Step 4: Applying Financial Modifiers And Caps To Determine The Operations Phase SACP

Certain additional factors may modify or cap the financial risk during operations. We assess the project's resiliency under stress, and its debt structure, liquidity position, refinancing risk (when applicable), and future value. We apply these five modifiers cumulatively in the order listed in table 2, from resiliency to future value. As we go down the list, a modifier may (or may not) change the preliminary operations phase SACP as determined under table 1. When applying each modifier, we use the preliminary operations phase SACP adjusted for the impact of the previous modifier.

In aggregate, these assessments cannot revise down the preliminary operations phase SACP below 'b-'. Conversely, we do not generally anticipate that the cumulative impact of these factors will push the operations phase SACP more than one category above the preliminary operations phase SACP, although it is possible.

A. Resiliency Analysis

Our resiliency analysis captures the project's ability to withstand financial and operational stresses. We assess:

- The strength or weakness of the project's DSCR under a downside scenario, and
- The median DSCR level.

Downside analysis

The downside analysis is a resiliency test, aiming to capture how well a project will survive and whether it can meet its financial obligations through a stress cycle.

Our downside analysis combines the market exposure case (defined above in "Market risk") with project-level operating stresses and macroeconomic and financial stresses (defined in our "[Sector-Specific Project Finance Rating Methodology](#)" and in the Appendix). These stresses may include low-likelihood, high-impact environmental or social events, as well as additional risks such as country and market access risk. For example, in emerging markets, we typically assume higher interest rates than for developed markets, particularly in countries that have higher country risks.

With regard to foreign exchange rates, if a project has exposure to multiple currencies and this is not fully hedged or mitigated, the downside scenario assumes that rates move against the project for the purpose of our cash flow scenario modeling (i.e., we develop a more stringent forward curve than used in the base case). To do that, we typically identify the worst currency movement observed during a representative economic cycle and replicate it starting from the weakest point in the transaction (minimum DSCR). We use our judgment, based on historical movements and S&P Global Ratings' economic forecasts, to define commensurate stress levels.

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The aim is to capture how a project will perform in a stress cycle, and whether it will still be able to meet its financial obligations.

The project's resiliency is assessed as very high, high, moderate, modest, or low (see table 9). Our assessment considers what the outcome of table 8 would be when combining the DSCRs we forecast in our downside scenario with the project's OPBA.

Table 9

Downside Performance Expectations And Resiliency Assessment

Resiliency assessment	Performance expectations in the downside scenario
Very high	The DSCR is always above 1.0x under the downside scenario, the project has an exceptional debt servicing cushion, and one of the following conditions is true: Given the project's OPBA, the DSCRs in the downside scenario map to at least the 'bbb' category in table 8 in most periods; or for projects that have stronger liquidity reserves*, the DSCRs in the downside scenario map to at least the 'bb' category in table 8 in most periods.
High	The DSCR is always above 1.0x under the downside scenario and one of the following conditions is true: Given the project's OPBA, the DSCRs in the downside scenario map to at least the 'bb' category in table 8 in most periods; or for projects with stronger liquidity reserves*, the DSCRs in the downside scenario map to at least the 'b' category in table 8 in most periods.
Moderate	The DSCR remains generally above 1.0x under the downside stress period. If the minimum DSCR falls below 1.0x, liquidity reserves are sufficient to support debt service payments for at least five years and would not be depleted within that period.
Modest	There is limited confidence that the project would maintain DSCRs above 1.0x under the downside stress period. However, the project is expected to be able to withstand a shorter stress period of three years or more before depleting its liquidity reserves.
Low	Projects would likely deplete their liquidity reserves by year three under our downside scenario.

*Stronger liquidity reserves are defined as those equivalent to at least one year of debt service or at least 5% of total project debt. DSCR--Debt service coverage ratio. OPBA--Operations phase business assessment.

The more resilient the project is to stress conditions, the higher we rate it. A highly resilient project may have an operations phase SACP up to two notches above the preliminary operations phase SACP. Conversely, the outcome of the resiliency assessment will lead us to cap the preliminary operations phase SACP at a particular rating category if the performance under stress reflects higher risks (see table 10).

For example, if we assess the preliminary operations phase SACP under the base-case scenario as 'bbb', but assess resiliency as modest, we will cap the transaction at the 'bb' category. In this instance, we determine whether the preliminary operations phase SACP is 'bb+', 'bb', or 'bb-' based on the size of the shortfall and a comparison with other transactions with a preliminary operations phase SACP in the same category.

Table 10

Incorporating Resiliency Assessment Into The Preliminary Operations Phase SACP

		--Resiliency assessment--				
		Very high	High	Moderate	Modest	Low
Base-case SACP						
'a' or higher	+1	-	Cap at 'bbb' category	Cap at 'bb' category	Cap at 'b' category	
'bbb'	+2	+1	-	Cap at 'bb' category	Cap at 'b' category	
'bb'	+2	+2	+1	-	Cap at 'b' category	
'b'	+2	+2	+2	+1	-	

SACP--Stand-alone credit profile.

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We provide specific guidelines on the typical operational stresses we apply to build the downside scenario for the most common sectors in the "[Sector-Specific Project Finance Rating Methodology](#)."

- For an asset outside these sectors, we apply this methodology.
- If the project has no market risk, then the downside scenario consists only of these operational stresses, as well as macroeconomic and financial stresses, where appropriate (see "Market Risk" above in this section).
- In some situations, the outcome of the downside analysis alone may determine the adjusted operations phase SACP (see "Rating to the downside" below, in this section).

The macroeconomic stresses we consider in our downside scenario include interest rates, inflation, and foreign exchange rates. We calibrate these to be roughly commensurate with the stress conditions we would expect over similar periods to those of debt repayment. We match the periodicity of the forecast with the timing of debt payments.

If we see anomalies in the data or statistics that are relevant to our analysis, or if the historical and future trends of a variable are unclear, we use our judgment to model the variable's expected path in our downside scenario. This would be the case, for example, when forecasting foreign exchange rates for a country that adopted a convertibility regime after experiencing significant foreign exchange devaluations in the past.

Rating to the downside: If the downside analysis provides unique insight into a project's default risk that cannot be properly captured in its OPBA and minimum base-case DSCR forecasts, the outcome of the downside analysis determines, rather than modifies, the preliminary operations phase SACP.

In those rare circumstances, we use table 11, rather than table 10, to map the effect of the resiliency assessment on the preliminary operations phase SACP. We may apply a + or – modifier, based on the relative strength of the outcome within the category. When rating to the downside, we do not apply financial modifiers such as debt structure, liquidity, refinancing risk, and future value; we only consider the holistic adjustment, the structural protection, and counterparty analyses.

Table 11

Determining The Preliminary Operations Phase SACP When Rating To The Downside

Resiliency assessment	Preliminary operations phase SACP
Very high or high	a
Moderate	bbb
Modest	bb
Low	b

SACP--Stand-alone credit profile.

Examples of situations where we may rate to the downside include projects that:

- Have exceptionally robust liquidity provisions, such that we have a very high level of confidence that they would endure through certain downside scenarios, regardless of their base-case DSCRs; or

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- Are ramping up volumes, provided that they have strong dedicated liquidity reserves to support debt repayment, ensuring that the project will meet its debt service obligations until volumes stabilize.

Rating to the downside during the ramp-up period: We define ramp-up as the period after construction is completed, but before operations reach a steady state. Conditions depend on the asset type. For a transportation deal, the ramp-up period may involve very high growth in traffic volumes. For an industrial facility, it may be characterized by increases in volumes as sections of the facility are brought online. Similarly, an availability project may have a phased opening. The ramp-up period typically lasts up to three years but, in rare circumstances, may last up to five years.

The dedicated reserve account mentioned above may be cash funded or be provided by a financial instrument. In the latter case, we would not expect projects to be liable for repayment of the financial instrument, and would weak-link the operations phase SACP to the obligor of the financial instrument. If the project is liable for repayment of the reserve, we would consider it as additional debt.

Median DSCR

We complement the resiliency assessment with the analysis of the median DSCR under our base-case scenario. If the median DSCR maps to a category higher than the minimum DSCR, it may indicate more robust coverage throughout the life of the transaction, and hence greater resiliency. We may therefore revise up the preliminary operations phase SACP by one notch. When calculating the median DSCR, we include all periods and do not exclude those that might be excluded when calculating the minimum DSCR. We do not adjust the preliminary operations phase SACP because of the median DSCR analysis when we forecast that the DSCR trajectory over the debt tenor is declining, when the project is approaching the end of the operations phase, or when we rate to the downside.

B. Debt Structure Modifier

In certain cases, we revise down the preliminary operations phase SACP due to shortcomings in the project's debt structure. For example, we would do this if the project has:

- Material dependence on cash flow sweeps to pay down debt under our base case.
- Excessive debt leverage (as measured by CFADS to debt or debt to EBITDA) relative to peers. This could occur if the project's debt tenor is materially longer than other projects that have comparable OPBAs.
- Unusually high mandatory amortization payments in later years, and we consider that the forecast depends on growth assumptions or more uncertain CFADS in the later years.
- Relatively high exposure to inflation rate changes.
- Sharp changes in amortization payments designed to match any forecast uneven capex, which could be subject to change.

We revise down the preliminary operations phase SACP by one or more notches, depending on our view of the severity of the weakness in the debt structure. A preliminary operations phase SACP in the 'b' category already encompasses such weakness in the debt structure, so we would not revise it down further due to debt structure considerations.

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Where a transaction has minimal amortization payments and material dependence on cash flow sweeps to repay debt, its minimal DSCR under our base case is likely to appear more robust than that of fully amortizing structures. To adjust for this, we revise down the preliminary SACP by at least two notches for projects mapping to the 'bbb' category or higher, and by at least one notch for those mapping to the 'bb' category. The maximum adjustment is three notches.

To measure the materiality of the dependence on cash flow sweeps, we run our base-case forecast first with the cash flow sweep and then without the cash flow sweep (so that the only amortization in the second case would be contracted amortization), and determine the minimum DSCR in each case. We map each DSCR to the corresponding preliminary operations phase SACP in table 8. The cash flow sweep is viewed as material if there is a difference of at least one notch between the two SACPs, or if there is any principal outstanding at final maturity without the sweep (but there is no principal outstanding at maturity with the sweep).

C. Liquidity Analysis

We may further modify the preliminary operations phase SACP based on the project's liquidity and certain cash management covenants. Our assessment of a project's liquidity focuses on its sources and uses of cash over a prospective 12-month horizon; these are the key indicators of its liquidity cushion. Robust liquidity can improve a project's risk profile during the operations phase and give it more flexibility to react to stress conditions. We assess liquidity as strong, neutral, or less than adequate.

Sources of liquidity include CFADS, liquidity reserves designated as available for debt repayment in the transaction documents, proceeds from asset sales, and undrawn committed credit facilities. We may also consider as a source of liquidity cash that is trapped in the structure if it cannot be distributed and is available to pay debt. We would not contemplate as sources those reserves to which we already give credit in the analysis, for example in our resiliency assessment. For example, we would not consider any reserve balance that is applicable against an expense in our analysis. For subordinated debt, liquidity sources are net of senior debt service, reserve replenishment, and any other uses that are senior to subordinated debt service in the waterfall.

Uses include debt service payments and capex senior to debt obligations.

Liquidity is neutral to most project finance transactions. This is because most projects size their DSRAs considering volatility to meet their next debt service payment, and size major maintenance reserve accounts to meet any forecast spikes in capex. Certain asset classes may require stronger reserve provisions if liquidity is to be neutral. We address these situations in "[Sector-Specific Project Finance Rating Methodology](#)."

Where we classify liquidity as strong, we may add one notch to the preliminary operations phase SACP. We would do this only if all of the following conditions are met, throughout the debt tenor:

- For projects that have an OPBA of 1-6, the ratio of sources to uses of liquidity exceeds 2.0x and the project has reserves (designated as available for debt repayment in the transaction documents and to which we do not give credit otherwise in the analysis) or committed credit lines covering at least 12 months of debt service.
- For projects that have an OPBA of 7-12, the ratio of sources to uses of liquidity exceeds 2.5x and the project has reserves (designated as available for debt repayment in the transaction documents and to which we do not give credit otherwise in the analysis) or committed credit lines covering at least 18 months of debt service.
- There is ample covenant headroom; and

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- The documentation includes forward and backward distribution tests, or there are backward tests and mitigating factors accounting for the absence of forward tests.

We would consider the absence of forward distribution tests mitigated if at least one of the following applies:

- Revenue and expenses are stable--this is usual, for example, in an availability payment project where significant deductions are not expected;
- The project has access to additional liquidity not already factored into our analysis of liquidity sources--for example, if we have evidence of the sponsor contributing equity on a voluntary basis in prior periods; or
- Other mechanisms are present, such as cash flow sweeps.

Conversely, we will consider liquidity as less than adequate and deduct at least one notch from the preliminary operations phase SACP if any of the conditions below are met:

- A project does not have sufficient liquidity sources to cover forecast debt service payments over the next 12 months by at least 1x. Most commonly, liquidity will be less than adequate if the project faces a bullet or balloon payment within the next 12 months that it has not yet refinanced;
- The project lacks a dedicated DSRA, or we do not consider the DSRA sufficient, given the nature of the transaction;
- Financial covenants have limited headroom. This means that (i) we anticipate a covenant breach or (ii) in the next 12 months, a decline in forecast CFADS of 15% or less for projects that have an OPBA of 5-12 or 10% or less for those that have an OPBA of 1-4 would lead to a covenant breach;
- The financing documents do not provide for the replenishment of debt service and O&M reserve accounts when used, or those reserves are not funded upfront; or
- Documents do not include any distribution tests and this absence is not mitigated by the means described above.

If a project faces refinancing and the operations phase SACP before the impact of refinancing is at least 'bbb-':

- We may only include debt maturities due over the next six months for the liquidity calculation; and
- If the refinancing is not completed six months before the maturity, we may still consider liquidity as neutral if we consider those refinancing terms as typical for the specific market and the project has presented a credible plan indicating that the refinancing will be completed three months before the bullet maturity. In absence of such a plan, the operations phase SACP would be capped at 'bb+'.

D. Refinancing Analysis

Project finance transactions can be structured so that the forecast CFADS and unrestricted cash on hand are insufficient to pay down all the debt by the scheduled maturity date, exposing the project to refinancing risk. To repay the outstanding debt, projects use cash proceeds from new bank debt or a capital markets issuance. This increases repayment risk because even seemingly healthy projects may fail if capital market conditions at the time of refinancing are unfavorable.

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To analyze refinancing risk, we first forecast the outstanding debt balance at maturity. This gives us the opening balance for the refinancing period. We account for any mandatory cash flow sweep mechanism, if present, and net any dedicated funded reserves or any cash trapped in the structure that we expect to be applied against the debt at maturity. Second, we estimate CFADS and the likely amortization schedule, enabling us to determine the minimum forecast DSCR after refinancing. Generally, we assume that the debt will fully amortize before the estimated end of the project's life. That said, we may consider a variety of amortization profiles, depending on the asset type, expected market conditions, and commonly used financing approaches. Estimates of an asset's life are informed by discussions with independent experts.

To determine the preliminary operations phase SACP, we use the lower of the two forecast minimum DSCRs: that during the initial loan period and that during the postrefinancing period. If the project's OPBA changes after refinancing, we use the revised OPBA and the post-refinancing DSCRs to determine the preliminary operations phase SACP.

The post-refinancing interest rates and credit spreads forecast can significantly affect the DSCRs. In our base case, we generally assume levels commensurate with the forward curve and longer-term averages. These rates can differ materially from the initial point of financing due to changes in market conditions. In our downside scenario, we assume a higher interest rate and wider credit spreads, as defined in the Appendix.

In addition to forecasting DSCRs in a refinancing, we also compare the present value of future cash flows to debt levels to determine the likelihood that the project will ultimately repay its debt. We measure asset coverage by calculating the project life coverage ratio (PLCR; see the glossary) at the point of refinancing. The PLCR measures the net present value (NPV) of the project's forecast CFADS relative to debt. In the NPV calculation, we forecast cash flows under our base case through the end of the project's life and use a discount rate commensurate with the project's expected cost of debt. The greater the PLCR, the greater the level of overcollateralization in a transaction, and the greater the chance of successfully refinancing, all else being equal. Table 12 shows the rating caps we derive from this analysis.

Table 12

Refinancing Risk Rating Caps

	--Stability of cash flow--		
	High (OPBA 1-4)	Medium (OPBA 5-8)	Low (OPBA 9-12)
Asset coverage			
High (PLCR is equal to or higher than 3.0x)	None	None	None
Medium (PLCR is equal to or higher than 1.5x, but lower than 3.0x)	None	None	'bb+' cap
Low (PLCR is equal to or higher than 1.1x, but lower than 1.5x)	None	'bb+' cap	'b+' cap
Very low (PLCR is lower than 1.1x)	'bb+' cap	'b+' cap	'b-' cap

OPBA--Operations phase business assessment. PLCR--Project life coverage ratio.

For projects that have cash flow sweeps or other types of mandatory prepayment mechanisms, the forecast debt outstanding at maturity can be materially higher under the downside scenario, or other sensitivity analyses, compared with our base case. For these projects, we generally

assess asset coverage as no better than low in table 12, unless we expect the PLCR to map to a stronger category, assuming minimal or modest cash flow sweep repayments.

