STANDARD & POOR’S
PROJECT FINANCE RATING CRITERIA
REFERENCE GUIDE
Visit www.SPRatings.com/ProjFinFocus for additional criteria-related materials.
# TABLE OF CONTENTS

- **Executive Summary: Standard & Poor’s Methodology for Project Finance Ratings**

- **PROJECT FINANCE FRAMEWORK METHODOLOGY**
  - **TRANSACTION STRUCTURE CRITERIA**
    - 52 Project Finance Transaction Structure Methodology
    - 77 Credit FAQ: An Overview Of Standard & Poor’s Criteria For Assessing Project Finance Transaction Structure

  - **CONSTRUCTION PHASE CRITERIA**
    - 90 Project Finance Construction Methodology
    - 124 Credit FAQ: An Overview of Standard & Poor’s Criteria For Assessing Project Finance Construction Risk

  - **OPERATIONS PHASE CRITERIA**
    - 136 Project Finance Operations Methodology
    - 175 Common Macroeconomic Assumptions Used in Project Financings
    - 178 Credit FAQ: An Overview Of Standard & Poor’s Criteria For Assessing Project Finance Operating Risk

  - **COUNTERPARTY RISK CRITERIA**
    - 186 Project Finance Construction And Operations Counterparty Methodology
    - 204 Counterparty Risk Framework Methodology And Assumptions

- **KEY CREDIT FACTORS AND ASSUMPTIONS FOR ENERGY PROJECTS**
  - 254 Key Credit Factors For Power Project Financings
  - 283 Key Credit Factors For Oil And Gas Project Financings
  - 303 Market Assumptions Used For Oil And Gas Project Financings

- **KEY CREDIT FACTORS AND ASSUMPTIONS FOR SOCIAL AND TRANSPORTATION PROJECTS**
  - 308 Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings
  - 331 Key Credit Factors For Road, Bridge, And Tunnel Project Financings
  - 350 Common Assumptions For U.S. Stadiums And Arena Projects
EXECUTIVE SUMMARY: STANDARD & POOR’S METHODOLOGY FOR PROJECT FINANCE RATINGS

Standard & Poor’s Ratings Services has completed a comprehensive redesign of our project finance ratings methodology to ensure our criteria are comparable globally and keep pace with market changes. The remaining key components of our Project Finance criteria and the overarching framework covering the entire methodology have been published and the criteria are now final.

These components include:

- **Counterparty Risk Criteria** – How we factor in the credit quality of a project’s key counterparties—be they the buyers of the project’s output or a provider of services and materials to the project
- **Construction Phase Criteria** – How we assess a project’s construction phase risk
- **Operations Phase Criteria** – How we assess a project’s operations phase risk
- **Transaction Structure Criteria** – How we assess the constraints, legal framework, and protections around a project, examples of which are whether a project can issue additional debt and under what circumstances, or when it can distribute cash flow

The framework methodology is the overarching architecture that brings together the above four components of criteria. When reviewing our new project finance criteria, we recommend you start with the framework methodology, where we describe the process for assigning a credit rating, break down the aforementioned components into a series of steps, and address how we rate other debt in a project financing.

To start, a transaction must meet our definition of a project financing for us to apply the relevant criteria. Assuming it does, projects have two distinct periods – Construction and Operations. When rating a project that is under construction, we assess the Construction Stand Alone Credit Profile (SACP), then we move on to operational risks and develop an Operations SACP. The weaker of the two determines our Project SACP. For example, if we conclude that a project’s Construction SACP is ‘BBB-’ and the Operations SACP is ‘BBB,’ the Project SACP would be ‘BBB-’.

The Project SACP becomes the Project Finance Issue Credit Rating unless there are modifiers applied. For example, we assess as part of Transaction Structure a project’s link to its parent and its structural protections. Weaknesses could result in a lower rating. Modifiers that could result in a higher rating include whether the project is a Government Related Entity (GRE), is subject to sovereign rating limits, or benefits from a full credit guarantee.
As part of our Framework methodology, we’ve also made more transparent our approach for rating other debt that is part of a project. While senior secured debt is always present in a project finance structure, we may also rate, for example, subordinated debt or holding company debt. We also assess the recovery prospects for a project’s debt.

**Counterparty Risk Criteria**

In December 2011, we updated our methodology and assumptions for assessing Counterparty risk associated with revenue, construction, equipment supply, operations and maintenance, and raw material supply agreements relating to project finance globally.

The reliance on third parties to make payments or perform under a wide range of agreements covering such areas as revenue, construction, equipment supply, operations and maintenance, or raw-materials supply, is a common feature in project finance issues. In cases where a counterparty assumes a material risk, we factor this into the project finance methodology to assess a project’s exposure if the counterparty were to become insolvent or for any other reason no longer accepted the risk. Our Counterparty Dependency Assessment (CDA) is a weak link that we factor into the rating we assign to a project finance issue.

**Construction Phase Criteria**

We use our Construction criteria, which we published in final form in November 2013, to assess whether a project will be built on time, within budget, and meet performance requirements during the operating phase. In certain cases, we incorporate country risk into our analysis. The criteria covers all industry sectors where we see project financing – including power, oil and gas, social infrastructure, accommodation and entertainment projects, and transportation.

To start, we evaluate the risks associated with technology and design, including a project’s cost, potential construction difficulty, and the experience of contractors. We also assess a project’s management risks.

---

*SACP = Stand Alone Credit Profile
**Or Subordinated Issue Credit Rating if Applicable

Permission to reprint or distribute any content from this presentation requires the prior written approval of Standard & Poor’s.
We then make adjustments based on our Construction Phase Business Assessment, which looks at financial risk adjustments – essentially to determine whether there is sufficient funding for our downside scenario. Our final adjustment is for construction and financial counterparty risk, which ultimately leads to the Construction SACP.

**CONSTRUCTION PHASE STAND ALONE CREDIT PROFILE**

**Operations Phase Criteria**

The main elements of our Operations Phase Business Assessment (OPBA) are performance risk, market risk, and country risk.

Performance risk is a determination of how vulnerable a project’s cash flows are to operational disruptions. We look at the general stability of the asset class and consider several project-specific factors, such as the contract profile, resource and raw-material risk, and technology risk, among others. Market risk is an assessment of the variability of cash flows due to market prices and volumes. Country risk covers risks that projects face due to country-specific factors.

Once we determine the OPBA, we then overlay our forecast of a project’s debt service coverage ratios (DSCR) under our base case forecast, which leads to the Preliminary Operations Phase SACP.

**OPERATIONS PHASE STAND ALONE CREDIT PROFILE**

At this point, we consider several other financial factors, including our downside scenario, refinancing risk, and liquidity. The final two steps are a comparable ratings analysis, in which we may raise or lower a project’s SACP by one notch in light of a holistic view of the project, and our factoring in any relevant counterparty credit constraints.

One element that is somewhat different than what we’ve done in the past is the downside analysis. While we’ve always done sensitivity analyses, we now explicitly tie a project’s performance in our downside scenario to our ratings definitions. Namely, we apply a similar stress to all projects, commensurate with our ‘BBB’ ratings definitions, which we believe improves the comparability of ratings – not only across asset classes within project finance, but to our broader ratings universe.

*Country risks are assessed / incorporated
Permission to reprint or distribute any content from this presentation requires the prior written approval of Standard & Poor’s.
Transaction Structure Criteria

For Standard & Poor’s to rate a project’s debt using this methodology, the project must have four basic characteristics:

- A Limited Purpose Entity (or group of entities) that is building and operating the project, and is independent and separate from the parent
- A senior secured ranking through a security package that limits the disposal of key assets or reduces the incentive for third parties (including the parent) to file for insolvency
- A covenant package that limits additional debt, security, and asset sales, and that also determines minimum insurance requirements, as well as limiting amendments to the structure (including mergers and acquisitions)
- A cash-management covenant package that includes mechanisms to establish the priority of cash payments to holders of senior debt after maintaining ongoing operations

We may modify the Project SACP depending on our assessments of linkage to the parent and the structural protection. In assessing the degree of parent linkage, we classify a project’s transaction structure as: delinked from, linked to, or capped by its parent’s creditworthiness. If a project is delinked, the creditworthiness of the parent isn’t a constraint to the Project SACP. If a project is linked, the Project SACP is no higher than its parent’s creditworthiness plus three notches. If a project is capped, the Project SACP is capped at its parent’s creditworthiness.

FRAMEWORK FOR ASSESSING TRANSACTION STRUCTURE

To determine the degree of linkage, we focus on such things as:

- The presence of independent directors
- The existence of cross-default provisions
- The project’s ability to merge or reorganize
- Limitations on amendments to organizational documents
- The project’s separateness from its parent
- The security interests over the project’s assets
- The existence of the parent’s dependencies (certain contracts with parents and affiliates, taxes, insurances)

*LPE = Limited Purpose Entity

Permission to reprint or distribute any content from this presentation requires the prior written approval of Standard & Poor’s.
We classify a project’s structural protection package as neutral, fair, or weak, depending on the assessment of two elements: the Limited Purpose Entity’s (LPE) covenants, and cash-management covenants. The elements in each of these categories are assessed as either neutral or negative.

**The typical LPE’s covenants include:**
- Limitations on additional debt
- Limitations on additional security to third parties
- Limitations on asset sales
- Minimum insurance requirements

**The typical cash management covenants include:**
- Cash flow protection and waterfall
- Liquidity and reserves
- Use of insurance proceeds
- Distribution tests

If a project’s structural protections are neutral, there is no effect on the SACP. However, if a project’s structural protections are fair, we lower the Project SACP one notch, and if structural protections are weak, we lower the Project SACP by two notches.

This Reference Guide contains the full suite of criteria articles for all the sections summarized above as well as Key Credit Factors (KCFs) for the major industry sectors we rate in project finance. The KCFs provide further guidance for the specific application of the criteria for each respective sector. Also included in this Guide are the key assumptions used in our project finance analysis for various sectors.
PROJECT FINANCE FRAMEWORK METHODOLOGY
Criteria | Corporates | Project Finance:

Project Finance Framework

Methodology

Criteria Officer, EMEA, Corporate Ratings:
Peter Kernan, London (44) 20-7176-3618; peter.kernan@standardandpoors.com

Table Of Contents

SCOPE OF THE CRITERIA

SUMMARY OF THE CRITERIA

IMPACT ON OUTSTANDING RATINGS

EFFECTIVE DATE AND TRANSITION

METHODOLOGY

A. Definition Of A Project Finance Transaction
Table Of Contents (cont.)

B. Determining A Project's Stand-Alone Credit Profile

C. Parent Linkage And Transaction Structure Weaknesses

D. Extraordinary Government Support And Sovereign Rating Limitations

E. Determining The Issue Credit Ratings

F. Rating Other Debt In Project Finance Structures

G. Assigning Recovery Ratings

H. Derivation Of The Subordinated SACP

APPENDIX

A. Derivation Of The Subordinated Issue Credit Rating When No
Operations SACP Exists

B. GRE Rating Impact From Cross-Default And Debt Acceleration Linkages

GLOSSARY

RELATED CRITERIA AND RESEARCH
Criteria | Corporates | Project Finance:

Project Finance Framework Methodology

1. Standard & Poor's Ratings Services has updated its project finance framework methodology criteria used to assign issue credit ratings to senior secured and subordinated debt or debt-like obligations issued from project finance structures. This follows our request for comment, "Request For Comment: Project Finance Framework Methodology," published Nov. 15, 2013.

2. The criteria are intended to enhance the comparability of our project finance issue credit ratings (see "Understanding Standard & Poor's Rating Definitions," published June 3, 2009) and increase the transparency about how we assign project finance issue credit ratings. The criteria constitute specific methodologies and assumptions under our "Principles Of Credit Ratings," published Feb. 16, 2011.

3. The criteria supersede our current project finance criteria, "Updated Project Finance Summary Debt Rating Criteria," published Sept. 18, 2007, as well as other related articles. For a comprehensive list of the project finance criteria that are superseded by these criteria, see the "Superseded Criteria" section at the end of this article.

SCOPE OF THE CRITERIA

4. These criteria apply to all project finance issue credit ratings on project finance structures globally—whether the debt is public, confidential, or privately rated. "Project finance" is a financing structure that is used to finance a variety of capital-intensive greenfield and brownfield assets (see the Glossary). Sectors that commonly use project finance structures include transportation infrastructure (e.g., toll roads, parking facilities, airports, and ports), social projects (e.g., barracks, hospitals, and schools), energy and water infrastructure (e.g., power generation, gas transmission, liquefied natural gas terminals, and water treatment plants), and integrated multisite commodity-based projects such as oil and gas and mining projects backed by reserves.

5. Paragraph 15 defines the key attributes of a project financing and establishes the minimum requirements that must be present for Standard & Poor's to assign an issue credit rating to a given debt issue or financial obligation that is part of a project finance transaction.

6. Standard & Poor's may assign issue credit ratings to one or more classes of debt or debt-like obligations in a project finance structure, such as senior secured debt, subordinated debt, and holding company debt (see paragraph 46).

7. These criteria do not apply to corporate ratings, structured finance ratings, project developers, corporate securitizations, and public finance ratings.

SUMMARY OF THE CRITERIA

8. This article describes how we use these criteria and related criteria to assign issue credit ratings to senior secured, subordinated, or other debt or debt-like obligations in project finance transactions. This article is one of five that
together constitute the approach we use to rate project finance issues. The four other pieces are:

- Project Finance Transaction Structure Methodology, Sept. 16, 2014;
- Project Finance Operations Methodology, Sept. 16, 2014;
- Project Finance Construction Methodology, Nov. 15, 2013; and

9. Sector-specific criteria articles called key credit factors (KCFs) complement these criteria. The KCFs describe specific risks and assumptions for sectors that commonly use project finance structures and expand on how we apply our criteria in each sector. The KCFs, published Sept. 16, 2014, that accompany these criteria are:

- Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings;
- Key Credit Factors For Road, Bridge, And Tunnel Financings;
- Key Credit Factors For Oil And Gas Project Financings; and
- Key Credit Factors For Power Project Financings.

10. Chart 1 provides an overview of our methodology for determining project finance issue credit ratings and subordinated project finance issue credit ratings. We assign project finance issue credit ratings to a project's senior secured debt. Subordinated project finance issue credit ratings are assigned to subordinated debt, if present in the structure. We refer to both as issue credit ratings in this criteria article.

11. Issue credit ratings reflect our view of the overall relative creditworthiness of a debt issue, which encompasses the likelihood of default, payment priority, and credit stability within a project finance structure. The criteria set out a multistep process for assigning an issue credit rating to each debt and debt-like obligation in a project finance structure (see chart 2). The process consists of:
• Determining whether project finance criteria are applicable. We apply these criteria to debt issues that meet the minimum requirements of a project finance transaction (see step 1 in chart 2 and paragraph 15);
• Establishing the project's stand-alone credit profile (project SACP, see step 4 in chart 2), which is the lower of either our assessment of the project's construction phase SACP (step 2) or operations phase SACP (step 3). If construction risk is not present, the operations SACP establishes the project SACP. We assign the project SACP to the most senior class of debt in the project structure and to other debt as described in paragraphs 31-33.
• Establishing the subordinated SACP, if subordinated classes of debt or debt-like obligations are present in the structure (see step 4a in chart 2).
• Factoring in any weaknesses in the transaction structure due to parent linkages or structural deficiencies, cross-default and debt acceleration linkages, as well as any extraordinary timely government support and sovereign risk (see steps 5 and 6 in chart 2 and sections C and D).
• Adjusting for any full credit guarantees (see step 7 in chart 2 and section E of this article), such as a financial guarantee provided by a monoline insurance company.
• Determining the project finance issue credit ratings for senior debt and, if present, the subordinated project finance issue credit rating(s) for any subordinated debt issued as an outcome of the adjustment in step 7 (see step 8 in chart 2).
• Using, where applicable, "Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings," Oct. 1, 2012, for project finance issue credit ratings and subordinated project finance issue credit ratings.
A project finance issue credit rating and a subordinated project finance issue credit rating do not reflect recovery post an event of default. Standard & Poor's may assign a recovery rating to a project finance or subordinated issue when the project finance issue credit rating is 'BB+' or lower and the project is in a jurisdiction in which Standard & Poor's assigns recovery ratings to corporate debt. (See Section G for a description of the methodology used to assign recovery ratings.)
IMPACT ON OUTSTANDING RATINGS

13. In aggregate, as a consequence of the three criteria pieces—operations, transaction structure, and framework (see paragraph 8)—and the KCFs listed in paragraph 9, about 99% of our project finance issue credit ratings will remain within one notch of the existing ratings. Of these, approximately 85% of our project finance issue credit ratings and subordinated project finance issue credit ratings will be unchanged, and most other project issues (about 14%) will experience a one-notch rating change. Of the total percentage of one-notch changes, 9% are upgrades and 5% are downgrades. The remaining approximately 1% of our project finance issue credit ratings will experience changes of two notches. We do not expect the implementation of the criteria will lead to any rating changes of more than two notches.

EFFECTIVE DATE AND TRANSITION

14. The criteria are effective immediately. We intend to complete our review of all project finance issue credit ratings within the next six months.

METHODOLOGY

A. Definition Of A Project Finance Transaction

15. In order for a debt issue or debt-like obligation to be assigned an issue credit rating under these criteria, the project and transaction structure (see chart 2 and paragraph 14 in "Project Finance Transaction Structure Methodology," published Sept. 16, 2014) must have all of the following characteristics:

- A project finance transaction structure: A project must have a transaction structure that meets certain minimum requirements. That is, the project is structured as a limited-purpose entity (LPE); provides senior lenders a senior secured ranking through a security package to the key project assets; contains covenants to limit the project’s range of permitted actions, including future financings; and includes cash management covenants and establishes a cash management system that prioritizes the payment of senior debt service ahead of other project obligations. (For details, see paragraph 15 of “Project Finance Transaction Structure Methodology.”)
- Limited recourse or nonrecourse to the sponsors or shareholders of a project, but full recourse to the project's cash flows and assets: In a project finance transaction, the project finance lenders typically only have recourse to the project's assets, cash flows, and contractual agreements. The lender's investment is protected by key structural elements, including the security structure, legal framework, payment structure, cash flow mechanics, reserve accounts, and credit enhancements. As a result, lenders rely on the project's cash flow available for debt service and collateral for the servicing, repayment, refinancing, and security of project debt or debt-like obligations.
- Both revenue and operating risk: A project's ability to service, repay, or refinance a project finance debt issue or bank loan is dependent on the future cash flows generated by the operations of the asset once constructed and fully operational.
- A limited asset life with restricted activities: A project financing has a finite economic life, and project documents constrain the level of permitted asset and business expansions.
Covenants and controls for senior secured debt in the structure: Project finance transactions are structured to issue senior secured debt, which is typically the majority of the project's capital structure. This is backed by covenants and forms of security for the benefit and credit protection of senior secured lenders in a project finance transaction.

Specified responsibilities and risk allocation over the life of project: Project finance transactions have established and specified responsibilities that limit risk through contracts and transaction documents over the project life. A project financing comprises a mix of integrated contracts that are in place over the life of a project.

B. Determining A Project's Stand-Alone Credit Profile

16. Our issue credit ratings reflect the credit quality of a project during its weakest period over the remaining term of the financial obligation and until the obligation is repaid through project cash flows. In project structures with bullet or balloon maturities (see Glossary), we assess the credit quality beyond the scheduled bullet debt maturities through the end of a project's life and over an assumed debt amortization period.

17. As a result, a project SACP is the lower of the construction phase SACP or the operations phase SACP (see step 4 in chart 2). For our construction and operations phase methodologies, see "Project Finance Construction Methodology," Nov. 15, 2013, and "Project Finance Operations Methodology," Sept. 16, 2014.

18. For example, if we determine a project's construction phase SACP is 'bb+' but assess its operations phase SACP--once the project is operational--as 'bbb-', the project SACP would be 'bb+'. Similarly, if the construction phase SACP is 'bbb' and the operations phase SACP is 'bbb-', then the project SACP would be 'bbb-'.

19. In cases where the construction phase SACP is the weak link, once construction is completed and we consider that all construction-related issues are resolved, we may adjust the project SACP to the operations phase SACP. The initial operations phase SACP would reflect start-up risks. It is commonly the case that we are asked to assign an issue credit rating at the time construction begins, but if the project has completed construction at the time of assigning the rating, only an operations SACP would apply.

20. Operating projects typically undertake maintenance and refurbishment activities such as road repaving, the repair or replacement of worn parts and equipment such as solar panels and inverters, or the refurbishment of the asset such as hotel or hospital rooms as part of social infrastructure projects. Generally, these activities are planned and assessed at the project's inception and updated according to a prescribed refurbishment and maintenance schedule. We typically assess these maintenance and refurbishment activities and their associated risks to the project as part of the operations phase (see "Project Finance Operations Methodology," Sept. 16, 2014). However, if maintenance and refurbishment activities result in a material expansion of the project or are new construction activities, we typically assess this under "Project Finance Construction Methodology," Nov. 15, 2013. We view an expansion as material if permanent debt increases, or if the expansion is required to repay existing or any new debt issuance or loans.

21. Projects that include subordinated classes of debt that we view to be part of the project's transaction structure will have a subordinated SACP for each subordinated debt or subordinated debt-like obligation that we rate.

22. As with the project SACP (that applies to the senior secured debt obligation), the subordinated SACP is also based on the weak-link assessment (see Glossary) of the operations and construction phase SACPs. The steps for determining
Once we establish the project SACP and subordinated SACP for a project structure with more than one class of debt or debt-like obligations, the adjustments shown in step 5 of chart 2 apply to all rated debt in the project structure.

### C. Parent Linkage And Transaction Structure Weaknesses

24. We could lower the project SACP and, if present, the subordinated SACP if, in our assessment, the project's transaction structure has weaknesses (see table 1 in "Project Finance Transaction Structure Methodology," Sept. 16, 2014).

25. Specifically, under the project finance transaction structure methodology, we assess:

- How linked a project structure is to its parent;
- Cross-default and debt acceleration linkages;
- How strong a project's structural protections are; and
- Whether a project's transaction structure has any other meaningful deficiencies that would cap the project SACP at 'bb+' and the subordinated SACP at 'bb'.

### D. Extraordinary Government Support And Sovereign Rating Limitations

26. If we assess a project as a government-related entity (GRE), we may adjust the project SACP and, if present, subordinated SACP for any extraordinary timely government support (or negative intervention if present) that improves or weakens the GRE's ability to meet its financial obligations (see "Rating Government-Related Entities: Methodology And Assumptions," Dec. 9, 2010). The project SACP and subordinated SACP also would be subject to our criteria for ratings above the sovereign (see "Ratings Above the Sovereign--Corporate And Government Ratings: Methodology And Assumptions," Nov. 19, 2013).

**Extraordinary government support**

27. We may factor extraordinary government support into our analysis, although we expect any support to be rare. For example, governments that elect to award a concession or contracts using a project finance structure often do so to shift the risks of constructing and operating an infrastructure asset to a private enterprise. As such, the government's incentives are typically limited to satisfying its obligations embedded in the concession or contract it awards. In addition, there is a clear distinction between government intervention that enables a timely repayment of a GRE's debt and intervention that principally aims at supporting an entity's employment or operations but might not necessarily reduce the likelihood of a project issue default.

28. In a limited number of situations, we may conclude that a project's SACP or subordinated SACP benefits from timely extraordinary government support because of its "role" and "link" as assessed under the GRE criteria. If there is more than one class of debt in the project structure, the "role" and "link" may differ between classes. Based on our view of how important a project's role is to the government and how linked the project is to the government and subject to the conditions outlined in Appendix B, on cross-default linkages, we could raise the project SACP and, if present, subordinated SACP from one notch to as high as the local currency rating on the government (see step 6 in chart 2). (For details, see "Rating Government-Related Entities: Methodology And Assumptions," Dec. 9, 2010.) For instance, a
strong precedent of government support for financial obligations of projects that operate in an essential segment of the
economy and are systemically important to a country (such as key water or power projects in some countries) could
qualify for SACP uplift if such extraordinary intervention supported a project meeting its financial obligations on a
timely basis.

**Sovereign rating considerations**

29. The project SACP and subordinated SACP, if present, may be constrained by the sovereign rating, depending on what
country the project operates in. As part of step 6 in chart 2, for the project or subordinated SACPs to be higher than
the respective sovereign foreign currency rating, the project should be able to pass a hypothetical sovereign foreign
currency default stress test and also may be constrained by a country's transfer and convertibility risk. (See "Ratings
Above The Sovereign--Corporate And Government Ratings: Methodology And Assumptions," Nov. 19, 2013, and
"Methodology: Criteria For Determining Transfer And Convertibility Assessments," May 18, 2009).

**E. Determining The Issue Credit Ratings**

30. We determine a project finance issue credit rating and any subordinated project finance issue credit rating after
applying any full credit guarantees as part of step 7 (see chart 2). Such adjustments typically relate to unconditional
and irrevocable guarantees for full and timely payment of interest and repayment of principal from a monoline
insurance provider or bank. (For more information, see "Methodology: The Interaction Of Bond Insurance And Credit
Transactions: Select Issues Criteria," Oct. 1, 2006.) Other forms of appropriate credit enhancements may apply and
include legal defeasance (see "Methodology And Assumptions: Assigning Ratings To Bonds In The U.S. Based On

**F. Rating Other Debt In Project Finance Structures**

31. Additional debt or debt-like obligations may sometimes be included as part of a project financing. We distinguish
between debt that is subordinated as outlined in paragraphs 36-40 and debt that we do not consider subordinated (see
paragraphs 49-50). As a result, the calculations of debt service coverage ratios (DSCRs) for each class of debt could
differ.

32. For a project with subordinated debt or debt-like obligations as defined in paragraph 37, we would view the default
potential for the senior and other subordinated debt classes to be different, and the calculation of the senior DSCR will
exclude subordinated principal and interest obligation(s). If a project has more than one class of subordinated debt, we
calculate DSCRs as cash flow available for debt service (CFADS) divided by debt service of the class of debt in
question plus the debt service of the more senior classes. As an example, if a project has three rated debt classes (e.g.,
a senior issue and two subordinated issues [A and B]), the DSCR for subordinated class A would be calculated as
CFADS divided by senior debt service plus the subordinated debt service of class A. Class B's DSCR would be
calculated as CFADS divided by senior debt service plus the subordinated debt service for class A and the
subordinated debt service for class B.
33. If debt or debt-like obligations do not meet the conditions defined in paragraph 37, we would consider them to have the same likelihood of default as senior secured financial obligations in the structure. As a result, the senior DSCR would include the interest and principal of both the senior debt and the other debt that is not subordinated.

Issuer to be part of "project"

34. We may evaluate other debt, issued by an entity that forms part of the "project" (see chart 3 in "Project Finance Transaction Structure Methodology") under these criteria, provided that the "project finance debt" meets the requirements of these criteria and remains outstanding in the project structure, or, on its repayment, the other debt becomes the senior debt in the project and meets the requirements to be rated as "project finance debt" under the transaction structure criteria. The issuer of the other debt or additional debt typically must have the following characteristics:

- An LPE that is included in the "project."
- A mechanism that acts to limit disposal of key assets or disincentives third-party—including parents’—attempts to file the project into insolvency or seize the project’s key assets after insolvency.
- A covenant package that establishes limits on additional debt, additional security, and asset sales; minimum insurance requirements; and limits on amendments to the structure, including mergers and acquisitions and existence over the debt term.
- A cash management covenant package that includes a mechanism that establishes priority of cash payments in favor of senior debt after maintaining ongoing operations and liquidity mechanisms that ration and preserve cash in the project in support of the senior debt.

35. If the other debt matures later than the senior secured debt and after the maturity of the senior debt would not meet the conditions in paragraph 34, the rating would be the lower of its rating under these criteria until repayment of the senior debt or its rating over the remaining term as assessed under our corporate criteria (see "Corporate Methodology," Nov. 19, 2013, and "2008 Corporate Criteria: Analytical Methodology," April 15, 2008).

Subordinated debt obligations

36. Within a project's capital structure, a subordinated debt or debt-like obligation refers to structurally or contractually subordinated debt at the project level and structurally or contractually subordinated debt at a holding company that we view as part of the project financing structure (see paragraph 46).

37. For Standard & Poor's to consider other debt or debt-like obligations in a project structure subordinated under the criteria, all of the following conditions must be met:

- Subordinated debt is only paid after any senior debt obligation is paid, any prior ranking reserves are replenished, and any cash flow waterfall lock-up conditions as a result of a senior lock-up trigger or cash flow sweep provisions, if present, are met.
- Subordinated debt has no right to access or share the reserves dedicated to senior financial obligations.
- 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 (see Glossary), even at maturity, and maintains its ranking in the cash flow waterfall while any senior financial obligation is outstanding.
- Nonpetition language is included in the project's transaction documents, pursuant to which subordinated debtholders or lenders agree not to initiate insolvency proceedings against the LPE and not to join any such
proceedings.

- Subordinated debt has no voting rights while any senior debt or debt-like obligation is outstanding.
- Any collateral and security interests or claims on liquidation granted to subordinate lenders should rank after senior debt.

38. We rate debt and debt-like obligations that meet the conditions of paragraph 37 at least one notch below the next most senior debt in the structure, reflecting a different likelihood of default. For example, if there are two classes of debt in a project structure—senior secured and subordinated—and the project finance issue credit rating assigned to the senior debt is 'BBB-', then the subordinated debt cannot be rated higher than 'BB+' unless paragraph 40 applies.

39. The minimum one notch difference referenced in paragraph 38 is maintained in cases in which rating caps apply due to weaknesses, including:

- Transaction structure shortcomings (see paragraphs 33 and 73-76 in "Project Finance Transaction Structure Methodology");
- Liquidity that is less than adequate during operations (see paragraph 82 in "Project Finance Operations Methodology");
- Refinancing risk (see paragraph 91 in "Project Finance Operations Methodology"); and
- Irreplaceable counterparties (see paragraph 14 in "Project Finance Construction And Operations Counterparty Methodology").

40. A subordinated project finance issue credit rating may be the same as a project finance issue credit rating if the following applies:

- GRE support applies to both issues. In some limited cases, the GRE mapping based on the project SACP, subordinated SACP, and government local currency rating equalizes the ratings. For example, if a project's senior and subordinated debt classes have an SACP of 'bbb' and 'bbb-', respectively, and the government local currency rating is 'A-', both of the issue credit ratings would be 'BBB+' (according to table 4 of "Rating Government-Related Entities: Methodology And Assumptions").
- A full credit guarantee exists. For example, if a monoline insurance company guarantees a project's senior and subordinated debt classes, then the issue credit rating for both classes of debt will be the same.
- The "Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings," Oct. 1, 2012, applies. For example, if the senior and subordinated debt ratings both meet the conditions of a 'CCC+' rating, each issue would be rated 'CCC+'.

**Determining the subordinated SACP**

41. We determine the subordinated SACP by taking the lower of the:

- Construction phase SACP less one notch, or
- Subordinated SACP over the operations phase that is derived using the steps in paragraph 42 (see also step 4a in chart 2), subject to the outcome being at least one notch below the project SACP.

42. The steps for determining a subordinated SACP over the operations phase (see Section H for a numerical example) are:

- Calculate i) the minimum total DSCR on senior debt service (interest and principal) plus subordinated debt service (interest and principal), and ii) the minimum DSCRs on senior debt service.
- iii) Divide the forecast minimum DSCRs on senior debt service by any senior distribution or lock-up test (see the
Glossary) between the senior and subordinated debt, if present.
• Take the lower of the forecast minimum total DSCR (i) or the forecasted minimum senior DSCRs divided by the distribution or lock-up test (iii).
• Apply table 15 of the "Project Finance Operations Methodology" and any notching modifiers under that criteria (see paragraph 64 of that article) to map the forecasted minimum DSCRs with the operations phase business assessment (OPBA).
• Apply any adjustments based on the downside analysis, liquidity, and refinance risk in the operations methodology (see paragraphs 66-95 of "Project Finance Operations Methodology").

43. In applying table 15 of the operations methodology, if the minimum DSCR lies toward one of the endpoints of the DSCR range for a relevant OPBA, the subordinated SACP will have a plus (+) or minus (-) sign, subject to paragraph 38.

44. In addition, "Project Finance Operations Methodology" (see paragraphs 75-78) outlines factors, such as unusually high amortization payments in the outer years of the project’s life, that could lead to additional downward adjustments to the operations phase SACP for the senior debt. Similarly, we may further lower the subordinated SACP if these factors are present in the project structures that include subordinated debt.

45. In rare situations, an operations phase SACP may not be assigned to a project because we are relying on the counterparty to absorb all operational risk (see paragraph 15 in "Project Finance Operations Methodology"). For example, if a project has subordinated debt, and the senior debt is not assigned an operations SACP (which could occur, for example, if all performance and market risk is transferred to a counterparty), the steps outlined in paragraph 42 would still apply to determine the subordinated SACP, so long as the subordinated issue credit rating is at least one notch below the project finance issue credit rating assigned to the senior debt. (See Appendix A for an example.)

**Project holding company debt**

46. Project holding company structures are sometimes created as part of a project financing structure. Typically, we treat holding company debt as subordinated debt so long as it meets the conditions of paragraph 37. Holding companies are typically formed for the sole purpose of issuing debt, which is serviced from the residual cash flows of the operating assets at one or more projects. In turn, the project holding company is structured as a wholly owned entity of one or more parents. Commonly, project structures that include a project holding company do so to issue debt at both the project and holding company level. A project holding company is typically secured by the equity shares of the project entity below it (see chart 3).

47. If a project has holding company debt, senior secured debt, and other classes of debt as part of the project structure, we will rate the holding company debt lower than both the senior and other debt obligations in the project cash flow waterfall.
48. Structures that contain a project holding company that has unfettered access to the cash flows of operating projects beneath it would typically not meet the requirement that the project have a cash management package that establishes a priority of cash payments in favor of senior obligations. As a result, we would analyze the project holding company and the project on a consolidated basis.

### Debt that is not subordinated

49. If a project structure contains more than one class of debt that is not subordinated (e.g., the debt class does not meet one or more conditions in paragraph 37), we would combine the senior and other debt service (interest and principal) in our DSCR analysis (see Appendix B in "Project Finance Transaction Structure Methodology"). As a result, we calculate debt service coverage for each class of debt, including senior obligations, as CFADS divided by the principal and interest of the senior and all other debt payments that are not subordinated.

50. We rate other debt that is not subordinated the same as the project finance issue credit rating assigned to the senior debt or debt-like obligation, subject to “Criteria For Assigning ‘CCC+’, ‘CCC’, ‘CCC-’, And ‘CC’ Ratings,” Oct. 1, 2012, “Timeliness Of Payments: Grace Periods, Guarantees, And Use Of ‘D’ And ‘SD’ Ratings,” and “Principles For Rating Debt Issues Based On Imputed Promises,” Oct. 24, 2013. The calculation of debt service, per paragraph 49, reflects our view that other debt in a project structure that does not meet the subordinated conditions of paragraph 37 has the same default potential as senior debt.
G. Assigning Recovery Ratings

51. Recovery ratings in project financings do not affect the project finance issue or subordinated issue credit ratings. Rather, a separate recovery rating is assigned on a scale of '1+' to '6'. The recovery rating estimates the range of principal that lenders can expect to receive following a default of the project (see table 1). We define the likely default scenario and then assess recovery using one of two techniques, such as discounted cash-flow analysis or liquidation analysis. Or, we will examine the terms and conditions of project assets, such as contracts and concession agreements, for example, to estimate the expected recovery.

52. We assign recovery ratings to debt in project financings when the project finance issue credit rating is 'BB+' or lower in jurisdictions where corporate ratings also assign recovery estimates (see "Criteria Guidelines For Recovery Ratings On Global Industrials Issuers' Speculative-Grade Debt," Aug. 10, 2009). When a project has multiple debt types, it is the rating on the senior debt that determines whether we assign recovery estimates. For example, if the project finance issue credit rating assigned to the senior secured debt in a project structure is 'BBB' and the project also includes subordinated debt, which has a subordinated project finance issue credit rating of 'BB-', we would not assign a recovery rating to the subordinated debt.

53. In many cases, because senior debt is the largest component of the project's capital structure, we would expect most subordinated debt to have a recovery estimate of or close to zero.

54. Recovery ratings do not blend default risk and recovery given default. Rather, they express only an opinion of an issue's recovery prospects. Each rating category corresponds to a specific range of recovery values (see table 1).

Table 1

<table>
<thead>
<tr>
<th>Recovery rating</th>
<th>Recovery description</th>
<th>Recovery expectations*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1+</td>
<td>Highest expectation, full recovery</td>
<td>100%§</td>
</tr>
<tr>
<td>1</td>
<td>Very high recovery</td>
<td>90%-100%</td>
</tr>
<tr>
<td>2</td>
<td>Substantial recovery</td>
<td>70%-90%</td>
</tr>
<tr>
<td>3</td>
<td>Meaningful recovery</td>
<td>50%-70%</td>
</tr>
<tr>
<td>4</td>
<td>Average recovery</td>
<td>30%-50%</td>
</tr>
<tr>
<td>5</td>
<td>Modest recovery</td>
<td>10%-30%</td>
</tr>
<tr>
<td>6</td>
<td>Negligible recovery</td>
<td>0%-10%</td>
</tr>
</tbody>
</table>

*Recovery of principal plus accrued but unpaid interest at the time of default. §Very high confidence of full recovery resulting from significant overcollateralization or strong structural features.

55. Assigning a recovery rating to a project or subordinated issue consists of analyzing the project's default risk and, secondly, analyzing whether cash from the project--post-default, whether derived from operations or from an asset sale--is sufficient to repay lenders' principal. The likelihood of default, of course, is irrelevant to a recovery analysis. It is not beyond the realm of possibility for a low probability of default to coexist with a weak recovery in default. Nevertheless, the circumstances of a potential default are germane to the recovery outcome. Thus, comprehending the default scenario is part of every analysis.
56. In rare cases, we may not assign a recovery rating to projects that meet the conditions outlined in paragraph 52 if we do not believe a default scenario exists. For example, for some U.S. project financings that involve municipally owned assets, a default scenario cannot be estimated because lenders lack acceleration rights under a project's transaction documents. Also, the application of Chapter 9 of the U.S. bankruptcy code (and equivalent statutes in other jurisdictions) can enable municipalities to reorganize their debt obligations and maturity such that a project's assets cannot be immediately liquidated.

57. As part of a project's debt issue analysis, Standard & Poor's also analyzes the project's legal structure and the collateral pledged to secure the project debt. The recovery risk profile is established by assessing the project collateral and subjecting the collateral values to stress analysis under different post-default scenarios. High collateral coverage levels can increase confidence that pledged assets will cover the secured debt, even under adverse conditions (although greater levels of collateral obviously do not entitle a creditor to any more than the amount of the claim).

Default scenarios

58. The analysis of recovery prospects for secured project debt—which underpins the assignment of both conventional issue credit ratings and recovery ratings—focuses exclusively on the economic value of the project in the post-default scenario. The only meaningful stress scenario is the one consistent with the default. This is true whatever method is used to appraise the project's value, be it discounted cash flow of the enterprise or some other approach.

59. Projects fail, or suffer downgrades, for various reasons, including: vulnerability to counterparty credit downgrades, sovereign risk, technical risk, competitive exposure, exposure to weak parents or sponsors, and poor financial performance. In most cases, these factors exacerbate the fundamental problem: an overly ambitious borrowing program that so burdens the project that it has little room to maneuver around a structural dependency or other weakness. In rare cases, the default issue lies with a fundamental misjudgment about the economic and/or technical viability of the project. In the first instance, a financial restructuring will often restore the project to viability. In the latter, the inability of the project ever to meet its obligations not only precludes any meaningful recovery, but may also expose the lender to clean-up or remediation costs when the equity in the project has long since vanished.

Availability of collateral

60. It is the nature of project financing to have the project's collateral pledged as security for the project debt. The security generally takes the form of a first-perfected security interest over all project assets (including physical assets, contracts, permits, cash flows, accounts, and shareholder's ownership interest in the project equity) as outlined in paragraphs 46-49 of "Project Finance Transaction Structure Methodology"). In effect, senior project lenders have the entire enterprise as collateral, including everything needed to ensure operations continue as smoothly as possible in case lenders take possession.

61. Furthermore, we assume that the whole is usually worth more than the sum of its parts, as long as the business enterprise remains a going concern. All else being equal, this supports strong recoveries because it greatly facilitates a creditor's ability to take over operations with minimal or no disruption to revenues. Indeed, a project's financing documentation typically anticipates the potential situation in which lenders take control of a project, thereby eliminating much of the enterprise value destruction that often accompanies a corporate bankruptcy due to a multitude of competing claims. A single class (or perhaps two or three at most) of secured lenders helps ensure that
Valuation methodologies

62. As noted above, we consider whether a default is likely because of factors unrelated to the business position of the project or a fundamental deterioration in the underlying project viability. Thus, if a project's underlying operations are sound but a default nevertheless occurs for other reasons, a restructuring of the project's capital structure, renegotiation of certain contracts, the replacement of nonperforming transaction parties, or other solutions might allow the project to return to profitability. If the project is capable of performing, a "project value analysis" is undertaken. On the other hand, when the project's viability is seriously at issue, a "liquidation analysis" might be a more appropriate method of determining the value of the assets constituting the collateral. The two approaches are described below.

Any value might be qualified by clean-up or remediation expenses to be borne by lenders under relevant lender-liability laws.

Project value analysis

63. Where project value analysis is appropriate because of the continuing viability of the project, a discounted cash flow (DCF) approach is generally employed. The DCF approach is based on financial analysis incorporating historical operating data and forecast cash flow (i.e., including any contracted termination payments under a concession agreement) over a discrete period that lasts until the originally scheduled final maturity date. The cash flows during a discrete period 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 reflects a number of factors such as country risk and expected asset values. For asset classes in which we have sales data, we could also use asset value multiples, for example, dollar per kilowatt sales information for power plants.

64. One of the advantages of assessing project finance recovery values using the DCF approach is that most projects produce a single commodity or provide one primary service--such as electricity or transport along a toll road. Typically, more easily observable demand and price exist for the product and its inputs, as opposed to a company that may manufacture hundreds, if not thousands, of products across multiple sites. Moreover, it is very likely that the project will never cease operations, which would eliminate the need to make assumptions about how and when the enterprise will resume operations and at what cost. Indeed, if a project has a long-term contract, that contract might very well survive the bankruptcy or default process intact.

65. Although projects by their nature have finite lives and the recovery is based on the level of rated debt, the value of the cash flows may extend beyond the term of the debt, particularly in the case of bullet maturities.

Liquidation approach

66. The liquidation approach is applied when the project is not considered a going concern or if the transaction is only partially secured. Value assumptions are based on the concept of an orderly liquidation of assets under 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 post-default scenarios, and any legal issues related to perfecting and enforcing the security interest. The analytical starting point is the assets' current value. For projects, this may be difficult to establish.
Projects tend to be unique and might lack any reference to establish a market value. Clearly, any objective valuation of the project assets will support a more accurate estimate of a project's recovery under a liquidation approach. For example, a project might have little future enterprise value but may be located on valuable real estate, which—if available for alternative usage—supports recovery. The assets' potential to retain value over time is critical. Collateral is, therefore, judged according to volatility, liquidity, and its special-purpose nature.

The recovery rating

In arriving at its collateral valuation, we determine the project's "ultimate recovery" of principal assuming that the bankruptcy or administration process fully plays out. We do not determine ultimate recovery on the basis of, for example, what a defaulted loan might sell for at a fire sale or distressed loan price. This approach is different from that applied to some collateralized debt obligation (CDO) structures, where the focus may be on liquidation values shortly after default—generally "distressed market" prices that are often lower than the ultimate recovery.

Our ultimate recovery calculation, therefore, is the net amount after deduction of administration and related direct costs of bankruptcy, or restructuring and workout costs (which can be significant), costs of resolution of any contingent liabilities, and any prior-ranking claims (for example: taxes, environmental claims, and state law liens).

Project capitalization and structural factors

Recovery ratings take into account various other factors, such as structural features of the transaction and the applicable insolvency laws applying to the project. For example, a sound security structure in a creditor-friendly environment might indicate a higher probability of successful recovery.

Project capitalization. A project's capital structure is a factor in the recovery rating. Subordinated debt generally protects the senior project debt lenders by absorbing certain potential losses. The relative position of the piece of debt within the capital structure and amount of prior claims are also factored in when calculating the recovery rating on a project. In estimating recovery for senior or subordinated debt, we assume that any debt-service reserve accounts are not available. In evaluating a project's capital structure, we consider:

- 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.

Any obligations under hedges and swaps are also considered.

Project security

In evaluating the sufficiency of project collateral, we also consider the completeness of the security package, enforceability of guarantees, and the location of the collateral. This latter factor is important because projects in creditor-friendly jurisdictions are assumed to have greater ability to enforce and realize security on a timely basis. If the project assets are widely dispersed or are located predominantly in debtor-unfriendly jurisdictions, the analysis...
Jurisdictional considerations
74. Access to collateral and the timing of its realization largely depend on how the relevant legal regime resolves bankruptcies. Creditor rights vary greatly, depending on the country. We have published reports on the security and insolvency regimes, which limits our assessment of recovery (see "Update: Jurisdiction-Specific Adjustments To Recovery And Issue Ratings," June 20, 2008).

An example of our recovery ratings methodology
75. We begin by selecting a hypothetical default scenario that we think best reflects the key risks that would lead to a default. For a project that has significant revenue exposure to commodity prices, the assumption may be that project revenues decline rapidly because of a collapse in market prices. In contrast, a project that contracts all of its output at a fixed price for the life of its debt may have resource risk (such as a wind farm that is paid only if it generates). In this case, the assumed default is likely to be related to a poorly characterized wind resource, which leads to consistent undergeneration relative to forecast, along with an unexpected increase in operations and maintenance costs.

76. Here is an example of our recovery analysis:

- The asset is a 400 MW natural gas combined cycle power plant project that has a long-term, fixed-price offtake contract with a $36 million letter of credit and $600 million in senior secured debt outstanding at the time of default, with no other debt in the project structure.
- Operational problems constrain project cash flows, and the letter of credit is drawn in year four of the project life and by year five the facility is exhausted, at which point the project default occurs in 2017.
- The offtake contract remains unchanged and cash flows continue for the remaining contract life. There is no residual asset value at contract termination, and the discounted net present value of the cash flow available for debt service (cash flows) is $575 million, using a discount rate of 12%.
- We reduce the net present value of the cash flows by 5% (which is typical) to account for estimated administrative expenses related to the default, assumed to be $29 million in this example.
- We add an amount equal to six months of interest as pre-petition expenses to debt outstanding, assumed to be $18 million.

77. Given these assumptions, the expected recovery is 84% (see table 2). This falls within the "substantial" recovery range of 70%-90%, resulting in a ‘2’ recovery rating, as outlined under our recovery scale shown in table 1.

Table 2

<table>
<thead>
<tr>
<th>Example Of A Project Finance Recovery Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery calculation (mil. $)</td>
</tr>
<tr>
<td>Default year</td>
</tr>
<tr>
<td>Discounted cash flow at 12%</td>
</tr>
<tr>
<td>Less: administrative expenses at 5%</td>
</tr>
<tr>
<td>Net enterprise value</td>
</tr>
<tr>
<td>Debt outstanding</td>
</tr>
<tr>
<td>Debt service reserve LC fully drawn</td>
</tr>
<tr>
<td>Add: prepetition interest (six months)</td>
</tr>
<tr>
<td>Total senior obligation</td>
</tr>
</tbody>
</table>
Table 2

<table>
<thead>
<tr>
<th>Example Of A Project Finance Recovery Rating (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected recovery (%)</td>
</tr>
<tr>
<td>Recovery rating</td>
</tr>
</tbody>
</table>

H. Derivation Of The Subordinated SACP

Example 1

78. The following example illustrates how we derive a subordinated SACP when other debt exists in the project structure that is rated and meets our conditions of subordination (see paragraph 37). The underlying assumptions we use in this example are:

- The senior debt in the project financing has a minimum senior DSCR of 1.70x over the life of the project debt.
- The OPBA (assessed according to "Project Finance Operations Methodology") is a '5'. (Note: The OPBA is always the same for each class of debt in the project structure.)
- Based on the operations methodology, this would map to an operations phase SACP of 'bbb', as shown in table 15 of "Project Finance Operations Methodology." We have provided this as table 5 in this example. In this example, it is assumed no adjustments per paragraphs 66-95 in the operations criteria apply. In example 2, we make adjustments to the subordinated SACP during operations because of the downside analysis.
- The construction phase SACP is 'bbb-'.
- The operations phase SACP is 'bbb'.
- The minimum total DSCR (senior debt service plus subordinated debt service) is 1.20x.
- A senior lock-up ratio is present in the structure and is 1.21x.
### Derivation Of The Subordinated SACP (Assumes No Adjustments Apply To The Subordinated SACP In Operations Due To The Downside)

<table>
<thead>
<tr>
<th>Steps</th>
<th>Explanation</th>
<th>Criteria references</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Calculate the minimum total DSCR for the senior plus subordinated</td>
<td>Based on the assumptions above, the minimum DSCR for senior plus subordinated debt is 1.20x, and the minimum for DSCR for senior debt service is 1.70x.</td>
<td>Framework criteria, paragraph 42, first bullet</td>
</tr>
<tr>
<td>debt service and the minimum DSCRs on senior debt service.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Divide the forecast minimum DSCR for senior debt service by the</td>
<td>1.70x/1.21x = 1.40x</td>
<td>Framework criteria, paragraph 42, second bullet</td>
</tr>
<tr>
<td>senior lock up trigger.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Take the lower of the:</td>
<td>The minimum total DSCR for senior plus subordinated debt is 1.20x, and the minimum senior DSCR derived in step 2 is 1.40x.</td>
<td>Framework criteria, paragraph 42, third bullet</td>
</tr>
<tr>
<td>• Minimum total DSCR for senior plus subordinated debt, or</td>
<td>The lower of the two is 1.20x</td>
<td></td>
</tr>
<tr>
<td>• Minimum senior DSCRs divided by the lock-up test trigger derived in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>step 2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Apply table 15 of &quot;Project Finance Operations Methodology&quot; to the</td>
<td>1.20x DSCR and an OPBA of '5' maps to a 'bb' category assessment for the subordinated SACP during operations, as per table 15.</td>
<td>Framework criteria, paragraph 42, fourth bullet, see also table 15 and paragraphs</td>
</tr>
<tr>
<td>results derived in step 3 above to calculate the subordinated SACP</td>
<td></td>
<td>65-66 in operations criteria</td>
</tr>
<tr>
<td>during operations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) Adjust the subordinated SACP in operations.</td>
<td>A DSCR of 1.20x is at the lower end of the DSCR ranges in table 15, resulting in a one-notch adjustment to 'bb-'.</td>
<td>Framework criteria, paragraph 44, no other adjustments assumed for this example</td>
</tr>
<tr>
<td></td>
<td>No other adjustments are assumed in this example.</td>
<td></td>
</tr>
<tr>
<td>6) Derive the subordinated SACP by taking the lower of the:</td>
<td>• The subordinated SACP during construction is equal to the construction phase SACP ('bbb-', see assumptions above), minus one notch, or 'bb+'.</td>
<td>Framework criteria, paragraph 41</td>
</tr>
<tr>
<td>• Subordinated SACP during construction, or</td>
<td>• The subordinated SACP during operations is 'bb-', as per step 5 above.</td>
<td></td>
</tr>
<tr>
<td>• Subordinated SACP during operations (step 5).</td>
<td>• The lower of the two is 'bb-'.</td>
<td></td>
</tr>
<tr>
<td>7)</td>
<td>RESULT = Subordinated SACP is 'bb-'</td>
<td></td>
</tr>
</tbody>
</table>
Example 2

79. The following example shows how we derive the subordinated SACP when the downside case modifies the subordinated SACP in operations. The underlying assumptions used in this example are the same as in example 1, except for the following:

- The prior example is a simple version in which the subordinated SACP during operations is not adjusted by the downside analysis. In fact, in many cases, we would expect the subordinated SACP during operations to face adjustments for the downside.
- An example of how this would affect the results for this example is below.
- To simplify, we assumed no downside adjustments to the project SACP, and, as a result, steps 1-4 in table 3 are unchanged, and example 2 begins at step 5.

Table 4

<table>
<thead>
<tr>
<th>Steps</th>
<th>Explanation</th>
<th>Criteria references</th>
</tr>
</thead>
<tbody>
<tr>
<td>5) Adjust the subordinated SACP in operations</td>
<td>A DSCR of 1.20x is at the lower end of the DSCR ranges in table 15, resulting in a one-notch adjustment to 'bb' level (the operations phase SACP) to the project. Assume: • The subordinated SACP, even considering its dedicated reserves, is unable, due to lock ups, to survive the stress and would default in less than three years. • This outcome would cap the subordinated SACP in operations at 'b+'.</td>
<td>Downside analysis is outlined in the operations criteria, paragraphs 67-74</td>
</tr>
<tr>
<td>6) Derive the subordinated SACP by taking the lower of the: • Subordinated SACP during construction, or • Subordinated SACP during operations (step 5).</td>
<td>• The subordinated SACP during construction is equal to the construction phase SACP ('bb-', see assumptions above), minus one notch, or 'bb+'. • The subordinated SACP during operations is 'b+' as per step 5 above. • The lower of the two is 'b+'.</td>
<td>Framework criteria, paragraph 41</td>
</tr>
<tr>
<td>7)</td>
<td>RESULT = subordinated SACP is 'b+'</td>
<td></td>
</tr>
</tbody>
</table>
Table 5

Preliminary Operations Phase SACP

--Preliminary operations phase SACP outcome in column headers--

--Minimum DSCR ranges shown in the cells below*--

<table>
<thead>
<tr>
<th>OPBA</th>
<th>aa</th>
<th>a</th>
<th>bbb</th>
<th>bb</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>=&gt; 1.75</td>
<td>1.75-1.20</td>
<td>1.20-1.10</td>
<td>&lt;1.10§</td>
<td>&lt;1.10§</td>
</tr>
<tr>
<td>3-4</td>
<td>N/A</td>
<td>=&gt; 1.40</td>
<td>1.40-1.20</td>
<td>1.20-1.10</td>
<td>&lt;1.10</td>
</tr>
<tr>
<td>5-6</td>
<td>N/A</td>
<td>=&gt; 2.00</td>
<td>2.00-1.40</td>
<td>1.40-1.20</td>
<td>&lt;1.20</td>
</tr>
<tr>
<td>7-8</td>
<td>N/A</td>
<td>=&gt; 2.50</td>
<td>2.50-1.75</td>
<td>1.75-1.40</td>
<td>&lt;1.40</td>
</tr>
<tr>
<td>9-10</td>
<td>N/A</td>
<td>=&gt; 5.00</td>
<td>5.00-2.50</td>
<td>2.50-1.50</td>
<td>&lt;1.50</td>
</tr>
<tr>
<td>11-12</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>=&gt; 3.00x</td>
<td>&lt;3.00</td>
</tr>
</tbody>
</table>

*DSCR ranges include values at the lower bound, but not the upper bound. As an example, for a range of 1.20x-1.10x, a value of 1.20x is excluded, while a value of 1.10x is included. §In determining the outcome in these cells, the key factors are typically the forecasted minimum DSCR (with at least 1.05x generally required for the ‘BB’ category), as well as relative break-even performance and liquidity levels.

APPENDIX

A. Derivation Of The Subordinated Issue Credit Rating When No Operations SACP Exists

80. The following is an example of how we would assign an issue credit rating to subordinated debt in the rare instance that the senior secured debt in the project structure does not have an operations SACP (see table 6).

81. Such a situation is possible if the project issues both senior secured and subordinated debt, but the operational risk inherent in a project financing has been entirely shifted to a counterparty.

82. This could occur, for example, if an offtaker of a power plant project financing agrees to purchase all electricity generated at a fixed price (eliminating market risk), assumes all fuel price and procurement risk (through a tolling agreement or other), and pays the project irrespective of output produced (e.g., the project is not subject to any performance requirements). As per paragraph 15 of "Project Finance Operations Methodology," in such a case, we would not assign the project an operations phase SACP. Rather, the senior secured rating would be based on a credit estimate or rating on the offtaker.

83. To illustrate how we would assign the subordinated issue credit rating, assume the following:

- A project is rated at its inception, so we assess both the construction and operations phases in assigning a project finance issue credit rating and a subordinated issue credit rating.
- We begin by establishing the project finance issue credit rating that is assigned to the senior debt. If the offtaker of a project financing assumes all operational risk that would normally be project risk, an operations SACP would not apply because all project risks are shifted to a counterparty (in this example, the offtaker).
- As a result, the project finance issue credit rating assigned to the senior debt will be based on the lower of the construction SACP and our assessment of the credit quality of the offtaker. Assume the counterparty dependency...
assessment (CDA) for the offtaker is 'bbb-' based on the issuer credit rating on the offtaker and the construction SACP is 'bb+'. The project finance issue credit rating would be 'BB+' (the weak link result as shown in table 6). (Post-construction, the rating could be raised to 'BBB-', reflecting the CDA of the offtaker.)

- Next, to assign the subordinated issue credit rating in such a structure, we begin with assessing the construction SACP, which, by convention, is one notch below the construction SACP assigned to the senior most debt in the structure (see paragraph 41), or 'bb' in table 6.
- To determine the SACP applicable to the subordinated debt in the operations phase, we start with the project's operational phase business assessment (OPBA). Assume the project asset is a natural-gas fired power plant that we would view to have an OPBA of '5'.
- The consolidated debt service coverage ratio (e.g., considering the principal and interest obligations of both the senior and subordinated debt classes) is 1.20x. Using table 15 of "Project Finance Operations Methodology," this coverage maps to a 'bb-', which is the project's subordinated debt SACP during operations. For simplicity, assume there are no further adjustments to the project's subordinated SACP due to the downside, liquidity, transaction structure, GRE support, or full credit guarantees. The subordinated debt would have a 'bb-' SACP during operations, reflecting the consolidated debt service coverage and the asset's OPBA.
- The weak link of the subordinated SACP during construction and operations, therefore, is 'bb-', resulting in a subordinated issue credit rating of 'BB-', provided that the result is at least one notch lower than the project finance issue credit rating. In this example, if the debt service coverage for the subordinated class was stronger, for example, such that it mapped to a 'bb+', the weak link result for subordinated debt would be one notch lower, to be consistent with paragraph 38.

<table>
<thead>
<tr>
<th>Issue type</th>
<th>Construction phase SACP</th>
<th>Operations phase SACP</th>
<th>Counterparty dependency assessment</th>
<th>Weak link results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior secured debt</td>
<td>'bb+'</td>
<td>N/A</td>
<td>'bbb-'</td>
<td>'BB+'</td>
</tr>
<tr>
<td>Subordinated debt</td>
<td>'bb-'*</td>
<td>'bb-'§</td>
<td>N/A</td>
<td>'BB-'</td>
</tr>
</tbody>
</table>

*By convention, per paragraph 41, the subordinated SACP during construction is the construction phase SACP assigned to the senior class, less one notch. §Reflects a '5' OPBA and a 1.20x debt service coverage level under table 15 of "Project Finance Operations Methodology." N/A--Not applicable.

**B. GRE Rating Impact From Cross-Default And Debt Acceleration Linkages**

84. If a project is considered a GRE and a project's loan documentation could result in debt acceleration as a result of a cross-default clause, the resulting project rating under step 6 in chart 2 will be determined as follows.

85. In case the creditor is a commercial lender, a project issue credit rating, subject to mitigants under paragraph 33 of "Project Finance Transaction Structure Methodology," will be capped at the creditworthiness of the weakest entity referenced by the cross-default clause. This is the same treatment as projects that are not GREs under paragraph 33 of the transaction structure methodology.

86. If the creditor is a development bank (see "Project Finance Transaction Structure Methodology"), which, in turn, is owned and controlled by the same government providing potential extraordinary government support to the GRE project, we expect the government to have a strong incentive to mitigate or remedy the cross-default clause on a timely basis, if the government support status is "strong enough." By "strong enough," we mean the government...
support for the GRE project is "high" or stronger ("almost certain," "extremely high," "very high," or "high") as defined under "Rating Government-Related Entities: Methodology And Assumptions." In such cases, the issue credit rating on the project will be determined by using the project's SACP (or subordinated SACP, if applicable) as the reference point for applying the GRE criteria after factoring in constraints under "Project Finance Transaction Structure Methodology," as illustrated in step 5 in chart 2. If the government support status is "moderately high," "moderate," or "low," under the GRE criteria, we will determine the issue credit rating on the project by using the project's SACP (or subordinated SACP, if applicable) as the reference point for applying the GRE criteria, and we would apply the constraints identified in paragraphs 33-35 of "Project Finance Transaction Structure Methodology."

GLOSSARY

Abatement
A reduction in the fee paid (revenues) to a concession for failing to meet certain key performance indicators (KPIs).

Acceleration or acceleration rights
Acceleration or acceleration rights are document clauses that are typically included in debt agreements (such as loans, bonds, and notes). They give the lender the right to demand the entire loan amount (principal plus interest) to be paid at once, in case the borrower fails to make payments (defaults) or gets into serious financial difficulties, or as a result of specified events of default within a projects transaction documents.

Accreting debt
A capitalizing instrument or program in which interest is added to principal according to a formula (e.g., inflation linked rather than being paid). It moves debt service to later periods in the project's life.

Ancillary services
Services that power plants provide to an electrical transmission system to help support the stable functioning of that system.

Arms-length agreement
An agreement between the project and a related party that is constructed as if they were unrelated. All documentation, terms (including consideration), and other arrangements associated with the transaction are as if an external unrelated party had been involved in the transaction.

Asset class operations stability
Standard & Poor's relative measure of a project's ability to be available to operate on a stable basis.

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

Asset protection
Typically measured by debt leverage, but generically, the value of the asset (measured a variety of ways) relative to the financial debt burden.
Availability-based projects
Projects are typically governed by a contract(s) between the project, a government or nongovernment entity, and commercial counterparties, where the project’s revenue is contractually established based on the achievement of KPIs, output specifications, and other market-related variables (such as inflation movements) stipulated in the contract. Typically, the vast majority of social infrastructure, accommodation, and entertainment projects structured as public-private partnerships would fall under this category.

Availability factor
An operating performance measure, typically equal to the number of hours in a period that a plant is available to produce output, divided by the number of hours in the period.

Availability period
The period of time during which the debt is available for advance.

Availability power projects
A type of project financing where receipt of payment is conditional on the project being available to operate even if it is not actually required to operate. Availability can be reduced through breakdowns, the project being taken off line for maintenance, or breaches of health and safety requirements.

Balance of plant
Essentially all of the nonpower island components that are required to support production and delivery of electricity.

Balloon payment
The principal balance due at maturity for a debt instrument that does not pay principal on a fully amortizing basis and, therefore, requires refinancing.

Base case
See "Project Finance Operations Methodology" and "Project Finance Construction Methodology."

Basis differential
The price of a commodity measured at two different delivery points.

Breakeven
A level of performance or market price (or quantity) that results in cash available for debt service being equal to scheduled debt service for a period or, where appropriate, to a financial covenant level.

Brownfield project
A project that is being developed on an existing site and, thus, benefits from or is constrained by existing infrastructure.

Bullet payment or maturity
Debt structures that pay only interest during the tenor of the debt; the full principal amount is payable at maturity.

Business interruption insurance
Insurance that covers lost cash flows for a specified period after a breakdown, subject to a deductible period and cap.
Capacity factor
A ratio of actual output to maximum potential output.

Capacity flywheel
A mechanical device typically consisting of a large flywheel that is used to store electric energy in the form of kinetic energy.

Cash flow available for debt service (CFADS)
CFADS for a period is calculated strictly as operating revenues less operating and maintenance expenses (defined later). As an operating cash-flow number, 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.

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 with revenue from operations typically applied in the following order: expenses necessary for the ongoing operation of the business (operating expenses), including taxes, ongoing maintenance, and lifecycle costs, management fees, and trustee fees, then as follows:

- 1. Senior debt interest
- 2. Scheduled senior debt principal
- 3. Senior debt reserve, accounts replenishment, LOC fees
- 4. Subordinate debt interest (provided any senior debt distribution test is passed)
- 5. Subordinate debt principal
- 6. Subordinate debt reserve account replenishment
- 7. Growth capital expenditures
- 8. Distributions to equity, provided any applicable distribution test and distribution conditions are passed

Cash management
Cash management refers to the management of a project’s financial activities, including account management, the allocation of operating revenue and other cash flows under a project’s waterfall, liquidity, and covenant and debt service management.

Collecting solar plant
A type of power plant in which sunlight is reflected off of solar panels and concentrated to a tower to heat up a fluid that is used to drive electric generation equipment.

Combined cycle gas turbine (CCGT) plant
A power plant that uses exhaust heat from a CT to heat water and create steam, which is then fed into a steam turbine to produce electricity.
Combustion turbine (CT) plant
A natural gas fired combustion turbine.

Commissioning
The act of testing and starting up a project that is at the end of construction consistent with long-term operational conditions.

Completion
The set of conditions that must be satisfied before construction of a project is considered complete under its construction agreements.

Completion test
The testing scheme defined in construction contracts that is used to determine whether the project meets required operational performance.

Concession agreement
An agreement between a government entity and a project, whereby the government grants the project the right to build and operate an asset for a specific period of time. The concession agreement may involve a payment from the government entity to the project for providing a service, or it may allow the project the right to capture revenues from third parties for providing a service.

Conditions precedent to drawdown (CP)
A set of conditions that must be completed before a drawing can be made under a bank loan.

Contingency
An allowance dedicated to help cover unexpected construction or operating costs. Contingency is often included in construction contracts and within the project budget and is typically in the form of cash or a letter of credit. Our analysis would typically only rely on contingencies that would be available to the project upon a termination of the construction contract.

Contractually obligated income (COI)
Contractually obligated income is revenue generated by a stadium or arena under the terms of a multiyear contract agreement. The agreements may be short term to medium term—from three years to 30 years. Products such as suites and naming rights are generally considered COI.

Conversion efficiency
A measure of a power plant’s efficiency in converting fuel to electricity. A lower heat rate is more favorable than a higher heat rate.

Cost to complete test
A calculation to determine whether the project can be completed within budget and on time. Such a test usually triggers the release of construction support, and the loan becomes typically fully nonrecourse. The test can set terms of offtake and payment to the builder.
Counterparty dependency assessment (CDA) (shortened definition from “Project Finance Construction And Operations Counterparty Methodology”)
Standard & Poor’s assessment of the risk a counterparty poses to a project financing takes into account the credit quality of the counterparty; any credit enhancement; factors that may increase or decrease risk in the context of the credit 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'. Standard & Poor’s uses lowercase letters for CDAs to indicate that they are not ratings per se. We refine the CDAs by using plus and minus signs to graduate the scale in the same way we do for ICRs.

Country risk
Standard & Poor’s uses the term "country risk" to mean the wide variety of economic, institutional, financial market, and legal risks that arise from doing business in a specific country and can affect credit quality. Some elements of country risk may be mitigated by project finance structures, while others, such as the legal system and strength or weakness of institutional features, that underpin it may increase or decrease the risk faced by a project financing.

Credit enhancement
Third-party support supplied to a project from a contractor that, in these criteria, can be used to cover the cost of replacement of a failed contractor or to cover immediate cash costs while other remedies are pursued. The form is normally an unconditional, irrevocable, letter of credit payable on demand.

Credit foncier style
A type of loan, structured with regular, usually monthly, repayments that incorporate principal and interest.

Credit substitution
Where one party substitutes its credit for that of another(s).

Critical path
The sequence of construction activities that must be completed on schedule to achieve substantial completion on schedule. A delay in completion of a critical path item will lead to an equal delay in substantial completion. A project may have more than one critical path.

Debt balance
The amount of debt outstanding at a point in time, adjusted to include the present value of accreting debt, if any.

Debt-like obligations
Liabilities or obligations, such as a loan or equivalent, that are serviced, paid, or capitalized. They are typically contractual in form or nature and include loans, 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 per kilowatt
A measure of valuation of a power plant in some market, equal to the debt outstanding divided by the operating kilowatt capacity of the plant.
Debt service coverage ratio (DSCR)
A measure of financial performance for a scheduled debt servicing period that is equal to CFADS divided by scheduled debt service.

Debt service reserve account (DSRA)
A liquidity reserve that can be used to pay debt service in the event that CAFDS is not sufficient to pay debt service. The DSRA is usually in the form of cash or a letter of credit and mitigates cash flow loss from temporary project outages or unexpected expenses.

Defects liability
The construction contractor’s liability for construction defects.

Design and construct (D&C)
A type of construction contract.

Direct costs
Specific costs that can be associated with a particular activity, including equipment and supplies, salaries, and travel, directly benefiting the project.

Dispatch level
The amount of time a plant is operational or called on to operate by an offtake or market administrator.

Distribution test (also known as a "lock-up" test)
A test that must be passed before cash balances can be used to satisfy cash flow priorities lower 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.

Downside case
The market downside case coupled with project-level operating stresses, and macroeconomic and financial stresses.

Embedded loans
Loans that are embedded in swaps and may cross default to senior debt.

Energy margin
Revenue from the sale of electricity less the cost of fuel used to produce it.

Engineering, procurement, and construction (EPC)
A type of construction contract.

Engineering, procurement, and construction management (EPCM)
A type of construction contract.

Escalation
The growth in cost or price between two periods of time, typically annually.

Feed-in tariff
A type of offtake arrangement in which a project is able to earn a revenue stream by simply feeding its production into
the electric system. The feed-in tariff can be paid in the form of a contract (such as in Canada) or through tariff agreements between power customers and regulatory agencies.

**Feedstock**
A raw material or feedstock used in the production of goods, finished products or intermediate materials that are themselves feedstock for an industrial process or finished products. The term "raw material" is typically used to denote material that is in an unprocessed or minimally processed state.

**Financial close**
The date at which the project's financing documents are executed and CPs have been satisfied or waived for the initial drawdown.

**First fill**
The supply of materials sufficient to fill the plant for a full run.

**Fit for purpose**
A contract by which the contractor agrees that the design will meet the project's operating requirements.

**Force majeure (expanded definition from "Project Finance Construction Methodology")**
A set of conditions, defined under the project contracts, under which a party to a contract is excused from meeting its obligations under the contract. These conditions are usually events beyond the party's control, are difficult to predict, and can disrupt a project's operations and devastate its cash flow. Typical conditions include events defined in each document (such as fire, floods, earthquakes, and freezing weather; civil disturbances such as strikes; and government actions such as change of law). In addition, catastrophic mechanical failure due to human error or material failure can be a form of force majeure that may excuse a project from its contractual obligations.

**Government-related entities (GREs)**

**Greenfield project**
A project that is being developed on a site where no existing operations or prior operations have been conducted.

**Hard facilities management**
Planned and reactive maintenance of the building fabric and fixed mechanical and electrical systems. This typically includes energy and water management, maintenance of building systems such as heating and hot water, and planned maintenance within a building such as routine repainting of walls.

**Heat rate**
A type of conversion efficiency measure for a power plant determined by the amount of energy used to generate one kilowatt-hour (kWh) of electricity. This heat rate is typically measured as million British thermal units (Btu) per kWh generated.

**Independent experts (IEs)**
An expert that is independent of the sponsors and contractors and reports to debt investors on its review of the accuracy and viability of the sponsors' plans and projections.
**Indirect costs**
Costs incurred by the project that cannot be identified specifically with a particular activity, such as administrative costs or insurance.

**Integrated gasification combined cycle (IGCC) plant**
A plant that converts a feedstock to synthetic natural gas that is used to fuel natural gas combustion turbine.

**Interest expense**
Interest expense in the period includes the interest component of financial leases and assumed interest (received or paid) under any swaps or derivative contracts, and it excludes interest earned on deposits. Where accreting debt is present, two interest numbers are calculated: one on the basis of cash interest and the other including the amount that would have been paid assuming no accretion.

**Joint and several obligation**
An obligation of two or more parties for which each party is equally liable for payment or performance.

**KPI**
Key performance indicator.

**Latent defects**
As used in a construction contract, normally means a potential risk (for example, contamination) that may already be present but has not been identified. The cost of rectifying latent defects often is a project cost rather than a constructor cost.

**Liability cap**
Maximum liability for nonperformance established under a contract.

**Lifecycle**
Major maintenance requirements at a point in the life of an asset that allow it to operate efficiently for the reminder of the expected life.

**Limited recourse**
Under certain conditions, the project's lenders have recourse to the sponsors that is limited in both conditions and amount.

**Limited-purpose entity (LPE)**
An entity that meets or exceeds the minimum requirements set out in "Project Finance Transaction Structure Methodology," published Sept. 16, 2014.

**Liquidated damages (LD)**
Amounts defined in contracts that a contractor will pay in the event that an agreed on performance requirement has not been met.

**Loan life cover ratio (LLCR)**
A measure of financial gearing, 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.
**LOC**
Letter of credit.

**Long-term service agreement (LTSA)**
An agreement in which a contractor will typically take the risk of certain major maintenance activities and related costs in exchange for an annual fee. The LTSA tenor is often variable, based on the operating profile of the project.

**Maintenance capital expenses**
Expenses incurred for major maintenance of existing infrastructure and the development of new infrastructure. These expenses are included in operations and maintenance expenses but may be identified as different from routine maintenance works.

**Maintenance reserve account (MRA)**
A reserve that is used to fund major maintenance expenses and that is typically funded over time prior to the moment of use.

**Managed fund**
A professionally managed investment portfolio that individual investors can buy into, typically through the purchase of units rather than shares. Each managed fund has a specific investment objective or mandate. This is usually based on the different asset classes, such as cash, fixed interest, property infrastructure, and shares. In the U.S., a managed fund is often referred to as a mutual fund, while in other countries, such as the U.K., they are referred to as an investment trust or investment fund.

**Managed lanes**
A tolled lane or set of lanes that is adjacent to a free or general purpose lane. Toll rates are variable and adjusted depending on the speed and volume of the traffic and congestion on the managed lane with the goal of maintaining free-flowing traffic. Examples of managed lane projects include high-occupancy vehicle lanes, high-occupancy toll lanes, and exclusive or special-use lanes.

**Market downside case**
Reflects our expectations for a project's performance under trough market conditions, consistent with the 'BBB' stress scenario defined in our general criteria ("Understanding Standard & Poor's Rating Definitions," published June 3, 2009) and generally defined as the worst market conditions we would expect over a 20-year period.

**Market exposure**
Measures the expected volatility of a project's CFADS from our projected base case to the market downside case due to price changes or volume fluctuations or both.

**Market-implied heat rate**
The market price of power in a particular region divided by the market gas price (including transportation) for that region. The measurement unit for market heat rate is British thermal units per kilowatt-hour (Btu/kWh). The market heat rate reflects the thermal efficiency of the generation plant deemed to be the marginal unit for the time period being measured. The market heat rate is different from a power plant's heat rate.
Maximum annual debt service (MADS)
An amount equal to the largest annual debt service payment of principal and interest scheduled over the debt tenor.

Merchant project
A project that lacks offtake agreements for its production or service, which exposes the project's revenue to volume sale and price risk.

Milestone
Dates or events that mark the progress of construction and are normally related to payments.

Nonrecourse
Lenders have access to a project's cash flows and collateral security to satisfy their claims as the only means of paying debt service.

O&M operator
A contractor that performs for a project routine operations and maintenance and sometimes major maintenance.

Offtaker
A party that contractually agrees to take the product of the project under a contract.

Opening debt balance
The balance of debt at the start of a calculation period.

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

Operating and maintenance reserve account (O&MA)
A reserve that is used to fund routine operating and maintenance expenses and is typically funded over time prior to the moment of use.

Operating margin
Operating profit divided by total revenue, which is commonly used in hotel projects.

Operating revenues
Project cash revenues that consist of cash receipts from normal operations for the period. These amounts exclude (all on a cash basis) interest earned on cash deposits, capital revenues such as capital subsidies and sales of assets, and any proceeds from insurance payments, borrowed funds, or equity contributions.

Operations phase business assessment (OPBA)
Standard & Poor's assessment of a project's performance, market, and country risks during the operations phase.

Parent
Parent is synonymous with owner, shareholder, or equityholder of a project. This differs from a sponsor, who is the proponent of a project but may not be the parent.
Peaking plant
A type of power plant designed to operate during periods of peak demand.

Performance bonding
Third-party support supplied to a project from a contractor in case of nonperformance or insolvency to cover cash costs while other remedies are pursued. The project may also be required to supply performance bonds to its suppliers or offtakers.

Physical completion (also known as mechanical completion)
The point at which a project is mechanically and structurally complete but not yet operating and generating revenue. Typically, at this point, completion testing begins.

PJM
The Pennsylvania, New Jersey, and Maryland administered power market.

Power island
The main components that produce electricity, usually the turbine (hydro, steam, and combustion), boilers, and generator components and the buildings that house them.

Power purchase agreement (PPA)
A form of offtake contract for power plants that is composed of an availability fee that typically covers specified fixed costs, including debt service. This fee is typically paid to the project subject to the project meeting and passing minimum availability standards. In addition to the availability fee, an energy fee is also typically paid that covers the variable costs of generating electricity. Typically, the fuel price is borne by the offtaker and the conversion risk by the project. The fee typically includes either an energy delivered and capacity payment or just an energy delivered payment.

Preliminaries
Construction costs related to time, such as craneage, offices, and fencing. These costs increase if there is a schedule delay and are often owner costs.

Principal expense
For a period, when a revolver draw is repaid, the principal expense included as principal expense will be no more than the amount drawn from the revolver. For a period, 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.

Probability of exceedance
A forecast of the probability that a power plant's production will exceed a specified amount in a defined time period, typically one year.

Project debt
In addition to bank or bond debt take-or-pay contracts, leasing, hedging, and swaps are included as project debt.
**Project documents or transaction documents**
Project documents are the set of documents that fully define the project and its legal, financial, and operating constraints. They can include formation documents for the project entity; credit documents, such as the indenture, intercreditor agreement, and hedging agreements; documents defining interactions with counterparties, such as construction contracts, operating agreements, and offtake agreements; and offering documents for project debt and third-party consultant reports, such as traffic reports and our independent engineering reports. The set of project documents fully defines the project and sets important limitations (such as on additional debt).

**Project finance issue credit rating**
The rating assigned to senior secured debt or debt-like obligations in the project finance structure.

**Project life cover ratio (PLCR)**
A measure of financial gearing, the PLCR measures the present value of CFADS from a specified point in time until the end of the project's life, discounted at the cost of debt divided by the debt outstanding at that point.

**Project**
A project is a limited-purpose operating business structure that comprises one or more LPEs that in combination form a project finance transaction structure. This includes all wholly or partly owned subsidiaries of any LPE in the project.

**Public-private partnership (PPP), also known as a P3 or a private finance initiative (PFI)**
This type of project usually involves a private entity that is financing, constructing, and operating public-sector infrastructure.

**Punchlist**
A list of minor construction tasks remaining after substantial completion that documents the work by the contractor that was incomplete or that did not meet specifications.

**Ramp-up**
The period between commencement of operations and achievement of steady-state operations.

**Real toll**
The toll that a project collects directly from the project user. Sometimes referred to as a "user pay" model.

**Relief events**
As defined in the project contracts, cover variations, breach of contract, and risks not allocated to the supplier in the risk allocation schedule. Whenever a relief event occurs, the parties must try to reach agreement on the time and the cost implications. If they fail to do so, the dispute resolution procedure can be applied.

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

**Reserve margin**
For a power market, the amount of power plant capacity in excess of the capacity that is expected to meet demand to mitigate unexpected demand for power, plant outages, or other events.
Retentions
Amounts that are held back under a construction contract from amounts payable and are used in lieu of providing credit enhancement in some circumstances.

RevPAR
Average daily room revenue generated per available hotel room and calculated as room revenues divided by available rooms.

Right of way
The right of the project to use a specific section of land or property, such as a roof.

Run of river hydro plant
A type of hydro power plant located along a river that uses river water to generate electricity.

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).

Senior lock-up test
A cash flow coverage test (typically a debt service coverage ratio 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 equityholders. 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.

Several or several obligation
An obligation of two or more parties for which each party is only liable for its share of payment or performance.

Shadow toll
The toll a project is paid by a government agency based on the number of vehicles rather than paid by users directly.

Sinking fund
A fund into which a project will set aside cash to help meet all or a portion of future debt service on typically large financial obligations.

Soft facilities management
Services provided to ensure staff working in a building may work in a safe, clean, and productive environment. This typically includes cleaning, grounds maintenance, portering, security, pest control, and catering services.

Solar photovoltaic plant
A solar project using conventional solar panels made of crystalline silicon solar cells.

Solar thin film plant
A solar project using solar cells made by depositing one or more layers of photovoltaic materials on a substrate.

Sovereign credit risk
The risk that a sovereign government will default, according to Standard & Poor's definitions, on its foreign or local currency debt.
**Sponsor**
A party that is developing or financing a project. A sponsor may or may not be an equity participant in the project.

**Step-in rights**
Lenders or offtaker rights under predetermined circumstances, where lenders or offtakers can step into the shoes of management to operate the project.

**Structural subordination**
Structural subordination is when the issuer of the debt is not the immediate beneficiary of the project's cash flow and assets—for example, the project company is a parent company of the issuer.

**Subordinated debt**
Standard & Poor's views subordinated debt as ranking junior to the existing rated debt, such that additional debtholders would not be expected to be able to successfully pursue remedies against collateral securing existing rated debt. In payment terms, subordinated debt should rank after service of both project senior debt principal and interest, and after any replenishment of senior project debt protections, such as reserve accounts. Nonpayment of subordinated debt should not result in an ability to accelerate the debt or otherwise act on the default while the project debt is outstanding.

**Subordinated issue credit rating**
The rating assigned, if present, to subordinated debt or debt-like obligations in a project structure.

**Substantial completion**
A set of conditions that must be met for a project to be considered substantially complete under the construction arrangements. The key conditions usually require that the project is fully operational and has met all completion tests, leaving only a well-defined set of minor punchlist items to complete.

**Sunset date, also known as a long-stop date**
The date on which a contract can be terminated if contractual obligations have not been met.

**Supercritical coal plant**
A coal plant that operates with much higher pressure and temperature than a conventional coal plant.

**Tail period**
The period between the last debt service payment and the end of concession, asset life, or other offtake agreement. In mining projects, a reserve tail is an amount of reserves after repayment of debt.

**Take-or-pay contract**
A type of offtake contract, where the offtaker agrees to pay for a project's production, whether or not the offtaker actually takes the production.

**Term loan B**
A form of high-yield lending typically from institutional investors where quarterly repayment terms include interest and a specific but small portion of principal, resulting in a balloon maturity. Term loan Bs often have cash flow sweeps.
Third-party income
Noncontractual income generated by an availability-based project. This may include revenues generated by leasing out school facilities outside of school hours or revenues generated by retail facilities in hospitals.

Tolling agreement
A type of offtake contract for which a counterparty pays a project to convert a feedstock into a product at a defined efficiency rate. Typically, the feedstock is supplied by the counterparty.

Top tier (also "very experienced")--refers to "Project Finance Construction Methodology"
Generally recognized by their industry or project location.

Transfer and convertibility risk
The risk that an entity will not be able to convert and transfer local currency into foreign currency to service its debt. Standard & Poor's reflects this risk in its T&C assessments.

Turnkey construction contract
A type of construction contract in which a contractor agrees to deliver an asset that is ready for use. In addition to the risk of building a project within budget and on schedule, the contractor assumes the risk that the plant will perform as designed and agrees to compensate the project for an amount related to the present value of the underperformance for the life of the project. In effect, the contractor needs only to turn over the keys at the end of construction.

Variation (also known as change order)
A change to the design or component leading to a payment claim by the construction contractor for additional funds to cover the cost of the change.

Volume based
Volume-based projects have been structured in accordance with project finance criteria and operate in a competitive environment whereby the project accepts volume or price risk, and revenues are either received directly from users of the facility or payments are made by a contracted counterparty based on performance and contracted prices. As with availability projects, the majority are structured as P3s because the facility is typically owned by a government and the commercial counterparty operates the facility under the terms of the contract.

Weak link (expanded definition from "Project Finance Construction Methodology")
A weak link means that the rating on project finance debt is rated the lower of any of the following: its own credit quality, the creditworthiness of the parent if the project is linked or capped due to a transaction structure weakness, the CDA of the counterparty, the construction phase SACP, or the operations phase SACP.

**RELATED CRITERIA AND RESEARCH**

**Related Criteria**
- Project Finance Transaction Structure Methodology, Sept. 16, 2014
- Project Finance Operations Methodology, Sept. 16, 2014
- Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings, Sept. 16, 2014
- Key Credit Factors For Road, Bridge, And Tunnel Financings, Sept. 16, 2014
Criteria | Corporates | Project Finance: Project Finance Framework Methodology

- Key Credit Factors For Oil And Gas Project Financings, Sept. 16, 2014
- Key Credit Factors For Power Project Financings, Sept. 16, 2014
- Corporate Methodology, Nov. 19, 2013
- Ratings Above The Sovereign--Corporate And Government Ratings, Nov. 19, 2013
- Project Finance Construction Methodology, Nov. 15, 2013
- Timeliness Of Payments: Grace Periods, Guarantees, And Use Of 'D' And 'SD' Ratings, Oct. 24, 2013
- Europe Asset Isolation And Special-Purpose Entity Criteria--Structured Finance, Sept. 13, 2013
- Guarantee Criteria--Structured Finance, May 7, 2013
- Methodology And Assumptions: Assigning Ratings To Bonds In The U.S. Based On Escrowed Collateral, Nov. 30, 2012
- Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings, Oct. 1, 2012
- Project Finance Construction And Operations Counterparty Methodology, Dec. 20, 2011
- Rating Government-Related Entities: Methodology And Assumptions, Dec. 9, 2010
- Methodology: The Interaction Of Bond Insurance And Credit Ratings, Aug. 24, 2009
- Understanding Standard & Poor's Rating Definitions, June 3, 2009
- Methodology: Criteria For Determining Transfer And Convertibility Assessments, May 18, 2009
- Update: Jurisdiction-Specific Adjustments To Recovery And Issue Ratings, June 20, 2008
- 2008 Corporate Criteria: Analytical Methodology, April 15, 2008
- Credit Enhancements (Liquidity Support) In Project Finance And PPP Transactions Reviewed, March 30, 2007
- Defeasance Of Corporate Bonds May Be Gaining Popularity, July 25, 2006

**Superseded Criteria**

The following criteria are superseded or partially superseded by this criteria article.

- Request For Comment: Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Road, Bridge, And Tunnel Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Oil And Gas Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Power Project Financings, Dec. 16, 2013
- Request For Comment: Project Finance Framework Methodology, Nov. 15, 2013
- Request For Comment: Project Finance Transaction Structure Methodology, Nov. 15, 2013
- Request For Comment: Project Finance Operations Methodology, Nov. 15, 2013
- Methodology For Forecasting Operating Assumptions For The U.S. Merchant Power Sector, March 15, 2013
- Project Finance: Summary Of Standard & Poor's Criteria Methodology For Refinancing Risk In PPP/PFI Projects, Oct. 28, 2009
- Project Finance: Key Credit Factors: Methodology And Assumptions On Risks For Utility-Scale Solar Photovoltaic Projects, Oct. 27, 2009
- Project Finance: Key Credit Factors: Methodology And Assumptions On Risks For Concentrating Solar Thermal Power Projects, Oct. 27, 2009
- Project Finance: Updated Project Finance Summary Debt Rating Criteria, Sept. 18, 2007
- Recovery Ratings For Project Finance Transactions, April 8, 2005
- Utilities: Are European Wind Power Projects On Their Way To Investment Grade?, Nov. 11, 2003
- Project Finance: Criteria For Special-Purpose Entities In Project Finance Transactions, Nov. 20, 2000
87. These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.
TRANSACTION STRUCTURE CRITERIA

Project Finance Transaction Structure Methodology

Credit FAQ: An Overview Of Standard & Poor’s Criteria For Assessing Project Finance Transaction Structure
Criteria | Corporates | Project Finance:

Project Finance Transaction Structure Methodology

Primary Credit Analysts:
Michela Bariletti, London (44) 20-7176-3804; michela.bariletti@standardandpoors.com
Pablo F Lutereau, Buenos Aires (54) 114-891-2125; pablo.lutereau@standardandpoors.com
Trevor J D’Olier-Lees, New York (1) 212-438-7985; trevor.dolier-lees@standardandpoors.com

Secondary Contacts:
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com
Paul Judson, CFA, Toronto 416-507-2523; paul.judson@standardandpoors.com
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Anne C Selting, San Francisco (1) 415-371-5009; anne.selting@standardandpoors.com

Global Chief Credit Officer:
Ian D Thompson, London (44) 20 7176 3395; ian.thompson@standardandpoors.com

Global Criteria Officer, Corporate Ratings:
Mark Puccia, New York (1) 212-438-7233; mark.puccia@standardandpoors.com

Criteria Officer, Asia-Pacific:
Andrew D Palmer, Melbourne (61) 3-9631-2052; andrew.palmer@standardandpoors.com

Criteria Officer, EMEA, Corporate Ratings:
Peter Kernan, London (44) 20-7176-3618; peter.kernan@standardandpoors.com

Table Of Contents

SCOPE OF THE CRITERIA
SUMMARY OF THE CRITERIA
IMPACT ON OUTSTANDING RATINGS
EFFECTIVE DATE AND TRANSITION
METHODOLOGY
Table Of Contents (cont.)

A. Parent Linkage Analysis
B. Structural Protection Analysis
C. Additional Structural Elements

APPENDIX

A. Changes From Request For Comment
B. Cash Management Controls And Financial Analysis

RELATED CRITERIA AND RESEARCH
Criteria | Corporates | Project Finance:

Project Finance Transaction Structure Methodology

1. Standard & Poor's Ratings Services has updated its methodology and assumptions for assessing transaction structure risk related to project finance globally. This follows our request for comment, "Request For Comment: Project Finance Transaction Structure Methodology," published Nov. 15, 2013.

2. The criteria are intended to enhance the comparability of our project finance issue credit ratings with ratings in other sectors (see "Understanding Standard & Poor's Rating Definitions," published June 3, 2009) and to increase the transparency about how we assign project finance issue credit ratings. The criteria constitute specific methodologies and assumptions under our "Principles Of Credit Ratings," published Feb. 16, 2011.

3. The criteria supersede our currently applicable criteria for assessing transaction structure risk in project financings (see "Updated Project Finance Summary Debt Rating Criteria," Sept. 18, 2007, and "Criteria For Special-Purpose Entities In Project Finance Transactions," Nov. 20, 2000), as well as other related articles. For a comprehensive list of the project finance criteria that are superseded by these criteria, see the "Superseded Criteria" section at the end of this article.

4. This criteria article is one of five that constitute our methodology for rating project finance issues. The other four are:

   - Project Finance Framework Methodology, Sept. 16, 2014;
   - Project Finance Operations Methodology, Sept. 16, 2014;
   - Project Finance Construction Methodology, Nov. 15, 2013; and

5. A project finance transaction structure is a limited-purpose operating business structure that consists of one or more limited-purpose entities (LPEs) that can collectively undertake construction and operation of assets. The common characteristic of limited-recourse transactions, such as project financings, is that debtholders can only use a project's cash flows for the servicing and repayment of the project's debt.
SCOPE OF THE CRITERIA

6. These criteria apply to all new and existing project finance issue credit ratings.

SUMMARY OF THE CRITERIA

7. A project finance transaction structure provides a governance framework that determines the scope of a project's operations and the type of business and financial risks it can incur. Our analysis of the transaction structure informs our opinion about how a project's senior debt lenders are protected from the credit risk pertaining to its parent(s), maintains a single purpose status, and limits additional debt.

8. In addition, in the criteria, we:

- Distinguish the role of the transaction structure in providing protection to the project's senior debt lenders;
- Clarify the role of the transaction's structural provisions that cover all the entities that are part of the project financing, including the asset-owning company, the debt-issuing entity, and any other project companies (see chart 3);
- Assess the credit risks associated with transaction structures; and
- Define how the structural elements are included in the analysis of the project SACP.

9. The criteria set out a multistep process (see chart 2) for assessing a transaction's structural elements and factoring the risks posed by the transaction structure into the project SACP. We assess:

- Whether the transaction structure meets the minimum elements to be analyzed under these criteria (see paragraph
The degree to which the credit quality of the project is linked to that of its parent(s) to determine whether the project finance is de-linked from, linked to, or capped by its parent(s)’ creditworthiness;

- The extent to which the transaction structure protects the credit quality of a project through the LPE covenants and cash management covenants to determine whether the project’s structural protection package is neutral, fair, or weak; and

- Additional structural elements to determine the impact of structural and contractual subordination and LPE’s prior existence.

Chart 2

Framework For Assessing Transaction Structure

- Does the transaction structure have the minimum elements?
  - Independent limited-purpose entity (LPE) legal structure
  - First-ranking collateral package over the business undertaking or concession
  - LPE’s covenants
  - Cash management covenants

- Yes

- No Project finance criteria do not apply

A. Parent Linkage Analysis
- The presence of independent directors (or equivalent anti-filing mechanism) (paragraphs 29-32)
- No cross-default provisions (paragraphs 33-36)
- No ability to merge or reorganize (paragraph 37)
- Limitations on amendments to organizational documents (paragraphs 38-39)
- Project’s separateness from its parent(s) (paragraphs 40-45)
- Security interests over the project’s assets (paragraphs 46-52)
- The existence of parent dependencies (i.e., contracts with parents, taxes, insurance) (paragraphs 53-56)

B. Structural Protection Analysis
- LPE’s covenants
  - i) Limitations on additional debt (paragraphs 65-68)
  - ii) Limitations on additional security to third parties (paragraph 69)
  - iii) Limitations on asset sales (paragraph 70)
  - iv) Minimum insurance requirements (paragraph 71)
- Cash management covenants
  - i) Cash flow protection and waterfall (paragraph 75)
  - ii) Liquidity and reserves (paragraph 76)
  - iii) Use of insurance proceeds (paragraph 77)
  - iv) Distribution test (paragraph 78)

C. Additional Structural Elements
- Structural and contractual subordination (paragraph 79)
- Prior existence (paragraph 80)
IMPACT ON OUTSTANDING RATINGS

10. These criteria, in and of themselves, do not result in any rating changes. (See "Project Finance Framework Methodology" for the rating changes related to the project finance criteria as a whole.)

EFFECTIVE DATE AND TRANSITION

11. These criteria are effective immediately. We intend to complete our review of all project finance issue credit ratings within the next six months.

METHODOLOGY

12. A project finance transaction structure is a limited-purpose operating business structure that comprises one or more LPEs. These, combined, are the "project" (see chart 3) and can collectively undertake construction and operation of assets. The common characteristic of limited-recourse transactions, such as project financings, is that project finance debtholders may only look to the project's cash flows—specifically, the cash flow available for debt service—for the primary servicing and repayment of the project's debt. A transaction structure typically:

- Seeks to limit a project's exposure to deterioration in the parent's credit quality or the parent's insolvency;
- Creates a right for debtholders to a project's cash flows and assets either through ownership of the assets or, in other cases, such as government concessions, the contractual right to cash flows for a specified time;
- Maintains the single purpose status of the project; and
- Seeks to limit additional debt.
13. As such, Standard & Poor's analysis of a project finance transaction structure assesses (see chart 2):

- The applicability of project finance criteria: A transaction structure must meet the minimum elements outlined in paragraph 14 to be analyzed under these criteria.
- Linkage to parent(s): The criteria classify a transaction structure's linkage to the project's parent(s) as de-linked from, linked to, or capped by its parent(s)' creditworthiness. The analysis determines the impact of any deterioration in credit quality or, at its extreme, insolvency of the parent(s) on the project's credit quality under the applicable legal regime in a jurisdiction.
- Structural protection: We assess structural protection as neutral, fair, or weak depending on the extent to which a transaction structure protects a project's credit quality through the LPE's covenants and its cash management covenants.
- Additional structural elements: The criteria analyze the impact of structural and contractual subordination of project finance senior debtholders (paragraph 79) and of an LPE not being a newly created entity (paragraph 80).
14. To be rated under these criteria, a project finance debt issue must have all of the following:

- An LPE (or group of entities) that forms a project where the limited purpose entity is building and operating the project that is independent and separate from the parent and where lenders' risk of repayment is restricted to the project's success or failure. We believe that this element, if present, may help lower the LPE's risk of insolvency by reducing the likelihood of claims against the project stemming from activities unrelated to the project's permitted activities.
- A senior secured ranking through a security package that limits the disposal of key assets or reduces the incentive for third parties (including parents) to attempt to file the project into insolvency or seize the business' key assets after insolvency. The security package should include first-ranking security over substantially all of the assets and undertaking of the business for the benefit of project finance debtholders.
- A covenant package that establishes limits on additional debt, additional security, and asset sales; minimum insurance requirements; and limits on amendments to the structure, including mergers and acquisitions. This covenant package should extend over the debt term.
- A cash management covenant package that includes a mechanism that establishes priority of cash payments to holders of senior debt after maintaining ongoing operations as well as liquidity mechanisms that ration and preserve cash in a project in support of the senior debt credit.

15. The criteria also evaluate other debt issued by an entity that forms part of the "project" (see chart 3), provided that the "project finance debt" meets the above requirements (paragraph 14) and remains outstanding in the project structure, or, on its repayment, the other debt becomes the senior debt in the project and meets the requirements to be rated as "project finance debt" (see also "Project Finance Framework Methodology").

16. We modify a project SACP, which is the weaker of the project's construction phase SACP (see "Project Finance Construction Methodology") or operations phase SACP (see "Project Finance Operations Methodology" and "Project Finance Framework Methodology") depending on our assessments of linkage to parent(s) and structural protection, as outlined in table 1.

17. The impact of the transaction structure on a project SACP is asymmetrical. For example, a neutral structure does not raise the SACP, but as the structural strength declines, the SACP may decline as well.

18. If the project SACP is 'b', the SACP generally will not be modified to be lower than 'b-' (see paragraph 19). If the project SACP is 'b-' or lower, we generally will not apply any modification. The project SACP will also be constrained by any rating limits resulting from the parent's creditworthiness (see table 1), cash management covenants (table 6), and the LPE's prior existence (paragraph 80).

19. If we view a project's capital structure as unsustainable or if it is currently vulnerable to nonpayment and is dependent on favorable business and financial and economic conditions to meet its financial commitment on its obligations, then we will determine the project SACP using "Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings," Oct. 1, 2012. Similar to structured finance, when assigning a plus (+) or minus (-) sign to a 'CCC' rating on a project, the project's financial stress is generally the dominant factor, and the time frame for anticipated default is generally a secondary consideration.

20. The existence of cross-default provisions to a third party (such as the parent) that can result in debt acceleration, in the absence of documented mitigants, will cap the project SACP at the creditworthiness of that party (see paragraph 33...
and separately paragraphs 34-36 under certain conditions). In this case, the project SACP is the result from table 1 and the application of any caps to the project SACP under paragraphs 33-36.

Table 1

<table>
<thead>
<tr>
<th>Linkage to parent</th>
<th>Neutral</th>
<th>Fair</th>
<th>Weak</th>
</tr>
</thead>
<tbody>
<tr>
<td>De-linked</td>
<td>The project SACP is not modified</td>
<td>The project SACP is modified to be equal to the project SACP minus one notch</td>
<td>The project SACP is modified to be equal to the project SACP minus two notches</td>
</tr>
<tr>
<td>Linked</td>
<td>The project SACP is modified to be equal to the lower of: 1) Project SACP, or 2) Parent(s)' creditworthiness* plus three notches</td>
<td>The project SACP is modified to be equal to the lower of: 1) Project SACP minus one notch, or 2) Parent(s)' creditworthiness plus three notches</td>
<td>The project SACP is modified to be equal to the lower of: 1) Project SACP minus two notches, or 2) Parent(s)' creditworthiness plus three notches</td>
</tr>
<tr>
<td>Capped</td>
<td>The project SACP is modified to be equal to the lower of: 1) Project SACP, or 2) Parent(s)' creditworthiness</td>
<td>The project SACP is modified to be equal to the lower of: 1) Project SACP minus one notch, or 2) Parent(s)' creditworthiness</td>
<td>The project SACP is modified to be equal to the lower of: 1) Project SACP minus two notches, or 2) Parent(s)' creditworthiness</td>
</tr>
</tbody>
</table>

*Parent(s)' creditworthiness is based on Standard & Poor's issuer credit rating on the parent, or, if the parent is not rated, on Standard & Poor's credit estimate on the parent.

A. Parent Linkage Analysis

21. The parent linkage analysis determines the degree to which the credit quality of a project is linked to that of its parent(s). We assess, under the applicable legal regime, the extent to which a project finance structure isolates the project entities (see chart 3) from the insolvency risk of other entities (such as the parent) that participate in the transaction. We also analyze cross-default provisions with counterparties that could result in debt acceleration (see paragraphs 33-36).

22. Standard & Poor's checks for the following characteristics to assess the extent to which a project's credit quality is linked to that of its parent(s):

- The presence of independent directors (or equivalent anti-filing mechanism);
- No cross-default provisions;
- No ability to merge or reorganize;
- Limitations on amendments to organizational documents;
- A project's separateness from its parent(s);
- Security interests over the project's assets; and
- The existence of parent dependencies (certain contracts with parents and affiliates, taxes, insurances).

23. In assessing the degree of parent(s) linkage, we classify a project's transaction structure as: de-linked from, linked to, or capped by its parent(s)' creditworthiness (see table 2). If a project is de-linked, the creditworthiness of the parent(s) is not a constraint to the project SACP. If a project is linked, the project SACP is no higher than its parent(s)' creditworthiness plus three notches. If a project is capped, the project SACP is capped at its parent(s)' creditworthiness (see table 1).
### Table 2

#### Classification Of Parent Linkage Analysis

<table>
<thead>
<tr>
<th>De-linked</th>
<th>Linked</th>
</tr>
</thead>
<tbody>
<tr>
<td>The project includes all of the following characteristics:</td>
<td>The project includes at least the following characteristics:</td>
</tr>
<tr>
<td>--Independent directors (or equivalent anti-filing mechanism);</td>
<td>--Independent directors (or equivalent anti-filing mechanism)</td>
</tr>
<tr>
<td>--No cross-default provisions;</td>
<td>--No cross-default provisions;</td>
</tr>
<tr>
<td>--No ability to merge or reorganize;</td>
<td>--Separateness from its parent(s);</td>
</tr>
<tr>
<td>--Limitations on amendments to organizational documents;</td>
<td>--Security interests over project's assets; and</td>
</tr>
<tr>
<td>--Separateness from its parent(s);</td>
<td>--No parent dependencies for tax liabilities (paragraph 55)</td>
</tr>
<tr>
<td>--Security interests over project's assets; and</td>
<td>The other characteristics in paragraph 22 are present but less restrictive than in the de-linked classification.</td>
</tr>
<tr>
<td>--No parent dependencies</td>
<td></td>
</tr>
</tbody>
</table>

| Capped                                                                    |                                                                        |
| The project does not meet the definition of de-linked or linked. For example, a project is capped if it does not include independent directors (or equivalent anti-filing mechanism). |                                                                        |

24. Our assessment of whether the project entities are insolvency remote from their parents is qualitative and uses the principles in paragraph 22 as its foundation. Our conclusions, regardless of the specific organizational structure of an LPE (such as a corporation, partnership, or trust), consider how the relevant organizational or transaction documents address these elements.

25. When a project is linked to or capped by its parents' creditworthiness and multiple parents own the project, the project SACP will be linked to or capped by the parent with the lowest creditworthiness. However, if the parents of the project are unaffiliated with each other and hold material blocking rights (meaning they can block the project from being filed into insolvency) and economic interest in the project and we conclude, depending on the legal jurisdiction, that:

- The parent(s) with the lowest creditworthiness will not hurt the project and result in the consolidation of the project on the insolvency of such a parent, then the project SACP will be linked to the creditworthiness of the next-weakest unaffiliated parent(s); or

- Any parent(s) will not negatively affect the project and result in the consolidation of the project on the insolvency of the parent(s), then the project SACP will be de-linked from the creditworthiness of any unaffiliated parent(s).

26. If we assess a project as linked to or capped by its parent's creditworthiness and if a managed fund owns the project (see also "Project Finance Framework Methodology" for the definition of a managed fund), then the project SACP generally would be linked to or capped by the managed fund's rating or creditworthiness. However, if we conclude that the managed fund's ownership of a project will not result in consolidation of a project with a failed managed fund under the insolvency law of the relevant jurisdiction, we classify the project as de-linked. For example, in Australia, it
may be possible to de-link a project from a managed fund that would otherwise be linked or capped. The reason for this is that a managed fund is typically constituted as a trust that holds assets in trust for the members of the fund (for example, by an independent trustee or responsible entity), and because a trust is not a separate legal entity, the fund cannot be technically insolvent.

27. We also recognize (and would factor into our analysis where appropriate) that local laws may address certain of these characteristics or provide that certain entities are isolated from their parent(s) or affiliates as a matter of law without regard to these specific characteristics. In this case, we would analyze the structure in the context of our legal criteria for that jurisdiction or the general principles of credit ratings (see "Principles Of Credit Ratings," Feb. 16, 2011).

28. We explain the rationale for each characteristic in the sections below.

i) Presence of independent directors (or equivalent anti-filing mechanism)

29. The presence of independent directors on an LPE's governing board may help to reduce the likelihood that the LPE would voluntarily initiate insolvency proceedings merely for the benefit of its parent. The absence of such a governance feature typically caps the project SACP at its parent(s)' creditworthiness (table 1).

30. Regardless of an LPE's legal form, we assess what mitigants exist to reduce the likelihood that the LPE will initiate insolvency proceedings. An example of how this governance feature could mitigate insolvency risk is an LPE that has independent shareholding entities whose vote is required—along with the vote of a parent shareholder—to commence voluntary insolvency proceedings.

31. If a change of control or consolidation of ownership occurs without the introduction of a mechanism that blocks the parent's ability to file the project into insolvency at the project level, we may cap the project SACP at the parent's creditworthiness.

32. We do not typically look for independent directors or an additional anti-filing mechanism to isolate the creditworthiness of the projects from the parent(s) and nonproject affiliates in the following cases:

- The presence of additional parents that have the rights and abilities to block a filing mitigates the credit risk associated with a single parent filing for insolvency. However, if a change of control or consolidation of ownership occurs without the introduction of an anti-filing mechanism at the project level, Standard & Poor's may assign the project a project SACP at the same level as that of the parent with the weakest creditworthiness.
- In jurisdictions where agreements not to file another entity into an insolvency proceeding (nonpetition covenants) are generally entered into, such agreement governing a project may be viewed as a mitigating factor.

ii) Cross-default provisions

33. If a project's transaction structure has cross-default provisions to a third party that has the potential to cause debt acceleration, the project's SACP will be capped by the third party's creditworthiness (or, where relevant as outlined in paragraph 34, will be capped by the related group credit profile (GCP), as defined in "Group Rating Methodology," Nov. 19, 2013), in the absence of any specific documented mitigants under the project's transaction documents. Documented mitigants that we have observed include:

- A permanent well-documented waiving of such cross-default provision.
- Remedies for key contractor replacement. If there is a cross default to a key contractor, we assess whether there is
an adequate remedy and cure period under a project's transaction documents that allow for a project to address and remedy the consequences of an event of default without resulting in debt acceleration through the replacement of a key contractor. In considering the adequacy of any remedy and cure periods in replacing a key contractor, we typically analyze and review the cost, manner, duration, and ability to replace in a timely manner a key contractor based on our sector experience in consultation with an independent expert, as required. This is to make sure that there is no material increase in our assessment of the likelihood of default from such a scenario. (Please refer to paragraphs 20 and 27-32 in "Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011.)

- Committed, unconditional, and available liquidity or reserves that are sufficient and dedicated to fully repay the project's debt (and any associated costs including any break costs, if applicable) at any point in time as a result of any debt acceleration event.
- The project transaction documents provide that there is no ability to enforce a cross default or potential acceleration of debt while the project is meeting its debt service or debt-like payment obligations.

34. If the following three conditions are concurrently met, then we would cap the project SACP at the third party's related GCP (subject to paragraph 35), rather than capping the project SACP at the creditworthiness of the third party.

- Cross-default provisions are to a third party, which is a member of the group and has direct or indirect "control" of the project (as we define in paragraph 31 of "Group Rating Methodology") and any of the following is true: the group member is the ultimate parent company; the group member has a group status, according to the group methodology, of core, highly strategic, or strategically important; the loan amount to the group member is immaterial in relation to the size of the loan to the project such that we expect group support to be forthcoming; or we expect the loan to the group member to soon mature without being renewed.
- Within the group, financial obligations at core, highly strategic, and strategically important group members are subject to cross-default and acceleration provisions among themselves.
- This cross default is to the benefit of a development bank (see paragraph 36).

35. In considering a cross default across a group's financial obligations and its GCP, we consider whether the group has sufficient financial resources, on an ongoing basis, to repay debt at the related group member, which is linked to the project via the cross-default clause, or can be expected to have available liquidity to repay the project debt and any other financial obligations, including break costs that may be subject to or consequence of a debt acceleration event. If the group does not have sufficient financial resources, the project's SACP is capped at the third party's creditworthiness. As a result of a cross-default clause outlined in paragraph 34, a project would not be considered an insulated subsidiary under "Group Rating Methodology," Nov. 19, 2013.

36. A development bank, for the purpose of these criteria, is a financial institution that is government-owned, supports a government's economic policies and directives, and focuses on creating and delivering projects that have a beneficial economic and social impact for a country. A development bank typically meets this goal through lending or investing for long tenor in essential infrastructure projects. For this reason, and for the purpose of these criteria, we exclude commercially oriented banks that primarily have an incentive to lend solely for commercial reasons.

iii) No ability to merge or reorganize

37. 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, liquidation, or asset sale, as well as another company purchasing the LPE's shares, could undermine the LPE's independent or limited-purpose
status. This restriction also reduces the risk of prior claims emerging.

iv) Limitations on amendments to organizational documents

38. We assess whether the LPE can amend its organizational documents while the rated debt is outstanding because doing so can undermine the project's isolation from its parent(s). We look for the documents to provide that debtholders must consent to any amendments to organizational documents.

39. Standard & Poor's assumes that the parent(s) of a project and its affiliates operate it in a manner consistent with the provisions of the project financing documents. We consider protections that the transaction structure provides as ineffective or null if, in our view, the parent(s) of the project or its affiliates can manipulate them to the detriment of the debtholders.

v) Separateness from parent(s)

40. We assess a project's separateness from its parent(s) by reviewing whether the project's organizational or transaction documents include covenants designed to provide comfort that the project will hold itself out as an independent entity.

41. We evaluate the risk that the courts may bring the LPE and its assets into the insolvency proceeding of another entity (such as a parent). For example, in certain jurisdictions, courts may use principles such as "piercing the corporate veil," "alter ego," or "substantive consolidation" or equivalent concepts in determining whether to disregard the separateness of the LPE.

42. In project finance transactions, we expect to see, with the exceptions described in paragraphs 43 and 44, the following separateness covenants, if applicable:

- Maintain books, records, financial statements, and its accounts separate from any other person or entity;
- Hold itself out as a separate entity and conduct its own business in its own name;
- Observe all corporate or other formalities that the project's organic documents require;
- Not to pledge or commingle its assets for the benefit of any other person or entity and not to make any loans or advances to any other entity or person (except as provided in the criteria);
- Avoid acquiring obligations or securities of its parent(s) or affiliates;
- Allocate fairly and reasonably any overhead for shared office space;
- Use separate stationery, invoices, and cheques;
- Pay the salaries of its own employees and maintain a sufficient number of employees in light of its contemplated business operations; and
- Avoid guaranteeing or becoming obliged for the debts of any other person or entity or hold out its credit as available to satisfy the obligations of others.

43. Standard & Poor's evaluates the breadth and number of separateness covenants based on the likelihood that the courts may, in a specific jurisdiction, bring a project or its assets into the insolvency proceeding of another entity (such as a parent). Furthermore, we have observed that the types of separateness covenants in project finance transactions may vary between legal jurisdictions, as well as depending on LPE type, meaning whether it is an "orphan" LPE or an LPE whose shares are held in trust for charitable purposes.

44. When a specific covenant is not present in a project's organizational documents or transaction documents, we also consider a project's track record and day-to-day practice in acting as a separate entity to assess the likelihood that the
courts could bring the LPE and its assets into the insolvency proceeding of another entity, as outlined in paragraph 43. For example, we have observed established projects publishing separate accounts, using their own stationery, and paying their own overheads independently from their parent(s).

45. We typically receive and review a nonconsolidation opinion to support our assessment of a project's separateness from its parent(s). We may also review legal opinions covering, among other things, the risk that a project may be consolidated with its parent(s) for tax purposes (see paragraph 55). In some jurisdictions, such as the U.S., we do not expect to receive a nonconsolidation opinion for projects that have multiple unaffiliated parents and no single parent owns more than 50% of the project entity. In cases where a single parent owns more than 50% of the project entity, we may request a nonconsolidation opinion.

vi) Security interests over the project's assets

46. Security interests over a project's assets in favor of the holders of the rated debt may help to reduce the likelihood of third parties filing a project into insolvency. Security interests can reduce the incentives of an unsecured third-party creditor of the LPE to file the project into insolvency proceedings to potentially gain access to the LPE's cash flows and assets. Along with the presence of security interests, Standard & Poor's also evaluates whether laws applicable to the LPE or certain structural features of the transaction provide incentives analogous to a security interest (see paragraph 49).

47. We assess a project's security package to determine the degree to which:

- The project finance debt benefits from first-ranking cash flow and security, including a perfected first-ranking security interest over all project assets, including documents and accounts, and the whole business undertaking, and
- The security covers all key activities and assets of the project (including physical assets, agreements, permits, cash flows, accounts, and shareholder's ownership interest in the project).

48. The security generally takes the form of a first-perfected security interest over all project assets (including physical assets, contracts, permits, cash flows, accounts, and project equity), except for the conditions outlined in paragraph 49. In assessing the security interests, the following considerations also apply:

- If the deficiencies in the security package do not meet the variations (see paragraph 49), we would assess the transaction structure as capped.
- If higher-ranking securities are present and project finance debtholders do not have an opportunity to remedy any breach of those securities (see paragraph 50), the default risk of the project debt depends on the breach that cannot be remedied.
- If liabilities ranking ahead of senior debtholders increase beyond the amount described in paragraph 51, then we would rate the project finance debt as being structurally or contractually subordinated.
- We analyze early termination of hedging arrangements because they may result in a cash flow shortfall, as described in paragraph 52.

49. The types of security interests over assets that may appear in project finance transactions vary depending on the project and the jurisdictions. Examples of these variations that, in our opinion, would satisfy the security package characteristics described in paragraph 48 include:

- Government concessions. Under government concessions or in some legal jurisdictions or some joint ventures, the
physical assets cannot be pledged directly, and debtholders lend on the basis of a key project agreement, such as the concession. In these cases, the secured asset is the concession or agreements that create the project, and the rating we would assign to the project would typically be no higher than that on the government counterparty (see "Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011).

• Limitation on physical security. At times, physical security may be impractical, such as registering a mortgage on each property for a pipeline easement that crosses a large number of small properties. In these cases, lenders must have the same rights as the project with respect to the easement, and those rights should be properly constituted and transferable. To the extent that lenders don't have those rights, the project cannot be rated under these criteria.

• Security limitations. In some countries, effective security, as commonly available in jurisdictions such as the U.K. and U.S., is not permitted or enforceable under local law on certain types of assets. The transaction should provide all security consistent with project financings that is permitted under the laws that govern the project. This means that project accounts and agreements governed under the laws of separate jurisdictions where security is permitted should be pledged. In cases where project accounts and agreements are not pledged because of the limitations described above, the analysis would view all debt classes in the project structure as having the same default likelihood and would cap the project SACP at the parent's creditworthiness.

50. Higher-ranking security. Higher-ranking security can create additional credit risks unless concessions and joint ventures give project finance debtholders an opportunity to remedy any breach before taking action. We evaluate lenders' ability to step in or take other action that will enable the project to keep operating without interrupting cash flow or negatively affecting the lenders' security. Any remedial action should be either automatic, such as replacement of an operator, or should nominate a qualified party, such as an independent technical expert familiar with the transaction, to recommend and to act or to recommend actions to be implemented. We would not consider the trustee as qualified. If a mechanism to remedy any breach before taking action is not in place, the default risk of the project debt becomes based on the activity that cannot be remedied.

51. Priority liabilities. Liabilities that rank ahead of or pari passu with senior debt, such as hedges and swaps, can increase the default risk of the project finance debt by introducing terms and conditions that may expose the project to risks that are otherwise limited under these criteria (see paragraph 52). Other than liabilities created in the normal course of business, we would expect priority liabilities (such as operating leases or take-or-pay-agreements) to be limited to those that reduce project risk and are factored into the rating when we first assigned it. To the extent that other priority liabilities are established, we would analyze the structural or contractual impact on senior debt and any other debt rated in a project's capital structure.

52. Early termination of hedging arrangements. An event of default or a termination event that potentially gives a derivative counterparty the right to terminate or suspend a derivative agreement may introduce uncertainties in the amount and timing of an issuer's derivative cash flows. To identify provisions and assess the potential rating impact in derivatives agreements that may introduce such uncertainties, we use the "Global Derivative Agreement Criteria," June 24, 2013. If, in our view, any forecast cash flow uncertainties may exist, we would consider these in our cash flow analysis under the "Project Finance Construction And Operations Counterparty Methodology" and "Project Finance Operations Methodology."

vii) Existence of parent dependencies

53. The parent linkage analysis also evaluates whether any dependencies exist between a project and its parent that weaken the structural protections. To assess the degree to which parent dependencies are present at the project level, we examine whether an LPE is separate from its parent(s) with respect to contracts with parents and affiliates (see paragraph 54), taxes (see paragraph 55), and insurance (see paragraph 56).
54. **Contracts with parents and affiliates.** For Standard & Poor's to assess a project as de-linked from its parent, it must be limited to arms-length dealings with its parent(s) and its affiliates. (The arm's length principle is that the parties to a transaction are independent and on equal footing.) If a parent provides personnel, shared services, or other key needs, that could create a counterparty risk or a priority liability through the service agreement and may link the project to the parent (see “Project Finance Construction And Operations Counterparty Methodology,” Dec. 20, 2011). We view seconded staff (the parent's employees) that are legally contracted to and paid by the project as project staff, not parent staff.

55. **Taxes.** If a project's parent or affiliates do not pay their taxes, that can result in a claim against the project's assets or cash flows. So, the analysis evaluates whether the project has any exposure to the tax obligations of its parent(s) or affiliates (see Appendix B). If it does—and if that exposure is not legally and structurally mitigated—the project SACP is capped by its parent(s) or affiliates (see table 2). For example, in certain jurisdictions, grouping all companies for tax calculation purposes can consolidate both tax losses and tax liabilities. Multijurisdictional transactions create additional tax issues that the criteria consider.

56. **Insurance.** The analysis evaluates whether project insurances are for the benefit of the project and are project specific. If a project relies on group insurance, it is exposed to the maintenance of insurance and the claims history of group members outside the project, effectively linking the project's credit quality to that of the group's. If we are unable to assess how the insurance benefits the project, we consider the project uninsured.

**B. Structural Protection Analysis**

57. We assess the extent to which a transaction structure protects the credit quality of a project through two main sets of covenants:

58. The LPE's covenants, which typically must include:

- Limitations on additional debt;
- Limitations on additional security to third parties;
- Limitations on asset sales; and
- Minimum insurance requirements.

59. Cash management covenants, which typically must include:

- Cash flow protection and waterfall;
- Liquidity and reserves;
- Use of insurance proceeds; and
- Distribution tests.

60. We classify a project's structural protection package as neutral, fair, or weak (see table 3) depending on the assessment of the LPE's covenants in table 4 and the cash management covenants in table 5. Both of these tables assess whether the LPE's covenants and the cash management covenants listed in paragraphs 58 and 59 are either neutral or negative. If a project's structural protections are fair, the project SACP is lowered by one notch. If a project's structural protections are weak, the project SACP is lowered by two notches.

61. The criteria assess the LPE's covenants and the cash management covenants based on the residual risk to the project—after mitigants and after allowing for any conditions attached to mitigants. If we assess fewer than two of the
covenants as neutral, then we will not rate the transaction under these criteria.

62. If we believe, following a review of a project's transaction and related documents, that any of the covenants listed in paragraphs 58 and 59 could materially limit the intended structural covenant protection under these criteria, we will likely classify a project's structural protection as weak.

### Table 3
**Structural Protections Analysis**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Corporates</th>
<th>Project Finance: Project Finance Transaction Structure Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neutral</strong></td>
<td>All the covenants listed in paragraphs 58 and 59 are neutral.</td>
<td></td>
</tr>
<tr>
<td><strong>Fair</strong></td>
<td>At least four of the covenants listed in paragraphs 58 and 59 are neutral, and cash flow protection and waterfall is one of the four.</td>
<td></td>
</tr>
<tr>
<td><strong>Weak</strong></td>
<td>At least two of the covenants listed in paragraphs 58 and 59 are neutral.</td>
<td></td>
</tr>
</tbody>
</table>

63. We explain the rationale for each covenant and the assessment of its quality (neutral or negative) in the sections below.

### LPE's covenants

64. Table 4 summarizes how we would assess the LPE's covenants.

### Table 4
**LPE's Covenant Quality Assessment**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Neutral</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limitations on additional debt</td>
<td>--Debt limits are specified for each obligation across the project;</td>
<td>--Additional debt limits are absent or excessive, in our opinion, and/or</td>
</tr>
<tr>
<td></td>
<td>--The additional debt is subject to appropriate nonrecourse provisions, and either the additional debt is rated at least as high as the project debt (at the time of issuance and at all times thereafter) or is subordinated to the project debt; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>--Increases in debt are backed by an improvement in the project’s business position or debt-funded expansions are conditional on the rating on existing debt not being lowered.</td>
<td></td>
</tr>
<tr>
<td>Limitations on additional security to third parties</td>
<td>--No additional security is permitted, except in the normal course of business.</td>
<td>--Additional security, beyond that granted in the normal course of business, is permitted.</td>
</tr>
<tr>
<td>Limitations on asset sales</td>
<td>--Material asset sales are only permitted to fund replacement asset purchase or where there is expected to be no rating impact and with proceeds applied to senior debt reduction. The sale of essential assets is not permitted.</td>
<td>--Material asset sales are permitted, which may have a rating impact, or proceeds are not mandatorily used to replace assets or reduce senior debt.</td>
</tr>
<tr>
<td>Minimum insurance requirements</td>
<td>--The project maintains insurances appropriate for activities and risks undertaken, as determined by an independent insurance expert, as long as they are commercially available and are for the benefit of the project.</td>
<td>--The project does not maintain sufficient insurance.</td>
</tr>
</tbody>
</table>

### i) Limitations on additional debt

65. Standard & Poor's examines limitations on additional debt to assess whether any restrictions on an LPE's ability to incur indebtedness exist, beyond those factored into the original rating. Additional debt limitations, if present, may help to reduce the likelihood that an LPE's other creditors would force the LPE into insolvency proceedings.

66. When analyzing permitted additional debt, Standard & Poor's also assesses the terms and conditions and form of any debt-like obligations, including take-or-pay arrangements and leasing agreements (see Appendix B for the treatment of additional debt in the financial analysis). Because the project is an operating business, at a minimum the additional
debt test must allow for the project to raise debt in the normal course of business, such as for working capital and day-to-day transactions, but not for shareholders' benefit.

67. When reviewing the extent to which an LPE is restricted from incurring additional indebtedness, we may view certain types of additional debt as not necessarily affecting an LPE's insolvency remoteness. Examples include debt that:

- Has the same or lower seniority and the same rating from Standard & Poor's as the rating on the existing rated debt; or
- Is issued as a series of deeply contractually and structurally subordinated debt. However, in addition to analyzing the specific terms and conditions of any deeply subordinated debt, we would also assess the extent to which the courts in a particular legal jurisdiction would enforce these terms and conditions (see "Project Finance Framework Methodology").

68. To assess this covenant as neutral, Standard & Poor's also evaluates whether:

- There are material agreements between the LPE and its creditors that include nonpetition language, pursuant to which the creditors agree not to initiate insolvency proceedings against the LPE and not to join any such proceedings; and
- There are material 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.

ii) Limitations on additional security to third parties

69. Additional security interests over a project's assets or security to third parties that is equal to or higher than the project debt weakens the credit standing of the senior debt, and we would assess it as a negative factor (see table 4). This excludes security resulting from the normal course of business (by trade creditors) and security taken into account that is typically in the form of leases over moving equipment, such as motor vehicles and moveable plants. If the additional security interests are extensive and cause the security to transfer control of essential project components, such as the power plant to a third-party lender that can reduce project lenders' ability to step in and operate the project, the transaction structure does not meet the requirements of an LPE, so these criteria will not apply.

iii) Limitations on asset sales

70. If material assets can be sold, the use of proceeds to reduce existing debt may be a negative or neutral factor (see table 4). Asset sales are often part of normal business. However, disposing of material income-producing or essential assets can weaken credit quality—particularly when they are sold below market value. Assets also include financial assets such as swaps and hedges that may be terminated for a profit if in the money and, hence, remove the credit advantage they provided. The ability to sell material assets and then purchase replacement services through a lease or equivalent (take or pay), such as the rolling stock to ship ore from a mine, generally places lenders in an inferior position relative to before the transaction, and we will typically consider this a negative factor. If acted upon, it may result in a lower rating if senior debt is structurally subordinated.

iv) Minimum insurance requirements

71. For the criteria to assess a project as neutral, the project should maintain insurances appropriate for activities and risks it undertakes, as determined by a reputable insurance expert, as long as they are commercially available and are for the benefit of the project. A neutral insurance package includes business interruption and casualty insurance policies. Absence of insurance or deductible limits that are high will result in Standard & Poor's analyzing the normally insured
risk as if it is not insured.

**Cash management covenants**

72. A cash management structure establishes priority of payments through cash flow waterfalls and provides liquidity measures, such as reserve accounts and restrictions on distributions. These provisions can reduce project risk because they establish contractual account management and the allocation of operating revenue and other cash inflows. We assess the cash management covenants as neutral or negative (see table 5). Furthermore, weaknesses in the cash management structure can result in the project SACP being capped (see table 6).

73. We analyze cash flow waterfall, reserve accounts, and distribution tests to determine whether a project retains adequate liquidity for future cash needs given the variability of cash flows from period to period. Because the cash is retained for future liquidity, forward-looking tests and reserving mechanisms provide stronger protection from future cash flow volatility.

74. If there is no trustee to control all cash flow the project generates (based on detailed project documents that define precisely how cash is collected and managed), the project SACP may be no higher than the rating on the cash manager (see also "Counterparty Risk Framework Methodology And Assumptions," June 25, 2013).

**Table 5**

<table>
<thead>
<tr>
<th>Cash Management Covenants Quality Assessment</th>
<th>Neutral</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash flow protection and waterfall</td>
<td>--Waterfall meets guiding principles (paragraph 75).</td>
<td>--The financing documents allow for payments for growth capital expenditure that ranks ahead of any component of senior debt service or senior debt reserve replenishment.</td>
</tr>
<tr>
<td>Liquidity and reserves</td>
<td>--All funds in reserve accounts, including the DSRA, are available at all times and in full, as established in the financing documents.</td>
<td>--The financing documents do not provide for the replenishment of reserve accounts when used (except for single use reserves) or reserve account replenishment ranks after subordinated debt service and growth expenditure in the cash waterfall.</td>
</tr>
<tr>
<td>Use of insurance proceeds</td>
<td>--The amount of the DSRA covers the period of time from the breakdown to return to full-scale operations after a major breakdown—such as a turbine failure for a power plant.</td>
<td>--The project can use insurance proceeds to meet distribution tests and, subject to passing those distribution tests, the project can distribute those proceeds to equity.</td>
</tr>
<tr>
<td>Distribution test</td>
<td>--Distribution test is robust and takes into account actual performance and future project needs (paragraph 78).</td>
<td>--Distribution test is absent or does not adequately reserve cash ahead of a project need, unless mitigated by compensating liquidity, additional reserve (see paragraph 78), or other mechanisms, such as an effective cash sweep; or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>--Parent or affiliate has the right to forego contractual payments such that the distribution test can be exceeded.</td>
</tr>
</tbody>
</table>

**Table 6**

<table>
<thead>
<tr>
<th>Category</th>
<th>Situation</th>
<th>Impact on project SACP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt service reserve account</td>
<td>DSRA is insufficient to cover a period of major operations interruption (paragraph 76).</td>
<td>Generally not higher than 'bb+' unless mitigated by compensating liquidity.</td>
</tr>
</tbody>
</table>
### Table 6

<table>
<thead>
<tr>
<th>Rating Limits Applied To Cash Management Covenants On Stand-Alone Projects (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DSRA</strong> is not replenished automatically from cash flow if drawn (paragraph 76).</td>
</tr>
<tr>
<td><strong>Insurance proceeds</strong></td>
</tr>
<tr>
<td><strong>Distribution test</strong></td>
</tr>
<tr>
<td>Distribution test is absent or the test is only backward-looking, except when expenses or revenues are variable by no more than 5% year over year (paragraph 78).</td>
</tr>
</tbody>
</table>

---

**i) Cash flow protection and waterfall**

75. A project’s cash flow waterfall is either neutral or negative (see table 5). The guiding principle of the cash flow waterfall is that the cash usage priority during operations should, as a first priority, provide for all expenses necessary to maintain ongoing operations, followed by senior debt service and then replenishment of senior debt protections, such as reserve accounts.

**ii) Liquidity and reserves**

76. Standard & Poor’s assesses a project’s liquidity and reserves as neutral or negative (see table 5), based on the extent to which a reserve account that provides protection against an interruption to debt service due to a breakdown or an interruption to operations reduces default risk. For example, the criteria typically assess a project that uses proven technology as neutral when it includes a debt service reserve account (DSRA) with a minimum of six months of debt service (interest payments and scheduled principal) or expected future demand on such reserve. If principal payments are made once every year, Standard & Poor’s would calculate the minimum protection the reserve offers by the number of months of coverage provided in every period. When calculating the level of reserve coverage in our analysis, we deduct the amount of sinking funds and committed agreements used to mitigate lumpy debt repayments and to refinance bullet or balloon maturities ahead of refinancing, from the amount of scheduled principal.

- **Major maintenance and other reserve accounts.** Standard & Poor’s assesses to what extent prefunding major maintenance, including lifecycle costs or setting aside a reserve to cover ramp-up, strikes, or tax payments, ensures funds are available when needed to mitigate specific risks (for the definition, see the Glossary in "Project Finance Framework Methodology"). To be effective mitigants, they will need to be funded adequately and in advance of the need. Lifecycle look-forward tests that identify and address remaining lifecycle deficiencies and that preserve cash well ahead of the need are a credit positive. Lack of a maintenance-reserve account for a project in which capital expenditures are expected to be lumpy or where there is some concern about the technology being employed is a negative factor for the project SACP. We do not have a minimum funding level threshold for these reserves, but we do gauge the need based on the findings of the independent expert’s technical evaluation and our experience.

- **Funding of reserve accounts.** For comparability in our cash flow analysis, we assume the reserve is cash funded and the letters of credit (LOCs), or similar instrument, are drawn and included as part of project debt service at the project interest rate after allowing for any fees payable for the LOC (see Appendix B). Cash reserves deposited in appropriate bank accounts or invested in low-risk and liquid deposits provide the most certainty of availability (see “Counterparty Risk Framework Methodology And Assumptions,” June 25, 2013).

- **Replenishment of reserve accounts.** For a project to have a ‘bbb-’ or higher project SACP once the project uses a
DSRA, the project must use excess cash flows to replenish the reserve before servicing subordinated debt or equity to ensure senior debt protection levels remain at the level assumed before the use of the reserve. If the DSRA is not replenished once used, senior debt no longer benefits from its protection. If compensating liquidity does not mitigate this weakness, the project SACP can be no higher than 'bb+' (see table 6). However, we would not expect the project to replenish reserve accounts for single-use events, such as change of law, once used.

iii) Use of insurance proceeds
77. A project's use of insurance proceeds is either neutral or negative (see table 5). Inclusion of insurance proceeds (other than any excess once the project is reinstated) in general project revenue could lead to funds leaking from the project, thus weakening the project's credit quality. Unless compensating liquidity mitigates this, the project SACP can be no higher than 'bb+' (see table 6).

iv) Distribution test
78. We assess a project's distribution tests (see the Glossary in "Project Finance Framework Methodology") as neutral or negative (see table 5). Tests vary in their format but should reflect needs within the next 12 months of operations, to allow for seasonality and volatile cash flows and to effectively preserve additional cash to meet project liquidity needs. A test that is absent or only backward-looking limits the project SACP to 'bb+', unless mitigated by compensating liquidity, or if cash flow available to service debt is very predictable (varies by no more than 5% year over year) (see table 6).

C. Additional Structural Elements

Structural and contractual subordination
79. For Standard & Poor's to apply these criteria, the project finance senior debt should not be structurally or contractually subordinated unless adequately mitigated. An example of structural subordination would be a project entity that is a subsidiary or a parent company of the debt issuer, and the issuer is not the immediate beneficiary of the project's cash flow and assets. If the security arrangements, back-to-back loans, and cross guarantees within the project structure seek to ensure that the debtholders have rights to enforce against the assets and cash flows at the project-company level, that could mitigate the risk related to the issuer not being the immediate beneficiary of the project's cash flow and assets. If any entity that forms part of the project is not part of the LPE structure, that entity exposes the project financing to its credit risk, defeating the risk mitigants of the transaction structure. As such, if a project entity is not covered by the project LPE structure directly or through some form of cross project loan or guarantee, we will incorporate that into our rating on the project's debt and may render the structure not ratable under these criteria.

Prior existence
80. We assess the risk associated with prior existence of an LPE by analyzing audited accounts, certifications from company officers about preexisting liabilities, including potential or actual legal proceedings and outstanding tax liabilities, and, where appropriate, legal and tax opinions (see table 7).
### Table 7

<table>
<thead>
<tr>
<th>Description</th>
<th>Impact on the analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>All project entities are newly created or are shelf companies with no operating history</td>
<td>No impact</td>
</tr>
<tr>
<td>An entity has prior operating history with all known outstanding potential liabilities, such as prior contractual obligations and/or employment liabilities, reasonably identified and able to be calculated</td>
<td>Project SACP incorporates the outstanding liabilities into the analysis.</td>
</tr>
<tr>
<td>An entity has prior operating history, but the transaction sponsor may remove or mitigate potential liabilities from the existing entity to create an LPE</td>
<td>Audited accounts, legal and tax opinions, certifications from company officers about preexisting liabilities, including, but not limited to, potential or actual legal proceedings and outstanding tax liabilities, may be requested to confirm such removal or mitigation. In addition, we would assess any resulting dependence or link to the parent as a result of the removal. Such removal or mitigation would reduce the outstanding liabilities included in the analysis.</td>
</tr>
<tr>
<td>An entity has audited accounts but prior operating history that is incomplete, or the entity has some outstanding liabilities or legal tax action that cannot be accurately quantified</td>
<td>Project SACP would incorporate the outstanding liabilities and would not be higher than 'b+'. If another rated counterparty takes on the liabilities, for example under an unconditional guarantee, that counterparty may constrain the project SACP.</td>
</tr>
</tbody>
</table>

### APPENDIX

#### A. Changes From Request For Comment

81. The criteria have no material changes relative to the request for comment, "Request For Comment: Project Finance Transaction Structure Methodology," Nov. 15, 2013. However, we have made some clarifications in Section A. Parent Linkage Analysis, subsection ii regarding cross defaults and in what cases the presence of cross defaults do and do not cap the SACP of a project.

#### B. Cash Management Controls And Financial Analysis

82. Our analysis assesses a project issue's cash flow management. For consistency and comparability across projects, we treat all cash management controls similarly in our financial analysis (see table 8).

### Table 8

<table>
<thead>
<tr>
<th>Category</th>
<th>Situation</th>
<th>Impact on the financial analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permitted activities</td>
<td>The project’s permitted activities include expansion or other activities beyond those necessary to undertake construction and operation of the assets.</td>
<td>The downside scenario may assume that any permitted activities will be carried out at the earliest date permitted, factoring in any other conditions and mitigants and any additional debt required to carry out the expansion, and that all cash that is permitted will be distributed to equityholders.</td>
</tr>
<tr>
<td>Transfer of tax losses</td>
<td>Tax losses have been or can be transferred to the parent or other nonproject entities.</td>
<td>In the base-case financial analysis, any taxes the project owes (such as income, withholding, sales, and property taxes) are treated as operating expenses. If the project’s tax losses are transferred to the parent or other nonproject entities, the cash flow analysis will ascribe no benefit to the tax losses that are permanently transferred unless otherwise mitigated (see &quot;Counterparty Risk Framework Methodology And Assumptions,&quot; published June 25, 2013). Consequently, we would expect the timing of cash payment of taxes to be earlier than when the tax losses had been retained.</td>
</tr>
</tbody>
</table>
**Table 8**

**Factoring Transaction Structure Into The Financial Analysis (cont.)**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government taxes</td>
<td>Government taxes are likely to be payable.</td>
<td>We would increase the debt service to ensure full payment of debtholders in case taxes need to be paid. This is often mitigated by dedicated cash reserves—or some other mitigant, such as a contractual obligation on the part of sponsors—to fund these taxes.</td>
</tr>
<tr>
<td>Priority liabilities</td>
<td>Swaps and other liabilities may rank higher or equal to senior debt before or after default.</td>
<td>We will analyze the project’s exposure to these additional liabilities as part of the project’s senior debt and in accordance with “Global Derivatives Agreement Criteria,” published June 24, 2013.</td>
</tr>
<tr>
<td>LPE covenants</td>
<td>LPE covenants set limits defined in the financing documents.</td>
<td>Our base-case financial analysis is that the project will operate within the levels that the covenants establish, except for additional debt.</td>
</tr>
<tr>
<td>Additional debt</td>
<td>Project is able to issue additional debt.</td>
<td>We’ll factor the limits set by the additional debt covenants into our base-case and downside scenarios, taking into account mitigants, conditions, and likelihood of additional debt being drawn.</td>
</tr>
<tr>
<td>Subordinated debt</td>
<td>Subordinated debt is not fully subordinated in payment and security or can constitute a claim on senior debt.</td>
<td>We would analyze subordinated debt as if part of the project’s senior debt.</td>
</tr>
<tr>
<td>Insurances</td>
<td>The transaction structure does not have adequate insurance.</td>
<td>Our base-case and downside scenarios will assume no mitigation of this risk.</td>
</tr>
<tr>
<td>Cash flow waterfall exception</td>
<td>The cash waterfall includes payments to subordinated debt ahead of topping up the senior debt reserve account or before paying senior debt principal.</td>
<td>We would treat subordinated debt as part of senior debt in the cash flow analysis.</td>
</tr>
<tr>
<td>Management fees</td>
<td>According to financing documents, expenses due to affiliates or management fees are considered subordinated.</td>
<td>We will include expenses necessary to operate the project’s asset as an operating expense, even though they are subordinated, according to financing documents.</td>
</tr>
<tr>
<td>Cash management discretion</td>
<td>Management has some discretion over cash management.</td>
<td>We will assume management will use its discretion to benefit the parent.</td>
</tr>
<tr>
<td>Distribution test</td>
<td>Project passes distribution test.</td>
<td>Once the project passes the distribution test, all available cash is distributed with no clawback (meaning that the cash cannot be claimed back).</td>
</tr>
<tr>
<td>Reserve account fluctuations</td>
<td>Target debt service reserve amount fluctuates with future scheduled debt repayments.</td>
<td>Funds from operations to top up the reserve are included as an expense ahead of any payment to subordinated debt in our rating analysis.</td>
</tr>
<tr>
<td>Reserve account balance</td>
<td>Reserve balance exceeds target.</td>
<td>The amount of excess reserves released above the target amount is added back to cash flows and may be distributed once the project passes the distribution test.</td>
</tr>
<tr>
<td>Reserve account funding</td>
<td>DSRA funded by LOC.</td>
<td>An LOC or similar instrument is drawn and included as part of the project’s debt service at the project interest rate after allowing for any fees payable for the LOC. Given the role of the DSRA, we do not include projected interest income on deposits as a funding mechanism, and we do not include the DSRA as available to reduce the final debt payment. Repayment of debt associated with drawing an LOC is added to the analysis where the LOC would rank if drawn.</td>
</tr>
<tr>
<td>Reserve account funding</td>
<td>DSRA funded from cash flows.</td>
<td>We would only give credit to a portion of the reserve account funded at the time of our analysis. Therefore, we would assign no value to the expected balance of the reserve until it was fully funded.</td>
</tr>
</tbody>
</table>

**RELATED CRITERIA AND RESEARCH**

**Related Criteria**

- Project Finance Framework Methodology, Sept. 16, 2014
- Project Finance Operations Methodology, Sept. 16, 2014
- Group Rating Methodology, Nov. 19, 2013
- Project Finance Construction Methodology, Nov. 15, 2013
Criteria | Corporates | Project Finance: Project Finance Transaction Structure Methodology

- Counterparty Risk Framework Methodology And Assumptions, June 25, 2013
- Global Derivative Agreement Criteria, June 24, 2013
- Asset Isolation And Special-Purpose Entity Criteria--Structured Finance, May 7, 2013
- Project Finance Construction And Operations Counterparty Methodology, Dec. 20, 2011
- Principles Of Credit Ratings, Feb. 16, 2011
- Understanding Standard & Poor's Rating Definitions, June 3, 2009

**Superseded Criteria**
The following criteria articles are superseded with the publication of these criteria.

- Request For Comment: Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Road, Bridge, And Tunnel Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Oil And Gas Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Power Project Financings, Dec. 16, 2013
- Request For Comment: Project Finance Framework Methodology, Nov. 15, 2013
- Request For Comment: Project Finance Transaction Structure Methodology, Nov. 15, 2013
- Request For Comment: Project Finance Operations Methodology, Nov. 15, 2013
- Methodology For Forecasting Operating Assumptions For The U.S. Merchant Power Sector, March 15, 2013
- Summary Of Standard & Poor's Criteria Methodology For Refinancing Risk In PPP/PFI Projects, Oct. 28, 2009
- Key Credit Factors: Methodology And Assumptions On Risks For Utility-Scale Solar Photovoltaic Projects, Oct. 27, 2009
- Key Credit Factors: Methodology And Assumptions On Risks For Concentrating Solar Thermal Power Projects, Oct. 27, 2009
- Updated Project Finance Summary Debt Rating Criteria, Sept. 18, 2007
- Recovery Ratings For Project Finance Transactions, April 8, 2005
- Utilities: Are European Wind Power Projects On Their Way To Investment Grade?, Nov. 11, 2003
- Criteria For Special-Purpose Entities In Project Finance Transactions, Nov. 20, 2000
- Project Finance Stadiums Can Score Investment-Grade Ratings, Aug. 29, 2000
- Rating Project-Financed Private Financing Of Public Hospital Infrastructure, April 4, 2000
- Rating U.K. NHS PFI Projects, Nov. 10, 1999
- Ring-Fencing a Subsidiary, Oct. 19, 1999
- Project Finance: Construction And Technical Risk Criteria, Aug. 27, 1999
- Mining Projects, Sept. 20, 1997

---

83. These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.
S&P may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P reserves the right to disseminate its opinions and analyses. S&P’s public ratings and analyses are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription) and www.spcapitaliq.com (subscription) and may be distributed through other means, including via S&P publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.

S&P keeps certain activities of its business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain business units of S&P may have information that is not available to other S&P business units. S&P has established policies and procedures to maintain the confidentiality of certain nonpublic information received in connection with each analytical process.

S&P may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P reserves the right to disseminate its opinions and analyses. S&P’s public ratings and analyses are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription) and www.spcapitaliq.com (subscription) and may be distributed through other means, including via S&P publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.
Credit FAQ:
An Overview Of Standard & Poor's Criteria For Assessing Project Finance Transaction Structure

**Primary Credit Analysts:**
Michela Bariletti, London (44) 20-7176-3804; michela.bariletti@standardandpoors.com
Pablo F Lutereau, Buenos Aires (54) 114-891-2125; pablo.lutereau@standardandpoors.com

**Secondary Contacts:**
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com
Paul Judson, CFA, Toronto 416-507-2523; paul.judson@standardandpoors.com
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Anne C Selting, San Francisco (1) 415-371-5009; anne.selting@standardandpoors.com
Trevor J D'Olier-Lees, New York (1) 212-438-7985; trevor.doler-lees@standardandpoors.com

**Table Of Contents**

- Frequently Asked Questions
- Related Criteria And Research
Credit FAQ:

An Overview Of Standard & Poor's Criteria For Assessing Project Finance Transaction Structure

(Editor's Note: We originally published this FAQ on Dec. 16, 2013. We are republishing an updated version following the release of our final criteria for assessing project finance transaction structure, titled "Project Finance Transaction Structure Methodology," on Sept. 16, 2014.)

On Sept. 16, 2014, Standard & Poor's Ratings Services published its methodology for analyzing risks related to project finance transaction structures (see "Project Finance Transaction Structure Methodology"). A project finance transaction structure provides a governance framework that determines the scope of a project's operations and the type of business and financial risks it can incur. Our methodology discusses how a project's senior debt lenders are protected from the credit risk of its parent(s), the right of debtholders' to a project's cash flows and assets, the ability of a project entity to raise additional debt, and our view on a project entity's single purpose status.

Here we provide answers to key questions that we expect to receive about the criteria and changes in our methodology. Unless otherwise stated, paragraph numbers refer to "Project Finance Transaction Structure Methodology," published Sept. 16, 2014.

Frequently Asked Questions

Under what conditions would Standard & Poor's not rate a debt issue according to the project finance transaction structure criteria?

We would not expect to rate a debt issue under the transaction structure methodology if:

- The transaction structure does not meet the minimum elements listed in paragraph 14 of "Project Finance Transaction Structure Methodology";
- We assess fewer than two of the transaction structure's covenants under section "B. Structural Protection Analysis" as neutral (see paragraph 61 of "Project Finance Transaction Structure Methodology");
- Limitations on additional security have gaps that may result in the transfer of security and control of essential project components, such as a power plant, to a third-party lender that can reduce project lenders' ability to step in and operate the project (see paragraph 69 of "Project Finance Transaction Structure Methodology"); and
- There are other restrictions, as outlined in paragraph 15 of "Project Finance Transaction Structure Methodology."