E. Future Value Modifier

Most project financings are structured so that the tenor of the debt is shorter than the life of the asset or duration of the concession. Although the cash flows generated during this tail period are not part of the collateral, we consider that projects that have a longer tail are stronger in credit terms than projects that have a shorter tail. A project with a longer tail would likely generate value above that of its debt. This may give it additional flexibility to react in cases of unforeseen stress, a stronger hand in negotiating with lenders, and potentially better refinancing terms. It may ultimately lead to higher recoveries.

If we think that, for a particular project, these strengths are significant enough to improve credit risk compared with other projects that have similar OPBAs and DSCRs, we may reflect this by revising the preliminary operations phase SACP up by one notch. We make this adjustment only if a project has no refinancing needs, has a minimum tail of at least 10 years and 20% of the original debt tenor, and we conclude that these features sufficiently benefit credit risk.

Step 5: Additional Modifiers And Caps To Arrive At The Operations Phase SACP

The final step in determining the operations phase SACP is to incorporate holistic analysis, structural analysis, and counterparty constraints.

A. Holistic Analysis

We may revise the adjusted preliminary operations phase SACP up or down by one notch to capture a more holistic view of creditworthiness during operations. This analysis incorporates additional credit factors that the criteria may not separately identify or fully capture, as well as our assessment of a project's underperformance or overperformance relative to its peers.

Considerations that may lead to an adjustment based on a project's relative ability to withstand stressful economic or industry conditions include:

- The presence of unusually strong or weak insurance policies;
- Supportive covenants that protect operating performance, for instance, a support mechanism for revenue or costs not accounted for elsewhere; and
- Other factors not accounted for in the preceding analysis, such as a record of stable revenue over a lengthy period or low unionization levels in a labor-intensive industry.

A holistic adjustment cannot override an applicable cap.

B. Structural Protection

We may further negatively modify the preliminary operations phase SACP because of our assessment of the strength of the security package and the covenants in place. Section 5 describes how the aggregate effect of the structural protection modifier could lead us to revise down the preliminary operations phase SACP by up to four notches.

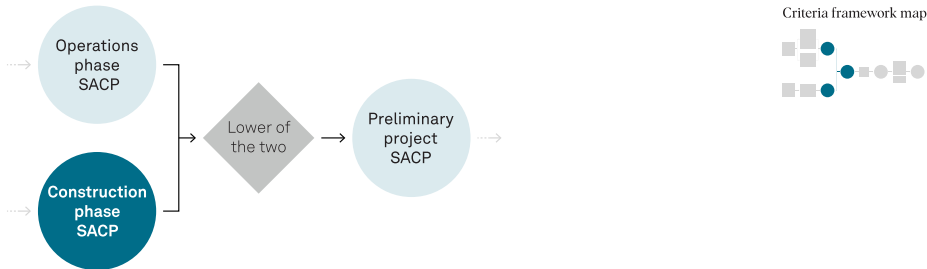
C. Counterparty Constraints

The preliminary operations phase SACP may be weak linked to the CDA of material counterparties relating to operations phase contracts (see section 6).

Section 4: Determining The Construction Phase SACP

Chart 15

Construction Phase Stand-Alone Credit Profile



SACP--Stand-alone credit profile.
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For projects that have a construction phase, we assess whether the project will be adequately funded, completed on time, and capable of operating as designed and to the contractual requirements. Depending on the asset type, we may view construction as the riskiest phase of a project, which affects the rating outcome. It is therefore critical to evaluate whether the project has sufficient committed funding, whether it will meet its contractual deadlines, and whether it will generate sufficient net cash flows to meet its debt servicing commitments. We determine a construction phase SACP as a combination of business and financial risks.

The construction phase covers the period from financial close through the commencement of operations and includes construction performance testing and project commissioning. The end of this phase is typically defined in the project documentation as the commercial or substantial completion of construction--that is, the point at which operational cash flows commence.

Chart 16

Construction Phase Stand-Alone Credit Profile Framework

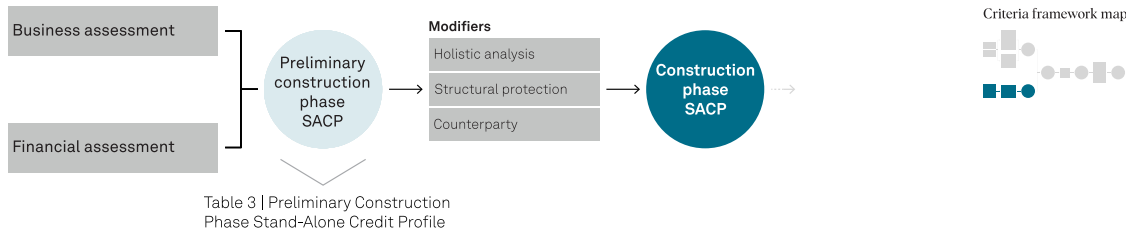


Table 3 | Preliminary Construction Phase Stand-Alone Credit Profile

SACP--Stand-alone credit profile.
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Deriving The Construction Phase SACP

Step 1: Determine the construction phase business assessment (CPBA), which captures the inherent level of risk, considering the nature and location of the asset to be built; the difficulty of construction; the contractual risk allocation; and the experience of the various stakeholders, including management.

Step 2: Determine the CPFA, which captures the risk that funds may not be available to the project when needed with sufficient certainty to complete construction as planned and within budget.

Step 3: Combine the CPBA and CPFA assessments to determine the preliminary construction phase SACP.

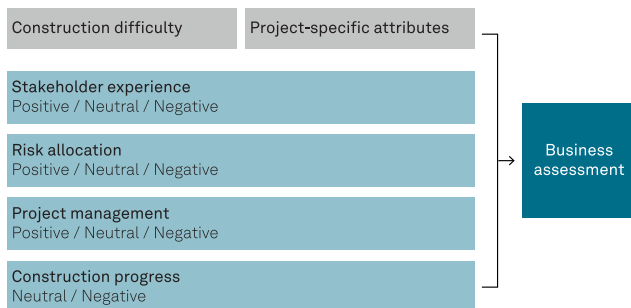
Step 4: Derive the construction phase SACP by incorporating our holistic analysis, structural protection analysis, and counterparty considerations.

A project may transfer all construction risks to a third party. If the third party assumes or guarantees all construction obligations and risks (including performance), as well as timely funding of any shortfall and debt repayment if the project is not completed, we substitute the credit quality of the guarantor in our analysis. Our construction phase SACP would then mainly depend on the quality of the counterparty's credit and its performance guarantees but will also incorporate our structural protection analysis and other counterparty dependencies. To meet the standards for credit substitution, we expect completion guarantees to specify that performance will meet the contracted standards and include compensation to the project if performance misses those standards.

Step 1: Construction Phase Business Assessment (CPBA)

Chart 17

Construction Phase Business Assessment



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The CPBA ranges from 1 to 6, with 1 being the strongest (lowest risk), and 6 being the weakest (highest risk). Our approach is both forward looking and informed by experience. The CPBA is based on the following factors, which we reassess throughout the project's construction phase:

- The difficulty of construction and project-specific features, including technology and design;
- The experience of the key stakeholders;
- The contract type and risk allocation;

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- The strength of the project's management; and
- The progress to date.

Construction phase risks include design, contract, technology, schedule, and budget risks, as well as the project's progress compared with its initial plan. We generally consider independent engineer, environmental, and market consultant reports, as applicable, as well as legal analysis, including legal opinions and technical reports. Where independent reports are not available, or we view them as unreliable, we apply our own analysis of the project, based on market data and rated peer transactions, if any.

In addition, the CPBA incorporates our view of country-specific risks. Given how important it is that contracts can be legally enforced, we pay particular attention to country risk in jurisdictions where there is a more limited history of project finance transactions. This may affect factors such as risk allocation, property rights, and seniority of creditors. In jurisdictions where we assess the country risk as 4, 5, or 6, we may revise down the CPBA by one or more notches, depending on our analysis of the relevant legal regime, compared with jurisdictions that have a more robust history of project finance transactions. However, we do not penalize the CPBA in cases where these risks have been effectively covered by strong counterparties and are mitigated through contractual arrangements or other mechanisms, such as acceptable political risk insurance policies.

A. Construction Difficulty

This factor captures the inherent level of construction risk considering the project's complexity, the type of asset, and the environment in which it is to be developed. More-complex assets are more exposed to technical issues, delays in completion, and cost overruns than a simple asset that uses proven construction techniques.

We think of construction difficulty as a continuum from simple to very difficult and measure it on a scale from 1 to 5, with 1 indicating the least difficulty and therefore lowest risk and 5 indicating the most difficulty and highest risk.

Constructing a relatively simple asset, such as a school, carries a lower risk of noncompletion than an industrial project like a nuclear power plant (see chart 18).

Chart 18

Construction Difficulty Assessment

1 Relatively simple building tasks Less difficult	2 Moderately complex works	3 Civil engineering or heavy engineering works	4 Heavy engineering and industrial projects	5 Industrial construction tasks More difficult
Schools Hotels Small offices Data centers Hydrocarbon tank storage or battery storage and solar projects	Hospitals Arenas High-rise buildings Gas pipelines Onshore wind turbines Simple highway or toll road projects	Railways Greenfield toll roads Less-complex power generation facilities such as combined cycle gas plants, oil tankers LNG regasification facilities Offshore wind	Thermal or large-scale hydroelectric power plants Complex tunneling projects and bridges LNG liquefaction plants Simple refineries Drill ships	Refineries Nuclear plants Complex processing plants Mining projects

LNG--liquefied natural gas
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Project-specific factors may mean that apparently similar assets may be classified as having a different construction difficulty. For example, building a single-site hotel is relatively simple; building the same hotel in a congested city center location could be assessed as moderately complex. Similarly, a simple highway construction becomes more challenging when the site is next to an existing road that is in use.

Project-specific attributes

If we think that project-specific features increase construction complexity or cost, when considered individually or in aggregate, the construction difficulty assessment may be raised by one to arrive at the CPBA. Attributes considered include our assessment of the technology used, the complexity of the design and how advanced it is, and the extent to which event risks such as ESG risks could affect the final design.

The technology used: We consider how reliably and predictably the project's technical solution operates under comparable conditions. In particular, we consider the risk that technology may undermine the project's ability to meet its contractual obligations, including any quality aspects.

Proven technology allows for a more effective forecasting of asset performance and operating costs over the technology's life cycle. Hence, it does not typically increase the construction risk, in our view, and we would not adjust the difficulty assessment.

Using technology that has a limited performance history, or that has not been tested in the specific configuration, may delay construction completion. Projects may be built using technologies that have not been demonstrated, even at pilot scale, or with major components that have not been tested in an environment similar to the one where the project will operate. This increases the risk that the project may fall short of material contract or performance expectations. In addition, costs may rise as enhanced technology is needed to rectify a problem or meet the contractual requirements. Therefore, use of technology that is new or unproven makes construction more difficult.

The design complexity: We capture the extent to which the design of the project can cause unexpected variations during the construction phase. We check whether a similar design has already been built elsewhere, in a similar configuration, or if the design is new, or has been modified (for example, to accommodate the site or the building permits). Construction difficulty increases if the design is complex or the first of a kind. We may also assess this negatively to reflect potential risk associated with poorly defined site or permit conditions, such as ground conditions, foundations, latent defects, archeological findings, and contamination or access constraints. Depending on the scale of the project, making a design change may also add complexity compared with the contractual terms, impairing the quality of construction and resulting in cost overruns compared with the estimate at financial close.

B. Experience Of The Key Stakeholders

Successful construction depends on how well the key stakeholders perform during the construction phase. We assess the experience and expertise of key stakeholders, including contractors, subcontractors, equipment suppliers, and concessionaires/grantors, and governments, to determine their ability to meet their contractual obligations so that the construction is delivered as designed, on time, and on budget. We look at each stakeholder individually, but assess this factor in aggregate. It may have a positive, neutral, or negative effect on the CPBA (see table 13).

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Aspects that affect our assessment include the stakeholder's reputation, size, relevant expertise with the project type, scale, and location, plus the experience of each contractor's project director and team, as well as its risk management and quality control systems and labor relations record. In addition, we consider the experience of key subcontractors and how the relationship between project parties is managed.

We assess this factor as neutral for most projects, given that most hire experienced contractors that have a strong track record. A very experienced contractor is likely to have delivered similar projects on time and within budget, in accordance with the design, and under the type of contract to be employed. Experienced contractors also have a proven record of selecting and managing subcontractors to ensure they have the technical, managerial, and financial capacity to meet their contractual obligations. The contractor is benchmarked against global peers that are also experienced in the project type. A neutral assessment does not impact the CPBA.

If a contractor lacks expertise in a specific geography, technology, or sector, we look for evidence of compensating strategies, such as the involvement of experienced subcontractors and partnering with a strong local firm. If a contractor is new in the sector, technology, or geography and does not mitigate its lack of experience--for example, by hiring local project staff or subcontracting to strong local firms--we would consider that it does not have the skills required to adequately mitigate risk. Where one or more of the contractors lacks experience compared with peers, or where the project's management has a limited record, we would apply a negative modifier. A negative assessment may raise the CPBA by one, or two in a case of significant weakness.

In rare circumstances, we could apply a positive modifier (and may lower the CPBA by one) where there is an extremely experienced contractor that has a proven record of:

- Building similar projects in similar locations;
- Exposure to the same grantor; and
- Strong project management skills.

Table 13 summarizes the attributes we consider when assessing the expertise of the stakeholders. Our analysis is qualitative and the stakeholder (or group of stakeholders) is not expected to have all of the attributes listed to achieve a certain assessment. Rather, we consider how the attributes are combined:

- Projects assessed as positive are expected to have both positive attributes.
- Projects assessed as neutral cannot have more than two negative attributes.

Table 13: Assessing Stakeholder Experience

Positive	Neutral	Negative
<ul style="list-style-type: none"> • The project team has successfully handled similar projects in similar locations, with similar stakeholders. • Very strong risk management culture and quality control systems exist, that are able to address project-specific challenges. 	<ul style="list-style-type: none"> • Project has a large contractor, which may be internationally recognized, and suppliers that have a record in delivering the project type, at a similar scale, and in a similar location. • There is recourse to experienced subcontractors or local partners. 	<ul style="list-style-type: none"> • Contractors or suppliers are smaller or less-experienced. • Contractors possess limited, or no, expertise in the market or geography.

- The project team possesses the required technical skills and local knowledge.
- The contractor has a record of strong labor relations.
- Risk management and quality control systems are in place and allow the contractor to address project-specific challenges.
- The sponsor(s) display strong project management skills.
- Concessionaire/grantor has a positive history of project procurement and transparent contractual structure.
- Contractor has a poor track record of project completion, with a history of delays or cost overruns.
- The project team lacks the technical skills or the local knowledge required to deliver the project.
- The project team has limited, or no, history of working with key contractors or subcontractors.
- The key contractors have limited, or no, risk management function and quality control.
- The sponsor's track record of managing this particular project type is limited, or absent.
- The concessionaire/grantor is procuring a project for the first time or has limited experience with this type of asset or contract structure.

C. Risk Allocation And Contract Type

We measure the effectiveness of the construction contract by assessing how well it transfers risks associated with cost overruns, delays, and project performance to the appropriate third parties--which include the contractor, subcontractor, equipment supplier, concessionaire/grantor, government--and how much risk the project retains. Our analysis considers the type of contract, risk pricing, contractors' incentives, and alignment with the project's goals.

First, we consider the extent to which the project's scope and detailed design has been formally approved by all parties. In some cases, financial close occurs before the project design is finalized. In these cases, we assess the effect of any potential design changes--for example, whether they may require additional funds or lead to delays--and how the contractor or other project parties cover this risk under the construction contract.

If the design is not well advanced, especially for more-complex projects that have a construction difficulty assessment of 3-5 (see chart 18), we will analyze their mechanisms for resolving disputes. These may include arbitration arrangements between all the parties involved. Potential scope and design disputes must be resolved quickly if the project's deadlines are not to be jeopardized. A project that has a strong governance structure should have a clear and efficient process for resolving both likely and unexpected issues during the construction process. If the project could be subject to a prolonged legal dispute, it would weigh on our assessment.

When a project uses multiple contractors, each operating under a separate contract, but there is an overarching document or agreement that stipulates the allocation of responsibilities and obligations across all parties, we determine one construction SACP. If those obligations are joint and several, the CDA would depend on the project's ability to replace the counterparty that has the highest credit quality, and we link the CDA to that counterparty. If the obligations are several, but not joint, then we link the CDA to the weakest counterparty that is critical to completing the task. If no such overarching document or similar mechanism exists, we determine multiple construction SACPs (see "Additional Considerations" below).

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We examine the contract price, in consultation with the independent engineer or technical advisor when possible, to ascertain whether the contract was fairly priced and whether there is adequate contingency to cover any potential cost overruns and variations. Low-priced contracts may indicate an aggressive pricing strategy, or inexperience in the type of contract. They may also create a need for variations in the design that will add to the project's costs, lead to delays, and weaken the incentive to perform under the contract.

We also analyze the extent to which contractual incentives match the project's goals. Incentives may take various forms, such as a bonus/penalty regime, a liability cap that provides an incentive for on-time completion, high levels of credit enhancement to backstop completion, or liquidated damages that are aligned with costs payable under revenue contracts. These can all provide strong alignment of contract incentives with the project's goals.

In our view, turnkey contracts typically offer the strongest form of risk transfer, because the contractor has accepted the responsibility for all aspects of the construction of a facility and is expected to provide the works ready for use at the agreed price and by a fixed date and be responsible for the performance of all subcontractors. Under these contracts, "Fit for purpose" is guaranteed and backed by compensation in case of underperformance, and there is limited relief for unexpected events.