What are the main differences between a project financing limited-purpose entity (LPE) and a structured finance special-purpose entity (SPE)?

Project financing LPEs typically have more operating flexibility than a structured finance SPE. LPEs:

- Permit the business decisions required of an operating business that typically are not permitted by the applicable documents under a structured finance SPE framework; and
- Conduct business activities that are actively managed and are subject to changing risk profiles over their life, such as their construction and operations phases.
What are typically the permitted activities necessary to undertake construction and operation of the assets of a project finance LPE?

Typically, the permitted activities of a project finance LPE are:

- Owning the project assets, or concession in the case of government concessions;
- Entering into the project documents (such as construction, operating, supply, input, and output contracts);
- Entering into the financing documents (the bonds, indenture, guarantee, intercreditor, common terms, depositary, and security agreements); and
- Constructing and operating the defined project business.

Does each entity that forms a project need to be assessed as an LPE in order for the project to be rated under the criteria?

Generally, yes. Project structures have evolved from a single entity that issues the debt and undertakes the construction and operation of the assets to project structures that include multiple entities and have tiered and complex capital structures (see chart). Under the methodology, each of the entities that collectively forms a "project" is expected to be part of the LPE project transaction structure (see paragraph 14). If any entity that forms part of the project does not meet LPE structure characteristics, that entity exposes the project financing to its credit risk and, thereby, minimizes or eliminates the risk mitigants of the transaction structure. Therefore, we would modify the project's SACP to reflect exposure to additional credit risks. These additional risks may render the structure not ratable under the project finance methodology.
How does Standard & Poor's assess whether an entity is limited in purpose?
Standard & Poor's considers how the transaction documents (to which the security holders or their representative are a party to) or the LPE's constituting document of establishment (such as articles/certificate of incorporation or deed of partnership/partnership agreement) constrain the LPE to the activities needed to carry out the project.

We believe that this element, if present, may help reduce the LPE's risk of insolvency by reducing the likelihood of claims created by activities unrelated to the project's permitted activities.

Under what conditions would the project finance transaction criteria cap a project's stand-alone credit profile?
We could cap a project's SACP depending on how we assess its link to its parent(s) under the methodology. If a project is de-linked from its parent(s), the creditworthiness of the parent(s) is not a constraint to the project SACP. If we assess the project as linked to its parent(s), then the project SACP would be limited to the creditworthiness of its parent(s) plus three notches. If we assess the project as capped by its parent(s)' creditworthiness, then we could limit the project...
SACP to the creditworthiness of its parent(s) (see table 1 of “Project Finance Transaction Structure Methodology”). The assessment of the creditworthiness of a parent is based on Standard & Poor's issuer credit rating or on Standard & Poor's credit estimate.

Furthermore, the project SACP will be no higher than 'bb+' if any one of the following applies (see table 6 of “Project Finance Transaction Structure Methodology”):

- The debt service reserve account (which reduces a project's default risk by providing a liquidity buffer) is insufficient, in our view, to cover a period of major operations interruption or is not replenished automatically from cash flow if drawn (paragraph 76), unless mitigated by compensating liquidity;
- The project does not use material proceeds of insurance claims to reinstate its operation or to reduce debt fully before including the proceeds in the general funds, which can be distributed (paragraph 77), unless mitigated by compensating liquidity; and
- A test that limits distribution of surplus cash to shareholders is absent, or includes expected, rather than actual, proceeds of an insurance claim, or is only backward-looking, except where expenses or revenues are variable by no more than 5% year over year (paragraph 78), unless mitigated by compensating liquidity, additional reserves, or other mechanisms, such as an effective cash sweep.

Finally, a project SACP would not be higher than 'b+' if its LPE had prior existence (not a newly created entity) and has audited accounts where the prior operating history is incomplete, or if there are some outstanding liabilities or legal tax action that we believe cannot be sufficiently quantified (see table 7 of “Project Finance Transaction Structure Methodology”).

Under the methodology, one of the two key elements that distinguish between a project that is de-linked from its parent and a project that is linked to its parent is limitations on amendments to a project's transaction documents. Under which circumstances would Standard & Poor's consider this limitations covenant met?

For Standard & Poor's to assess a project as de-linked, we would need to view this covenant as effective in protecting the holders of the rated project finance debt from any deterioration in the credit quality of the parent(s). A transaction structure can vary in how it is created, but we expect it to remain intact until the rated debt is fully repaid or is refinanced. The reason for this is that the terms of a transaction structure are often contained in a project's finance and security documents, so any protection a transaction structure provides may terminate when such a key document is significantly altered.

What may be the consequences of changes to the documentation in a project finance transaction?

Covenants work as a package for the benefit of project finance debtholders. Although many of the project finance characteristics may be partially present in a corporate financing, it is the documentary nature, strength, and coordinated combination of these covenants that result in the project financing. The analysis considers how each element operates to mitigate risk in the context of the project construction and operational phases. As a result, a significant change in a key document creating the transaction structure or the provisions governing the repayment of the debt could weaken the protection for holders of rated project finance debt. This could have an impact on our issuer credit rating on the project.

The terms of the transaction structure are often contained in debt and security documents, so any protection for holders of rated project finance debt that the transaction structure provides may be weakened when a key document
creating the transaction structure is significantly altered.

**Could you provide examples of what anti-filing mitigants exist to reduce the insolvency filing risk of an LPE?**

Standard & Poor's typically considers the mitigants that exist--if any--to reduce the potential insolvency filing risk of an LPE in assessing the insolvency remoteness of a project financing. The presence of an independent director appointed to the governing board of an LPE may help to reduce the likelihood that the LPE may resolve to commence voluntary insolvency proceedings (see paragraph 29).

For corporations, it is often the case that shareholders (the corporation's owners) elect the directors. In many jurisdictions, among the decisions that a board of directors may make is the decision to initiate voluntary insolvency proceedings. Equityholders, depending on the jurisdiction, may also have the power to initiate voluntary insolvency proceedings for a corporation.

If an LPE has directors or voting entities (where relevant) in common with, or under the common control of, its parent, the parent may have an incentive to attempt to cause an LPE subsidiary to file for or initiate voluntarily insolvency proceedings to consolidate the assets of the LPE with those of its parent. However, if, as noted above, the LPE subsidiary has at least one director or voting entity (where relevant) who is independent from the parent, and this director's or voting entity's vote is required in any action seeking to initiate insolvency proceedings for the subsidiary, we would typically conclude that such LPEs may be less likely to commence voluntary insolvency proceedings.

Anti-filing mechanisms that may be equivalent to an independent director include:

- If a shareholder of the LPE has the power to voluntarily petition the LPE into insolvency proceedings, but the financing structure and transaction documents mitigate this risk. An example is a "golden share" structure, in which the project issues a special class of shares to some independent entity (such as the bond trustee), whose vote is required for a voluntary filing.
- If an LPE is a partnership. In this situation, we would determine whether at least one general partner is also constituted as an LPE, as well as whether we consider such general partner as insolvency remote.
- If an LPE is a trust. Here, Standard & Poor's generally considers whether the related declaration of trust restricts the issuer trustee's ability to voluntarily terminate the LPE while there is any rated security outstanding.
- If an LPE has multiple parents. Where there are additional parents that have the rights and abilities to block a filing that may mitigate the insolvency risk of having no independent director, we would determine whether their presence mitigates this risk.

We also recognize (and may factor into our analysis) that local laws may address some of these characteristics or provide that certain entities are isolated from their parent(s) or affiliates as a matter of law without regard to these specific characteristics.

**Could Standard & Poor's view some covenants as ineffective?**

Yes, we may view some protections that a transaction's structural elements provide as ineffective if we believe they are—or may be—manipulated or are not in the spirit of the original transaction structure. This may nullify the protection that the structural element offers. In this case, we would expect to assess the covenant as negative under table 3 of "Project Finance Transaction Structure Methodology." Examples we would consider as affording ineffective protections include:
• Waiving management fees to pass a distribution test;
• Not updating the project's financial model used to calculate covenants;
• Maintaining a forecast input into a covenant calculation when it is no longer a reasonable reflection of the project's likely performance; and
• Providing a preferential benefit to the parent, associates, or affiliates.

How does security reduce a project's insolvency risk?
Project finance relies on some form of security to prevent disposal of key assets or to reduce the incentive for parents and other third parties to attempt to file the project into insolvency or seize the business’ key assets after insolvency (see paragraphs 46-49). If the debt is fully secured by a pledge of all, or substantially all, of the assets of and equity interests in the project, then, in principle, the parent or a third party has less of an incentive to file its subsidiary project into insolvency. Therefore, we would evaluate the security according to the degree of control given to project finance debtholders and the disincentives for management and other creditors to take an action that may weaken senior debt protection or that might precipitate a default. For Standard & Poor's to apply its project finance methodology to a proposed transaction, the LPE's security should--at a minimum--cover the project accounts and agreements and provide protections and incentives.

How does Standard & Poor's view a rating agency confirmation (RAC) request in the context of addressing risks identified in its transaction structure analysis?

In our experience, transaction parties may include provisions in transaction documents to build in potential flexibility during the life of the project. This can include provisions that allow for additional debt that may not, at the outset, fall within the types of additional debt that we view as not necessarily affecting an LPE's insolvency remoteness (see paragraphs 65-68). If the project is able to issue additional debt, in the base-case and downside scenarios, we incorporate the additional debt limits set by the additional debt covenants, taking into account mitigants, conditions to draw the additional debt, and the likelihood that such covenants levels would be achieved.

Transaction parties may choose to include a RAC provision, which is a request to assess whether we can confirm that a proposed change to a project's transaction structure will not, in itself, cause us to lower or withdraw our current ratings.

Investors may view a RAC as an effective limitation to additional debt, but it is up to the transaction parties to decide whether to include RAC provisions in documents. Furthermore, since we are never a party to the documents for the transactions we rate, the presence of a RAC requirement in a transaction document does not obligate us to provide a RAC; it also does not imply that we would agree to review it.

If insurance is not "commercially available" (under paragraph 71), how will Standard & Poor's score a project's minimum insurance covenant?
A project's minimum insurance covenant is one of the factors we assess when determining the project's structural protection. We would characterize this covenant as neutral when the project maintains insurances appropriate for activities and risks undertaken, as determined by a reputable insurance expert. In the case where insurance is not "commercially available" (not available in the market), or deductible limits are high, this will result in Standard & Poor's analyzing the normally insured risk as if it is not insured. In these cases, we expect to assess the covenant as neutral, so long as the credit risk associated with not having insurance is captured in the SACP.
For example, for a transaction with a plant in an established earthquake-risk area not remote for the rating, our analysis would include an assessment of the probability and consequences of an earthquake, after allowing for mitigants such as earthquake design standards. Another example is not having freight insurance for long lead-time major components coming by sea, which would pose a significant weakness.

How does Standard & Poor's view the use of letters of credit that provide credit enhancement to project financings?

A project may, from time to time, need cash to cover the expense of replacing an insolvent or failing construction contractor or operating service company or to cover the cash costs of delays, cost overruns, or repair of unexpected damages. Traditionally, letters of credit (LOCs) have been the main instrument issuers use to provide payment certainty in such adverse circumstances.

LOCs are often used in project finance transactions to support the obligation of a sponsor to infuse its equity contribution into the project during the construction phase instead of at financial closing. A sponsor may use an LOC as a substitute for funding project-reserve accounts, such as a debt service reserve fund.

Under the methodology, we would recognize a credit enhancement or liquidity instrument, such as an LOC, in our rating analysis as providing support to a project finance transaction only if (see paragraph 76):

- The instrument has unambiguous terms and conditions that oblige the provider to pay unconditionally and irrevocably, promptly, and without limitation a certain sum of money if a particular circumstance occurs;
- The project is in a legal jurisdiction that has a demonstrable history of enforcing instruments of this type;
- The instrument provider has been in the business of entering into such agreements and demonstrated a track record to make timely, rather than eventual, payment in accordance with the instrument's terms; and
- The instrument provider has the ability and willingness to make timely payment based on its rating (see "Counterparty Risk Framework Methodology And Assumptions," June 25, 2013)

At a minimum, for Standard & Poor's to take into account a credit enhancement instrument in its credit analysis, we would expect the credit enhancement instrument to contain the following:

- Explicit and unambiguous undertakings consistent with irrevocable and unconditional direct and primary financial obligation to pay promptly and in full;
- Terms and conditions that permit a draw at the project's discretion;
- A governing law in a jurisdiction where speedy enforcement is available and jurisdiction that is willing to speedily enforce payment;
- An instrument provider that waives all defenses to payment;
- A provider that waives its right to amend the instrument without paying it out fully, and that is not able to terminate the instrument while rated debt is outstanding;
- A specification that, as appropriate, the project or the holders of rated securities are beneficiaries of the instrument; and
- Clarity that the funds drawn can be used to rectify an expected problem.

Could you provide an example of “compensating liquidity” in the context of cash management covenants?

We would expect a typical project financing to have adequate liquidity to fund debt service if there is a temporary disruption of the project's operations. However, some asset classes have additional liquidity or compensating liquidity...
to mitigate longer periods of cash flow disruptions for assets that may result from cyclical market trends and have high levels of fixed costs. For example, convention center hotel projects typically have additional reserves to cushion a downturn in demand and occupancy. The additional reserves are available during the critical ramp-up period and throughout the debt term to help withstand the expected downturns in economic cycles.

**How does Standard & Poor's view transactions where the cash waterfall allows for servicing of senior debt ahead of operating expenses (see table 5 and paragraph 75)?**

We generally assess a project's cash waterfall as neutral when the cash usage priority during operations provides, as a first priority, for all expenses necessary to maintain ongoing operations, followed by senior debt service and then replenishment of senior debt protections, such as reserve accounts.

However, we note that some project finance transactions include a priority of payments that provides priority first to senior debt service and then to operating expenses. In these cases, we can still assess the cash waterfall as neutral because our cash flow forecasts will reflect both operating expenses and debt service payments in our DSCR analysis rather than the waterfall included in the financial documentation. This is because we want to assess whether, under our downside case, that project is expected to generate sufficient cash flows to cover both expenses necessary for operation and to cover debt service.

**How does Standard & Poor's view transactions that have a cash flow sweep but do not have a distribution test (see table 5 and paragraph 78)?**

We generally only assess the test that limits distribution of surplus cash to shareholders as neutral under the structural protection analysis if the tests are forward-looking, if cash flow available for debt service (CFADS) volatility is very low, or if there is compensating liquidity. Some project finance debt instruments have no distribution tests but have cash flow sweep mechanisms under which any excess cash flows must be used to pay down debt. These sweep mechanisms can vary materially, both in terms of the percentage of excess cash flow that must be used to pay down debt (such as 100% or 50%) and the target level of debt paydown (i.e., the cash flow sweep is no longer effective once a certain amount of debt has been paid down). When we consider the cash flow sweeps robust, then we assess these mechanisms as providing sufficient compensating liquidity to a project and, as a result, the distribution test covenant as neutral.

**How does Standard & Poor's view a project's use of the debt service reserve account to make the final debt service payment?**

We typically view it as insufficient protection to ensure full repayment of the rated debt. The debt service reserve account (DSRA) should reduce the project's default risk by providing a liquidity buffer to support continued debt service payments in the event of disruption to cash flows due to a breakdown or an interruption to operations. The end phase of a project is vulnerable to shortfalls in maintenance, plus old projects are more likely to have problems. This increases the possibility that if the project does not have sufficient operating revenues to meet its final debt obligations, it could count on the DSRA for final payment.

**Related Criteria And Research**
Related Criteria

- Project Finance Framework Methodology, Sept. 16, 2014
- Project Finance Operations Methodology, Sept. 16, 2014
- Project Finance Construction Methodology, Nov. 15, 2013
- Counterparty Risk Framework Methodology And Assumptions, June 25, 2013
- Global Derivative Agreement Criteria, June 24, 2013
- Asset Isolation And Special-Purpose Entity Criteria--Structured Finance, May 7, 2013
- Project Finance Construction And Operations Counterparty Methodology, Dec. 20, 2011

Under Standard & Poor’s policies, only a Rating Committee can determine a Credit Rating Action (including a Credit Rating change, affirmation or withdrawal, Rating Outlook change, or CreditWatch action). This commentary and its subject matter have not been the subject of Rating Committee action and should not be interpreted as a change to, or affirmation of, a Credit Rating or Rating Outlook.
CONSTRUCTION PHASE CRITERIA

Project Finance Construction Methodology

Credit FAQ: An Overview of Standard & Poor's Criteria For Assessing Project Finance Construction Risk
Criteria | Corporates | Project Finance:
Project Finance Construction Methodology

**Primary Credit Analysts:**
Ian R Greer, Melbourne (61) 3-9631-2032; ian.greer@standardandpoors.com
Trevor J D’Olier-Lees, New York (1) 212-438-7985; trevor.doler-lees@standardandpoors.com
Michela Bariletti, London (44) 20-7176-3804; michela.bariletti@standardandpoors.com

**Secondary Contacts:**
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com
Paul Judson, CFA, Toronto 416-507-2523; paul.judson@standardandpoors.com
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Pablo F Lutereau, Buenos Aires (54) 114-891-2125; pablo.lutereau@standardandpoors.com
Terry A Pratt, New York (1) 212-438-2080; terry.pratt@standardandpoors.com
Anne C Selting, San Francisco (1) 415-371-5009; anne.selting@standardandpoors.com

**Global Chief Credit Officer:**
Ian D Thompson, London (44) 20 7176 3395; ian.thompson@standardandpoors.com

**Global Criteria Officer, Corporate Ratings:**
Mark Puccia, New York (1) 212-438-7233; mark.puccia@standardandpoors.com

**Criteria Officer, Asia-Pacific:**
Andrew D Palmer, Melbourne (61) 3-9631-2052; andrew.palmer@standardandpoors.com

**Criteria Officer, EMEA, Corporate Ratings:**
Peter Kernan, London (44) 20-7176-3618; peter.kernan@standardandpoors.com

**Table Of Contents**

SCOPE OF THE CRITERIA
SUMMARY OF THE CRITERIA
IMPACT ON OUTSTANDING RATINGS
EFFECTIVE DATE AND TRANSITION
Table Of Contents (cont.)

METHODOLOGY
A. Construction Phase Business Assessment
1. Technology And Design Risk
2. Construction Risk
3. Project Management
4. Adjusting The Preliminary Construction Phase Business Assessment
B. Financial Risk Adjustment
1. Funding Adequacy (Uses Of Funds)
2. Construction Funding (Sources Of Funds)
C. Construction Phase Stand-Alone Credit Profile
1. Construction Counterparty Adjustment
D. Other Factors
1. Third-Party Construction Guarantee
2. Scope Of Project Finance Construction
3. Event Risk During Construction
4. Insurance
APPENDIX
Base-Case And Downside Scenarios
1. Construction Base-Case Scenario
2. Construction Downside Scenario
GLOSSARY
RELATED CRITERIA AND RESEARCH
Criteria | Corporates | Project Finance:
Project Finance Construction Methodology

(Editor's Note: Following the publication of our final country risk methodology, titled "Country Risk Assessment Methodology And Assumptions," on Nov. 19, 2013, we have updated paragraphs 17, 40, and 64, as well as table 14, of this criteria article. Along with the fully and partially superseded criteria articles listed in paragraph 3, this article partially supersedes the section referencing construction in the article titled, "Mining Projects," published on Sept. 20, 1997.)

1. Standard & Poor's Ratings Services is finalizing its methodology and assumptions for assessing project finance construction phase risks. This follows our request for comment "Global Project Finance Methodology--Construction Phase," published Jan. 28, 2013.

2. The criteria are intended to enhance the comparability of ratings on project finance issues with ratings in other sectors (see "Understanding Standard & Poor's Rating Definitions," published June 3, 2009) and improve transparency about how we assign project finance ratings. The criteria constitute specific methodologies and assumptions under our "Principles Of Credit Ratings," published on Feb. 16, 2011.

3. The criteria supersede--in full or in part--our currently applicable criteria for assessing construction risk in project financings:

SCOPE OF THE CRITERIA

4. These criteria apply to all project finance issue credit ratings. These criteria do not apply to corporate ratings, structured finance ratings, project developers, corporate securitizations, and U.S. public finance ratings.

SUMMARY OF THE CRITERIA

5. The construction phase ratings methodology assesses the likelihood that a project will be adequately funded for it to be built and completed on time and within budget, and that the project will be capable of operating as designed and as expected. The construction and funding assessment is critical to ensure not only that a project will be built and
completed with sufficient committed funding in place, but also to ensure that a project meets its operational and contractual deadlines in a timely manner (i.e., before any potential contractual termination events) to produce sufficient net cash flows to meet scheduled debt service and any other financing commitments.

6. The inherent risk of construction, including the credit quality of construction companies, limits the typical construction phase stand-alone credit profile (SACP) to 'aa-', after we include the benefits of a well-run project (see table 9 and table 10), unless a creditworthy party substitutes its credit for the construction risk and thereby assumes all obligations of the project (see paragraph 67).

7. The amount of financing available to fund a project's construction is typically limited to a committed value or level. We assess whether such funding or support is adequate to complete a project so that it is ready to begin operations even if there is a cost overrun or a delay in commissioning. A shortfall in the amount of funds or support available is most commonly due to cost underestimation, design changes, permit conditions, adverse weather, or force majeure events (see Glossary). In addition, for projects experiencing difficulties, a source of funds that is not committed or underwritten may not be available in a timely manner when needed.

8. The construction phase covers the period from financial close (see Glossary) through the commencement of operations. This period typically includes construction performance testing and any plant commissioning, rectification of any defects, and final acceptance of construction—the point at which construction is generally considered complete. Construction warranties and defects resolution are typically applicable during an agreed and contracted "defect liability" period into the operations phase but may limit any rating upgrade until the risk is de minimis.

9. The criteria set out a multistep framework (see chart 1) to determine a project's overall construction phase SACP:

   • Assessing the construction phase business assessment. This involves assessing "technology and design risk" (table 2) and "construction risk" (table 5). We combine the resultant "technology and design risk" and "construction risk" assessments to derive a preliminary construction phase business assessment (see table 1). We then modify the preliminary construction phase business assessment by evaluating the "project management" (tables 8 and 9) to determine the construction phase business assessment (paragraph 46).

   • Modifying the construction phase business assessment by the "financial risk adjustment" (table 15). This analysis results in the preliminary construction phase SACP. The "financial risk adjustment" assesses a project's "funding adequacy" (tables 11 and 12) and "construction funding" (tables 13 and 14). This assessment incorporates any contracted third-party support, including sponsor or parent support and the transaction structure analysis.


10. This methodology is an overarching framework, which we will expand on through key credit factors articles that we will publish for major sectors such as power projects; oil and gas projects; social infrastructure, accommodation, and entertainment projects; and road, bridge, and tunnel projects. The key credit factors will elaborate on our methodology for assessing construction risk in key project finance sectors.

11. Under the criteria, a project's technological and design risk and construction risk can be fully transferred to a contractor or equipment supplier under a turnkey contract (see table 7). If the risk is wholly transferred to the
technology supplier and designer, this weak links (see Glossary) the construction phase SACP to the counterparty dependency assessment (CDA) of that counterparty (see paragraph 62).

Chart 1

Factors And Methodology For Determining The Construction Phase SACP

© Standard & Poor’s 2013.
IMPACT ON OUTSTANDING RATINGS

12. We will apply the criteria as part of the "Updated Project Finance Summary Debt Rating Criteria," published on Sept. 18, 2007. As a result of the implementation of these criteria, we expect less than 1% of the global portfolio to be impacted, by a maximum of one notch lower. This represents less than 10% of the projects that are still in the construction phase.

EFFECTIVE DATE AND TRANSITION

13. The criteria are effective immediately. We intend to complete our review of all project finance issue ratings within the next six months.

METHODOLOGY

A. Construction Phase Business Assessment

14. Under the methodology, we evaluate three main analytical factors to determine the construction phase business assessment:

• "Technology and design risk," which assesses the risk that costs may underestimate the final need or that design changes and technology enhancements may require additional funds to rectify a problem;
• "Construction risk," which assesses the ability of the construction contractor based on the contractual risk transfer to deliver the project as designed; and
• "Project management," which assesses the ability of project management to manage the risks it is responsible for.

15. We assign our assessments for "technology and design risk" and "construction risk" as if the project is at financial close. The contracts and funding are established based on the design risk at financial close, and cost-variation risk is usually greatest at the end of construction, so it's rare that we would improve these assessments during construction, even for design completion. The size of funding is established at financial close, and normally any overrun or delay is not evident until near the end of construction. In addition, a number of costs during construction are often subject to market variations, and the level of independent review after financial close may not include extensive details about the cost to complete the project and associated risk analysis.

16. An exception to this is a long construction task that involves the building of a series of largely repetitive projects. Once the project establishes a track record, we could revise some assessments. An example is a project to build multiple military barracks that are similar in design, and once one is complete, the design is proven.

17. Country-specific risks can influence a project's construction risk. Standard & Poor's country risk assessments reflect the relative risks of operating in different countries where we rate issuers or transactions. The country risk assessment is determined on a scale of 1 (very low risk) to 6 (very high risk). These assessments reflect our view of four subfactors: economic risk, institutional and governance effectiveness risk (which includes risks known as "political risk"), financial
system risk, and payment culture or rule of law risk. For a list of country risk assessments, see "Standard & Poor's Publishes Finalized Country Risk Assessments For 103 Countries." For the methodology we use to arrive at country risk assessments, see "Country Risk Assessment Methodology And Assumptions," published Nov. 19, 2013. Offsetting country risk is that construction is typically a relatively short period in the life of a project and almost always is at the start.

18. We assess both "technology and design risk" (see table 2) and "construction risk" (see table 5) on a scale from 1-5 (strongest to weakest) and then combine these assessments to determine the preliminary construction phase business assessment (see table 1).

Table 1

<table>
<thead>
<tr>
<th>Preliminary Construction Phase Business Assessment*</th>
</tr>
</thead>
<tbody>
<tr>
<td>--Construction risk (table 5)--</td>
</tr>
<tr>
<td>Technology and design risk (table 2)</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>a+</td>
</tr>
<tr>
<td>a</td>
</tr>
<tr>
<td>a-</td>
</tr>
<tr>
<td>bbb+</td>
</tr>
<tr>
<td>bbb-</td>
</tr>
</tbody>
</table>

*Subjects to caps described in following tables.

1. Technology And Design Risk

19. "Technology and design risk" assesses the likelihood that when a project is built it will perform as expected and will not cost more than estimated. The assessment quantifies how well the choice of technology and design is likely to result in a project that performs as predicted and in accordance with the requirements of any revenue-producing contracts. The "technology and design risk" assessment is a combination of:

- The "technological risk" of the technical solution the project uses (see table 3). We assess the likelihood that the technology will perform under project operating conditions as measured against contractual requirements.
- The "design cost variation risk" (see table 4) evaluates the risk that the final cost may be different than the estimated cost at financial close.

20. The combination of our assessments of "technological risk" and "design cost variation risk" determines "technology and design risk," which we evaluate on a 1-5 scale, with 1 being the strongest (lowest risk) (see table 2).

Table 2

<table>
<thead>
<tr>
<th>Technology And Design Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>--Technological risk (table 3)--</td>
</tr>
<tr>
<td>Design cost variation risk (table 4)</td>
</tr>
<tr>
<td>Very low</td>
</tr>
<tr>
<td>Low</td>
</tr>
</tbody>
</table>
Table 2

<table>
<thead>
<tr>
<th>Technology And Design Risk (cont.)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modest</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Moderate</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>High</td>
<td>4</td>
<td>5</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Note: All assessments reflect residual risk to the project after mitigants and after allowing for any conditions attaching to mitigants. *Construction phase business assessment is generally not assessed higher than ‘b-‘ unless mitigated by recourse to compensating third-party financial support otherwise more typical of full-recourse financings (see paragraph 69).

a) Technological risk

21. The assessment of technological risk reflects the technology's track record in operating circumstances that are similar to those the project must meet according to the terms of the contracts. The analysis compares the likely performance of the technology at site conditions. We analyze "technology track record in this application" and "technology performance match to contract requirements and expectations" to assess technological risk, which ranges from very strong to very weak (see table 3).

Table 3

<table>
<thead>
<tr>
<th>Technological Risk</th>
<th>--Technology performance match to contract requirements and expectations (see paragraph 24)--</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology track record in this application (see paragraph 22)</td>
<td>Exceeds</td>
</tr>
<tr>
<td>Commercially proven</td>
<td>Very strong</td>
</tr>
<tr>
<td>Proven</td>
<td>Strong</td>
</tr>
<tr>
<td>Proven but not in this application or arrangement</td>
<td>Adequate</td>
</tr>
<tr>
<td>New or unproven technology</td>
<td>Weak</td>
</tr>
</tbody>
</table>

Note: All assessments reflect the residual risk to the project after mitigants and after allowing for any conditions attaching to mitigants. *Construction phase business assessment generally not assessed higher than ‘b-‘ unless mitigated by recourse to compensating third-party financial support otherwise more typical of full-recourse financings (see paragraph 69). §Where “falls short of material” or “very weak,” the construction phase business assessment is not assessed higher than ‘bb+'.

i) Technology track record in this application

22. In assessing "technology track record in this application," we evaluate the degree of reliability and predictability of technology. The criteria have four categories:

- Commercially proven: This type of technology is "off the shelf," prefabricated, or is widely commercialized technology. Furthermore, it must have been used for an amount of time that allows for accurate predictions of its performance over the technology’s lifecycle. Commercially proven would not include technology that may have a long history, but in another application or operating environment, or at a different scale.
- Proven: This type of technology has a satisfactory operating record relative to the project and technology life in a similar application, but the operating period is not long enough to provide reliable cost and performance estimates of lifecycle expenditure. Technology that we view as commercially proven, but that has been modified slightly, would be classified in this category.
- Proven but not in this application or arrangement: This technology has been used in a similar application, but on a different scale, under different operating conditions, or in a different configuration. However, there is a reasonable expectation that it will perform as expected in this application. The application of the chosen technologies in
different configurations or for different purposes to that of the project introduces additional performance and
interface risks. Furthermore, we assess the impact of the choice of materials or equipment on the replacement cycle
and operations and maintenance costs. Pilot-scale testing and at-scale testing of components under operating
conditions that match those of the project provide performance information that reduces the uncertainty of an
untried configuration.

- New or unproven technology: We assign this assessment to technologies that have not been demonstrated at even
  pilot scale, or the major components have not been tested in an environment similar to the one the project is
  operating in.

23. Although almost all projects have some novel or new combinations of technology, this does not preclude a higher
assessment provided all technology interfaces are adequately tested under operating conditions and all technologies
are at the same level of development. The assessment is linked to the weakest technology or interface essential to the
project's operation. For example, a train system may have operational difficulties where the train's motors interfere
with the signaling system.

**ii) Technology performance match to contract requirements and expectations**

24. We assess "technology performance match to contract requirements and expectations" by comparing the expected
performance of the technology against the project performance (including any quality aspects) set out in the project's
contracts. In most circumstances, we assess this as "matches all," though we may revise this assessment during
surveillance if we determine that the design did not match all as expected. The assessments range from "exceeds" to
"falls short of material" as follows:

- Exceeds: We assign this in the rare instances in which our opinion of the technology's expected performance
  exceeds industry norms and local permitting requirements even under extreme conditions. For example, a prison
  that was built with triple security redundancy even though the typical requirements call for less.
- Matches all: This assessment indicates the technology matches or exceeds the range of conditions expected if a
  plant operates as designed under the range of expected conditions.
- Falls short of minor: This indicates normal operations, but may fall short of some minor conditions that are not
  expected to have a material effect.
- Falls short of material: This assessment reflects that the technology falls short of some material contract or
  performance expectation.

**b) Design cost variation risk**

25. The "design cost variation risk" assessment reflects our view of the risk that the final construction cost may materially
exceed the "project budget." We define the project budget as the base cost estimate to build plus a contingency to
cover uncertainty about the base estimate and an escalation factor (see Glossary) to cover the increases in costs during
the construction period, such as inflation and other market-related cost changes. Actual and estimated costs can differ
as a result of variations in such items as level of design completion, errors or omissions in the estimating process,
quantity and cost of materials, labor productivity and cost, and weather. Recognizing that a project's budget changes
over time as the design is completed and contracts are executed, the assessment measures the expected status at
financial close. Also affecting the final cost are contingent risks (not accounted for by the project budget) that are not
certain, but may occur, such as severe weather events or industrial actions such as strikes.

26. The assessments for "design cost variation risk" range from very low to high, and we determine them by analyzing the
variability of estimation error and the risk of exceeding the project budget. The two components that comprise this assessment are the "degree of design completion and costing" and the "design complexity" (see table 4). For example, we believe that estimates based on projects that use a proven design that has been built many times with minor modification present a low risk that the project's final cost will materially exceed the project's budget. Conversely, first-of-a-kind projects or those using new technology have a greater risk of exceeding the project budget and by a greater amount.

Table 4

Design Cost Variation Risk

<table>
<thead>
<tr>
<th>Degree of design completion and costing (see paragraph 27)</th>
<th>Proven design</th>
<th>Modified proven design</th>
<th>Established design modified for site conditions</th>
<th>Simple first of a kind</th>
<th>Complex first of a kind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very advanced</td>
<td>Very low</td>
<td>Low</td>
<td>Modest</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Advanced</td>
<td>Very low</td>
<td>Modest</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
<td>*</td>
</tr>
<tr>
<td>Preliminary</td>
<td>Moderate</td>
<td>High</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Note: All assessments reflect the residual risk to the project after mitigants and after allowing for any conditions attaching to mitigants. We assign "brownfield" sites the next-weakest assessment relative to a similar "greenfield" site if the degree of risk the site presents is higher because of difficult or unknown ground conditions, or where activity is constrained by the presence of other infrastructure activity at or around a project site. Rehabilitated "brownfield" sites, or where, in the case of a concession, the grantor assumes the risk, are treated the same as greenfield sites. *Construction phase business assessment is generally not assessed higher than 'b-' unless mitigated by recourse to compensating third-party financial support otherwise more typical of full-recourse financings (see paragraph 69).

i) Degree of design completion and costing

27. The assessment of degree of design completion and costing ranges from "very advanced" to "preliminary" as follows:

- Very advanced indicates that the majority of the detailed design for the project is completed. The detail is backed by executed or firm orders placed for major equipment and major works that provide a high degree of certainty about price and about which party bears the cost of variations in exchange rate and other variables at financial close. The contingency and escalation factors are appropriate for the project.
- Advanced reflects that detailed design is significantly advanced and is backed by executable contracts for major equipment and major works. The contingency and escalation factors are assessed as appropriate for the project, and the remaining design risk relates to the refinement of minor details. For example, the level of completion of the detailed design for a project that is more of a first-time endeavor for the contractor would be about 50% for complex work. In contrast, the level of completion of the detailed design for a major industrial power project that is being built by an experienced contractor who has built similar projects with comparable site conditions and location could be about 20% or 30%.
- Moderate has a percentage of detailed design completion between preliminary and advanced, backed by firm quotes for major equipment and major works. This also includes fast-track construction processes used where completion of detailed design runs in parallel with construction. The contingency and escalation factors are appropriate for the project design.
- Preliminary indicates that, in our view, the level of design completion is based on previous similar designs and the design can be built to specification with the risk of delay limited to construction problems. Costs must be based on firm quotes for major work packages from a reputable contractor who intends to undertake the work—for example, the package of civil engineering works. Military barracks or school projects at a preliminary stage of design at financial close would be assessed as preliminary provided that they use a proven design or modified proven design.
More complex projects, such as heavy engineering, industrial tasks, or complex building projects, if only at a preliminary stage at financial close, would generally not have a construction phase business assessment higher than 'b-', unless mitigated by recourse to compensating third-party financial support otherwise more typical of full-recourse financings, such as a parent guarantee of construction risk (see paragraph 67).

ii) Design complexity

28. "Design complexity" captures the extent to which the design of the project system used can result in unexpected variations during the construction and operations phases. The design complexity assessment ranges from "proven" to "complex first of a kind" as follows:

- A "proven" design has been built a number of times largely in the configuration proposed. The project is a repeat project, with good historical costs and performance data to support the estimate.
- A "modified proven" design complexity is largely an extension of a design that has been used elsewhere but has been modified for siting, permitting, or other reasons.
- An "established design modified for site conditions" is a project based on a design that has been built only once or a small number of times before or has had a greater degree of modification on a proven design for the site or permit conditions. We also assign this assessment to a proven design that has a portion of risk associated with poorly defined site or permit conditions, such as ground conditions, foundations, latent defects, archeological findings, and contamination or access constraints.
- A "simple first of a kind" design is a new design, but with a simple configuration.
- "Complex first of a kind" design is more risky than any of the above.

2. Construction Risk

29. The construction risk assessment reflects the extent to which "construction difficulty" (see chart 2) and the "delivery method" (see table 6) used can impair a project's expected completion date and target budget. We compare the project's completion date, or "sunset" date (see Glossary), with the schedule in the relevant contracts (mainly revenue and funding contracts), and we analyze the project's ability to generate the cash flow required to meet the first debt-service payment.

30. Together, the construction difficulty and delivery method assessments determine the construction risk assessment on a 1-5 scale, with 1 being the strongest (lowest risk) (see table 5).

Table 5

<table>
<thead>
<tr>
<th>Delivery method (table 6)</th>
<th>Simple building task</th>
<th>Moderately complex building or simple civil engineering task</th>
<th>Civil or heavy engineering task</th>
<th>Heavy engineering-to-industrial task</th>
<th>Industrial task complex building task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very strong</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Strong</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Adequate</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>*</td>
</tr>
<tr>
<td>Weak</td>
<td>4</td>
<td>5</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Very weak</td>
<td>5</td>
<td>5</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>
a) Construction difficulty

31. “Construction difficulty” (see chart 2) assesses the difficulty in building a project. The assessment recognizes that construction difficulty, even for a specific type of project, is a continuum with the assessment determined by rounding to the nearest assessment, or, in borderline cases, to the next-weakest assessment. For example, a simple civil project such as a flat-surface, greenfield (see Glossary) toll road is differentiated from a more complex bridge-building task. Similarly, complex hospitals or covered stadiums would be assessed as 2 because an average hospital is midway between 1 and 2.

32. Standard & Poor's observations are that more difficult construction tasks are more likely to lead to delays and cost overruns than simple construction. Simple construction tasks (buildings and real estate) typically have lower risk of completion than civil or heavy engineering work. In addition, proven construction techniques can simplify the construction tasks. Broad definitions reflect standard industry classifications as follows:

- Civil engineering construction work includes railways, roads, and highways.
- Heavy engineering includes large machines and equipment such as power plants, pipelines, and bridges.
- Industrial construction includes projects such as refineries and mining plants.

33. If there is significant risk that a task can become challenging because of the way the project plans or schedules construction activities, we would assign a "construction difficulty" assessment representative of a more complex construction task, notwithstanding a simple design or construction task. For example, a simple road construction is made more challenging by building the road or upgrading a road next to an existing, operating road. This would introduce execution risk to what may otherwise be a simple design that is not captured by the brownfield adjustment (see table 4).
b) Delivery method

34. The "delivery method" assessment ranges from "very strong" to "very weak" and is derived from the analysis of the "contractor experience" and the "degree of contract risk transfer" (see table 6). A material task on the project's critical path (see Glossary) is the reference point for the assessment.

Table 6

<table>
<thead>
<tr>
<th>Contractor experience (see paragraphs 35-37)</th>
<th>High</th>
<th>High to moderate</th>
<th>Moderate</th>
<th>Moderate to low</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very experienced</td>
<td>Very strong</td>
<td>Strong</td>
<td>Adequate</td>
<td>Weak</td>
<td>Very weak</td>
</tr>
<tr>
<td>Experienced</td>
<td>Strong</td>
<td>Adequate</td>
<td>Weak</td>
<td>Very weak</td>
<td>Very weak</td>
</tr>
<tr>
<td>Experienced but not in local conditions or project type</td>
<td>Adequate</td>
<td>Weak</td>
<td>Very weak</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Inexperienced</td>
<td>§</td>
<td>Very weak</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>
Table 6

Delivery Method (cont.)

Note: All assessments reflect the residual risk to the project after mitigants and after allowing for any conditions attaching to mitigants.
*Preliminary construction phase business assessment is generally not assessed higher than 'b-' unless mitigated by recourse to compensating third-party financial support otherwise more typical of full recourse financings (see paragraph 69). \(\)Not applicable--Turnkey contracts are used mainly in major plant requiring special expertise normally restricted to a small group of high level of contractors for the sector.

i) Contractor experience

35. We assess the ability and experience of the contractors, together with major subcontractors, to deliver the project on time (including time buffers). We base this on their relevant expertise with the project's type, scale, and location, the experience of each contractor's project director and team, their risk-management and quality-control systems, their labor-relations record, and how well they select subcontractors and manage interfaces. The contractor's technical capacity and experience can be a significant factor in ensuring the project is completed as expected (on time and within budget, among other factors). The assessments range from "very experienced" to "inexperienced."

36. If a contractor does not meet all of the characteristics for a category, we will assign it the next-weakest assessment. The assessment is a best fit for the arrangements--company staff, arrangements with subcontractors, and joint ventures with other contractors who mitigate a particular weakness. The assessment also incorporates interface issues between various prime or subcontractors because they can result in mismatches and disputed responsibilities.

37. We define the contractor experience categories as follows:

- A very experienced contractor, also considered top-tier (see "Project Finance Construction And Operations Counterparty Methodology," published Dec. 20, 2011), is generally recognized in the sector and the project location as having a consistent record of delivering similar projects on time, in accordance with design, and within budget. The project team includes an experienced project director who has a track record of delivering similar projects according to the target budget and schedule under the type of contract used. The contractor has a proven record of selecting and managing subcontractors to ensure they have the capacity to deliver by not overcommitting to too many projects and by similarly having experienced staff. To be considered "very experienced" for projects that extend from civil engineering through industrial (see chart 2), the contractor is benchmarked against global contractors for that type of project--for example, the construction of liquefied natural gas plants. To compensate for a lack of local expertise, the contractor may be one of the best in the world and supplement its global expertise with a strong local partner for a specific project.

- An experienced contractor does not meet the requirements of very experienced but is a high-quality, second-tier construction contractor or multiple contractors with an experienced project director and well-defined contractor interface issues.

- An assessment of experienced contractor, but not in local conditions or project type, is assigned to otherwise experienced contractors who are branching out into a new market either geographically or by style of project. Contractors we assess in this category have the general characteristics of the above categories, except for the relevant experience, which is usually mitigated by hiring experienced staff or partnering with a local firm.

- A contractor that is inexperienced in both a sector and geography does not normally have the skills required to adequately mitigate risk in project finance structures. Therefore, contractors that do not mitigate their lack of experience, for example by hiring local project staff, are not considered suitably qualified to take "turnkey" contract risk (see table 7), and the contractor experience is assessed in this category.
38. **Multiple contractors/contracts.** When a project uses multiple contractors, the definition of responsibilities should be clear and allow for an integrated delivery to be assessed as "experienced" overall. In this context, the assessment depends on the arrangements among counterparties, and it generally reflects:

- The strength of the strongest party within "joint and several arrangements" (see "Project Finance Construction And Operations Counterparty Methodology," published Dec. 20, 2011);
- The weakest link among "several" (see Glossary) arrangements with a focus on the materiality of the task that each party carries out; and
- An inexperienced assessment if responsibilities are vaguely defined.

**ii) Degree of contract risk transfer**

39. We measure the effectiveness of the construction contract by assessing how well the risks of cost and time overruns and project performance are transferred to the builder and how much risk the project retains. This is a function of the type of contract, as well as the pricing, the contractor incentives, and the alignment with project's goals. Our assessment uses the terminology and guidance established in table 7. Because of the possible permutations of contracts, the assessment is made on the basis of the best-fit of the contracts terms to the guidance for each typical contract, except that turnkey must meet all guidance terms.

40. In countries where we believe the legal system would not support the terms and conditions of the contract because of significant risk (country risk assessments of 5 or 6), we will assess the contract risk transfer (see table 7) at least at the next-weakest assessment or lower if the legal system is unsupportive of contract obligations.

41. Standard & Poor's looks beyond the contract types to the degree of risk-sharing because contract types vary and are often interpreted differently. The prime difference between the contracts, and therefore the assessment, is which party takes the risk of cost overruns, project delays, and who keeps any savings (see table 7). Although some contracts may be cheaper, this is usually because the project accepts a greater risk share.
**Table 7**

<table>
<thead>
<tr>
<th>Typical contract name</th>
<th>Guidance</th>
<th>Assessment</th>
</tr>
</thead>
</table>
| Turnkey contract       | All of the following:  
  --The contractor agrees to complete the project to a fixed price and certain date and has a very high incentive to perform to a fixed schedule aligned to the project goals;  
  --The contractor guarantees “fit for purpose” backed by compensation for the project for the present value of any underperformance against a completion test*. Fit for purpose will be determined contractually by a performance test. For the test to be effective, it should be conducted under normal operating conditions at full capacity for a period long enough to be representative of normal operating performance: and  
  --There is limited relief for unexpected events, and modifications can only be requested under a strict regime; these factors reduce the risk of any price increases or delays. | High |
| Engineering, procurement, and construction (EPC) contract | Engineering, design, procurement of materials, construction, and management are risks borne by the contractor either through its own labor or subcontractors based on an agreed scope and specifications with little project involvement.  
  --The contract is for a fixed price and schedule with a limited risk of variations (change orders) to affect a project's costs and time of completion.  
  --A major contractor coordinates all construction activities and has moderate to high alignment with project goals.  
  --The contract has a high incentive to perform. | High to moderate |
| Engineering, procurement, and construction management (EPCM) contract | This contract is similar to an EPC contract with greater sharing of management risk with the project’s management.  
  --The project’s management takes greater risk in managing the variety of procurement and contract interfaces and the consequences of any failure.  
  --The project’s management takes a greater risk on price and time to delivery without the buffer of a major contractor coordinating all activities. | Moderate |
| Construct contract | The contractor agrees to build to a design supplied by the project or its agent and limits its responsibility to quality of workmanship and does not warrant failure of the design to meet project objectives.  
  --There is a greater risk of change orders or variations (see Glossary).  
  --Incentives are limited to liquidated damages and warranties on workmanship. | Moderate to low |
| Cost plus price | Contractor paid on cost per volume or unit of work such as in earthworks or rail-track laying.  
  --Low incentives and alignment with project goals.  
  --This contract only provides the requisite certainty when used for simple linear construction tasks where the length is known with a high degree of certainty such as pipelines, or railway tracks across flat predictable terrain. | Low |

Note: Paragraphs 42-43 describe in greater detail the characteristics that support the assessment decision process.  
*If the project is reliant on this compensation for underperformance against design, the CDA is directly weak-linked to the contractor.

42. We examine the contract price--if possible in consultation with the independent expert (see Glossary)--to ascertain whether the contract was fairly priced and whether there is adequate contingency to cover any potential cost overruns and variations. Deliberately low-priced or poorly priced contracts indicate an aggressive pricing strategy or
inexperience for the type of contract and associated task and may be a precursor to variations in the design that will add to the project's cost and weaken the incentive to perform under the contract. This is identified by an analysis of the contracting culture in the country, the form of the contract, and comparison with any other known comparable costs. Where the contracting culture is to bid low and rely on change orders to achieve a profit under the contract, the contract assessment and other analysis will assume that the contract is one type lower—for example, a construct contract (moderate to low) will be treated as a cost-plus contract (low), unless the contractor can demonstrate it understands the contract type and has adequately priced the work. We analyze to what extent the contract incentives match the project's goals. For instance, the bonus-penalty regime backed by amounts that make performance attractive provides a strong alignment of the type of contract's cash management, penalties, and incentives with the project's goals. Therefore, we assess it as stronger, reflecting a strong match between contract incentives with the project's goals.

43. Characteristics of high incentives include a combination of some of the following:

- The contract is competitive, but fairly priced (see paragraph 40).
- The liability cap is not less than the sum of possible cost and time overruns as measured by their consequences.
- Liquidated damages are assessed relative to the project costs incurred or other contract costs from an extended delay (for example, late delivery penalties under revenue offtake contracts) (see Glossary). The defect liability period and warranties to protect the project against construction defects are reasonable for the technology and market practice.
- The level of credit enhancement (letters of credit, performance bonds, and surety instruments) exceeds 10% of the contract cost and does not decline (step down) toward the end of construction. This is in addition to any replacement credit enhancement (see "Project Finance Construction And Operations Counterparty Methodology," published Dec. 20, 2011).
- The payment profile matches the work completed and is not front-loaded.
- A contractor has equity in the project. This gives the contractor an incentive to perform, but the contractor may also obviate a replaceable conclusion (see "Project Finance Construction And Operations Counterparty Methodology," published Dec. 20, 2011), if it is able to veto the vote on a replacement, or may delay a decision. If it has a veto right, the contractor will be considered irreplaceable.

3. Project Management

44. The analysis of the construction phase project management assesses the ability of the project's management to manage the risks that the project retains responsibility for. We evaluate seven components, which we assess as positive, negative, or very negative (see table 8):

- Construction cash management. This focuses on the release of cash to pay for construction, the effectiveness of budgeting to ensure costs are contained, and that cash is deposited in controlled accounts. We analyze it with reference to those conditions precedent to drawdown (see Glossary) and representations and warranties that may result in a temporary or permanent stop to drawings.
- Design approval. It focuses on to what extent the design may be subject to variations that can result in the need for additional funds or delays not covered by the construction contractor or a third party.
- Permits and acquisition of right of way. This assesses the likelihood of all permits being issued and all right-of-way arrangements (see Glossary) being completed.
• Project management expertise.
• Planning and budgeting execution risk. We focus on those activities that are on the critical path (see Glossary) of the project’s plan. A delay in any critical path activities will lead to a delay in the project, as well as possible increased costs.
• Sunset date. This allows the project a buffer to complete construction. We evaluate whether the date of the first scheduled debt service and the amount of buffer are sufficient to cover delays. A project may have a number of sunset dates built into the construction contract, the project agreements or concession, and supporting contracts such as fuel supply. Implicitly, the scheduled debt service may also create a sunset date that requires operations to be started to meet scheduled debt service.
• Dispute resolution.

Table 8

<table>
<thead>
<tr>
<th></th>
<th>Positive</th>
<th>Negative</th>
<th>Very negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction cash management</td>
<td>Cash management includes a variety of measures that manage the payment of construction costs and look forward to provide early warning of cost overruns, such as cost-to-complete tests, milestone (see Glossary) payments, and preservation of interest payments. Independent oversight and certification of work completed also enhance cash controls.</td>
<td>Cash management is basic and lacks an independent, forward-looking review.</td>
<td>Cash management lacks adequate controls on payments/disbursement of funds or permits payments ahead of completion of work package.</td>
</tr>
<tr>
<td>Design approval</td>
<td>Operator and user or offtaker have provided a detailed project scope and have approved design, accounting for ease of operation and maintenance. All parties have sufficient resources to approve design in a timely manner.</td>
<td>Operator and user or offtaker have had limited input into or review of the project scope and have not formally approved the design as the project is the only partly involved. The scope is not well defined, or some parties are poorly resourced to review designs.</td>
<td>Operator and user or offtaker have not been involved in design or approval. No review of the design relative to contract requirements has occurred.</td>
</tr>
<tr>
<td>Permits and acquisition of right of way</td>
<td>All right of ways and material permits that can be issued at financial close are issued, and the remainder are known and quantified with very low risk of unexpected conditions.</td>
<td>Permits are not issued or potential site conditions have material consent conditions or have not been quantified (such as contamination or archaeology), design variations may be required that potentially increases project risk. The assessment of the risk increase considers such factors as transparency, precedent, and the legislative environment. Right of way not fully acquired but viable alternate routes available.</td>
<td>Design risks due to archeological, environmental, or endangered species cannot be quantified or where the permitting process is opaque. Right of way at risk of being substantially delayed.</td>
</tr>
<tr>
<td>Project management expertise</td>
<td>Sponsor has strong project management skills and a previous track record of delivering similar projects on time and budget.</td>
<td>Sponsor’s project management track record is limited and risk of contractor-introduced change is higher.</td>
<td>Not applicable*</td>
</tr>
<tr>
<td>Planning and budgeting execution risk</td>
<td>Critical-path items present limited risk to achieving schedule and budget.</td>
<td>Schedule and budget are tight, with a number of items or a material item on the critical path subject to uncertain factors (long lead time, weather, access, etc.).</td>
<td>Schedule and budget are very tight; with items or a material item on the critical path that may create a delay beyond the project sunset date if missed.</td>
</tr>
</tbody>
</table>
Table 8

<table>
<thead>
<tr>
<th>Summary Of Assessment Rules For Project Management Subfactors (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunset date</td>
</tr>
<tr>
<td>Dispute resolution</td>
</tr>
</tbody>
</table>

*While the management track record is limited we would expect this to be supplemented by external hires with skills necessary to deliver the project and a skilled and experienced operator who is capable of managing the project. As such, there is no “very negative” assessment.

45. Standard & Poor's uses the following scale to assess a project's construction management: strong, satisfactory, fair, and weak (see table 9).

Table 9

<table>
<thead>
<tr>
<th>Determining The Overall Assessment For Project Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall assessment of project management</td>
</tr>
<tr>
<td>Strong</td>
</tr>
<tr>
<td>Satisfactory</td>
</tr>
<tr>
<td>Fair</td>
</tr>
<tr>
<td>Weak</td>
</tr>
</tbody>
</table>

4. Adjusting The Preliminary Construction Phase Business Assessment

46. We adjust the preliminary construction phase business assessment to account for the "project management" assessment, which then establishes the construction phase business assessment. The effect of the project management assessment on the preliminary construction phase business assessment can be positive, neutral, or negative (see table 10). The effect is greater in high-risk projects, where a skilled and well-run project management can significantly affect outcomes compared with a project developed under a low-difficulty form of construction where an experienced contractor assumes a large portion of the cost and schedule risk of delivery.

Table 10

<table>
<thead>
<tr>
<th>Construction Phase Business Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall assessment of project management (see table 9)</td>
</tr>
<tr>
<td>Strong</td>
</tr>
<tr>
<td>Satisfactory</td>
</tr>
<tr>
<td>Fair</td>
</tr>
<tr>
<td>Weak</td>
</tr>
</tbody>
</table>
B. Financial Risk Adjustment

47. The "financial risk adjustment" assesses whether the project has enough funding (use of funds) to cover the costs of construction and ensure the project is ready for operations even under a downside scenario. This is evaluated against the certainty of the sources of finance that will be needed to meet funding requirements.

48. The assessment of a project's "financial risk adjustment" is based on the analysis of sources and uses of funds. We assess funding adequacy (uses of funds, tables 11 and 12) and construction funding (sources of funds, tables 13 and 14) relative to the financing required to complete construction and establish the financial funds necessary for the project to commence operations. We measure financial risk relative to the cost and timing of construction, as determined by the business assessment, and the establishment of a capital structure ready for starting the operating phase, including debt service.

1. Funding Adequacy (Uses Of Funds)

49. Funding adequacy compares the amount and certainty of available funds against all expected uses, particularly those in the downside scenarios due to the fixed nature of funding and the need to begin operations as expected. Uses of funds include (see tables 11 and 12):

- **Construction costs and other start-up project costs.** These extend beyond the contract costs and incorporate allowances for variable construction costs, such as schedule of rates works, and for costs not covered by the builder under the construction contract (such as variances, escalations, latent defects (see Glossary), and movements in exchange rates). The project, rather than the contractor, may also bear the cost of time-related costs, such as preliminaries (see Glossary), force majeure events, or delays not attributable to the builder (such as permit 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 project's first spares and first fill (see Glossary).

- **Establishment of reserve accounts.** The operating phase relies on having fully funded reserve accounts at the start of operations. Therefore, funding is considered adequate when the reserve accounts are fully funded before the operating phase starts. Reserve accounts would be required earlier when cash payments during construction for debt service are required. This is mitigated if debt service is prefunded or specifically sized in the project funding after allowing for other uses.

- **Interest payable during construction.** This may be in the form of cash payments or an amount to be capitalized. Even if interest is capitalized, the debt limits must include an amount equal to the capitalized amount, otherwise the loan will be in default. Interest is a time-based cost and, as such, the amount required increases with project delays. Total interest payable to a project during construction can vary as a result of any project delays that could squeeze available funds.
Table 11

Funding Adequacy (Uses Of Funds)

<table>
<thead>
<tr>
<th>Construction costs and other project start-up costs</th>
<th>Downside need</th>
<th>Base need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction costs and other project start-up costs</td>
<td>Funding meets or exceeds construction costs under Standard &amp; Poor's downside scenario (see Appendix) or funding covers any early completion bonus payment under a fast-track scenario</td>
<td>Funding exceeds construction costs for base-case scenario, but not that of the downside scenario (see Appendix)</td>
</tr>
<tr>
<td>Interest payable during construction (see Appendix)</td>
<td>Interest payments cover the downside case need</td>
<td>Interest payments funded until operations commence to cover interest under base case</td>
</tr>
<tr>
<td>Working capital</td>
<td>Initial working capital fully funded</td>
<td>Initial working capital fully funded</td>
</tr>
<tr>
<td>Reserve accounts</td>
<td>Fully funded</td>
<td>Fully funded</td>
</tr>
</tbody>
</table>

50. Our assessment recognizes that while funding is normally fungible, some expenses, such as construction costs, are normally paid progressively, whereas reserves are usually established at the end of construction and after paying for any cost overruns. Adequacy is tested against the downside funding, including any increased interest costs resulting from any project delays.

51. The assessment of funding adequacy can be either neutral or negative to the financial risk profile—it cannot, in itself, raise the assessment (see table 12). The assessment is effectively a summation of all the components and is biased toward a project being able to cover its funding needs in a downside scenario.

Table 12

Use Of Subfactor Assessments For Determining The Impact Of Funding Adequacy (Uses Of Funds, See Table 11)

<table>
<thead>
<tr>
<th>The impact of funding adequacy</th>
<th>Subfactor assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>Funding is available for all costs under the downside scenario.</td>
</tr>
<tr>
<td>Marginally negative</td>
<td>Funds cover construction costs but are not sufficient to meet the combination of other uses, such as reserves funding adequacy. Reserve accounts can be less than needed in the downside case, but not less than needed in the base case.</td>
</tr>
<tr>
<td>Negative</td>
<td>A combination of the marginally negative conditions above plus any material conditions under the transaction documentation, which are assumed as having the potential to inhibit the timely drawing of a letter of credit (or similar instrument) used to support a reserve account in all downside requirements.</td>
</tr>
<tr>
<td>Insufficient</td>
<td>Funding is not sufficient to cover construction costs, interest, or working capital required to commence operations under our downside case. Total funding sources do not meet the sum of all downside requirements.</td>
</tr>
</tbody>
</table>

2. Construction Funding (Sources Of Funds)

52. Construction funding may come from many sources that may vary by degrees of certainty, conditionality, and timeliness. Due to the normally tight financing schedule, a funding source that is late or uncertain may result in a default, particularly if interest is payable and not paid when due.

53. The assessment of construction funding is based on the analysis of the following six funding and liquidity sources:
• Debt funding certainty. We assess to what extent funds not contributed at financial close can be drawn down during construction subject to meeting the conditions precedent (CP) established in the loan documentation. If debt is a mix of bank debt subject to progressive draws and bond funding that is fully paid, the bondholders are disadvantaged if the banks can withhold funding. A failure to meet any CP may prevent drawdown, and the more extensive the CP, the greater the drawdown risk. For example, this could mean that the failure to provide a report on time may link through the project documents to the CP and, as such, may be grounds to prevent a drawdown. If we have significant concerns about the project's ability to meet the CP in order to drawdown, this factor would be assessed as uncertain.

• Equity certainty. We assess how certain equity that has been deferred and not fully invested before debt is drawn will be contributed at the end of construction.

• Interest income during construction. We assess the availability of interest earned during construction. The amount of interest may be less if the project is built faster than expected or if unexpected costs require its early expenditure. Therefore, we do not consider it a reliable source of financing. The amount earned is subject to the market's short-term same day deposit rates and the amount of cash on deposit at any time.

• Revenue from operations during construction. We assess operating cash inflows (such as those coming from operating an existing hospital while a replacement one is built next door) during construction using the operations phase credit profile analysis for a start-up project downside case. The cash is based on the excess available after all operating costs. Operating surplus cash inflow is often vulnerable to delays or unforeseen costs due to the difficulties in establishing an operation on a new site and conducting that operation adjacent to or on the same site as construction.

• Third-party support, including grants from government or third-party or parent support. The assessment of the effectiveness of these additional sources of cash inflows used to finance construction, in addition to timing, is performed on economic and legal grounds. For example, the economic incentive of a government or local authority to provide a grant, the authority's creditworthiness, and the authority's legal ability to provide the grant are important factors.

• Contractor support. Contractors' liquidated damages (payable by the contractor on certain events) are usually paid after arbitration and, at times, after legal action. Therefore, we do not consider liquidated damages a funding source, unless backed by performance bonds, letters of credit, retentions, or similar mechanisms (see "Insurers: Rating Methodology," May 7, 2013, "Bond Insurance Rating Methodology And Assumptions," Aug. 25, 2011, and "Credit Enhancements (Liquidity Support) In Project Finance And PPP Transactions Reviewed," March 30, 2007). The amount of liquidated damages that require coverage also involves some uncertainty because it will be based on specific performance at certain times during construction. Retentions and third-party liquidity support can ensure that payments to support construction continue while any disputes related to liquidated damages are settled.

54. 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, counterparty risk, and willingness (including incentives) to contribute under our downside scenarios. We assess each of the components as "highly certain," "certain," or "uncertain" (see table 13). The highly certain assessment is based on debt and equity financing that is contributed at or before financial close and deposited in a restricted account (usually controlled by the trustee).

55. Standard & Poor's measures liquidity on a net basis after first allowing for the funding of the downside scenario needs (see table 14) and then the credit enhancement necessary for contractor replacement, specifically assessed as part of the CDA (see "Project Finance Construction And Operations Counterparty Methodology," published Dec. 20, 2011). As such, we do not include the credit enhancement necessary for contractor replacement as general liquidity.
### Table 13: Construction Funding (Sources Of Funds)

<table>
<thead>
<tr>
<th>Highly certain</th>
<th>Certain</th>
<th>Uncertain*</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>--Debt funding certainty--</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk of debt being unavailable when required is remote.</td>
<td>Risk of debt being unavailable when required is low.</td>
<td>Potential for delayed debt drawdown when required to make a payment, or, would create an insolvency of the project.</td>
</tr>
<tr>
<td>The debt is either contributed in full or unconditionally and irrevocably underwritten from a financial institution (counterparty risk would apply) at financial close.</td>
<td>The CP for drawings are innocuous, narrowly defined, and only subject to “fatal”§ conditions that are highly likely to result in debt not being serviced or lead to project termination for projects with a construction phase business assessment below ‘a’.</td>
<td>Onerous, more extensive or administratively cumbersome CP present, decreasing the level of certainty, also depending on the degree of administrative or other loose requirements included.</td>
</tr>
<tr>
<td>The CP for drawings are innocuous, narrowly defined, and only subject to “fatal”§ conditions that are highly likely to result in debt not being serviced or lead to project termination for projects with a construction phase business assessment equal to or above ‘a’ due to the low risk to covenants.</td>
<td></td>
<td>Debt funds from financial institutions that appear no longer committed to the project and are actively seeking methods to stop drawdowns. Evidence of this includes formal notices from lenders or other communications that reference the project’s board of management concern about ongoing solvency.</td>
</tr>
<tr>
<td><strong>--Equity certainty--</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deferred equity in projects with a construction phase business assessment above ‘bb+’ must be backed by a financial instrument such as an unconditional and irrevocable letter of credit (LOC), from a bank (for counterparty impact see paragraph 66). The instrument must be unconditional and irrevocable and payable by a fixed date or earlier if the finance documents trigger an early call.</td>
<td>Deferred equity in projects with a construction phase business assessment ‘bb+’ or below is backed by a financial instrument such as an unconditional and irrevocable LOC from a bank (for counterparty impact see paragraph 66). The instrument must be unconditional and irrevocable and payable by a fixed date or earlier if the finance documents trigger an early call.</td>
<td>The guarantee is provided by stronger publicly rated parents provided the guarantee is effectively ranking with senior unsecured debt and a failure to pay would be considered a default of the parent (see Standard &amp; Poor’s guarantee criteria listed in the “Related Criteria And Research” section below) for projects with a construction phase business assessment above ‘bb+’.</td>
</tr>
<tr>
<td><strong>--Interest income during construction--</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The construction drawdown is very predictable and cannot exceed a fixed schedule of drawings under the transaction documentation for projects with a construction phase business assessment above ‘a-’. The amount of interest income paid on a project’s conservative cash balances held with highly rated banks at locked-in deposit rates is included.</td>
<td>Construction drawdown is very predictable and cannot exceed a fixed schedule of drawings. If hedged, interest income is based on conservative balances with rated banks or governments rated at the same or higher level than the project at established deposit rates. Where unhedged, we include an amount of interest income no greater than 75% of the predicted income after costs by a generally available on call deposit less 1%.</td>
<td>Interest income not resulting from deposit with a highly rated bank.</td>
</tr>
<tr>
<td><strong>--Revenues from operations during construction--</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excess proceeds from operations are highly certain under all reasonable conditions.</td>
<td>Excess proceeds from operations are slightly vulnerable to underperformance.</td>
<td>Operating cash inflow income from untested or uncontracted operations that are vulnerable to interruption or delay.</td>
</tr>
</tbody>
</table>
Table 13

Construction Funding (Sources Of Funds) (cont.)

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess proceeds</td>
<td>come from a downside scenario of an availability based project that has at least a 'a' construction phase business assessment and is not viewed as weaker than that in operations phase.</td>
</tr>
<tr>
<td>Operating surplus</td>
<td>income from operations that have at least five years of operations history, but limited to a downside scenario.</td>
</tr>
</tbody>
</table>

The surplus funds are based on a downside scenario for a project in which the operations risk from which funds are provided is no higher than the construction phase business assessment (see paragraph 46).

---Third-party support†---

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third-party support</td>
<td>available on demand when required.</td>
</tr>
<tr>
<td>Risk of third-party support</td>
<td>not being available when required is low.</td>
</tr>
<tr>
<td>Third-party support</td>
<td>is highly conditional or may not be contributed in time to prevent a default.</td>
</tr>
</tbody>
</table>

Explicit third-party financing support (typically supplied through grants, contingent capital, and guarantees) is expected to be contributed ahead of the time required, even if the project is facing difficulty (see paragraph 65 and refer to Standard & Poor's guarantee criteria listed in the "Related Criteria And Research" section).

Funds are expected to be contributed before a default is triggered, but the conditionality may limit its timely contribution.

---Contractor support (see paragraphs 52 and 53)---

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor's funds</td>
<td>are either cash deposits, retentions, or unconditional and irrevocable instruments.</td>
</tr>
<tr>
<td>Contractor's support</td>
<td>is unconditional and irrevocable, but the construction contract may restrict ability to draw under the instrument (e.g., an arbitration period that is payable within a reasonable time to complete the project within the project cash needs).</td>
</tr>
<tr>
<td>Liquidated damages</td>
<td>are not backed by an unconditional and irrevocable instrument (such as an LOC).</td>
</tr>
</tbody>
</table>

On-demand instruments are more certain than those that may be payable after a certain time period or have some conditionality.

The instrument should not have any restrictions on drawing under the construction contract. Furthermore, the amount is limited to no more than 10% of funding.

*No funds from uncertain sources are included in the analysis. §By “fatal” conditions we refer to the reasonable decision by lenders to prevent a drawdown when the project is on the brink of failing and has little prospect of recovery and being completed. †If the quality of any third-party support is very weak or not backed by an appropriate credit quality (see paragraph 66), rather than assess it uncertain, we do not include any value in the analysis.

56. The assessment of construction funding can be either neutral, marginally negative, negative, or uncertain to the financial risk adjustment--it cannot, in itself, raise the assessment (see table 14). The construction funding is assessed against the benchmark of having all funds contributed at financial close and recognizes that debt and equity contribute the majority of all funding.

57. The minimum funding requirement is the sum of the following:

- 100% of total downside case scenario costs, including additional downside interest expense to meet downside delays and funds needed for the smooth start-up of operations;
- A further buffer of generally at least 10% of any additional costs incurred under the downside scenario (excluding interest costs that cover the project to sunset date); and
- In order not to double count costs, we exclude the costs to support the builder replacement under the CDA (these supports are also excluded from funding sources). (See "Project Finance Construction And Operations Counterparty..."
Table 14
Use Of Subfactor Assessments For Determining The Impact Of Construction Funding (Sources Of Funds) (See Table 13)

<table>
<thead>
<tr>
<th>The impact of construction funding</th>
<th>Country risk assessment 1-3</th>
<th>Country risk assessment 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>Highly certain sources are sufficient to meet the minimum funding requirement of all the downside scenario (see Appendix) needs.</td>
<td>Highly certain sources are sufficient to meet 101% of the minimum funding requirement of all the downside scenario (see Appendix) needs.</td>
</tr>
<tr>
<td>Marginally negative</td>
<td>Sources are sufficient to meet minimum funding requirement of the downside scenario needs with debt funding being certain and all other sources assessed as highly certain or with debt funding and equity being highly certain and all other sources as certain.</td>
<td>Sources are sufficient to meet 101% of the minimum funding requirement of the downside scenario needs. With debt funding being certain and all other sources assessed as highly certain or with debt funding and equity being highly certain and all other sources as certain.</td>
</tr>
<tr>
<td>Negative</td>
<td>Exceeds the conditions necessary for uncertain but does not meet the conditions necessary for marginally negative.</td>
<td>Exceeds the conditions necessary for uncertain but does not meet the conditions necessary for marginally negative.</td>
</tr>
<tr>
<td>Uncertain</td>
<td>Sources are not sufficient to meet the minimum funding requirement of the downside scenario. The construction phase SACP for uncertain is generally not higher than 'b-'.</td>
<td>Sources are not sufficient to meet 101% of the minimum funding requirement of the downside scenario. The construction phase SACP for uncertain is generally not higher than 'b-'.</td>
</tr>
</tbody>
</table>

Note: Sources that have conditions on their use are only included where the conditionality means they can be used to complete construction. In jurisdictions with a country risk assessment of 4, additional funding cushion is required net of mitigants. In jurisdictions with a country risk assessment of 5 or 6, we will develop a country-specific construction downside scenario analysis because the country risk factors that impact construction are expected to be more predictable.

C. Construction Phase Stand-Alone Credit Profile

58. The assessment of the construction phase financial risk profile can be either neutral or negative to the construction phase business assessment—it cannot, in itself, raise the assessment (see table 15). Project financings are traditionally capitalized to cover the cost of construction, including the expected downside expenditure. This is supplemented at times by limited recourse to funding from the parent or another interested third party. Ordinary parent support under these criteria is specifically provided by the contracts that make up the project. As such, the financial agreements define ordinary support from a parent.

59. Standard & Poor’s then confirms or adjusts the construction phase business assessment (see paragraph 46) weaker according to the financial risk adjustment (see table 15) to determine the preliminary construction phase SACP. Failure to achieve a minimum standard—where in our analysis one or more features cause the financing to be highly vulnerable to default in the very near to near term—may result in a preliminary construction phase SACP of no higher than ‘b-’.

Table 15

Financial Risk Adjustment

<table>
<thead>
<tr>
<th>How we express our analytical opinion (rankings and qualifiers)</th>
<th>Impact on the construction phase business assessment by a maximum*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial risk adjustment: Funding adequacy (use of funds) (see table 12)</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>No change</td>
</tr>
<tr>
<td>Marginally negative</td>
<td>-1 notch</td>
</tr>
</tbody>
</table>
Table 15

<table>
<thead>
<tr>
<th>Financial Risk Adjustment (cont.)</th>
<th>Negative</th>
<th>-2 to -3 notches§</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient</td>
<td></td>
<td>Generally not assessed higher than 'b-' and at least minus 2-3 notches</td>
</tr>
</tbody>
</table>

Financial risk adjustment: Construction funding (source of funds) (see table 14)

<table>
<thead>
<tr>
<th>Neutral</th>
<th>No change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marginally negative</td>
<td>-1 notch</td>
</tr>
<tr>
<td>Negative</td>
<td>-2 to -3 notches§</td>
</tr>
<tr>
<td>Uncertain</td>
<td>Generally not assessed higher than 'b-' and at least minus 2-3 notches</td>
</tr>
</tbody>
</table>

Note: Not generally rated higher than 'b-', then 'CCC' criteria applies (see "Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings," published Oct. 1, 2012). The total impact on the construction phase business assessment is the sum of the funding adequacy and construction funding impacts. §Three notches are applied when the total funding or financing is closer to the base case than the downside case. In contrast, two notches would mean the funding and financing are less than the total downside but not significantly below that scenario.

Operating activities during the construction phase

60. Operating activities undertaken during construction are assessed using the operations phase credit profile analysis to determine any business or financial impact on the construction phase. This impact is primarily based on constraints on construction activities next to an operating site and the contribution to construction cash flows coming from operating activities.

1. Construction Counterparty Adjustment

61. The preliminary construction phase SACP may be weak-linked (see Glossary) to construction, equipment, or financial counterparties relating to construction phase contracts.

62. The construction contractor's CDA (see "Project Finance Construction And Operations Counterparty Methodology," published Dec. 20, 2011) is applied as a weak-link to the preliminary construction phase SACP. If the technology and design risk is partly or wholly transferred to the technology supplier and designer, this will weak-link or partially de-link the construction phase SACP to the CDA of that counterparty. Warranties and other performance measures provided by a creditworthy counterparty can support our view that risk has been adequately transferred to the technology supplier or designer. For replaceable construction counterparties, as the CDA assumes the counterparty can be replaced if it becomes insolvent, the CDA is determined at the time of the initial rating and then again only at any replacement of that counterparty.

63. For multiple contracts covering supply of equipment and with a second contract covering installation and construction of the building, the CDA reflects the weaker of the supplier CDA and constructor CDA. For example, the counterparty CDA of the contract to build a stadium and install equipment is assessed as a construction activity, whereas the counterparty CDA of the contract to supply furniture, fixtures, and equipment is assessed as an equipment supplier activity. Similarly, for a power station, the turbine manufacturer is a supplier and the building and associated balance of plant is civil, mechanical, and electrical engineering.

64. In countries where our assessment of the legal system is that it will not support replacement in a timely manner due to significant country risk (country risk assessment of 5 or 6), we will treat the contractor as an irreplaceable contractor.
We assess the high risk transfer to be of limited benefit where the contractor is irreplaceable (according to our criteria) and of weak credit quality, which renders the contractor unlikely to fulfill its obligations. Such a circumstance would effectively lead to a lower contract risk transfer assessment being assigned with the resultant analysis of other risk transfer, financial analysis and counterparty CDA (see "Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011), reflecting this lower assessment. In the case where a replaceable contractor with weak credit quality enters into a "turnkey contract," the assessment will be the better of either:

- A high assessment as if all risks are transferred to such a contractor, thus linking the project's credit quality to the contractor CDA; or
- Assessing the contract as high to moderate (like an engineering, procurement, and construction contract) assuming the contractor is a replaceable contractor. We will include design risk transfer and consider in the financial analysis that the contractor is unlikely to deliver on the credit positives associated with a turnkey contract, and would need to be replaced.

For financial counterparties—including bank accounts, liquidity or credit support facilities, interest rate swaps, and currency swaps—and how they may affect a project rating, refer to "Counterparty Risk Framework Methodology And Assumptions," published June 25, 2013.

D. Other Factors

1. Third-Party Construction Guarantee

We consider a third party to act as a form of credit substitution if that party substitutes its credit and if it guarantees performance, thereby assuming all obligations for the construction risk, including timely funding of any shortfall, and principal repayment if the project is not completed. Completion guarantees that do not guarantee performance to specification and compensate the project for weaker performance would not meet this standard.

2. Scope Of Project Finance Construction

The fixed funding and finite timeframe together with the limited/nonrecourse nature of project financings require a degree of predictability in the construction arrangements for the purposes of limited recourse financing.

Construction tasks that do not sufficiently exhibit this predictability are more characteristic of full-recourse financings typically attributed to corporate and government financings. Such situations are identified with asterisks (*) in tables 2 to 6. If structured as a project financing, it is highly likely that the funding may be insufficient as assessed under these criteria. As such, for these financings, the preliminary construction phase SACP is generally not higher than 'b-', unless the construction tasks are mitigated, or otherwise are more appropriately evaluated under corporate or other criteria.

3. Event Risk During Construction

The construction analysis includes event risks that are considered probable during the construction period. The risks
are considered in the "technology and design risk" and "construction risk" assessments. The assessments assume the risks materialize in the downside case scenario (see Appendix). A tight construction timeframe tends to magnify the effect of events and can result in delays or higher construction costs for the project. This can, in turn, lead to a failure to meet contractual deadlines. Examples of events that are probable include a fire, mechanical failure, and human error that we consider normal at any rating level. An event is probable if the region is known for those events—for example, natural events such as earthquakes, volcanism, floods, cyclones, etc., and non-natural events such as litigation and environmental clean-up. We also assess changes to regulation or law (particularly tariff setting) and permit conditions or project-specific legislation expected at the time of issuance and subsequently.

4. Insurance

71. Insurance from a provider with a rating the same as or higher than the project (see "Counterparty Risk Framework Methodology And Assumptions," published June 25, 2013) is a mitigant for some risks, such as fire, subject to the payout amounts, which are reduced by the deductibles for time and cost and for the likely time lag between the occurrence and receipt of insurance payout. Because most project financings rely on the performance of a single site, some low-probability risks can have a high impact. Therefore, when our analysis indicates a material and highly likely event not otherwise covered, the project construction phase business assessment is weak-linked to the rating on the insurance provider, meaning that it's weak-linked to the rating on the lowest-rated insurance provider. Uninsured risks are included in the downside scenario (see Appendix).

APPENDIX

Base-Case And Downside Scenarios

1. Construction Base-Case Scenario

72. The construction base-case projections reflect Standard & Poor's expected scenario. We develop the base-case scenario based on the expected cash flows of the project over the project's construction phase given the various contract and financing document conditions, the expected macroeconomic and microeconomic conditions, and project-specific conditions. The base case includes total costs to meet the project's expected completion date to the start of operations and comfortably meet first debt service. The costs include:

- Direct costs, indirect costs, and margins related to the construction contracts, including allowances for weather, industrial action, and protests.
- Expected delays, such as delay in obtaining necessary permits, especially if not all permits can be obtained by financial close, and delay risk of third-party tasks, such as service connection or relocation.
- Expected risks for tasks that are potentially affected by unknown or little-known conditions, such as ground conditions, foundations, latent defects, archeological findings, and contamination.
- A project's direct costs that are in addition to the contract costs and stem from the project sponsors or parents, such as project staff, and any project services the parent or sponsor provides.
• Escalation (see Glossary) for economic and industry factors for the expected construction period consistent with Standard & Poor's expectations for macroeconomic conditions.
• Costs payable under project agreements, including early contracted completion bonus payments and other costs if the project is completed ahead of time.
• Interest payable, including capitalized interest (see paragraph 49).
• Establishment of a project's initial working capital needs.
• Establishment of project liquidity measures, including reserve accounts.
• Costs of performance testing, including materials.
• Working capital is fully funded at completion. We will factor unfunded working capital into the operating phase analysis as a significant weakness.
• The debt service reserve account is funded at completion. Such an account, funded through operating cash flows, but backed by a letter of credit at completion, is considered fully funded, and although a project can start operations without funded reserve accounts, we will reflect this in the operations phase assessment.

73. We apply an escalation factor (see Glossary) to each year's cash flows to adjust for higher costs due to inflation and other market factors from the time when the estimate was completed until construction is finished. Because inflation is cumulative, so too is the escalation factor, and often the market price rises more in good times. Therefore, long-term contracts will have a greater escalation risk than short-term contracts.

74. We use the independent expert's report in forming our base case. The project and independent expert's assumptions are adjusted for Standard & Poor's experience with similar projects, our view of economic conditions affecting the project, and experience from other rated projects.

2. Construction Downside Scenario

75. The construction downside scenario envisions that the project is successfully completed by the sunset date (see paragraph 44) and takes into consideration the cost of delays and cost overruns, including any allowance of costs resulting from a delayed start-up and the commencement of scheduled debt service. Where relevant, a downside scenario analysis of an early completion scenario may be created, taking into account early completion bonus payments, early payment of construction expenses, and any restrictions on the start of revenue-generating activities.

76. The downside scenario is the base case adjusted for the most likely cost and delay impacts. Issues we typically consider include:

• Allowances for extreme weather events, industrial actions, and protests.
• Maximum delay for tasks, such as obtaining necessary permits.
• Allowance for replacement of a replaceable builder not already covered under CDA analysis. To avoid double counting, funding of the downside needs and builder replacement under the CDA cannot be used for another need. If the builder is not considered replaceable, then the analysis will not assume any costs required for builder replacement.
• Impact of missed time-critical construction windows, particularly for third-party tasks, such as service connection or relocation, and critical path items such as completing offshore tasks during calm periods.
• Long lead-time items, including an assessment of manufacturing and delivery risks (shipping).
• Maximum delay caused by risks associated with uncertain or little-known conditions, such as ground conditions,
foundations, latent defects, archeological findings, and contamination.

- Construction delays resulting from access constraints (due to limitations on working hours) or a project's proximity to adjacent existing operating sites.
- Increased costs through short-term movements in key assumptions (including adverse movements in macroeconomic conditions or exchange rates) when the costs of key materials are not locked in (exposure to market price increases). For example, assumptions are made on increasing steel prices, based on historical movements in that market.
- The amount of any penalty charged.

**GLOSSARY**

**Brownfield project**
A project that is being developed on an existing site and, thus, may benefit from or be constrained by existing infrastructure.

**Commissioning**
The act of testing and starting up a project at the end of construction consistent with long-term operational conditions.

**Completion test**
The testing scheme defined in construction contracts that is used to determine whether the project meets required operational performance.

**Conditions precedent to drawdown (CP)**
A set of conditions that must be completed before a drawing can be made under a bank loan.

**Contingency**
Liquidity that is kept in reserve to help cover unexpected construction or operating costs. Contingency is often included in construction contracts and within the project budget and is typically in the form of cash or a letter of credit.

**Cost-to-complete test**
A calculation to determine whether the project can be completed, within budget and on time. Such a test usually triggers the release of construction support and the loan typically becomes fully nonrecourse. The test can set terms of production offtake and payment to builder.

**Critical path**
The sequence of construction activities that must be completed to achieve substantial completion on schedule. A delay in completion of a critical path item will lead to an equal delay in substantial completion. A project may have more than one critical path.

**Defects liability**
The liability taken by the construction contractor for construction defects.

**Design and construct contract (D&C)**
A type of construction contract.
Engineering, procurement, and construction (EPC)
A type of construction contract.

Engineering, procurement, construction management (EPCM)
A type of construction contract.

Escalation
The growth in cost or price between two periods of time, typically annually.

Financial close
The date at which the project's financing documents are executed and CPs have been satisfied or waived for the initial drawdown.

First fill
The supply of materials sufficient to fill the plant for a full run.

Fit for purpose
A contract by which the contractor agrees that the design will meet the employer's demands.

Force majeure
A set of conditions, defined under the project contracts, under which a party to a contract is excused from meeting its obligations under the contract. These conditions are usually events beyond the party's control, are difficult to predict, and can disrupt a project's operations and devastate its cash flow. Typical conditions include events such as defined in each document (fire, floods, earthquakes, and freezing weather; civil disturbances such as strikes; and government actions such as change of law.) In addition, catastrophic mechanical failure due to human error or material failure can be a form of force majeure that may excuse a project from its contractual obligations.

Greenfield project
A project that is being developed on a site where no existing operations or prior operations have been conducted.

Independent expert
An expert that is independent of the sponsors and reports to debt investors on their review of the accuracy and viability of the sponsor's plans and projections.

Joint and several obligation
An obligation of two or more parties for which each party is equally liable for payment or performance.

Latent defects
As used in a construction contract, this normally means a potential risk (for example, contamination) that may already be present but has not been identified. The cost of rectifying latent defects often is a project cost rather than constructor cost.

Liability cap
Maximum liability for nonperformance established under a contract.
LOC
Letter of credit.

Milestone
A set of dates or events that mark the progress of construction and are normally related to payments.

Offtaker
A party that contractually agrees to take the product of the project under a contract.

Performance bonding
Third-party support supplied to a project from a contractor in case of nonperformance or insolvency to cover cash costs while other remedies are pursued. The project may also be required to supply performance bonds to its suppliers or offtakers.

Preliminaries
Construction costs related to time, such as craneage, offices, and fencing. These costs increase if there is a delay and are often owner costs.

Retentions
Amounts that are held back under a construction contract from amounts payable and are used in lieu of providing credit enhancement in some circumstances.

Right of way
The right of the project to use a specific section of land or property, such as a roof.

Several or several obligation
An obligation of two or more parties for which each party is only liable for its share of payment or performance.

Sunset date (also known as long stop date)
The date on which a contract can be terminated if contractual obligations have not been met.

Top tier (also "very experienced")
Generally recognized by their industry or project location.

Variation (also known as a change order)
A change to the design or component leading to a payment claim by the construction contractor for additional funds to cover the cost of the change.

Weak link
A weak link means that the rating on the project finance debt is the lower of any of the following: its own credit quality, the issuer credit rating on the parent, or the CDA of the counterparty.

RELATED CRITERIA AND RESEARCH
Guarantee criteria articles
- Methodology: Timeliness Of Payments: Grace Periods, Guarantees, And Use Of 'D' And 'SD' Ratings, Oct. 24, 2013
- Guarantee Criteria--Structured Finance, May 7, 2013

Other criteria articles
- RFC Process Summary: Standard & Poor's Summarizes Changes From The Project Finance Construction Methodology Request For Comment, Nov. 15, 2013
- Counterparty Risk Framework Methodology And Assumptions, June 25, 2013
- Criteria For Assigning 'CCC+', 'CCC', 'CCC-', And 'CC' Ratings, Oct. 1, 2012
- Project Finance Construction And Operations Counterparty Methodology, Dec. 20, 2011
- Principles Of Credit Ratings, Feb. 16, 2011
- Updated Project Finance Summary Debt Rating Criteria, Sept. 18, 2007

Superseded in full
- Residential Construction Project Financing: The Singapore And Australian Experience, Aug. 18, 2003

Partly superseded (the part of the following that relates to construction risk analysis)
- Updated Project Finance Summary Debt Rating Criteria, Sept. 18, 2007
- Key Credit Factors: Methodology And Assumptions On Risks For Utility-Scale Solar Photovoltaic Projects, Oct. 27, 2009
- Key Credit Factors: Methodology And Assumptions On Risks For Concentrating Solar Thermal Power Projects, Oct. 27, 2009
- Project Finance Stadiums Can Score Investment-Grade Ratings, Aug. 29, 2000
- Rating Project-Financed Private Financing Of Public Hospital Infrastructure, April 4, 2000
- Rating U.K. NHS PFI Projects, Nov. 10, 1999
- Water And Wastewater Utilities, Projects, And Concessions, Aug. 30, 1999
- Project Finance: Construction And Technical Risk Criteria, Aug. 27, 1999

Standard & Poor's (Australia) Pty. Ltd. holds Australian financial services licence number 337565 under the Corporations Act 2001. Standard & Poor's credit ratings and related research are not intended for and must not be distributed to any person in Australia other than a wholesale client (as defined in Chapter 7 of the Corporations Act).

77. These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.

(Watch the related CreditMatters TV segment titled, "Standard & Poor's Revised Approach To Rating Construction Phase Project Finance Transactions," dated Nov. 15, 2013.)
Credit FAQ:
An Overview Of Standard & Poor's Criteria For Assessing Project Finance Construction Risk

Primary Credit Analysts:
Ian R Greer, Melbourne (61) 3-9631-2032; ian.greer@standardandpoors.com
Trevor J D'Olier-Lees, New York (1) 212-438-7985; trevor.dolier-lees@standardandpoors.com
Michela Bariletti, London (44) 20-7176-3804; michela.bariletti@standardandpoors.com
James Hoskins, London (44) 20-7176-3393; james.hoskins@standardandpoors.com

Secondary Contacts:
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com
Paul Judson, CFA, Toronto 416-507-2523; paul.judson@standardandpoors.com
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Pablo F Lutereau, Buenos Aires (54) 114-891-2125; pablo.lutereau@standardandpoors.com
Anne C Selting, San Francisco (1) 415-371-5009; anne.selting@standardandpoors.com

Table Of Contents

Frequently Asked Questions
Related Criteria And Research
Credit FAQ:

An Overview Of Standard & Poor's Criteria For Assessing Project Finance Construction Risk

On Nov. 15, 2013, Standard & Poor's Ratings Services published its revised criteria for assessing the construction risk associated with project finance infrastructure (see "Project Finance Construction Methodology"). Here we aim to answer questions that some readers raised during the request for comment or may raise about the criteria. (We refer to the construction risk criteria as the methodology in this FAQ.)

Frequently Asked Questions

How does the project finance construction phase methodology account for risk mitigants?
The assessment of each of the components in the methodology takes into account the residual risk after adjusting for any features that mitigate the project company's risk exposure. For Standard & Poor's to consider a mitigant effective, it must be able to benefit the project, including debt service. Therefore, when analyzing mitigants, we assess any conditionality on their use, any time limitations on when they are available, and any consequences of using them. (See the footnotes to tables 2-6 in the methodology.)

For example, parent support for a project during construction may be conditional. A credit facility at the parent may only be drawn to support construction of the project between certain dates, or may be only for particular uses, or must be repaid from cash flows at a predefined time and rate. This means that it does not effectively mitigate risks and does not meet the guarantee criteria.

Can you provide an example of technology that you assess as "proven but not in its application or arrangement"?
A good example is a mining operation that's located at a high altitude in a wet climate with low temperatures and has an established track record of operation. The extraction process for this mining operation would likely be different than for a mine that might be built in a hot, dry place at sea level. (See paragraph 22 and table 3 in the methodology.)

Can you give some examples of technology performance that exceeds contract requirements?
In most cases, projects are designed to match the technical performance to the contract requirements. As part of the construction methodology, we have tried to anticipate circumstances that we may encounter. In rare situations, we assign a score of "exceeds" when, in our opinion, the technology's expected performance exceeds industry norms and local permitting requirements even for extreme conditions (see paragraph 24 and table 3 in the methodology). For example, a prison may provide three levels of security when the contract requires two. Where systems are likely to affect operations across the whole asset, we will adopt a weak-link methodology in assessing technological performance (i.e., the overall assessment of the technology of the system will be determined by the weakest material technology that makes up the system). Another example is a heating system that provides significant redundancy over contracted requirements.
What are some examples of risk mitigants to design cost variation risk and design complexity?

As part of our assessment of technology and design risk, we also assess the project's "design cost variation risk" (see paragraph 25 in the methodology). The design of a project is rarely fully complete at financial close, which may leave the project vulnerable to a potential budget shortfall should there be material changes or variations in design, errors in the estimating process, and market fluctuations in pricing for materials not under firm-priced contracts. Moreover, "design complexity" (see paragraph 28) can further compound risks. Based on this, we consider what stage the design is, the design complexity, as well as any potential risk mitigants.

Potential risk mitigants we have observed in projects that can improve our confidence in estimating the accuracy of the construction cost include:

- The relative amount of project contingencies;
- The use of relevant market-based escalation factors that capture any movements in pricing that might not be locked down;
- Payment mechanisms that include milestone payments triggered by independently assessed specific and certified milestones;
- The number of times the contractor has built the same type of project in the same geographic region. Conversely, first-of-kind projects would need a greater degree of design completion;
- The degree of modularity in the construction process. For example, a project may comprise different arrangements of modular elements to meet the construction requirements;
- Whether the project demonstrates a methodical construction element based approach toward estimating. For example, we have seen the use of overlapping consultants (such as bridge designers) providing independent estimates to support the estimation of construction costs; and
- An independent verification that the project has identified all major areas of design and, in particular, those that might have a high level of variability.

How does the risk of cost overruns and delays differ for "brownfield" and "greenfield" projects?

The risk of cost overruns and delays is higher in brownfield sites where ground conditions are difficult or other infrastructure at the site constrains activity. Greenfield sites typically have fewer access issues or potential for unknown conditions and are generally lower risk than brownfield sites. Difficult ground conditions make construction harder to predict, as does a unique design, increasing the potential for more contractor error. (See the footnote to table 4 in the methodology.)

Examples of potential causes of cost overruns and delay risks in brownfield sites include the presence of existing buildings that are scheduled for demolition by the project and prevent adequate ground surveys from being completed beneath the existing building. Brownfield sites may also be at a higher risk of uncovering contaminated ground, particularly if the project is being constructed in a previously industrial area.

How accurate at financial close are construction cost estimates that Standard & Poor's typically receives?

The estimate of "confidence" (or precision) of funding is linked to the industry standard of estimation for the relevant sector (see paragraph 27 in the methodology). For most projects, at financial close, the estimate of construction costs is normally based on 50%-100% design completion and is usually associated with precision of plus/minus 3% to plus/minus 15%, based on detailed unit costs and actual design quantities. We may obtain greater confidence in the
cost estimate and reduced variability if, for instance, the project has contracted prices or firm orders, while lesser confidence results if the estimate is at a different probability or at a stage before our definitive estimate of costs.

**How do subcontractors factor into Standard & Poor's analysis?**

In our view, projects typically become more complex as the number of interfaces increases. These include subcontractors and equipment suppliers interfacing with the main contractor(s), as well as any tasks that the project is directly managing outside of the scope of the main contractor.

Our analysis typically considers whether any of these interfaces present additional risks to the project (see paragraphs 35 and 36, as well as table 6, in the methodology). For example, although the project may have an engineering procurement and construction contract (EPC) contract with a main contractor, if the performance obligations can be reduced because of the poor performance of a key subcontractor, we will likely consider this a weakness.

Another example would be if the main contractors building a project were operating under a joint and several arrangement, and one of the contractors owned several of the subcontractors that were key to the project. For joint and several arrangements, we generally look at the credit strength of the strongest party (see paragraph 38 in the methodology), but in this instance, we would look at the credit strength of the weakest main contractor given the exposure to both it and the subcontractors it owned.

Some projects maintain a portion of the construction risk by directly subcontracting works without the benefit of a main contractor. In these cases, the project is exposed to the interface risk associated with managing multiple contractors.

**When assessing project management expertise, what are you looking for?**

Studies by the construction industry tie construction performance issues to the quality of project management expertise in managing the construction activities. We evaluate project management expertise directly in our methodology both for the contractor (see paragraph 37 in the methodology) and the project's management that have oversight responsibility of the contractor and sometimes other construction work not covered by the main contractor (see paragraph 44 in the methodology).

The information we use is gathered from meetings with both the contractor and the management of the project, site visits, input from the independent engineer, resumes, the experience of sponsors and the contractor, the transparency and thoroughness of project reporting mechanisms in place, and other secondary sources. For example, the project management expertise has demonstrated success in the business of building, operating, and decommissioning multiple projects would more likely be viewed positively compared with a sponsor that has limited or no track record.

The project team should have an experienced project director who has a track record of delivering similar projects within budget and on schedule under the type of contract used. However, we would be more confident in the management expertise for a project with complex construction if the contractor's team has experienced leads in the engineering, procurement, construction, and commissioning phases. A positive is also if the project sponsor has input on the selection and say in how much time the key leads spend on the project.

Market observers have suggested that a signal that project management has the tools necessary to identify issues that might arise during the construction of a large, complex project is the type of reporting mechanisms that are in place
prior to financial close. Such reports include quality assurance/quality control, schedule and progress update, and contingency analysis.

**How can delays in or changes to design approvals result in the need for additional funds?**

Design variations can result in the need for additional funds or delays not covered by the construction contractor or third party (see table 8 in the methodology). For example, a delay in design sign-off or issuing permits can lead to a delay in access to a site and possibly cause a builder to miss a construction time window (e.g., where certain tasks may be undertaken only once a year because of weather). The extent that the design may be subject to variations that can lead to delays can result in the need for additional funds not covered by the construction contractor or third party.

**Could you provide examples of critical path activities that can lead to a "negative" assessment for planning and budgeting execution risk?**

We analyze planning and budgeting execution risks as part of our assessment of project management (see table 8 in the methodology). One of the areas we examine is critical path activities, which we define as activities that will lead to a delay in the project, as well as possible increased costs. Some examples of critical path activities that can lead to a "negative" assessment include:

- Long lead-time items with uncertain manufacturing and delivery risks (shipping);
- A small cushion for delays due to adverse weather or cycling between trades (moving different trades--e.g., electrical and plumbing--through the construction task);
- History and management of industrial action;
- The risk of third-party tasks, such as service connection or relocation;
- Implications of delays on time-critical windows, such as completing offshore tasks during calm periods;
- The risk of delay due to activities of groups opposed to the project; and
- Lack of on-site storage space that allows no buffer for critical path tasks against component delivery or removal.

**How do you view credit enhancements, such as bonding, in your analysis?**

Credit enhancements are provided in projects to deliver timely and certain liquidity support for a project's cash flows (see paragraph 53 in the methodology). To help mitigate construction risks, new forms of credit enhancements have emerged, including liquidity support during construction or operations. For a comprehensive discussion, including how we treat adjudication bonds, see our criteria, "Credit Enhancements (Liquidity Support) In Project Finance And PPP Transactions Reviewed," published March 30, 2007.

**Why does Standard & Poor's modify the preliminary construction phase business assessment for project management?**

Strong preconstruction programming, experienced project management, and a fully permitted project are typically associated with a project's construction activities that are delivered on time and budget. Even where a high degree of risk is transferred to a contractor, good project management can avert cost overruns. An example would be a project that is being built under a contract by a highly rated and very experienced contractor. A number of design changes are introduced by the project after the execution of the contract leading to significant cost increases and delays resulting from restricted availability of new materials for the project that were not covered under the construction contract. (See paragraph 44 in the methodology.)
What are the main characteristics of third-party financing support?
Third-party financing support typically provides additional sources of cash inflows used to finance construction (see paragraph 53 in the methodology). These sources are, in the majority of cases, conditional and time-specific (for example, until construction is completed as determined by tests under the contract) and are often in the form of credit support through guarantees to inject cash if the project encounters circumstances that may lead to lower-than-expected or delayed cash flow. In some cases, projects may also obtain funding from production offtakers (see paragraph 53 in the methodology), such as a commodity trader or concessionaires to cover costs incurred for delays and increases in scope or variations subject to any counterparty limits.

Why does the assessment of construction funding take into account the conditions precedent to drawdown financial facilities?
Funds not contributed at financial close are typically drawn down during construction, subject to meeting the conditions precedent to drawings established in the loan documentation (see paragraph 53 and table 13 of the methodology). If debt is a mix of bank debt subject to progressive draws and bond funding that is fully paid, the bondholders are disadvantaged if the banks can withhold funding. If the conditions precedent covenant has a broad definition, it can be triggered by performance risks under other clauses. For example, this could mean that the failure to provide a report on time may breach another clause that is captured through the conditions precedent requirement to affirm all representations and warranties at each drawdown and, therefore, be grounds to prevent a drawdown.

For debt that is provided at progressive drawings, we assess as "certain" funding for projects that are characterized by conditions precedent for drawings that are innocuous, narrowly defined, and only subject to "fatal" conditions (see table 13 in methodology). We also recognize that for projects with a construction phase business assessment equal to or higher than 'a' with debt that is provided at progressive drawings with conditions precedent for drawings that are innocuous, narrowly defined, and only subject to "fatal" conditions as having "highly certain" funding because of the lower risk of a condition breach that would result in a stop to drawdowns. By "fatal" conditions, we mean the reasonable decision by lenders to prevent a drawdown when the project is on the brink of failing and has little prospect of recovery and being completed.

When onerous, more extensive, or administratively cumbersome conditions precedents are present, uncertainty increases, and, depending on the degree of administrative or other loose requirements included, the funds available from these loans are scored as "uncertain." Similarly, debt funds from financial institutions that appear no longer committed to the project and are seeking methods to stop drawdowns create uncertain financing.

Why do you set a buffer of generally at least 10% additional costs incurred under the downside scenario, and can you give an example of the minimum funding requirement with a contractor replacement scenario?
Paragraph 57 of the methodology indicates that the minimum funding requirement includes a buffer of at least 10% of any additional costs incurred under the downside scenario. The reason we use a buffer of generally at least 10% is that our downside case is the most likely case for the rating level--and not the most severe downside we can contemplate.

For an example of the minimum funding requirement with a contractor replacement scenario, take a project that is a simple construction, such as a school. Our base-case scenario funding requirement is about $138 million. Our analysis indicates that the additional downside cost due to a delay is about $1.5 million, including a 10% buffer, which we think
is appropriate for the complexity of the task and the experience of the contractor, among other factors. The construction phase business assessment for this project is 'bbb+'.

The project has available funds, including a letter of credit of about $157 million. This leaves liquidity of about $17 million after we account for the downside requirements. Our assessment of the contractor is 'b-', and for a project with simple construction, the counterparty criteria ("Project Finance Construction And Operations Counterparty Methodology," published Dec. 20, 2011) allows uplift of up to six notches above the contractor rating or estimate. As calculated under the counterparty criteria, we determine that the replacement costs are $17 million for six notches of elevation above our 'b-' credit estimate of the contractor (see table). This leads us to conclude that the counterparty dependency assessment (CDA) of the contractor is 'bbb-'. Under the construction methodology, the preliminary construction phase stand-alone credit profile (SACP) is capped by the CDA of the contractor (see paragraph 62 in the methodology), so the construction phase SACP outcome is 'bbb-'.

<table>
<thead>
<tr>
<th>Estimated Replacement Costs</th>
<th>Mil. US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base-case total uses</td>
<td>138.0</td>
</tr>
<tr>
<td>Add additional downside costs including 10% buffer</td>
<td>1.5</td>
</tr>
<tr>
<td>Minimum funding requirement</td>
<td>139.5</td>
</tr>
<tr>
<td>Less available funds, including LOC</td>
<td>157.0</td>
</tr>
<tr>
<td>Net funds available for CDA replacement</td>
<td>17.5</td>
</tr>
<tr>
<td>Which is greater than</td>
<td>17.0</td>
</tr>
<tr>
<td>Estimated replacement costs to get six notches</td>
<td>17.0</td>
</tr>
</tbody>
</table>

Do you view third parties, such as sponsors, contractors, and offtakers, as providing credit substitution?

Typically, credit substitution by sponsors, contractors, or offtakers in projects is rare, given the nonrecourse nature of projects (see paragraph 69 in the methodology). Examples where we have seen this include growth areas, such as solar power projects in Spain, where contractors were motivated to use their balance sheets to secure contracts. Other areas include the introduction of a new technology or project that is strategic to a government entity.

Credit substitution works in a number of ways, including: The party providing the credit substitution may fully guarantee the timely payment of debt even if the project is never completed, or a third party may guarantee a certain level of operational performance, and if this performance is not achieved, the third party provides funds to pay down the debt to achieve the same level of debt coverage.

Could a contractor guarantee supporting liquidated damages be considered a highly certain funding source?

Liquidated damages are typically supported either by letters of credit that are unconditional and irrevocable and payable on demand or via dedicated retention mechanisms which ensure that the project has timely liquidity in the event of delays. In rare circumstances, we may assess a contractor guarantee supporting liquidated damages highly certain, provided we consider it meets our guarantee criteria, it is unconditional and irrevocable, and funding is expected to flow ahead of the need for funds. Furthermore, the creditworthiness of the contractor would need to be at least as high as the construction phase SACP, and we would assess the contractor as irreplaceable under our
counterparty criteria. In these circumstances, the rating would be capped by the creditworthiness of the contractor.

**How do you evaluate a project's effective sunset date under the downside scenario?**

Having an adequate sunset date is a benefit under the project management assessment (see table 8 in the methodology) provided this date can be met through available funds under a downside scenario. The construction downside case is our base case scenario, which is adjusted for the most likely impact of any cost overruns and delays in completion, including any allowance of costs resulting from a delayed start-up and the commencement of scheduled debt service (see paragraphs 75 and 76 in the methodology). The downside case measures the ability to cover costs to the project’s sunset date, as it allows the project to be completed under a delay scenario or replacement of a failed builder. To reach a sunset date, a project's funding sources must be able to cover the additional interest expense and costs until the project is completed and commences operations.

If our downside case analysis indicates that the project cannot fund a time buffer for construction delays, it is assessed as “very negative,” which will limit the final construction SACP to no higher than 'b-' (see table 8 in the methodology). Where a project's funding is only sufficient to cover either an adequate time buffer or a replacement of the contractor (see table 8 in the methodology), but not both, we would normally choose to recognize the adequate time buffer in the assessment and to assess the contractor as irreplaceable (see table 8 in the methodology and "Project Finance Construction And Operations Counterparty Methodology," published Dec. 20, 2011). Alternatively, we could assess the sunset date as negative (see table 8 in the methodology) and use funds for contractor replacement. Assessing the sunset date as negative can lead to a lower construction phase business assessment.

**What typically is considered a variable cost in the downside case?**

Variable costs are not fully fixed under a construction contract and any ancillary transaction documents. For example, costs, if not fully fixed, could change because of a delay in completion or a variation or change to a project's design or scope. This could result in additional interest costs or day-to-day third-party service and monitoring costs and fees. For example, a one-month delay in construction completion may require an additional one month of fees for the independent expert. Under our analysis, any potential additional costs are based on our assessment on the likely cost for any delay in completion or variation or change to a project's design or scope together with any mitigants.

Where a project has a turnkey construction contract, the methodology (see table 7 in the methodology) would generally weak link the rating to that of the turnkey contractor who has assumed the cost overrun and delay risk. We often see fixed-price, date-certain EPC contracts that have had increased costs because of a variety of reasons, including changes to scope, underestimation of some risk by the contractor, or changes to permit conditions. Often in practice the contractor may absorb these costs under their contract. In this case, the counterparty CDA would generally be weak linked to the contractor's credit quality. Where we consider the contractor to be replaceable the assumption is the project can be completed with available funds despite the contractor's failure. The CDA analysis allows for the costs of replacing a contractor but does not allow for support by the contractor to fix increased project costs; as such these become project costs (see paragraph 65 in the methodology).

Unlike turnkey contracts other weaker contract styles, such as EPC and EPCM, can result in a project being exposed to changes in design and scope. These costs are generally not borne by the contractor and become a project cost (see paragraphs 49 and 75 in the methodology).
Related Criteria And Research

Related Criteria

- Request For Comment: Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Oil And Gas Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Power Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Road, Bridge, And Tunnel Project Financings, Dec. 16, 2013
- Project Finance Construction Methodology, Nov. 15, 2013
- Project Finance Construction And Operations Counterparty Methodology, Dec. 20, 2011
- Credit Enhancements (Liquidity Support) In Project Finance And PPP Transactions Reviewed, March 30, 2007

Related Research

- Credit FAQ: Provision Of Information For Assessing Project Finance Transactions, Dec. 16, 2013
- RFC Process Summary: Standard & Poor's Summarizes Changes From The Project Finance Construction Methodology Request For Comment, Nov. 15, 2013

Standard & Poor's (Australia) Pty. Ltd. holds Australian financial services licence number 337565 under the Corporations Act 2001. Standard & Poor's credit ratings and related research are not intended for and must not be distributed to any person in Australia other than a wholesale client (as defined in Chapter 7 of the Corporations Act).
OPERATIONS
PHASE CRITERIA

Project Finance Operations Methodology

Common Macroeconomic Assumptions Used in Project Financings

Credit FAQ: An Overview Of Standard & Poor's Criteria For Assessing Project Finance Operating Risk
Criteria | Corporates | Project Finance:

Project Finance Operations
Methodology

Primary Credit Analysts:
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Terry A Pratt, New York (1) 212-438-2080; terry.pratt@standardandpoors.com
James Hoskins, London (44) 20-7176-3393; james.hoskins@standardandpoors.com
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com

Secondary Contacts:
Michela Bariletti, London (44) 20-7176-3804; michela.bariletti@standardandpoors.com
Paul Judson, CFA, Toronto 416-507-2523; paul.judson@standardandpoors.com
Pablo F Latre, Buenos Aires (54) 114-891-2125; pablo.latre@standardandpoors.com
Anne C Selting, San Francisco (1) 415-371-5009; anne.selting@standardandpoors.com

Global Chief Credit Officer:
Ian D Thompson, London (44) 20 7176 3395; ian.thompson@standardandpoors.com

Global Criteria Officer, Corporate Ratings:
Mark Puccia, New York (1) 212-438-7233; mark.puccia@standardandpoors.com

Criteria Officer, Asia-Pacific:
Andrew D Palmer, Melbourne (61) 3-9631-2052; andrew.palmer@standardandpoors.com

Criteria Officer, EMEA, Corporate Ratings:
Peter Kernan, London (44) 20-7176-3618; peter.kernan@standardandpoors.com

Table Of Contents

SCOPE OF THE CRITERIA
SUMMARY OF THE CRITERIA
IMPACT ON OUTSTANDING RATINGS
EFFECTIVE DATE AND TRANSITION
METHODOLOGY
Table Of Contents (cont.)

A. Operations Phase Business Assessment
   1. Performance Risk
   2. Market Risk
   3. Country Risk

B. Determining The Operations Phase SACP
   1. Preliminary Operations Phase SACP
   2. Adjusted Preliminary Operations Phase SACP
   3. Final Adjustments To Arrive At The Operations Phase SACP

RELATED CRITERIA AND RESEARCH
1. Standard & Poor's Ratings Services has updated its methodology and assumptions for assessing project finance operating risks. This follows our request for comment, "Request For Comment: Project Finance Operations Methodology," published Nov. 15, 2013.

2. The criteria are intended to enhance the comparability of our project finance issue credit ratings with ratings in other sectors (see "Understanding Standard & Poor's Rating Definitions," published June 3, 2009) and increase the transparency about how we assign project finance issue credit ratings. The criteria constitute specific methodologies and assumptions under our "Principles Of Credit Ratings," published Feb. 16, 2011.

3. The criteria supersede our currently applicable criteria for assessing operations phase risks in project financings (see "Updated Project Finance Summary Debt Rating Criteria," published Sept. 18, 2007) as well as other related articles. For a comprehensive list of the project finance criteria that are superseded by these criteria, see the "Superseded Criteria" section at the end of this article.

SCOPE OF THE CRITERIA

4. These criteria apply to all new and existing project finance issue credit ratings.

SUMMARY OF THE CRITERIA

5. The methodology establishes an operations phase stand-alone credit profile (SACP), which reflects our assessment of the likelihood that a project would meet its financial commitments during the operations phase. The operations phase begins when the construction phase ends and continues until the end of a project's life or until full repayment of the project's debt. For debt structures with bullet or balloon maturities (see the Glossary in "Project Finance Framework Methodology," published Sept. 16, 2014), our analysis includes risks after scheduled debt maturities (including refinance risk).

6. Projects can have distinct phases during operations. We analyze each phase separately if there are material credit quality differences between the phases. The operations phase SACP reflects the credit quality of the weakest phase. For example, a project may have an initial ramp-up period, followed by a period of stabilization, and then an end-of-life phase. Another example would be a project that initially has a fully contracted revenue stream, followed by a merchant period, during which it is subject to market forces.

7. The operations phase SACP is a component in determining the overall rating on a project, as summarized in the project finance ratings framework (see chart 1). In addition, we have published key credit factors criteria articles that describe the industry risk assessments associated with each sector and provide additional analytical guidance.
8. The criteria set out a multistep framework to assess the operations phase SACP (see chart 2). We first establish a project's operations phase business assessment (OPBA). The main factors to determine the OPBA are:

- Performance risk assessment: We determine this by analyzing asset class operations stability and then adjusting for several factors, including project-specific contractual terms and risk attributes, performance standards, and resource and raw material risk.
- Market risk assessment: Market risk only applies when a project's cash flow available for debt service (CFADS) has the potential to decline by more than 5% from our base case to our downside case due to market risk. In such cases, we then assess the project's market exposure (an assessment of its CFADS volatility due to market forces) and its competitive position.
- Country risk.

9. We then assess financial risks and other factors to determine the operations phase SACP through the following steps:

- Based on a project's OPBA, the minimum forecasted debt service coverage ratios (DSCRs) typically establish the preliminary operations phase SACP.
- We then adjust the preliminary operations phase SACP for several factors—mainly our downside analysis, debt structure, liquidity, and refinance risk—to determine the adjusted preliminary operations phase SACP.
- Finally, we use a comparative ratings analysis and counterparty ratings adjustments to arrive at the operations phase SACP.
IMPACT ON OUTSTANDING RATINGS

10. For the rating changes related to the project finance criteria as a whole, see "Project Finance Framework Methodology."
EFFECTIVE DATE AND TRANSITION

11. These criteria are effective immediately. We intend to complete our review of all project finance issue credit ratings within the next six months.

METHODOLOGY

12. These criteria assign an operations phase SACP to a project. We first determine a project's OPBA and then incorporate our assessments of financial risk and other factors. This article is one of five that comprise our project finance criteria. The other four are:

- Project Finance Framework Methodology, Sept. 16, 2014;
- Project Finance Transaction Structure Methodology, Sept. 16, 2014;
- Project Finance Construction Methodology, Nov. 15, 2013; and

13. The framework methodology article describes how the individual articles, including this one, interrelate and how we determine the project finance issue credit rating.

A. Operations Phase Business Assessment

14. Under the criteria, the OPBA reflects our overall view of relative cash flow variability, which can result from performance (or operational) and market risks. We assess performance risk in all cases unless all performance risk is completely transferred to a counterparty. We assess market risk in the cases where market risk is material. We define material market risk as projects whose CFADS has the potential to decline by more than 5% from our base case to our downside case because of price or volume changes. We assess performance risk on a 1-12 scale and market risk on a 1-5 scale. We then combine these two assessments to determine the preliminary OPBA (see table 1). The criteria then factor in country risk to arrive at the OPBA (see paragraphs 54-61 and table 14).

Table 1

<table>
<thead>
<tr>
<th>Performance risk</th>
<th>N/A</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
</tbody>
</table>
15. In rare cases, contractual provisions can transfer all performance and market risks to a counterparty, such that a project will continue to receive a forecasted level of cash flow irrespective of operational performance or market conditions. If we determine that the risk transfer is adequate, contractual cash flows are sufficient for full and timely repayment, and cancellation and termination provisions are appropriately restricted, then we will not assess the project's operations phase SACP. In these cases, the project SACP is the lower of the construction SACP or the counterparty dependency assessment (CDA) as defined in the project finance construction and operations counterparty methodology (paragraph 23). An example would be a project that, for the life of the debt, acts simply as an intermediary buying a product from one party at a fixed price and selling it to another party for a higher fixed price, with essentially zero operations and maintenance (O&M) costs and revenue earned regardless of operational performance.

16. Projects can have distinct phases during operations. As an example, a project may have an initial ramp-up period, followed by a period of stabilization, and then, ultimately, an end-of-life phase. Another example would be a project that initially has a fully contracted revenue stream, followed by a merchant period during which it is subject to market forces. In these cases, we analyze each phase separately if there are material credit quality differences between the phases. The operations phase SACP reflects the credit quality of the weakest phase.

17. Projects often use contractual agreements to mitigate or transfer risk. Doing so may improve the operations phase SACP but can create a counterparty dependency (see "Project Finance Construction And Operations Counterparty Methodology"). In some cases, otherwise beneficial contracts would be excluded from the operations phase analysis because of the counterparty's creditworthiness (see paragraphs 101-103).

18. The criteria address the role and impact of contracts within performance risk:

- Project-specific contract terms and risk attributes address how contracts may mitigate O&M and technology risks.
- Performance standards address the risks that projects may not meet minimum standards that revenue contracts require and may incur penalties.
- Resource and raw materials address how contracts may insulate projects from having inadequate resources or raw materials supplies.

19. Finally, the market risk analysis addresses the extent to which contracts insulate a project from market forces. Depending on the form, terms, and conditions of the contracts, they can transfer or mitigate market risk, resulting in a project potentially being immune to market risk. An example of a project with fully mitigated market risk is a fully contracted power plant that receives fixed payments regardless of market conditions.

20. We analyze a project's contracts individually and in the context of its other contracts in assessing both performance risk and market risk. Certain contracts work in tandem to mitigate risk. A project's contracts must meet the following characteristics to effectively mitigate risk:
• Transfer risk to the counterparty under all likely operating and market conditions;
• Provide clear definitions of roles and responsibilities of each counterparty, especially when two or more counterparties are performing interrelated tasks;
• Include highly restrictive conditions for changing contract terms;
• Include highly restrictive force majeure (see the Glossary in “Project Finance Framework Methodology”) conditions under which a counterparty is excused from meeting its obligations; and
• Have termination conditions that are highly unlikely to be realized.

1. Performance Risk

21. Performance risk evaluates a project's ability to deliver products and services reliably and to meet contracted specifications consistently as required.

22. To determine a project's performance risk, the criteria first assess asset class operations stability on a 1-10 scale, with 1 indicating the lowest risk. We then could make adjustments to this for project-specific contractual terms and risk attributes, performance standards, and resource and raw material risk. The adjustments can raise or lower the asset class operations stability assessment to determine performance risk, subject to the assessment being no lower than 1 and no higher than 12.

a) Asset class operations stability

23. Under the criteria, asset class operations stability assesses the risk that a project's cash flow will differ from expectations as a result of it being unable to provide services or products based on the type of activities it is engaged in. Projects with lower numerical asset class operations stability assessments (indicating lower risk) tend to have simpler business activities or processes that are less prone to breaking down unexpectedly, resulting in less risk of unexpected cash flow loss. Conversely, projects with higher numerical asset class operations stability assessments (indicating higher risk) tend to have complex and sometimes interrelated activities that can severely affect performance in the event of an operational breakdown, resulting in a higher risk for unexpected cash flow loss.

24. Chart 3 and table 2 show the general characteristics associated with the various operations stability assessments and how we assess the asset classes. The assessments typically focus on the sophistication of mechanical and electrical components and their interlinkages, as well as the challenges of managing the general operations and maintenance of those assets. The factors are usually predictive of a project's likelihood of not meeting operational expectations and, therefore, cash flow forecasts. In these assessments, we do not make any adjustments for project-specific contractual terms and risk forecasts, performance standards, or resource and raw materials risk.
<table>
<thead>
<tr>
<th>Assessment 1-2</th>
<th>Assessment 3-4</th>
<th>Assessment 5-6</th>
<th>Assessment 7-8</th>
<th>Assessment 9-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple building maintenance tasks</td>
<td>More complex building maintenance tasks</td>
<td>Moderately complex mechanical or electric engineering-based assets</td>
<td>Complex mechanical or electric engineering-based assets with complex interactions &amp; highly specialized maintenance</td>
<td>Unusually complex mechanical or electric engineering-based assets with multifaceted industrial designs</td>
</tr>
</tbody>
</table>

© Standard & Poor's 2014.
<table>
<thead>
<tr>
<th>Asset class operations stability assessment</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Attributes typically include simple buildings and maintenance and facilities management services that do not require specialist skills. This lowers the risk that the projects will be unavailable to earn the expected level of cash flow due to unexpected operating underperformance. These projects have predictable and well-defined lifecycle requirements, both in terms of asset life and replacement costing, which further results in lower risk of underperformance. Schools, offices, stadium, and roads typically have service requirements, which are limited to cleaning, grounds and building, and simple structure maintenance tasks and would typically receive assessments of 1. Multistory office blocks and hotels, most hospitals, simple bridges and tunnels, and photovoltaic solar projects would typically receive assessments of 2 due to the more complex systems that require maintenance, more stringent operating requirements, or a combination of both.</td>
</tr>
<tr>
<td>3-4</td>
<td>Attributes typically include more challenging buildings and maintenance and facilities management services compared with assets with assessments of 1 or 2, typically because of a larger requirement for specialized maintenance skills or staff management or where simple mechanical or chemical manufacturing processes are involved. In these cases, the more sophisticated makeup typically results in more unexpected operating performance and potentially greater cash flow loss relative to assets with assessments of 1 or 2. Projects that typically would receive assessments of 3 include: hospitals that have more complex operations and maintenance compared with hospitals assessed as 1 or 2, bridges and tunnels with more complicated maintenance requirements, simple ports, pipelines with simple gas compression activities, and most transmission lines. Projects that typically would receive assessments of 4 include: simple industrial projects such as small scale ethanol production or limited scale manufacturing of simple products such as cement or solar panels, on-shore wind projects, or water ports with complex logistics activities due to their large scale or scope of operations (for example, high volume container lifting, dry and liquid product storage, and intermodal rail take-away services).</td>
</tr>
<tr>
<td>5-6</td>
<td>Attributes typically include moderately complex mechanical or electrical engineering-based assets involving relatively straightforward mechanical or chemical processes. Operations and maintenance generally requires advanced skills. In these cases, the additional sophistication of the assets and interlinkages typically lead to more unexpected operational underperformance and potential cash flow loss relative to assets with assessments of 3 or 4. Projects that typically would receive assessments of 5 include: multitrain liquefied natural gas (LNG) plants, relatively simple oil refineries or chemical processing plants, and many types of power stations (such as natural gas fired and hydro). Projects that typically would receive assessments of 6 include: moderately complex refineries, processing plants and certain power plants, such as supercritical coal plants, and open cut mining operations.</td>
</tr>
</tbody>
</table>
25. We typically increase the asset class operations stability assessment by one (e.g., from 4 to 5) if we are uncertain about a project's operation and maintenance profile relative to industry standards for the asset class.

b) Project-specific contractual terms and risk attributes

26. Under the criteria, the project-specific contractual terms and risk attributes assessment reflects the unique aspects of a project that make it more or less susceptible to operating breakdowns relative to what the asset class operations stability assessment would otherwise imply. The assessment comprises five subfactors: performance redundancy, operating leverage, O&M management, technological performance, and other operational risk factors.

27. The assessments for the subfactors are positive, neutral or not applicable, negative, and very negative (see table 3). In determining the range of assessments for the subfactors, we considered the types of projects we see and would expect to see, as well as the impact on the asset class operations stability assessment.

28. If we determine that any of the subfactors are not material to a project's risk profile, then we assess it as neutral or not applicable (N/A). Any assessments of positive, negative, or very negative indicate that the project is subject to greater...
or less risk relative to industry peers and that such risk could have a tangible impact on operating performance. As an example, performance redundancy and operating leverage will not be relevant to most toll roads. As such, we typically assess these subfactors as neutral or N/A for this asset class.

Table 3

<table>
<thead>
<tr>
<th>Positive</th>
<th>Neutral or not applicable (N/A)</th>
<th>Negative</th>
<th>Very negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance redundancy</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Operating leverage</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>O&amp;M management</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Technological performance</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Other operational risk factors</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

29. Contractual terms and project-specific risk attributes can influence the subfactor assessments (see tables 4-8). As an example, a positive O&M management assessment could result from a project having an O&M contract with an experienced third-party provider that guarantees a high level of O&M performance. We also assess the form, terms, and conditions of the guarantee and the consequences of any failure to perform its obligations, all of which should ensure that the project will maintain a high level of operating performance. In addition, a positive assessment could result if the project is responsible for its own O&M and its O&M management team has demonstrated a long track record of above-average industry performance.

30. For each subfactor, a positive assessment decreases (improves) the asset class operations stability assessment by one, a negative assessment increases (worsens) it by one, and a very negative assessment increases it by two. Regardless of the number of positive assessments, if the asset class operations stability assessment is 3 or lower, the maximum decrease is one. For assessments of 4 or higher, the maximum decrease is two. There are no limits on how much these factors can increase the resulting performance risk assessment, subject to it not exceeding 12.

31. **Subfactor 1: Performance redundancy**: This subfactor assesses whether a project has a greater or smaller likelihood of underperforming expectations because of operational redundancies (see table 4). Having several independent assets or redundant production processes can result in a positive assessment provided that the breakdown risk between the assets does not have high positive correlation. Conversely, lacking industry-standard redundancy measures can result in a negative assessment.
Subfactor 2: Operating leverage: This subfactor assesses the sensitivity of CFADS to changes in revenue (see table 5). Greater sensitivity would generally result from a ratio of fixed operating expenses and maintenance capital spending to revenue that is higher than industry peers'. Typically, a project with a positive assessment will have a lower proportion of fixed operating expenses and maintenance capital spending, meaning CFADS will decline at a slower pace under adverse conditions. For the majority of projects, we expect to assess this subfactor as neutral or N/A.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Projects contain several similar independent assets or there are significant redundancies in place to mitigate identified failure paths and prevent service interruptions. Typical examples would include projects that have portfolios of independent assets providing meaningful diversity and low correlation risk, such as a portfolio of five power plants of roughly the same size in different geographic regions. In addition, single asset projects can have positive assessments when there are significant redundancies in place. Examples include a single power plant with more turbines relative to industry standards, or a complex hospital that has an extensive backup power capability that virtually eliminates cash flow loss from electricity interruption in extreme outages.</td>
</tr>
<tr>
<td>Neutral or N/A</td>
<td>The assessment includes projects that do not meet the positive or negative categories. It encompasses single asset projects or portfolios with limited diversification. Such projects have industry-standard redundancies in place.</td>
</tr>
<tr>
<td>Negative</td>
<td>Projects contain predictable service or production failure paths or lack redundancies, leading to increased risk of production or service failures relative to industry norms. An example would be a complex hospital with critical patient care that lacks a backup power system that would be typical for the industry.</td>
</tr>
</tbody>
</table>
Table 5

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>The project's ratio of fixed operating expenses and routine or major maintenance expenses to revenue is significantly lower than industry peers'. For many availability projects in particular, a given percentage increase in routine maintenance expenses would result in a smaller proportional decline in cash flow available for debt service compared with industry peers. For example, a positive assessment could apply for a project that is required to construct two new buildings but is only required to provide maintenance services for one building. Another example would be a new road that is fully constructed using reinforced concrete that will need very little major maintenance over the project concession.</td>
</tr>
<tr>
<td>Neutral or N/A</td>
<td>The assessment includes projects that do not meet the positive or negative categories. The project would have average fixed operating expenses and routine or major maintenance expenses relative to revenue compared with industry peers'.</td>
</tr>
<tr>
<td>Negative</td>
<td>The project has a ratio of fixed operating expenses and routine or major maintenance expenses to revenue that is significantly higher than industry peers'. For many availability projects in particular, a given percentage increase in routine maintenance expenses would result in a larger proportion decline in cash flow available for debt service compared with industry peers. For example, this could result from a project that is required to construct one new lane alongside an existing three-lane motorway and, post construction, is required to maintain the whole road.</td>
</tr>
</tbody>
</table>

33. **Subfactor 3: O&M management**: This subfactor assesses the O&M provider's skill and experience level, which may mitigate or magnify potentially foreseeable operating problems (see table 6). The provider may be a third party or internal. We form our assessment based on input from independent technical experts and our own experience with the contractor and asset class.
34. **Subfactor 4: Technological performance**: This subfactor assesses the extent to which a project may face operating challenges as a result of the technology employed.

### Table 6

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive</strong></td>
<td>The project contracts with an experienced and qualified third-party O&amp;M provider that guarantees above-industry-average performance subject to material liquidated damages incentives (or potentially other incentives), where a shortfall in performance does not have any negative impact on other contracts related to performance requirements. We may also assign a positive assessment when the project’s internal provider has demonstrated the ability to consistently achieve above-industry-average performance in numerous applications of the same technology, design, and general location under a variety of operating conditions. The provider employs industry’s best practices and uses proactive, scheduled major maintenance cycles to extend the project’s expected useful life. The project has the ability to remedy predictable failures with minimal anticipated service or production interruptions because it has spare parts on-site, has access to specialized serving equipment, or has a contract with a dedicated spare parts provider. The provider has been functioning under its own policies and procedures for many years.</td>
</tr>
<tr>
<td><strong>Neutral or N/A</strong></td>
<td>The assessment includes projects that do not meet the positive or negative categories. The project contracts with a third-party O&amp;M provider that ensures performance in line with contractual obligations and industry standards. This assessment also applies when the project’s internal provider has a track record of performing in line with general industry standards. This assessment also applies when the role of the O&amp;M provider is not expected to be material to the project’s performance and when performance requirements for full payment are easily achievable. An example would be schools or military barracks constructed under a PPP framework, where upkeep is limited to very simple operations and maintenance.</td>
</tr>
<tr>
<td><strong>Negative</strong></td>
<td>The provider has limited experience with technology, design, or location, as well as a questionable ability to meet performance requirements, or the provider has a limited track record of operating under its own policies and procedures. Project downtimes could be longer than industry norms because the project does not have spare parts that are on site or contractually available from a reliable provider for predictable failures. An example could be a sports team that plans to assume operations for the first time in a new larger stadium that has more points of sale and food and beverage concessions. Another example would be a provider experienced in operating ethanol plants that is now managing a much larger and more complex fertilizer plant.</td>
</tr>
</tbody>
</table>
35. **Subfactor 5: Other operational risk factors**: Here we assess variations from a project's expected long-term performance that subfactors 1-4 do not capture. These risks typically include labor inefficiency and unexpected frequency, duration, or magnitude of major maintenance costs. An example would be a new toll road that experiences large cracks during ramp up, requiring a potential acceleration of major maintenance costs. Contracts could mitigate some of these risks—in which case, we assess this subfactor as neutral or N/A.

---

### Table 7: Technological Performance

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral or N/A</td>
<td>For projects not yet in operations, the technology has a proven track record. There are large amounts of industry data demonstrating good operating performance for assets of a similar scale and operating under similar conditions. For operational projects, the technology has a proven track record and performed to our initial performance assessment, or may have experienced underperformance that we consider temporary. Technology assessments of weaker than neutral may be revised to neutral once the operating performance stabilizes in line with our base-case assumptions. For technology that we would otherwise assess as negative or very negative but whose risks are substantially mitigated by contractual terms, such as technology guarantees or long-term service agreements (LTSAs), we would assess as neutral.</td>
</tr>
<tr>
<td>Negative</td>
<td>For projects not yet in operations, the technology is proven but in a different application, arrangement, or scale. Industry data and independent expert opinions support a conclusion that the project is able to perform to industry norms at expected site conditions. An example would be a project planning to transport LNG with an untested tanker design that is based on a proven tanker design but is 30% larger. Another example would be a project planning to use onshore wind turbine— that is proven in moderate temperature climates—in a climate with harsh winters. For operational projects originally assessed as negative, the technology has performed well, and the project has been able to meet its contract specifications. However, the project’s track record and operating performance remain relatively short. In some cases, historical performance may have been very negative, but we believe the past problems have been rectified or anticipated problems have not materialized, and there is now greater confidence that the technology will operate in a stable manner as originally forecast under our base case. Conversely, if technologies previously considered neutral have encountered underperformance significantly below expectations that we think will persist, we would revise the assessment to negative.</td>
</tr>
<tr>
<td>Very negative</td>
<td>For projects not yet in operations, a very negative assessment results if technology is new or unproven, suggesting that the project may not be able to reliably deliver contracted levels of products or services, or if evidence of operating in other applications or conversations with independent experts does not provide sufficient confidence that the technology will perform well in this application. For operational projects, the technology is performing materially below initial expectations, and we have limited confidence that technological issues will be rectified in the foreseeable future. An example would be a project converting biomass to fuel, where production is low and fuel is out-of-specification because of chemical process failures that have not been resolved despite several attempts.</td>
</tr>
</tbody>
</table>
36. At the onset of the operations phase, we will assess this subfactor as neutral or N/A for all projects but may revise it to negative or very negative during surveillance. Assessments other than neutral will generally be temporary. They signal that unexpected operating events have occurred or could occur, causing us to potentially revise our base-case expectations. If we later revise our base-case forecast for these reasons, we would likely revise this assessment to neutral or N/A.

Table 8

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neural or N/A</td>
<td>Operating performance is in line with our expectations.</td>
</tr>
</tbody>
</table>
| Negative       | Operating performance has been below expectations, which may be temporary but could cause us to lower our base-case CFADS forecast despite no changes being made to the first four subfactor assessments. Examples could be:  
  - A hotel that had an unexpected downturn because occupancy suddenly dropped and is unable to adjust staffing levels to meet the low occupancy  
  - A bridge that develops severe icing on its cables, changing the preventative maintenance cycles  
  - A gas fired power plant that has more frequent starts and stops relative to our initial forecast, resulting in changes to its major maintenance costs and cycles |
| Very negative  | Operating performance has been materially below our base-case expectations, causing us to potentially decrease, perhaps sharply, our base-case CFADS forecast despite no changes being made to the first four subfactor assessments. An example would be a processing plant that experiences an unexpected poor quality of feedstocks, resulting in frequent plant outages that continually result in lower production and unexpected repair costs. |

c) Performance standards

37. A project that generates revenue through contracts can face risk if the project does not meet the minimum performance requirements specified in the various project contracts. Penalties for underperformance are also an important consideration. They can vary from a gradual reduction in revenue for underperformance to outright contract termination. Under the criteria, we adjust the performance risk assessment to reflect these relative risks (see table 9).
### Table 9

**Performance Standards Adjustment**

<table>
<thead>
<tr>
<th>Contractual protection</th>
<th>Characteristics</th>
<th>Adjustment to asset class operations stability assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above-average contract standards</td>
<td>The project’s expected operational performance in our base case exceeds minimum contract standards with a substantial cushion that is not typical in its industry. Under our downside case, there would be no penalties for underperformance or no adverse impact under other project contracts relating to underperformance. An example would be a complex hospital that would need to experience an unusually high number of failures relative to key performance indicators before being assessed penalties. Another example would be a simple processing plant with low outage risk that receives full payment if it is 60% available, and base-case availability is expected at 95%. We would expect very few projects to receive this assessment given that we usually observe forecast and actual performance levels in line with general industry standards.</td>
<td>-1</td>
</tr>
<tr>
<td>Average contract standards</td>
<td>The project’s expected operational performance in our base case exceeds minimum contract standards, and the contract terms are such that the loss of revenue for failing to meet a performance requirement is proportional to the level of underperformance of the requirement. Under our downside case, there may be modest penalties for underperformance, and there may be a modest impact related to underperformance. Contract terms are in line with industry norms and allow for a moderate level of underperformance and have reasonable provisions for planned major maintenance work. The risk of contract termination is remote. An example would be an availability road that would have to be unavailable to handle any traffic for an extended period (more than one full day in a month) before incurring any revenues penalty. Another example is a biogas plant with an industry average availability of 97% earning full cash flow so long as it is 94% available. Penalties for underperformance are linear with the level of underperformance, and termination conditions are less than 90% availability for any 18-month period.</td>
<td>None</td>
</tr>
</tbody>
</table>
d) Resource and raw material risk

38. We may adjust the performance risk assessment for projects that require access to natural resources and raw materials to maintain service or production levels. We assess resource and raw material risk as minimal or not applicable, modest, moderate, or high (see table 10). The resource and raw materials risk reflects the potential for a project to experience a shortfall in production or service provision resulting from the lack of resources or raw materials of sufficient quality to meet our base-case projections. Examples of resources and raw materials include geothermal energy, crude oil, natural gas, wind, and iron ore.

39. Resource risk is not applicable to all projects, and we only assess it where this exposure exists. For some projects, such as real estate, toll roads, and hospitals, exposure is minimal since these projects do not rely on resources or raw materials. In these cases, we will not make an adjustment to performance risk.

40. Some projects allocate raw materials supply risk to third parties through contracts. An example would be a firm fuel transportation agreement, under which a project is ensured access to a supply pipeline and is not subject to any logistical supply issues. We examine the contract terms to determine the degree to which the counterparty is covering input supply, quality, and delivery risk, as well as analyze the residual risk in this section. If contracts effectively shield projects from resource and raw material risk, then we assess this risk as minimal, whereas it could have been moderate.
or high absent the contracts.

41. In the case of renewable projects (such as wind, solar, and geothermal), physical guarantees are not possible, and few parties are willing to insure against shortfalls. In such cases, we focus on the risk of estimating the adequacy of resources over the debt tenor. Usually, an independent expert initially evaluates such resources, and we take into account actual resource performance over time and experiences from other similar projects.

42. Factors that may result in a higher level of confidence in resource estimates are:

- Evaluation by an independent expert who has many years of experience in the region of the project and who has experience in other countries with similar types of resource regimes;
- Evaluation based on many years of data at the exact project site, such as wind data at the height of the wind turbine, rather than just at the ground location of the supporting tower;
- Reevaluation of the resource periodically, especially for resources that are likely to have limited or declining reserve life, such as a geothermal resource or oil field; and
- Reliance on several completely independent resources, such as a portfolio of solar projects that rely on solar regimes that are not correlated to one another.
<table>
<thead>
<tr>
<th>Assessment</th>
<th>Characteristics</th>
<th>Adjustment to asset class operations stability assessment</th>
</tr>
</thead>
</table>
| Minimal or not applicable | Resource and raw materials of expected quality and quantity are expected to be available at all times based on contracts or redundant connectivity to deep and mature supply markets with essentially zero risk that such supply would be affected by force majeure events along any part of the delivery chain. Examples:  
  • A contracted supply open surface coal mine that has established reserves and stockpiles large enough to cover any foreseeable interruptions  
  • A gas processing plant in a mature gas market with access to multiple pipelines                                                                                                                                  | No change                                                 |
| Modest                    | Resource and raw materials availability and quality are expected to be high based on:  
  • Contracts with credible counterparties that have limited force majeure risk through the supply chain;  
  • Connectivity to deep and mature supply markets with limited risk that such supply would be affected by force majeure events along any part of the delivery chain; or  
  • High confidence in resource estimation over the debt tenor. Examples:  
  • LNG facility or gas processing plant where there is limited risk of supply disruption that is not fully mitigated by contracts or a deep resource base with redundant pipeline connectivity  
  • Some renewable energy projects (such as geothermal and solar) where the resource estimation is performed by a very experienced independent expert and is typically based on robust, multiyear data being available at the site level                                                                                   | +1                                                       |
| Moderate                  | Resources and raw materials may not be available as expected in terms of volume and quality at all times, and the risks are not adequately transferred to a qualified third party via contracts. For renewable energy projects, there is medium confidence in estimation accuracy of the resource over the debt tenor. The adjustment to the operations stability assessment will typically be +2 when potential volume variances are estimated to be 10%-20% over the long term or 20%-30% in the short term, while the adjustment will typically be +3 when such variances are estimated at 20%-30% over the long-term or 30%-40% in the short term. Examples include renewable energy projects where there is only a moderate level of confidence in the resource estimate, such as when available site-specific data is limited, or the independent expert lacks sufficient experience. | +2 to +3                                                  |
| High                      | Resource or raw materials supply is uncertain, based on the lack of contracts, weak supply infrastructure, or exposure to frequent force majeure conditions. Examples include a supply route that is exposed to a high risk of interruption (operational, cross-border geopolitical, or environmental) or has the potential for prolonged adverse weather to disrupt supply. There is low confidence in the estimation accuracy of resource. Volume variance can be significant. | At least +4, and usually resulting in an OPBA of 11 or 12  |
2. Market Risk

The criteria only analyze market risk for projects whose CFADS has the potential to drop by more than 5% from our base-case forecasted levels because of price changes or volume fluctuations or both. Market risk comprises two assessments—market exposure and competitive position—and we assess it on a 1-5 scale, with 1 indicating the lowest risk (see table 11).

<table>
<thead>
<tr>
<th>Competitive position</th>
<th>Very low</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>1</td>
<td>2/3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Fair</td>
<td>1/2</td>
<td>3</td>
<td>4/5</td>
<td>5</td>
</tr>
<tr>
<td>Weak</td>
<td>2</td>
<td>3/4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

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 low or moderate. Its relative positioning within the competitive position assessment determines the outcome when the market exposure assessment is very low.

a) Market exposure

Market exposure measures the expected volatility of a project’s CFADS from our projected base case to the market downside case due to price changes or volume fluctuations or both. Market exposure may affect not only a project’s revenue, but also its operating expenses and capital expenditures. It does not measure expected volatility resulting from performance risk. Examples of projects that have market exposure include certain toll roads or stadiums that have revenues that may change based on market demand, or power plants with CFADS that may fluctuate because of commodity prices, competition, or end-user demand.

We assess market exposure on a five-point scale: not applicable, very low, low, moderate, and high (see table 12). The assessment captures our expectations for the decline in CFADS from our base case to the market downside case.

<table>
<thead>
<tr>
<th>Projected decline in CFADS from the base case to the market downside case (%)</th>
<th>Assessment</th>
<th>Typical examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>Not applicable</td>
<td>Availability projects</td>
</tr>
<tr>
<td>5-15</td>
<td>Very low</td>
<td>Mature operating toll roads with traffic risk; projects with predominantly contracted revenues but a modest level of price or volume exposure</td>
</tr>
<tr>
<td>15-30</td>
<td>Low</td>
<td>Certain volume-sensitive stadiums and hotels</td>
</tr>
<tr>
<td>30-50</td>
<td>Moderate</td>
<td>Merchant power plants or gas processing plants with contracts covering a portion of expected product sales</td>
</tr>
<tr>
<td>&gt;50</td>
<td>High</td>
<td>Projects with full exposure to volatile commodity prices, such as mines, oil refineries, and merchant power plants in volatile markets (like the U.S.)</td>
</tr>
</tbody>
</table>
46. The base case is our expected scenario. We will develop this scenario based on our expected view on a project's contractual performance, as well as its operational, financial, economic, industry, and project-specific conditions. Discussions with independent experts can inform the assumptions that underpin the base-case scenario. The key credit factors will provide guidance for the major industry sectors we follow. The base-case scenario factors in contracts that effectively mitigate risk for the stated minimum duration of the contract. For contracts with renewal extensions, we do not assume extension unless the project has the unilateral right to extend the contract and we conclude that the project would do so.

47. The market downside case reflects our expectations for project performance under trough market conditions, consistent with the 'BBB' stress scenario defined in our criteria (see "Understanding Standard & Poor's Rating Definitions," June 3, 2009). Generally, these would be the worst market conditions we would expect over a 20-year period. In the U.S., as reference, this case would generally be consistent with a GDP decline of as much as 3%, unemployment at 10%, and a drop in the stock market by up to 50%. We will typically consider trough market conditions over the past 20 years to help form our market downside case. However, this scenario may be more (or less) severe relative to historical conditions if we consider the past 20 years to have been benign (or abnormally stressful). Since our market downside is forward-looking, we may also consider structural changes in the market that could lead to trough conditions that diverge from historical examples. The key credit factors articles will provide guidance on the market downside cases. Examples of trough market conditions include:

- For commodities (such as crude oil): 20-year historical low prices, adjusted for inflation. However, if we believe there have been secular changes in the industry that have changed the marginal cost of production, we would also factor in that judgment.
- For hotels and stadiums: worst market conditions witnessed over the past 20 years.

48. We generally use a 20-year period for assessing market downside risk because this is a good proxy for projects' expected lives across many asset classes, and it would generally capture a full economic cycle. We may change this time frame if a project's expected life or debt tenor is materially longer or shorter. For example, if a project's debt matures in three years and we have a greater level of visibility on potential market volatility given our outlook on supply and demand, then we may use a more modest market downside assumption. Conversely, if a project's debt tenor and asset life extend well beyond 20 years, we will assess expected trough market conditions over that longer period, which could be harsher.

49. For fully merchant projects, market exposure will have a high correlation with the project's industry risk. However, a project's contracts or financial hedges may effectively place its market exposure anywhere along the four-point scale. Take the power sector as an example:

- A fully contracted plant with full fuel pass-through mechanisms (i.e., all fuel costs are fully absorbed by the offtaker) that are truly effective in the jurisdiction would not be assessed for market exposure.
- A plant that has 50% of its output contracted may receive a low or moderate assessment.
- A plant that has no contracts with offtakers or hedges could be assessed as having high market exposure.

50. For certain projects, Standard & Poor's will have limited pertinent historical data to inform its base-case and downside case forecasts. Examples include emerging asset classes with limited peers or thinly traded commodities with no
reliable futures pricing. In these cases, we will use our judgment based on discussions with the project’s independent engineer, if considered reliable, and our experience in analyzing projects or companies in similar industries. If we judge the independent engineer’s estimate to be highly reliable, based on the amount of data used to form the estimate as well as the firm’s track record in making such estimates, we will use these estimates to inform our base and market downside cases. If we consider the independent engineer’s estimates potentially less reliable, we will use more conservative estimates in our base case and market downside case.

b) Competitive position

51. Competitive position encompasses project-specific business features and operating attributes that differentiate projects in the same asset class. Projects with superior competitive position assessments are more likely to persevere through adverse industry conditions than those with worse competitive position assessments, everything else being equal. We will assess competitive position on a four-point scale: strong, satisfactory, fair, and weak.

52. The following general guidance applies for assigning competitive position assessments:

- **Strong**: We assess a project as strong if it has superior advantages over competitors that allow for strong and sustainable profitability metrics. For commodities-based industries, these projects have first-quartile costs positions (i.e., their costs are among the lowest 25% in the industry)—after taking into account any relevant quality and geographic differentials that could affect sales price—that the projects are likely to sustain over the debt tenor. In other industries, geographic location could be the crucial factor, allowing the project to benefit from highly favorable supply and demand dynamics and creating high barriers to entry.

- **Satisfactory**: A project assessed as satisfactory has good comparative advantages that lead to above-average and generally sustainable profitability metrics. For commodities-based industries, these projects have second-quartile costs positions (after taking into account any relevant quality and geographic basis differentials) that the projects are likely to sustain. Geographic location may provide some advantages, allowing the project to benefit from favorable supply and demand dynamics and creating moderately high barriers to entry.

- **Fair**: Projects with fair competitive positions have somewhat weak comparative advantages. Profitability measures are below average or, if good, unlikely to be sustained. For commodities-based industries, these projects would only be able to survive a moderate drop in prices before reaching break-even profitability. Such projects generally face weaker supply and demand dynamics and do not enjoy high barriers to entry.

- **Weak**: Projects with weak competitive positions are disadvantaged relative to competitors. Profitability measures are weak or could likely become weak. For commodities-based industries, these projects have cost positions that are broadly in line with commodity prices, and the projects would not be profitable if prices were to drop, even marginally.