We would assess risk allocation as negative if the contract limits the contractor's responsibility, or gives it limited incentives to perform, thereby exposing the project to cost overruns or delays. A negative assessment may raise the CPBA by one or two in cases of significant weakness.

Risk allocation is expected to be neutral to the CPBA given that, in our experience, most projects enter into engineering, procurement, and construction (EPC) or EPC management contracts that offer adequate risk transfer.

Table 14 summarizes the attributes we consider when assessing risk allocation and the contract type. Our assessment is qualitative, so the risk allocation and contract type do not necessarily have to meet all of the attributes listed to achieve a certain assessment. Rather, we consider how the attributes are combined:

- A fixed-price, date-certain, turnkey contract will typically be assessed as positive and, as a result, may lower the CPBA by one.
- Projects assessed as neutral cannot have more than two negative attributes and should have a majority of neutral attributes. A neutral assessment does not impact the CPBA.

Table 14: Assessing Risk Allocation And Contract Type

Positive	Neutral	Negative
<ul style="list-style-type: none"> • The contract is a fixed-price, date-certain turnkey EPC contract. • The contractor has a strong incentive to perform in alignment with the project goals. • The contract includes compensation payable to the project company or grantor if the contractor underperforms. 	<ul style="list-style-type: none"> • The contract has a fixed price and date, with a limited risk of variations (change orders). • The contractor bears most of the risks, with various degrees of involvement from the project management team. • A major contractor coordinates all construction activities and has moderate-to-high alignment with project goals. 	<ul style="list-style-type: none"> • The contractor's responsibility is limited, or the contractor is paid by cost per unit of work. • There is a greater risk of change orders or variations. • The project is exposed to the risk of cost overruns and delays.

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- There is limited relief for unexpected events. In addition, possible modifications are limited, reducing the risk of price increases or delays.
- The project scope is detailed and clear and all parties have formally approved the design, thus limiting the risk of design change.
- A strong working relationship between project parties allows disputes to be resolved quickly.
- The contract has a moderate-to-high incentive to perform.
- Liquidated damages are adequate.
- The working relationship between the project parties allows disputes to be resolved with no effect on the construction progress.
- Incentives are limited, and there is imperfect alignment with project goals.
- The level of liquidated damages is inadequate.
- The project scope is not well defined, or some parties have not formally approved the detailed design, creating a high risk of design change.
- The dispute resolution process is weak or complex.
- The project has no control over a task that can affect construction cost or completion date.

D. Project Management

Project management may have a positive, neutral, or negative effect on the CPBA. A positive assessment may lower the CPBA by one, a neutral assessment has no impact, and a negative assessment may raise the CPBA by one or two. Where management has demonstrated extreme weakness—for example, if risks related to permits, rights-of-way, or expropriation risks are visible and material—the preliminary construction phase SACP is capped at 'b-'.

We conduct a qualitative analysis of the project company's ability to manage the risks the project has retained and still meet construction milestones by evaluating project management risks in the following areas.

Construction cash management

We focus on the effectiveness of budgeting, the timely release of cash to pay construction costs when due, and the existence of strong management reporting and controls. We view as positive a management team that takes a forward-looking approach to cash flows and implements adequate controls over payments. This ensures that the project meets the conditions precedent for drawing down funding and addresses warning signs indicating potential cost overruns early enough to manage them or avoid them. The absence of such controls could lead to issues such as missed payments or nonadherence to key contractual provisions, and will weigh on our assessment.

Management of permits, community stakeholders, and acquisition of rights-of-way

We consider whether all permits or right-of-way acquisitions are finalized at financial close, and the extent to which making such arrangements after closing could hinder access and scheduling, and add to costs. Substantial delays can occur if site conditions such as contamination, or the need to allow archeological excavation, are not anticipated and quantified, or if disputes arise over the allocation of these risks. A project that is unpopular with the local community may also face delays in gaining the required approvals, slower construction progress, and increased costs.

Planning and budgeting execution risk

We focus on activities that are on the critical path to completion and assess whether the schedule and budget have room to absorb any delays to those critical activities. Delays can arise

from errors or omissions in the estimating process; the availability, quantity, and cost of materials; staffing levels and labor productivity; and other uncertain factors (for example, weather events or industrial actions such as strikes, access, etc.) which are not contractually excusable events.

Degree of design completion and cost variation risk

We assess whether management has incorporated in the budget the level of design completion and minimized the risk of unforeseen cost escalation through executable contracts and adequate contingency funding. This includes budgeting contingencies to cover potential cost increases caused by inflation, exchange rate movements, and other market-related variables.

Sunset dates

Understanding the scheduling of sunset days relative to key milestones, such as the first scheduled debt service payment or a project agreement or concession termination date, is critical to determining the time buffer that exists in case of delays. A well-calibrated sunset date gives the project adequate time to absorb any delay or replace a contractor, if needed. A project may have multiple sunset dates built into the construction contract and concession agreement. We assess as negative project management that does not include contingency planning to mitigate any potential delays in construction that could threaten the earliest sunset date. In addition, we consider the availability of sufficient liquidity to cover additional costs if the onset of the operations period is delayed.

Table 15 summarizes the attributes we consider when assessing project management. Our assessment is qualitative, and we make our assessment based on a combination of features:

- Projects assessed as positive will typically possess all the positive attributes.
- Projects assessed as neutral exhibit most of the neutral attributes and cannot have more than two negative ones.

Table 15: Assessing Project Management

Positive	Neutral	Negative
<ul style="list-style-type: none"> • Cash management is forward-looking and includes a variety of reporting tools, such as cost-to-complete tests or milestone payment schedules, that help monitor the payment of construction costs and provide early warning of overruns. • Management implements cash controls through independent oversight and certification of works completed. • All rights-of-way and material permits have either been acquired or issued at financial close, or are known and quantified, with very low risk of unexpected conditions. 	<ul style="list-style-type: none"> • Cash management is basic and lacks an independent, forward-looking review. • Not all material permits have been issued, or potential site conditions have significant consent conditions or have not been quantified. Design variations may be required that could increase project risk. Rights-of-way are not fully acquired, but viable alternative routes are available. • Schedule and budget are tight, with key items on the critical path subject to uncertain factors. • Most of the detailed design is significantly advanced and backed by executable contracts for major equipment and works. The remaining design risk relates to the refinement of minor details. 	<ul style="list-style-type: none"> • Control over funds disbursement is inadequate. Poor cash management could result in missed payments or payments before works are completed. • The permitting process is opaque, or design risks cannot be quantified. Project right-of-way is at risk of being substantially delayed. • Schedule and budget are very tight, with material items on the critical path that, if missed, could create delays beyond the sunset date.

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- Project management's planning and budgeting are sophisticated, and the schedule and budget are exposed to limited risk associated with items on the critical path to completion.
 - Project management has ensured that most of the detailed design is complete and backed by executed or firm orders for major equipment and works, providing a high degree of certainty regarding costs. Contingency funding for any cost escalation is adequate.
 - The buffer between the sunset date and date of first debt service payment is sufficient, should the project need to replace a contractor or absorb an unexpected delay.
- Contingency funding for cost escalation is appropriate.
- The buffer between the sunset date and the date of the first debt service payment is sufficient to cover the period required to replace a contractor, but the time buffer to accommodate additional delays is limited.
- Detailed design is moderately advanced or preliminary. Contingency funding for cost escalation is appropriate.
 - Project management has built in no time buffer to allow for delays in construction ahead of the first debt service payment, or to replace a contractor. The viability of the project is threatened if underlying contracts are terminated.
 - Project reporting is poor and disclosure or governance displays weaknesses.

E. Construction Progress

Given the many factors that affect the success of a large construction project, the risks will vary throughout the construction period. After financial close, we may revise the assumptions that the CPBA was originally based on. Therefore, we aim to capture any deviation in complexity, scheduling, or nature of funding that may affect the timeliness of final completion and whether the construction meets the quality standards laid out in the contracts.

Our analysis considers the project performance relative to each stage of construction, adherence to milestones, changes in critical path items, and the nature of the remaining works that have yet to be completed. If we conclude that new risks have arisen during construction, we may weaken the CPBA by one or more notches, depending on the severity of the issue. The CPBA may be raised by more than one notch if there is, for example, a significant delay in replacing a key construction party, such as the contractor; a very high likelihood that an equipment supplier will fail to meet its deadline for delivering crucial equipment; or material delays in obtaining key permits or approvals for utility relocations.

F. Potential Caps

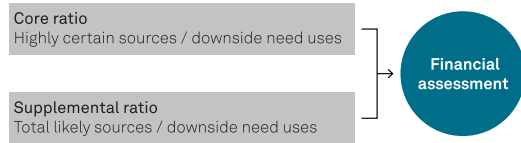
We cap the CPBA at 6 if:

- The risk allocation and contract type assessment is negative, and the contractors have no experience with similar projects; or
- Construction difficulty is 4 or 5, and the detailed design is only preliminary at financial close.

Step 2: Construction Phase Financial Assessment

Chart 19

Determining The Construction Phase Financial Assessment



SACP--Stand-alone credit profile.
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This assessment evaluates whether the project has sufficient funding to cover the costs of construction and ensure the project can be completed, even under a stress scenario. It captures the risk that funds may not be available to the project on time and with sufficient certainty to complete construction as planned and within budget. The financial assessment ranges from 1 to 6, with 1 being the strongest (lowest risk), and 6 being the weakest (highest risk).

We consider the project's funding needs in a downside scenario to measure its liquidity and the size of the cushion available to withstand stress scenarios. Given that total sources of funding are typically fixed, measuring them against the uses of funding required in a downside scenario indicates how likely it is that the project will be completed before the sunset date.

We derive our downside scenario from our base case. It incorporates the cost of likely delays and overruns, including any costs incurred due to a delay in the start of operations and commencement of scheduled debt service. Common sources of delay include extreme weather events, access constraints, long lead times for key equipment, industrial actions, protests or other social issues, critical path construction items, or increased market costs for key materials that are not subject to contracts. Our assessment is based on the amount and certainty of available sources of funds, compared with all expected uses under our downside scenario.

A. Sources Of Funds

The funding required to build an asset can come from many sources. Our analysis considers the certainty and timeliness of the money coming from a source, as well as the conditions attached. Because the financing schedule is normally tight, funding from an uncertain source being paid late may result in a default, particularly if the delay prevents the project from paying interest when due.

Funding and liquidity sources include:

- Debt instruments such as progressive-draw bank facilities or bond funding: We consider whether any funds not contributed at financial close will be made available when the project needs them. In addition, we consider any conditions precedent to drawing and the likelihood that these may delay or prevent funding of project costs. A failure to meet the required conditions may prevent drawdown, and the more extensive the conditions, the greater the risk of this occurring.
- Equity: Equity contributions may be deferred until all debt has been funded. We incorporate our view of the likelihood that the equity will be provided when required.

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- Interest income during construction: We do not typically view interest income as a reliable source of funding that can be used to cover construction costs, unless it is subject to a financial arrangement such as a guaranteed investment contract (GIC).
- Revenue from operations during construction: In some cases--for example, a project that is being built in phases or the replacement of an existing operational asset with new facilities--cash flow from completed projects or portions of projects may contribute to the funding for the construction of the new assets. The amount available would be limited to the excess cash from operations after payment of all operating (and potentially financial) costs. Such cash flow could also be vulnerable to delays because of operational issues.
- Third-party support: For example, grants from a government, parent, or other third party. We assess the certainty and timing of such funding sources on economic and legal grounds. For example, we analyze the economic incentives for a government or local authority to provide a grant, the creditworthiness of the counterparty, and the legal authority to provide such funding.
- Contractor support: Given that liquidated damages are often paid after a dispute resolution process, we would only consider these as a funding source if backed by liquid instruments such as LOCs, retained cash, or some types of performance bonds, and only if they can be drawn while any disputes related to liquidated damages are resolved.

We analyze the certainty and availability of each funding source relative to the timing of its use, including any conditionality established in the financing documentation, and our view of the source's willingness to contribute under our downside scenario, taking into account any incentives. We exclude from our calculations any funding source that we do not assess as either certain or likely (see table 16) and calculate core and supplemental financial ratios to determine the sufficiency of cash flow.

To be assessed as certain, the financing is expected to be:

- Contributed at or before financial close and deposited in a restricted account (usually controlled by a trustee); or
- Unconditionally and irrevocably committed, so that we expect it to be available when required, subject to the counterparty being rated at or above the project.

To be assessed as likely, the funding is expected to be committed to the project, but it may be available in a less timely manner or with some conditionality. Other sources that may vary in amount and time would be considered too volatile to be a reliable source of financing.

Table 16

Sources Of Construction Funding

Certain	Likely
Debt	
Is committed and we expect it to be available when required. The conditions precedent for drawings are sufficiently specific and are unlikely to result in debt not being provided.	Is committed. The conditions precedent for drawings are more onerous and could affect, to some extent, the timely availability of the funds, but without putting at risk the project's solvency.
The debt is either contributed in full or unconditionally and irrevocably underwritten from a financial institution* at financial close.	

Sources Of Construction Funding

Certain	Likely
Equity	
Equity is contributed upfront or, if deferred, is backed by a financial instrument such as an unconditional and irrevocable LOC from a bank*; or deferred equity is backed by a corporate guarantee§ that meets the requirements of our guarantee criteria and will be available to be drawn when required. (The guarantee provider's CDA caps the construction phase SACP.)	Deferred equity backed by a corporate guarantee§ whose availability when required may be affected by conditions precedent, deterioration of creditworthiness, or other factors. (The guarantee provider's CDA caps the construction phase SACP.)
Interest income during construction	
Risk of having interest income unavailable during construction is very low, as a result of predictable construction drawdowns, and cash is held in a highly rated bank at locked deposit rates or provided through a GIC that meets our relevant criteria.	Risk of having interest income unavailable during construction is low, as a result of less predictable construction drawdowns or unhedged rates.
Revenue from operations during construction	
Excess proceeds from operations are highly certain under all reasonable scenarios, projects are rated at least 'BBB-' and have a positive operating history.	Excess/net proceeds from operations are slightly vulnerable to underperformance due to a lack of history or volatility.
Third-party support†	
Third-party support is unconditional and irrevocable, and available on demand when required*. Typical examples include grants, contingent capital, and guarantees§ that meet the requirements of our guarantee criteria, and that will be available to be drawn when required. (The counterparty's CDA caps the construction phase SACP.)	Third-party support has a low risk of not being available when required*. Funds are expected to be contributed before a default is triggered, although conditionality may limit timely contribution. (The counterparty's CDA caps the construction phase SACP.)
Contractor support	
Contractor support is backed by unconditional and irrevocable on-demand LOCs, cash deposits, or retention. The instrument should not have any restrictions under the construction contract.	Contractor support is backed by unconditional and irrevocable instruments, although the construction contract could restrict the ability to immediately draw under the instrument (for example, there is an arbitration period during which the support is payable within a reasonable time to complete the project).

*Counterparty analysis applies to all providers of deferred funding. §Must consider subordination if the guarantor is a holding company. †If the instrument does not meet the conditions to be assessed as certain or likely, it is not included as a source of funding. CDA--Counterparty dependency assessment. SACP--Stand-alone credit profile. GIC--Guaranteed investment contract. LOC--Letter of credit.

B. Uses Of Funds

Uses of funds during construction include:

- Construction and other start-up project costs. These extend beyond the contract costs and incorporate allowances for costs not covered under the construction contracts, such as variances, escalations, movements in exchange rates, latent defects, and environment-related costs (such as watershed protection, pollution mitigation, or the protection of local species). The project may also bear time-related costs for force majeure events or delays not attributable to the builder (such as permit or land acquisition delays).
- Funding of working capital. This is the initial amount needed for operations to begin satisfactorily. Typical working capital needs for the proposed operations include the purchase of equipment or material required for project testing and commissioning.
- Interest payable during construction. This is commonly capitalized, covered under the project's funding facilities, and included in the financial ratio calculations below, since it is a project cost. If interest is capitalized, debt limits must include an amount equal to the

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capitalized interest amount. Interest is a time-based cost and, as such, the amount required increases if the project is delayed.

- Funding of reserve accounts. The operating phase typically relies on having fully funded reserve accounts at the start of operations, or earlier if interest during construction is to be paid in cash.

C. Determining The Construction Phase Financial Assessment

To assess whether the sources described in table 16 cover the minimum funding required for the project construction, we calculate two ratios of sources over uses.

The core financial ratio equals certain sources to downside scenario uses. It ranges from 1 to 6, with 1 indicating the lowest funding risk (strongest coverage). This ratio is the starting point for the CPFA.

Table 17

Core Financial Ratio*

Assessment	Certain sources (x)
1	≥ 1.15
2	1.00-1.15
3	0.90-1.00
4	0.80-0.90
5	0.50-0.80
6	< 0.50

*Ranges include value at the lower bound, but not the upper bound.

The supplemental financial ratio equals both certain and likely sources to downside scenario uses. If this supplemental ratio maps to an assessment at least one score above what the core financial ratio indicates, we might raise the financial assessment score by one to reflect the additional financial buffer against stress scenarios provided by the total sources.

Table 18

Supplemental Financial Ratio

Assessment	Total sources (x)
1	≥ 1.30
2	1.15-1.30
3	1.05-1.15
4	1.025-1.05
5	1.00-1.025
6	< 1.00

*Ranges include value at the lower bound, but not the upper bound.