53. The key credit factors articles will outline more specific criteria for determining competitive position assessments for the major asset types currently rated as project financings. Table 13 lists selected drivers of the competitive positions for projects in four sectors: power; roads, bridges, and tunnels; oil and gas; and social infrastructure, accommodation, and entertainment.
3. Country Risk

54. Country-specific risks can influence a project's business risk. Standard & Poor's uses country risk assessments to reflect the relative risks of operating in different countries where we rate issuers or transactions. The country risk assessments are on a 1–6 scale (strongest to weakest). These assessments reflect our view of four components: economic risk, institutional and governance effectiveness risk (includes political risks), financial system risk, and payment culture/rule-of-law risk. For more information, see "Country Risk Assessment Methodology And Assumptions," published Nov. 19, 2013.

55. For project finance transactions, we formulate an adjusted country risk assessment by considering potential mitigants to certain risks normally captured in the country risk assessment. We then combine the adjusted country risk assessment with the preliminary OPBA to arrive at the OPBA (see table 14).

### Table 13

<table>
<thead>
<tr>
<th>Competitive Position</th>
<th>Selected drivers of competitive position</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset type</strong></td>
<td><strong>Country Risk</strong></td>
</tr>
<tr>
<td>Power</td>
<td>• Regulatory support and predictability</td>
</tr>
<tr>
<td></td>
<td>• Barriers to entry</td>
</tr>
<tr>
<td></td>
<td>• Delivery cost relative to peers</td>
</tr>
<tr>
<td></td>
<td>• Fuel supply</td>
</tr>
<tr>
<td></td>
<td>• Transmission access</td>
</tr>
<tr>
<td>Roads, bridges, and tunnels</td>
<td>• Road rationale</td>
</tr>
<tr>
<td></td>
<td>• Competitiveness</td>
</tr>
<tr>
<td></td>
<td>• Organic growth drivers</td>
</tr>
<tr>
<td></td>
<td>• User characteristics</td>
</tr>
<tr>
<td>Oil and gas</td>
<td>• Feedstock cost</td>
</tr>
<tr>
<td></td>
<td>• Production efficiency</td>
</tr>
<tr>
<td></td>
<td>• Geographic and/or market position</td>
</tr>
<tr>
<td></td>
<td>• Scale, scope, and diversity</td>
</tr>
<tr>
<td></td>
<td>• Customer mix</td>
</tr>
<tr>
<td>Social infrastructure, accommodation, and entertainment</td>
<td>• Market position</td>
</tr>
<tr>
<td></td>
<td>• Market strength</td>
</tr>
<tr>
<td></td>
<td>• The asset's condition</td>
</tr>
<tr>
<td></td>
<td>• Pricing elasticity/sensitivity</td>
</tr>
<tr>
<td></td>
<td>• Collocation</td>
</tr>
<tr>
<td></td>
<td>• Marketing process</td>
</tr>
<tr>
<td></td>
<td>• Offtaker incentives</td>
</tr>
</tbody>
</table>
56. In some cases, a project's structure mitigates its exposure to specific country risks. If any of the three mitigants exist, as described below, and if they apply to the country risk subfactors that are considered a constraint on the overall country risk assessment, then we will reduce the country risk assessment by one (e.g., 5 to 4) to determine the adjusted country risk assessment. Otherwise, the country risk assessment is the adjusted country risk assessment.

57. Economic risk mitigants: Transferring the relevant economic and market risks fully to a counterparty could mitigate a project's economic risk. In this situation—which is uncommon—our credit assessment of the counterparty would already capture the country's relevant economic risks and, hence, would be incorporated in the project rating via the counterparty constraint.

- An example could be a power project that sells all of its electricity to a single utility. If the power purchase agreement provides that the utility purchase all the electricity produced at a fixed price and there is a full pass-through clause for all fuel costs and other variables, such as losses due to exchange rate movements, then effectively all the relevant risks are reflected in the counterparty rating.
- Most projects by their nature will not be able to completely shift economic and market risks to counterparties. Toll roads would be typical examples. Even in cases where a counterparty agrees to pay the project a flat fee regardless of traffic volumes, the projects would typically be responsible for variations in O&M expenses, thereby exposing them to the country's economic risk.

58. Institutional and governance risk mitigants: These exist only in rare instances, even if projects have political risk insurance. Institutional and governance risks are mitigated only when a project has sufficiently robust political risk insurance that addresses its most relevant political risks. Key considerations are the counterparty rating on the entity providing the insurance, the form and terms and conditions (what is covered or excluded), the level of coverage, and the timelines of payment under the cover. We examine these considerations on a case-by-case basis. The key risks covered by political risk insurance would typically be currency transfer and inconvertibility, expropriation, war and civil disturbance, breach of contract, and arbitration and award deficits. On the other hand, we often consider "creeping" expropriation (the risk of increasing tariffs, royalties, or taxes) a key source of political risk. Political risk

### Table 14

<table>
<thead>
<tr>
<th>Preliminary OPBA</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>
Financial system risk mitigants: Financial system risk could be lower for a project that exports the majority of its products overseas and has no direct exposure to a country's banking system that would affect its funding, debt servicing, cash reserves, or payment transfer from or to its key counterparties.

- An example would be an offshore crude oil production platform or a liquefied natural gas export facility that ships its output to other markets and has no reliance on a country's capital markets or banking system because it has issued fixed rate, fully amortizing debt and has established debt service reserve or other supporting reserves or instruments, such as letters of credit, that are held outside that country's jurisdiction. Payment transfers to and from key debtors and creditors would also need to be external to a country's banking system, or otherwise they would be subject to the country's financial system risk.

The payment culture/rule-of-law risk cannot be mitigated because projects rely on the contracts' enforceability under a country's rule of law.

Project finance transactions are structured to encompass a single asset or a discrete set of assets that are rarely located in more than one country. For a project finance transaction that has cross-border assets, the country risk assessment is generally based on where the project generates the largest proportion of its CFADS or where the larger portion of its cash-generating assets is located. Where relevant, however, we 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. For example, if a bullet pipeline transports crude oil through three countries, we use the worst country risk assessment, even if a relatively small proportion of the assets are located in that country, because the project is fully dependent on operating in that country to generate forecasted cash flow.

### B. Determining The Operations Phase SACP

After determining the OPBA, we then take the following steps to arrive at the operations phase SACP:

- First, we combine the OPBA with our base-case forecasted minimum DSCRs to determine the preliminary operations phase SACP.
- Second, we make several adjustments to establish the adjusted preliminary operations phase SACP. This includes adjustments based on the downside analysis, debt structure (including average DSCRs), liquidity, and refinance risk.
- Finally, we consider comparative ratings analysis and counterparty constraints to determine the operations phase SACP.

#### 1. Preliminary Operations Phase SACP

a) **Debt service coverage ratios**

Under the criteria, the OPBA and our forecast for minimum DSCRs determine the preliminary operations phase SACP (see table 15). For non-fully amortizing projects, we will also forecast DSCRs subsequent to the original debt's maturity date until all debt has been fully repaid and will use the lower of the minimum DSCR during the initial and the post-refinance period in the table.
For an example of how we determine the preliminary operations phase SACP, take a project that has an OPBA of 8 and its minimum forecasted DSCR is 2.1x. In the "7-8" OPBA row of table 15, 2.1x is within the 1.75x-2.50x range, which corresponds to the 'bbb' column. Hence, the preliminary operations phase SACP is 'bbb'. If the minimum DSCR lies toward one of the endpoints in the range, the preliminary operations phase SACP will typically have a plus (+) or minus (-) sign. As an example, if two projects have an OPBA of 8 and one project has a forecasted minimum DSCR of 2.40x (at the upper end of the 1.75-2.50x range) and the other project has a forecast minimum DSCR of 1.80x (at the lower end of the range), this would likely result in a preliminary operations phase SACP of 'bbb+' for the first project and 'bbb-' for the second. Generally, we assume a project's revolving credit facilities and any discrete debt baskets (that is, the ability to issue additional debt up to a specified amount) are fully drawn when calculating DSCRs.

### Table 15

---Preliminary operations phase SACP outcome in column headers---

---Minimum DSCR ranges shown in the cells below*---

<table>
<thead>
<tr>
<th>OPBA</th>
<th>aa</th>
<th>a</th>
<th>bbb</th>
<th>bb</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>=&gt; 1.75</td>
<td>1.75–1.20</td>
<td>1.20–1.10</td>
<td>&lt;1.10§</td>
<td>&lt;1.10§</td>
</tr>
<tr>
<td>3-4</td>
<td>N/A</td>
<td>=&gt; 1.40</td>
<td>1.40–1.20</td>
<td>1.20–1.10</td>
<td>&lt;1.10</td>
</tr>
<tr>
<td>5-6</td>
<td>N/A</td>
<td>=&gt; 2.00</td>
<td>2.00–1.40</td>
<td>1.40–1.20</td>
<td>&lt;1.20</td>
</tr>
<tr>
<td>7–8</td>
<td>N/A</td>
<td>=&gt; 2.50</td>
<td>2.50–1.75</td>
<td>1.75–1.40</td>
<td>&lt;1.40</td>
</tr>
<tr>
<td>9–10</td>
<td>N/A</td>
<td>=&gt; 5.00</td>
<td>5.00–2.50</td>
<td>2.50–1.50</td>
<td>&lt;1.50</td>
</tr>
<tr>
<td>11-12</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>=&gt; 3.00x</td>
<td>&lt;3.00</td>
</tr>
</tbody>
</table>

*DSCR ranges include values at the lower bound, but not the upper bound. As an example, for a range of 1.20x–1.10x, a value of 1.10x is excluded, while a value of 1.20x is included. §In determining the outcome in these cells, the key factors are typically the forecasted minimum DSCR (with at least 1.05x generally required for the 'BB' category), as well as relative break-even performance and liquidity levels.

On a given scheduled debt servicing date, the forecasted minimum DSCR may be abnormally low for a foreseeable operational reason, such as an anticipated major maintenance outage or a one-time cash tax payment. If we determine that (i) such a period is affected by a one-off event that is highly unlikely to repeat itself, (ii) it will not result in any breach of any financial covenants, and (iii) the project has dedicated and fungible liquidity sufficient to persevere through the period even under stressed conditions, then we would potentially exclude this period's DSCRs from the forecasted minimum DSCR calculation. However, if the minimum DSCR were likely to recur (for example, because of a regularly scheduled maintenance program), then we will typically include that period's DSCRs in our minimum DSCR calculation.

### 2. Adjusted Preliminary Operations Phase SACP

Where relevant, we will make a number of adjustments to the preliminary operations phase SACP, which can lead to a higher or lower adjusted preliminary operations phase SACP under the criteria. The adjustments relate to downside analysis, debt structure, liquidity, and refinance risk. However, the adjustments cannot lower the adjusted preliminary operations phase SACP below 'b-'. See paragraph 97 for when SACPs of 'ccc+' or lower apply.
a) Downside analysis

67. In the downside analysis, we assess the likelihood that a project will be able to meet its financial obligations in a downside case. We define this as the market downside case (see paragraphs 47-50), coupled with project-level operating stresses and macroeconomic and financial stresses (see paragraph 68). If the project has no market risk, then the downside case consists only of operational stresses, as well as macroeconomic and financial stresses, where appropriate. As an example, for a power project with merchant exposure, market conditions are commensurate with a 20-year trough period and it incurs moderate levels of operating stress, such as lower availability and higher operating expenses. The impact of the operational stresses will be commensurate with the project’s performance risk assessment. The worse the performance risk assessment, the more vulnerable the project will be to operational stresses. Table 16 outlines the downside analysis performance expectations by rating category.

68. Macroeconomic stresses will apply in the downside analysis where relevant, and we calibrate them to be roughly commensurate with the worst conditions we would expect over a 20-year period. As an example, we generally assume materially higher interest rates for any projects with floating-rate debt as well as higher credit spreads or margins for those projects with refinancing risk.

69. For projects with multiple assets, the downside analysis considers the benefit of having multiple assets, provided that we believe the performance and market risks of these assets are not highly correlated with one another. For example, if we consider an 8% availability reduction (that is, the project is unable to operate 8% of the time) as a downside case assumption for a single power plant, then a smaller availability reduction (e.g., 5%) may be warranted for a project with a number of independent power plants, given the lower probability that all plants would suffer this operational loss at the same time.

70. The downside analysis can refine the preliminary operations phase SACP if the project is more (or less) resilient to downside conditions relative to what the preliminary operations phase SACP would otherwise indicate. This could be the case for several reasons:

- **Structural provisions:** More (or less) restrictive structural features, such as DSCR tests permitting distributions to subordinated debt or equityholders can, if meaningfully structured, result in better (or worse) expected performance during downturn conditions.
- **Liquidity:** Superior fungible or dedicated liquidity, or committed unconditional and irrevocable third-party credit support may be another reason for better performance in a downside case. For example, if a project has a four-year debt service liquidity reserve, it will be more resilient than a similar one that has a one-year reserve (provided that the liquidity reserve can be used to fund losses). We factor in potential liquidity from business interruption insurance in limited situations in which we have high confidence that such proceeds would occur under probable downside conditions. Supporting factors would be that business interruption insurance is specifically required with terms that are unambiguous, within market norms, and readily available in the market. We factor in committed unconditional and irrevocable third-party credit support when we expect such credit support to be contributed or drawn in timely manner under our downside scenario(s). (For more information on these forms of support and counterparty exposure, see "Guarantee Criteria—Structured Finance," May 7, 2013, "Credit Enhancements (Liquidity Support) In Project Finance And PPP Transactions Reviewed," March 30, 2007, and "Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011).
- **Market risk assessment:** The market risk assessment can encompass broad CFADS volatility ranges, which the downside analysis can further refine. For example, if two projects have market risk assessments of "moderate"
(reflecting a volatility range of 30%-50%) but one has an expected CFADS decline in a downside case (because of market risk) of 35% and the other a 45% decline, then the former could perform better under our downside case.

Table 16

<table>
<thead>
<tr>
<th>Downside-Case Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expectations for the adjusted operations phase SACP category</strong></td>
</tr>
<tr>
<td>'aa' or higher</td>
</tr>
<tr>
<td>'a'</td>
</tr>
<tr>
<td>'bbb'</td>
</tr>
<tr>
<td>'bb'</td>
</tr>
<tr>
<td>'b'</td>
</tr>
</tbody>
</table>
• One notch if the category that our downside case maps to is one higher than the preliminary operations phase SACP.
• Two notches if our downside case mapping is two or more categories higher than the preliminary operations phase SACP.
• Potentially an additional notch for projects with liquidity levels equivalent to more than 10% of project debt. In these circumstances, in addition to what we outlined in the bullet points above, we may raise the preliminary operations phase SACP by one more notch.

72. If the category that the downside case maps to is lower than the preliminary operations phase SACP, then the downside case mapping will cap the preliminary operations phase SACP per the outcome in table 15. This approach provides for greater consistency with our "Understanding Standard & Poor's Rating Definitions" criteria. As a starting point, we will lower the preliminary operations phase SACP to the downside mapping without a plus (+) or minus (-) modifier. However, if the downside mapping per table 16 lies toward the upper or lower bound of the category (in terms of time frame coverage ratios or both), we may apply a plus or minus modifier. For example, if the preliminary operations phase SACP is 'bbb' and the downside case maps to the 'bb' category, then the preliminary operations phase SACP will be 'bb' unless the downside case maps to the upper or lower end of the 'bb' category, in which case the preliminary operations phase SACP will be 'bb+' or 'bb-'.

73. In modeling the downside case, we generally assume that it commences during the most vulnerable phase of a project's life. This will usually coincide with the project's weakest forecasted DSCRs. Once the downside case commences, we assume a more gradual transition to trough-like conditions for projects that have better OPBAs due to their lower cash flow volatility. For such projects, it may be more likely that certain structural features, like distribution lock-up tests, will be triggered, which enhance liquidity under the downside case. Table 17 depicts the typical transition time for projects to enter a downside scenario, depending on the operations stability and market exposure assessments. Some exceptions to this general guidance exist. In particular, availability projects, regardless of the OPBA, will usually have an immediate transition to the downside case.

Table 17

<table>
<thead>
<tr>
<th>OPBA</th>
<th>Transition to downside case</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>3 years</td>
</tr>
<tr>
<td>5-8</td>
<td>2 years</td>
</tr>
<tr>
<td>9-12</td>
<td>1 year</td>
</tr>
</tbody>
</table>

74. In less frequent situations, the results of the downside analysis alone determine the adjusted operations phase SACP. If the downside analysis provides unique insight into a project's default risk that cannot be properly captured in its OPBA and the minimum base-case DSCR forecasts, it will override rather than modify the result from table 15. Such situations would typically involve projects that exhibit extremely low volatility between the base and downside case minimum forecasted DSCRs or have exceptionally robust liquidity provisions, such that we would expect--with a very high level of confidence--that they would persevere through certain downside scenarios, regardless of their base-case DSCRs.
b) Debt structure (and forecast average DSCRs)

75. In certain cases, we may lower the preliminary operations phase SACP because of the project's debt structure. Examples of when we make such adjustments include:

- 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 would typically occur if the project's debt tenor is materially longer than other projects with comparable OPBAs. The risk is amplified when debt maturities are close to or possibly exceed the estimated end of the project's useful life.
- Unusually high mandatory amortization payments in later years if coverage ratios are more reliant on growth assumptions.
- Relatively high exposure to inflation rate changes. Examples include availability projects (see the Glossary in "Project Finance Framework Methodology") whose debt may be indexed semiannually but revenues are indexed annually.
- Sharp changes in amortization payments designed to match forecasted uneven capital expenditures, which could be subject to change.

76. Depending on the severity of these factors, we will typically lower the preliminary operations phase SACP by at least one notch unless the preliminary operations phase SACP is already in the 'b' category or the downside case maps to a lower category and already encompasses such debt structure weaknesses.

77. In the case of debt structures with minimal amortization payments and material dependence on cash flow sweeps to repay debt under our base case, DSCRs will typically be more robust relative to fully amortizing structures. Here we will generally lower the preliminary SACP by at least two notches (excluding those projects without fixed contractual maturity dates per paragraph 96) for projects mapping to the 'bbb' category or higher, and by at least one notch for those mapping to the bb category.

78. A project's average forecasted DSCRs can also affect the preliminary operations phase SACP. When the average DSCR maps to at least one rating category higher (in table 15), then we may raise the outcome from table 15 by one notch. When calculating the average DSCR, we typically exclude any anomalously high periods. If the average DSCR maps to a higher category but is at the lower end of the designated DSCR range, then we will typically not make an adjustment. We will also not make an adjustment when we forecast a declining DSCR trajectory over the debt tenor.

c) Liquidity

79. We assess liquidity as neutral or less than adequate. In most project financings, liquidity is neutral. Debt service reserve accounts are generally sized to meet the next debt service payment (generally scheduled every six months), while major maintenance accounts are generally sized to meet any forecasted spikes in capital expenditures. For certain asset classes, stronger liquidity provisions may also be required to be a neutral consideration. The key credit factors articles will outline such cases. An example would be most volume-sensitive U.S. stadiums. These projects must generally have a one-year liquidity reserve to mitigate the risk of labor stoppages to receive a neutral liquidity assessment.

80. Under the criteria, liquidity will be less than adequate if a project does not have sufficient cash sources (cash on hand, available liquidity reserves, and forecasted CFADS) to cover forecasted 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. Under certain conditions, we will only include debt maturities coming due over the next nine months for the purposes of the liquidity calculation. These conditions are:
the project has an operations phase SACP of at least 'bbb' and has a well-defined and credible plan to execute a refinancing within the next three months.

81. Liquidity will also be less than adequate if financial covenants have limited headroom. For OPBAs of 5 or higher, liquidity will typically be less than adequate if a 15% decline in forecasted CFADS would lead to a covenant breach. For OPBAs of 3-4, a 10% decline would typically result in less than adequate liquidity. For OPBAs of 1-2, we typically do not assess liquidity as less than adequate because of financial covenant headroom resulting from the very high cash flow stability and compressed DSCRs under our base-case forecasts.

82. If liquidity is less than adequate, then the operations phase SACP will be no higher than 'bb+'. Depending on how vulnerable a project is to nonpayment, the SACP may be in the 'ccc' or 'cc' categories (see paragraph 97).

83. In addition, a project's preliminary operations phase SACP may capture liquidity risks since minimum forecasted DSCRs are a key driver. If, for example, we forecast the DSCR to fall below 1.2x for a project with a 5 OPBA, the preliminary operations phase SACP would likely be no higher than 'b+'.

84. While the criteria do not assess liquidity better than neutral, more robust liquidity can improve a project's risk profile during the operations phase. We would capture this improvement in our downside analysis.

d) Refinance risk

85. Project finance debt can have refinance risk. That is, forecasted CFADS and unrestricted cash on hand may not be sufficient to fully pay down debt by the scheduled maturity date. Hence, the project would need to repay the outstanding debt with cash proceeds from new bank debt or a capital markets issuance. Refinancing needs add incremental risk. Even seemingly healthy projects may fail if they face challenging capital market conditions at the time of refinance.

86. To analyze refinancing risk, we first forecast the outstanding debt balance at maturity. If the project has a mandatory cash flow sweep mechanism (see the Glossary in "Project Finance Framework Methodology"), we use our base-case forecast to determine this balance. We then forecast CFADS and a likely amortization schedule to determine the minimum forecasted DSCRs in the post-refinance period. We generally assume that the debt fully amortizes before the estimated end of the project's life subject to the following guidance:

- For OPBAs of 1-2, the debt matures one year before the estimated project's estimated end of life. For example, if a plant has an estimated life of 30 years or there is a 30-year concession, then the debt matures by year 29.
- For OPBAs of 3-4, the debt matures two years before the end of life.
- For OPBAs of 5-6, the debt matures three years before the end of life.
- For OPBAs above 6, the debt matures five years before the end of life.

87. We apply the lower of the forecasted minimum DSCRs during the initial loan period and the post-refinance period in table 15. As an example, a project has a 5 OPBA and has a 25-year estimated life and is initially financed with a seven-year term loan. During the forecasted seven-year period, the minimum DSCR is 2x. We then calculate the forecasted DSCR from year seven through year 22 (three years prior to the estimated end of the project's life per
paragraph 85). In the post-refinance period, the minimum DSCR is 1.5x. For purposes of the DSCR mapping in table 15, we use 1.5x.

88. If the project's OPBA changes in the post-refinance period, we use the revised OPBA when mapping the DSCRs in the post-refinance period in table 15. In the previous example, if the project had revenue contracts that ended in year seven, then the OPBA would likely be worse in the post-refinance period because of market risk. We would then use the worst OPBA for determining the preliminary operations phase SACP.

89. In the post-refinance period, forecasted interest rates and credit spreads can significantly affect DSCRs. In our base case, we generally assume levels commensurate with the futures curve and longer-term averages, respectively. These rates can differ materially from the initial point of financing as a result of changes in market conditions or other reasons. For example, a project that has received funding from a credit export agency on concessional terms but with no commitment of participation in the refinancing would typically see a higher cost of debt upon refinancing.

90. In our downside case, we generally assume a higher interest rate and wider credit spreads. The wider credit spreads will generally be commensurate with levels that are one category worse (e.g., using 'bb' level credit spreads for a 'bbb' project). In instances where the project's downside case shows limited variability compared with the base case (which is typically evidenced by the DSCRs in the base and downside cases falling into the same category under table 15), we will typically use narrower credit spread assumptions, consistent with our base-case assumptions.

91. In addition to forecasting DSCRs, we compare the present value of future cash flows against debt levels to establish the likelihood that the project will ultimately repay its debt. This analysis is particularly relevant for projects with cash flows that are uncertain due to the level of operational or market-related risks. Depending on the project's forecasted asset coverage and stability of cash flows, this analysis will result in certain rating caps (see table 18).

| Table 18 |

| Refinance Risk Ratings Caps |

| --Stability of cash flows-- |

<table>
<thead>
<tr>
<th>High (OPBA 1-4)</th>
<th>Medium (OPBA 5-8)</th>
<th>Low (OPBA 9-12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset coverage (PLCR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (more than 3x)</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Medium (1.5x-3.0x)</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Low (1.1x-1.5x)</td>
<td>None</td>
<td>bb+ cap</td>
</tr>
<tr>
<td>Very low (less than 1.1x)</td>
<td>bb+ cap</td>
<td>b+ cap</td>
</tr>
</tbody>
</table>

92. We generally measure asset coverage as the project's forecasted project life coverage ratio (PLCR) at the point of maturity. The PLCR measures the net present value (NPV) of the project's 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 cost of debt. The discount rate will generally increase with the project's OPBA and country risk and will often vary from country to country, depending on interest rates and other macroeconomic factors. For asset classes where there are liquid asset sales markets, we will also look at comparable sales multiples to supplement the NPV analysis. As an example, merchant power plants in the U.S. are frequently bought and sold, and we use value per kilowatt ratios to supplement our valuations.
93. The higher the PLCR, the greater the chances of successfully refinancing, everything else being equal. The following guidance applies to table 18:

- High asset coverage: generally above 3x
- Medium asset coverage: generally between 1.5x and 3x
- Low asset coverage: generally between 1.1x and 1.5x
- Very low asset coverage generally less than 1.1x

94. The stability of cash flow assesses the relative volatility of cash flows after refinancing. The greater the cash flow stability, the higher confidence in forecasted cash flows. The following guidance applies to table 18:

- High stability: corresponds to OPBAs of 1-4 in the post-refinance period
- Medium stability: corresponds to OPBAs of 5-8 in the post-refinance period
- Low stability: corresponds to OPBAs of 9-12 in the post-refinance period

95. For projects that have cash flow sweeps or other types of mandatory prepayment mechanisms, the forecasted debt outstanding at maturity can be materially higher under the downside case or other sensitivity analyses relative to our base-case assumptions. For these projects, we generally assess the asset coverage no better than low unless we expect the PLCR to map to a stronger category assuming minimal or modest cash flow sweep repayments.

Projects without fixed contractual maturity dates

96. Certain projects will not have fixed maturity dates and, instead, rely on other economic or operational tests to trigger debt repayment. For example, in the mining sector, project debt maturities are typically based on proven reserve levels, and the project may incorporate debt amortization triggers based on proven reserves falling below a predetermined level. In these circumstances, we forecast the DSCR until the date at which the cash flow sweep is expected to commence and use this forecasted minimum DSCR in table 15. We then calculate the PLCR at this point. Depending on the forecasted asset coverage in our base case and downside case, as well as the project's OPBA, we may then lower the project's adjusted preliminary SACP per tables 19 and 20.

Table 19

<table>
<thead>
<tr>
<th>Project Asset Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>--Downside case asset coverage--</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>Medium</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Very low</td>
</tr>
</tbody>
</table>

Note: Blank cells indicate that such combinations are highly unlikely. *If the downside asset coverage is below 1.0x in this case, then the project asset coverage will be very low.
Table 20

<table>
<thead>
<tr>
<th>Project asset coverage (per table 19)</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Medium</td>
<td>None</td>
<td>None</td>
<td>-1 notch</td>
</tr>
<tr>
<td>Low</td>
<td>-1 notch</td>
<td>-2 notches</td>
<td>-2 notches</td>
</tr>
<tr>
<td>Very low</td>
<td>-1 notch</td>
<td>-2 notches</td>
<td>-2 notches</td>
</tr>
</tbody>
</table>

e) SACPs in the 'ccc' or 'cc' categories

97. If we view a project's capital structure as unsustainable or if it is currently vulnerable to nonpayment and depends on favorable business, financial, and economic conditions to meet the financial commitments on its obligations, then we will determine the SACP using “General Criteria: Criteria For Assigning ‘CCC+’, ‘CCC’, ‘CCC-’, And ‘CC’ Ratings,” Oct. 1, 2012. Similar to structured finance, the degree of financial stress is generally the dominant factor, and the time frame for anticipated default is generally a secondary consideration when assigning a plus (+) or minus (-) sign modifier to the ‘CCC’ rating.

3. Final Adjustments To Arrive At The Operations Phase SACP

a) Comparable ratings analysis

98. The comparable ratings (peer) analysis refines the adjusted preliminary operations phase SACP to arrive at the operations phase SACP. We may raise or lower the adjusted preliminary operations phase SACP by one notch based on our holistic comparative analysis and our assessment of a project's credit characteristics and under- or over-performance relative to its peers.

99. Our analysis of a project's credit characteristics recognizes that a project can have material differences in key operating, financial, and structural elements relative to its peers. Examples of differentiating factors between projects include a project's relative ability to withstand stressful economic or industry environments relative to peers, including:

- Unusually strong or weak insurance policies,
- Relative stability and visibility in operating and financial performance,
- Relative likelihood of low-probability, high-risk event-related factors (in some cases referred to as tail risks),
- Relative predictability of contractual regimes (i.e., the risk that the project may face contract frustration), and
- Weak subcontracting strategies or contractual structures (as a negative only).

100. Peers are generally projects in the same sector or asset class that use the same technology and, where possible, are subject to similar levels of country risk and have debt with similar tenors. Peers may also include projects occupying similar niches in different countries or projects that can be clearly compared to make an informed comparative assessment. As an example, we may use comparative ratings analysis when there is a large number of projects in a given segment (such as power plants in the U.S.). However, we generally do not make any adjustments related to comparable ratings analysis for a first-of-a-kind project or one with a very limited set of peers.
b) Counterparty rating adjustments

101. Projects often use contracts to mitigate risk. Favorable contracts may improve a project's OPBA and, ultimately, its operations phase SACP. Such contracts also expose a project to counterparty risk. When contracts are material, a contract provider's CDA may cap the project's operation phase SACP at its CDA. See "Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011, for further detail. Counterparty ratings related to financial contracts may also cap the operations phase SACP if the contracts are material (see "Counterparty Risk Framework Methodology And Assumptions," June 25, 2013).

102. In certain cases, the operations phase SACP may be higher when attributing no benefit to a contract, depending on the contract provider's CDA. If the services are widely available in the market, we may reassess the project's OPBA as if it freely transacted in the market without giving any benefit to that contract. For example:

- A favorable O&M contract results in a positive O&M management assessment, which improves the project's performance risk assessment and, in turn, its OPBA;
- The O&M contract provider's CDA is 'bb'; and
- The project's operations phase SACP is 'bbb'.

103. In this case, the O&M contract provider's CDA is below the project's SACP. We would therefore reassess the project's O&M management assessment on the basis of services available to the project un-contracted in the market. This could increase the project's performance risk and potentially result in a worse adjusted preliminary operations phase SACP relative to the initial analysis.

RELATED CRITERIA AND RESEARCH

Related Criteria

- Project Finance Framework Methodology, Sept. 16, 2014
- Project Finance Transaction Structure Methodology, Sept. 16, 2014
- Country Risk Assessment Methodology And Assumptions, Nov. 19, 2013
- Project Finance Construction Methodology, Nov. 15, 2013
- Counterparty Risk Framework Methodology And Assumptions, June 25, 2013
- Project Finance Construction And Operations Counterparty Methodology, Dec. 20, 2011
- Principles Of Credit Ratings, Feb. 16, 2011
- Understanding Standard & Poor's Rating Definitions, June 3, 2009

Superseded Criteria

The following are superseded or partially superseded by this criteria article.

- Request For Comment: Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Road, Bridge, And Tunnel Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Oil And Gas Project Financings, Dec. 16, 2013
- Request For Comment: Key Credit Factors For Power Project Financings, Dec. 16, 2013
- Request For Comment: Project Finance Framework Methodology, Nov. 15, 2013
- Request For Comment: Project Finance Transaction Structure Methodology, Nov. 15, 2013
These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.
Common Macroeconomic Assumptions Used In Project Financings

Primary Credit Analysts:
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com
James Hoskins, London (44) 20-7176-3393; james.hoskins@standardandpoors.com
Pablo F Lutereau, Buenos Aires (54) 114-891-2125; pablo.lutereau@standardandpoors.com

Table Of Contents

Additional Guidance
Common Macroeconomic Assumptions Used In Project Financings

The following table provides guidance for the most common macroeconomic assumptions used in Standard & Poor's Ratings Services' "Project Finance Operations Methodology," published Sept. 16, 2014. We will periodically update the guidance as market conditions warrant, or if there is a need to publish new assumptions.

<table>
<thead>
<tr>
<th>Common Macroeconomic Assumptions Used In Project Financings</th>
<th>Base case</th>
<th>Downside case</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. dollar three-month LIBOR</td>
<td>Futures curve or Standard &amp; Poor's economists' forecast, when available</td>
<td>6%</td>
</tr>
<tr>
<td>'BBB' credit spreads</td>
<td>250 bps</td>
<td>400 bps</td>
</tr>
<tr>
<td>'BB' credit spreads</td>
<td>400 bps</td>
<td>600 bps</td>
</tr>
<tr>
<td>'B' credit spreads</td>
<td>600 bps</td>
<td>900 bps</td>
</tr>
<tr>
<td>U.S. and U.K. inflation rates</td>
<td>Standard &amp; Poor's economists' forecast, when available; where applicable, central bank target inflation rates in outer years</td>
<td>100 bps shock in each of the first five years</td>
</tr>
</tbody>
</table>

Bps-Basis points.

Additional Guidance

Typically, we will review our assumptions based on an analysis of forward rates for the market, our forecasted economic assumptions where available, and historical data.

Interest rates
- In emerging markets, we typically assume higher interest rates than for developed markets, particularly in countries with higher country risks.
- The inflation shock can serve to either increase or decrease the interest rate relative to the base case, whichever is more detrimental to the project.

Credit spreads
- Depending on the specific market, we may use assumptions that deviate from those shown in the table. Typically, they will be within 50 basis points (bps) of the above levels. In rarer cases in which a project's downside performance is closely aligned with the base-case performance, we will use the base-case levels in our downside scenario.

Inflation
- We use a similar approach for other developed markets, with the shock in the downside case commonly being within 50 bps of the levels indicated above.
- In emerging markets, particularly those that have exhibited high inflationary periods in the past, the inflation shocks may be significantly higher.
Credit FAQ:
An Overview Of Standard & Poor's Criteria For Assessing Project Finance Operating Risk

Primary Credit Analysts:
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Terry A Pratt, New York (1) 212-438-2080; terry.pratt@standardandpoors.com
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com

Secondary Contacts:
Michela Bariletti, London (44) 20-7176-3804; michela.bariletti@standardandpoors.com
Paul Judson, CFA, Toronto 416-507-2523; paul.judson@standardandpoors.com
Pablo F Lutereau, Buenos Aires (54) 114-891-2125; pablo.lutereau@standardandpoors.com
Anne C Selting, San Francisco (1) 415-371-5009; anne.selting@standardandpoors.com

Table Of Contents

Frequently Asked Questions
Related Criteria And Research
Credit FAQ:

An Overview Of Standard & Poor's Criteria For Assessing Project Finance Operating Risk

(Editor's Note: We originally published this FAQ on Dec. 16, 2013. We are republishing an updated version following the release of our final criteria for assessing project finance operating risk, titled "Project Finance Operations Methodology," on Sept. 16, 2014.)

On Sept. 16, 2014, Standard & Poor's Ratings Services published its methodology for analyzing risks related to the operations phase of project finance transactions (see "Project Finance Operations Methodology"). Here we provide answers to common questions that we received about the methodology.

The methodology establishes an operations phase stand-alone credit profile (SACP), which reflects our assessment of the likelihood that a project would meet its financial commitments on a timely basis during the operations phase. We first establish a project's operations phase business assessment (OPBA)--by assessing performance, market, and country risks. Based on the OPBA, the minimum forecasted debt service coverage ratios (DSCRs) typically establish the preliminary operations phase SACP. We then adjust this for several factors--mainly our downside analysis, liquidity, and refinance risk--to determine the adjusted preliminary operations phase SACP. And finally, we use a comparative ratings analysis adjustment to arrive at the operations phase SACP.

Frequently Asked Questions

How does Standard & Poor's consider the risk attributes of different phases of a project finance transaction under the methodology, and how can ratings change over time?

A project can have different phases of risk over the life of the project, and the level of credit risk can vary with each phase. Credit risk can differ between phases because of business risk or expected financial performance, or both. A project finance issue credit rating reflects the credit quality of the project during the weakest credit phase over the remaining term of the financial obligation and until the obligation is repaid through project cash flows or, if any bullets or balloon maturities exist, it is refinanced. For example, a project might have a very high level of risk during construction, but once built and operating, would have much lower risk. In this case, the issue credit rating on the debt would initially reflect the construction phase risk, not the operating phase risk.

The operations phase may also include different credit risk subphases that can have varying effects on a project's creditworthiness. Take, for example, a project that contracts out most of its risk to creditworthy third parties for the first half of the debt tenor, resulting in potentially lower credit risk, but lacks risk-mitigating contracts for the second half of the debt tenor, which could result in greater credit risk. In this case, the debt rating would reflect the creditworthiness of the uncontracted phase.

Another example is an operating project that is fully contracted for the debt tenor but has operational phases that present different credit risks. For example, a toll road concession may have a ramp-up period when traffic builds to a steady level. Following that would be a period of more steady traffic volume, and then finally a "hand-back period,"
when the project must prepare itself to be given back to the concessioner in a predetermined condition that could involve a substantial cost. In such situations, our risk assessment at any given time reflects the riskiest phase remaining over the operational phase. For the toll road, the ramp-up phase may present the greatest risk. So, once the ramp-up phase ends, the rating would then reflect our view of the risks of the steady-state and hand-back stages.

**How did you develop the base-case scenario in the methodology?**

The base case reflects our reasonable expectations of a project's operating profile and market conditions. Under our base case, Standard & Poor's will forecast project cash flows and key credit metrics based on our view of operating and market conditions and the project's ability to meet contractual terms. Our forecast may vary from the project sponsor's forecast.

*Example of an industrial plant availability project.* An availability project financing is one where revenues are typically conditional on the project being available to operate, even if it is not actually in use or operation. Availability can be reduced as a result of breakdowns, the project being taken off line for maintenance, or breaches of specific contractual requirements.

In developing a base case for an availability project, we would typically establish an initial view of availability operational performance based on performance-related contract terms, if any. We would then make adjustments based on our knowledge or other external information that we consider to be reliable.

Contractual terms we typically assess are completion tests usually defined in construction contracts that indicate the likely operational performance of the project if construction is completed as planned. We may set our initial operating phase expectation to these performance tests levels if we are confident that they will be met. Otherwise, we may assume a lower initial performance than defined in the completion tests. Then we typically examine terms of any operations and maintenance (O&M) agreements to determine whether they establish a minimum availability, noting that these agreements may create a counterparty dependency. For example, if a project secured a 10-year contract in which a counterparty guarantees 94% availability subject to financial penalties that make the project whole given underperformance, then we would assume 94% availability for the contract tenor.

Next, we form an opinion on the project's likely availability after the O&M contract ends, factoring in our experience with the asset class and any relevant third-party opinions. During surveillance, we may change our availability assumptions. For example, if we assumed 97% availability, but the project is unable to get past 95% during the initial ramp-up period, we would revise our base-case availability to 95% or lower.

*Example of a toll road.* Consider a toll road exposed to traffic volume risk. The ramp-up is complete and the road has established traffic but is not yet operating at full capacity. To develop this project's base-case traffic volume, we would typically begin with the existing level of traffic and look at the historical correlation among traffic growth and GDP, population and employment. Rather than establishing a precise formula, we rely on historical trends and compare variations of each variable and which of these has the closest correlation to traffic growth. Using this analysis will then determine our future traffic growth.

For a toll road with tolls that are contractually indexed to annual inflation, we would typically assume that tolls will increase in line with our base-case inflation forecast and at the frequency allowed under the road's concession. We may apply a lower-than-contractually allowed toll rate increase (or reduce the frequency) if we have concerns about timeliness of approval or public acceptance of rising toll rates.
Can you describe the design of the downside case?
We designed the downside case analysis to enhance the stress analyses that we had always performed, as well as to provide a check on the preliminary OPBA, to provide a quantitative valuation of liquidity features, and to better ensure our project finance issue credit ratings are in line with Standard & Poor's credit ratings definitions.

The downside case factors in market (if applicable) and performance stresses, with the idea that the combined stress reflects trough market and performance conditions consistent with the 'BBB' scenario defined in our general criteria (see "Understanding Standard & Poor's Rating Definitions," published June 3, 2009). The operations methodology article and key credit factors articles (which outline sector-specific criteria) provide detailed information on market and performance stresses used to develop the downside case. Some stresses--such as macroeconomic assumptions--may be similar to all asset classes in a region, while performance stresses typically vary by asset class.

How does Standard & Poor's factor event risk into project ratings?
We typically incorporate reasonably foreseeable event risk into various parts of our analysis. For example, the risk of new competition or regulatory uncertainty is part of a project's market risk score. Similarly, the risk of an operating problem, like a turbine failure, is incorporated into our asset class operations stability assessment for the project. If an asset is located in an area subject to natural events, such as seismic activity or severe weather, we would typically assess a project's design, engineering, operations stability, and financing structure to withstand and operate under such natural events. Finally, our counterparty dependency assessment (CDA) evaluates the risk of a counterparty failure. However, unforeseeable or highly improbable types of event risk would not be incorporated into our analysis. An example would be a change in law in a low-risk country (e.g., one with a country risk assessment of '1') that nullifies a project's off-taker contract.

How does Standard & Poor's analyze refinance risk?
When we forecast that a project's cash flow available for debt service (CFADS) will not fully amortize debt by the end of the initial debt tenor, we add a refinancing phase to our analysis and consider the sufficiency of cash flows to amortize and service debt under our DSCR analysis over the remainder of the project life. For example, a 10-year term loan B financing with 1% annual amortization and no mandatory debt amortization through excess cash flows (a cash flow sweep) would have 90% of the initial project debt remaining at maturity. If the financing structure contains a cash flow sweep, we would assume additional debt repayment per the waterfall structure in conjunction with our CFADS forecast and DSCR analysis. We would then assume the most likely amortization profile to fully repay the outstanding debt (at year 10) by the end of the project's asset life.

Challenging market conditions can complicate refinancing. We assess this risk using a combination of the project's asset coverage--using a project life coverage ratio at the point of refinancing--and its expected cash flow volatility during the assumed refinancing period. Where there is very low asset coverage (generally less than 1.1x) or low cash flow stability (generally an OPBA of '9' or worse, unless asset coverage is high), we will cap ratings as described in table 18 of the criteria.

Does a weak counterparty always cap a project rating in the criteria?
Not always. Under the criteria, the rating on a project is typically weak linked to either a material CDA or the project's SACP without taking into account any beneficial contracts from counterparties (meaning we would use the weaker of
the two assessments).

Counterparty dependencies cap the rating if we view them as material and if they provide beneficial terms that cannot be replaced under similar terms and without disruption to project operations or cash flow (for more, see "Project Finance Construction And Operations Counterparty Methodology," published Dec. 20, 2011). This is typically the case when contractual arrangements improve a project's performance risk or market exposure assessment (such as through strong O&M or revenue contracts, respectively), but the agreements are provided by a counterparty with a weaker CDA than the resulting rating. For example, a revenue contract can raise the rating on a project in several ways: it can improve a project's market exposure score by lowering cash flow volatility, and it can raise the project's minimum DSCR if contract pricing is above market terms. For example, assume a project has only senior debt and a contract raises its operations phase SACP to 'bbb' from 'bb', but the counterparty's CDA is 'bbb-'. In this case, the counterparty would cap the SACP at 'bbb-'.

However, in the same example, if the revenue counterparty's CDA was 'b', we would not necessarily lower the project's operations phase SACP from 'bb' because a default by the counterparty would leave the project no worse than its uncontracted profile. Critical to this conclusion would be our assessment that cash flows from the existing contracts can be reasonably replaced, meaning that the contracts would terminate upon default by the counterparty, market-based replacement revenue through new contracts or spot sales would be available and sufficient to support a 'bb' operations phase SACP, and adequate liquidity exists to bridge the project until new cash flows begin.

For example, suppose an airport has contracted cash flows with airline counterparties that support a 'bb' operations phase SACP, but many of the airlines have CDAs of 'b'. If we determine the contracted cash flow is reasonably replaceable as described above, we could still assign an operations phase SACP to the airport of 'bb'.

However, in some cases, we may not rate a project based on the higher of its material counterparty's CDA or its uncontracted SACP.

- If a lower-rated revenue counterparty defaults and there is significant risk a beneficial contract will not terminate, thereby preventing replacement revenue, the counterparty CDA would weak link the operations phase SACP to the CDA.
- If a project has a contract with worse-than-market terms that lowers its DSCRs, we will base our DSCR analysis on the contract terms and will not give credit to the project's potential to generate stronger cash flows on the open market unless the contract terminates. For example, take a power project that sells electricity into the open market for which we assess the operations phase SACP on an uncontracted basis at 'bbb'. If this project has an underwater revenue contract with a counterparty with a CDA of 'b', and that contract would result in weaker DSCRs and a 'bb' operations phase SACP for the project, the operations phase SACP would be 'bb' because we would not assume a counterparty default that would allow the project to generate higher cash flow on the open market (this would be the outcome regardless of the counterparty's CDA).

**How do you factor leverage metrics—such as debt to EBITDA or cash flow available for debt service to debt—into the operations phase analysis?**

DSCRs are a key financial metric we use to assess a project's cash flow coverage of both interest and principal repayments over the term of a loan and any postrefinancing assessment. The amount of debt, forecasted CFADS, debt term, amortization profile, and the interest rate on the loan can affect a project's DSCRs. As such, forecasted DSCRs
are a useful measure of a project's debt servicing ability over time.

A project's debt tenor and amortization term typically are long to manage a project's higher leverage (relative to a corporate entity). As a result, leverage ratios, such as debt to EBITDA, are typically high. Although we do not explicitly map leverage ratios, as we do DSCRs, higher leverage (assuming equivalent DSCRs) would typically translate into longer loan tenors or higher refinancing risk, which we may penalize under the criteria, depending on the situation.

A long loan tenor or a refinancing exposure means that a project can have exposure to risk later in the life of the project—when its performance could be affected by issues associated with an ageing plant or hand-back conditions under a concession agreement, for example. High financial leverage may also translate into heavily back-ended amortization structures (that is, when amortization payments occur late in a project's life), in which the forecasted DSCRs in the later years of the project's life become highly dependent on inflationary growth that may not occur. Finally, the longer tenors can translate into market risk that becomes more pronounced over time. In these circumstances, the criteria may penalize these projects by assuming higher operating expenses, greater outages and increased market exposure in the later years of the project's life. We may also lower a project's preliminary operations phase SACP for having atypical debt structures, such as ones with abnormally high financial leverage, typically resulting from unusually long loan tenors or back-ended amortization payments.

Related Criteria And Research

Related Criteria

- Project Finance Operations Methodology, Sept. 16, 2014
- Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings, Sept. 16, 2014
- Key Credit Factors For Road, Bridge, And Tunnel Project Financings, Sept. 16, 2014
- Key Credit Factors For Oil And Gas Project Financings, Sept. 16, 2014
- Key Credit Factors For Power Project Financings, Sept. 16, 2014
- Project Finance Construction And Operations Counterparty Methodology, Dec. 20, 2011
- Principles Of Credit Ratings, Feb. 16, 2011

Related Research

- Credit FAQ: Provision Of Information For Assessing Project Finance Transactions, Dec. 16, 2013

Under Standard & Poor's policies, only a Rating Committee can determine a Credit Rating Action (including a Credit Rating change, affirmation or withdrawal, Rating Outlook change, or CreditWatch action). This commentary and its subject matter have not been the subject of Rating Committee action and should not be interpreted as a change to, or affirmation of, a Credit Rating or Rating Outlook.
S&P may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P reserves the right to disseminate its opinions and analyses. S&P’s public ratings and analyses are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription) and www.spcapitaliq.com (subscription) and may be distributed through other means, including via S&P publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.

S&P keeps certain activities of its business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain business units of S&P may have information that is not available to other S&P business units. S&P has established policies and procedures to maintain the confidentiality of certain nonpublic information received in connection with each analytical process.

S&P may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P reserves the right to disseminate its opinions and analyses. S&P’s public ratings and analyses are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription) and www.spcapitaliq.com (subscription) and may be distributed through other means, including via S&P publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.
COUNTERPARTY RISK CRITERIA

Project Finance Construction And Operations Counterparty Methodology

Counterparty Risk Framework Methodology And Assumptions
Criteria | Corporates | Project Finance:

Project Finance Construction And Operations Counterparty Methodology

Primary Credit Analyst:
Ian R Greer, Melbourne (61) 3-9631-2032; ian.greer@standardandpoors.com

Secondary Contact:
Trevor J D'Olier-Lees, New York (1) 212-438-7985; trevor_dolier-lees@standardandpoors.com

Global Chief Credit Officer:
Ian D Thompson, Managing Director, Melbourne (61) 3-9631-2100;
ian_thompson@standardandpoors.com

Criteria Officer, Asia Pacific:
Terry E Chan, CFA, Managing Director, Melbourne (61) 3-9631-2174;
terry_chan@standardandpoors.com

Global Criteria Officer, Corporate Ratings:
Mark Puccia, Managing Director, New York (1) 212-438-7233; mark_puccia@standardandpoors.com

Table Of Contents

I. SCOPE OF THE CRITERIA
II. SUMMARY OF THE CRITERIA
III. CHANGES FROM REQUEST FOR COMMENT
IV. IMPACT ON OUTSTANDING RATINGS
V. EFFECTIVE DATE AND TRANSITION
VI. METHODOLOGY
A. Assigning A Counterparty Dependency Assessment (CDA)
B. Materiality
Criteria | Corporates | Project Finance:

Project Finance Construction And Operations Counterparty Methodology

(Editor's Note: We originally published this criteria article on Dec. 20, 2011. We're republishing this article following our periodic review completed on Dec. 5, 2013. This article supersedes the sections on counterparty risk in the article titled, "Key Credit Factors: Methodology And Assumptions On Risks For Concentrating Solar Thermal Power Projects," published on Oct. 27, 2009.)

1. Standard & Poor's Ratings Services is updating its methodology and assumptions for assessing counterparty risk associated with revenue, construction, equipment supply, operations and maintenance, and raw material supply agreements (construction and operations counterparties) relating to project finance globally. This update follows our request for comment "Project Finance Construction And Operations Counterparty Methodology" published Aug. 16, 2011. Contract counterparty risk is one of the key factors considered when analyzing and assigning ratings to project finance securities. The reliance on third parties to make payments or perform under a wide range of agreements such as revenue, construction, equipment supply, operations and maintenance, or raw material supply, is a common feature in project finance issues. The proposed criteria will improve the transparency of how we assess construction and operations counterparty risk for project finance.

2. The criteria are intended to enhance the comparability of ratings on project finance issues with ratings in other sectors (see "Understanding Standard & Poor's Rating Definitions" published June 3, 2009 ) and improve transparency about how we assign ratings. The criteria constitute specific methodologies and assumptions under our "Principles of Credit Ratings", published on Feb. 16, 2011.

3. The criteria supersedes our currently applicable criteria for assessing construction and operations counterparty risk in project financings, as described in "Updated Project Finance Summary Debt Rating Criteria," published on Sept. 18, 2007.

I. SCOPE OF THE CRITERIA

4. These criteria are applied to all new and existing project finance debt issues.

II. SUMMARY OF THE CRITERIA

5. The construction and operations counterparty framework and the link between the rating on a security and the rating on a counterparty applies to the analysis of all construction and operations counterparties in project finance ratings that rely on a contract to transfer and mitigate a material risk (see ¶18) for the period of the project covered by the contract to which they are a counterparty. Examples of the types of contracts whose counterparty is considered within the scope of these criteria include government concessions, offtake contracts, purchase contracts, construction agreements, operating and maintenance agreements, and supply or procurement agreements.
6. These criteria are an input to the project finance methodology where a material risk is transferred to a counterparty. They provide an estimate of the exposure to the project should the counterparty become insolvent or for any other reason cannot accept the risk assigned to it under the respective contract. The counterparty risk is matched to the term of the contract it is a counterparty to and to any enduring obligations.

7. These criteria do not apply to financial counterparties. The implications of financial counterparties—including bank accounts, liquidity or credit support facilities, interest rate swaps, and currency swaps—on credit quality are covered by the criteria report “Counterparty And Supporting Obligations Methodology And Assumptions,” published on Dec. 6, 2010, and “Expanding The Scope Of Counterparty Criteria To Corporate And Government Ratings,” published June 21, 2011.

8. Notable features of this criteria update include:

- Defining the concept of Counterparty Dependency Assessment (CDA) (see ¶13) as a constraining factor (‘weak link’) on the project finance issue credit rating;
- Establishing the Issuer Credit Rating (ICR) or credit estimate on the construction and operating counterparty as the starting point for determining the CDA (see ¶23);
- Explaining that the starting point at which a CDA may be adjusted upward or downward to arrive at a final CDA based on: i) Replaceability of the counterparty (see ¶ 20); ii) Ability, incentives, and disincentives for the counterparty to perform its designated role under various types of duress (see ¶ 39); iii) Credit enhancement (see ¶ 27); and iv) Contract type (refer to Part VII). See table 1.

### Table 1

**Summary Of Counterparty Dependency Assessments (CDA) Relative To Contract Type**

<table>
<thead>
<tr>
<th>Counterparty</th>
<th>Type of Contract Obligation</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Revenue (concession or off-taker)</td>
<td>Construction</td>
<td>Equipment supplier</td>
<td>Operations and maintenance</td>
</tr>
<tr>
<td>Irreplaceable</td>
<td>CDA is equated to counterparties’ ICRs or credit estimates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replaceable (Subpart VII.C)</td>
<td>CDA is linked to basket of off-take counterparties (Subpart VII.A.1)</td>
<td>CDA uplifted by up to two categories from counterparty ICR, reflecting credit enhancement and type of construction (Subpart VII.B &amp; table 3)</td>
<td>CDA uplifted by up to two categories from counterparty ICR, reflecting credit enhancement and availability of viable alternate suppliers (Subpart VII.C &amp; table 5)</td>
<td>No CDA assigned, as de-linked subject to number of alternate parties and credit support equal to one month’s fees (Subpart VII.D)</td>
</tr>
</tbody>
</table>

**EXCEPTIONS**

| Counterparty with regulatory or legal support | CDA may be raised for counterparties rated ‘BB’ and lower (¶39 & table 2) | N/A | N/A | N/A | N/A |
| Unwilling counterparty               | CDA capped at one category lower than the counterparty ICR, subject to a maximum ‘bb+’ (Subpart VII.A.3) | N/A | N/A | N/A | N/A |

CDA—Counterparty Dependency Assessment. ICR—Issuer Credit Rating. N/A—Not applicable.
III. CHANGES FROM REQUEST FOR COMMENT

9. On Aug. 16, 2011, Standard & Poor's published a request for comment titled: "Project Finance Construction And Operations Counterparty Methodology". A majority of investors and issuers who provided comments to Standard & Poor's supported the increased transparency around project finance issue ratings. There is no material change to the criteria as detailed in the request for comment. Minor changes were made to clarify definitions.

IV. IMPACT ON OUTSTANDING RATINGS

10. We expect that changes to existing ratings would be relatively small in both number and magnitude.

V. EFFECTIVE DATE AND TRANSITION

11. These criteria are effective immediately. We intend to complete our review of project finance issue ratings within the next six months.

VI. METHODOLOGY

12. Project finance structures typically depend on the cash flow from a single asset, or cash flows from a small portfolio of assets, to support debt obligations. Project finance structures utilize contractual arrangements to establish obligations and risk allocation among the project and the project's various counterparties. The credit quality of project finance transactions takes into account the financial capacity and operating capability of counterparties to accept risk and perform under these contracts.

13. The issue rating assigned to the project finance issue incorporates the counterparty dependency assessment (CDA) as a weak link. The CDA is an analytic tool used to assess the creditworthiness of counterparties (refer to the Glossary) that take material risks (see ¶18) and potentially expose the credit of the project to the risk of the counterparty failure.

14. The criteria set out a four-step process (see chart 1) in assessing how risks posed by construction and operations counterparties may constrain the issue rating on a project:

   • Identify the material construction and operations contracts (see ¶18 for definition of "material").
   • Determine the replaceability or irreplaceability of material construction and operations counterparties (see ¶20).
   • Identify the type of contract obligation i.e. revenue (concession or offtaker), raw material supply, equipment supplier, operation or construction (Part VII).
   • For irreplaceable counterparties, the CDA is linked to the counterparties’ ICRs and is raised where the service is regulated or essential and there is regulatory or legal support of payments (see ¶39). The CDA is lowered when the counterparty is an unwilling participant in the contract (see ¶41). For replaceable counterparties, the CDA may be raised dependent on the presence of substitute counterparties and the level of credit enhancement provided (see ¶27).

15. Where a material risk is transferred to a counterparty through a contract, we assess whether the counterparty can be
replaced (see ¶20 and Part VII) and over what period the CDA applies. The role of material counterparties and the risk exposure can vary over the project's lifetime. For example, a construction contract covers the construction phase, although some terms (e.g. warranties or defects liability) may continue beyond construction. Similarly, credit quality, economic and industry cycles, incentives linked to the project, changes in market position, or reputation concerns may change a counterparty's willingness to meet contractual obligations over a project's life.

16. In cases where Standard & Poor's does not have a rating on the construction and operations counterparties, a credit estimate is assigned to those counterparties.

*Chart 1*
A. Assigning A Counterparty Dependency Assessment (CDA)

17. A CDA is assigned where a construction or operations counterparty is material (see ¶20) or cannot easily be replaced without significant time or cash flow impact (see subpart VI.C). A CDA applies only to that part of the project's life covered by the relevant phase's contract. For example, a construction company might only be a counterparty during the construction phase and for any warranty or defects liability period covered by the contract; the CDA would be assigned for the relevant time period.

B. Materiality

18. A material counterparty is one that significantly affects the timeframe or cash available to service debt through construction and/or operation of the project. Examples include: concession or offtake contracts that govern all or substantially all of the project's revenue; construction contracts governing the major construction tasks and any significant construction activities; operations and maintenance contracts; and raw material supply contracts that cover the supply of critical and major inputs to the operating process.

19. As an example, during the construction phase, a significant effect would be the failure to deliver the project on time, being one month late or more than 10% over budget compared to the initial schedule and budget. During the operations phase, a significant effect encompasses counterparties whose failure to perform negatively impacts the project's capacity to deliver service, resulting in either reduction of cash flows by 10%, or interruptions to operations lasting more than one day.

C. Replaceability

20. Replacement language in the contract is not sufficient for a counterparty to be assessed as replaceable for the purposes of this criteria. For Standard & Poor's to consider a counterparty as replaceable under the proposed criteria, all of the following conditions need to be met:

- Alternative contractors with similar skills must be available and able to provide the same service or product at a similar price and quality (see ¶24). Specialist skills may limit the field of possible alternatives;
- The original contractors must have priced the contract appropriately. We believe that top-tier, or well-run second-tier operators that have extensive local experience in delivering on time and budget, are likely to engage in contracts that are more attractive to replacements than operators with less experience that may under-price risk;
- The contract must allow the termination and replacement of the failed party, with sufficient time to appoint a replacement without disrupting cash flows supporting the project's debt-service payments (see ¶ 31);
- Contracts with suppliers and subcontractors, licenses, permits, and project records must be assignable or transferable without undue delay; and
- The project management must have the skills and ability to manage (see ¶ 26) and fund the replacement (see ¶ 47).

21. Examples of irreplaceable counterparties include:

- Where the counterparty provides essential specialist skills, and the time to source replacement services and or
equipment from another supplier would be too long to prevent significant cash flow deterioration that would likely lead to a project default.

- Where the construction or operations counterparty assumes greater risk than its peers would normally accept, thereby limiting the field of alternative contractors.

22. For an explanation of the impact of replaceability, see the types of counterparties in Part VII.

**Availability and willingness**

23. Standard & Poor's CDA for an irreplaceable counterparty equates to the long-term ICR, credit estimate, or rating that reflects the nature of the obligation of the counterparty, whether public or confidential, unless adjusted for regulatory or legal support of payments (see ¶ 39) or unwillingness of the counterparty (see ¶ 41).

24. The likelihood of the availability and willingness of an alternative party to step into the project functions if the original party resigns, is unable to perform, or is removed for any reason at any time during the life of the rated debt is assessed. The structural and market features, adequacy of the fee to attract a substitute party, the availability of alternative parties in that sector or region, and the specific characteristics of the assets that may hinder an orderly transition of the function are assessed.

25. Sufficient time to replace a failed contractor depends on the market conditions and particular project circumstances. It generally takes more than two weeks to find an alternative contractor for simple projects, and longer for more complex projects. Any delay may result in the demobilization of other sub-contractors, resulting in higher replacement costs and negatively affecting the project's credit profile.

26. To replace a counterparty, project management must have the capacity to monitor performance in real time to quickly identify any failures and to act swiftly. Monitoring can also be provided by independent experts that are explicitly charged with ongoing project oversight on behalf of the project company.

**D. Credit Enhancement For Counterparty Replacement**

27. The sufficiency of any credit enhancement provided by the counterparty is assessed relative to the funding required to replace the counterparty. Credit enhancement may take the form of secure cash deposits, or unconditional and irrevocable instruments from a financial institution or insurance companies (see Financial Enhancement Ratings, published Dec., 10, 2004) payable on demand (for example, letters of credit and guarantees) (see "Credit Enhancements (Liquidity Support) In Project Finance and PPP Transactions Reviewed," published on March 30, 2007).

28. To be assessed as replaceable under the proposed criteria, the contractor credit enhancement should cover the cost of replacing the contractor should they fail or become insolvent (see ¶ 48). The quantum of each credit-enhancement instrument reflects the amount needed to offset the cash flow derived from the counterparty's role and function, the likelihood of failure to perform, and any resulting cash flow consequences of mitigating the damage caused. Contractual retentions (refer to the Glossary) can provide cash, but there is a risk that there may not be sufficient cash retained at the time of a failure, and as such, they are not counted as credit enhancement until funded.

29. Standard & Poor's credit-enhancement analysis recognizes that some components do not need to be backed by an
on-demand instrument. For example, an increased margin needed to attract an alternative contractor is a replacement cost for construction counterparties (see ¶48), and is payable over the remaining life of the construction period. This can be funded by alternative means, provided the funding is timely and unconditional.

30. Arrangements to directly pay subcontractors (see ¶48), or a credit enhancement covering all or part of the subcontractor's fees, may mitigate the risk of subcontractor payments getting caught up in any contractor bankruptcy. In cases where credit enhancement is provided by subcontractors and is assignable, or for the benefit of the project's company, this amount is included in our analysis.

31. Credit-enhancement instruments that are poorly drafted or contain conditionality are reviewed with reference to the likelihood of funds required to fund a timely replacement. While the CDA of a counterparty will reflect any implicit or explicit support from its parent, a failure of the contractor signifies that the support is exhausted, and as such any undertakings provided by the contractor or its parent are too highly correlated in a bankruptcy or similar action and, hence, do not mitigate the risk.

32. The credit enhancement in this criteria deals only with the insolvency risk of the counterparty. In total, the project financing actual credit enhancement and construction support will normally be higher than as calculated under this criteria and include support for project level liquidated damages.

VII. TYPES OF COUNTERPARTIES

A. Revenue Contract/Offtake Counterparties

33. Analysis of a counterparty revenue risk is key for forecasting expected cash flows for the term of the project finance debt. Revenue contracts often match or exceed the term of the rated debt. For example, government concessions and some power projects’ revenue contracts are for terms of 30 years or more. Commodity projects often have shorter terms. The CDA assigned differentiates between:

- Irreplaceable counterparties (see ¶21), which cannot be replaced by virtue of their market or contract position. These counterparties include government concession granters and monopoly market operators. These counterparties typically are contracted for the entire term of a project, as without their support there is no market for a project's output. In many cases, a project may be unable to sell its product to another party in the event of a default by an irreplaceable counterparty on the senior unsecured debt.
- Replaceable counterparties, which may cover only part of the output or only a portion of the project's life, or can be replaced in predetermined circumstances (see ¶36).

34. The proposed criteria acknowledge there are situations where laws or regulation require ongoing payments and services under a contract, even when the counterparty may be in default under its debt obligations (see ¶39).

1) Replaceable counterparties: multiple commodity and energy offtakers

35. Multiple offtake agreements are common in commodity and some energy projects. In these instances, the proposed criteria base the CDA on the weighted average counterparties' ICR or credit estimate and calculation of the proportion of revenue. The CDA will reflect the revenue basket's characteristics over time. These characteristics change over time
as a result of composition, allocation, and the credit strength of the contract counterparties.

36. A project may have long-term contracts for most, but not all, of its revenue. The residual revenue may be sourced from short-term contracts or the spot market. In cases where a counterparty (s) represents less than 15% of project revenues, and that counterparty is either unrated or its ICR or credit-estimate is more than one rating category (three notches) lower than the weighted average creditworthiness of the other counterparties, the revenues of the weak or unrated counterparty (s) is excluded from the basket. The costs associated with the production for the weak counterparty are included, however, in the analysis of project cash flows. The CDA in this circumstance is calculated on the basis of the revenue-weighted basket of higher-rated counterparties that cover at least 85% of revenue.

37. Where sales are done at market or under short-term arrangements, the CDA will reflect the credit risk determined by the weighted trading exposure, market risk, and contracting policy of the project, as assessed under project finance ratings methodology for that sector.

38. In cases where a highly-rated intermediary assumes the credit risk of the revenue or offtake customers, Standard & Poor's assigns the CDA of the intermediary if the credit substitution instrument meets rating criteria for the type of credit substitution, such as letter of credit, bond, or guarantee.

2) Regulatory or legal support may enhance a revenue counterparty's CDA

39. In situations where the service or product delivered is a regulated essential service—such as power—the proposed criteria would assign a CDA higher than the counterparty ICR or credit estimate in circumstances described in table 2. This applies in cases where: the contract does not terminate on the default of an offtaker and where a regulator would maintain the contract as part of ongoing operations; or payments would continue due to their essentiality, regulatory support, or commercial incentives.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Counterparty rating</th>
<th>Cap on uplift to CDA from counterparty ICR or credit estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory or legal precedent to support</td>
<td>Investment grade</td>
<td>No uplift</td>
</tr>
<tr>
<td>counterparty payments (¶40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulatory or legal precedent to support</td>
<td>’bb’ category</td>
<td>One notch</td>
</tr>
<tr>
<td>counterparty payments (¶40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulatory or legal precedent to support</td>
<td>‘b’ category</td>
<td>Two notches</td>
</tr>
<tr>
<td>counterparty payments (¶40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counterparty enters bankruptcy or defaults</td>
<td>--</td>
<td>Reflecting prospects on continued payment, and capped at ‘ccc+’</td>
</tr>
<tr>
<td>on unsecured debt (¶40)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CDA—Counterparty Dependency Assessment. ICR—Issuer credit rating.

40. In cases where there is regulatory and legal precedent to support payments or services for a specific counterparty or similar type of counterparty, the CDA will be elevated, as shown in table 2. Regulatory support is more valuable for below-investment-grade counterparties, and of limited value for an investment-grade counterparty. A counterparty entering into bankruptcy or defaulting on its unsecured debt does not automatically fail to perform under the project contract. For example, an electric utility is likely to continue to produce or purchase, and, in turn, supply power even in bankruptcy. The CDA would reflect the reasons for the default and assesses the prospects of the counterparty.
continuing to meet its obligations to either provide a service or pay for the project's output. In such cases, a CDA as high as 'ccc+' might be maintained on the counterparty. The potential level of an offtake counterparty's CDA is limited under increasing duress, in default on its senior unsecured debt, or in bankruptcy, to 'ccc+'.

3) Unwillingness may weaken a revenue contract counterparty's CDA

There can be delays in payment, including under bona fide commercial disputes. Further, in some cases, a counterparty can be consistently late with payments, despite no dispute over the amount of the payment. The proposed criteria assess commercial, political, and other incentives that can lead to a project sponsor or parent being reluctant to pursue legal remedies.

In cases where a counterparty is consistently late with payments, the risk is assessed by analyzing the cash flow impact and weak-linking the issue rating. For projects where there has been a delay in payment, a counterparty has a history of late payments, or delays are common market practice, Standard & Poor's incorporates payment delays in liquidity and cash flow analysis at the project level. In addition, Standard & Poor's will cap the CDA view at one category below the counterparty ICR or equivalent on the counterparty, with a maximum CDA of 'bb+'. For a government-related entity (GRE), our analysis may equate the CDA to at most, its SACP (standalone credit profile) or credit estimate.

Circumstances which may lead to this analytical approach include:

- When there has been a demonstrated practice of late payments. For example, some regional governments are well known for paying late on "commercial contracts" while paying promptly on external debt.
- Situations in which we assess a counterparty to be an "unwilling participant" in a contract. An example of an unwilling participant is a local authority that undertook a public-private partnership (PPP) transaction, but where the local authority, or its executive, is publicly against the concept. In our view, the authority may seek to terminate or frustrate the contract.

B. Construction Contract Counterparties

Unlike revenue contracts, construction contracts generally cover a relatively short period of time, usually ranging from a few months to four years, although some provisions, including warranties, often extend for longer periods. In most circumstances, a replacement should be able to complete construction if the initial counterparty fails. However, in some circumstances this may affect the project's viability, and therefore we apply our replacement analysis in these situations (see ¶20). If counterparty substitution is possible, we will increase the CDA from the construction counterparty's ICR or credit estimate based on the degree of credit enhancement relative to the cost of replacing the counterparty and or its subsidiaries as described in table 3.

An irreplaceable construction counterparty's CDA is equated to their counterparty's ICR or equivalent. An example of an irreplaceable construction counterparty is a head construction contractor that has only a small field of replacement contractors available, reflecting the nature of the task. Also, contractors performing under a "turn-key construction contract" (as defined in the Glossary), where the builder takes design and performance risk, or contracts providing specialist design or construction skills are considered not replaceable.
### Table 3

<table>
<thead>
<tr>
<th>Credit enhancement provided (calculation in table 4)</th>
<th>Simple-to-moderately complex building</th>
<th>Civil or heavy engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>No credit enhancement</td>
<td>Builder's ICR or credit estimate</td>
<td>Builder's ICR or credit estimate</td>
</tr>
<tr>
<td>Credit enhancement covers costs sufficient to cover replacement of main contractor</td>
<td>+2 notches</td>
<td>+1 notches</td>
</tr>
<tr>
<td>Credit enhancement covers cost to replace main contractor and a minor subcontractor</td>
<td>+4 notches</td>
<td>+2 notches</td>
</tr>
<tr>
<td>Credit enhancement covers costs sufficient to cover replacement of main contractor and a major subcontractor</td>
<td>+5 notches</td>
<td>+3 notches</td>
</tr>
<tr>
<td>Credit enhancement covers 1.5x costs to replacement of main contractor and a major subcontractor</td>
<td>+6 notches (two categories)</td>
<td>+4 notches</td>
</tr>
</tbody>
</table>

*Industrial and more complex construction types do not qualify as replaceable. CDA—Counterparty Dependency Assessment. ICR—Issuer Credit Rating.

46. Simple-to-moderately complex projects are able to attract a wider field of potential contractors. Second-tier contractors generally are able to complete more basic building projects as effectively as top-tier builders. Reflecting a wider field, replacement contractors generally can be found for simple projects. Builders typically complete simple projects faster and for less money than they would for more complex projects. Reflecting this wider field for replacement and simpler nature of the task, the CDA is higher for these projects under each scenario for a given builder's ICR than for more complex construction tasks. Examples of simple-to-moderately complex buildings include:

- Schools
- Military barracks
- Hospitals

Examples of civil or heavy engineering include:

- Gas pipelines
- Road works (not including tunnels or bridges)
- Power-generation plants (civil components, not equipment suppliers)

1) **Calculating construction credit enhancement**

47. Contractor credit enhancement is measured against the estimate of all costs to replace and complete the project, as if the contractor did not fail (see table 4). Determining a cost estimate involves interviews with contractors and the independent expert (IE), any IE analysis on requirements to replace a builder or operator, and analysis of comparable projects in the jurisdiction.
48. The cost of replacing a contractor or subcontractor relates to the state of the relevant market and is calculated on the total cost of construction. It includes:

- Searching and re-contracting costs, including any legal fees and offtake contractor review required as typical for the market in which the project is being constructed;
- 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, paid to the main contractor but not passed on to subcontractors matching the subcontractor payment cycle; and
- A higher margin on the contract, reflecting the new counterparty's strong bargaining position and added risk absorbed through taking on the failed counterparty's obligations.

2) Multiple construction counterparties

49. Where there are multiple construction contractors without one head contractor taking overall construction risk, the sharing of risk of contractor failure is based on whether the contract obligations are "joint and several" or "several".

50. In projects where construction responsibility is spread between multiple parties, and the contract obligations are "joint and several" (refer to the Glossary), the CDA is linked to the ability to replace the higher-rated or credit-estimated party because, in cases of an insolvency of the weaker party, the more creditworthy party is expected to replace the weaker party. The more creditworthy party could finish the project if sufficient funds are available. The credit enhancement required would be equivalent to the exposure of both contractors rather than only the higher-rated or credit-estimated parties. Given there is a high degree of correlation, no uplift is provided for the joint and several obligations.

51. In situations where the obligations are "several" (refer to the Glossary), the counterparty risk will be linked to the CDA of the weaker party (refer Table 3 for replaceable counterparty), if the weaker party is critical to the task completion.

C. Equipment Supply Counterparties

52. An irreplaceable equipment supplier is a supplier with specialist skills, and where the time to source replacement
equipment from another supplier would be too long to prevent a significant disruption in cash flows or the project’s default. A counterparty with specialist skills, or a counterparty that takes greater risk than would normally be accepted by its peers, is also an irreplaceable counterparty (see table 5).