As construction progresses, we would recalculate the core and supplemental ratios to reflect any potential weakening or improvement in the project's funding coverage compared with the initial

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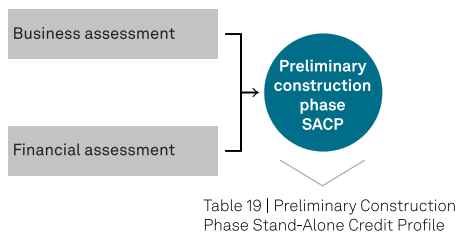
assessment. If the project's funding sources have altered compared with our initial assessment, the CPFA could be revised. There is unlimited downside, but the upside is limited to one score.

If the supplemental ratio is 6, signaling that total sources do not cover uses and the project is highly vulnerable to default in the near term, the preliminary construction phase SACP is capped at 'b-'.

Step 3: Preliminary Construction Phase SACP

Chart 20

Preliminary Construction Phase Stand-Alone Credit Profile



SACP--Stand-alone credit profile.
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The third step is to combine the outcome from the CPBA and the CPFA to determine the preliminary construction phase SACP (see table 19). When two outcomes are listed for a given combination of business assessment and financial assessment, we determine the preliminary construction phase SACP as follows:

- For projects that have a stronger financial assessment (1-4), we base the preliminary construction phase SACP on the comparative strength of the business assessment.
- For projects that have a financial assessment of 5, we base the preliminary construction phase SACP on the comparative strength of the financial assessment.

Table 19

Preliminary Construction Phase SACP

		--Business assessment--					
		1	2	3	4	5	6
Financial assessment							
1	a+	a/a-	a-/bbb+	bbb+	bbb-	bb+	
2	a/a-	a-/bbb+	bbb+/bbb	bbb/bbb-	bb+	bb-	
3	a-/bbb+	bbb	bbb/bbb-	bbb-/bb+	bb	b+	
4	bbb/bbb-	bbb-	bbb-/bb+	bb	bb-	b	
5	bb+	bb	bb	bb-/b+	b+	b	
6	b-	b-	b-	b-	b-	b-	

SACP--Stand-alone credit profile. The preliminary construction phase SACP is no lower than 'b-' unless the default scenarios in the 'CCC' criteria apply.

Step 4: Applying Financial Modifiers And Caps To Determine The Construction Phase SACP

The final step in determining the construction phase SACP is to incorporate holistic analysis, structural protection, and counterparty constraints.

A. Holistic Analysis

We may revise the preliminary construction phase SACP determined in table 19 up or down by one notch to capture a more holistic view of creditworthiness during construction. This analysis incorporates additional credit factors that the criteria may not separately identify or fully capture, or our assessment of a project's greater or lower risk relative to its peers'.

Considerations that may lead us to adjust the preliminary construction SACP include:

- The period between expected completion and the sunset date is materially longer than peers';
or
- The project may access unusually large funding instruments that we do not consider as a likely source in our liquidity analysis, because of their conditionality, such as insurance company-provided performance bonds.

A holistic adjustment cannot override an applicable cap.

B. Structural Protection

Our assessment of the strength of the security package and of the covenants in place may trigger a further negative modification of the preliminary construction phase SACP. For example, if a building constructed as part of the project cannot be insured because it falls short of the minimum insurance requirements, we would revise down the preliminary construction phase SACP. The aggregate effect of the structural protection modifier could be to revise down the preliminary SACP by up to four notches (see section 5).

C. Counterparty Constraints

The preliminary construction phase SACP may be weak linked to the CDA of material counterparties involved in construction phase contracts (see section 6).

D. Additional Considerations

Construction risk for projects that have multiple construction processes

To determine the construction SACP for projects with multiple independent, parallel, or phased construction processes, we follow the steps below.

Construction SACP For Projects With Multiple Construction Processes

Step 1: Determine a CPBA for each asset (or pool of assets) under construction.

In principle, the project's CPBA reflects the likelihood of completion for the weakest construction process. That said, we also consider the effect on cash flows if construction of an asset were not completed, and how critical it is to the project as a whole. If the loss of cash flows from a particular asset does not result in a lower preliminary operations phase SACP, we may exclude it when determining the weakest link. However, we would not do so if it is essential to the future operations of the project as a whole. For example, the construction of a short road may not generate significant cash flow by itself upon completion, but it may be crucial to the operation of a network of roads.

Step 2: Determine the CPFA for the project as a whole, that is, considering all assets to be built, even if they are excluded from the CPBA determination.

We aggregate construction sources and uses, and assess whether the project has enough funding to cover the total costs of construction and ensure it is ready for operations, even under a downside scenario. This consolidated approach applies when the project can contractually use common funding sources interchangeably, including revenue generated by assets already in operation, to cover costs at any asset. When funds cannot be shared among different assets, we determine the CPFA for each asset. The final project CPFA is equal to the weakest of the asset-specific CPFAs.

Step 3: Combine the weak-linked CPBA with the aggregate CPFA to derive the preliminary construction phase SACP.

Step 4: Incorporate the remaining modifiers.

To determine the construction CDA, we first calculate the benefit of any credit enhancement specific to an individual contract, such as a performance LOC, and apply the financing sources on a risk-adjusted basis, divided by the total construction costs. This calculation will allow us to distinguish between sources that are dedicated to specific assets and common funding sources that can be used interchangeably. We determine the construction CDA for each of the contracts. If this results in any CDA being weaker than the preliminary construction phase SACP, the construction phase SACP of the project is constrained by this assessment.

If assets are being built progressively, we perform this analysis each time a new asset is brought into the portfolio, as soon as we have all of the relevant construction documentation.

Construction risk for projects that are already in operations

Minor construction works associated with expanding a project during the operating phase are assessed as part of the operations phase SACP. However, if we consider the expansion to be material, we may determine a construction phase SACP to cover the period of the expansion works. This applies whether the expansion was planned at financial close or subsequently. Where we determine a construction phase SACP for expansion works, the project SACP is the lower of the project's operations phase SACP and the construction phase SACP.

We determine a construction phase SACP if:

- The preliminary operations phase SACP weakens to a lower category (see table 8) if we include the debt and exclude the projected cash flows from the expansion works.
- Failure to complete the new works puts the concession (or relevant revenue contract, such as a power purchase agreement), permit, or asset at risk of termination.

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- The new construction process jeopardizes the operational performance of the asset, even if temporarily and only within the construction period of the new works; or
- The new contractual terms could jeopardize the creditworthiness of the project. This could occur, for example, if the new construction contract includes cross-default clauses with any counterparty that are not properly mitigated.

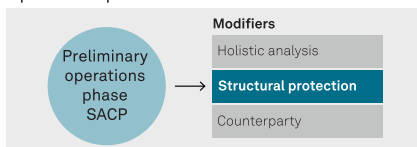
Section 5: Analyzing Structural Protection

Project finance transactions include structural features that place important controls on the issuer and provide rights to creditors that can help reduce default risk through collateral packages and covenants. We analyze the transaction structure to assess the strength of the protection provided to a project's debt lenders.

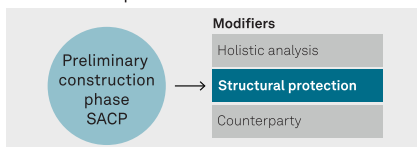
Chart 21

Analyzing Structural Protection

Operations phase



Construction phase



SACP--Stand-alone credit profile.
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We incorporate our structural protection analysis by modifying the operations phase SACP and, where applicable, the construction phase SACP. This assessment reflects the strength of the security package, as well as the degree of protection provided to lenders by the LPE and cash management covenants.

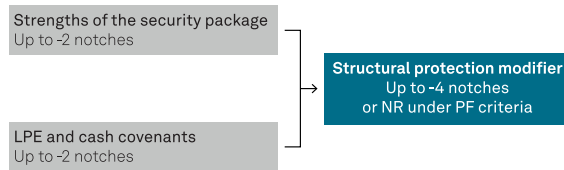
Our analysis of structural protection considers the following two factors:

- The strength of the security package; and
- The LPE and cash management covenants.

The combination of these two assessments determines the structural protection modifier, which we apply to the relevant preliminary operations phase and/or preliminary construction phase SACPs. Not only could we revise down the relevant preliminary SACP by up to four notches as a result of this analysis, but we may also identify a weakness in the enforceability of the security that leads us to not rate the transaction under these criteria (see section 2).

Chart 22

Impact Of Structural Protection On Preliminary SACP



LPE--Limited purpose entity, NR--Not rated, PF--Project finance, SACP--Stand-alone credit profile
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A. The Strength Of The Security Package

When assessing the level and quality of the security provided to lenders, we consider the retained risks, the existence of weaknesses, and the presence of mitigants in each phase. Specifically, if we determine that the security package has weaknesses, either because the security is partial or is not a first-ranking lien, we typically revise down the relevant preliminary SACP by at least one notch unless the preliminary SACP is already in the 'b' category. For projects mapping to the 'bb' category (see tables 8 and 19), we generally revise down the preliminary SACP by one notch. For projects mapping to the 'bbb' category or higher (see the same tables), we generally revise down the preliminary SACP by two notches. This is because a lower-rated project already encompasses some risks associated with a potentially weaker structure, whereas a highly rated project is expected to offer stronger security. Certain guiding principles, such as the materiality of the asset and potential incentives for the counterparty, help us to determine the level of notching.

The materiality of the asset, permit, or cash flows that are excluded from the security package

In structures that have partial security, the key analytical factor that determines the level of notching is how material to the project the asset that is not pledged is. A substation that is essential if a power project is to deliver energy and meet its contractual obligations is more material than the security cars owned by a toll road project, assuming these are not essential to the project's operations. A power deal that does not pledge an essential substation may see a two-notch downward adjustment to a preliminary SACP of 'bbb-' or above (or a one-notch adjustment if the preliminary SACP is in the 'bb' category). If the toll road project in our example does not pledge its cars, the downward adjustment could be limited to one notch, and only if its preliminary SACP is 'bbb-' or above.

The nature of the counterparty and incentives

If the parties have no incentives to enforce their rights, this can partly mitigate weaker security. This is because an alignment of interests among the different parties that comprise the project--the sponsors, creditors, contractors, and counterparties--could lower the potential for any encroachment, or placement of encumbrance, on the security. Therefore, if incentives are aligned, the negative adjustment to the preliminary SACP may be smaller than that suggested by the materiality of the excluded asset alone. In our substation example, if the owner of that material substation is the project's off-taker, we would regard the exclusion of the asset as less negative for the project than if the off-taker were a third party because the off-taker would have an incentive to keep operating the project. In such a case, we could limit the adjustment to the relevant preliminary SACP to one notch, if it is in the 'bbb' category or above. We acknowledge

that incentives are dynamic and may change over time. This could cause us to adjust the notching.

B. LPE And Cash Management Covenants

We expect a project finance structure to have the following LPE covenants:

- Requirement for a cash flow waterfall;
- Restrictions on additional debt;
- Restrictions on asset sales and the inclusion of new assets;
- Restrictions on additional security to third parties; and
- Requirement for minimum insurance.

We assess each feature as neutral or negative, based on the presence and strength of the covenants. We then combine these assessments as shown in table 20 to determine the impact on the construction or operations phase SACP.

Table 20

Limited-Purpose Entity Covenant Analysis

Neutral All LPE and cash management covenants are neutral.

-1 At least three of the LPE and cash management covenants are neutral, and the cash flow waterfall is one of them.

-2 Only two of the LPE and cash management covenants are neutral and/or the cash flow waterfall is negative.

LPE--Limited-purpose entity.

Cash flow protection and waterfall

We expect to see a cash flow waterfall in all transactions, because it establishes priority of payments and contractually allocates operating revenue and other cash inflows. It is also used to set the replenishment of reserve accounts and establish distribution tests before dividend distributions. For most projects, the waterfall provides that during operations cash should first be used to pay all expenses necessary to maintain operations; then taxes, if applicable; then super-senior expenses and fees payable to transaction parties, for example the security trustee and account bank; then to service the senior debt, including any hedging arrangements; and then to replenish senior debt protections, such as reserve accounts. If this is the case, we assess the covenant as neutral.

However, a cash flow waterfall may give priority to paying senior debt service before operating expenses. In those cases, we may still assess the waterfall covenant as neutral if our base-case scenario forecasts indicate that the project will generate sufficient cash flow to cover operating costs, debt service, and the replenishment of necessary reserves. Yet, we would assess the covenant as negative if the financing documents allow for payment of expansionary capex or payments to the sponsors that we would consider akin to distributions, ahead of debt service. A deficiency in the cash flow waterfall would cause us to revise down the operations or construction phase SACP by two notches.

Restrictions on additional debt

We expect to see restrictions on an LPE's ability to incur indebtedness, beyond the debt factored into the original rating. If additional debt limits are absent or weak, we would assess this covenant as negative.

When analyzing permitted additional debt, we assess the terms and conditions and form of any debt and debt-like obligations, including take-or-pay arrangements and leasing agreements. We factor in the limits set by the additional debt covenants into our base-case and downside scenarios, considering mitigants, conditions, and likelihood of additional debt being drawn. We generally assume all permitted debt is drawn in our base-case and downside forecasts, unless we have evidence, track record, or strong expectation that it will not be drawn. In addition, our forecasts will not include additional debt that is permitted if, as a condition precedent, this additional debt must not deteriorate the creditworthiness of the transaction.

Certain types of additional debt would not necessarily affect an LPE's bankruptcy remoteness--for example, the debt may be issued as subordinated debt. In addition, we expect the project to be allowed to raise debt in the normal course of business, such as for working capital and day-to-day transactions. A covenant that allows a limited amount of additional debt for working capital is assessed as neutral. The project may not raise debt for the shareholders' benefit. A covenant that allows the project to incur debt to make additional shareholder dividend distributions is assessed as negative. This might not be the stated purpose of the debt, but it also applies where the amount of debt allowed implies that an indirect result will be to benefit shareholders.

To assess this covenant as neutral, we also evaluate whether:

- There are agreements between the LPE and its creditors that include nonpetition language, under which the creditors agree not to initiate bankruptcy proceedings against the LPE and not to join any such proceedings;
- There are agreements between the LPE and its creditors that limit the creditors' recourse to the assets backing the rated debt, in accordance with the relevant order of priority set out in the documentation; and
- Any increase in debt, including debt-funded expansions of the project, does not weaken the rating on the outstanding debt.

Restrictions on asset sales or inclusion of new assets

Asset sales are often part of normal business. However, disposing of material income-producing or essential assets can weaken the credit quality of a project. If material assets can be sold, we may view it as neutral or negative, depending on whether the proceeds are used to reduce existing debt. We regard this factor as negative if the sale of the assets hampers the project's CFADS generation and does not offer a commensurate reduction in debt. The factor is also negative if it reduces debt, but in doing so causes the transaction's operating performance to deteriorate (for example, by increasing the operating risk). If a sale is only permitted to fund the purchase of replacement assets or to reduce debt, we will consider this factor neutral.

As stated in section 2, we expect most projects to be closed portfolios to which no new assets are added during the life of the debt. That said, we assess this factor as neutral for transactions that include eligibility criteria or similar mechanisms to allow new assets to be added, as long as creditworthiness is maintained and there is no negative effect on the operations phase SACP.

Restrictions on additional security to third parties

Additional security interests over a project's assets, or security granted to third parties that ranks equal to or higher than the project debt, weaken the credit standing of the senior debt. We regard this situation as negative. However, we may still assess the covenant as neutral if the additional security interests stem from the normal course of business (such as trade creditors or leases for minor moving equipment).

Extensive additional security interests may cause the security to transfer control of essential project components, such as a power plant, to a third-party lender. This would reduce the ability of the project's lenders to step in and operate the project. If this were the case, the transaction structure would not meet the requirements of an LPE, and these criteria would not apply.

Minimum insurance requirements

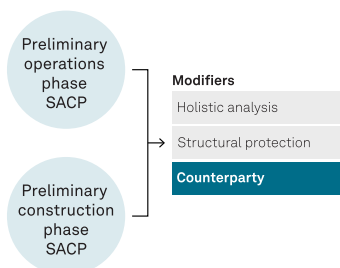
A neutral insurance package typically includes business interruption and casualty insurance policies. If these policies are absent, we assess the covenant as negative. We also treat the project as if it is not insured if deductible limits are high.

Section 6: Determining Exposure To Counterparty Risks

A project finance structure utilizes contractual arrangements to establish obligations and risk allocation across the project and the various third parties. As such, the project's ability to operate and service debt may be affected if any counterparty fails to perform its obligations as contracted. Unless there are mitigating factors, this reliance may create a dependency. Our operations and construction phase SACPs therefore consider the financial capacity and operating capability of the third parties to perform under their respective contracts.

Chart 23

Analyzing Counterparty Dependencies



SACP--Stand-alone credit profile.
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We determine a CDA for each material counterparty to whom the project is exposed. A material counterparty is one whose failure presents a risk to the project's construction or operations. The CDA is a function of:

- The project's exposure to the risk of a material counterparty becoming insolvent or failing to perform under the respective contract; and
- The degree to which such exposure is mitigated. If the material counterparty risk is fully mitigated, the CDA is not relevant.

Determining How The Risks Posed By Counterparties May Constrain A Project

Step 1: Identify any contractual obligation where a project's risk is transferred to a counterparty.