**Table 5**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Maximum effect on equipment supplier’s ICR or credit estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist supplier or bespoke design</td>
<td>Supplier’s ICR or credit estimate</td>
</tr>
<tr>
<td>Alternate suppliers available with capacity to meet delivery but may require some minor adjustments to the design configuration</td>
<td>+2 notches</td>
</tr>
<tr>
<td>Generic equipment available from a range of suppliers who have capacity to deliver timely</td>
<td>+1 category</td>
</tr>
<tr>
<td>Equivalent equipment from multiple suppliers readily available without delay</td>
<td>+6 notches (two categories)</td>
</tr>
</tbody>
</table>

CDA—Counterparty Dependency Assessment. ICR—Issuer Credit Rating.

53. A CDA of up to six notches (two categories) can be achieved for suppliers above the equipment supplier’s ICR, where there is a market for alternative technology and there is a high confidence in sourcing comparable alternatives in a timely manner at a similar cost. The amount of uplift is greatest where there are several viable alternatives available—for example, replacement solar panels.

54. For non-material equipment that is widely available, no CDA is to be applied.

**D. Operations And Maintenance Counterparties**

55. Specialist services or operations and maintenance contractors that are irreplacable are assigned a CDA equivalent to the counterparty’s ICR. An example is a long-term service agreement covering proprietary technology by an original equipment manufacturer.

56. No CDA will be applied where credit enhancement equal to one month’s fees is available and if the field of replacements is large or the task is simple. This category includes counterparties that perform general maintenance tasks during the operations phase and there is a wide field of competent alternatives with excess capacity to undertake the contract and deliver at the expected performance levels. The replacement scenario will assume the project covers any increased margin.

**E. Raw Material Suppliers**

57. The ability of a project to mitigate raw material pricing risk through commercial contracts is key to cashflow stability for the term of the project finance debt. Analysis of raw material commercial contracts is similar to that for equipment supply contracts (see table 6).
Table 6

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Maximum effect on raw material supplier's ICR or credit estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist supplier or raw material or alternative’s quality and delivered cost will adversely impact project cash flows by 10% or more</td>
<td>Supplier’s ICR or credit estimate</td>
</tr>
<tr>
<td>One or two alternative suppliers available, with capacity to meet delivery and quality at similar cost.</td>
<td>+2 notches</td>
</tr>
<tr>
<td>Raw material from multiple suppliers, readily available without delay</td>
<td>No CDA required</td>
</tr>
</tbody>
</table>

CDA—Counterparty Dependency Assessment. ICR—Issuer Credit Rating.

VIII. APPENDIX

Summary of Responses to Request for Comments

We received comments from some respondents to provide further clarity around some of the definitions used in this criteria article. Where appropriate, we have added this clarity. We also received several comments related to the methodologies used to evaluate project finance construction and operations phases. In our Advance Notice Of Proposed Criteria Change–Project Finance Rating Methodology And Assumptions, published Aug. 16, 2011, we gave notice that our broad criteria review would be conducted in a number of stages. This methodology article and the Request for Comment on Project Finance Transaction Structure Methodology (Nov. 17, 2011) are the first steps in this review. The next stage in our review will cover the criteria framework, and construction and operations phases methodologies.

Glossary

Counterparty Dependency Assessments (CDA)

Standard & Poor’s assessment of the risk a counterparty poses to a project financing that 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 role being performed; and any differences between the default risk on the counterparty's financial debt and the counterparty's obligations to the project. The CDA is not a rating, but Standard & Poor’s assessment of the risk a counterparty poses to a project financing takes into account: the credit quality of the counterparty; any credit enhancement; factors that may increase or decrease risk in the context of the credit 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, nor place them on CreditWatch. The CDAs are assigned on a scale ranging from 'aaa' to 'd', which parallels the issuer credit rating (ICR) scale, 'AAA' to 'D'. Standard & Poor's uses lowercase letters for CDAs to indicate their status as a component of a rating rather than as a rating in and of itself. We refine the CDAs by using "+" and "-" signs to graduate the scale in the same way we do for ICRs.
Concession agreement
An agreement between a government entity and a project, whereby the government grants the project the right to build and operate an asset for a specific period of time. The concession agreement may involve a payment from the government entity to the project for providing a service, or it may allow the project the right to capture revenues from third parties for providing a service.

Credit enhancement
Third party support supplied to a project from a contractor that, in this criteria, can be used to cover the cost of replacement of a filed contractor to cover immediate cash costs while other remedies are pursued. The form is normally an unconditional, irrevocable, letter of credit payable on demand.

Credit substitution
Where one party substitutes its credit for that of another(s).

Force majeure (FM)
A set of conditions that excuse a contracted party from meeting its contractual obligations. These conditions are usually events beyond the party's control, are difficult to predict, and can disrupt a project's operations and devastate its cash flow. Typical conditions include: "acts of God", such as defined in each contract (fire, floods, earthquakes, and freezing weather; civil disturbances such as strikes; and government actions such as a change of law).

Joint & several obligation
An obligation of two or more parties for which each party is equally liable for payment.

Liquidated damages (LD)
Amounts defined in contracts that a contractor will pay in the event that an agreed performance requirement has not been met.

LOC
Letter of credit

Offtaker
A party that contractually agrees to take the product of the project under a contract.

PPP
Public-private partnership; also known as a P3 or a private finance initiative (PFI). This type of project usually involves a private entity who is financing, constructing, and operating public sector infrastructure.

Retentions
Amounts held back under a construction contract from amounts payable, and which are used in lieu of providing credit enhancement in some circumstances.

Several obligation
An obligation of two or more parties for which each party is only liable for its respective share of payment.
Sponsor
A party that is developing or financing a project. A sponsor may or may not be an equity participant in the project.

Step-in rights
Lenders or offtaker rights under predetermined circumstances, where lenders or offtakers can step into the shoes of the management to operate the project.

Turnkey construction contract
A type of construction contract in which a contractor agrees to deliver an asset that is ready for use. In addition to the risk of building the project to a budget and schedule the contractor assumes the risk that the plant will perform as designed and agrees to compensate the project for an amount related to the present value of the underperformance for the life of the project. In effect, the contractor needs only to turn over the keys at the end of construction.

RELATED CRITERIA AND RESEARCH

- Expanding The Scope Of Counterparty Criteria To Corporate And Government Ratings, June 21, 2011
- Principles of Credit Ratings, Feb. 16, 2011
- Counterparty And Supporting Obligations Methodology And Assumptions, Dec. 6, 2010
- Understanding Standard & Poor's Rating Definitions, June 3, 2009
- Updated Project Finance Summary Debt Rating Criteria, Sept. 18, 2007
No content (including ratings, credit-related analyses and data, valuations, model, software or other application or output therefrom) or any part thereof (Content) may be modified, reverse engineered, reproduced or distributed in any form by any means, or stored in a database or retrieval system, without the prior written permission of Standard & Poor's Financial Services LLC or its affiliates (collectively, S&P). The Content shall not be used for any unlawful or unauthorized purposes. S&P and any third-party providers, as well as their directors, officers, shareholders, employees or agents (collectively S&P Parties) do not guarantee the accuracy, completeness, timeliness or availability of the Content. S&P Parties are not responsible for any errors or omissions (negligent or otherwise), regardless of the cause, for the results obtained from the use of the Content, or for the security or maintenance of any data input by the user. The Content is provided on an "as is" basis. S&P PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED, OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs or losses caused by negligence) in connection with any use of the Content even if advised of the possibility of such damages.

To the extent that regulatory authorities allow a rating agency to acknowledge in one jurisdiction a rating issued in another jurisdiction for certain regulatory purposes, S&P reserves the right to assign, withdraw, or suspend such acknowledgement at any time and in its sole discretion. S&P Parties disclaim any duty whatsoever arising out of the assignment, withdrawal, or suspension of an acknowledgment as well as any liability for any damage alleged to have been suffered on account thereof.

S&P keeps certain activities of its business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain business units of S&P may have information that is not available to other S&P business units. S&P has established policies and procedures to maintain the confidentiality of certain nonpublic information received in connection with each analytical process.

S&P may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P reserves the right to disseminate its opinions and analyses. S&P's public ratings and analyses are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription) and www.spcapitaliq.com (subscription) and may be distributed through other means, including via S&P publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.
Criteria | Structured Finance | General:

**Counterparty Risk Framework Methodology And Assumptions**

**Primary Contacts:**
Fabienne Michaux, Asia-Pacific, Chief Credit Officer, Melbourne (61) 3-9631-2050; fabienne.michaux@standardandpoors.com
Lapo Guadagnuolo, EMEA, Chief Credit Officer, London (44) 20-7176-3507; lapo_guadagnuolo@standardandpoors.com
Herve-Pierre P Flammier, EMEA Structured Finance Ratings, Criteria Officer, Paris (33) 1-4420-7338; herve-pierreflammier@standardandpoors.com
Claire K Robert, EMEA Structured Finance Ratings, Criteria Officer, Paris (33) 1-4420-6681; claire_robert@standardandpoors.com
Adrian D Techeira, U.S. Structured Finance Ratings, New York (1) 212-438-2103; adrian_techeira@standardandpoors.com

**Secondary Contacts:**
Felix E Herrera, CFA, Structured Finance Ratings, Senior Criteria Officer, New York (1) 212-438-2485; felix_herrera@standardandpoors.com
Lucy A Collett, Chief Credit Officer – Americas, New York (1) 212-438-6627; lucy.collett@standardandpoors.com
Takamasa Yamaoka, Asia-Pacific, Criteria Officer, Tokyo (81) 3-4550-8719; takamasa.yamaoka@standardandpoors.com
Nancy G Chu, U.S. RMBS, Criteria Officer, New York 212-438-2429; nancy.chu@standardandpoors.com
Vera Chaplin, Asia-Pacific Structured Finance Ratings, Melbourne (61) 3-9631-2058; vera.chaplin@standardandpoors.com
Philip A Baggaley, CFA, Corporate Ratings, New York 212-438-7683; philip.baggaley@standardandpoors.com
Ian R Greer, Corporate Ratings, Melbourne (61) 3-9631-2032; ian.greer@standardandpoors.com
David C Lundberg, CFA, Corporate Ratings, New York 212-438-7551; david.lundberg@standardandpoors.com
Belinda Ghetti, Global Structured Credit, Criteria Officer, New York 212-438-1595; belinda.ghetti@standardandpoors.com
Table Of Contents

I. SCOPE OF THE CRITERIA
II. SUMMARY OF THE CRITERIA
III. SUMMARY OF CRITERIA UPDATE
IV. IMPACT ON OUTSTANDING RATINGS
V. EFFECTIVE DATE
VI. METHODOLOGY AND ASSUMPTIONS: GENERAL
   A. Replacement Framework
   B. Minimum Eligible Counterparty Rating
   C. Failing To Implement Remedies
   D. Variant Features
   E. Alternatives To Counterparty Criteria
VII. METHODOLOGY AND ASSUMPTIONS: BANK ACCOUNTS
   A. Definition
   B. Minimum Eligible Counterparty Rating
   C. Replacement Commitment
   D. Remedy Period
   E. Government-Sponsored Deposit Insurance
VIII. METHODOLOGY AND ASSUMPTIONS: INDIRECT SUPPORT OBLIGATIONS
   A. Definition
   B. Minimum Eligible Counterparty Rating
   C. Replacement And Draw-To-Cash Commitment
   D. Remedy Period
   E. Commingling Risk
IX. METHODOLOGY AND ASSUMPTIONS: DIRECT SUPPORT OBLIGATIONS
Criteria | Structured Finance | General:

Counterparty Risk Framework Methodology And Assumptions

(Editor's Note: This criteria article, originally published Nov. 29, 2012, is being republished to update paragraph 3, which discusses the types of transactions to which these criteria apply, and to clarify the criteria for bank accounts relating to corporate and government issues. This article, originally published on May 31, 2012, was republished on Nov. 29, 2012, to make some corrections to the advance rates for certain currencies in Tables 10a, 10b, and 10c. We also updated paragraph 27, which relates to fiduciary accounts, and clarified the criteria relating to bank accounts collateralized by cash in funded synthetic transactions. This article supersedes and partially supersedes the articles listed in Appendix 6, paragraph 132. In addition, it partially supersedes the article titled, "Criteria For Rating Swedish Covered Bonds," published on June 20, 2006. We're republishing this article following our periodic review completed on June 10, 2014.)

1. Standard & Poor's Ratings Services is updating the methodology and assumptions for assessing counterparty and supporting party risk (collectively counterparty risk). This update follows our request for comment (RFC), "Request For Comment: Counterparty And Supporting Obligations Methodology And Assumptions--Expanded Framework," published Nov. 21, 2011. This criteria update addresses the counterparty risk principle described in "Principles Of Credit Ratings," published Feb. 16, 2011.

2. These criteria fully and partially supersede the criteria articles listed in Appendix 6, paragraph 132.

I. SCOPE OF THE CRITERIA

3. These criteria apply to:

- All new and existing structured finance securities. Note that specific aspects of these criteria do not apply to asset-backed commercial paper (ABCP) programs, terminating synthetic transactions, or repackaged securities or securities collateralizing funded synthetic structures (all as outlined in paragraph 4);
- Covered bonds, subject to and in conjunction with "Covered Bonds Counterparty And Supporting Obligations Methodology And Assumptions," published May 31, 2012; and
- Counterparties supporting corporate and government issues that possess structured finance characteristics (e.g., project finance transactions, catastrophe bonds, gas pre-pay financings, stand-alone tax-exempt single- and multifamily housing bonds, equipment trust certificates, municipal pools, industrial development bonds, etc.). However, see paragraph 25 for treatment of bank accounts.

4. These criteria do not apply to:

- Structures involving credit substitution, in which a counterparty is intended to fully support repayment of the supported securities (e.g., fully supporting bond insurance policies, guarantees, letters of credit [LOCs]). Other criteria cover these forms of support.
- Temporary investments or defeasance structures, which are covered by the "Global Investment Criteria For Temporary Investments In Transaction Accounts," and "Methodology And Assumptions: Assigning Ratings To Bonds In The U.S. Based On Escrowed Collateral," both published May 31, 2012.
- Liquidity facilities, programwide credit enhancement, or derivative agreements in ABCP programs. Ratings assigned
to ABCP programs and other securities with short-term ratings are typically linked to the lowest of the ratings assigned to any of the support providers (i.e., the "weak-link" approach; see "Assessing Credit Quality By The Weakest Link," published Feb. 13, 2012). This approach is consistent with the greater focus on liquidity and timeliness associated with our short-term ratings.

- All other aspects of terminating synthetic structures, with the exception of the minimum rating below which the counterparty posts the collateral amount to support full payment of interest and principal when the transaction terminates. The applicable minimum eligible counterparty ratings are set out in table 4, under replacement option 1 without collateral. Terminating synthetic structures, typically synthetic collateralized debt obligations (CDOs), are structures that usually require a termination event and consequently a mandatory redemption of the notes if a supporting counterparty were to default. Therefore, these structures typically do not incorporate a replacement framework for when the rating on a supporting counterparty falls below a certain minimum rating level. The specific criteria relating to amounts that need to be posted, legal opinions, and other relevant criteria (in particular for CDOs) are outlined in "CDO Spotlight: Counterparty Risk In Structured Finance Transactions," published March 7, 2005.

- The securities collateralizing funded synthetic structures and repackaged securities (these are rated using the "weak-link" approach; see "Assessing Credit Quality By The Weakest Link," published Feb. 13, 2012). Furthermore, swaps in repackaged securities where the counterparty is covering more than interest rate or currency risk (i.e., the swap has elements of yield support, credit, or market value risk, e.g., the collateral is insufficient to meet all expenses of the special-purpose entity (SPE) and all timely payments of interest and principal) are also rated using the "weak-link" approach.

II. SUMMARY OF THE CRITERIA

5. The fundamental premise of Standard & Poor’s counterparty criteria is the replacement of a counterparty when the rating on the counterparty falls below a minimum eligible rating. Based on this view, we can rate a supported security higher than the rating on the counterparty because exposure to a counterparty whose rating becomes ineligible is expected to be for a limited period of time. Without the incorporation of replacement mechanisms or equivalent remedies in the terms of the agreement with the counterparty, and if there are no other mitigating factors, the rating on the supported security would generally be no higher than the issuer credit rating (ICR) on the counterparty.

6. These criteria classify counterparty obligations into four categories: Bank accounts (part VII), indirect support obligations (part VIII), direct support obligations (part IX), and derivatives (part X). Criteria are set out under each of these four categories, including the relevant minimum eligible counterparty ratings, replacement commitments, remedy periods, and collateral requirements (if applicable) that apply to these obligations.

7. Certain obligations may have characteristics that fit the definition of more than one category of counterparty obligation. Where this is the case, the obligation is treated as a direct support obligation (part IX), unless the obligation fully meets the requirements of one of the other categories as outlined in parts VII, VIII, or X. (See table 14 in Appendix 5 for comparative minimum eligible counterparty ratings for nonderivative exposures and table 4 for minimum eligible counterparty ratings for derivatives by replacement option).

8. These criteria establish a link between a rating on a supported security and the minimum eligible counterparty rating for a specific counterparty obligation. See chart 1 for a summary of the framework. In determining the minimum
eligible counterparty rating with respect to a counterparty obligation, these criteria consider:

- The category and nature of the counterparty's obligation and its impact on the credit performance of supported securities;
- An obligation's structural features such as the commitment to replace or remedy, and termination provisions; and
- Economic incentives, such as the commitment to post collateral in a derivative obligation, that would increase the likelihood of a counterparty replacing itself.

9. If a rating on a counterparty falls below the minimum eligible counterparty rating for a specific obligation and the downgrade is not remedied, the ratings on supported securities will likely be lowered.

III. SUMMARY OF CRITERIA UPDATE

10. For a summary of how these criteria differ from "the Dec. 6, 2010 framework" (as defined in Appendix 6, paragraph 121), and the RFC ("Request For Comment: Counterparty And Supporting Obligations Methodology And Assumptions--Expanded Framework") published Nov. 21, 2011, see Appendix 6.
IV. IMPACT ON OUTSTANDING RATINGS

11. We expect limited impact on outstanding ratings, with the following exceptions:

- Ratings on funded synthetic transactions with instruments and associated counterparty obligations (including collateral) that support all, or substantially all, of principal repayment (e.g., including those structures that use guaranteed investment contracts [GICs], repurchase agreements, and total return swaps) may be lowered. The minimum eligible counterparty rating for these transactions is now no lower than one notch below the rating on the supported security (e.g., for 'AAA' rated notes, the minimum eligible counterparty rating increases to 'AA+' from 'AA').
- Ratings on supported securities with certain bank accounts that these criteria reclassify may be raised. The minimum eligible counterparty rating for these bank accounts has been lowered (e.g., for 'AAA' rated notes, the minimum account provider rating decreases to 'A' from 'AA'). Further, the clarification of the treatment of deposit insured accounts may lead to the raising of a small number of ratings on Japanese structured finance securities.

V. EFFECTIVE DATE

12. These criteria are effective immediately and apply to all new and outstanding ratings within scope.

VI. METHODOLOGY AND ASSUMPTIONS: GENERAL

13. Counterparty risk is an important consideration in assessing the credit risk of structured finance and certain other securities. Cash received or collected from the underlying assets is typically deposited with or held by counterparties pending interest payment dates, and interruptions to accessing that cash may impede the issuer's ability to meet its payment obligations to supported securities in full or on time. Moreover, a variety of agreements may be entered into between the issuer and counterparties to enhance or otherwise transform the nature or timing of cash flows received from the underlying assets. A counterparty's failure to perform its obligations may lead to a downgrade of, or even payment default on, supported securities, notwithstanding the performance of the underlying assets.

A. Replacement Framework

14. The foundation of the counterparty criteria is the replacement of a counterparty when its creditworthiness deteriorates. A replacement framework is based on the replacement, or equivalent remedy, of a downgraded counterparty with another counterparty, whose rating would support the same rating on the security prior to the original counterparty's downgrade below its minimum eligible counterparty rating. If there are no other mitigating factors, the rating on a supported security would typically be no higher than the counterparty's ICR. These criteria assess a counterparty and its support obligation by considering, among other things, the nature of the obligation, the minimum eligible counterparty rating for replacement or other equivalent remedies, the commitment to remedy a breach of the minimum eligible rating, the remedy period, the issuer's rights, and—specifically for derivatives—the types of collateral that can be posted and the required collateral amount.
15. Given the bespoke nature of some counterparty obligations, even with a replacement framework in place, it is possible that a counterparty may not be able to replace itself when the need arises. If there are no other mitigating factors, and replacement has not occurred at all, we may lower the rating on the supported securities to the counterparty's ICR. Furthermore, if a counterparty is replaced but the rating on the replacement counterparty, or the terms in any new support documents, do not support the same rating on the security that existed before the replacement, then the rating on the supported security may be raised or lowered in accordance with these criteria.

B. Minimum Eligible Counterparty Rating

16. The minimum eligible counterparty rating is the rating level below which a counterparty commits (in the documentation) to replace itself and, in part, it determines the maximum potential rating on the supported securities. Once a counterparty is rated below the minimum eligible counterparty rating, it is considered ineligible for purposes of these criteria and its replacement commitment applies.

17. If a supported security has multiple rated tranches, then the minimum eligible counterparty rating is usually based on the most highly-rated tranche that benefits from the counterparty obligation.

18. The minimum eligible counterparty rating is expressed using the long-term ICR on the counterparty, or other applicable rating. These criteria apply only where the counterparty has a Standard & Poor's credit rating, either public or nonpublic (private or confidential). Counterparty ratings with a 'pi' suffix (i.e., "public information") are not eligible, nor are other types of opinions such as credit estimates and credit assessments. Where the counterparty does not have an applicable rating, we assess whether other mitigating factors (e.g., additional credit enhancement) address exposure to the counterparty.

19. For purposes of inferring a long-term minimum eligible rating for entities that have only short-term ratings, or in transactions where only short-term ratings on the counterparty are referenced, the following apply:

- 'A-1+' corresponds to 'AA-'.
- 'A-1' corresponds to 'A' for financial institutions, and 'A-' for all other entities.
- 'A-2' corresponds to 'BBB'.
- 'A-3' corresponds to 'BBB-'.
- To meet the minimum eligible rating of 'A', the entity should also have a short-term rating of 'A-1'.
- To meet the minimum eligible rating of 'BBB', the entity should also have a short-term rating of 'A-2'.

C. Failing To Implement Remedies

20. If a counterparty fails to perform or implement replacement remedies relating to a supported security, then ratings may be lowered on other supported securities with similar obligations from the same counterparty.

D. Variant Features

21. Appendix 3 summarizes the rating approach where counterparty obligations are documented in line with previous
versions of Standard & Poor's counterparty criteria (but do not fully meet the current criteria). In most instances, each variation results in a notching down of the maximum potential rating that can be assigned on the supported security by up to three notches, depending on the feature (see table 11). The adjustments are cumulative for multiple variant features, subject to a floor of the counterparty's ICR plus one notch for any supported security that contains a replacement provision that is in line with previous versions of Standard & Poor's counterparty criteria. This approach is taken to appropriately reflect the relative creditworthiness of securities that benefit from some form of replacement framework, compared with those that do not. Furthermore, for variants in derivative agreements, higher volatility buffers (see paragraph 114) and additional collateral amounts (see table 12) may apply.

E. Alternatives To Counterparty Criteria

22. Instead of these criteria:

- The counterparty may pledge collateral at issuance in an amount projected to fully cover the counterparty's payment obligations for the life of the supported security. In this case, the analytical considerations shift to the issuer's timely ability to access and liquidate the posted collateral under a market value liquidation framework (and include an assessment of the legal enforceability of the collateral in the appropriate jurisdiction).
- Counterparty risk may be adequately mitigated by available credit enhancement within a transaction. For instance, credit enhancement may accumulate, while at the same time reliance on the counterparty may diminish. In this case, appropriate rating stresses are applied to project whether available credit enhancement will be sufficient to cover both asset credit risk and counterparty risk.
- Multiple counterparties may wish to jointly and fully support each other's obligations, in which case Standard & Poor's joint support criteria may apply (see "Joint-Support Criteria Update," published April 22, 2009).
- The rating on a supported security may be constrained by the lowest-rated counterparty (see "Assessing Credit Quality By The Weakest Link," published Feb. 13, 2012).

23. The remainder of this article focuses on the replacement framework and is set out under each of the four categories of counterparty obligation.

VII. METHODOLOGY AND ASSUMPTIONS: BANK ACCOUNTS

A. Definition

24. Bank account is a generic term and, for the purposes of these criteria, may include bank accounts holding cash or securities. Examples include reserve accounts, collection accounts, and payment accounts. These criteria apply to the financial institution providing the account. While there is no limit to the exposure amount in such accounts, the minimum eligible ratings differ depending on the nature of the exposure and the exposure amount (see paragraph 26).

25. For the purposes of applying these criteria, this category does not include:

- Securities in such accounts that are within the scope of the "Global Investment Criteria For Temporary Investments In Transaction Accounts," published May 31, 2012.
- Accounts in defeasance structures that are within the scope of the "Methodology And Assumptions: Assigning
Bank accounts holding cash collateral in funded synthetic transactions, which are treated as direct support obligations (see paragraph 59).

Section VII, "Bank Accounts," will not apply to corporate and government issues (e.g., stand-alone tax-exempt single- and multifamily housing bonds, municipal pools, industrial development bonds, etc.) that do not have a special-purpose vehicle as part of their structure. We believe that these issuers or obligors have active management and are not constrained in their management as in the case of a structured finance special-purpose vehicle. This reflects our belief that the management teams of these issuers or obligors have the ability to make decisions to mitigate the credit risk associated with the bank account provider.

B. Minimum Eligible Counterparty Rating

26. The minimum eligible counterparty ratings in table 1 apply to bank account providers and depend on whether the expected exposure amount is considered to be "limited" or "minimal". They are considered to be "limited" unless they are considered to be "minimal". To qualify for treatment as "minimal", the aggregated exposure to the counterparty is expected to be small (e.g., typically no more than 5% of the original pool balance or, for revolving structures and programs with ongoing issuance, the higher of the original and current pool balances), and the analysis should show that either:

- The impact of a counterparty's failure to perform is not likely to cause a direct disruption of payments on the rated security during the replacement period; or
- An adverse impact on the supported security would only be likely to result from the occurrence of multiple events.

Table 1

<table>
<thead>
<tr>
<th>Maximum potential rating on supported security</th>
<th>Bank account (limited)</th>
<th>Bank account (minimal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>A</td>
<td>BBB</td>
</tr>
<tr>
<td>AA+</td>
<td>A</td>
<td>BBB</td>
</tr>
<tr>
<td>AA</td>
<td>A-</td>
<td>BBB</td>
</tr>
<tr>
<td>AA-</td>
<td>A-</td>
<td>BBB</td>
</tr>
<tr>
<td>A+</td>
<td>BBB+</td>
<td>BBB-</td>
</tr>
<tr>
<td>A</td>
<td>BBB</td>
<td>BBB-</td>
</tr>
<tr>
<td>A-</td>
<td>BBB-</td>
<td>BB+</td>
</tr>
<tr>
<td>BBB+</td>
<td>BBB-</td>
<td>BB</td>
</tr>
<tr>
<td>BBB</td>
<td>Security rating</td>
<td>BB</td>
</tr>
<tr>
<td>BB+</td>
<td>Security rating</td>
<td>BB</td>
</tr>
<tr>
<td>BB and below</td>
<td>Security rating</td>
<td>Security rating</td>
</tr>
</tbody>
</table>

1. For purposes of inferring a long-term minimum eligible rating for entities that have only short-term ratings, or in transactions where only short-term ratings on the counterparty are referenced, the following apply:
   - 'A-1+' corresponds to 'AA-'.
   - 'A-1' corresponds to 'A' for financial institutions, and 'A-' for all other entities.
   - 'A-2' corresponds to 'BBB'.

WWW.STANDARDANDPOORS.COM/RATINGSDIRECT | JUNE 25, 2013
Table 1

<table>
<thead>
<tr>
<th>Minimum Eligible Counterparty Ratings For Bank Account Providers (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>o ‘A-3’ corresponds to ‘BBB-’</td>
</tr>
<tr>
<td>2. To meet the minimum eligible rating of ‘A’, the entity should also have a short-term rating of ‘A-1’.</td>
</tr>
<tr>
<td>3. To meet the minimum eligible rating of ‘BBB’, the entity should also have a short-term rating of ‘A-2’.</td>
</tr>
<tr>
<td>ICR—Issuer credit rating.</td>
</tr>
</tbody>
</table>

27. In certain circumstances, these criteria contemplate exceptions to the minimum eligible counterparty rating or replacement commitment in relation to certain bank accounts. For instance, trust or custodial institutions may be subject to laws and regulations that isolate the accounts from the insolvency risk of the institution (although in most jurisdictions this applies to securities rather than cash). In the case of the U.S., U.K., Argentina, Japan, and Mexico, we believe applicable laws and regulations provide that securities held in true corporate trust, custody, or other fiduciary accounts are sufficiently isolated from the insolvency risk of the institution (usually a bank) that provides such an account. For the avoidance of doubt, the temporary investments criteria and minimum eligible ratings in those temporary investments criteria would still apply to the securities held in such an account, and if such institution places cash in a deposit account at the institution or with another deposit taking institution, the minimum eligible counterparty rating applies to that institution, unless mitigating factors apply. For example, in our view, a mitigating factor exists in the U.S. if the account provider is acting in a fiduciary capacity and the account is governed by Title 12 section 9.10(b) of the U.S. Code of Federal Regulations (Title 12 Regulations) or a similar U.S. state law. Title 12 Regulations require that collateral be set aside to protect account beneficiaries with respect to fiduciary funds held in a deposit account.

C. Replacement Commitment

28. A bank account provider that commits to replace itself with an eligible counterparty or to obtain an appropriately rated guarantor within the remedy period is consistent with a supported security achieving the maximum potential rating. If the commitment to replace the bank account provider rests with the issuer or trustee (rather than the bank account provider), the issuer or trustee taking "reasonable efforts" to replace the bank account provider with an eligible counterparty or obtain an appropriately rated guarantor within the remedy period is consistent with the supported security achieving the maximum potential rating.

D. Remedy Period

29. From the date that the rating on a counterparty is lowered below the minimum eligible counterparty rating, there is a remedy period that is consistent with a supported security achieving the maximum potential rating. These remedy periods are:

- For "limited" exposure bank accounts: 60 calendar days; and
- For "minimal" exposure bank accounts: 30 calendar days.

30. The remedy period may be extended for up to an additional 30 calendar days if the counterparty provides the trustee and Standard & Poor's with a written action plan before the initial remedy period expires. The plan should describe the
steps the counterparty has taken, and will take, to remedy the downgrade within the extended remedy period. The plan may include draft documentation or a letter of intent from the replacement counterparty.

31. The exercise of a remedy action should not result in any losses on the supported security (e.g., losses related to negative carry or the issuer bearing any unaccounted for costs).

E. Government-Sponsored Deposit Insurance

32. For deposits that are insured by a government sponsor, the minimum eligible counterparty rating applies to the insurer, rather than the depository institution where we believe:

- Payments from the deposit insurer will be timely; or
- If timely payment is not certain, a delay in payment is unlikely to result in a default on the supported security.

33. The applicable minimum eligible counterparty rating as set out in table 1 is determined by applying the conditions as described in paragraph 26.

34. For government-sponsored deposit insurance, a replacement mechanism is not required for achieving the maximum potential rating on the supported security, for the following reasons:

- In effect, the deposit insurer is an already committed replacement counterparty;
- Both the primary institution and deposit insurer must default before the supported security will be directly affected; and
- If the rating on the sovereign is lowered, it is likely that all ratings within that jurisdiction will trend lower, reflecting the relevant country risk factors.

35. Depending on the nature, amount, and/or timeliness of the deposit insurance, these criteria may treat the benefit as an indirect or direct support obligation. For instance, it may mitigate commingling risk, as is the case for certain RMBS schemes originated by Japanese deposit taking institutions (see paragraph 48). Similarly, it may inform our analysis and sizing of deposit set-off risk where a depositor insurance scheme applies.

36. Examples of deposit insurance provided by government-sponsored entities include the Financial Deposit Insurance Corp. (FDIC) in the U.S., the Deposit Insurance Corp. of Japan (DIC), and the Financial Services Compensation Scheme (FSCS) in the U.K.

VIII. METHODOLOGY AND ASSUMPTIONS: INDIRECT SUPPORT OBLIGATIONS

A. Definition

37. Indirect support obligations are obligations that meet the conditions set out in paragraph 38. They may include originator set-off and commingling risk, servicer and trustee advances, and liquidity reserves and liquidity facilities that function akin to servicer advances.
38. To qualify for treatment as an indirect support obligation under these criteria, (i) the aggregated exposure to the counterparty is expected to be small (e.g., typically no more than 5% of the original pool balance or, for revolving structures and programs with ongoing issuance, the higher of the original and current pool balances); (ii) the replacement period is up to 30 calendar days; and (iii) the analysis should show that either:

- The impact of a counterparty's failure to perform is not likely to cause a direct disruption of payments on the supported security during the replacement period; or
- An adverse impact on the supported security would only be likely to result from the occurrence of multiple events.

39. If the conditions in paragraph 38 are not satisfied, these criteria treat the exposure as a direct support obligation and part IX applies.

B. Minimum Eligible Counterparty Rating

40. The minimum eligible counterparty ratings in table 2a apply to exposures that for purposes of these criteria meet the definition of an indirect support obligation.

### Table 2a

<table>
<thead>
<tr>
<th>Maximum potential rating on supported security</th>
<th>Minimum eligible counterparty rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>BBB</td>
</tr>
<tr>
<td>AA+</td>
<td>BBB</td>
</tr>
<tr>
<td>AA</td>
<td>BBB</td>
</tr>
<tr>
<td>AA-</td>
<td>BBB-</td>
</tr>
<tr>
<td>A+</td>
<td>BBB-</td>
</tr>
<tr>
<td>A</td>
<td>BBB-</td>
</tr>
<tr>
<td>A-</td>
<td>BB+</td>
</tr>
<tr>
<td>BBB+</td>
<td>BB+</td>
</tr>
<tr>
<td>BBB</td>
<td>BB</td>
</tr>
<tr>
<td>BBB-</td>
<td>BB</td>
</tr>
<tr>
<td>BB+</td>
<td>BB</td>
</tr>
<tr>
<td>BB and below</td>
<td>Security rating</td>
</tr>
</tbody>
</table>

1. For purposes of inferring a long-term minimum eligible rating for entities that have only short-term ratings, or in transactions where only short-term ratings on the counterparty are referenced, the following apply:
   - ‘A-1+’ corresponds to ‘AA-’.
   - ‘A-1’ corresponds to ‘A’ for financial institutions, and ‘A’- for all other entities.
   - ‘A-2’ corresponds to ‘BBB’.
   - ‘A-3’ corresponds to ‘BBB-’.

2. To meet the minimum eligible rating of ‘A’, the entity should also have a short-term rating of ‘A-1’.

3. To meet the minimum eligible rating of ‘BBB’, the entity should also have a short-term rating of ‘A-2’.

ICR–Issuer credit rating.
C. Replacement And Draw-To-Cash Commitment

41. An indirect support counterparty that commits to, within the remedy period, replace itself with an eligible counterparty, obtain an appropriately rated guarantor, or fund a reserve for the counterparty's obligation, if the rating on that indirect support counterparty falls below the minimum eligible counterparty rating, is consistent with the supported security achieving the maximum potential rating.

42. For those indirect support counterparty obligations that are structured with draw-to-cash provisions (e.g., liquidity facilities), we consider that the combination of a counterparty's commitment to undertake "commercially reasonable efforts to replace" (according to the documents) and, if the counterparty fails to replace itself or apply other appropriate remedies within the remedy period, a commitment to draw-to-cash, is generally equivalent to a replacement framework. Cash draws are subject to bankruptcy-remoteness analysis, and the criteria for bank accounts (part VII) apply to the related bank account. For the avoidance of doubt, these criteria do not require the counterparty to replace itself once an indirect support obligation is drawn-to-cash.

D. Remedy Period

43. A remedy period of 30 calendar days from the date that the rating on the counterparty is lowered below the minimum eligible counterparty rating is consistent with the supported security achieving the maximum potential rating.

44. The remedy period may be extended for up to an additional 30 calendar days if the counterparty provides the trustee and Standard & Poor's with a written action plan before the initial remedy period expires. The plan should describe the steps the counterparty has taken, and will take, to remedy the downgrade within the extended remedy period. The plan may include draft documentation or a letter of intent from the replacement counterparty.

45. The exercise of a remedy action should not result in any losses on the supported security (e.g., losses related to negative carry or the issuer bearing any unaccounted for costs).

E. Commingling Risk

46. Investors may be exposed to payment delays (liquidity risk) or losses (credit risk) if remittances from the underlying assets in a structured finance transaction are collected into a servicer account and the servicer becomes the subject of insolvency proceedings, i.e., commingling risk. These criteria consider the rating on the servicer, the amount of funds likely to be held in a servicer account at any given time, and the potential impact of a delay in receipt of those funds on supported securities. To be consistent with these criteria, the servicer should pay to the SPE collection account any collections that the SPE is entitled to receive, in time for the issuer to make payments on supported securities on each payment date.

1. Mitigating commingling risk based on a minimum eligible servicer rating

47. To address commingling risk, structured finance transactions may apply eligibility standards based on the rating on the servicer. The minimum eligible servicer ratings in table 2b consider the amount of commingled collections held by the
servicer at any given time. Based on the amount of commingled collections, these criteria treat the exposure as "limited" unless it qualifies for treatment as "minimal". To qualify for treatment as "minimal", the aggregated exposure to the commingled funds is expected to be small (e.g., typically no more than 5% of the original pool balance or, for revolving structures and programs with ongoing issuance, the higher of the original and current pool balances), and the analysis should show that either:

- The impact of a servicer insolvency on the commingled funds is not likely to cause a direct disruption of payments on the rated security during the replacement period; or
- An adverse impact on the supported security would only be likely to result from the occurrence of multiple events.

### Table 2b

<table>
<thead>
<tr>
<th>Maximum potential rating on supported security</th>
<th>Commingling risk (limited)</th>
<th>Commingling risk (minimal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>A</td>
<td>BBB</td>
</tr>
<tr>
<td>AA+</td>
<td>A</td>
<td>BBB</td>
</tr>
<tr>
<td>AA</td>
<td>A-</td>
<td>BBB</td>
</tr>
<tr>
<td>AA-</td>
<td>A-</td>
<td>BBB-</td>
</tr>
<tr>
<td>A+</td>
<td>BBB+</td>
<td>BBB-</td>
</tr>
<tr>
<td>A</td>
<td>BBB</td>
<td>BB+</td>
</tr>
<tr>
<td>A-</td>
<td>BBB-</td>
<td>BB+</td>
</tr>
<tr>
<td>BBB+</td>
<td>Security rating</td>
<td>BB</td>
</tr>
<tr>
<td>BBB</td>
<td>BBB-</td>
<td>BB</td>
</tr>
<tr>
<td>BBB-</td>
<td>Security rating</td>
<td>Security rating</td>
</tr>
<tr>
<td>BB and below</td>
<td>Security rating</td>
<td>Security rating</td>
</tr>
</tbody>
</table>

1. For purposes of inferring a long-term minimum eligible rating for entities that have only short-term ratings, or in transactions where only short-term ratings on the counterparty are referenced, the following apply:
   - 'A-1+' corresponds to 'AA-'.
   - 'A-1' corresponds to 'A' for financial institutions, and 'A-' for all other entities.
   - 'A-2' corresponds to 'BBB'.
   - 'A-3' corresponds to 'BBB-'.
2. To meet the minimum eligible rating of 'A', the entity should also have a short-term rating of 'A-1'.
3. To meet the minimum eligible rating of 'BBB', the entity should also have a short-term rating of 'A-2'.

Where the commingling risk is covered by a government-sponsored deposit insurer, as is the case with certain RMBS schemes originated and serviced by Japanese deposit-taking institutions, the relevant minimum eligible counterparty rating applies to the higher of the deposit insurance institution and the deposit-taking institution's ICR (see "Updated Criteria For Deposit Insurance For Commingling Risk In Japan RMBS Deals", published Dec. 6, 2010). The condition set out in paragraph 34 applies here (superseding paragraph 13 of the Dec. 6, 2010 criteria above), meaning that a replacement mechanism is not a prerequisite for achieving the maximum potential rating on Japanese RMBS.
2. Remedy period

49. From the date that the rating on a servicer is lowered below the minimum eligible servicer rating, there is a remedy period that is consistent with a supported security achieving the maximum potential rating. These remedy periods are:

- For "limited" exposures: 60 calendar days; and
- For "minimal" exposures: 30 calendar days.

3. Remedies and alternative methods to address commingling risk

50. Remedies, if the rating on the servicer falls below the minimum eligible servicer rating, or alternative methods of addressing commingling risk include such structural risk mitigants as:

- For unrated servicers (or servicers whose rating is or falls below the minimum eligible servicer rating), the deposit of all collections that the SPE is entitled to receive into a deposit account with an eligible counterparty that is in the name of the SPE, within two business days of receipt. Both the potential exposure amount and potential impact on the supported security are considered in determining whether this two-day exposure period is consistent with the rating on the supported security, without the benefit of additional risk mitigants.
- Cash reserves.
- Additional credit enhancement.
- A liquidity facility to cover potential payment delays.
- Payments being made directly into a deposit account in the name of the SPE and held with an eligible counterparty. Payments being made into a lockbox account (to which the servicer's access is appropriately limited), and then being transferred to a deposit account in the name of the SPE and held with an eligible counterparty.

51. When assessing the effectiveness of the risk mitigants listed in paragraph 50, the governing legal jurisdiction is considered.

IX. METHODOLOGY AND ASSUMPTIONS: DIRECT SUPPORT OBLIGATIONS

A. Definition

52. Counterparty obligations that provide liquidity or partial credit support to a security are direct support obligations if they do not fit the definitions for bank accounts (see paragraph 24), indirect support obligations (see paragraph 37), or derivatives (see paragraph 65). For purposes of these criteria, the following examples are direct support obligations only if they partially support repayment of the supported securities: LOCs, GICs, guarantees, repurchase agreements, liquidity facilities, total return swaps, and put options held by the SPE.

53. Direct support obligations may form all or part of the credit enhancement provided to a supported security, provided they cannot be the sole source of repayment for the supported security, as in a credit substitution.

54. In addition, bank accounts holding cash collateral in funded synthetic transactions are also treated as direct support obligations under these criteria (see paragraph 25), as are obligations of funded synthetic transaction counterparties that provide functional equivalents (see paragraph 59).

55. Certain obligations may have characteristics that fit the definition of more than one category of counterparty
obligation. Where this is the case, the obligation is treated as a direct support obligation, unless the obligation fully meets the requirements of one of the other categories as outlined in parts VII, VIII, or X.

B. Minimum Eligible Counterparty Rating

56. The nature of the direct support obligation determines the applicable minimum eligible counterparty rating. There are three subcategories of direct support obligations:

- Obligations of funded synthetic transaction counterparties that provide bank accounts collateralized by cash and certain derivative or other obligations in those transactions, as specified in paragraph 59;
- Direct substantial support obligations; and
- Direct limited support obligations.

57. The more significant the exposure to, and the greater the reliance of the supported security on, the counterparty, the higher the minimum eligible counterparty rating (see table 3). Direct substantial support obligations are defined as obligations that exceed an exposure period of 365 days, with an average exposure amount exceeding 5% of the original pool balance (or for revolving programs or programs with ongoing issuance, the higher of the original and current pool balances). Direct limited support obligations are defined as obligations that do not satisfy all conditions for direct substantial support obligations or indirect support obligations. In classifying a counterparty's support as direct substantial or direct limited support, the security's exposure to that counterparty is aggregated if the counterparty provides multiple forms of support. In addition, the exposures are expected to be continuous, so the classification disregards temporary or one-off peaks that do not reflect the ongoing exposure to a counterparty.

58. These criteria define the exposure period for purposes of categorizing direct support obligations as the shorter of (i) the term of the obligation, and (ii) the period the rating relies on the support.

59. Providers of bank accounts collateralized by cash and certain derivative or other counterparties in funded synthetic transactions, whose support obligations include investment agreements, repurchase agreements, or functional equivalents, are subject to (regardless of the exposure period) a minimum eligible counterparty rating that is no lower than one notch below the rating on the supported security, reflecting the significant interrelationships with and exposures to the counterparty (see table 3).

Table 3

<table>
<thead>
<tr>
<th>Maximum potential rating on supported security</th>
<th>Minimum eligible counterparty rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funded synthetic structure</td>
<td>Direct support obligation (substantial)</td>
</tr>
<tr>
<td>AAA</td>
<td>AA+</td>
</tr>
<tr>
<td>AA+</td>
<td>AA</td>
</tr>
<tr>
<td>AA</td>
<td>AA-</td>
</tr>
<tr>
<td>AA-</td>
<td>Security rating</td>
</tr>
<tr>
<td>A+</td>
<td>Security rating</td>
</tr>
<tr>
<td>A</td>
<td>Security rating</td>
</tr>
<tr>
<td>A-</td>
<td>Security rating</td>
</tr>
<tr>
<td>Security rating</td>
<td>Security rating</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>BBB+</td>
<td>Security rating</td>
</tr>
<tr>
<td>BBB</td>
<td>Security rating</td>
</tr>
<tr>
<td>BBB- and below</td>
<td>Security rating</td>
</tr>
</tbody>
</table>

1. For purposes of inferring a long-term minimum eligible rating for entities that have only short-term ratings, or in transactions where only short-term ratings on the counterparty are referenced, the following apply:
   - ‘A-1+’ corresponds to ‘AA-‘.
   - ‘A-1’ corresponds to ‘A’ for financial institutions, and ‘A-‘ for all other entities.
   - ‘A-2’ corresponds to ‘BBB’.
   - ‘A-3’ corresponds to ‘BBB-‘.

2. To meet the minimum eligible rating of ‘A’, the entity should also have a short-term rating of ‘A-1’.
3. To meet the minimum eligible rating of ‘BBB’, the entity should also have a short-term rating of ‘A-2’.

ICR--Issuer credit rating.

### C. Replacement And Draw-To-Cash Commitment

60. A direct support counterparty that commits to, within the remedy period, replace itself with an eligible counterparty, obtain an appropriately rated guarantor or pre-fund/draw-to-cash the obligation, if the rating on that direct support counterparty falls below the minimum eligible counterparty rating, is consistent with the supported security achieving the maximum potential rating.

61. For those direct support counterparty obligations that are structured with draw-to-cash provisions (e.g., liquidity facilities), we consider that the combination of a counterparty's commitment to undertake "commercially reasonable efforts to replace" (according to the documents) and, if the counterparty fails to replace itself or apply other appropriate remedies within the remedy period, a commitment to draw-to-cash, is generally equivalent to a replacement framework. Cash draws are subject to bankruptcy-remoteness analysis, and the criteria for bank accounts (part VII) apply to the related bank account. For the avoidance of doubt, these criteria do not require the counterparty to replace itself once a direct support obligation is drawn-to-cash.

### D. Remedy Period

62. A remedy period of 60 calendar days from the date that the rating on the counterparty is lowered below the minimum eligible counterparty rating is consistent with the supported security achieving the maximum potential rating.

63. The remedy period may be extended for up to an additional 30 calendar days if the counterparty provides the trustee and Standard & Poor's with a written action plan before the initial remedy period expires. The plan should describe the steps the counterparty has taken, and will take, to remedy the downgrade within the extended remedy period. The plan may include draft documentation or a letter of intent from the replacement counterparty.

64. The exercise of a remedy action should not result in any losses on the supported security (e.g., losses related to negative carry or the issuer bearing any unaccounted for costs).
X. METHODOLOGY AND ASSUMPTIONS: DERIVATIVES

A. Definition

65. Derivatives, for the purposes of these criteria, include counterparty obligations governed by the International Swaps and Derivatives Association Inc.’s (ISDA) standard swap agreement framework, or a similar appropriate document.

66. Currency, interest rate, and basis swaps, as well as caps and floors are all examples of obligations that would typically be treated as derivatives for purposes of these criteria.

67. For purposes of these criteria, the definition of derivatives excludes repurchase agreements and total return swap agreements that cover, among other risks, market value exposures. These criteria treat these repurchase and total return swap agreements as direct support obligations.

B. Minimum Eligible Counterparty Ratings And Collateral Amounts

68. These criteria outline four options (replacement options 1 to 4) that combine the minimum eligible counterparty ratings, collateral amounts, and remedy periods to support the same maximum potential rating (see table 4). These criteria consider that similar credit quality (and hence similar maximum potential ratings) may be achieved through balancing the minimum eligible counterparty rating and the collateral amount, where lower minimum eligible counterparty ratings result in higher collateral amounts. The replacement collateral amounts for the four options range from the highest level of collateral in option 1 to no collateral in option 4. (See chart 2 in Appendix 1 for a relative comparison.) These criteria consider that the commitment to replace at a higher rating level balances the need for collateral as an incentive to replace, because the security rating is closer to the counterparty’s ICR.

69. The purpose of posting collateral, including the volatility buffer, is to increase the likelihood that the counterparty will be replaced by covering the derivative’s replacement cost and providing an economic incentive for an ineligible counterparty to replace itself.

Table 4

<table>
<thead>
<tr>
<th>Minimum Eligible Counterparty Ratings For Derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum potential rating on supported security</strong></td>
</tr>
<tr>
<td>AAA</td>
</tr>
<tr>
<td>AA+</td>
</tr>
<tr>
<td>AA</td>
</tr>
<tr>
<td>AA-</td>
</tr>
<tr>
<td>A+</td>
</tr>
</tbody>
</table>
### Table 4
Minimum Eligible Counterparty Ratings For Derivatives (cont.)

<table>
<thead>
<tr>
<th>Security rating</th>
<th>A-</th>
<th>BBB-</th>
<th>BBB</th>
<th>BBB+</th>
<th>BBB+</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>BBB</td>
<td>BBB-</td>
<td>BBB+</td>
<td>BBB</td>
<td>BBB+</td>
</tr>
<tr>
<td>A-</td>
<td>BBB</td>
<td>BBB-</td>
<td>BBB+</td>
<td>BBB</td>
<td>BBB+</td>
</tr>
<tr>
<td>BBB+</td>
<td>BBB</td>
<td>BBB-</td>
<td>BBB+</td>
<td>BBB</td>
<td>BBB+</td>
</tr>
<tr>
<td>BBB-</td>
<td>BBB</td>
<td>BBB-</td>
<td>BBB+</td>
<td>BBB</td>
<td>BBB+</td>
</tr>
<tr>
<td>Collateral amount BEFORE replacement trigger (see note 1)</td>
<td>N/A</td>
<td>MTM + Option 1 VB</td>
<td>N/A</td>
<td>MTM x 1.25</td>
<td>N/A</td>
</tr>
<tr>
<td>Collateral amount AFTER replacement trigger (see note 1)</td>
<td>N/A</td>
<td>MTM + Option 1 VB</td>
<td>Not applicable</td>
<td>Higher of: (i) MTM + Option 2 VB, or (ii) MTM x 1.3</td>
<td>MTM x 1.25</td>
</tr>
<tr>
<td>Remedy period</td>
<td>10 business days</td>
<td>60 calendar days</td>
<td>10 business days</td>
<td>60 calendar days</td>
<td>60 calendar days</td>
</tr>
</tbody>
</table>

1. A derivative counterparty agrees to replace itself when its rating falls below the minimum eligible counterparty rating with collateral for options 1 and 2, and the minimum eligible counterparty rating for options 3 and 4.

2. MTM means the "mark-to-market" value of a derivative contract.

3. VB means "volatility buffer", as specified in Appendix 1.

4. For purposes of inferring a long-term minimum eligible rating for entities that have only short-term ratings, or in transactions where only short-term ratings on the counterparty are referenced, the following apply:
   - 'A-1+' corresponds to 'AA-'.
   - 'A-1' corresponds to 'A' for financial institutions, and 'A-' for all other entities.
   - 'A-2' corresponds to 'BBB'.
   - 'A-3' corresponds to 'BBB-'.

5. To meet the minimum eligible rating of 'A-', the entity should also have a short-term rating of 'A-1'.

6. To meet the minimum eligible rating of 'BBB', the entity should also have a short-term rating of 'A-2'.

N/A—Not applicable. ICR—Issuer credit rating.

70. For purposes of operational efficiency and flexibility, it is possible that issuers and counterparties may document more than one replacement option when a derivative agreement is entered into. These criteria do not require that more than one replacement option is documented. If more than one replacement option is documented, the counterparty must indicate which option applies from Day 1, but it is not required to elect any of the other options as a remedy if its rating becomes ineligible under its original option.

71. When more than one replacement option is documented, these criteria require that as a condition of electing to switch options:
   - The counterparty is not a defaulting party or an affected party under the derivative agreement;
   - The counterparty will give at least one day's notice clearly specifying the new replacement option to the trustee and to Standard & Poor's before the change occurs;
   - The change would not result in a breach of the minimum eligible counterparty rating for replacement; and
   - The change occurs before any initial remedy period has expired (i.e., disregarding any remedy period extension resulting from a written action plan).

72. As shown in table 4, under replacement options 1 and 2, a counterparty first posts collateral when its rating falls below the minimum eligible counterparty rating without collateral; it agrees to replace itself when its rating falls below the
minimum eligible counterparty rating with collateral. Under replacement option 3, the derivative counterparty agrees to post collateral and replace itself when its rating falls below the minimum eligible counterparty rating. Under replacement option 4, the derivative counterparty agrees to replace itself when its rating falls below the minimum eligible counterparty rating.

73. Generally, the rating level for collateral posting would depend on the current rating on the supported security. However, if the rating on the supported security has been lowered as a consequence of the counterparty's failure to perform, the rating level for collateral posting would be based on the rating on the supported security before that downgrade occurred (see Appendix 3, paragraph 113). To achieve the maximum potential rating, the failure by a counterparty to post collateral, when due, should give the issuer the right to terminate the derivative agreement.

74. If a counterparty's ICR falls below the minimum eligible counterparty rating for replacement and the counterparty fails to implement a remedy within the remedy period, then, absent mitigating factors, the rating on the supported security would be lowered to the counterparty's ICR.

C. Replacement Commitment

75. The counterparty should covenant in the derivative agreement to use "commercially reasonable efforts to", within the remedy period:

- Replace itself with an eligible derivatives counterparty; or
- Obtain a guarantee from an appropriately rated guarantor.

See paragraphs 109 and 110 for related termination provisions.

76. The exiting counterparty should agree to cover all costs relating to any remedy.

D. Remedy Period

77. For replacement options 1, 2, and 3, a remedy period of 60 calendar days from the date that the rating on the counterparty is lowered below the minimum eligible counterparty rating for replacement is consistent with the supported security achieving the maximum potential rating. For replacement option 4, a shorter remedy period of 30 calendar days similarly applies.

78. The remedy period of 30 or 60 calendar days may be extended for up to an additional 30 calendar days, except when the counterparty is switching to an alternate replacement option (see paragraph 71), if the counterparty provides the trustee and Standard & Poor's with a written action plan before the initial remedy period expires. The plan should describe the steps the counterparty has taken, and will take, to remedy the downgrade within the extended remedy period. The plan may include draft documentation or a letter of intent from the replacement counterparty.

79. Alternatively, the counterparty may covenant to remedy the downgrade below the minimum eligible counterparty rating for replacement "as soon as reasonably practicable," in cases where the issuer's right to terminate the derivative agreement is subject to the receipt of a replacement bid and "breach of agreement" by the counterparty is included as
an event of default in the derivative agreement (see paragraph 110 for further details about this alternative). This alternative is consistent with the supported security achieving the maximum potential rating.

**E. Collateral Posting And Related Documentation**

80. The counterparty should execute a credit support document, typically an ISDA Credit Support Annex (CSA) governed by New York or English law or similar document. The credit support document should provide for the counterparty to, among other things, post and maintain collateral consistent with these criteria. These criteria do not require a CSA if only replacement option 4 is documented in the applicable derivative agreement.

81. To be consistent with these criteria, the CSA may contemplate a collateral posting period of up to 10 business days from the date the counterparty's rating is lowered to below the applicable rating level for posting collateral (replacement options 1, 2, and 3). If, before the initial 10 business days expire, the counterparty provides the trustee and Standard & Poor’s with written plans for collateral posting, these criteria provide for an additional 10 business days to the remedy period to allow for collateral posting.

82. Any posted collateral should be held by the SPE, trustee, securities intermediary, or a custodian that is independent of the counterparty. The criteria for bank accounts (part VII) apply to such collateral accounts, including those circumstances stated in paragraph 27 when the minimum eligible counterparty rating may not apply.

83. The counterparty should agree to absorb all costs related to posting and maintaining the collateral.

84. The parties should make elections in the CSA that give the issuer clear enforcement rights against the collateral in circumstances when the counterparty is the defaulting party or the sole affected party.

**F. Eligible Collateral**

85. The criteria define eligible collateral as:

- Cash,
- Sovereign government securities, and

86. The value given to posted collateral is equal to the product of the collateral's mark-to-market value and the applicable market value advance rate (or valuation percentage according to ISDA terminology), e.g., for a market value haircut of 20%, the applicable market value advance rate or ISDA valuation percentage is 80% (100% minus 20%). For purposes of these criteria, haircuts are not applied to cash or sovereign government securities rated at least as high as the rating on the supported securities. However, haircuts are applied to sovereign government securities rated lower than the rating on the supported securities, and all other securities. Where market value haircuts apply, the valuation percentages of the other securities listed in Standard & Poor's market value criteria are based on haircuts for the next
lower rating category. For example, 'AA' haircuts for securities listed in our market value criteria may support 'AAA' ratings and 'A' haircuts may support 'AA' ratings. In this context, the haircuts can be based on the lower liability ratings because the collateral's market value risk in a derivative is a second-order risk, after the credit risk of the counterparty.

87. These criteria accommodate collateral posting in currencies other than that of the counterparty's payment obligation, if:

- The counterparty posts additional collateral to account for the foreign exchange risk (see paragraph 88 and Appendix 2); and
- Both the counterparty's payment obligation and posted collateral are denominated in the more liquid and less volatile currencies classified in currency risk groups 1 or 2 (see table 5 and paragraphs 89-96).

88. When a counterparty posts collateral in currencies that are different from its payment obligations, the net value given to the posted collateral is based on the product of the collateral's mark-to-market value, the applicable market value advance rate, and the applicable currency advance rates from Appendix 2. In this scenario, the ISDA valuation percentage is the product of the application of the market value advance rate and the currency advance rate (e.g., for a market value advance rate of 80% and currency advance rate of 90%, the ISDA valuation percentage is 72%). These currency advance rates (that apply when the mark-to-market of the collateral is weekly) are based on the rating on the supported security: 'AAA' (see table 10a), 'AA' category (see table 10b), and 'A+' or lower (see table 10c). These rates were derived by looking across the eligible currencies in currency risk groups 1 and 2, using extreme tail analyses similar to the principles outlined in "Modeling Unhedged Foreign Exchange Risk in Structured Ratings," published Nov. 20, 2000.

G. Currency Framework To Support Collateral Analysis

89. These criteria use a currency framework to assign volatility buffers (see paragraphs 97-108), and additional haircuts for currency risk where collateral is provided in currencies other than the counterparty's payment obligation (see paragraphs 87-88).

90. The currency framework classifies currencies into four risk groups (groups 1 to 4, with group 1 being the least risky and group 4 being the most risky). The classification is based on an analysis of whether the currency is a reserve currency (see paragraph 91), and if not, is based on three factors: sovereign risk (see paragraph 92), political risk (see paragraph 93), and data analysis and historical events (see paragraph 94). For nonreserve currencies, these criteria treat sovereign risk as the primary measure, with the other factors only able to move the currency to a more risky group (see table 5).

<p>| Table 5 |
| Analytical Factors By Currency Risk Groups |</p>
<table>
<thead>
<tr>
<th>Analytical factors</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sovereign foreign currency rating (see paragraph 92)</td>
<td>AAA and AA category</td>
<td>A category</td>
<td>BBB category</td>
<td>BB+ or below</td>
</tr>
<tr>
<td>Political risk ranking (see paragraph 93)</td>
<td>Strongest</td>
<td>Range between strongest and weakest</td>
<td>Range between strongest and weakest</td>
<td>Weakest</td>
</tr>
</tbody>
</table>
Table 5

Analytical Factors By Currency Risk Groups (cont.)

<table>
<thead>
<tr>
<th>Data analysis and historical events (see paragraph 94)</th>
<th>Satisfactory</th>
<th>Satisfactory</th>
<th>Satisfactory</th>
<th>Not satisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatility buffers (see Appendix 1)</td>
<td>Group 1</td>
<td>Group 2</td>
<td>Group 3</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Maximum potential rating</td>
<td>AAA</td>
<td>AAA</td>
<td>AAA</td>
<td>Counterparty's issuer credit rating plus 1 notch</td>
</tr>
</tbody>
</table>

1. Reserve currencies

91. Reserve currencies are classified in group 1. Reserve currencies are those defined as such in our sovereign criteria (see paragraph 65 in "Sovereign Government Rating Methodology And Assumptions," published June 30, 2011). Reserve currencies currently include British pound sterling, euro, Japanese yen, and U.S. dollar.

2. Nonreserve currencies: Factors to determine the currency risk group

92. Sovereign risk. For purposes of these criteria, the factors that influence sovereign creditworthiness (as measured by the sovereign foreign currency rating for the jurisdiction) are considered to be likely to affect the derivatives market by having an impact on market confidence and the willingness of counterparties to do business in that jurisdiction. (See "Sovereign Government Rating Methodology And Assumptions," published June 30, 2011.)

93. Political risk. This is a component of Standard & Poor's sovereign ratings analysis and measures the effectiveness of a government's institutions to respond to economic or political shocks, and to stabilize the sovereign's credit fundamentals during a downturn. It is measured using the political risk ranking scale in Standard & Poor's sovereign criteria (see "Sovereign Government Rating Methodology And Assumptions," published June 30, 2011). Political risk is considered separately, because other factors (e.g., fiscal risk and external exposure) may lead to a higher sovereign rating than the political risk analysis might suggest. The ability to replace a counterparty may be impaired if counterparties decide to withdraw from a market due to an unstable political environment.

94. Data analysis and historical events. These criteria consider data analysis to be satisfactory if there are available and sufficient data reflecting performance through economic downturns and financial market shocks. A lack of data or historically observed volatile behavior may result in a currency being allocated to a higher risk group than indicated by its sovereign and political risk assessments. Relevant data may include government security prices, swap bid/ask spreads, interest rates, exchange rates, and derivative trading volumes.

95. Table 6 lists the risk groups for currencies that these criteria have classified. Classifications may change as the relevant analytical factors change, and this framework can be applied to other currencies that have not yet been classified.

Table 6

Currencies By Risk Groups*

<table>
<thead>
<tr>
<th>Currency</th>
<th>Single-currency swap§</th>
<th>Cross-currency swap</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. dollar</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Euro</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Japanese yen</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>British pound</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Canadian dollar</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Australian dollar</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Danish krone</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Norwegian krone</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Swedish krona</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Currencies By Risk Groups* (cont.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swiss Franc</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>New Zealand dollar</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Singapore dollar</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Hong Kong dollar</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>New Taiwan dollar</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Korean won</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Mexican peso</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>South African rand</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Russian ruble</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

*Classifications may change as the relevant analytical factors change, and this framework can be applied to other currencies that have not yet been classified. §For example, interest rate and basis swaps.

96. In determining the appropriate currency risk group, these criteria consider the nature of the derivatives, for instance, whether it is a single-currency or cross-currency swap. Consequently, these criteria may classify a currency into two risk groups (e.g., a currency may be classified as a lower-risk group for single-currency swaps, and as a higher risk group for cross-currency swaps).

H. Volatility Buffers

97. These criteria establish that the required collateral amount for a derivative is equal to the greater of (i) zero, and (ii) the sum of the agreement's mark-to-market value and the applicable volatility buffer (as multiplied by the notional amount). The published volatility buffers (see Appendix 1) apply to replacement options 1 and 2 only, and are based on weekly internal valuations of the derivative agreement by the counterparty. To comply with these criteria, once a counterparty is posting collateral, it will make available its weekly internal valuations of the derivative agreements to Standard & Poor’s.

98. These criteria allow the derivative's value to be netted against the applicable volatility buffer, when the value of the contract is in favor of the counterparty.

99. The volatility buffers are a function of the following analytical factors:

- Derivative type: Whether the derivative is an interest rate swap (amortizing or not) or cross-currency swap, and whether the basis is fixed-to-floating, floating-to-floating, or (for currency swaps) fixed-to-fixed. (The fixed-to-floating interest rate swap volatility buffers also apply to caps and floors);
- Weighted-average life (WAL): The calculation of the remaining WAL of a derivative agreement should be based on a prepayment speed of 0.0%, or such other stressed low prepayment rate as indicated in the relevant criteria for the hedged asset or liability. The stresses used will depend on the relevant maximum potential rating;
- Replacement option: For replacement option 1 volatility buffers, see Appendix 1, tables 8a ('AAA'), 8b ('AA' category), and 8c ('A+' or lower), and for replacement option 2 volatility buffers, see Appendix 1, tables 9a ('AAA'), 9b ('AA' category), and 9c ('A+' or lower);
- Rating on the supported security: Whether it is rated 'AAA', in the 'AA' category, or 'A+' or lower; and
- Currency risk group: The currency risk group is based on the currency of the counterparty's payment obligation (with further haircuts applied if the currency of the collateral is different to the currency of the counterparty's currency).
payment obligation.

100. The price volatility for fixed-to-floating swaps approximates the price volatility of fixed-rate securities with similar maturities. Because an interest rate swap is a series of cash flows occurring at known future dates, it can be valued by estimating the present value of each of these cash flows. The present value of the floating-rate leg of the swap should approximate its par amount. The present value of the fixed-rate leg of the swap will vary as yields or discount rates change.

101. The replacement option 1 volatility buffers for interest rate swaps are based on a review of the largest interest movements, which are converted to price declines for government securities and interest rate stress scenarios. Sovereign securities were used as a proxy for how swap pricing may decline in similar stressed environments to supplement the more limited availability of historical data for swaps. Table 7 summarizes the observed three-month price declines in government bond prices from several sovereigns. These values are incorporated into the option 1 volatility buffers for 'AAA' rated supported securities of 12.5% and 15.0% for five- and 10-year, fixed-to-floating rate swaps, respectively.

**Table 7**

<table>
<thead>
<tr>
<th>Inferred Price Declines From The Largest Observed Three-Month Interest Rate Movements In Select Government Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>--Five-year maturity (%)--</strong></td>
</tr>
<tr>
<td>U.S.</td>
</tr>
<tr>
<td>12.0 (March 1980)</td>
</tr>
<tr>
<td><strong>--10-year maturity (%)--</strong></td>
</tr>
<tr>
<td>U.S.</td>
</tr>
<tr>
<td>16.0 (March 1980)</td>
</tr>
</tbody>
</table>


102. The foreign exchange fixed-to-floating volatility buffers derive from the analysis of historical currency volatility over a one-month window. These results reflect the maximum historical volatility of a single currency, because the fixed leg in a fixed-to-floating swap generally accounts for the volatility. For fixed-to-fixed currency swaps, the criteria double the single currency volatility based on the potential for the maximum historically observed volatility to simultaneously occur in both currencies and in opposite directions.

103. The 'AAA' volatility buffers for replacement option 2 are intended to cover extreme historical yield increases and currency movements. Sizing of the replacement option 2 volatility buffers took into consideration the relative risk between the minimum eligible counterparty ratings, historical interest and currency exchange rates, stress scenarios, and the observed collateral amounts posted in transactions rated by Standard & Poor’s. The replacement option 2 volatility buffers range from about 30% to 70% of replacement option 1’s volatility buffers, depending on the type of derivative. Regarding the relativities between collateral amounts for replacement options 1 and 2, the shape of the curve (see chart 2 of Appendix 1) approximates a geometric progression and is consistent with the relationship of default rates used in calibrating the corporate CDO criteria (see "Update To Global Methodologies And Assumptions For Corporate Cash Flow And Synthetic CDOs," published Sept. 17, 2009). The reduction in the collateral amount should reflect reduced credit risk associated with the higher minimum eligible counterparty rating of 'A-' for
replacement option 2.

104. The volatility buffers for securities rated in the 'AA' category and 'A+' or lower are respectively about 65% and 30% of the applicable levels for 'AAA' ratings. The reduced volatility buffers for supported ratings below 'AAA' reflect lower stresses applied at lower rating levels and the reduction in the number of notches between the maximum potential rating and the counterparty's ICR. For example, under replacement option 1, securities rated 'AAA' may be supported by a 'BBB+' rated counterparty, which represents seven notches of uplift above the counterparty's ICR. However, for securities rated 'A+', the maximum uplift on the supported security is four notches from the counterparty's ICR.

105. All else being equal, the volatility buffers differ depending upon the currency risk group classification of the counterparty's payment obligations.

106. For group 2 currencies, the applicable volatility buffers are 1.5x the group 1 levels. Derivatives in group 2 currencies are likely to be more difficult to replace than derivatives in group 1 currencies, thereby warranting higher volatility buffers. Moreover, historical data analysis for group 2 currencies typically shows greater fluctuation in interest rates and foreign exchange rates, as well as a less liquid derivatives market relative to group 1 currencies.

107. For group 3 currencies, the volatility buffers are 2x the group 1 levels. For group 3 currencies, a replacement of the derivative is even less likely to occur.

108. Group 4 currencies are the riskiest and, as a result, the maximum potential rating on the supported security would be no higher than one notch above the counterparty's ICR.

I. Termination Provisions And Events Of Default

109. Termination provisions (referred to as additional termination events [ATEs]) consistent with the maximum potential rating give the issuer the right to terminate the derivative if either of the following occurs with regard to the counterparty:

- It fails to post collateral when due; or
- It fails to remedy a breach of the minimum eligible counterparty rating for replacement within the remedy period.

110. More specifically, the following termination provisions regarding the minimum eligible counterparty rating for replacement are consistent with the maximum potential rating on a supported security:

- The issuer has the right to terminate the derivative agreement, if within the remedy period the counterparty fails to replace itself with an eligible derivatives counterparty or obtain a guarantee from an appropriately rated guarantor as set out in paragraph 75 (this right applies whether or not the issuer has received a bid from a potential replacement counterparty); or
- The issuer has the right to terminate the derivative agreement, only if the counterparty has received a bid from a potential replacement counterparty (assuming no other event of default or termination event has occurred) and provided that "breach of agreement" applies to the existing counterparty under the derivative agreement. In this scenario, the counterparty may covenant to remedy the downgrade "as soon as reasonably practicable," as opposed to "within the remedy period," as described in paragraph 75. This replacement commitment is consistent with the maximum potential rating on the supported security, as the counterparty is incentivized to fulfill its commitment to
use "commercially reasonable efforts to replace" or remedy the downgrade because failing to do so would be an event of default under the derivative agreement. Such an event of default would give the issuer the right to terminate the agreement, whether or not the counterparty has received a bid from a potential replacement counterparty.

111. If the derivative counterparty is "in-the-money", but is the defaulting party or sole affected party, the impact of a termination payment owed to the counterparty should be mitigated (e.g., by subordination). Furthermore, the counterparty should agree that any early termination payment due will be subject to the transaction's priority of payments.

XI. APPENDICES

Appendix 1: Derivatives—Volatility Buffers (Tables By Security Rating)

Table 8a

<table>
<thead>
<tr>
<th>Replacement Option 1 Volatility Buffer By Currency Risk Group (% Of Notional) For Supported Securities Rated 'AAA'*</th>
<th>Interest rate swaps (%)</th>
<th>Cross currency swaps (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swap tenor--weighted-average life (years)</td>
<td>Fixed to floating</td>
<td>Floating to floating</td>
</tr>
<tr>
<td>Currency Risk Group 1 volatility buffers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>8.5</td>
<td>4</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>12.5</td>
<td>5</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>21</td>
<td>8</td>
</tr>
<tr>
<td>Currency Risk Group 2 volatility buffers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>32</td>
<td>12</td>
</tr>
<tr>
<td>Currency Risk Group 3 volatility buffers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>30</td>
<td>12</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>36</td>
<td>14</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>42</td>
<td>16</td>
</tr>
</tbody>
</table>

*For notes that we rate below 'AAA', see tables 8b and 8c.
### Table 8b

Replacement Option 1 Volatility Buffer By Currency Risk Group (% Of Notional) For Supported Securities Rated In The ‘AA’ Category*

<table>
<thead>
<tr>
<th>Swap tenor—weighted-average life (years)</th>
<th>Interest rate swaps (%)</th>
<th>Cross currency swaps (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed to floating</td>
<td>Floating to floating</td>
</tr>
<tr>
<td><strong>Currency Risk Group 1 volatility buffers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>5.5</td>
<td>2.6</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>8.1</td>
<td>3.3</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>9.8</td>
<td>3.9</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>11.7</td>
<td>4.6</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>13.7</td>
<td>5.2</td>
</tr>
<tr>
<td><strong>Currency Risk Group 2 volatility buffers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>8.5</td>
<td>3.9</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>12.4</td>
<td>5.2</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>15.0</td>
<td>5.9</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>17.6</td>
<td>7.2</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>20.8</td>
<td>7.8</td>
</tr>
<tr>
<td><strong>Currency Risk Group 3 volatility buffers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>11.1</td>
<td>5.2</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>16.3</td>
<td>6.5</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>19.5</td>
<td>7.8</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>23.4</td>
<td>9.1</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>27.3</td>
<td>10.4</td>
</tr>
</tbody>
</table>

*For other note ratings, see tables 8a and 8c.