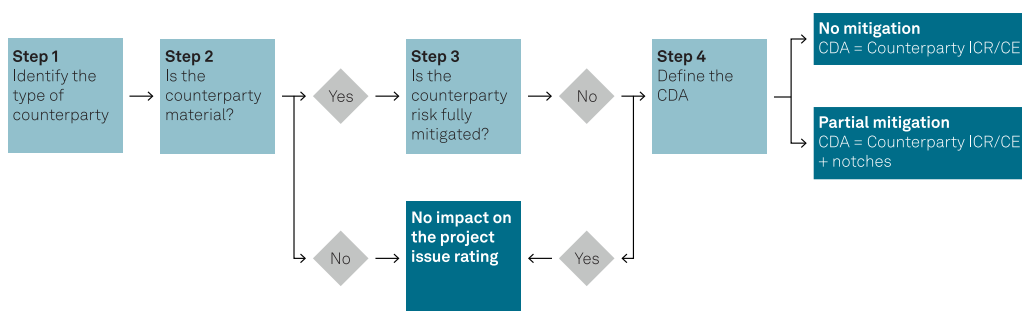
Step 2: Determine the materiality of the counterparty, based on how its failure to perform as contracted would affect the project's creditworthiness.

Step 3: Analyze to what extent the mitigating factors, if any, offset the counterparty risk and determine if the CDA is applicable.

Step 4: When applicable, determine the CDA. The starting point for the CDA is the creditworthiness of the counterparty, but we may assess it as higher, depending on our view of the effectiveness of any mitigating factors, and the type of contractual obligation.

Chart 24

Counterparty Risk Framework



CDA--Counterparty dependency assessment . CE--Credit estimate. ICR--Issue credit rating.
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We use the counterparty's creditworthiness as a proxy for the counterparty's ability to fulfil its obligations to the project. We measure creditworthiness by the counterparty issuer credit rating (ICR) or a credit estimate. A CDA of 'ccc+' or lower would not bring the construction or operations phase SACP below 'b-' unless the conditions for a potential SACP of 'ccc+' or lower are met (see "[General Criteria: Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings](#)").

The CDA applies only to the period of the project's life covered by the relevant contract with the third party. For example, a construction company is typically only a counterparty during the construction phase and for any warranty or defects liability period covered by its contract that we consider relevant for the analysis. The CDA related to that construction company will only be relevant during construction and until the liability period expires.

At any time during the project's life, we may reassess the materiality of the counterparty and the CDA to reflect changes in the project, the market, or the counterparty because those changes may affect the project's exposure to that counterparty, or the counterparty's ability and willingness to meet its contractual obligations to the project.

For construction counterparties that we believe can be replaced if they become insolvent, the CDA is generally determined at the time when the initial rating is assigned to the project and then again if the counterparty is replaced. However, for long construction periods, or, if we believe that

the performance of the construction counterparty can affect the project's creditworthiness before replacement, we might update the CDA during the surveillance process.

Step 1: Determining The Types Of Counterparties

Table 21 shows examples of contracts whose counterparty is considered within the scope of this methodology.

Table 21

Counterparty Types

Category	Counterparty type	Examples of contracts
Nonfinancial	Revenue	Government concessions, offtake contracts, purchase contracts
	Construction	Construction agreements
	O&M; equipment and raw material supplier	O&M agreements; supply or procurement agreements
	Structural	Joint-venture agreements; third-party contingency equity agreements
Financial	Bank account provider	Bank account agreements
	Deferred funding providers	Bank loans, LOCs

O&M--Operations and maintenance. LOC--Letter of credit.

This methodology does not apply to our analysis of financial counterparties, other than deferred funding providers during construction works and bank account providers. The implications of other financial counterparties--including providers of liquidity or credit support facilities, interest rate swaps, and currency swaps--on the credit quality of the project are covered by our criteria "[Counterparty Risk Methodology](#)."

Step 2: Determining The Materiality

We typically consider a counterparty to be material if its exclusion, failure, or deterioration in creditworthiness would change the project's preliminary SACP during construction or operations. Conversely, we assess a counterparty as nonmaterial if we consider that its failure to perform under its contract would not affect the preliminary SACP.

In most cases, a revenue counterparty is regarded as material because the project would be more exposed to market risk without the contracted revenue. However, we classify a revenue counterparty as nonmaterial if loss of the contracted revenue does not affect the preliminary operations phase SACP. Similarly, a counterparty that supplies raw material or equipment could be nonmaterial where a resource is a commodity that is widely available in the area where the project is located. The effect on the preliminary SACP of a change in such a counterparty would be minimal.

When we conclude that a counterparty is material and the negative impact of its failure to the project's schedule or cash flow is not fully mitigated, the CDA is applicable. Otherwise, the CDA is not relevant.

Step 3: Mitigating The Exposure To Material Counterparties

Where a project is exposed to any material counterparty, we assess the risk by considering the presence of the following mitigating factors, and the degree to which they reduce the risk:

- Ability to replace the counterparty;
- Liquidity for counterparty replacement; and
- Ability of a nonfinancial counterparty to perform its designated role under various types of duress, combined with the incentives and disincentives that apply.

A. Replaceability Of Each Counterparty

A counterparty that is easy to replace reduces the project's exposure to the risk of its failure. However, the presence of replacement language in the contract is not, by itself, sufficient for a counterparty to be assessed as replaceable. We also typically consider whether:

- There are alternative parties in the market, such as contractors that have similar skills, or off-takers willing to provide or accept the same service or product at a similar price and quality.
- The original contract was priced appropriately, or it provides other economic value to the alternative party.
- The contract allows the termination and timely replacement of the failed party.
- For contractors or contracts with suppliers and subcontractors, licenses and permits can be reassigned or transferred without delay.

If the counterparty cannot be replaced, by virtue of its market or contract position, it is treated as irreplaceable. Examples of irreplaceable counterparties include:

- A supplier that provides essential skills so specialized that the time needed to source replacement services or equipment from another supplier could cause a significant delay and, thus, cash flow deterioration.
- A counterparty that assumes greater risk than the market standard, thereby limiting the field of alternative contractors.

B. Liquidity For Counterparty Replacement

Replacing a counterparty requires the availability of sufficient liquidity to pay the replacement costs without any disruption to the transaction cashflows. We include in our calculations the amount needed to offset any negative impact on the project's cash flow caused by the failing counterparty. Our analysis of liquidity for this purpose would include only those funds that are available to offset the specific risk that the counterparty may fail, and that are not earmarked for another purpose. The project will have much wider overall liquidity that is used for construction and operations. The funds set aside for this specific use typically consist of:

- Secure cash deposits, such as funded contractual retentions or other specific reserves;
- Parental support, provided it is timely and unconditional;
- Excess cash flow after debt service; or

- Unconditional and irrevocable instruments from a financial institution or insurance company that are payable on demand, such as LOCs and guarantees.

As long as the risk that the funds are unavailable to fund a timely replacement is low, we may accept an instrument that contains conditionality as an appropriate liquidity source to replace a counterparty. This would be the case, for example, for a reserve that has trivial or easy-to-meet conditions precedent, such as independent engineer approval that we expect will be given. Our assessment of the risk is also affected by the amount of available liquidity, although to differing extents, depending on the type of counterparty.

C. Ability And Incentives For A Nonfinancial Counterparty To Perform

Continuity of business or presence of legal or regulatory support

When a nonfinancial counterparty enters into bankruptcy or defaults on its debt obligations, it may continue to perform according to its operating contracts if doing so is considered essential or economically important. Thus, contracts do not automatically terminate on the default of the counterparty. The payment or service may continue, even if the counterparty is in default, if the service provided is essential, and if there is regulatory support, legal precedent, or commercial incentives to maintain continuity of business. If we consider that economic incentives reduce the risk that the counterparty will interrupt its obligations to the project, we reflect this positively in our risk assessment.

Unpunctual counterparties

Our project-level liquidity and cash flow analysis incorporate the risk of delays to payment or services, including those that result from commercial disputes. However, for projects where a nonfinancial counterparty has a history of consistent late payments, or where service delivery or delays are common market practice, we may classify a counterparty as unpunctual. In such cases, we cap the construction and operations phase SACPs at the lower of the counterparty ICR, lowered by one rating category, or 'bb+', regardless of the counterparty type.

Examples of unpunctual counterparties include:

- A counterparty that has consistently made late payments. For example, some regional governments are well known for paying late on commercial contracts, but promptly on external debt.
- A local authority that undertook a public-private partnership transaction, but where the local authority, or its executive, is publicly against the concept. In our view, this increases the likelihood that the authority may seek to delay payments, terminate the contract, or make it impossible to perform (a frustrated contract).

Step 4: Determining The CDA By Type Of Counterparty

We determine the CDA based on the type of counterparty and how well mitigated the project's exposure to the counterparty is. Typically, the greater the exposure to a counterparty, the harder it is to mitigate that risk and the closer the CDA is to the counterparty's creditworthiness. If a counterparty's obligation benefits from an unconditional and irrevocable guarantee from a

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creditworthy third party that meets our guarantee criteria, we consider the creditworthiness of the guarantor in determining the CDA.

Multiple counterparties

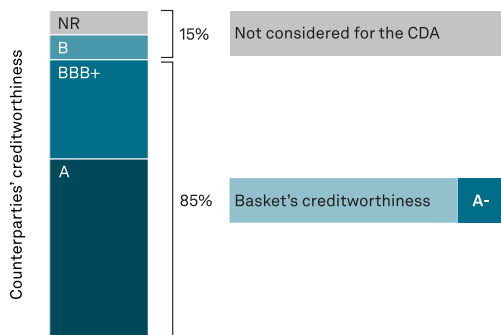
When a project has multiple counterparties that together endorse a particular risk for the project, we determine the CDA as follows:

- If the counterparties are jointly and severally responsible for the obligation--so that one can and must step in if the others fail--we base the CDA on the counterparty that has the highest creditworthiness.
- If the counterparties are severally responsible, we base the CDA on the counterparty with the lowest creditworthiness.
- If there is a basket of replaceable counterparties, we average the creditworthiness of these counterparties by weighting their share in the obligation. The weighting can change over time.
- If there is a basket of replaceable and irreplaceable counterparties, the CDA is based on the lower of (i) the creditworthiness of the weakest of the irreplaceable counterparties, and (ii) the weighted average of the creditworthiness of the replaceable counterparties.

When calculating the weighted average of the creditworthiness of a basket of replaceable nonfinancial counterparties that are not construction counterparties, we may exclude from the calculation weaker or unrated counterparties that account, in aggregate, for up to 15% of the obligation. In our view, given the replaceability of the parties, this range captures the project's exposure to that basket. We do not give benefit in the analysis to a counterparty or counterparties that we exclude from the calculation of the weighted average. For example, if we exclude a revenue counterparty or counterparties from the calculation of the weighted average of the creditworthiness of a basket of replaceable revenue counterparties, we will not include in our cash flows any contracted revenue coming from that counterparty or counterparties. Rather, we may exclude any revenue from these counterparties or consider the sale done at market prices. However, we would still include the cost of producing the goods or services associated with those sales, regardless of whether any revenue is assumed for these counterparties.

Chart 25

Determining The Creditworthiness Of A Basket Of Replaceable Counterparties



CDA--Counterparty dependency assessment.
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A. Revenue Contract/Offtake Counterparties

The failure of a material revenue counterparty directly affects the project's cash flows and its ability to repay its debt. In our view, the risk associated with this type of counterparty cannot be fully mitigated. Therefore, the CDA always applies and is close to the creditworthiness of the counterparty.

We determine the CDA primarily based on the replaceability of the counterparty, the liquidity available for replacement, and our expectation that the counterparty will continue to buy the product or service, even through a default or bankruptcy proceeding. The framework is described in chart 26.

Chart 26

Determination Of The CDA For Revenue/Offtake Counterparties

CDA relative to counterparty creditworthiness

<p>Capped</p>	<p>Applies to:</p> <ul style="list-style-type: none"> • Irreplaceable counterparty and no business continuity*. • Replaceable counterparty without liquidity for replacement and no business continuity.
<p>+1 notch</p>	<p>Applies to:</p> <ul style="list-style-type: none"> • Replaceable counterparty with sufficient liquidity for replacement and no business continuity. • Replaceable counterparty with insufficient liquidity for replacement and business continuity and no expectation or evidence that the counterparty will try to amend its obligations in a way that could weigh on the project. • Irreplaceable counterparty and business continuity and no expectation or evidence that the counterparty will try to amend its obligations in a way that could weigh on the project.
<p>+2 notches</p>	<p>Applies to:</p> <ul style="list-style-type: none"> • Replaceable counterparty with sufficient liquidity for replacement AND expectation of business continuity AND no expectation or evidence that the counterparty will try to amend its obligations in a way that could weigh on the project.
<p>-3 notches (with a cap at 'bb+')</p>	<p>Applies to:</p> <ul style="list-style-type: none"> • Unpunctual counterparty.

*Business continuity means that we have comfort that the counterparty will continue to buy the product or service, even through default or bankruptcy proceedings. Source: S&P Global Ratings. Copyright © 2022 by Standard & Poor's Financial Services LLC. All rights reserved.

In limited circumstances, when an irreplaceable counterparty is in distress but continues to honor its offtake commitments, we could establish the CDA two notches above that counterparty's creditworthiness.

B. Construction Counterparties

Generally, construction contracts have a relatively short tenor of up to four years, and may last just a few months. It is critical that construction is completed on time and on budget if the project is to service its debt; therefore, we typically classify most construction counterparties as material and consider that the associated risks can't be fully mitigated. Therefore, the CDA for a

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material construction counterparty is always linked to the latter's creditworthiness. We determine a CDA for a construction counterparty based on the replaceability of the counterparty, the incentives and ability of the counterparty to perform the contracted work under financial distress, and the strength of the liquidity to secure a replacement. The CDA can be up to six notches above the creditworthiness of the counterparty. The framework is described in table 22.

Table 22

Determining The CDA For Construction Counterparty

	Less difficult (1-3)	More difficult (4 or 5)
Sources/uses ratio*		
< 1.0x	No enhancement	No enhancement
1.0x - 1.05x	+ 2 notches	+ 1 notch
1.05x – 1.25x	+ 4 notches	+ 2 notches
1.25x – 1.5x	+ 5 notches	+ 3 notches
1. 5x –2x	+ 6 notches	+ 4 notches
> 2x	+ 6 notches	+ 6 notches

*Sources of liquidity relate to those available to replace the counterparty. Ranges include value at the lower bound, but not the upper bound. Section 4 explains how we assess construction difficulty in more detail.

Rarely, a construction counterparty could be deemed as nonmaterial if the project's exposure to the performance of that counterparty is not relevant. For example, toward the end of the construction phase, the project's exposure to the performance of a construction counterparty may become so limited that we could regard it as nonmaterial. This may happen if all the construction works have been finalized, and we consider that it is just a matter of time before the relevant authority gives the final approval for the commencement of operations. A delay could be administrative, or the relevant authority may have given its provisional acceptance and a certain amount of time needs to pass before the project can obtain the final approval. In some cases, approval may be granted subject to the resolution of minor defects (which we expect to be quick and inexpensive to fix) and the project has enough funds to pay an alternative party to fix the defects that have been identified.

Replaceability and complexity of the works

The simpler the work to be performed and the wider the field of alternative counterparties, the quicker and cheaper it should be to replace the counterparty. Therefore, where the contractor is replaceable and the project is simple to moderately complex, the CDA can be higher than it would be for more difficult construction tasks.

Conversely, we would consider a contractor responsible for the construction of a complex and specialized processing plant to be irreplaceable. Contractors performing under a turnkey construction contract are also likely to be considered irreplaceable. For construction counterparties that we consider irreplaceable, the CDA is capped at the contractor's creditworthiness, regardless of the presence of other mitigants.

Liquidity available to replace

To determine the CDA for replaceable construction counterparties, we measure the liquidity coverage by comparing the amount of funds available to replace the counterparty with the

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estimated cost to replace it, through a calculated ratio of sources to uses. Depending on the coverage, the CDA can be above the contractor's creditworthiness by up to six notches.

We calculate the level of liquidity available to cover the cost of replacing a construction counterparty as construction sources minus construction uses of funds.

Sources of funds: For the purposes of the counterparty analysis, sources include the remaining construction funding available once the downside uses have been covered. We also include funding provided by subcontractors when it can be assigned to the project if the contractor fails.

Uses of funds: These include our estimate of all costs required to replace the contractor and complete the project, compared with those if the contractor had not failed. Estimating this may involve interacting with the independent engineer, analysis by the independent engineer, reviewing what the independent engineer considers is required to replace a builder or operator, and analyzing comparable projects in the jurisdiction.

These costs typically include:

- Search and re-contracting costs;
- Time-based costs to cover the period from notification of failure to securing a replacement contractor, measured at the peak cost period;
- An allowance of at least one month's subcontractor fees sized to the time of interruption or required rework; and
- A higher margin on the contract to reflect the new counterparty's assumed risk through taking on the failed party's obligations.

When responsibility for construction is joint and several and, therefore, we determine the CDA starting from the creditworthiness of the higher-rated builder, the cost of replacing such a counterparty would also need to cover the cost of replacing the others, because there is often a high degree of interdependence among builders working on the same asset.

C. Operations, Maintenance, Equipment, Or Raw Material Supplier Counterparties

Contracts that reduce pricing volatility related to O&M, equipment, or raw materials increase a project's cash flow stability. In our view, it is possible to fully mitigate the risk associated with exposure to these counterparties because:

- A wide range of alternative parties capable of undertaking the contract at the expected performance level is usually available; and
- Limited liquidity is needed to cover the increase in costs and any potential shortfall until the replacement is finalized.

Chart 27

Determining The CDA Of Operations And Maintenance Or Supply Counterparties

CDA relative to counterparty creditworthiness

<p>No CDA</p>	<p>Applies to:</p> <ul style="list-style-type: none"> • Replaceable counterparty with sufficient liquidity to cover the replacement period.
<p>Capped</p>	<p>Applies to:</p> <ul style="list-style-type: none"> • Irreplaceable counterparty. Contracts with irreplaceable counterparties include, for example, long-term service agreements covering proprietary technology by an original equipment manufacturer or a supplier with specialist skills. The time needed to source replacement equipment from another supplier would be so long that a significant disruption to cash flows could not be prevented and the project may even default. • Replaceable counterparty without sufficient liquidity for replacement or no expectation of business continuity.
<p>+1 notch</p>	<p>Applies to:</p> <ul style="list-style-type: none"> • Irreplaceable counterparty with expectation of business continuity. • Replaceable counterparty but insufficient liquidity for replacement, and expectation of business continuity and no evidence nor expectation that the counterparty will try to amend its obligations in a way that could weigh on the project.
<p>-3 notches (with a cap at 'bb+')</p>	<p>Applies to:</p> <ul style="list-style-type: none"> • Unpunctual counterparty.

*Business continuity means that we have comfort that the counterparty will continue to buy the product or service, even through default or bankruptcy proceedings. CDA—Counterparty dependency assessment.

Source: S&P Global Ratings.

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D. Structural Counterparties

Where the failure of a third party to comply with an obligation can disrupt the project cash flows, we consider these third parties to be structural counterparties. For example:

- A counterparty is structural if it provides contingent equity obligations, or pays dividends or distributions that are needed to service debt.
- If project debt includes cross-default clauses with debt issued by another entity, that entity is a structural counterparty.
- If a project expands on an existing asset, cash flows for the expansion may depend on the performance of counterparties to the original asset, making them structural counterparties to the new project. These dependencies are not captured in our parent linkage analysis (see section 7).

Nearly all structural counterparties are material and irreplaceable. Therefore, we equate the CDA to that party's creditworthiness. Rarely, we may classify a structural counterparty as nonmaterial, in which case we would not assign a CDA. This could occur if neither our base case nor our downside scenario suggests that any pending obligations to the project--such as a capital injection, mandatory capex, or future operating costs--will materialize while there is outstanding project debt.

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Some projects have cross-defaults to parties other than the parent. In these cases, that counterparty's creditworthiness generally caps the CDA. That said, we could assess the counterparty as nonmaterial if the documentation includes mitigants making the cross-default ineffective. Examples include:

- A permanent, well-documented waiving of such cross-default provisions;
- The presence of legal or regulatory provisions that render the cross-default clause ineffective;
- Provisions in the transaction documents that cancel, invalidate, or suspend the ability to enforce a cross-default or potential acceleration of debt while the project is meeting its debt service or debt-like payment obligations;
- Committed, unconditional, and available liquidity or reserves that are sufficient and dedicated to fully repaying the project's debt (and any associated costs, including break costs, if applicable) at any time if there is a debt acceleration event; or
- The existence of an adequate remedy and cure period that allows for the consequences of an event of default without resulting in debt acceleration.

E. Bank Account Providers

A bank account provider is typically a material counterparty in a project because it holds funds destined to service the project's debt and its liquidity reserves. Although the project is, therefore, exposed to the credit quality of the bank, the project can largely mitigate this exposure by actively managing its banking relationships. If necessary, it could replace the bank account provider within a short timeframe without affecting the transaction's cash flow and liquidity. Despite the simplicity of the task from administrative and operating standpoints, management skills and track record are key considerations for assessing the project's capacity to replace the bank account provider in a timely manner. Where active management allows the project to react in case of stress, management has visibility regarding potential replacements, and liquidity is available in the structure to allow for the replacement, we set the CDA for bank account providers at six notches above the bank's creditworthiness.

If we conclude that the cash flows supporting the project's debt service may be at risk because of the bank account provider, the bank's creditworthiness generally caps the CDA. This may occur if the bank account provider:

- Is in a riskier jurisdiction than the project's assets and operations, which could expose the project to transfer and convertibility (T&C) restrictions;
- Has either no track record, or a doubtful record; or
- Is using an agreement that is not aligned with market conditions and, as such, is considered irreplaceable.

Exposure to a bank account provider can be fully mitigated, and thus no CDA is required, if the bank places the project's cash in a trust or custodial institution and we consider that the trust or custodial institution would be subject to laws and regulations that isolate these accounts from the bank's insolvency risk. So far, we have concluded this is the case in the U.S., the U.K., Argentina, Japan, Australia, and Mexico (see "[Counterparty Risk Methodology](#)").

F. Providers Of Deferred Funding For Construction Works

Often, funding for a project is not fully contributed at financial close. Instead, it is drawn down when the required conditions laid out in the project agreements are satisfied. We consider the parties committed to provide such funding (either debt or equity) to be material and irreplaceable counterparties because, if those funds are not available when needed, the project will be unable to complete the pending construction work. As a result, the CDA is capped at the creditworthiness of the deferred-funding provider. If the contribution is supported by a valid LOC, the provider of the LOC becomes the relevant counterparty.

Single-sponsor pension plan funding

If the deferred funding was committed by a single-sponsor defined-benefit pension plan, we provide a risk assessment of the plan using concepts from our "[Group Rating Methodology](#)." The plan must be sponsored by a corporate or financial services entity, which may be a holdco, for which we have a legal opinion confirming that the plan can enter such a commitment.

The risk assessment is derived from the sponsor's group credit profile (GCP), subject to government-related entity (GRE) and sovereign constraints, as follows:

- If the defined-benefit pension plan is core, we match the risk assessment to the GCP.
- If the defined-benefit pension fund is highly strategic, the risk assessment is one notch below the GCP.
- Otherwise, we do not assign a risk assessment.

We classify a plan as core if it is integral to the group's current identity, future strategy, and reputation; if the rest of the group is likely to support the pension plan under any foreseeable circumstances; and if the plan has all of the following characteristics:

- It has not been and is not expected to be wound up, and is highly unlikely to be bought out;
- There is a very low risk that, while the sponsor is solvent, it will terminate the plan or that a regulator will initiate involuntary termination;
- There is no reason to expect that the plan would not meet its contractual commitments;
- The pension plan benefits from a strong, long-term commitment of support from senior group management, or incentives exist to induce such support; and
- We consider the pension plan to be well-managed and funded. If the plan has a deficit, the deficit in terms of the value of plan assets compared to plan liabilities, as measured by S&P Global Ratings, is expected to remain less than 30% of the scheme's liabilities, and the sponsor and pension plan trustees have agreed a credible and achievable plan to eliminate the actuarial deficit.

We classify a plan as highly strategic if it is almost integral to the group's current identity, future strategy, and reputation; the rest of the group is likely to support the pension plan under almost all foreseeable circumstances; and it has the first two characteristics listed above, plus, if the plan has a deficit, the deficit, as measured by S&P Global Ratings, is expected to remain less than 50% of the scheme's liabilities.

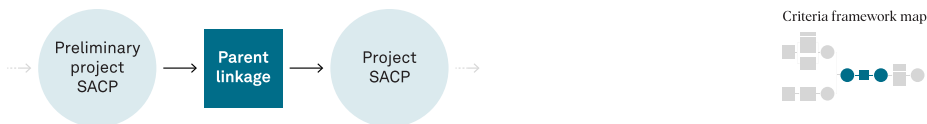
G. Additional Considerations

If the counterparty is a GRE or is part of a group, and if we expect that support from the parent or the supporting government will also flow to the project, we use the counterparty ICR (or a credit estimate) as a starting point when determining the CDA. If we do not expect the project to benefit from direct support, we use the counterparty's SACP (or an estimate of its SACP).

Section 7: Analyzing Parent Linkage

Chart 28

Moving From The Preliminary Project SACP To The Project SACP



SACP--Stand-alone credit profile.
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We assess the extent to which a project finance structure isolates the project entities from the bankruptcy risk of the other entities (such as the parent) that participate in the transaction under the applicable legal regime. We could revise down the preliminary project SACP and, if present, the preliminary subordinated SACP on the subordinated debt, depending on the degree of linkage between the project structure and its parent.

Economic or legal connections to parents or sponsors could make the project reliant on the continuing financial strength of those entities. We classify a project's linkage to its parent(s) as delinked, linked, or capped by its parent(s)' creditworthiness (see table 23).

- If a project is delinked, the creditworthiness of the parent(s) does not constrain the project SACP.
- If a project is linked, the project SACP can be no higher than three notches above its parent(s)' creditworthiness.
- If a project is capped, the project SACP is capped at the level of its parent(s)' creditworthiness.

To determine parent linkage, we consider which of the following provisions apply to the structure:

- An anti-filing mechanism that mitigates the risk that the LPE may choose to start voluntary bankruptcy proceedings for the convenience of its parent;
- No ability to merge or reorganize;
- Limitations on amendments to organizational documents;
- No parent dependencies, or any tax dependency is mitigated;
- Degree of separateness from its parents; and
- No cross-default provision or other provisions that could lead to bankruptcy of the LPE, unless they are mitigated.

Our assessment of these factors is qualitative and based on how the relevant organizational or transaction documents address these elements.

Table 23

Parent Linkage Assessment

Delinked

The project includes all of the following characteristics:

Presence of anti-filing mechanisms or lack of such a mechanism is mitigated;
No cross-default provisions or cross-defaults are mitigated;
No ability to merge or reorganize;
Limitations on amendments to organization documents;
Separation from its parent(s); and
No parent dependencies.

Linked

The project includes at least the following characteristics:

Presence of anti-filing mechanisms or lack of such a mechanism is mitigated;
Cross-default provisions exist, but there is a remote or low likelihood of acceleration;
Some degree of separation from its parent(s)
No parent dependencies for tax liabilities or any tax dependency is mitigated; and
The other characteristics are present, but less restrictive than in the delinked classification.
The project does not meet the definition of delinked or linked. For example, a project is capped if it does not include anti-filing mechanisms.

Capped

A. Anti-Filing Mechanisms

If a project lacks anti-filing mechanisms, the parent(s)' creditworthiness generally caps the preliminary project SACP, unless mitigants are in place and we consider they would reduce the likelihood of the LPE initiating bankruptcy proceedings. We would consider bankruptcy risk to be mitigated and would not cap the project SACP if, for example:

- The LPE has independent shareholders whose vote is required--along with the vote of a parent shareholder--to commence voluntary bankruptcy proceedings.
- There are additional parents that have the right and ability to block a filing.
- There is robust legal comfort on the enforceability of i) nonpetition covenants and/or ii) share pledges (or other proposed mitigant) that secure the parents' undertakings not to file the LPE into insolvency.

B. No Ability To Merge Or Reorganize

Restricting an LPE from participating in a merger or reorganization reduces the possibility that, while the rated debt is outstanding, any merger or consolidation with a non-LPE; a reorganization, dissolution, or liquidation; or another company purchasing the LPE's shares, could undermine the LPE's independent or limited-purpose status. This restriction also reduces the risk of more senior claims emerging.

C. Limitations On Amendments To Organizational Documents

We assess whether the LPE can amend its organizational documents while the rated debt is outstanding. The documents should indicate that debtholders must consent to any amendments to organizational documents.

D. Separateness From Parent(s)

We assess a project's separateness from its parents by reviewing whether the documents include covenants stipulating that the project will remain an independent entity, and that the LPE and its assets will not be brought into the bankruptcy proceeding of another entity.

We evaluate whether the project:

- Maintains books, records, financial statements, and accounts separate from any other person or entity;
- Behaves as a separate entity and conducts its own business in its own name;
- Does not pledge or commingle its assets for the benefit of any other entity and does not make any loans or advances to any other entity;
- Avoids acquiring obligations or securities of its parent(s) or affiliates;
- Avoids guaranteeing or taking on obligations to pay the debts of any other entity;
- Observes all corporate or other formalities that the project's organic documents require;
- Allocates fairly and reasonably any overhead for shared office space;
- Uses separate stationery and invoices; and
- Pays the salaries of its own employees and maintains sufficient employees to undertake the planned business operations.

We consider the specific covenants listed above and the project's track record and day-to-day practice in acting as a separate entity when assessing the likelihood that the courts could bring the LPE and its assets into the bankruptcy proceeding of another entity. In addition, we could request a nonconsolidation opinion that would support our assessment of separateness, if needed. One caveat to note is that in some jurisdictions, for example, in Canada and other jurisdictions that are members of the Commonwealth, the law does not recognize the principle of substantive consolidation. This means that a project cannot be dragged into the bankruptcy proceedings of its parent(s).

Meeting all the conditions listed above is commensurate with a delinked status. If most of the covenants are met, including the first five listed above, and we conclude that the consolidation risk is still remote, we assess the project as linked. The project will be capped if the first five covenants above are not met, causing us to conclude that the transaction could be consolidated within a bankruptcy proceeding for a different entity.

E. Other Parent Dependencies

To assess the degree to which other parent dependencies are present at the project level, we examine whether an LPE is separate from its parent(s) in terms of contracts with parents and affiliates, taxes, and insurance.

Exposure to contracts with parents

To assess a project as delinked from its parent, dealings with its parent(s) and its affiliates are expected to be at arm's length. This implies that the project and its sponsors are independent and on an equal footing. If, for example, a parent provides the project with personnel, shares services with it, or meets other key needs, this could create a counterparty risk or a priority liability through the service agreement, in which case we may consider the project to be linked to the parent.

Exposure to tax obligations of parent or affiliates

If a project has potential exposure to the tax obligations of its parent or affiliates, we will determine whether this links it to the parent based on existing mitigants and our ability to quantify the exposure. Our analysts may consider external tax opinions to inform their view of the likelihood of occurrence.

- If the tax obligation is structurally or legally mitigated, we consider the project to be delinked.
- If the tax obligation is not structurally or legally mitigated, we can quantify the exposure, demonstrate that the project can cover the potential liability without defaulting in the base case scenario, and we see that the likelihood that the tax liability will materialize is remote or low, we consider the project to be linked.
- If we can neither quantify the potential liability nor assess the likelihood that the tax liability may materialize, we will consider the project as capped.

F. Insurance

We assess whether the project's insurance policies are project specific and only benefit the project. If a project relies on group insurance, it is exposed to the maintenance of insurance by the group and the claims history of group members outside the project. This effectively links the project's credit quality to that of the group. If we are unable to assess how the insurance benefits the project, we consider the project uninsured and analyze it as such.

G. Cross-Default Provisions

If a project's financial documents include cross-default provisions to its parent, and these could cause debt acceleration, the project's final SACP is capped by the parent's creditworthiness (or, where relevant, by the related GCP, as defined in the "[Group Rating Methodology](#)").

We may not cap the project to the parent's creditworthiness if the documents also include specific mitigants, as detailed in section 6 under "Structural counterparties" or, in the absence of documented mitigants, if we consider the likelihood of acceleration to be remote or low. We would consider the factors below, by themselves and in combination, when assessing the likelihood of acceleration:

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- Lack of outstanding debt: If the parent has no debt and no ability or intention to issue debt, we may consider the likelihood of acceleration to be remote because there would be no other debt to cross-default to;
- Economics of the project: Where a project is performing as expected and offering bondholders an attractive return, the practical benefit to the lenders of triggering an acceleration is reduced, which lowers the risk of it occurring. To assess the risk of acceleration being triggered, we also consider the differential between the project SACP and the parent's creditworthiness: the higher the differential between the two, the less likely the lenders are to have an interest in accelerating the project's debt.

Our view of the likelihood of acceleration affects whether we would rate the project SACP up to one category above the parent, considering all other factors. We expect the decision to be dynamic; it may be revised during the life of the debt.

If the cross-default is to a parent that is a member of a group and has direct or indirect control over the project (as defined in the "[Group Rating Methodology](#)"), we would cap the project SACP at the parent's related GCP (rather than at the parent ICR), if:

- Within the group, financial obligations to core, highly strategic, and strategically important group members are subject to cross-default and acceleration provisions among themselves; and
- The cross default is to the benefit of a development bank.

Plus, one of the following conditions is true:

- The project's parent is the group parent, or a group member that has a group status of core, highly strategic, or strategically important;
- The amount of the loan to the project's parent is immaterial compared with the size of the loan to the project, such that we expect group support to be forthcoming; or
- We expect the loan to the project's parent will mature soon and not be renewed.

H. Other Considerations

If we view a project as linked to or capped by its parent, the parent's creditworthiness becomes a material factor to determine the project SACP. Accordingly, our analysis requires that we assess the parent's creditworthiness by determining either an ICR or a credit estimate.

However, if the parent is a managed fund and we conclude that the fund's failure will not result in the consolidation of the project under the bankruptcy law of the relevant jurisdiction, we classify the project as delinked.

When multiple parents share ownership of a project, the project SACP will be constrained by the parent that has the lowest creditworthiness. However, we may take a different approach in the following circumstances. First, the parents of the project are not affiliated with each other and second, they hold material blocking rights or a similar anti-filing mechanism is in place. Third, their economic interest in the project is subject to one of the two conditions below:

- If we conclude, based on the legal jurisdiction of the parent with the lowest creditworthiness, that its bankruptcy will not affect the project's ability to service debt and would not result in the consolidation of the project, then the project SACP is linked to the creditworthiness of the next-weakest unaffiliated parent; or

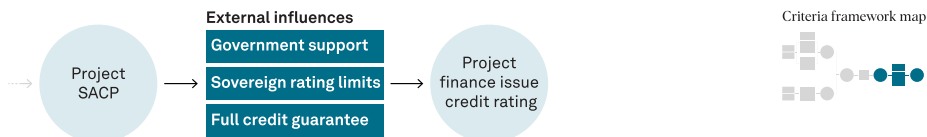
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- If we conclude, based on the legal jurisdictions involved, that the project would not be affected by the bankruptcy of its parent (or any of its parents) and that a bankruptcy at the parent level would not cause the consolidation of the project into that bankruptcy, then the project SACP is delinked from the creditworthiness of any of its parents.