### Table 8c

Replacement Option 1 Volatility Buffer By Currency Risk Group (% Of Notional) For Supported Securities Rated ‘A+’ Or Lower*

<table>
<thead>
<tr>
<th>Swap tenor—weighted-average life (years)</th>
<th>Interest rate swaps (%)</th>
<th>Cross currency swaps (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed to floating</td>
<td>Floating to floating</td>
</tr>
<tr>
<td><strong>Currency Risk Group 1 volatility buffers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>2.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>3.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>4.5</td>
<td>1.8</td>
</tr>
</tbody>
</table>
Table 8c

### Replacement Option 1 Volatility Buffer By Currency Risk Group (% Of Notional) For Supported Securities Rated ‘A+’ Or Lower* (cont.)

<table>
<thead>
<tr>
<th>Currency Risk Group 2 Volatility Buffers</th>
<th>Greater than 10 and less than or equal to 15</th>
<th>Greater than 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 3</td>
<td>5.4</td>
<td>6.3</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>2.1</td>
<td>2.4</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>6.6</td>
<td>7.5</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>13.2</td>
<td>15.0</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>3.3</td>
<td>3.9</td>
</tr>
</tbody>
</table>

### Currency Risk Group 3 Volatility Buffers

<table>
<thead>
<tr>
<th>Greater than 10 and less than or equal to 15</th>
<th>Greater than 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currency Risk Group 3 Volatility Buffers</td>
<td>8.1</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>9.6</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>11.4</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>14.8</td>
</tr>
</tbody>
</table>

*For notes rated above ‘A+’, see tables 8a and 8b.

Table 9a

### Replacement Option 2 Volatility Buffer By Currency Risk Group (% Of Notional) For Supported Securities Rated ‘AAA’*

<table>
<thead>
<tr>
<th>Swap tenor—weighted-average life (years)</th>
<th>Interest rate swaps (%)</th>
<th>Cross currency swaps (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed to floating</td>
<td>Floating to floating</td>
</tr>
<tr>
<td><strong>Currency Risk Group 1 Volatility Buffers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>6</td>
<td>3.5</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td><strong>Currency Risk Group 2 Volatility Buffers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>5</td>
<td>3.5</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>8</td>
<td>4.5</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>9</td>
<td>5.5</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>11</td>
<td>6</td>
</tr>
</tbody>
</table>
### Table 9a

**Replacement Option 2 Volatility Buffer By Currency Risk Group (% Of Notional) For Supported Securities Rated 'AAA'* (cont.)**

<table>
<thead>
<tr>
<th>Currency Risk Group 3 volatility buffers</th>
<th>Up to 3</th>
<th>6</th>
<th>4</th>
<th>14</th>
<th>24</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>8</td>
<td>5</td>
<td>16</td>
<td>26</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>10</td>
<td>6</td>
<td>18</td>
<td>28</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>12</td>
<td>7</td>
<td>19</td>
<td>30</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Greater than 15</td>
<td>14</td>
<td>8</td>
<td>21</td>
<td>32</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

*For notes that we rate below 'AAA', see tables 9b and 9c.

### Table 9b

**Replacement Option 2 Volatility Buffer By Currency Risk Group (% Of Notional) For Supported Securities Rated In The 'AA' Category**

<table>
<thead>
<tr>
<th>Swap tenor--weighted-average life (years)</th>
<th>Interest rate swaps (%)</th>
<th>Cross currency swaps (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed to floating</td>
<td>Floating to floating</td>
</tr>
<tr>
<td><strong>Currency Risk Group 1 volatility buffers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>2.0</td>
<td>1.3</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>2.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>3.3</td>
<td>2.0</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>3.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>4.6</td>
<td>2.6</td>
</tr>
</tbody>
</table>

| **Currency Risk Group 2 volatility buffers** |                         |                          |                   |               |                         |
| Up to 3                                  | 3.3                     | 2.3                      | 7.2               | 11.7          | 3.3                      |
| Greater than 3 and less than or equal to 5 | 3.9                     | 2.6                      | 7.8               | 13.0          | 3.9                      |
| Greater than 5 and less than or equal to 10 | 5.2                     | 2.9                      | 9.1               | 13.7          | 4.6                      |
| Greater than 10 and less than or equal to 15 | 5.9                     | 3.6                      | 9.8               | 15.0          | 5.2                      |
| Greater than 15                           | 7.2                     | 3.9                      | 10.4              | 15.6          | 5.9                      |

| **Currency Risk Group 3 volatility buffers** |                         |                          |                   |               |                         |
| Up to 3                                  | 3.9                     | 2.6                      | 9.1               | 15.6          | 3.9                      |
| Greater than 3 and less than or equal to 5 | 5.2                     | 3.3                      | 10.4              | 16.9          | 5.2                      |
| Greater than 5 and less than or equal to 10 | 6.5                     | 3.9                      | 11.7              | 18.2          | 5.9                      |
| Greater than 10 and less than or equal to 15 | 7.8                     | 4.6                      | 12.4              | 19.5          | 6.5                      |
| Greater than 15                           | 9.1                     | 5.2                      | 13.7              | 20.8          | 7.2                      |

*For other note ratings, see tables 9a and 9c.*
Table 9c
Replacement Option 2 Volatility Buffer By Currency Risk Group (% Of Notional) For Supported Securities Rated 'A+' Or Lower*

<table>
<thead>
<tr>
<th>Swap tenor--weighted-average life (years)</th>
<th>Currency Risk Group 1 volatility buffers</th>
<th>Currency Risk Group 2 volatility buffers</th>
<th>Currency Risk Group 3 volatility buffers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interest rate swaps (%)</td>
<td>Cross currency swaps (%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fixed to floating</td>
<td>Floating to floating</td>
<td>Fixed to floating</td>
</tr>
<tr>
<td>Up to 3</td>
<td>1.0</td>
<td>1.0</td>
<td>2.1</td>
</tr>
<tr>
<td>Greater than 3 and less than or equal to 5</td>
<td>1.2</td>
<td>1.0</td>
<td>2.4</td>
</tr>
<tr>
<td>Greater than 5 and less than or equal to 10</td>
<td>1.5</td>
<td>1.0</td>
<td>2.7</td>
</tr>
<tr>
<td>Greater than 10 and less than or equal to 15</td>
<td>1.8</td>
<td>1.1</td>
<td>2.9</td>
</tr>
<tr>
<td>Greater than 15</td>
<td>2.1</td>
<td>1.2</td>
<td>3.2</td>
</tr>
</tbody>
</table>

*For notes rated above 'A+', see tables 9a and 9b.
Appendix 2: Derivatives—Currency Advance Rates For Collateral With Currency Exposure (Tables By Security Rating)

Table 10a

| Currency Advance Rates For Collateral With Currency Exposure For ‘AAA’ Rated Securities |
|----------------------------------|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                                  | U.S. dollar | Euro  | Japanese yen | British pound | Canadian dollar | Australian dollar | Danish kroner | Norwegian kroner | Swedish krona | Swiss Franc | New Zealand dollar | Singapore dollar | Hong Kong dollar | New Taiwan dollar |
| U.S. dollar                      | 92.5        | 92.0  | 94.0         | 95.0           | 92.0            | 92.5             | 92.0         | 92.0            | 92.0           | 91.5         | 95.0               | 98.5              | 96.0              |
| Euro                             |             | 90.5  | 94.0         | 90.5           | 92.0            | 96.0             | 94.0         | 94.0            | 94.0           | 91.5         | 93.0               | 92.5              | 92.5              |
| Japanese yen                     |             |       | 89.0         | 91.5           | 87.0            | 91.0             | 90.5         | 91.0            | 91.0           | 87.0         | 92.5               | 92.0              | 92.0              |
| British pound                    |             |       |              | 91.5           | 92.0            | 94.0             | 92.5         | 92.5            | 92.5           | 91.5         | 92.0               | 94.0              | 93.0              |
| Canadian dollar                  |             |       |              |                | 92.0            | 92.5             | 92.0         | 92.0            | 92.0           | 91.5         | 94.0               | 95.0              | 94.0              |
| Australian dollar                |             |       |              |                |                | 91.5             | 91.0         | 91.0            | 90.0           | 94.5         | 90.0               | 92.0              | 91.0              |
| Danish kroner                    |             |       |              |                |                |                 | 95.0         | 95.0            | 96.5           | 91.0         | 92.5               | 92.5              | 92.0              |
| Norwegian kroner                 |             |       |              |                |                |                 | 94.5         | 94.5            | 91.0           | 92.0         | 92.0               | 92.0              | 92.0              |
| Swedish krona                    |             |       |              |                |                |                 |              | 94.5            | 91.0           | 92.0         | 92.0               | 92.0              | 91.5              |

© Standard & Poor’s 2012.
### Table 10a

**Currency Advance Rates For Collateral With Currency Exposure For 'AAA' Rated Securities (cont.)**

<table>
<thead>
<tr>
<th>Currency</th>
<th>Rate</th>
<th>Rate</th>
<th>Rate</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss Franc</td>
<td>90.0</td>
<td>92.0</td>
<td>92.0</td>
<td>91.5</td>
</tr>
<tr>
<td>New Zealand dollar</td>
<td></td>
<td>89.5</td>
<td>91.5</td>
<td>90.5</td>
</tr>
<tr>
<td>Singapore dollar</td>
<td></td>
<td></td>
<td>95.0</td>
<td>94.5</td>
</tr>
<tr>
<td>Hong Kong dollar</td>
<td></td>
<td></td>
<td></td>
<td>96.0</td>
</tr>
</tbody>
</table>

### Table 10b

**Currency Advance Rates For Collateral With Currency Exposure For Securities Rated In The 'AA' Category**

<table>
<thead>
<tr>
<th>Currency</th>
<th>U.S. dollar</th>
<th>Euro</th>
<th>Japanese yen</th>
<th>British pound</th>
<th>Canadian dollar</th>
<th>Australian dollar</th>
<th>Danish krone</th>
<th>Norwegian krone</th>
<th>Swedish krona</th>
<th>Swiss Franc</th>
<th>New Zealand dollar</th>
<th>Singapore dollar</th>
<th>Hong Kong dollar</th>
<th>New Taiwan dollar</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. dollar</td>
<td>93.5</td>
<td>92.5</td>
<td>94.5</td>
<td>95.5</td>
<td>93.0</td>
<td>93.0</td>
<td>93.0</td>
<td>93.0</td>
<td>92.5</td>
<td>95.5</td>
<td>99.0</td>
<td>96.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Euro</td>
<td>91.5</td>
<td>94.5</td>
<td>91.5</td>
<td>92.5</td>
<td>96.5</td>
<td>94.5</td>
<td>94.5</td>
<td>94.5</td>
<td>92.5</td>
<td>91.5</td>
<td>93.5</td>
<td>92.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japanese yen</td>
<td>90.0</td>
<td>92.5</td>
<td>89.0</td>
<td>92.0</td>
<td>91.5</td>
<td>92.0</td>
<td>92.0</td>
<td>88.5</td>
<td>93.5</td>
<td>92.5</td>
<td>92.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>British pound</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canadian dollar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian dollar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Danish krone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norwegian krone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swedish krona</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swiss Franc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Zealand dollar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singapore dollar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hong Kong dollar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Taiwan dollar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 10c

**Currency Advance Rates For Collateral With Currency Exposure For Securities Rated 'A+' Or Lower**

<table>
<thead>
<tr>
<th>Currency</th>
<th>U.S. dollar</th>
<th>Euro</th>
<th>Japanese yen</th>
<th>British pound</th>
<th>Canadian dollar</th>
<th>Australian dollar</th>
<th>Danish krone</th>
<th>Norwegian krone</th>
<th>Swedish krona</th>
<th>Swiss Franc</th>
<th>New Zealand dollar</th>
<th>Singapore dollar</th>
<th>Hong Kong dollar</th>
<th>New Taiwan dollar</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. dollar</td>
<td>94.0</td>
<td>93.0</td>
<td>95.0</td>
<td>96.0</td>
<td>93.5</td>
<td>94.0</td>
<td>93.0</td>
<td>93.0</td>
<td>93.0</td>
<td>93.0</td>
<td>96.0</td>
<td>99.5</td>
<td>97.0</td>
<td></td>
</tr>
<tr>
<td>Euro</td>
<td></td>
<td>92.0</td>
<td>95.0</td>
<td>92.0</td>
<td>93.0</td>
<td>97.0</td>
<td>95.0</td>
<td>95.0</td>
<td>95.0</td>
<td>93.0</td>
<td>92.0</td>
<td>94.0</td>
<td>93.0</td>
<td></td>
</tr>
</tbody>
</table>
Table 10c

<table>
<thead>
<tr>
<th>Currency Advance Rates For Collateral With Currency Exposure For Securities Rated 'A+' Or Lower (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japanese yen</td>
</tr>
<tr>
<td>90.5</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>89.5</td>
</tr>
<tr>
<td>92.5</td>
</tr>
<tr>
<td>92.0</td>
</tr>
<tr>
<td>92.5</td>
</tr>
<tr>
<td>89.0</td>
</tr>
<tr>
<td>94.0</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>British pound</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>95.0</td>
</tr>
<tr>
<td>94.0</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>94.0</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>95.0</td>
</tr>
<tr>
<td>95.0</td>
</tr>
<tr>
<td>Canadian dollar</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>91.0</td>
</tr>
<tr>
<td>95.0</td>
</tr>
<tr>
<td>96.0</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>94.0</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>Australian dollar</td>
</tr>
<tr>
<td>92.5</td>
</tr>
<tr>
<td>92.5</td>
</tr>
<tr>
<td>92.5</td>
</tr>
<tr>
<td>91.5</td>
</tr>
<tr>
<td>95.5</td>
</tr>
<tr>
<td>91.5</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>94.0</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>Danish krone</td>
</tr>
<tr>
<td>96.0</td>
</tr>
<tr>
<td>96.0</td>
</tr>
<tr>
<td>97.5</td>
</tr>
<tr>
<td>92.5</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>94.0</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>Norwegian krone</td>
</tr>
<tr>
<td>95.5</td>
</tr>
<tr>
<td>95.5</td>
</tr>
<tr>
<td>92.5</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>Swedish krona</td>
</tr>
<tr>
<td>95.5</td>
</tr>
<tr>
<td>92.5</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>Swiss Franc</td>
</tr>
<tr>
<td>91.5</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>93.5</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>New Zealand dollar</td>
</tr>
<tr>
<td>91.0</td>
</tr>
<tr>
<td>93.0</td>
</tr>
<tr>
<td>92.0</td>
</tr>
<tr>
<td>Singapore dollar</td>
</tr>
<tr>
<td>96.0</td>
</tr>
<tr>
<td>95.5</td>
</tr>
<tr>
<td>Hong Kong dollar</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Appendix 3: Treatment Of Variant Features

Maximum potential rating adjustments

112. Table 11 summarizes the rating approach where counterparty obligations are documented in line with previous versions of Standard & Poor's counterparty criteria (but do not fully meet the current criteria). In most instances, each variation results in a notching down of the maximum potential rating that can be assigned on the supported security by up to three notches, depending on the feature. The adjustments are cumulative for multiple variant features, subject to a floor of the counterparty's ICR plus one notch for any supported security that contains a replacement provision that is in line with previous versions of Standard & Poor's counterparty criteria. This approach is taken to appropriately reflect the relative creditworthiness of securities that benefit from some form of replacement framework, compared with those that do not.

Table 11

<table>
<thead>
<tr>
<th>Conditions To Obtain The Maximum Potential Rating With Variants And Adjustments (With Paragraph References)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank accounts, indirect support obligations, direct support obligations, and derivatives</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Conditions to obtain the maximum potential rating (tables 1 to 4)</th>
<th>Variant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence of an enforceable, legally binding obligation reflecting the new criteria</td>
<td>Any arrangement that is enforceable and legally binding on the counterparty.</td>
<td></td>
</tr>
</tbody>
</table>
**Table 11**

<table>
<thead>
<tr>
<th>Conditions To Obtain The Maximum Potential Rating With Variants And Adjustments (With Paragraph References) (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum counterparty rating for replacement (variant applicable to option 1 only) (see paragraphs 16-19)</strong></td>
</tr>
<tr>
<td>Counterparty has enforceable legal obligation reflecting the minimum counterparty ratings in table 1 using long-term ratings (or the corresponding short-term rating if the counterparty has no long-term rating)</td>
</tr>
<tr>
<td>Enforceable legal obligations reflecting lower minimum counterparty ratings from previous Standard &amp; Poor's criteria versions.</td>
</tr>
<tr>
<td>Minus 1 notch</td>
</tr>
<tr>
<td><strong>Replacement commitment (see paragraphs 28, 41, 60, 61, and 75)</strong></td>
</tr>
<tr>
<td>Bank accounts, indirect support obligations, and direct support obligations</td>
</tr>
<tr>
<td>Bank accounts, indirect support obligations, and direct support obligations</td>
</tr>
<tr>
<td>&quot;Will replace&quot;</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>&quot;Commercially reasonable efforts to replace&quot; and &quot;Will remedy&quot;, i.e., commitment to draw-to-cash</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>&quot;Commercially reasonable efforts to replace&quot; for bank accounts, if trustee or issuer replacement commitment</td>
</tr>
<tr>
<td><strong>Derivatives:</strong></td>
</tr>
<tr>
<td>&quot;Commercially reasonable efforts to replace&quot; depending on the termination provisions (see section on ATE)</td>
</tr>
<tr>
<td>&quot;Commercially reasonable efforts to replace&quot; depending on the termination provisions (see section on ATE)</td>
</tr>
<tr>
<td>Minus 3 notches</td>
</tr>
<tr>
<td><strong>Remedy conditions to obtain the maximum potential rating (see paragraphs 29, 30, 43, 44, 62, 63, 77, and 78)</strong></td>
</tr>
<tr>
<td>Bank accounts (limited) and direct support obligations:</td>
</tr>
<tr>
<td>Bank accounts (limited) and direct support obligations:</td>
</tr>
<tr>
<td><strong>60 calendar days</strong></td>
</tr>
<tr>
<td><strong>90 calendar days</strong></td>
</tr>
<tr>
<td><strong>Minus 1 notch</strong></td>
</tr>
<tr>
<td>Any other variation</td>
</tr>
<tr>
<td>Security rating is no higher than the counterparty ICR plus 1 notch</td>
</tr>
<tr>
<td><strong>Derivatives:</strong></td>
</tr>
<tr>
<td>Options 1, 2, and 3: 60 calendar days</td>
</tr>
<tr>
<td>90 calendar days</td>
</tr>
<tr>
<td>Minus 1 notch</td>
</tr>
<tr>
<td>Any other variation</td>
</tr>
<tr>
<td>Security rating is no higher than the counterparty ICR plus 1 notch</td>
</tr>
<tr>
<td><strong>Option 4: 30 calendar days</strong></td>
</tr>
<tr>
<td>60 calendar days</td>
</tr>
<tr>
<td>Minus 1 notch</td>
</tr>
<tr>
<td>Any other variation</td>
</tr>
<tr>
<td>Security rating is no higher than the counterparty ICR plus 1 notch</td>
</tr>
<tr>
<td><strong>Bank accounts (minimal) and indirect support obligations:</strong></td>
</tr>
<tr>
<td><strong>30 calendar days</strong></td>
</tr>
<tr>
<td><strong>60 calendar days</strong></td>
</tr>
<tr>
<td><strong>Minus 1 notch</strong></td>
</tr>
<tr>
<td>Any other variation</td>
</tr>
<tr>
<td>Security rating is no higher than the counterparty ICR plus 1 notch</td>
</tr>
<tr>
<td><strong>For all the above:</strong></td>
</tr>
<tr>
<td>Plus additional 30 days if we receive a written proposal regarding the remedy</td>
</tr>
<tr>
<td>Criteria</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Collateral amount calculation (see paragraph 98)</td>
</tr>
<tr>
<td>Volatility buffer (see Appendix 1)</td>
</tr>
<tr>
<td>Volatility buffers in Appendix 1 (variant applicable to option 1 only)</td>
</tr>
<tr>
<td>Collateral posting period (see paragraph 81)</td>
</tr>
<tr>
<td>Additional termination event (ATE) (see paragraphs 109-111)</td>
</tr>
<tr>
<td>Additional collateral amounts for no ATE (see paragraphs 115 and 116)</td>
</tr>
<tr>
<td>Eligible collateral (see paragraphs 85-88, Appendix 2)</td>
</tr>
<tr>
<td>o Cash</td>
</tr>
<tr>
<td>o Government securities rated as high as notes</td>
</tr>
<tr>
<td>o Other securities listed in Standard &amp; Poor’s market value criteria as published from time to time, subject to liability haircuts for the next lower rating category</td>
</tr>
</tbody>
</table>

ICR—Issuer credit rating.

**Collateral posting**

113. If the supported security was originally rated using previous versions of Standard & Poor’s counterparty criteria and was downgraded as a result of an adjustment to the maximum potential rating for the use of a variant, then collateral posting reflecting the current rating, not the original rating, is consistent with these criteria.
Adjustments for securities without an SPE right to terminate

114. These criteria require higher volatility buffers (1.25x) and additional collateral for securities where the applicable derivative agreement does not include an ATE for a failure to replace itself or remedy.

115. For all replacement options, the counterparty agrees to post increasing collateral amounts if it fails to replace itself or remedy when necessary. The required collateral amounts are based on the time elapsed (see table 12). The amount of the additional collateral is capped at 100% of the derivative's notional amount. The burden to post increasing collateral amounts provides the counterparty with an incentive to replace itself as quickly as possible. If a counterparty fails to replace itself despite the collateral posting burden, the rating on the supported security may be reassessed.

Table 12

<table>
<thead>
<tr>
<th>Time since the event</th>
<th>Additional percentage of notional amount per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 1-4 weeks</td>
<td>0.0%</td>
</tr>
<tr>
<td>Within 5-8 weeks</td>
<td>1.0%</td>
</tr>
<tr>
<td>Within 9-12 weeks</td>
<td>2.0%</td>
</tr>
<tr>
<td>After 12 weeks</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

ATE--Additional termination event.

116. The maximum potential rating will be reduced if additional collateral amounts are capped (in the documents) at less than 100% of the swap notional, as this may reduce the counterparty's incentive to replace itself. Downward adjustments to the maximum potential rating are:

- One notch for a cap of 75% of the swap notional,
- Two notches for a cap of 50% of the swap notional, and
- Three notches for a cap of 25% of the swap notional.

Example—Calculation of collateral (where there is no ATE)

117. Consider a five-year fixed-to-floating interest rate swap supporting a 'AAA' rated security (under replacement option 1). The security is structured without an ATE, so the volatility buffer is 1.25 multiplied by 12.5% (see table 8a), or 15.625%. During the first four weeks after a triggering event (downgrade), the collateral amount is the mark-to-market portion, plus 15.625% of the notional balance (but not less than zero). If the counterparty fails to replace itself or remedy, the collateral amount increases by 1% per week over the next four weeks so that by the eighth week, the collateral amount is the mark-to-market portion plus collateral equal to 19.625% of the notional balance. If this were to continue, the collateral amount would be 27.625% by the 12th week, 30.125% by the 13th week, and so on until the additional collateral amount reaches 100% of the swap notional. Upon replacement of the counterparty with another counterparty that satisfies the minimum eligible counterparty rating, these additional collateral amounts would no longer apply.

118. A timeline for how the additional collateral amount increases is shown in table 13. The volatility buffer and additional collateral amount percentages apply to the notional balance of the swap.
Table 13

<table>
<thead>
<tr>
<th>Date</th>
<th>Collateral amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before April 5</strong></td>
<td></td>
</tr>
<tr>
<td>Counterparty rated 'BBB+' as per option 1</td>
<td>MTM + (1.25 x VB)</td>
</tr>
<tr>
<td><strong>April 5</strong></td>
<td></td>
</tr>
<tr>
<td>Counterparty rating lowered to 'BBB' or lower as per option 1</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 0%</td>
</tr>
<tr>
<td><strong>After four weeks</strong></td>
<td></td>
</tr>
<tr>
<td>May 3</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 1%</td>
</tr>
<tr>
<td>May 10</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 2%</td>
</tr>
<tr>
<td>May 17</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 3%</td>
</tr>
<tr>
<td>May 24</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 4%</td>
</tr>
<tr>
<td>May 31</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 6%</td>
</tr>
<tr>
<td>June 7</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 8%</td>
</tr>
<tr>
<td>June 14</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 10%</td>
</tr>
<tr>
<td>June 21</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 12%</td>
</tr>
<tr>
<td>June 28</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 14.5%</td>
</tr>
<tr>
<td>July 5</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 17%</td>
</tr>
<tr>
<td>July 12</td>
<td>MTM + (1.25 x VB) + additional collateral amount of 19.5%</td>
</tr>
</tbody>
</table>

This weekly calculation continues until the additional collateral amount reaches 100% of the swap notional.

Note: MTM—mark-to-market value of the derivative that may be netted against the VB. VB—Volatility buffer as a percentage of the swap notional. ATE—Additional termination event.

Appendix 4: Derivatives—Examples Of Replacement Options

**EXAMPLE 1: Replacement Option 1**

Minimum eligible counterparty rating with collateral: 'BBB+'

ICR of counterparty: 'A-

Variant features: None

**What is the assigned rating?**

Assigned rating is 'AAA', which is the higher of:

- Counterparty ICR = 'A-
- Maximum potential rating = 'AAA'

**At what rating levels does the counterparty post collateral prior to replacement being triggered? How much?**

'A-' and 'BBB+': The mark-to-market value plus option 1 volatility buffer for securities rated 'AAA' (see table 8a)
At what rating level does the counterparty replace itself? What is the collateral amount?
'BBB' or below: The mark-to-market value plus option 1 volatility buffer for securities rated 'AAA' (see table 8a)

EXAMPLE 2: Replacement Option 1 With Alternative Features
Minimum eligible counterparty rating with collateral: 'BBB+'

ICR of counterparty: 'A-

Variant features:
- Lower volatility buffer calculation: Minus three notches
- No external marks: No adjustment

What is the assigned rating?
Assigned rating is 'AA-', which is the higher of:
- Counterparty ICR plus one notch = 'A'
- Maximum potential rating = 'AAA' reduced by three notches = 'AA-'  

At what rating levels does the counterparty post collateral prior to replacement being triggered? How much?
'BBB+' and 'BBB': Collateral amount as indicated in the document reflecting previous versions of Standard & Poor's counterparty criteria

At what rating level does the counterparty replace itself? What is the collateral amount?
'BBB-' or below: Collateral amount as indicated in the document reflecting previous versions of Standard & Poor's counterparty criteria

EXAMPLE 3: Replacement Option 2
Minimum eligible counterparty rating with collateral: 'A-

ICR of counterparty: 'A'

Variant features: None

What is the assigned rating?
Assigned rating is 'AAA', which is the higher of:
- Counterparty ICR = 'A'
- Maximum potential rating = 'AAA'

At what rating level does the counterparty post collateral prior to replacement being triggered? How much?
'A-': The collateral amount is the mark-to-market value multiplied by 1.25

At what rating level does the counterparty replace itself? What is the collateral amount?
'BBB+' or below: The collateral amount is the higher of:
- Mark-to-market value plus option 2 volatility buffer for securities rated 'AAA' (see table 9a)
- Mark-to-market value multiplied by 1.3
EXAMPLE 4: Replacement Option 3
Minimum eligible counterparty rating: ‘A‘

ICR of counterparty: ‘A‘

Variant features: None

What is the assigned rating?
Assigned rating is 'AAA', which is the higher of:

- Counterparty ICR = 'A'
- Maximum potential rating = 'AAA'

At what rating level does the counterparty post collateral prior to replacement being triggered? How much?
There is no collateral posting prior to replacement being triggered

At what rating level does the counterparty replace itself? What is the collateral amount?
'A-' or below: The collateral amount is the mark-to-market value multiplied by 1.25

EXAMPLE 5: Replacement Option 4
Minimum eligible counterparty rating: 'A+'

ICR of counterparty: 'A+'

Variant features: None

What is the assigned rating?
Assigned rating is 'AAA', which is the higher of:

- Counterparty ICR = 'A+'
- Maximum potential rating = 'AAA'

At what rating level does the counterparty post collateral prior to replacement being triggered? How much?
There is no collateral posting prior to replacement being triggered

At what rating level does the counterparty replace itself? What is the collateral amount?
'A' or below: There is no collateral posting (provided the swap has an ATE feature)

Appendix 5: Comparison For Nonderivative Exposures
### Table 14

**Minimum Eligible Counterparty Ratings: Comparative Table For Nonderivative Exposures**

*From tables 1 to 3*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>AA+</td>
<td>AA</td>
<td>A</td>
<td>BBB</td>
</tr>
<tr>
<td>AA+</td>
<td>AA</td>
<td>AA</td>
<td>A</td>
<td>BBB</td>
</tr>
<tr>
<td>AA</td>
<td>AA-</td>
<td>AA-</td>
<td>A-</td>
<td>BBB-</td>
</tr>
<tr>
<td>AA-</td>
<td>Security rating</td>
<td>Security rating</td>
<td>A-</td>
<td>BBB-</td>
</tr>
<tr>
<td>A+</td>
<td>Security rating</td>
<td>Security rating</td>
<td>BBB+</td>
<td>BBB-</td>
</tr>
<tr>
<td>A</td>
<td>Security rating</td>
<td>Security rating</td>
<td>BBB</td>
<td>BBB-</td>
</tr>
<tr>
<td>A-</td>
<td>Security rating</td>
<td>Security rating</td>
<td>BBB-</td>
<td>BB+</td>
</tr>
<tr>
<td>BBB+</td>
<td>Security rating</td>
<td>Security rating</td>
<td>Security rating</td>
<td>BB</td>
</tr>
<tr>
<td>BBB</td>
<td>Security rating</td>
<td>Security rating</td>
<td>Security rating</td>
<td>BB</td>
</tr>
<tr>
<td>BBB-</td>
<td>Security rating</td>
<td>Security rating</td>
<td>Security rating</td>
<td>BB</td>
</tr>
<tr>
<td>BB and below</td>
<td>Security rating</td>
<td>Security rating</td>
<td>Security rating</td>
<td>Security rating</td>
</tr>
</tbody>
</table>

1. For purposes of inferring a long-term minimum eligible rating for entities that have only short-term ratings, or in transactions where only short-term ratings on the counterparty are referenced, the following apply:
   - 'A-1+' corresponds to 'AA-'.
   - 'A-1' corresponds to 'A' for financial institutions, and 'A-' for all other entities.
   - 'A-2' corresponds to 'BBB'.
   - 'A-3' corresponds to 'BBB-'.

2. To meet the minimum eligible rating of 'A', the entity should also have a short-term rating of 'A-1'.

3. To meet the minimum eligible rating of 'BBB', the entity should also have a short-term rating of 'A-2'.

ICR—Issuer credit rating.

### Appendix 6: Summary Of Criteria Update

119. These criteria adopt the proposed changes outlined in the RFC, most notably the expanded framework for derivatives and the classification of certain types of bank accounts as direct limited support. Furthermore, these criteria revise key aspects of the framework for derivatives.

120. These changes to the general framework, and in particular the criteria revisions for derivatives, further support the replacement premise by providing for additional replacement options, enhancing swap agreement liquidity, and reducing swap transaction costs.

121. Since the implementation of "the Dec. 6, 2010 framework" (comprising "Counterparty And Supporting Obligations Methodology And Assumptions," published Dec. 6, 2010, "Counterparty And Supporting Obligations Update," published Jan. 13, 2011, "Expanding The Scope of Counterparty Criteria To Corporate And Government Ratings," published June 21, 2011, and "Global Counterparty And Supporting Obligations Framework For Classifying Currencies," published June 28, 2011) and throughout the RFC period, we have considered market feedback and...
monitored market developments. The expanded framework for derivatives may be applied by a wider range of counterparties depending on their motivations, ratings, and sensitivity to collateral costs.

122. The changes from the Dec. 6, 2010 framework are, as follows:

**Derivatives**

123. **Expanded replacement framework.** These criteria view that similar credit quality may be achieved through balancing the minimum eligible counterparty rating (or the replacement trigger) and the collateral amount. Therefore, the criteria expand to four from one the number of combinations of minimum eligible counterparty ratings and collateral amounts, where higher minimum eligible counterparty ratings result in lower collateral amounts. These criteria consider that the commitment to replace at a higher rating level balances the need for collateral as an incentive to replace, because the security rating is closer to the counterparty's ICR. Option 1 reflects the Dec. 6, 2010 framework for minimum eligible counterparty ratings and collateral amounts. Options 2, 3, and 4 require higher minimum eligible counterparty ratings, but lower collateral amounts to achieve the same rating on a supported security (see paragraphs 68-69 and table 4).

124. **Documentation of multiple options.** Because the criteria view the different replacement options as achieving comparable credit quality, a structure that outlines upfront one or all of the replacement options to support the same maximum potential rating is consistent with the criteria framework (see paragraphs 70-71).

125. **More market-standard features to increase liquidity.** These changes should result in more market-standard derivative instruments, leading to increased liquidity. The changes are consistent with assigning the maximum potential rating, provided there are structural features that enhance the likelihood of counterparty replacement (see paragraphs 109-111). The role of the collateral remains to facilitate counterparty replacement, so that the collateral continues to provide an economic incentive to replace, but the terms in the agreement do not impede replacement by being too onerous. These changes are the following:

- External marks: These criteria remove the requirement for the provision of external marks for all replacement options.
- Netting: These criteria expand the netting provision. These criteria allow for netting the derivative contract's value against an applicable volatility buffer, when the value of the contract is in favor of the counterparty. Prior to this expansion, netting was possible only if a counterparty provided a firm commitment to replace itself (see paragraph 98).
- Volatility buffers—use of weighted-average life (WAL): These criteria now determine applicable volatility buffers according to the derivative agreement's weighted-average life. The calculation of WAL should be based on a prepayment rate of 0%, or such other stressed low prepayment rate as indicated in the relevant criteria for the hedged asset or liability (see paragraph 99).
- Volatility buffers for securities rated below 'AAA': These criteria introduce lower volatility buffers for supported securities rated below 'AAA'. The reduced volatility buffers reflect lower stresses applied to the lower ratings, as well as the fact that the maximum potential rating is closer to the counterparty's ICR. For securities rated in the 'AA' category and those rated 'A+' or lower, the volatility buffers are respectively about 65% and 30% of the applicable levels for 'AAA' ratings (see Appendix 1).
- Currency of the collateral: These criteria now accommodate posted collateral in currencies other than that of a derivative counterparty's payment obligation. This is subject to the counterparty posting additional collateral to address the foreign exchange risk and the counterparty's payment obligation and posted collateral being denominated in currencies classified in currency risk groups 1 or 2 (see Appendix 2).
Contingent right to terminate. These criteria clarify that if an SPE's right to terminate a derivative contract after a counterparty has failed to replace itself is contingent on a bid by a potential replacement counterparty, then a breach of agreement should apply to the counterparty and it should covenant to replace as soon as reasonably practicable (rather than "within the remedy period") (see paragraph 110).

Failing to implement remedies on obligations. These criteria clarify that if a counterparty fails to implement remedies relating to a supported security, then ratings may be lowered on other supported securities with similar obligations from the same counterparty (see paragraph 20).

Direct support obligations

Limited exposure. These criteria classify bank accounts classified as direct support obligations under the Dec. 6, 2010 framework as direct limited support, except for bank accounts collateralized by cash in funded synthetic structures. This change decreases the minimum eligible counterparty rating for the affected accounts. However, the minimum eligible counterparty rating for bank accounts collateralized by cash in funded synthetic transactions and other functionally equivalent obligations in those transactions has increased, such that the rating on these securities will be no higher than one notch above the relevant counterparty's ICR.

Other changes

Categories. These criteria reclassify the previous three categories of counterparty risk under the Dec. 6, 2010 framework (namely other support obligations, direct support obligations, and derivatives) into four categories: bank accounts, indirect support obligations, direct support obligations, and derivatives. The associated minimum eligible counterparty ratings have not changed. The reclassification serves to improve clarity and ease of application of the criteria as it pertains to certain types of obligations.

Currency risk framework. Reserve currencies are classified in group 1. The currencies that are currently considered reserve currencies include British pound sterling, euro, Japanese yen, and U.S. dollar (see paragraph 91).

Temporary investments. These criteria do not apply to temporary investments that fall under the scope of “Global Investment Criteria For Temporary Investments In Transaction Accounts,” published May 31, 2012.

These criteria supersede or partially supersede the articles below.

Superseded

• Global Counterparty And Supporting Obligations Framework For Classifying Currencies, June 28, 2011
• Expanding The Scope of Counterparty Criteria To Corporate And Government Ratings, June 21, 2011
• Counterparty And Supporting Obligations Update, Jan. 13, 2011
• Counterparty And Supporting Obligations Methodology And Assumptions, Dec. 6, 2010

Partially superseded

• Updated Criteria For Deposit Insurance For Commingling Risk In Japan RMBS Deals, Dec. 6, 2010
• Methodology And Assumptions For Rating Japanese Credit Card And Consumer Loan Securitizations, Sept. 29, 2010
• Methodology And Assumptions For Rating Japanese Lease Receivables Securitizations, May 11, 2010
• Equipment Leasing Criteria: Credit Risks Evaluated In Lease-Backed Securitizations, Sept. 1, 2004
• Equipment Leasing Criteria: Legal Considerations In Rating Lease-Backed Transactions, Sept. 1, 2004
• U.S. Residential Subprime Mortgage Criteria: Legal Criteria For Subprime Mortgage Transactions, Sept. 1, 2004
Appendix 7: Glossary Of Terms

Additional collateral amount
If the security does not include an additional termination event (ATE), the amount of additional collateral a derivative counterparty posts after it is required to remedy a breach of the minimum eligible counterparty rating for replacement. The additional collateral amount applies to all four replacement options.

Additional termination event (ATE)
A provision that allows a trustee to terminate a swap before its maturity.

Bank account
For purposes of these criteria, an on-demand deposit. It is one of the four categories of counterparty obligations.

Collateral amount
The amount of collateral a derivative counterparty is required to post under these criteria.

Currency risk group
The risk category to which the criteria assign currencies, ranging from group 1 (lowest risk) to group 4 (highest risk).

Derivative
These criteria use the term "derivative" interchangeably with "swap".

Direct support obligation
A counterparty obligation that provides direct credit support or liquidity support to a security.

Direct limited support
A counterparty obligation that does not fit the definitions for bank accounts, indirect support obligations, direct substantial support obligations, or derivatives.

Direct substantial support
A direct support obligation with a typical exposure amount greater than 5% of the original pool balance (or current pool balance if applicable), and an exposure period greater than 365 days.

Eligible counterparty
A counterparty whose ICR is at least the minimum eligible counterparty rating.

External marks
Marks on swaps provided by a counterparty, from an entity that is independent from the counterparty and that is able to enter into the type of obligation being priced (e.g., a bank, broker/dealer, or insurance company).

Indirect support obligation
To qualify for treatment as an indirect support obligation under these criteria, (i) the aggregated exposure to the counterparty is expected to be small (e.g., typically no more than 5% of the original pool balance or, for revolving structures and programs with ongoing issuance, the higher of the original and current pool balances); (ii) the replacement period is up to 30 calendar days; and (iii) the analysis should show that either:
• The impact of a counterparty's failure to perform is not likely to cause a direct disruption of payments on the supported security during the replacement period; or
• An adverse impact on the supported security would only be likely to result from the occurrence of multiple events.

**Issuer credit rating (ICR)**  
Standard & Poor's issuer credit rating, either public or private.

**Maximum potential rating on supported security**  
The maximum rating that could be assigned to a security for a given minimum eligible counterparty rating.

**Minimum eligible counterparty rating**  
The lowest counterparty rating that can support a given maximum potential rating on a security prior to the remedy commitment coming into effect.

**Minimum eligible counterparty rating without collateral**  
For replacement options 1 and 2 only, the lowest counterparty rating that can support a given maximum potential rating on a security prior to posting collateral.

**Minimum eligible counterparty rating with collateral**  
For replacement options 1 and 2 only, the lowest counterparty rating prior to the remedy commitment coming into effect and at which the counterparty is posting collateral.

**Remedy**  
The cure following a counterparty's rating falling below the minimum eligible counterparty rating. These include replacing with an eligible counterparty or obtaining an appropriately rated guarantor. For certain obligations, prefunding the obligation, drawing-to-cash, or funding a reserve is required if a suitable remedy has not been found.

**Remedy period**  
The period during which the counterparty must provide a remedy.

**Replacement principle**  
The basic premise that a security rating may be higher than the ICR on the counterparty because an ineligible counterparty can be replaced within a short time.

**Temporary investment**  
Investment in which cash from collections or held in a reserve account is invested according to a transaction's investment guidelines (see "Global Investment Criteria For Temporary Investments In Transaction Accounts," published May 31, 2012).

**Variant features**  
Variations in the structural features of a counterparty obligation, which according to these criteria leads to a downward adjustment of the maximum potential rating on a supported security.

**Volatility buffer**  
A component of the collateral amount calculated as a percentage of the swap notional amount.
RELATED CRITERIA AND RESEARCH

- Covered Bonds Counterparty And Supporting Obligations Methodology And Assumptions, May 31, 2012
- Methodology And Assumptions: Assigning Ratings To Bonds In The U.S. Based On Escrowed Collateral, May 31, 2012
- Standard & Poor's Ratings Definitions, May 23, 2012
- Assessing Credit Quality By The Weakest Link, Feb. 13, 2012
- Request For Comment: Counterparty And Supporting Obligations Methodology And Assumptions--Expanded Framework, Nov. 21, 2011
- Sovereign Government Rating Methodology And Assumptions, June 30, 2011
- Global Counterparty And Supporting Obligations Framework For Classifying Currencies, June 28, 2011
- Expanding The Scope of Counterparty Criteria To Corporate And Government Ratings, June 21, 2011
- Request For Comment: Covered Bonds Counterparty and Supporting Obligations Methodology And Assumptions, March 23, 2011
- Principles Of Credit Ratings, Feb. 16, 2011
- Counterparty And Supporting Obligations Update, Jan. 13, 2011
- Counterparty And Supporting Obligations Methodology And Assumptions, Dec. 6, 2010
- Updated Criteria For Deposit Insurance For Commingling Risk In Japan RMBS Deals, Dec. 6, 2010
- Methodology And Assumptions For Rating Japanese Credit Card And Consumer Loan Securitizations, Sept. 29, 2010
- Request For Comment: Methodology And Assumptions For Market Value Securities, Aug. 31, 2010
- Methodology And Assumptions For Rating Japanese Lease Receivables Securitizations, May 11, 2010
- Update To Global Methodologies And Assumptions For Corporate Cash Flow And Synthetic CDOs, Sept. 17, 2009
- Joint-Support Criteria Update, April 22, 2009
- CDO Spotlight: Counterparty Risk In Structured Finance Transactions, March 7, 2005
- Equipment Leasing Criteria: Credit Risks Evaluated In Lease-Backed Securitizations, Sept. 1, 2004
- Equipment Leasing Criteria: Legal Considerations In Rating Lease-Backed Transactions, Sept. 1, 2004
- U.S. Residential Subprime Mortgage Criteria: Legal Criteria For Subprime Mortgage Transactions, Sept. 1, 2004
- Modeling Unhedged Foreign Exchange Risk in Structured Ratings, Nov. 20, 2000
- Leveraged Funds/Market Value Criteria And Overcollateralization Requirements: Leveraged Funds: Market Value Ratings Criteria, March 1, 1999

These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.
S&P may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P reserves the right to disseminate its opinions and analyses. S&P's public ratings and analyses are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription) and www.spcapitaliq.com (subscription) and may be distributed through other means, including via S&P publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.

S&P keeps certain activities of its business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain business units of S&P may have information that is not available to other S&P business units. S&P has established policies and procedures to maintain the confidentiality of certain nonpublic information received in connection with each analytical process.

S&P may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P reserves the right to disseminate its opinions and analyses. S&P's public ratings and analyses are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription) and www.spcapitaliq.com (subscription) and may be distributed through other means, including via S&P publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.

Credit-related and other analyses, including ratings, and statements in the Content are statements of opinion as of the date they are expressed and not statements of fact. S&P’s opinions, analyses, and rating acknowledgment decisions (described below) are not recommendations to purchase, hold, or sell any securities or to make any investment decisions, and do not address the suitability of any security. S&P assumes no obligation to update the Content following publication in any form or format. The Content should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. S&P does not act as a fiduciary or an investment advisor except where registered as such. While S&P has obtained information from sources it believes to be reliable, S&P does not perform an audit and undertakes no duty of due diligence or independent verification of any information it receives.

Credit-related and other analyses, including ratings, and statements in the Content are statements of opinion as of the date they are expressed and not statements of fact. S&P’s opinions, analyses, and rating acknowledgment decisions (described below) are not recommendations to purchase, hold, or sell any securities or to make any investment decisions, and do not address the suitability of any security. S&P assumes no obligation to update the Content following publication in any form or format. The Content should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. S&P does not act as a fiduciary or an investment advisor except where registered as such. While S&P has obtained information from sources it believes to be reliable, S&P does not perform an audit and undertakes no duty of due diligence or independent verification of any information it receives.

To the extent that regulatory authorities allow a rating agency to acknowledge in one jurisdiction a rating issued in another jurisdiction for certain regulatory purposes, S&P reserves the right to assign, withdraw, or suspend such acknowledgement at any time and in its sole discretion. S&P Parties disclaim any duty whatsoever arising out of the assignment, withdrawal, or suspension of an acknowledgment as well as any liability for any damage alleged to have been suffered on account thereof.

S&P keeps certain activities of its business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain business units of S&P may have information that is not available to other S&P business units. S&P has established policies and procedures to maintain the confidentiality of certain nonpublic information received in connection with each analytical process.
KEY CREDIT FACTORS AND ASSUMPTIONS FOR ENERGY PROJECTS

Key Credit Factors For Power Project Financings

Key Credit Factors For Oil And Gas Project Financings

Market Assumptions Used For Oil And Gas Project Financings
Criteria | Corporates | Project Finance:

Key Credit Factors For Power Project Financings

**Primary Credit Analysts:**
Terry A Pratt, New York (1) 212-438-2080; terry.pratt@standardandpoors.com
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Aneesh Prabhu, CFA, FRM, New York (1) 212-438-1285; aneesh.prabhu@standardandpoors.com

**Secondary Contacts:**
Nicole D Martin, Toronto (1) 416-507-2560; nicole.martin@standardandpoors.com
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com
Anne C Selting, San Francisco (1) 415-371-5009; anne.selting@standardandpoors.com
Trevor J D'Olier-Lees, New York (1) 212-438-7985; trevor.dolier-lees@standardandpoors.com
Michela Bariletti, London (44) 20-7176-3804; michela.bariletti@standardandpoors.com
Pablo F Lutereau, Buenos Aires (54) 114-891-2125; pablo.lutereau@standardandpoors.com

**Criteria Officers:**
Mark Puccia, New York (1) 212-438-7233; mark.puccia@standardandpoors.com
Andrew D Palmer, Melbourne (61) 3-9631-2052; andrew.palmer@standardandpoors.com
Peter Kernan, London (44) 20-7176-3618; peter.kernan@standardandpoors.com

**Table Of Contents**

- SCOPE OF THE CRITERIA
- SUMMARY OF THE CRITERIA
- IMPACT ON OUTSTANDING RATINGS
- EFFECTIVE DATE AND TRANSITION
- METHODOLOGY
- Part I: Construction Phase SACP
  - A. Technology And Design Risk
Table Of Contents (cont.)

B. Construction Risk
C. Project Management
D. Financial Risk Adjustment

Part II: Operations Phase SACP
A. Performance Risk
B. Market Risk
C. Preliminary Operations Phase SACP (Including Base-Case Assumptions)
D. Adjusted Preliminary Operations Phase SACP

APPENDIX A
APPENDIX B

RELATED CRITERIA AND RESEARCH
1. Standard & Poor's Rating Services is refining and adapting its methodology and assumptions for its Key Credit Factors (KCF) for rating power project financings. We are publishing this article to help market participants better understand the key credit factors in this sector.

2. This article is related to our global project finance criteria (see "Project Finance Framework Methodology," published Sept. 16, 2014) and to our criteria article "Principles Of Credit Ratings," published Feb. 16, 2011.

SCOPE OF THE CRITERIA

3. These criteria apply to all electricity generation and transmission power project financings (referred to as "power projects" hereafter).

SUMMARY OF THE CRITERIA

4. These criteria specify the key credit factors relevant to analyzing the construction phase stand-alone credit profile (SACP) and the operations phase SACP for power projects, which we rate in accordance with "Project Finance Construction Methodology," published Nov. 15, 2013, and "Project Finance Operations Methodology," published Sept. 16, 2014.

5. As indicated in tables 1 and 2, factors marked with an ‘X’ in the key credit factor column provide additional guidance to the sections of the "Project Finance Construction Methodology," Nov. 15, 2013, and "Project Finance Operations Methodology," Sept. 16, 2014. For factors not marked with an ‘X’ in the key credit factor column, the information provided in the "Project Finance Construction Methodology," Nov. 15, 2013, and "Project Finance Operations Methodology," Sept. 16, 2014, apply. This KCF also provides the assumptions for determining our base and downside cases for power projects.

Table 1

<table>
<thead>
<tr>
<th>Power: Areas Of Additional Guidance</th>
<th>Where assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors</td>
<td>Construction phase criteria</td>
</tr>
<tr>
<td>A. Construction phase business assessment</td>
<td></td>
</tr>
<tr>
<td>1. Technology and design risk</td>
<td>X</td>
</tr>
<tr>
<td>a) Technology risk</td>
<td></td>
</tr>
<tr>
<td>i) Technology track record in this application</td>
<td>X</td>
</tr>
<tr>
<td>ii) Technology performance match to contract requirements and expectations</td>
<td>X</td>
</tr>
<tr>
<td>b) Design cost and variation risk</td>
<td></td>
</tr>
<tr>
<td>i) Degree of design completion and costing</td>
<td>X</td>
</tr>
<tr>
<td>ii) Design complexity</td>
<td>X</td>
</tr>
<tr>
<td>2. Construction risk</td>
<td></td>
</tr>
</tbody>
</table>
**Table 1**

<table>
<thead>
<tr>
<th>Power: Areas Of Additional Guidance (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Construction difficulty</td>
</tr>
<tr>
<td>b) Delivery method</td>
</tr>
<tr>
<td>i) Contractor experience</td>
</tr>
<tr>
<td>ii) Degree of contract risk transfer</td>
</tr>
<tr>
<td>3. Project management</td>
</tr>
<tr>
<td>4. Adjusting the preliminary construction phase business assessment</td>
</tr>
</tbody>
</table>

**B. Financial risk adjustment**

<table>
<thead>
<tr>
<th>Where assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Funding adequacy (uses of funds)</td>
</tr>
<tr>
<td>2. Construction funding (sources of funds)</td>
</tr>
</tbody>
</table>

**C. Construction phase stand-alone credit profile**

| 1. Construction counterparty adjustment | X |   |
| D. Other factors                     |   | X |

**Table 2**

<table>
<thead>
<tr>
<th>Power: Areas Of Additional Guidance</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Factors</th>
<th>Operations phase criteria</th>
<th>Key credit factor</th>
</tr>
</thead>
</table>

**A. Operations phase business assessment**

<table>
<thead>
<tr>
<th>1. Performance risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Asset class operations stability</td>
</tr>
<tr>
<td>b) Project-specific contractual terms and risk attributes</td>
</tr>
<tr>
<td>i) Performance redundancy</td>
</tr>
<tr>
<td>ii) Operating leverage</td>
</tr>
<tr>
<td>iii) O&amp;M management</td>
</tr>
<tr>
<td>iv) Technological performance</td>
</tr>
<tr>
<td>v) Other operational risk factors</td>
</tr>
<tr>
<td>c) Performance standards</td>
</tr>
<tr>
<td>d) Resource and raw material risk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Market risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Market exposure (including downside-case guidance)</td>
</tr>
<tr>
<td>b) Competitive position</td>
</tr>
<tr>
<td>3. Country risk</td>
</tr>
</tbody>
</table>

**B. Determining the operations phase SACP**

<p>| 1. Preliminary operations phase SACP (including base-case guidance) |</p>
<table>
<thead>
<tr>
<th>2. Adjusted preliminary operations phase SACP</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Downside analysis</td>
</tr>
<tr>
<td>b) Debt structure (and forecast average DSCRs)</td>
</tr>
<tr>
<td>c) Liquidity</td>
</tr>
<tr>
<td>d) Refinance risk</td>
</tr>
<tr>
<td>e) Projects without fixed contractual maturity dates</td>
</tr>
<tr>
<td>f) SACPs in the 'ccc' or 'cc' categories</td>
</tr>
<tr>
<td>3. Final adjustment to arrive at the operations phase SACP</td>
</tr>
</tbody>
</table>
Table 2

Power: Areas Of Additional Guidance (cont.)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Corporates</th>
<th>Project Finance: Key Credit Factors For Power Project Financings</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Comparable ratings analysis</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>b) Counterparty ratings adjustments</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

O&M—Operations and maintenance. SACP—Stand-alone credit profile.

IMPACT ON OUTSTANDING RATINGS

6. These criteria in and of themselves, do not result in any rating changes (see "Project Finance Framework Methodology," Sept. 16, 2014).

EFFECTIVE DATE AND TRANSITION

7. These criteria are effective immediately. We intend to complete our review of all project finance issue credit ratings within the next six months.

METHODOLOGY

Part I: Construction Phase SACP

8. The construction phase SACP factors in an assessment of risks related to construction and its funding under the "Project Finance Construction Methodology," Nov. 15, 2013. To mitigate some elements of construction risk, power projects may use contractual agreements to transfer some elements of construction risk to counterparties. As such, the construction phase SACP includes an assessment of any contractual terms and potential risk transfer.

9. Power projects can be classified by the type of technology and contracts. Typical contracts and commercial arrangements include the following:

- Power purchase agreements (see the Glossary in "Project Finance Framework Methodology," Sept. 16, 2014). These are offtake contracts for power projects that generally consist of an availability fee that covers fixed costs, including debt service, that is paid subject to passing minimum availability standards; and an energy fee that covers the variable costs of generating electricity, such as fuel. The power project or offtaker may take the fuel price risk, while the power project typically takes the risk of converting the fuel to electricity. Sometimes the fee is paid only for the energy delivered.

- Tolling agreements (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014). These are offtake contracts for which a counterparty pays a power project to convert a feedstock (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014) into electricity or another product, such as steam, at a defined efficiency rate. Typically, the counterparty supplies the feedstock.

- Feed-in-tariff agreements (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014). These are offtake arrangements in which a power project is able to earn a revenue stream simply by feeding its production into the electric system. The feed-in-tariff can be paid in the form of a contract (such as in Canada) or by a regulatory regime (such as in Spain).
• Cogeneration arrangements (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014). These are offtake arrangements in which a buyer purchases the electricity produced from the waste steam or heat of an industrial process.

• Merchant arrangements (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014). These offtake arrangements typically involve a power project selling its electricity output into a wholesale or bilateral electricity market without long-term contracts, making its competitive position a key credit factor. These power projects may also enter into short-term contracts, such as heat rate call options with third parties or ancillary service agreements with a local transmission system operator, to mitigate market risk.

A. Technology And Design Risk

10. Power projects span from simple technological sophistication and operational challenges, such as a solar photovoltaic panel, to very advanced technology requiring highly skilled staff to maintain performance, such as an integrated gasification combined cycle technology. Power projects also operate in very diverse operating conditions. Use of inadequate technology for the expected application or poor design could inhibit a power project's ability to meet its expected operating performance, availability and efficiency levels, or delivered operating cost profile over its life span.

11. There are many types of generation technologies used in the power sector. For a given technology, advancement in technology is typically evolutionary over time, meaning that modest improvements are continually made to a power plant's underlying design. The advancements typically focus on materials or equipment that improve efficiency and reliability or on modest scale ups. However, sometimes a technology can represent a significant leap for the power industry, such as a new wind turbine that is double the size of the previous turbine.

12. There are many different power plants design configurations. The underlying technology typically has different design features, depending on the manufacturer; and the same technology from the same manufacturer might be designed differently to accommodate local environmental conditions. A wind turbine in a very cold environment would include a heater package, while the same turbine in a warm environment would not. The overall power plant design risk is typically greater than the underlying technology design risk. Overall design risk comprise all of the elements that need to be considered for the plant to operate and deliver its electricity to the market, including the ground (or sea) and air conditions of the site, the plant building and foundations, and the fuel supply and production offtake infrastructure. The large variation of site conditions and configurations can result in a large variation in design risk for power plants.

1. Technology track record in this application

13. Under the criteria, we generally assess the following key factors for assessing the track record of a power project's technology:

• Track record over the technology's lifecycle;
• Number of power plants in operation that use the technology;
• Track record of performing under similar operating conditions to those of the project, including fuel type;
• Performance predictability;
• Lifecycle maintenance predictability;
• Manufacture track record; and
• Track record of a mix of technologies and complexity.
14. The technologies we typically assess include the following:

- Generator;
- Turbine;
- Fuel conversion system, such as a boiler; and
- Transmission systems.

15. Under the criteria, an assessment of "commercially proven" typically reflects a high level of confidence, in our view, of how the project is likely to perform over its useful life in terms of operational performance, costs, life cycle timing, and effectiveness. The factors that typically support our assessment of a high level of confidence include a long history of commercial operation; a large number of projects that have exposure to the technology under different operation conditions, including the one for the project being rated; and statistically reliable data that generally indicate very predictable performance and stable operating costs. For example, we typically assess conventional polysilicon and monosilicon solar photovoltaic panel technology as "commercial proven" because the commercial period exceeds two decades in numerous locations globally; the panel's degradation performance over a 25-year period is predictable, based on substantial and reliable commercial degradation rate data over the same length of time; and maintenance is easy, with costs well established by the industry. If a "commercially proven" technology does not have a track record in the operating conditions of the project being rated, we typically assess it as "proven" or weaker.

16. An assessment of "proven" typically reflect a satisfactory operating track record relative to the power project's scope and technology life in a similar application, but the operating period does not cover a period long enough to provide a very reliable estimate of operating performance, cost, and lifecycle profile. The factors that typically support this assessment include a meaningful number of uses of the technology in several different operating conditions, reliable data on likely future performance and costs, and a sound understanding of the power project's lifecycle. An example is a natural gas-fired turbine that has been used in a large number of power plants and has shown steady performance through at least one major lifecycle and good cost predictability. We typically classify a technology that meets the characteristics of "commercially proven" with minor modifications in this category.

17. An assessment of "proven but not in this application or arrangement" will typically apply to a technology that meets the characteristics of "proven" but has a limited number of applications in a limited number of operating conditions or one that links two proven technologies, but there is uncertainty about the effectiveness of the power projects' integration. An example is a natural gas-fired combustion turbine that meets the characteristics of "proven" but is operating for the first time on a synthetically produced form of natural gas that may have impurities that could affect the turbine's performance or lifecycle. Another example is where a proven wind turbine designed for onshore use is used in an offshore project. Once a project has operated for a period of time and developed a track record that would support reliable long-term forecasts, we typically revise the assessment to "proven."

2. Technology performance match to contract requirements and expectations

18. Power projects may use various types of offtake contracts, such as power purchase agreements, tolling agreements, and feed-in tariffs (see paragraph 9) that have various types of performance requirements. More common contract types and typical performance requirements have minimum availability limits measured over a prescribed time period (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014). These availability levels take scheduled maintenance and expected forced outages into account.
19. We analyze a power project's technology performance relative to its availability limits based on the following:

- The technology's expected maintenance cycle and reliability performance, which may include both the fuel supply system (including boilers) and the power generation equipment; and
- The time period over which the availability is measured.

20. For merchant power projects that do not have contract requirements, we assess a project's technology match to the level of dispatch (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014) needed to meet its target generation, which we establish in our base-case performance expectations (see paragraph 82 and table 7).

21. We typically assess a power project's technology performance match to contract requirements as "exceeds" when the technology exceeds all contractual requirements with a significant cushion so that full revenue would be earned even in periods of significant performance shortfalls. By significant, in this case, we generally mean that the expected performance in our base case will exceed the performance required to obtain full payment by a cushion of about 10%. For example, if a power project earns full payment under a contract when it demonstrates 80% availability and we expect it to operate at 94% availability in our base case with little variation, we will typically assess the project as "exceeds."

22. We typically assess a power project's technology performance match to contract requirements as "falls short of minor" when the contractual requirements would not be fully met under normal operating conditions, but the impact of underperformance is not likely to have a material effect on the power project's performance or cash flow. For example, we assess a coal plant as "falls short of minor" if it meets its primary availability requirement but falls short of its secondary heat rate requirement and does not suffer material cash flow loss due to underperformance.

23. We typically assess a power project's technology performance match to contract requirements as "falls short of material" when the technology choice is not consistent with the expected application or where it does not meet a key performance requirement and the impact on cash flow is material. For example, a combustion turbine peaker technology designed only to operate in peaking periods of high electricity demand would be inconsistent for a project seeking to operate during most hours of the day because the peaker technology's relatively high cost structure would typically make it uncompetitive to other plants designed to operate this way. This could include a project that operates under a tolling contract where a failure to meet its target output results in a large payment reduction for a small drop in availability. We typically assess this case as "falls short of material" under the criteria.

3. Design complexity

24. Because power plants have been built extensively around the world, their general design for many technology types is well known. However, there are some power technology applications that have a limited track record of design performance, such as offshore wind plants. Nonetheless, few power plants have the same design because each one is designed specifically to accommodate local site and permitting conditions. By local site conditions, we generally mean the ground, air, sea, and environmental conditions; plot characteristics; water supply; storage areas; and the presence of other utility infrastructure adjacent to the site. The risk allocation of design factors for power projects among projects and counterparties can vary considerably, and we assess design complexity after contract mitigation. We consider planning and permitting risk a part of the project management assessment.
25. There are several factors that typically influence the complexity of a power project design that could impact its construction and likely operational performance under the criteria. They comprise the following:

- **Environmental regulations.** Restrictions on the emission of environmental contaminants or other discharges that are restricted under regulation or could negatively affect the environment are key parameters that influence a power plant's design. These contaminants could include oxides of nitrogen and sulfur, carbon, mercury, dust, and others. The discharges could include the water used for cooling that is put back into a river after use.
- **Ground conditions.** Soil with limited ability to structurally support building or dam loads may require more complex foundation designs to maintain building or dam stability. In addition, underground structures such as tunnels or flow tubes for hydro plants may require more complex foundation designs to prevent a tunnel collapse.
- **Air conditions.** The output of some types of power technologies is related to ambient air temperature or pressure, which can vary considerably during the year. Weather conditions can significantly affect the performance of some projects, such as icing on wind turbine blades. Similarly, solar projects that rely on annual rains to clean solar panels may experience lower output if rainfall is less than expected.
- **Sea conditions.** An inadequate assessment of sea conditions can result in immense unexpected loads on exposed equipment, which can significantly reduce useful life or result in substantial underperformance or damage. Sea conditions can also introduce significant construction challenges even in benign seas.
- **Water availability.** Many power plants rely on water for cooling equipment and supplying steam boilers. An inadequate assessment of the water supply could result in lower production capacity or the project not operating.
- **Site surveys.** Inadequate surveys can create uncertainty that could limit flexibility of design and cause unexpected delays and increase construction costs. Brownfield sites (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014) are at particular risk of inadequate survey data if existing buildings prevent survey access.
- **Utilities.** Sites that have a large number of utility service assets such as power lines or water pipes could limit working time and increase the risk of cable strikes, which in turn could lead to delays. Brownfield sites with limited records of utilities service asset positioning are particularly exposed to this risk.
- **Environmental conditions.** Contamination, endangered species, and unexpected archaeological finds could delay construction and increase construction costs.
- **Site access.** Very confined building sites without room for on-site material storage, poor road access, or complex decanting requirements and construction phasing can limit the contractor's ability to recover from unexpected delays.
- **Refurbishment works and building conversions.** Sometimes a power project involves converting a plant from one technology to another, such as converting a coal-fired plant to a natural gas-fired plant. These works can create uncertainty regarding the impact on both construction time and cost, particularly when structural works are undertaken. In addition, the refurbished building's long-term performance could also be less certain than that of a new building.

26. Under the criteria, we assess the following factors to determine the design complexity assessment:

- **"Proven design."** The design and construction sequence does not require material modification from known designs to account for site conditions, based on solid available site condition survey information, good construction site access, and little refurbishment work. Examples include simple solar or wind power plants with simple support foundations that have been installed in numerous ground conditions globally.
- **"Modified proven design."** This includes an otherwise straightforward design and construction sequence that has been tailored to meet specific site conditions, such as environmental conditions, utilities, or site access. This assessment typically applies to a commonplace combustion turbine design that has been significantly adjusted to
accommodate site conditions.
• "Established design modified for site conditions." This assessment typically applies to power projects where the
design either has not been extensively used or requires a lot of changes to meet site conditions or permit
requirements. This typically includes a large coal plant in a tight configuration with a complex fuel feedstock system
that is significantly different from common designs due to plot restrictions or nearby facilities.
• "Simple first of kind." This type of power project typically employs a design that is new but simple. For example, a
capacity flywheel that has not been installed in the planned configuration but is assessed to work based on its
simple design premise.
• "Complex first of kind." Power projects are unlikely to receive this assessment, since most offtakers and investors
would not likely be attracted to the risks involved. A project will typically receive this assessment when it employs a
new design with a complex configuration.

B. Construction Risk

1. Construction difficulty

27. Power plant design usually includes a number of components, such as the design and supply of the power generation
system (the physical assets through which electricity is produced); the fuel delivery and conversion system, such as a
boiler; and the balance of plant, which includes other works such as buildings, concrete foundations, and operations
facilities. These contracts may also cover connections to the fuel supply or energy grid, or they may be contracted to
third parties not under the power project's direct control.

28. When assessing a power project's construction difficulty and counterparty linkages, we may differentiate between the
civil engineering tasks and the technology supplier tasks. We may further differentiate material and nonmaterial
construction and supply works (see "Project Finance Construction And Operations Counterparty Methodology," Dec.
20, 2011).

29. Under the criteria, an assessment of "simple building task" typically applies to a power project that is built with simple
construction equipment under most environmental conditions using proven technology generally comprising simple
small-scale and proven modules. The power project types and construction activities that we generally expect to fall
into this category are solar photovoltaic, solar thin film, fuel cells, batteries, capacity flywheels, small scale
transmission lines, and simple underground cabling.

30. Some "simple building task" power projects that comprise a very large number of module components could be
exposed to construction delay risks if logistics management is not performed well. This is especially true if
components are being imported from other countries. If we believe that weak logistics management would increase
the risk of construction delay, we typically assess the construction complexity as "moderately complex building or
simple civil engineering task" instead of "simple building task." This could occur if, for example, we view the logistics
management for a large solar power project that comprises millions of solar panels sourced from different
manufacturing plants around the world as weak.

31. The types of power projects we typically assess as "moderately complex building or simple civil engineering task"
include onshore wind turbines, skid-mounted natural gas-fired combustion turbines, large scale transmission lines, and
substations. These power projects involve more sophisticated works and specialized equipment, compared with those
for simple building projects, and include cranes and rigs that require skilled operators.

32. The types of power projects we typically assess as "civil or heavy engineering task" include boilers, tunnels and dams for hydropower plants, combined cycle natural gas-fired plants, drilling for geothermal plants, collecting solar tower power plants, conventional coal-fired plants, and offshore wind and subsea transmission in benign sea conditions. These types of power projects typically involve large pieces of equipment that are transported great distances and erected on site, and require specialty skills and equipment.

33. The types of power projects that we typically assess as "heavy engineering-to-industrial task" include solar collecting tower power plants that store electricity generated in a molten medium, supercritical coal fired plants, offshore wind plants in harsh sea environments, and integrated gasification combined cycle plants.

34. The types of power projects that we typically assess as "industrial task complex building task" include nuclear power plants.

C. Project Management

35. Project management is a key consideration for power projects, and it assesses the management of the risk the power project retains responsibility for. We assess project management using seven components, as defined in the "Project Finance Construction Methodology," Nov. 15, 2013. This KCF provide additional guidance for assessing only the "design approval" component, as outlined below.

36. We generally expect to assess a power project's "design approval" as "positive." Nearly all power projects are built to strict technical requirements established by the offtaker and regulatory bodies. Also, most power plant technologies typically have well-known operating profiles and procedures. So the additional credit benefit of having operators and users or offtakers approve the design to limit construction or operational problems is typically less than, say, in a typical large transportation concession project where the concessionaire's design input and approval are a fundamental part of the project.

37. A "negative" assessment is likely in situations where the scope of the design is not well defined or is unlikely to meet all local regulatory requirements, which could impede the project's ability to operate as expected.

38. In cases where a power project is designed to integrate in a complex way with another project, such as a combined cycle power plant providing steam and electricity to a refinery, the operator and user's or offtaker's approval of the design is important, given the additional performance requirements that the power project will typically have to meet, such as variations in electricity and steam supply and the quality of the steam going into the refinery process. In this situation, we assess "design approval" using the "Project Finance Construction Methodology," Nov. 15, 2013.

D. Financial Risk Adjustment

1. Construction base case

39. Most power projects use an engineering, procurement, and construction contract to mitigate most construction cost
and delay risk for nearly all elements of a power project. The key risks that typically remain for the project in this sector are force majeure risk (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014), which contractors usually will not take, and the cost and delay associated with any significant change orders to the design during construction that the project and the contractors agree to. Power projects may also be exposed to delay due to variations that are agreed to during the construction process. If we conclude that force majeure is a significant risk or that change orders are likely to occur, we typically make provisions within our base-case scenario to account for such likely delays or cost increases.

40. Some power projects allocate major construction efforts to a major contractor and then less challenging works to other third parties. One arrangement is where the project employs one contractor for the electricity production system and another contractor for the balance of plant, with neither contractor providing full responsibility for the power project's completion. The electricity production contractor will typically engineer, procure, and construct the production components on foundations established by the balance of plant contractor. In these situations, our base case typically includes additional cost and delay that could result from disagreements between the two contractors on the scope, quality, and schedule of construction works.

41. Another typical construction risk allocation arrangement in the power sector is a situation where a project uses a contractor for the main electricity production components and several other local contractors for the balance of plant works. Usually, local contractors perform this balance of plant works under cost-plus agreements. This balance of plant works could include simple underground cabling to connect an array of wind turbines to a substation, erecting dock and rail facilities for a solid fuel handling system, building natural gas supply lateral to a major pipeline, or erecting the operations and maintenance building. In these situations, we use information from our previous experience with the sector and, if available, from the contractors or independent experts to determine the likely construction cost and schedule impact in our construction base case.

42. In rare circumstances where a project does not use fixed-price contracts and the construction is undertaken on a "cost plus" basis or using a schedule of rates, we will, for the purpose of our base case, use the information the project and its contractors provide and supplement it with data gathered from similar projects in the sector. We will also use, where relevant, input from an independent expert.

2. Construction downside case

43. A primary risk exposure for a project in this sector is the failure and subsequent timely replacement of the project's building contractor. We calculate the forecast costs associated with replacing the construction contractor in accordance with "Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011. The downside case includes an allowance for the impact of a replaceable builder not already included in the counterparty replacement analysis (see paragraph 76 of the "Project Finance Construction Methodology," Nov. 15, 2013). In cases where our issuer credit rating or credit estimate on the construction contractor is equal to or higher than the construction phase SACP profile before counterparty adjustment, the construction phase SACP is not weak-linked (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014) to the construction counterparties. As a result, the available liquidity can be allocated entirely to fund the downside scenario, or we would complete a counterparty dependency assessment for the contractor.
44. Another primary risk exposure for a power project is its failure to complete tasks under its own control that are required to complete construction or even to pass critical performance tests during the construction process. Our downside analysis factors in the potential for delay in completion of tasks that are within the power project's scope.

45. Factors that could cause an increase in engineering, procurement, and construction contract prices, which the construction downside case takes into account, include the residual risks to a project after any contractual mitigants due to variation-related delays or cost increases; planning consents; ground contamination; construction works that are required to be completed in close proximity to existing assets; and delays and cost increases linked to land acquisition, where the power project retains this risk. We also assess the potential delays related to inclement weather against the provisions that have been incorporated in the construction program, such as a contingency allowance (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014). Our downside scenario could incorporate further weather-related delays if we conclude that the contingency allowance will be fully used under normal weather conditions.

46. The construction downside cost scenario includes our assessment of likely cost increases or revenue shortfall in the following allowances:

- Project operating costs. This includes project salary allowances, office availability, insurances, and additional lender-related costs (such as increased monitoring fees and higher margins).
- Operations and maintenance costs incurred during the construction period. For example, a power project will typically deploy its operations and maintenance staff to begin work when the construction is near completion to help support completion testing and prepare for initial operations after completion.
- The impact from a reduction in expected revenues when construction funding relies on revenues earned during the construction period. This impact is offset in some cases by third-party support, such as an equity commitment or a letter of credit that replaces dollar for dollar the shortfall in construction phase revenues.
- Any construction-delay risks that the power project's owner accepts. These may include, for example, the risks the power project accepts if the construction delay is not covered by liquidity available on demand (such as through a letter of credit) or revised construction schedule.
- Additional costs the power project incurs directly in relation to the risks the construction contractor is not responsible for. These could include land acquisition costs or the costs related to the buildout of a natural gas pipeline lateral to a major gas pipeline.