Section 8: External Influences And Guarantees

Chart 29

Moving From The Project SACP To The Project Finance ICR



ICR--Issue credit rating. SACP--Stand-alone credit profile.
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In deriving the final project finance issue credit rating, we incorporate:

- Governmental influence;
- The impact of sovereign rating limits; and
- The protection offered by full credit guarantees.

We may revise up or cap the project SACP according to our assessment of the potential for a related government to offer extraordinary support or intervene in the project (see "[General Criteria: Rating Government-Related Entities: Methodology And Assumptions](#)"). The GRE criteria assess the likelihood of extraordinary government support by considering the importance of the GRE's role to the government, and the link between the GRE and the government. If there is more than one class of debt in the project structure, our view of their various roles and links may differ between classes.

The project SACP and subordinated SACP, if present, can be constrained by the relevant sovereign rating and T&C assessment as described in "[General Criteria: Ratings Above The Sovereign--Corporate And Government Ratings: Methodology And Assumptions](#)."

When a project enjoys the protection of an unconditional and irrevocable guarantee for full and timely payment of interest and repayment of principal from a bond insurance provider, financial institution, or other third party, and that guarantee meets the conditions of our "[General Criteria: Guarantee Criteria](#)," the project issue rating will reflect the higher of the project SACP (after considering the government influence and sovereign rating limits) and the creditworthiness of the guarantee provider.

Section 9: Recovery Considerations

We assign a recovery rating to project finance debt when the project finance issue credit rating is 'BB+' or lower and the project is in a jurisdiction in which S&P Global Ratings assigns recovery estimates to corporate debt as described in "[Recovery Rating Criteria For Speculative-Grade Corporate Issuers](#)" (see table 24).

Table 24

Recovery Expectations And Ratings

Recovery rating*	Recovery description	Group A jurisdiction		Group B jurisdiction	
		--Nominal recovery expectations--			
		Greater than or equal to	Less than	Greater than or equal to	Less than
1+	Highest expectation, full recovery	100%	N/A	N/A	N/A
1	Very high recovery	90%	100%	N/A	N/A
2	Substantial recovery	70%	90%	90%	100%
3	Meaningful recovery	50%	70%	50%	90%
4	Average recovery	30%	50%	30%	50%
5	Modest recovery	10%	30%	10%	30%
6	Negligible recovery	0%	10%	0%	10%

*Recovery ratings are capped in certain countries to adjust for reduced creditor recovery prospects in these jurisdictions (see "Methodology: Jurisdiction Ranking Assessments"). Recovery ratings on unsecured debt issues would generally also be subject to caps similar to those outlined under the "Recovery Rating Criteria For Speculative-Grade Corporate Issuers." A recovery rating of '1+' or '1' can only be applied in Group A jurisdictions. ICR--Issuer credit rating. N/A--Not applicable.

The recovery rating, assigned on a scale of '1+' to '6', where '1+' indicates an expectation of full recovery, estimates the range of principal and accrued interest that lenders can expect to recover following a default of the project. We also provide an estimate of our nominal recovery expectation, rounded down to the nearest 5%, or, in the case of '1+', down to a 100%. However, recovery ratings assigned to project finance debt do not affect the issue credit ratings or issue credit ratings on subordinated debt, as they do for corporate issuers.

When a project has multiple debt types, it is the rating on the senior debt that determines whether we assign recovery estimates. A project in which we assign an investment-grade rating to the senior debt would not have a recovery rating for any tranche of debt. In many cases, because senior debt is the largest component of the project capital structure, recovery at the subordinated debt level is expected to be zero or close to zero.

Assigning a recovery rating to a project's senior or subordinated debt issue consists of analyzing the project's default risk and then assessing whether cash from the project after a default is sufficient to repay lenders' principal. Cash from the project includes that derived from operations and from an asset sale. Our ultimate recovery calculation is the net amount of principal after deducting administration and related direct costs of bankruptcy (or restructuring and workout costs); the cost of resolving any contingent liabilities and any prior-ranking claims. Prior-ranking claims may include taxes, environmental claims, and state law liens.

A. Default Scenarios

Projects fail for various reasons, including the weakness or failure of counterparties, sovereign risk, changes in regulation, technical risk, competitive exposure, exposure to weak parents or sponsors, and poor financial performance. The primary cause of default may be a factor unrelated to the project's business position, or a fundamental deterioration in the project's viability.

If the default was caused by factors unrelated to the underlying operations, it may be possible to return the project to sustainability by restructuring the project's capital structure, renegotiating contracts, or replacing counterparties. If we believe the project can perform in the future, we undertake a project value analysis. Conversely, if the viability of the project is at issue, a

liquidation analysis may be a more appropriate method of determining the value of the assets that constitute the collateral, and thus assessing the recovery prospects. We include in our liquidation analysis asset sale value or termination payments if we expect the project or related contracts or concessions to terminate on default.

The date of default is based on events of default in the project documents--this could be the first payment date that the project misses or another event of default, such as a termination of a contract or concession that accelerates debt. If a project is underperforming, with debt service coverage below 1x, the default date would be the payment date when the project reserve accounts have been drained and no longer have sufficient funds to cover shortfalls in CFADS. Other common default dates occur at renegotiation points for operating contracts or debt refinancing dates for the project.

B. Project Value Analysis

Where the project is still viable, a project value analysis is appropriate. We generally employ a discounted cash flow (DCF) approach based on financial analysis incorporating historical operating data and forecast cash flow. That is, the DCF includes any contracted termination payments under a concession agreement over a discrete period that lasts until the end of the economic life of the project. The economic life can be defined by the physical life of the asset, concession length, or offtake agreement life. The cash flows during the economic life are stressed to reflect the most likely default scenario. The adjusted cash flows are discounted back to the present value at the point of default, using a discount rate that reflects our assessment of the risk of the enterprise, to arrive at a project value. The discount rate incorporates various factors, such as country risk and expected asset values. Additional methods, such as EBITDA multiple analysis, could be used to determine project value.

C. Liquidation Approach

This approach is applied when the project's viability is at issue. Under the liquidation approach, our valuation assumptions are based on the concept of an orderly liquidation of assets in a forced sale. Important considerations include the type and amount of collateral, whether its value is objectively verifiable and likely to hold up during various postdefault scenarios, and any legal issues related to enforcing the security interest. The analytical starting point is the assets' current value and potential to retain value over time.

D. Structural Factors

Recovery ratings incorporate various other factors, such as the project's capital structure, security over collateral and the insolvency laws that apply to the project. A sound security structure in a creditor-friendly environment might indicate a higher probability of successful recovery.

We consider the project's capital structure in deriving the recovery rating. Subordinated debt generally protects the senior project debt lenders by absorbing certain potential losses. The relative position of the debt issuance within the capital structure, combined with the amount of prior claims, helps us calculate the recovery rating. In estimating recovery for senior or subordinated debt, we assume that any DSRAs are not available, while other reserves may be available depending on the default path assumed. In evaluating a project's capital structure, we consider:

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- Equity contributions;
- Subordinated debt;
- Contingent equity;
- Whether the composition of the stakeholder group makes it likely that the business will be restructured;
- Debt service schedule;
- Intercreditor agreement terms, especially the rights of senior lenders in relation to subordinated debt providers;
- Payment blockage mechanisms;
- Acceleration rights; and
- The voting majority required to initiate enforcement proceedings.

We also consider any obligations under hedges and swaps.

Given the nature of project finance, the project's collateral is pledged as security for the project debt. Most project documents anticipate a situation in which creditors take control of the project, thereby eliminating much of the enterprise value destruction that often accompanies a corporate bankruptcy in which there is a multitude of competing claims. This supports strong recoveries because it greatly facilitates a creditor's ability to take over operations with minimal or no disruption to revenue. A single class (or perhaps two or three classes at most) of secured lenders helps ensure that lenders' interests will be aligned with each other, which should facilitate a project restructuring. This factor also helps to preserve enterprise value.

Section 10: Rating Other Debt In Project Finance Structures

A. Subordinated Project Finance Debt Obligations

Additional debt or debt-like obligations may sometimes be included as part of a project finance transaction. We distinguish between debt that is subordinated and debt that we do not consider subordinated; this distinction has implications for the calculation of the DSCRs for each class of debt. Subordinated debt or debt-like obligations could include, for example, loans, leases, derivatives, or take-or-pay obligations.

We consider the debt in a project structure as subordinated if all of the following conditions are met:

- Subordinated debt is paid only after all senior debt is paid, and any cash flow lock-up conditions due to a senior lock-up trigger or cash flow sweep provisions, if present, are met. Moreover, we expect any prior-ranking reserves to be replenished before subordinated debt is paid.
- Subordinated debt has no right to access or share the reserves dedicated to senior debt.
- Subordinated debt has no right to call or trigger a default and no cross-default exists between it and any senior debt or debt-like obligation.
- Subordinated debt has no acceleration rights, even at maturity, and maintains its ranking in the cash flow waterfall while any senior debt is outstanding.

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- Nonpetition language is included in the project's transaction documents, under which subordinated debtholders or lenders agree not to initiate bankruptcy proceedings against the LPE and not to join any such proceedings.
- Subordinated debtholders have no voting rights while any senior debt or debt-like obligation is outstanding.
- Any collateral and security interest or claims on liquidation granted to subordinate lenders rank after senior debt.

We rate subordinated debt at least one notch below the next most senior debt in the structure because it is more likely to default. However, we may rate the subordinated debt at the same level as the senior debt if:

- GRE support applies to both issues and brings the SACP of both the senior and subordinated debt to the same level;
- A full credit guarantee exists that also benefits the subordinated debt; or
- "[General Criteria: Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings](#)" applies.

How we calculate the DSCR for different classes of debt varies. The DSCR for the senior debt excludes subordinated principal and interest obligation(s). If a project has more than one class of subordinated debt, we calculate the DSCR for each class as CFADS divided by debt service for the class of debt in question, plus the debt service of the more senior classes. As an example, consider a project that has three rated debt classes--a senior issue and two subordinated issues, the class A and B debt, where B is junior to A. The DSCR for the subordinated class A debt would be calculated as CFADS divided by senior debt service, plus the subordinated debt service for the class A debt. The class B debt DSCR would be calculated as CFADS divided by senior debt service, plus the subordinated debt service for the class A debt and the subordinated debt service for the class B debt.

Where debt or debt-like obligations do not meet the conditions to be considered subordinated, we consider them to have the same likelihood of default as senior financial obligations in the structure. As a result, the senior DSCR includes the interest and principal of both the senior debt and the other debt that is not subordinated.

In some cases, the other debt matures later than the senior debt and would not meet the conditions to be rated under our project finance criteria after the senior debt has matured. In this situation, we rate the other debt at the lower of (i) the rating on it under these criteria until the senior debt is repaid and (ii) the rating on it over the remaining term, as assessed under the relevant criteria.

Determining the SACP of the subordinated debt

We determine the subordinated debt SACP by taking the lower of the:

- Construction phase SACP, less one notch;
- Project SACP, less one notch; or
- Subordinated SACP over the operations phase, derived using the four-step process described below.

Subordinated Operations Phase SACP

Step 1: Calculate:

- The minimum total DSCR on senior debt service (interest and principal) plus subordinated debt service (interest and principal); and
- The minimum DSCR on senior debt service.

Divide the forecast minimum DSCR on the senior debt service by any senior distribution or lock-up test between the senior and subordinated debt, if present.

Step 2: Take the lower of a) the forecast minimum total DSCR or b) the forecast minimum DSCR senior debt service divided by the distribution or lock-up test.

Step 3: Determine the preliminary operations phase SACP by mapping the forecast minimum DSCR against the OPBA, using table 8.

Step 4: Apply any adjustments based on the resiliency analysis, liquidity position, debt structure, refinancing risk, and future value as outlined in section 3, followed by applying our holistic, structural protection, and counterparty analysis.

B. Debt Issued By Project Finance Holding Companies

Most holdco structures associated with a project finance transaction are created to issue debt that is serviced from the residual cash flows of the opcos or a combination of residual cash flows and holdco revenue. Depending on the project, debt may be raised solely by the holdco, or by both holdco and opco.

Typically, the nature of the cash flow and security provided to lenders when the debt is issued by a project finance holdco will differ from that in a traditional project finance transaction. To rate such debt, we therefore follow the general framework in these criteria, but apply some variations.

Determining the holding company SACP

If the holdco owns a single opco and that opco is encumbered, we rate the holdco debt following the provisions applicable to subordinated debt (see "Section 10-A: Subordinated Project Finance Debt Obligations").

If the holdco owns only a single project under construction, we follow the general approach in section 4. For holdcos that have several projects under construction at the same time, we determine the holdco construction SACP using our approach for projects that have multiple construction processes, as described in "Construction risk for projects that have multiple construction processes" under "Additional Considerations" in section 4 and the provisions applicable to subordinated debt (see "Section 10-A: Subordinated Project Finance Debt Obligations").

If the holdco owns projects that are in operation, we apply the approach outlined in section 3, but apply the variations below.

In all situations, we also consider the potential weaknesses associated to the security package.

Holdco operations phase business assessment: To determine the OPBA for the holdco, we typically calculate a weighted average of the OPBAs for each of the opcos. The weighting is based

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on each opco's cash flow contribution to the holdco, allowing us to reflect each opco's risk profile and its relative importance to the repayment of the holdco's debt. We may decide not to determine the OPBA of an opco, or a combination of different opcos if, combined, they represent less than 15% of the holdco's total CFADS. We would only exclude these opcos if they do not, in our view, increase the risks inherent to the structure, for example, by adding market risk. If we did exclude certain opcos, we would also exclude the revenue they generate when calculating the holdco's CFADS.

The weighted average OPBA is determined as follows:

- Each opco is assigned an OPBA.
- We calculate the holdco's OPBA as a weighted average of the opcos' OPBAs based on their CFADS over the project's life, as measured by each opco's contribution to the holdco's total cash flows under our base-case projections.
- Where the OPBA of an individual opco or pool of opcos changes over time, we calculate the holdco's OPBA for each phase. The holdco's preliminary operations phase SACP would be based on the weakest phase.
- Volatility of contributions from the opcos will be captured during regular surveillance and OPBAs will be adjusted if required.

If the outcome of the weighted average calculation is two OPBA categories below the OPBA of the riskiest opco, we would adjust the holdco's preliminary SACP down by one notch, to capture the potential for higher cash flow variability than the weighted average outcome suggests. For example, if we assess one opco as having an OPBA of 9 or 10, but the weighted average of all the opcos' OPBAs is 5 or 6, we revise down the holdco's preliminary SACP by one notch.

In addition, if one of the opcos in the holdco's portfolio is critical to the repayment of debt at the holdco level, so that performance of that opco could materially affect the predictability of cash flows for the whole portfolio, we would weak-link the holdco OPBA to the OPBA of that opco.

Holdco financial assessment: In determining the holdco's DSCR, we incorporate CFADS from unencumbered opcos and distributions from encumbered opcos. The distributions included in CFADS factor in any jurisdiction-specific accounting regulations that may prohibit the payment of dividends, such as accounting losses or minimum net worth. We calculate the DSCR as CFADS divided by the holdco debt service.

Holdco preliminary operations phase SACP: Using table 8, we combine the OPBA with the DSCR to determine the holdco's preliminary operations phase SACP. We then apply the modifiers and caps in section 3 (see "Step 4: Applying Financial Modifiers And Caps To Determine The Operations Phase SACP" and "Step 5: Additional Modifiers And Caps To Arrive At The Operations Phase SACP").

Other considerations: The holdco's resiliency under the downside scenario helps us incorporate the risk of interruption in the distributions. The downside analysis incorporates the potential for lockups to be triggered at any of the opcos and demonstrates the structurally subordinated nature of a holdco's cash flows. The outcome of the downside analysis for the holdco captures the materiality of the subordination: the less resilient the project, the more material the subordination.

On top of any adjustment resulting from the resiliency analysis, we may adjust the preliminary operations phase SACP--determined as per "Holdco preliminary operations phase SACP" in section 10--down by a further notch if we consider that the subordination risk has not been

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adequately captured in the rating. This could be the case, for example, if the downside is very close but does not trigger cash traps. In addition, we will notch for subordination unless we believe that the benefit from the diversification outweighs the impact of subordination.

Reflecting relative weaknesses in the security package

Finally, we analyze the nature and extent of the security granted to the holdco. Given the absence of direct security over the project assets, contracts, bank accounts, and other assets of the opcos, security granted to holdco creditors is relatively weak. In our view, such weakness can be partially mitigated by restrictions on additional debt. Nevertheless, we typically revise down the holdco's preliminary SACP by one notch unless it is already in the 'b' category, because we consider that this level already encompasses such security weaknesses.

Potential caps

Potential cap--material opcos: We cap the holdco's SACP at the level of the creditworthiness of any material opco. We consider an opco to be material if:

- Excluding dividends from that opco when calculating the holdco CFADS causes the holdco SACP to be lower; or
- There are cross-default or cross-acceleration clauses between the opco and the holdco debt.

Potential cap--consolidated SACP: In addition, we cap the holdco issue rating at the level of a notional consolidated SACP. This consolidated SACP serves as a test of the ability of the assets in the project to cover the combined project's consolidated debt service. We determine the consolidated SACP by combining the holdco OPBA with a consolidated DSCR calculated by adding all cash flows from, and all debt at, the holdco and opco level. We also apply all modifiers, as we do to the holdco SACP (with the exception of any notching for subordination).

C. Project Finance Debt Issued By Multiple LPEs

In certain markets, assets may be financed through project finance debt issued by multiple LPEs as co-issuers. Under the conditions described below, this type of structure can be analyzed as if the debt were issued by a single LPE.

We apply these criteria to assign a rating to the debt issued by co-issuers if all of the following conditions are met:

- The rated debt is governed by a single indenture or similar document;
- All co-issuers meet the criteria requirements of an LPE and are bankruptcy remote from their parent(s);
- There is a single set of transaction documents that governs the consolidated project cash flows, distribution tests, and calculation of transaction metrics;
- All co-issuers cross-guarantee each other's principal and interest payments; and
- There is no structural subordination or cash leakage within the structure, meaning that if one entity is underperforming and unable to pay any of its expenses including debt service, excess revenue from other entities would be used to cover those expenses.

When rating debt issued by co-issuers, we apply these criteria with the following modifications:

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- OPBA: We first determine the OPBA for each of the co-issuers. We determine the combined OPBA by calculating the weighted average of the co-issuers' OPBAs or by taking the weakest OPBA among the co-issuers, depending on the characteristics of the co-issuer pool. We use the weighted average when the assets are operationally independent and correlation is low. For assets whose performance is linked in some way, or where one of the assets is critical to the repayment of the debt, we determine the project's OPBA through the weak-link approach.
- DSCR: We calculate CFADs, debt service, and the DSCR on an aggregate basis.

D. Projects Without A Fixed Contractual Maturity Date

Certain projects do not have fixed maturity dates and, instead, rely on other economic or operational tests to trigger debt repayment until their final legal maturity. For example, in the mining sector, the expected life of a project and the maturity of its debt are sometimes tied to a projection of reserves falling below a predetermined level (the mine life). In these circumstances, we forecast the DSCR until the date on which a 100% cash flow sweep has to start to fully repay the debt before the mine life ends. We use this forecast minimum DSCR and apply table 8 to determine the project's preliminary SACP.

Since asset coverage informs the likelihood that a project will ultimately repay its debt, we also calculate a PLCR (as defined in the glossary). After combining the forecast asset coverage in our base case and downside case, and the project OPBA, we may apply a negative adjustment to the preliminary operations phase SACP. The framework is outlined in tables 25 and 26 below.

Table 25

Project Asset Coverage

--Downside case asset coverage--				
	High	Medium	Low	Very low
Base-case asset coverage				
High	High	High	Medium	Low*
Medium	Medium	Medium	Low	Very low
Low			Low	Very low
Very low			Very low	Very low

Note: Blank cells indicate that such combinations are highly unlikely. High--PLCR is equal to or higher than 3.0x. Medium--PLCR is equal to or higher than 1.5x but lower than 3.0x. Low--PLCR is equal to or higher than 1.1x but lower than 1.5x. Very low--PLCR is lower than 1.1x. *If the downside asset coverage is below 1.0x in this case, the project asset coverage will be very low. PLCR--Project life coverage ratio.

Table 26

Potential Downward Adjustment To The Preliminary Operations Phase SACP

--Stability of cash flow--			
	High (OPBA 1-4)	Medium (OPBA 5-8)	Low (OPBA 9-12)
Project asset coverage*			
High	None	None	None
Medium	None	None	-1 notch

Potential Downward Adjustment To The Preliminary Operations Phase SACP

--Stability of cash flow--			
	High (OPBA 1-4)	Medium (OPBA 5-8)	Low (OPBA 9-12)
Low	-1 notch	-2 notch	-2 notch
Very low	-1 notch	-2 notch	-2 notch

*As determined in table 25. SACP--Stand-alone credit profile.
OPBA--Operations phase business assessment.

E. Debt Instruments With Deferrable Features

We apply the criteria--with specific additional provisions--to rate project debt issued under the U.S. Transportation Infrastructure Finance and Innovation Act (TIFIA), or other debt instruments that we view as similar to TIFIA debt. TIFIA was established to allow the U.S. Department of Transportation to provide secured loans to volume-exposed transportation infrastructure projects, such as toll roads and managed lanes.

Under the TIFIA program, a portion of debt service can be repaid under flexible terms in certain circumstances. Specifically, these would be issues that have terms and conditions that provide for full amortization by legal final maturity, but allow for deferral of interest, principal, or both during the debt term. This approach does not apply to instruments such as term loan B facilities (which depend on cash flow sweep structures), deferrable embedded loan derivative structures, amortizing index bonds, and zero-coupon bond instruments.

The interest and principal due for TIFIA and similar loans are separated into mandatory and scheduled debt service obligations, as described below (see the glossary for definitions of specific terms).

- Mandatory debt service (principal and interest) must be paid when due and cannot be deferred without triggering an event of default.
- By contrast, scheduled debt service (principal and interest) can be deferred without triggering a default if there is insufficient cash flow to meet the scheduled payment. If the scheduled interest or principal is deferred, when the deferred amounts must be repaid depends on the deferral period specified in the transaction documents.
- A predefined number of years before the loan maturity, as defined in the transaction documents, all interest and principal payments, including any deferred amounts, become mandatory and must be paid before the instrument's final legal maturity.
- The capital structure for projects that have issued deferrable TIFIA debt often includes other, nondeferrable, senior debt. We include such senior debt as part of the mandatory debt service in our calculations.
- The project's cash waterfall establishes that TIFIA debt is paid after senior debt before a bankruptcy-related event. However, the presence of a springing lien would lead us to consider TIFIA debt as ranking pari passu with senior debt in our analysis, because it would rank pari passu after a default.

To rate TIFIA financing structures, we determine the operations phase SACP according to section 3, but make two key substitutions when calculating financial ratios:

- In our base-case and downside analysis, we replace the minimum DSCR with the weaker of (i) the minimum mandatory debt service coverage ratio (MDSCR) or (ii) the minimum loan-life

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coverage ratio (LLCR) in each scenario. We use this substitute minimum to determine the preliminary operations phase SACP (including the resiliency analysis). We use the MDSCR to size the flexibility provided by the ability to defer any TIFIA scheduled principal and interest during a deferral period. The use of the LLCR captures both mandatory and scheduled debt service, irrespective of deferability.

- As an additional measure of resiliency, we replace the median DSCR assessment with the median total DSCR.

APPENDIX: SECTOR AND INDUSTRY VARIABLES

The sector and industry variables and associated details in this appendix are expected to be periodically updated and republished as market conditions warrant.

Interest rate and credit spreads typical assumptions

If a project is exposed to floating interest rates (either through revenue, debt instruments, or if it faces refinancing risk), we develop a base case and a downside case interest rate forward curve.

Table 27

Interest rate and credit spreads assumptions

	Base case (bps)	Downside case (bps)
Risk-free rate	The relevant contractual floating local risk-free benchmark forward rate curve--such as central bank published rate or market standard base rate (or, if not available, based on our best judgment derived from historical data and peer comparisons)	Rate curve assumed 100 bps-300 bps above the base-case curve
'A' spread	200 or less	200-300
'BBB' spread	200-300	350-450
'BB' spread	300-450	500-700
'B' spread	400-600	700-900

bps--Basis points.

Inflation rate typical assumptions

If a project is exposed to inflation, we use the following assumptions.

Table 28

Inflation rate assumptions

	Base case	Downside case
Developed markets	Based on historical data, S&P Global Ratings economists' forecast, and market estimates	100 basis points above or below (whichever is more stressful) base-case inflation in each of the first five years of the stress period
Emerging markets	Same	At least 100 basis points above or below (whichever is more stressful) base-case inflation in each of the first five years of the stress period, but can be raised to reflect historical inflation fluctuations during a down economic cycle

We may adjust the downside shock both in size and duration, particularly for markets that have exhibited high inflationary periods in the past, or for markets where we have less confidence in the forecasts.

GLOSSARY

Asset class operations stability (ACOS): S&P Global Ratings' relative measure of a project's ability to generate cash flows on a predictable basis, based on the complexity of the activities it engages in.

Asset coverage: A project's forecast project life coverage ratio (PLCR) at the point of maturity.

Cash flow available for debt service (CFADS): CFADS for a period is calculated strictly as operating revenue less operating and maintenance expense. As a measure of operating cash flow, CFADS excludes any cash balances that a project could draw on to service debt, such as the debt service reserve fund or maintenance reserve fund, or cash balances that do not have to be kept in the structure. Under specific conditions, CFADS may include cash released from dedicated reserves. CFADS may include cash flow available for debt service from opcos that are unencumbered, and dividends from encumbered opcos.

Cash flow sweep, also known as a sweep: A method for reducing debt balances by which a portion of the cash flow available after paying scheduled debt service and replenishing reserves is used to pay down principal.

Cash flow waterfall: Cash flow priority during the operations phase for projects that receive revenue from operations, typically applied in the following order: expenses necessary for the ongoing operation of the business (operating expenses), which includes taxes, ongoing maintenance and life cycle costs, management fees, and trustee fees, then:

- Senior debt interest;
- Scheduled senior debt principal;
- Senior debt reserve account replenishment, LOC fees;
- Subordinate debt interest (provided any senior debt distribution test is passed);
- Subordinate debt principal;
- Subordinate debt reserve account replenishment;
- Growth capex; and
- Distributions to equity, provided any applicable distribution test and distribution conditions are passed.

Counterparty dependency assessment (CDA): S&P Global Ratings' assessment of the risk a counterparty poses to a project finance transaction takes into account the credit quality of the counterparty; any credit enhancement; factors that may increase or decrease risk in the context of the project, such as the ability to replace the party; the type of commercial role being performed by the counterparty; any differences between the default risk on the counterparty's financial debt and the counterparty's obligations to the project. We do not assign outlooks to CDAs, and we do not place them on CreditWatch. The CDAs are assigned on a scale from 'aaa' to 'd', which parallels the issuer credit rating (ICR) scale of 'AAA' to 'D'. S&P Global Ratings uses

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lowercase letters for CDAs to indicate that they are not ratings, as such. We refine the CDAs by using plus and minus signs to graduate the scale, in the same way as we do for ICRs.

Debt-like obligations: Certain implicit financing arrangements that we treat as debt from an analytical perspective, due to their characteristics. They typically include leases, derivative agreements, and take-or-pay obligations. Debt-like obligations are examined on a case-by-case basis, relative to their terms and conditions, substance, form, and intent.

Debt service: See scheduled debt service below.

Debt service coverage ratio (DSCR): A measure of financial performance for a scheduled debt servicing period that is equal to CFADS divided by the scheduled debt service per period.

Debt service reserve account (DSRA): A liquidity reserve that can be used to pay debt service in the event that CFADS is insufficient to pay debt service. The DSRA usually takes the form of cash or a letter of credit (LOC) and mitigates cash flow loss from temporary project outages or unexpected expenses.

Debt servicing period: The time interval used to calculate the DSCR. Depending on the terms and conditions of debt obligations (such as a loan or bond) and the stability of a project's cash flows, debt servicing periods may be annual or more frequent. The circumstances that determine which approach we take are described in section 3.

Distribution test (also known as a "lock-up" test): A test that must be passed before cash balances can be used to satisfy lower cash flow priorities in the cash flow waterfall. The cash waterfall prevents cash from being distributed until all project expenses are paid, and a distribution test may, subject to its terms, preserve additional cash for future liquidity.

Financial close: The date on which the project's financing documents are executed and conditions precedent have been satisfied or waived for the initial drawdown.

Liquidated damages: An award of pre-agreed damages.

Loan life coverage ratio (LLCR): A measure of financial leverage, the LLCR measures the present value of CFADS (discounted at the cost of debt) from a specified point in time through the loan's maturity, divided by the debt outstanding at that point in time. We may calculate this for senior debt or for all debt including subordinated debt. The discount rate is the weighted average cost of the debt outstanding.

Mandatory debt service: For projects with deferrable debt, the mandatory debt service is the portion of senior or pari passu debt service that must be paid when due and cannot be deferred.

Mandatory debt service coverage ratio (MDSCR): CFADS divided by mandatory debt service.

Operating and maintenance (O&M) expenses: Cash costs for a period that are required to conduct operations and perform regular and major maintenance, including paying taxes, and prefund dedicated operational reserves such as ramp-up and major maintenance reserves. Costs in the period that are paid from prefunded reserves are excluded from expenses for the period.

Operating revenue: Project cash revenue that consists of cash receipts from normal operations for the period. These amounts exclude interest earned on cash deposits, capital revenue such as capital subsidies and proceeds from the sale of assets, and any proceeds from insurance payments, borrowed funds, or equity contributions (all on a cash basis). CFADS may include proceeds from financial instruments that affect the price or quantity of the operating revenue (for example, heat rate swaps).

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Parent: Parent is synonymous with the owner, shareholder, or equity holder of a project. This differs from a sponsor, which is the proponent of a project but may not be the parent.

Principal expense: For a period, payments toward the original amount of debt instruments that are owed. When funds drawn from a RCF are repaid, the principal expense will be no more than the amount drawn from the RCF. If there is a cash flow sweep feature that reduces principal through excess cash after all prior obligations are satisfied, the reduction in principal from the sweep is not considered a principal expense.

Project life coverage ratio (PLCR): A measure of financial leverage, the PLCR measures the present value of CFADS from a specified point in time until the end of the project's life, discounted by the cost of debt divided by the debt outstanding at that point. We calculate PLCR for a debt tranche (e.g., senior debt or subordinated debt) using CFADS available to, and outstanding debt at, that tranche of debt.

Reserve account: An amount of funding set aside to cover expenses before the moment of use (see the sections: "debt service reserve account", "major maintenance reserve account", and "operating and maintenance reserve account").

Scheduled debt service: For a scheduled debt service period, an amount equal to the cash interest expense, plus scheduled principal due in the period, including payments due under financial leases, and swaps (net). If a project has deferrable debt, scheduled debt service includes debt service obligations that are scheduled to be paid in this period, but that can be deferred without triggering an event of default, acceleration, or cross-default of the senior or pari passu debt if there is insufficient cash flow to meet the scheduled payment in this period. In case of deferrable debt, interest is typically capitalized and added to debt outstanding.

Senior lock-up test: A cash flow coverage test (typically a DSCR test) that, if breached under a project's transaction documents, will lock up cash flow that would have otherwise been available for distribution to subordinated debtholders or equity holders. Such cash flows, if locked up, are typically reserved for the benefit of senior debtholders, or ultimately used to repay senior debt principal, if structured accordingly under a project's transaction documents.

Sponsor: A party that is developing or financing a project. A sponsor may or may not be an equity participant in the project.

Springing lien: For projects that have multiple tranches of debt, a springing lien is a covenant that will change the seniority of one tranche of debt if a particular covenant is triggered. TIFIA's springing-lien feature preserves TIFIA lenders' rights, remedies, security, and payment priority if the project experiences significant financial stress. TIFIA loans rank subordinate in priority to senior obligations if the project is performing, but they spring to the position of senior debt if the project triggers a bankruptcy-related event.

Transportation Infrastructure Finance and Innovation Act (TIFIA): This U.S. federal program provides federal loans and guarantees, often with partially deferrable debt structures.

Total debt service: For projects that have deferrable debt, total debt service equals mandatory plus scheduled debt service for the period. CFADS divided by total debt service is the total debt service coverage ratio.

Section 11: Information Related To The Publication Of The Criteria

REVISIONS AND UPDATES

This article was originally published on Dec. 14, 2022.

Changes introduced after the original publication (other than to the contact list or criteria cross-references):

- On March 14, 2025, we republished this criteria article to make nonmaterial changes. In section 3.4, we clarified that the modifiers to the preliminary operations phase SACP apply cumulatively. In section 9.B, we clarified that additional methods than the discounted cash flow approach can be used to determine the project value.
- On June 5, 2024, we republished this criteria article to make nonmaterial changes. We moved the relevant content of "[Sector And Industry Variables: Project Finance Rating Methodology](#)," without any substantive changes, to the Appendix of these criteria. We will archive the sector and industry variables report once local registrations are completed. In addition, we made the following nonmaterial changes: In sections 3.2.C, 3.4.B, 3.4.C, and 7.A, we reworded four sentences to clarify the criteria intent. In section 5, we deleted repetitive language, updated a chart that was unclear, and corrected a misstatement. In section 9, we clarified two provisions related to recovery estimate. In section 10.B, we clarified how we incorporate structural weaknesses and caps in the analysis of a holding company.
- On Dec. 19, 2023, we republished this criteria article to make nonmaterial changes. Specifically, we deleted information related to the initial publication of the criteria.
- On June 2, 2023, we republished this article to make the following non-material changes: In Section 2.B, we clarified that the criteria apply to holding companies of operating companies structured as projects. In Sections 3 and 4, we clarified our approach when using credit substitution if we assess that risks have been adequately transferred to a counterparty in the operations phase and in the construction phase. In Section 3.1.B, we clarified how we use the SIVR. In Section 3.4.A, we clarified how we use our judgement to model our downside scenario. In Section 3.4.B, we reworded a sentence in the debt structure to clarify the criteria intent. In Section 3.4.C, we explained what we viewed as limited headroom when assessing liquidity. In Section 3.5.B, we removed an example that was not clear. We also corrected publication errors in Sections 1, 3.4.A, and 4.1.E.

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This report does not constitute a rating action.

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