Part II: Operations Phase SACP

47. The operations phase SACP factors in an assessment of risks related to operational, market, and financial performance and adjustments. To mitigate some elements of operations phase risk, power projects can often use contractual agreements to transfer some elements of this risk to counterparties. As such, the operations phase SACP includes an assessment of any contractual terms and potential risk transfer.

A. Performance Risk
1. Asset class operational stability

48. For power projects, we use the following guidance to assess the asset class operations stability defined in the "Project Finance Operations Methodology," Sept. 16, 2014. Power technologies assessments generally fall in the range of '2', which represents simple processes that are easy to operate with predictable stability, to '6', which represents technologies involving complex processes that present significant operational challenges. In rare cases, assessments of '7' to '9' are possible, which reflect much higher sophistication and potential for lengthy outages.

- A '2' assessment typically includes solar photovoltaic, fuel cell, batteries, capacity flywheels, very simple land-based transmission lines of limited scale with no substations, and steam turbines because of the relatively simple processes involved and the well-understood lifecycle requirements, which have contributed to a track record of stable availability rates.

- A '4' assessment typically includes boilers, onshore wind and combustion turbines, solar thermal, and geothermal due to greater sophistication of technology, which require more specialized skills and equipment to maintain performance and deal effectively with outages. Subsea transmission lines typically fall into this category.

- A '5' assessment typically includes combined-cycle gas turbines, offshore wind, hydro, conventional coal, and some biomass due to these power projects' additional complex electrical or mechanical engineering aspects and access challenges in some cases. Maintenance is more challenging and requires specialty equipment.

- A '6' assessment typically includes supercritical coal and more complex biomass, reflecting a higher level complex or chemical interactions and advanced skills to maintain performance and perform effective predicative maintenance.

- A '7' or '8' assessment typically includes integrated gasification combined cycle plants due to a higher level of mechanical or electrical sophistication and interactions that can result in a greater uncertainty about how outages could occur and how long they will last. Existing nuclear power plants will typically be included in this category.

- A '9' assessment typically includes relatively new nuclear power plants, reflecting the high level of complexity with dangerous materials and potential for long outages along with designs that may be relatively new.

49. Our assessment of the asset class operational stability uses a weak-link approach when more than one technology is involved. For example, a power project that comprises a peaking power plant that is assessed as '4' and a combined cycle plant that is assessed as '5' is typically assessed as '5' under this KCF.

2. Performance standards

50. A power project that generates revenues through contracts can face risk if it does not meet the minimum performance requirements specified in the various contracts. Penalties for underperformance are also an important risk consideration. They can vary from a linear reduction in revenue for underperformance to outright contract termination. We perform this assessment based on the power project's specific contract terms. We summarize the typical types of contract revenue streams and related performance requirements for power projects in table 3.

Table 3

<table>
<thead>
<tr>
<th>Typical Power Project Contract Revenue Streams And Performance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Typical main revenue stream</strong></td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td><strong>Regulation</strong></td>
</tr>
<tr>
<td>Contracted price</td>
</tr>
<tr>
<td>Utility - rare</td>
</tr>
</tbody>
</table>
### Table 3

**Typical Power Project Contract Revenue Streams And Performance Requirements (cont.)**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Corporates</th>
<th>Project Finance: Key Credit Factors For Power Project Financings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand forecasts</td>
<td></td>
<td>Cost of service</td>
</tr>
<tr>
<td>Feed-in-tariff (sometimes in form of a contract)</td>
<td>Fixed-price tariff for all energy delivered, possibly with escalators; no volume guarantee</td>
<td>Minimum level of electricity production over a period</td>
</tr>
<tr>
<td>Capacity markets</td>
<td>Capacity payment, usually based on market auctions and fixed for a short number of years</td>
<td>Tested capacity annually</td>
</tr>
<tr>
<td>Availability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax credits/grants</td>
<td>Fixed tax credit per unit of production</td>
<td>Level of production</td>
</tr>
<tr>
<td>Fixed grant tied to capital cost</td>
<td>Grant typically tied to completion of construction and startup of plant</td>
<td></td>
</tr>
<tr>
<td>Contracts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power purchase agreement/concession</td>
<td>Capacity payment subject to availability</td>
<td>Availability</td>
</tr>
<tr>
<td>Energy payment covering variable operating costs</td>
<td>Conversion efficiency (such as heat rate)</td>
<td></td>
</tr>
<tr>
<td>Payments for other services as contracted</td>
<td>A minimum level of electricity production (such as geothermal, solar, and wind)</td>
<td></td>
</tr>
<tr>
<td>All types may have escalators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tolling agreement</td>
<td>Fixed price capacity payment subject to availability that may have escalator</td>
<td>Availability</td>
</tr>
<tr>
<td>Variable operation and maintenance start or stop fees, and heat rate adjustment for dispatch variation</td>
<td>Conversion efficiency (heat rate)</td>
<td></td>
</tr>
<tr>
<td>Merchant</td>
<td>Price of power sold into wholesale markets or short-term bilateral agreements</td>
<td>Availability</td>
</tr>
<tr>
<td>Heat rate call options</td>
<td>Conversion efficiency (heat rate)</td>
<td></td>
</tr>
<tr>
<td>Price of renewable energy credits</td>
<td>Cost competitiveness</td>
<td></td>
</tr>
<tr>
<td>Penalties for failing to provide bid energy or capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cycling profile of plant: base load nuclear, base load fossil fuel, and peaking</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3. Resource and raw material

51. Power projects secure access to resource and raw material feedstocks in different ways. Many power projects tap directly into resource and raw material reserves, such as run-of-river hydro, wind, solar, and geothermal. A coal power plant that relies on its own coal mine for all feedstocks is another example. Our resource and raw material assessment for these types of projects focuses on the characterization of the natural resource to determine if the resource or raw material will be available in the quantity and quality needed to meet production and performance expectations.

52. Some power projects such as combined cycle gas turbine plant and coal plants will typically contract for feedstocks with third parties. In these cases, our analysis focuses on contract terms and counterparty creditworthiness. Sometimes, these projects might obtain part or all feedstocks on spot markets or under very short-term contracts. In those cases, after contract mitigation, we focus on the power project's ability to secure from the market the quantity and quality of resource and raw material it needs to meet production forecasts.

53. Contractual arrangements typically have two components: one contract for the supply of a feedstock and another contract for the transportation and delivery of a feedstock. Quality requirements are a major consideration of the
contracts, and supply contracts vary from a few months to a power project's entire asset life. We assess fuel supply price risk under "market risk."

54. A power project might take force majeure risk in supply contracts. For example, a coal supplier would likely be excused from supplying coal under a contract if a severe winter storm interrupts its ability to mine coal and deliver it to a transportation hub. In this case, we assess the likelihood of this event and the mitigants to this risk, such as the availability of alternate suppliers or large stockpiles on site that can support expected operation for several weeks or months.

55. Transportation of natural gas feedstocks typically occurs in pipelines that have limitations on throughput. Some projects will contract for "firm" transportation rights to pipeline capacity, which insures that the power project's contract capacity is always available whenever demand for the pipeline capacity exceeds supply. Under firm contracts, the power project may be exposed to force majeure risk. In this case, we assess the potential for force majeure interruption along the pipeline and examine any mitigants to this risk, such as the availability of alternate supply chains. Some power projects will contract for "non-firm" transportation rights to pipeline capacity that give the power project access to pipeline capacity when its capacity is not being fully utilized. This could introduce risk, since the power project may not be able to obtain fuel when there is high demand on the pipeline. Under transportation contracts, a power project may take force majeure risk, so we assess the potential and mitigants for this risk as noted above.

56. An assessment of "minimal" requires essentially no risk of interruption of resource and raw material to the power project. Under contractual situations, this requires that there is essentially no impact on the power project under likely force majeure events through the supply chain. For example, a reliable contractual coal supplier could expose the power project to lower volumes during winter months due to weather force majeure events, but a stockpile of several months of supply at the power project could mitigate this risk. We typically assess a natural gas-fired power plant that lacks a supply contract for fuel as "minimal" only if it was located in a mature natural gas market that has proven reserves well in excess of the power project's needs, with direct access to multiple natural gas pipelines. A "minimal" assessment also applies in situations in which a power project has direct access to a resource that can supply its expected requirements comfortably.

57. An assessment of "modest" matches the attributes of a "minimal" assessment except that there is a higher risk of interruption in the supply of resource or raw material to the power project due to greater risk of contract force majeure interruptions that could negatively affect production or performance, or due to an increased reliance on the availability of natural resources. We typically assess a solar resource as "modest" when we have a high level of confidence in the resource estimation, based on reliable analysis from multiyear data at the site that supports a long-term view of resource availability. We typically assess a geothermal project as "modest" in situations where the geothermal resource is well characterized by solid and reliable data on the resource's actual performance, provided that analysis indicates that the proven resource life will comfortably supply the power project's expected needs.

58. Our assessment of "moderate" typically applies when there is some uncertainty that resource and raw material will be available at all times in the quantity and quality expected. This assessment typically applies to natural resources that exhibit significant variability or that are not well characterized, in our opinion. Generally, if the resource is likely to
vary from a baseline amount by 10%-20% over the long term or 20%-30% in the short term, in our view, we typically assess the resource as "moderate" and apply a '+2' adjustment to the asset class operations stability assessment. If the long-term variation is higher, generally between 20%-30% from a baseline amount, in our view, or if the short-term variation is greater, generally 30%-40%, we typically assess the resource as "moderate" and apply a '+3' adjustment to the asset class operations stability assessment. For example, if a run-of-river hydro project has limited on-site data suggesting that production could vary plus or minus 25% from a baseline amount over the long term, we typically assess this resource as "moderate" with a '+3' adjustment to the asset class operations stability assessment.

59. Sometimes a power project consists of a portfolio of several individual projects of generally similar size in which each project relies on a separate natural resource regime to generate cash flow. An example is a wind project portfolio comprising seven individual wind projects located in different parts of Australia, and each project relies on a wind regime that is independent from the wind regime supplying the other projects. By independent, we mean that variation in one wind regime is not highly correlated to the variation of another, based on analysis of historical data. In this case, we expect the overall variation in the wind project's production to be less variable than the production from any single project in the portfolio. Therefore, we typically assess the project one level better than the lowest assessment among the individual projects in the portfolio. For example, if each of the seven projects in the portfolio had a resource assessment of "moderate" with a '+2' adjustment, we typically assess the overall power project portfolio as "modest."

60. A project that relies on a solar or wind resource may have limited or no operating data. In these situations, we will conclude our assessment of resource and raw materials risk after taking into account information that can provide us with a long-term view of resource adequacy, including reliable data that is available for the project site, and, if available, an experienced independent expert's statistical assessment of the resource and the likely production of electricity from it. For projects of this type, we will assess resource and raw materials using the methodology defined in Appendix A and table 10.

61. We generally assess transmission projects as "minimal," since they are not typically exposed to resource and raw material risk.

B. Market Risk

62. Market risk assesses the likely impact nonperformance market-related risks have on a power project's cash flow after factoring in contract terms that mitigate market risk and the project's competitive position. These risks generally include the power project's ability to sell and deliver all of its production to offtakers or into the market, the electricity price it earns for its production, the cost it pays for raw materials that influence its cost structure, and the penalty for under-delivering on a contract requirement.

63. If a power project's cash available for debt service drops by less than 5% from the base case to the market downside case, we do not assess market risk. For example, there is typically no market risk for a tolling power plant that is usually exposed only to operational availability and efficiency risk.

64. The type of market a power project is operating in influences the level of market risk. There are generally three types of power markets, and each has different levels of market risk. They are as follows:
Regulated markets: where typically a central authority periodically establishes market prices based on anticipated demand to provide a participant with a fixed return on equity investment. In this case, we typically conclude that the project is not exposed to market risk. However, some regulated power projects may be subject to regulated tariff, which mitigates market price risk, but are still exposed to volume risk, such as a merchant transmission project that has a regulated tariff but no captive customer base.

Administered wholesale markets: where typically a central authority manages a power market for buyers and sellers in which market price signals typically determine the volumes delivered. Cash flow in these markets can be quite volatile when market prices are driven by commodity prices, which in and of themselves can be volatile. This volatility could also affect a power project's ability to economically place all of its output into the market. Some markets, however, exhibit more stable pricing, hence much less market risk. Administered markets could also include capacity markets in which producers receive a capacity payment, based generally on available production capacity, to attract investment and maintain a certain reserve margin for the region. Revenues from a capacity market may be less variable than those from an energy market.

Bilateral markets: where typically there often is no established deep market, and buyers and sellers contract directly with each other. However, bilateral markets may also exist within administered wholesale markets, such as when a utility that is active in wholesale markets contracts directly with a geothermal project. In addition, some governments may offer long-term contracts as a form of support to power projects in these types of markets to incentivize investment in certain technologies, particularly renewable technologies. If a power project has a contract in this type of market that covers price and volume risk, we generally conclude no or "very low" market exposure. For an uncontracted power project in a bilateral market, market exposure could be very high. For example, a project with a high cost position may not be able to secure any meaningful bilateral contract and thus earn little or no cash flow.

A power market may have a limited history. Therefore, when assessing market downside conditions for power projects (as noted in the "Project Finance Operations Methodology," Sept. 16, 2014), we look at unfavorably low points within the market's limited historical context and make any adjustments to historical performance to reflect current market factors. For example, if a new carbon tax is imposed that results in higher power prices, we take this carbon tax into account when assessing low historical power pricing for the downside case.

1. Market exposure

Market exposure risk addresses a power project's exposure to nonoperational risks and includes adverse movements in market conditions and cost of inputs to the project commensurate with very depressed market conditions (as noted in the "Project Finance Operations Methodology," Sept. 16, 2014). When we assess market exposure, we base the projected decline in cash flow available for the debt service used on our market downside case (see table 4 for more detail). We typically evaluate the risk of higher costs for variable and fixed operations, maintenance, and major maintenance as an operating stress in the downside case.

We generally expect that power projects with power purchase agreements, tolling agreements, and feed-in-tariff arrangements will not be exposed to market risk when there is very limited fuel price risk and very limited transmission curtailment.

The key market risks for power projects aside from regulation include the following:

- Power price, base or peak, depending on which market the plant must deliver into;
- Ability to sell all potential production volume into the market;
• Fuel cost;
• Transmission interruption and dispatch constraints; and
• Exposure to replacement cost for contract underperformance.

69. The price of power is typically a function of many demand and supply factors, and it is heavily influenced by the overall configuration of the market's transmission system. Power projects in most established markets are typically price takers, so they are not usually able to significantly influence market price. However, some projects in bilateral markets are able to influence market prices by their scale or location.

70. The price of power can influence the amount of production volume that a power project can economically place into the market. If the market price for a period of time is not sufficient to cover a power project's total cost of production, it is typical for a power project to not operate and thus not sell into the market during that time (though some may operate during that time to avoid the cost of shut down and restart). Since market prices typically vary during the day and over the course of a year, the amount of production that a plant will sell into the market could vary as well. Generally, the lower the cost of production, the more volume a power project can sell into the market. For example, nuclear plants generally have low costs of production in relation to other power plants in the system and thus are able to operate at full capacity and sell all possible production volume into the market economically. A combined cycle power plant usually has a much higher overall cost of production than a nuclear power plant, and it thus operates only during the day when demand for electricity is high but not at night when other lower-cost power plants can supply the lower demand. For this power plant, the price of power determines its level of operation and the revenue it earns when operational.

71. The cost profile of a power project is closely related to its fuel cost and the fuel costs of other power plants in the market. If a power project's fuel cost changes significantly, the result would likely be either an improved or worse-off cost position relative to the market. This new cost structure could significantly affect the power project's ability to sell economically into the market. For example, if a coal plant with a cost profile that is very stable due to stable coal prices competes with a natural gas-fired plant, when the cost of natural gas is high, the coal plant would typically be the lower cost producer; but if natural gas prices were to decline to very low levels, the coal plant would then be the higher cost producer, which could result in lower capacity factors (see Glossary in "Project Finance Framework Methodology," Sept. 16, 2014) and cash flow for the coal plant.

72. When there is a linkage between price and volume, we focus on the power project's energy margin to assess market exposure. The energy margin for a period is equal to revenue net of fuel costs.

73. Fuel costs could expose a power project to revenue and cost mismatch under an offtake contract. For example, when an offtaker pays a project for production based on the price of fuel at one location, but the project is only to obtain the fuel at a different location where the price is much higher; or when an offtaker pays a project for production based on the price of one fuel, but the project uses a different fuel.

74. Natural resource power projects, such as solar and wind and run-of-river hydro, will produce electricity and sell it into the market whenever the resource is sufficient to allow production. Market prices do not affect those power projects' ability to sell all of their output into the market. We capture volume risk for these types of projects in our "resource and raw material" assessment.
Power projects are typically exposed to transmission interruption, or "curtailment" risk in two ways: if the transmission line used to deliver the electricity is at full capacity and, as a result, the project is not able to deliver its production; or if the transmission line is unavailable to take the power the project produces due to a system outage. A power project could mitigate the first type of risk through a contract in which the offtaker takes all transmission risk or by obtaining firm transmission rights on the transmission system to ensure that the power project has the capacity to deliver all of its production at all times. In situations where there is no effective contractual mitigant to transmission curtailment risk, our assessment of transmission curtailment risk takes into consideration the historical level of transmission outages and any likely changes planned for the transmission system that might result in greater or fewer outages.

Some power projects have offtake contracts that introduce the following exposure to replacement risk: if the project does not produce an expected amount of electricity, it has to pay the offtaker for the amount not delivered at market rates. While this market risk is due to the price exposure, we account for it only in our downside case, since it is typically due to operational underperformance.

<table>
<thead>
<tr>
<th>Market Exposure: Market Downside Case Guidance For Power Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market factors</strong></td>
</tr>
<tr>
<td><strong>Price and volume</strong></td>
</tr>
<tr>
<td><strong>We typically use commodity prices to define our downside case for power projects on a similar basis to that in the downside case in &quot;Key Credit Factors for Oil and Gas Project Financings,&quot; Sept. 16, 2014. However, our assumption of commodity prices could be more (or less) severe relative to historical conditions if we consider the past 20 years to have been relatively benign (or abnormally stressful).</strong></td>
</tr>
<tr>
<td><strong>When taking historical prices into account, we assess variations that have been driven by outside factors, such as changes in regulation or additional tax (such as carbon tax). We then look to normalize those historical prices to forecast prices and ensure a like-for-like comparison. For example, in a power market where power prices have been stable since its development and a new carbon tax is introduced that we conclude will lead to higher market power prices since the tax will be passed on to consumers, if we use historical power prices to develop our assumption of future power prices, we adjust those historical power prices upward to reflect the impact of the new carbon tax.</strong></td>
</tr>
<tr>
<td><strong>For a capacity market, we assume a capacity price generally reflecting two factors: about one-third of the capital cost required to attract investment in new power plants and the reserve margin the market administrators usually establish.</strong></td>
</tr>
<tr>
<td><strong>Typically a 2% increase from our base-case assumptions. We would typically assume no transmission curtailment if the project is in a well-established power market—one that is centrally administered with a proven track record of very high reliability—and the transmission system, for example, is not undergoing significant expansion.</strong></td>
</tr>
</tbody>
</table>

2. Competitive position

We assess competitive position for power projects based generally on the following five attributes:

- Regulatory support and predictability,
- Barriers to entry,
- Delivered cost relative to peers,
• Fuel supply, and
• Transmission access.

78. We assess our "competitive position" for power projects as defined in tables 5 and 6. Note that for a factor not matching the descriptors for either "positive" or "negative" in table 5, we assess it as "neutral."

Table 5

<table>
<thead>
<tr>
<th>Factor</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation support</td>
<td>Stable and transparent regulatory regime.</td>
<td>Weak regulatory regime. Significant potential for unfavorable changes to</td>
</tr>
<tr>
<td>and predictability</td>
<td>Low probability for adverse changes to tariff regimes or contracts.</td>
<td>tariff regime or contracts. Significant potential for introduction of new</td>
</tr>
<tr>
<td></td>
<td></td>
<td>costs that are difficult to quantify and that producers would likely bear.</td>
</tr>
<tr>
<td></td>
<td>Low potential for introduction of new industry costs that cannot be fully</td>
<td></td>
</tr>
<tr>
<td></td>
<td>passed through to offtakers or customers.</td>
<td></td>
</tr>
<tr>
<td>Barriers to entry</td>
<td>Strong long-term electricity demand prospects.</td>
<td>Weak long-term demand prospects.</td>
</tr>
<tr>
<td></td>
<td>High commercial barriers to entry.</td>
<td>Limited commercial barriers to entry, or government programs that</td>
</tr>
<tr>
<td></td>
<td></td>
<td>strongly support the addition of significant capacity on uneconomic terms.</td>
</tr>
<tr>
<td>Delivery cost relative</td>
<td>First-quartile delivery cost position and strong reliability record.</td>
<td>Third-quartile or worse delivered cost position, poor reliability, or</td>
</tr>
<tr>
<td>to peers</td>
<td></td>
<td>capacity factor that can vary materially over market cycles.</td>
</tr>
<tr>
<td></td>
<td>Capacity factor is not likely to vary significantly during market cycles</td>
<td></td>
</tr>
<tr>
<td>Fuel supply</td>
<td>Firm fuel supply and transport that may be supplemented with fuel</td>
<td>Non-firm fuel supply and transport in a market lacking depth and</td>
</tr>
<tr>
<td></td>
<td>switching capability with no loss of performance.</td>
<td>maturity of supply and transport.</td>
</tr>
<tr>
<td>Transmission access</td>
<td>Low potential for curtailment risk.</td>
<td>Significant potential for curtailment risk.</td>
</tr>
</tbody>
</table>

Table 6

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Typical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>All five factors in table 5 are assessed as &quot;positive.&quot;</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>Three of the factors in table 5 are assessed as &quot;positive,&quot; but none are assessed as &quot;negative.&quot;</td>
</tr>
<tr>
<td>Fair</td>
<td>Applies when the assessments of &quot;strong,&quot; &quot;satisfactory,&quot; and &quot;weak&quot; (as defined in this table) are not met.</td>
</tr>
<tr>
<td>Weak</td>
<td>More than two factors in table 5 are &quot;negative&quot; and no assessments are &quot;positive,&quot; or a &quot;negative&quot; assessment of any one factor that by itself severely constrains the project's ability to generate and sell power.</td>
</tr>
</tbody>
</table>

79. For a power project that has market risk but sells all of its output to an offtaker for a known price, we assess the competitive position as "strong" or "satisfactory" (as defined in table 6). We typically assess the market risk as "strong" when the revenue earned does not vary with the power project's capacity factor, which the offtaker usually controls, and as "satisfactory" when there is some potential for the revenue to be based on the capacity factor.

80. For a power project in a bilateral market, we assess the "competitive position" as "strong" (as defined in table 6). For this assessment, we also require that the power project's delivered cost structure is (and will) likely remain essentially the lowest in the region and that it supplies electricity to large and growing load centers.

81. For solar, wind, hydro, and geothermal projects, fuel supply is usually not a competitive factor, and we have already accounted for those power projects' fuel supply risk in our assessment of "resource and raw material." Therefore, we
assess fuel supply risk as "positive" (as defined in table 5) for these types of projects.

C. Preliminary Operations Phase SACP (Including Base-Case Assumptions)

82. The minimum debt service coverage ratios (DSCRs) we use in table 15 in the "Project Finance Operations Methodology," Sept. 16, 2014, are based on the DSCRs for the power project that result from our base-case assumptions. We develop our base-case assumptions using the guidance in table 7.

Table 7

<table>
<thead>
<tr>
<th>Power Projects: Standard &amp; Poor's Base-Case Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
</tr>
<tr>
<td><strong>Operational factors</strong></td>
</tr>
<tr>
<td>Performance (availability, conversion efficiency, etc.)</td>
</tr>
<tr>
<td>Variable operations and maintenance cost</td>
</tr>
<tr>
<td>Routine operations and maintenance cost</td>
</tr>
<tr>
<td>Major maintenance schedule and cost</td>
</tr>
<tr>
<td>Fuel supply risk</td>
</tr>
<tr>
<td>Natural resource and raw material availability</td>
</tr>
<tr>
<td><strong>Market factors parameters</strong></td>
</tr>
<tr>
<td>Key commodity and raw materials costs and basis differentials</td>
</tr>
<tr>
<td>Power prices</td>
</tr>
<tr>
<td>Capacity prices and emissions-related taxes</td>
</tr>
</tbody>
</table>
We typically develop our assumptions based on historical demand patterns for the project location and make adjustments to the historical trend to reflect current market developments. To the extent that our demand assumptions are tied to economic factors, we rely on Standard & Poor's economic assumptions.

Electricity markets are subject to changing regulation. We typically factor into our analysis the likely impact of regulation that has been approved but not yet implemented. In situations where regulation has not yet been approved but approval is highly likely, in our view, we are likely to factor the impact of the proposed regulation into our analysis.

D. Adjusted Preliminary Operations Phase SACP

1. Downside analysis

Our downside case combines our market downside case (see table 4) with our operational downside assumptions and financial stresses linked to any refinancing, where relevant. We develop our downside case generally using the guidance in table 8.

Table 8

<table>
<thead>
<tr>
<th>Operational factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
</tr>
</tbody>
</table>
| We typically assume delivery volume and quality equal to the worst level we expect for this factor over a 20-year period. For example, for a run-of-river hydro plant that has been operating for many years and sees annual variation in water supply, our downside case typically uses a water flow assessment that is near the low point of the historical performance. And for a coal plant that relies solely on coal from its own coal mine and has a track record of consistent quality but volume disruptions periodically due to extreme weather events, our downside case reflects a level of supply curtailment due to potential weather events and also factor in any mitigant to supply disruption, such as a large on-site stockpile of coal that could supply the plant for several months. For projects that rely on solar or wind resources that have limited or no operating data and on an independent expert's statistical resource and production forecasts, we establish the base case using the methodology defined in Appendix A.

| Operations and routine maintenance and major maintenance costs |
| We generally use a 10%-15% increase from our base-case expectation for a "neutral" technology performance assessment: 10% when the operations and maintenance (O&M) management assessment in the "Project Finance Operations Methodology," Sept. 16, 2014, is "positive," 15% when it is "negative" (see paragraph 32 of the "Project Finance Operations Methodology," Sept. 16, 2014), and 12% when it is otherwise. We generally use a 15%-25% increase from our base-case expectation for a "negative" technology performance assessment: 15% when the O&M management assessment is "positive," 25% when it is "negative," and 20% when it is otherwise. We generally use a 25%-40% increase from our base-case expectation for a "very negative" technology performance assessment: 25% when the O&M management assessment is "positive," 40% when it is "negative," and 32% when it is otherwise.

| Resource and raw materials availability |
| We assume delivery volume and quality equal to the worst level we expect for this factor over a 20-year period. For example, for a run-of-river hydro plant that has been operating for many years and sees annual variation in water supply, our downside case typically uses a water flow assessment that is near the low point of the historical performance. And for a coal plant that relies solely on coal from its own coal mine and has a track record of consistent quality but volume disruptions periodically due to extreme weather events, our downside case reflects a level of supply curtailment due to potential weather events and also factor in any mitigant to supply disruption, such as a large on-site stockpile of coal that could supply the plant for several months. For projects that rely on solar or wind resources that have limited or no operating data and on an independent expert's statistical resource and production forecasts, we establish the base case using the methodology defined in Appendix A.
Table 8

<table>
<thead>
<tr>
<th>Power Projects: Standard &amp; Poor's Downside Case Assumptions Guidance (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance degradation: Typically a 3% increase from our base case. For example, if a combustion turbine has a base-case efficiency rate of 9,000 million Btu per kilowatt hour, the downside case efficiency rate would be 9,270 million Btu per kilowatt hour (that is, 9,000 x [100% + 3%]). We generally would not assume a continually declining degradation, since most power projects will typically perform periodic maintenance to recapture efficiency losses. For solar power projects, which typically experience an annual decline in output due to panel degradation, we would typically assume that degradation is 25% greater than the annual degradation assumed in the base case. These types of projects typically do not perform periodic maintenance on the solar panels to recapture lost efficiency. For example, if the base case assumes an annual solar degradation of 0.9%, we would assume an annual degradation of 1.125% (that is, 0.9% x [100% + 25%]) in the downside case.</td>
</tr>
</tbody>
</table>

2. Liquidity

84. Liquidity is important for power projects, since they experience periodic outages that can involve substantial downtime and repair costs. In addition, major maintenance costs are incurred every few years and such costs can be quite large and difficult to pay out of operating cash flow. Under this KCF, a “neutral” liquidity assessment for a power project typically includes the following:

- A six-month debt service reserve. However, if cash flow is highly seasonable, a larger debt service reserve is typically required to assess liquidity as “neutral.” For example, if a wind project has equal winter and summer debt payments but earns 80% of cash flow in winter and 20% in summer, a one-year debt service reserve is typically required for a “neutral” assessment, absent other accessible liquidity that provide an effective six-month reserve.
- An operations and routine maintenance reserve or similar liquidity sized on a rolling basis to cover expected operating expenses. The amount typically relates to the technology’s overall complexity, the operations and maintenance tasks, and the availability of spare parts.
- A major maintenance reserve or similar liquidity that is typically funded in advance of expected need—if the power project performs periodic major maintenance. The period of advance funding typically depends on both the amount of major maintenance expenditure in relation to the amount of cash flow after paying expenses and filling reserves and how often it occurs. If major maintenance costs are a small share of this cash flow, advance funding of generally six to 12 months or so helps to ensure that the major maintenance reserve is full when needed. If major maintenance costs are a significant share of this cash flow, then funding several years in advance would generally provide more assurance that the major maintenance reserve will be fully funded when needed. The appropriate time period depends on the expenditure amount and the cash flow up to that point. The key issue is that funding is provided comfortably in advance of need.

85. A power project may allocate major maintenance costs and performance risks to a third party under what is typically known in the power industry as a long-term service agreement (LTSA). LTSA’s are project specific but may typically provide equivalent protection as the major maintenance reserve. However, an LTSA’s value is subject to the skill and creditworthiness of the counterparty selected to perform the major maintenance work (see "Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011).

3. Refinance risk

86. In U.S. markets in which merchant power plants are frequently bought and sold in a generally transparent market process, we may also assess power projects on a debt-per-kilowatt comparable valuation basis to supplement our project life coverage ratio (PLCR) analysis in paragraphs 91-93 in that criteria. For example, we may value a U.S. 500 megawatt combined cycle gas turbine plant in the well-established PJM power market at about $1,000 per kilowatt, resulting in a valuation of $500 million. If this plant had $250 million of debt, the PLCR would be 2x.
87. In markets outside the U.S., we expect to apply the "Project Finance Operations Methodology," Sept. 16, 2014 for the DSCR and PLCR analysis.

88. For the purpose of calculating post-refinancing DSCRs over the remaining asset life of a power project, we use the asset lives outlined in table 9. Note that for refinancing risk analysis we reduce these asset life spans depending on the power project’s operation phase business assessment (OPBA) in paragraph 85 of the "Project Finance Operations Methodology," Sept. 16, 2014. However, we may assume a longer asset life in situations if we believe the actual wear and tear on the asset has been below industry average for such plant, or if we believe the plant has been maintained at levels well above industry norms.

89. We would take into account the asset's actual performance and, if available, input from an independent expert. For example, if a combined cycle project designed to operate at a 60% capacity factor actually operated at a 25% capacity factor for many years due to market conditions, we would likely assume an asset life longer than 25 years, provided that the asset had been properly maintained as scheduled and we assessed the future operational profile to fall within the project's design capabilities. However, if we expect the project to operate at an 85% capacity factor due to limited market supply, we would typically conclude that such a profile exceeds the plant's design parameters, and we would, therefore, typically not assume a longer asset life than recommended in table 9. On the other hand, if the actual capacity factor was lower than expected due to persistent operational problems at the project, we would not assume an asset life greater than 25 years and would instead likely assume a shorter asset life due to operational underperformance. For example, if a plant designed for a 60% capacity factor operated at a 20% capacity factor but had a history of material operational problems not typically seen for the asset class, we would typically not assume a longer asset life than recommended in table 9.

Table 9

<table>
<thead>
<tr>
<th>Power Project</th>
<th>Asset life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustion turbine</td>
<td>Up to 25 years</td>
</tr>
<tr>
<td>Combined cycle gas turbine</td>
<td>Up to 30 years</td>
</tr>
<tr>
<td>Wind - onshore</td>
<td>Up to 25 years</td>
</tr>
<tr>
<td>Wind - offshore</td>
<td>Up to 20 years</td>
</tr>
<tr>
<td>Solar photovoltaics and thin film</td>
<td>Up to 25 years</td>
</tr>
<tr>
<td>Solar tower</td>
<td>Up to 25 years</td>
</tr>
<tr>
<td>Coal</td>
<td>Up to 40 years</td>
</tr>
<tr>
<td>Geothermal</td>
<td>Up to 25 years; up to field life</td>
</tr>
<tr>
<td>Hydro</td>
<td>Up to 50 years</td>
</tr>
</tbody>
</table>

APPENDIX A

90. A project using a solar or wind resource to produce electricity may lack an operating track record. In this situation, we conclude our resource and raw materials risk assessment after taking into account information that provide a long-term view of resource adequacy, including reliable data available for the project site and, if available, an experienced independent expert's statistical assessment of both the resource and the likely production of electricity
from it. In this case, we would typically expect the independent expert to cover not only solar and wind resource forecasts but also specific technology, operating cost, capital expenditure, and maintenance requirements.

91. Solar or wind resource forecasting is typically based on a statistical analysis of resource data relevant to the project's location and site conditions. For solar and wind projects, we typically assess resource and raw materials risk and develop our base case and downside case as defined in table 10. We typically adjust the resource and raw material assessment defined in table 10 down by at least one notch if we consider the projected cash flow to be highly dependent on resource available during very short periods of the year, unless compensated for by liquidity reserves. We typically adjust the resource and raw material assessment defined in table 10 down by at least one notch if we conclude that the independent expert have limited experience with assessing the solar or wind resource regimes or the power project's technology.

92. The independent expert should be experienced (see "Credit FAQ: Provision of Information for Assessing Project Finance Transactions," published Dec. 16, 2013). In addition to their relationship with the project sponsors, we also focus on the independent expert's experience and expertise. The key attributes include the following:

- **Independence.** The independent expert is typically engaged for the debt providers' benefit rather than the project sponsors', and the expert's compensation should not be directly linked to the project's successful financing.
- **Experience.** The independent expert should have appropriate prior experience in the sector the project covers as well as in the country where the project is located. For example, being a mining expert covering Scandinavia may not be sufficient to assess a mining project in Africa, given the different operational, weather, and market conditions.
- **Track record.** An independent expert's track record may also support its experience in a particular area.

93. We typically expect an independent expert report to include the following:

- **Factual presentation of the project.** This summarizes what the independent expert has specifically reviewed and analyzed, and it ensures that all aspects of the project have been considered.
- **Risk assessment of the project.** This covers all the risks pertinent to the independent expert's area of focus that could result in cash flow disruptions. For example, if the independent expert is assessing the construction of a power plant, the report would usually include the risk that the plant may not be built on budget or on time and that it ultimately may not perform as designed. The independent expert would then typically group the risks according to their likelihood of occurrence (low to high probability) and impact (low to high impact) to ensure that the key risks (high probability and high impact) are thoroughly reviewed.
- **Other sections.** These include the independent expert's views and analysis of the related parties' ability and experience in similar projects as well as the sponsors' assumptions in certain key areas. For example, for public-private partnership projects, the independent expert would typically review the payment mechanism and determine the level of financial abatements that could occur. For power projects, the independent expert would typically opine on assumed availability levels over the life of the project, including any potential deterioration as the plant ages.
Table 10

<table>
<thead>
<tr>
<th>Asset type, asset composition, and the amount of on-site data included in the independent expert's analysis</th>
<th>Typical resource and raw materials assessment</th>
<th>Typical base-case assumption for power production probability of exceedance value*</th>
<th>Typical downside case assumption for power production probability of exceedance value§</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single solar site - significant data (see paragraphs 57-58)</td>
<td>1</td>
<td>P90</td>
<td>P99</td>
</tr>
<tr>
<td>Single solar site - limited data (see paragraphs 57-58)</td>
<td>2</td>
<td>P90</td>
<td>P99</td>
</tr>
<tr>
<td>Portfolio of several solar sites - significant data (see paragraphs 57-59)</td>
<td>1</td>
<td>P90</td>
<td>P99</td>
</tr>
<tr>
<td>Portfolio of several solar sites - limited data (see paragraphs 57-59)</td>
<td>2</td>
<td>P90</td>
<td>P99</td>
</tr>
<tr>
<td>Single wind project - significant data (see paragraphs 57-58)</td>
<td>2</td>
<td>P90</td>
<td>P99</td>
</tr>
<tr>
<td>Single wind project - limited data (see paragraphs 57-58)</td>
<td>3</td>
<td>P90</td>
<td>P99</td>
</tr>
<tr>
<td>Portfolio of several wind sites - significant data (see paragraphs 57-59)</td>
<td>1/2†</td>
<td>P90</td>
<td>P99</td>
</tr>
<tr>
<td>Portfolio of several wind sites - limited data (see paragraphs 57-59)</td>
<td>3</td>
<td>P90</td>
<td>P99</td>
</tr>
</tbody>
</table>

*P90—An electricity production amount that would be exceeded 90% of the time when assessed statistically on a one-year period. §P99—An electricity production amount that would be exceeded 99% of the time when assessed statistically on a one-year period. †We typically use a ‘1’ assessment when the portfolio is highly diversified with a large number of sites that show little or no correlation of natural resource regimes. Otherwise, we use a ‘2’ assessment.

APPENDIX B

This article follows Standard & Poor's Request for Comment, where we solicited public feedback to the proposed criteria (see "Request for Comment: Key Credit Factors For Power Project Financings," published Dec. 16, 2013). The comments we received contributed to the changes we included in these criteria, and they are outlined in the article "RFC Process Summary: Standard & Poor's Summarizes Request For Comment Process For New Project Finance Methodology," published Sept. 16, 2014.

RELATED CRITERIA AND RESEARCH

Related Criteria
- Project Finance Framework Methodology, Sept. 16, 2014
- Project Finance Operations Methodology, Sept. 16, 2014
- Project Finance Transaction Structure Methodology, Sept. 16, 2014
- Project Finance Construction Methodology, Nov. 15, 2013
- Project Finance Construction And Operations Counterparty Methodology, Dec. 20, 2011
- Principles of Credit Ratings, Feb. 16, 2011
Related Research

- Credit FAQ: An Overview of Standard & Poor's Criteria For Assessing Project Finance Operating Risk, Sept. 16, 2014

These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.
S&P may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P reserves the right to disseminate its opinions and analyses. S&P's public ratings and analyses are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription) and www.spcapitaliq.com (subscription) and may be distributed through other means, including via S&P publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.

S&P keeps certain activities of its business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain business units of S&P may have information that is not available to other S&P business units. S&P has established policies and procedures to maintain the confidentiality of certain nonpublic information received in connection with each analytical process.

S&P may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P reserves the right to disseminate its opinions and analyses. S&P's public ratings and analyses are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription) and www.spcapitaliq.com (subscription) and may be distributed through other means, including via S&P publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.
Criteria | Corporates | Project Finance:

Key Credit Factors For Oil And Gas Project Financings

**Primary Credit Analysts:**
Karim Nassif, Dubai (971) 4-372-7152; karim.nassif@standardandpoors.com
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Terry A Pratt, New York (1) 212-438-2080; terry.pratt@standardandpoors.com

**Secondary Contacts:**
Michela Bariletti, London (44) 20-7176-3804; michela.bariletti@standardandpoors.com
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com
Pablo F Lutereau, Buenos Aires (54) 114-891-2125; pablo.lutereau@standardandpoors.com
Paul Judson, CFA, Toronto 416-507-2523; paul.judson@standardandpoors.com
Trevor J D'Olier-Lees, New York (1) 212-438-7985; trevor.doler-lees@standardandpoors.com
Anne C Selting, San Francisco (1) 415-371-5009; anne.selting@standardandpoors.com

**Criteria Officers:**
Mark Puccia, New York (1) 212-438-7233; mark.puccia@standardandpoors.com
Andrew D Palmer, Melbourne (61) 3-9631-2052; andrew.palmer@standardandpoors.com
Peter Kernan, London (44) 20-7176-3618; peter.kernan@standardandpoors.com

**Table Of Contents**

- SCOPE OF CRITERIA
- SUMMARY OF THE CRITERIA
- IMPACT ON OUTSTANDING RATINGS
- EFFECTIVE DATE AND TRANSITION
- METHODOLOGY
- Part I: Construction Phase SACP
  - A. Technology And Design Risk
Table Of Contents (cont.)

B. Construction Risk
C. Project Management
D. Financial Risk Adjustment

Part II: Operations Phase SACP
A. Performance Risk
B. Market Risk
C. Preliminary Operations Phase SACP (Including Base-Case Guidance)
D. Adjusted Preliminary Operations Phase SACP

APPENDIX A
APPENDIX B

RELATED CRITERIA AND RESEARCH
Criteria | Corporates | Project Finance:
Key Credit Factors For Oil And Gas Project Financings

1. Standard & Poor's Ratings Services is refining and adapting its methodology and assumptions for its key credit factors for rating oil and gas project financings. We are publishing this article to help market participants better understand the key credit factors in this sector.

2. This article is related to our global project finance criteria (see “Project Finance Framework Methodology,” published on Sept. 16, 2014) and to our criteria article "Principles Of Credit Ratings," published Feb. 16, 2011.

SCOPE OF CRITERIA

3. These criteria apply to all oil and gas projects, which we broadly separate into four asset groups:
   - Refining, processing, and liquefied natural gas (LNG): This group of assets involves converting or separating hydrocarbons into value-add energy products that can be sold into commodity markets.
   - Pipelines: These are typically transmission systems or integrated transmission and distributions systems that transport natural gas and liquids across regions to link supply with demand, bridging price or basis differentials.
   - Storage: This involves storing commodities such as liquid fuels, crude oil, or natural gas. Storage is principally used to meet load variations. For example: When gas is injected into storage during periods of low demand and withdrawn from storage during periods of peak demand. It is also used for a variety of secondary purposes such as balancing the load in pipeline systems. Such assets can capture the intrinsic value of seasonal price swings and the extrinsic value of short-term volatility. Storage facilities also ensure reliability of supply, and provide aggregation and blending services to customers.
   - Vessels: This includes assets such as crude tankers, LNG tankers, or drill ships that are typically chartered to offtakers and can be geographically deployed into different markets. Tankers generally transport commodities between regions that are not well linked by pipelines. Drill ships are typically used in the exploration and production of fossil fuels.

SUMMARY OF THE CRITERIA

4. These criteria specify the key credit factors relevant to analyzing the construction phase stand-alone credit profile (SACP) and operations phase SACP for oil and gas assets, which we rate in accordance with "Project Finance Construction Methodology" published Nov. 15, 2013, and "Project Finance Operations Methodology" published Sept. 16, 2014.

5. As indicated in tables 1 and 2 below, factors marked with an 'X' in the KCF column provide additional guidance to the sections of the construction phase criteria and operations phase criteria. For factors not marked with an ‘X’ in the KCF column, the information provided in the construction phase criteria and operations phase criteria apply solely. This KCF also provides assumptions for determining our base and downside cases specific to oil and gas projects.
### Table 1

**Oil And Gas Projects--Construction Phase: Areas Of Additional Guidance**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Construction phase criteria</th>
<th>Key credit factor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Construction phase business assessment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Technology and design risk</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>a) Technological risk</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>i. Technology track record in this application</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ii. Technology performance match to contract requirements and expectations</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b) Design cost variation risk</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>i. Degree of design completion and costing</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ii. Design complexity</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Construction risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Construction difficulty</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b) Delivery method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Contract risk transfer</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ii. Contractor experience</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3. Project management</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4. Adjusting the preliminary construction phase business assessment</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>B. Financial risk adjustment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Funding adequacy (uses of funds)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Construction funding (sources of funds)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>C. Construction phase SACP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Construction counterparty adjustment</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>D. Other factors</strong></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2

**Oil And Gas Projects--Operations Phase: Areas Of Additional Guidance**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Operations phase criteria</th>
<th>Key credit factor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Operations phase business assessment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Performance risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Asset class operations stability</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b) Project--specific contractual terms and risk attributes</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>-Performance redundancy</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>-Operating leverage</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>-O&amp;M management</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>-Technological performance</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>-Other operational risk factors</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>c) Performance standards</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>d) Resource and raw material risk</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Market risk</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Table 2

<table>
<thead>
<tr>
<th>Oil And Gas Projects--Operations Phase: Areas Of Additional Guidance (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Market exposure</td>
</tr>
<tr>
<td>b) Competitive position</td>
</tr>
<tr>
<td>3. Country risk</td>
</tr>
</tbody>
</table>

B. Determining the operations phase SACP

<table>
<thead>
<tr>
<th>1. Preliminary operations phase SACP (including base-case assumptions)</th>
<th>X</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Debt service coverage ratios</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Adjusted preliminary operations SACP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Downside analysis</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b) Debt structure (and forecast average DSCRs)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>c) Liquidity</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>d) Refinance risk</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>e) SACPs in 'ccc' or 'cc' categories</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3. Final adjustments to arrive at the operations phase SACP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Comparable ratings analysis</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>b) Counterparty ratings adjustments</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

IMPACT ON OUTSTANDING RATINGS

6. We do not expect that these KCF criteria alone will cause project issue credit rating changes. See "Project Finance Framework Methodology", published Sept. 16, 2014.

EFFECTIVE DATE AND TRANSITION

7. These criteria are effective immediately. We intend to complete our review of all project issue credit ratings within the next six months.

METHODOLOGY

Part I: Construction Phase SACP

A. Technology And Design Risk

8. The assessment of technology and design risk is a key credit factor for oil and gas facilities. Oil and gas facilities and associated assets often require long lead times to construct complex integrated systems that must withstand extreme conditions and environments (e.g., pressures, temperatures, or chemistry) while achieving high throughput or availability rates. Poor design and use of inadequate technology or inappropriate construction technique can lead to substantial construction delays and cost overruns, as well as higher-than-expected operating costs or asset replacements over the life of a project.
9. Oil and gas facilities and associated assets are generally custom-built for a project's requirements, so we evaluate technology and design choices in the context of its specific operating configuration, scale, and environment. Therefore, a key credit factor is the track record of the technology and design in similar applications, as well as the suitability of the technology and design solutions for the specific project. Technology risk entails two components: its track record in similar application and its suitability for the project's contract requirements.

1. Technology track record in this application

10. We expect to assess most oil and gas technologies as "commercially proven," given the use of conventional technology that has operated in many facilities for at least 20 to 30 years. Examples include refineries, gas processors, LNG export and import facilities, natural gas and crude oil pipelines, tank storage, and crude oil tankers.

11. We typically assign a lower assessment of "proven" when technology is successfully deployed in service but has not yet operated through a lifecycle. Examples include underground salt dome storage, a pet-coke gasifier utilizing new technology, or more recently developed seaborne assets like newer generation LNG vessels and drill ships. We typically revise assessments of "proven" to "commercially proven" once the technology has demonstrated operating performance consistent with design standards through its lifecycle in multiple facilities.

12. In more unique cases, an entity may adapt a "commercially proven" or "proven" technology to a new purpose, or the entity may have piloted a new technology but has not operated the technology at commercial scale. In such cases, we assign an assessment of "proven but not in this application or arrangement." For example: A bespoke technology that chemically converts materials from one state to another using enzymatic processes or heat and pressure at tolerance levels, scales, or configurations that have not been proven at commercial scale, but have been proven at pilot scale plants or in different applications. This could include bio-refineries, cellulosic ethanol plants, or gasification plants using technology other than a standard Fischer-Tropsch process. We typically revise assessments of "proven, but not in this application or arrangement" to "proven" once the facility has successfully implemented the technology at the plant's expected scale, configuration, and throughput levels for a sustained period while achieving stable operations. We form our view of the necessary operating period based on input from an independent technical expert (see Appendix A) and our own experience, but it will typically range from a few months to a year in order for the project to experience a typical range of operating conditions and activities.

13. We generally do not expect to rate projects with "new or unproven technology," but this applies to technologies with no implementation in a different application or at pilot scale. For example: A new cellulosic technology utilizing physical, chemical, or enzymatic processes that have only been demonstrated in the laboratory or at "bench scale."

2. Technology performance match to contract requirements and expectations

14. We generally expect to assess most oil and gas projects as "matches all," including projects that have no contractual output requirements where our view of technology performance risk will be directly factored into our base-case assumptions for the project. In limited circumstances and as described below, we may assign an assessment of "exceeds" or "falls short of minor." In unusual situations where we believe major shortfalls in technology performance could occur that could trigger a contract termination or result in a lower debt service coverage ratio (DSCR) range (in table 15 of the operations phase criteria), we assign an assessment of "falls short of material."

15. To achieve an assessment of "exceeds" under the proposal, a project must demonstrate that it can achieve the relevant
performance standards in extreme conditions and operating stresses that are possible on site. This can be achieved in a number of different ways depending on detailed project requirements. If a project has significant excess capacity (10% or more) relative to offtake contracts, we could consider there to be sufficient performance cushion to consider an "exceeds" assessment. However, if we assume cash flows from the excess capacity in our base case, we do not assess technology performance as "exceeds" so as not to double count the benefit of the cushion. For example, we could assess a pipeline or LNG project with contracts that cover 90% of capacity and no expectation of merchant cash flows on the remaining 10% as "exceeds." However, if we assume additional merchant cash flows to use full capacity, we assess technology performance as "matches all."

16. If we believe performance requirements are tight and technology could fall short of our base-case expectations, but without major contract or long-term cash flow consequences, then we assess technology performance as "falls short of minor."

17. Where technology systems are likely to affect operations across the asset, we adopt a weak-link methodology in assessing technological performance risk. For example, if liquefaction systems provide significant headroom above the contract performance thresholds, but docking or storage capacities match performance requirements, then we assign an assessment of "matches all."

3. Degree of design completion and costing

18. Although oil and gas projects are generally customized, integrated assets, they can often be disaggregated into discrete, compartmentalized activities with standardized equipment and well-known processes and pathways. This can help to reduce the risk of low design completion, and we incorporate it into our assessment of design completion. For example, we typically assess assets such as storage, pipelines, processors, and LNG facilities as "moderate" with detailed design work often at about 10% at financial close, as opposed to "preliminary." We generally do not expect to see projects with higher assessments, but exceptions could include tankers, drillship vessels, or refining facilities that typically have a degree of design completion commensurate with a "very advanced" or "advanced" assessment, depending on the level of price certainty at financial close.

4. Design complexity

19. Because oil and gas plants have been built extensively around the world, their general design for many technology types is well known. However, there are some oil and gas technology applications that have a limited track record of design performance. Nonetheless, few oil and gas projects have the same design because each one is designed specifically to accommodate local site and permitting conditions. The risk allocation of design factors for oil and gas projects among projects and counterparties can vary considerably, and we assess design complexity after contract mitigation. The main drivers that we believe could affect an oil and gas project's design complexity are:

- Soil and ground conditions: Soil and ground with poor structural properties may require more complex foundation designs to support design loads. Construction in swamp or marsh environments is an example of greater required design complexity.
- Site surveys: Inadequate surveys create uncertainty, which may limit flexibility and cause unexpected delays and increase construction costs. Brownfield sites are at particular risk of inadequate survey data if existing buildings require demolition prior to construction and prevent access.
- Environmental conditions: Contamination, endangered species, emission limits and unexpected archaeological finds
could delay construction and increase construction costs.

- **Water availability:** Many oil and gas power plants use water extensively in processes and rely on water for cooling equipment and supplying steam boilers. Inadequate assessment of the water supply could result in lower production capacity or the project not operating.
- **Site access:** Very confined sites without room for onsite material storage, poor road access, or complex decanting requirements and construction phasing will limit the contractor’s ability to recover from unexpected delays. Construction adjacent to sensitive areas may also limit working times and practices.
- **Utilities:** Sites that have a large number of utility services such as power lines or water pipes could limit working time and increase the risk of cable strikes, which in turn could lead to delays. Brownfield sites with limited records of utilities service are particularly exposed to this risk.
- **Brownfield conversions:** The conversion of existing facilities to a new use can create uncertainty in terms of construction cost as the condition, performance, and integrity of the existing facilities may be uncertain. Long-term performance of the refurbished asset may also be less certain than for new build works. For example, the conversion of a brewing plant to an ethanol facility.

20. **Under the criteria, we assess the following factors to determine the design complexity assessment:**

- **"Proven design."** The design and construction sequence does not require material modification from known designs to account for site conditions, based on solid available site condition survey information, good construction site access, and little refurbishment work. An example might be a natural gas liquids plant using simple distillation columns in a region where such columns have been used extensively in the same configuration.
- **"Modified proven design."** An otherwise straightforward design and construction sequence that has been tailored to meet specific site conditions, such as environmental conditions, utilities, or site access. This assessment typically applies to a commonplace liquefied natural gas train design that has been significantly adjusted to accommodate site conditions.
- **"Established design modified for site conditions."** This assessment typically applies to oil and gas projects where the design either has not been extensively used or requires many changes to meet site conditions or permit requirements. An example is a fertilizer project that plans to use several well understood process modules but is a configuration that is relatively new for the industry.
- **"Simple first of kind."** This type of oil and gas project typically employs a design that is new but simple. An example is a project planning to build simple storage tanks using a new design to improve safety performance.
- **"Complex first of kind."** Oil and gas projects are unlikely to receive this assessment since most offtakers and investors are not likely to be attracted to the risks involved. A project typically receives this assessment when it employs a new design with a complex configuration.

## B. Construction Risk

### 1. Construction difficulty

21. Oil and gas projects span a wide range of asset types and construction difficulty. Under the proposal, we use the following guidelines for assessing construction risk under the construction methodology criteria.

### Table 3

<table>
<thead>
<tr>
<th>General Oil And Gas Asset Class Construction Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction Difficulty</strong></td>
</tr>
<tr>
<td>Simple building task</td>
</tr>
</tbody>
</table>
Table 3

<table>
<thead>
<tr>
<th>General Oil And Gas Asset Class Construction Difficulty (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderately complex building or simple engineering task</td>
</tr>
<tr>
<td>Civil or heavy engineering task</td>
</tr>
<tr>
<td>Heavy engineering to industrial task</td>
</tr>
<tr>
<td>Industrial task to complex building task</td>
</tr>
</tbody>
</table>

22. If there is significant risk that a task can be made challenging because of the programming of construction activities, we assign the project the next weakest assessment than a similar construction task without this challenge. For example, construction is more challenging if it occurs near a congested urban area or has access constraints from geography or inclement weather conditions. For the avoidance of doubt, this is an execution risk of what may otherwise be a simple design that the brownfield adjustment in the design complexity assessment doesn’t capture.

C. Project Management

23. Most credit risks in this section affect all sectors alike and are addressed in the construction methodology criteria. However, we provide the following additional guidance for assessing the design approval subfactor for oil and gas projects.

24. Most oil and gas assets employ standard processes to handle or produce commodity products, and nearly all are built to strict technical terms established by regulatory bodies or by energy markets and to specific permit requirements and limitations. As designs must in the course of business be reviewed to assure compliance, we generally expect to assess design approval as "positive."

25. "Offtaker approval" is most relevant for assets like tankers and drill ships that offtakers with specific technical needs lease out on a charter basis. Typically all design specifications are approved prior to financing, and such assets must pass an inspection and meet performance tests prior to delivery. For such assets, we again expect to assess operator or offtaker design approval as "positive."

26. We generally do not expect to see "negative" or "very negative" design approval assessments, but they could apply in situations where a technology is entirely new, a proven design is substantially extended, operating procedures are not well established, and the operator or offtaker has either limited or no experience in the sector.

D. Financial Risk Adjustment

1. Construction base case

27. The construction financial profile assesses whether the project has enough funding to cover the costs of construction and ensures the project will be ready for operations, even under a downside scenario. Most oil and gas projects use engineering and procurement contracts (EPC) to mitigate construction cost and delay risk. However, the project may retain some cost and schedule exposure in the form of force majeure risk, delays in receiving permits, change orders, or any portion of the overall construction scope retained by the owner to manage. We may make provisions for these
risks within our base case under these criteria.

28. In rare circumstances where the project does not use fixed price contracts and it undertakes construction on a "cost plus" basis or using a schedule of rates, we use, for the purpose of determining our base case, information that the project and its contractors provide and supplement it with data gathered from similar projects in the sector. We also use, where relevant, input from an independent expert as required.

2. Construction downside case

29. A primary risk exposure for a project in this sector is likely to be the failure and subsequent timely replacement of the project's building contractor. We determine the forecast costs associated with replacing the construction contractor in accordance with our “Project Finance Construction And Operations Counterparty Methodology,” published Dec. 20, 2011. The downside case includes an allowance for the impact of a replaceable builder not already included in the counterparty replacement analysis (see paragraph 76 of the “Project Finance Construction Methodology,” published Nov. 15, 2013).

30. Factors that could increase the EPC contract price, which we include in the construction downside case, may include the residual risk to a project after any contract risk allocation as a result of delays or cost increases due to variations, planning consents, construction works that are required to be completed near sensitive operational facilities, or refurbishment works. In most cases, oil and gas projects seek to transfer all such risks to the building contractor or the offtaker, or institute a sharing mechanism that caps the project exposure. To the extent that risks that remain with the creditworthy offtaker are mitigated by timely additional payments (e.g., upfront payments of capital costs for agreed variations), we do not typically make provisions for these possible costs in our construction downside analysis. If such contractual mechanisms are not present or are regarded as ineffective, then the downside analysis includes provisions for such additional costs. Due to the way these transactions are typically designed and structured together with independent oversight of construction payments, under a building contractor replacement scenario we typically expect such additional costs to be limited. If the project does not have sufficient liquidity to meet these additional costs, then the construction phase SACP will be weak-linked to the building contractor's credit quality.

31. The construction downside scenario include our assessment of likely cost increases or revenue shortfalls in the following areas:

- Project operating costs: Project salary allowances, office availability, insurances, etc.
- Project construction costs: Typically for discrete and comparatively small and nontechnical site/infrastructure improvements or equipment sourcing outside the scope of the EPC.
- Change orders under the EPC: These may occur more frequently in situations with poor or unknown ground conditions, proximity to sensitive facilities or environmental locations, or in unconventional configurations of complex assets.
- To the extent that the project relies on revenues earned during the construction period, the construction downside will consider the impact of a reduction in revenues to the extent not mitigated by retentions or liquidated damages under the contract terms.
- Any construction delay risks the project owner accepts that are not covered by timely and on-demand liquidity or mitigating construction schedule revisions.
Part II: Operations Phase SACP

A. Performance Risk


32. The following guidance generally applies for refining, processing, and LNG projects:
   
   - We typically assess basic biofuel projects converting starch to ethanol as '4' because of the relatively simple processes involved, which have contributed to a track record of high availability rates.
   - We typically assess simple distillation or "topping" refineries as '5' because of the operational stresses that can cause periodic outages. Refineries with more complex and interdependent assets using severe temperature, pressure, and chemical processes like crackers and cokers are at greater risk of operational outages. We normally assess them at a '6'.
   - We generally assess gas processors that separate natural gas liquids (NGLs) from natural gas streams as '5' because of their relatively reliable physical and chemical processes that utilize low rather than high pressure and temperature.
   - We generally assess LNG facilities that receive and regasify LNG for distribution into natural gas pipelines as '4' as a result of low process complexity. We typically assess more complex and capital intensive liquefaction facilities that convert natural gas into LNG as '5' because of incremental complexity relative to gas processors.

33. The following guidance generally applies for pipeline projects:
   
   - Simple natural gas pipelines with basic compression requirements have some of the simplest operations of oil and gas asset types. We typically assess them as '3'. We typically assess natural gas pipelines in more extreme operating conditions, such as those with large underwater segments, and liquids pipelines subject to greater operational stress and maintenance, as '4'.

34. The following guidance generally applies for storage assets:
   
   - We typically assess above-ground storage facilities as '3' because of their low complexity and operating risk. We generally assess below-ground storage facilities requiring high deliverability or displacement, and projects with greater operating risk from subsurface pressure and integrity, as '4'.

35. The following guidance generally applies for vessel projects:
   
   - We typically assess crude tankers as '3', given their reliable operating track record, though we may generally assess vessels older than 10 years as '4' if additional operating risks exist resulting from age or outdated specifications.
   - We typically assess LNG tankers as '4', similar to a regasification facility.
   - We assess drill ships, because of their more complex operating requirements, as '5'.

36. Where certain project financings involve several assets each of which contributes to cash flow, we first determine whether the assets are part of an integrated chain or whether they operate independently of each other. If the assets operate as part of an integrated chain then performance risk is assessed based on a weak-link approach to the weakest performance assessment for the different assets. In a scenario where the assets are not integrated we assess
performance risk based on the expected cash flow weightings of the different assets.

2. Resource and raw materials risk

37. In projects connected to highly reliable and diverse natural gas resources with low risk, we typically assess redundant infrastructure as "minimal." Examples include LNG projects in the U.S. and Qatar. This contrasts with projects reliant upon single resources without a long production track record, with limited transportation infrastructure. We may assess these projects as having "modest" or "moderate" risk. Examples could include some Canadian and Australian LNG projects. "High" risk examples likely include projects exposed to supply disruption because of social or political risks, such as projects dependent on feedstock from Egypt or Nigeria (that are outside of these countries), or through the Straits of Hormuz.

B. Market Risk

1. Market exposure (including base-case guidance)

38. The following guidance generally applies for refining, processing, and LNG projects (for our base-case assumptions, please see the Adjusted Preliminary Operations Phase SACP section below).

Market exposure:

- Generally a "high" market exposure assessment for refiners and biofuel manufacturers, and a "moderate" for uncontracted processors/LNG facilities. Contracts can improve the market risk assessment, depending on the terms and portion of cash flows covered. We do not assess fully contracted tolling projects for market risk.
- Because the commodity prices are prone to large cyclical and geopolitical driven swings, and because prices for the input and output commodities are not perfectly correlated, margins can be very volatile. The strategic importance of these industries and lack of viable alternatives for the foreseeable future mean we do not anticipate conditions are likely to deteriorate enough to imperil these sectors as a whole. However, margins could contract enough to affect marginal producers, which makes competitive position key to our analysis.

Market downside case assumptions:

- Refining: Compressed crack spreads reflecting our expectation of trough conditions for the project's market, and depressed crude oil pricing reflecting marginal production costs. We generally define trough conditions as the worst market conditions we expect over a 20-year period. At the asset-specific level, we also assume compressed crude discounts. Basis differentials (the price differential of a commodity due to its location, e.g., Brent-WTI or WCS-May) reflect only the marginal cost of transportation, and quality differentials (i.e., the price differential of a commodity due to its quality, e.g., Light-Heavy or Sweet-Sour) drop to trough levels.
- LNG/processor: Depressed crude oil and natural gas pricing reflecting marginal production costs for LNG price indexation, with NGLs at trough pricing relative to crude to reflect marginal production costs and weak NGL correlation. For projects with volume exposure, a decline from base-case volumes to reflect poor production economics.

39. For gas processing plants, depressed gas pricing assumptions are used to reflect the worst conditions anticipated over a 20 year period, unless the gas sector has either recently witnessed an important structural shift or in our view is anticipated to witness an important structural shift in the future. In such cases, we review aggregate pricing data for gas contracts as well as supply-demand dynamics prevalent in that market and use our experience of that market to
derive assumptions on appropriate gas price stress conditions in consultation with the independent expert. Independent experts will typically meet the requirements under Appendix A.

40. The following guidance generally applies for pipeline projects:

Market exposure:

- Pipelines are typically supported by shipper contracts for some or all of capacity for several years, though a merchant tail lasting half of the asset life or longer is not uncommon. This raises recontracting risk and the potential for lower rates. A pipeline's competitive position is the primary factor in our consideration of recontracting risk, assuming no regulatory or geographic restrictions. Generally, we assess the market exposure of pipelines at least "moderate" for uncontracted assets, but we could adjust up or down based on the pipeline's competitive position, as described below.

Market downside case assumptions:

- We assume no revenue from uncontracted spot volumes during the shipper contract period.
- We assume expiring shipper contracts renew at below-market rates, typically 15% to 60% lower, depending on the specific pipeline's competitive position assessment and the tightest sustained basis spreads observed over the last 20 years in the relevant market. For example, with competitive position assessments of "strong" or "above average," we typically lower renewal rates by 15% or 30%, respectively, from the initial contracted rates. For "below average" or "weak" competitive positions, we lower renewal rates by 45% or 60%, respectively.

41. The following guidance generally applies for U.S. storage assets:

Market exposure:

- Natural gas storage in the U.S. is typically assessed as '4' since the contract life is usually three years or less and rate volatility is high. Liquids storage providers in the U.S. is typically assessed as '3', and in some cases (for example, with a '1' competitive position) as low as '2'. Liquid storage contract duration can vary by geography. In the U.S., they last about five years on average and have lower volatility than natural gas storage upon recontracting. Assessments may differ in other geographies to the extent that contracting structures differ.

Market downside case assumptions:

- We assume no ancillary or hub service revenues other than cost pass-throughs for services like heating, and a base level of injections/withdrawals.
- After storage contracts expire, we assume recontracting occurs at lower prices. For assets like gas storage, we assume pricing is based only on the value generated by seasonal rather than short-term price fluctuations. For liquids, we generally lower renewal rates by 20% if the project has a "strong" competitive position, 40% if it is "above average," 60% if it is "below average," and 80% if it is "weak."

42. The following guidance generally applies for vessel projects:

Market exposure:

- Assessments range widely depending on a project's offtake agreement. Market risk is not applicable when a project has fixed-rate bareboat charters that run through maturity on fully amortizing debt, since the offtaker is responsible for all operating and market risk, although we will factor in counterparty dependency.
• We generally assess projects with operating cost exposure (e.g., those with time charters rather than bareboat charters) as low as '1' market exposure. However, in cases with unusually high costs, we generally assess projects at least '2', since operating costs, including periodic dry docking, can be significant.

• Exposure to market charter rates can significantly weaken a project's market exposure assessment because long-term supply and demand, influenced by overbuild risk and macroeconomic factors, can result in high volatility, as evidenced by crude tanker rates from 2009 to 2013. We therefore typically assess market exposure at '4' when merchant revenues are required to fully amortize debt. However, we may consider better assessments if the asset is highly specialized with limited competition, there are high barriers to entry, and there is greater certainty of long-term demand prospects.

Market downside case assumptions:

• After charters contracts expire, we assume they recontract on a long-term or spot charter, but at rates equivalent to the trough experienced globally over the last 20 years. We overlay this with our view of the most likely market downside conditions, given any structural changes that may have occurred in the sector. For example, we take the sustained market low over the last 20 years, excluding 2010-2012, which is unsustainable, in our opinion. We then adjust for structural changes that could affect the market over the project tenor, and for the specific attributes of the project assets.

43. For vessel asset classes where we have limited historical data or that have recently witnessed an important structural shift, or in our view are anticipated to witness an important structural shift in the future, we review charter contract pricing as well as merchant pricing prevalent for that asset class, taking into account our experience of the asset class and the market in which it operates to derive assumptions on appropriate stress conditions in consultation with an independent expert. Independent experts will typically meet the requirements outlined under Appendix A.

2. Competitive position

44. The factors we use to assess the competitive position for oil and gas projects are set out in tables 4, 6, 8, and 10. We assess the attributes as "positive," "neutral," or "negative." The characteristics for "positive" and "negative" are described below. If a factor does not meet these characteristics, then we assess it as "neutral." After each of these tables we provide guidance on how these factors determine the competitive position assessment. In limited circumstances, we may assess one factor as "highly negative." In this case, we generally lower the assessment of the competitive position by one category below that, defined by table 5 (e.g., "weak" instead of "fair"). For example, we may assess a refinery in a uniquely disadvantaged position with regard to sourcing crude as "highly negative" on feedstock costs, and we generally lower the competitive assessment by one category compared with the outcome from table 5.

45. Where certain project financings involve several assets that each contribute to cash flow, we first determine whether the assets are part of an integrated chain or whether they operate independently of each other. If the assets operate as part of an integrated chain then competitive position is assessed based on a weak-link approach to the weakest competitive position assessment for the different assets. In a scenario where the assets are not integrated, we assess competitive position based on the expected cash flow weightings of the different assets.

46. The competitive position of refiners, processors, and LNG projects generally depend, in our view, on the project's feedstock cost, production efficiency, and geographic position, as described and assessed in tables 4 and 5.
### Table 4

**Competitive Position Factors--Refining, Processing, And LNG Projects**

<table>
<thead>
<tr>
<th></th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedstock cost</td>
<td>Top quartile feedstock costs. Can be due to advantageous contracts or a monopoly position with barriers to entry. For example a gas processor to a captive natural gas production market. Other examples include a refiner able to process low-quality or stranded crudes, or an integrated LNG facility with low-cost, dedicated supply.</td>
<td>Bottom quartile feedstock cost. Can be due to out-of-market contract terms, or a disadvantageous sourcing position.</td>
</tr>
<tr>
<td>Production efficiency</td>
<td>First quartile production cost. Can be due to scale or complexity that is difficult and/or expensive to duplicate, or otherwise advantaged due to unique operating cost such as beneficial O&amp;M contracts or regulatory support such as a cost recovery mechanism.</td>
<td>Bottom quartile operating leverage potentially due to lack of scale or age of assets.</td>
</tr>
<tr>
<td>Geographic position</td>
<td>A unique geographic position that is difficult to replicate either due to permitting or physical constraints. For example, proximity to demand-pull markets that allows for higher netback pricing.</td>
<td>Poor location disconnected from markets and subject to negative basis and/or transportation costs.</td>
</tr>
</tbody>
</table>

### Table 5

**Competitive Position Assessment Of Refining, Processing, And LNG Projects**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Typical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>All three factors in table 4 are assessed as positive.</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>One or two factors are assessed as positive under table 4. None are negative.</td>
</tr>
<tr>
<td>Fair</td>
<td>Does not meet the requirements of strong, satisfactory, or weak.</td>
</tr>
<tr>
<td>Weak</td>
<td>Two or three factors are assessed as negative under table 4.</td>
</tr>
</tbody>
</table>

### Table 6

**Competitive Position Factors--Pipeline Projects**

<table>
<thead>
<tr>
<th>Pipelines</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer mix</td>
<td>A strong mix of highly rated shippers with underlying needs, e.g., utilities and local distribution companies (LDCs) that are primarily concerned with supply security, are able to pass costs through to their own customer rate base, and are therefore more likely to recontract.</td>
<td>Largely contracted with traders or other parties unlikely to recontract if basis opportunities contract.</td>
</tr>
<tr>
<td>Value proposition</td>
<td>Pipelines that link stable, reliable demand centers to supply from production basins (demand-pull pipelines), where large basis differentials are present.</td>
<td>Supply push pipelines in an oversupplied market with weak basis differentials.</td>
</tr>
<tr>
<td>Scale, scope, and diversity</td>
<td>The project is large scale and covers diverse markets - multiple receipt and drop-off points covering three or more markets. This diversifies geographic exposure and raises barriers to entry.</td>
<td>Small scale assets subject to localized market risk and competition.</td>
</tr>
<tr>
<td>Value add offerings</td>
<td>A project has connectivity to major trading hubs and storage, which improves optionality and value to customers.</td>
<td>Asset disadvantaged relative to competitors that provide additional services.</td>
</tr>
</tbody>
</table>

### Table 7

**Competitive Position Assessment Of Pipeline Projects**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Typical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>At least three factors in table 6 are assessed as positive. None are negative.</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>One or two factors in table 6 are assessed as positive. None are negative.</td>
</tr>
<tr>
<td>Fair</td>
<td>Does not meet the requirements of strong, satisfactory, or weak.</td>
</tr>
<tr>
<td>Weak</td>
<td>Two or more factors are assessed as negative under table 6.</td>
</tr>
</tbody>
</table>

47. The competitive position of pipeline projects generally depends, in our view, on the project's customer mix, value proposition, scale scope and diversity, and its value added offerings, as described and assessed in tables 6 and 7.
The competitive position of storage projects generally depends, in our view, on the project’s customer mix, value proposition, scale, scope, diversity, and demand, as described and assessed in tables 8 and 9.

**Table 8**

<table>
<thead>
<tr>
<th>Storage</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer mix</td>
<td>A strong, highly rated mix of customers with stable underlying needs, i.e., oil and gas companies, utilities, and LDCs, rather than traders.</td>
<td>Largely contracted with traders or other parties unlikely to recontract if volatility opportunities contract.</td>
</tr>
<tr>
<td>Value proposition</td>
<td>There is a strong logistical value or volatility dynamic. For example, a crude storage facility that is used to aggregate and blend to various specifications, or to break down and blend large shipments into more easily marketable lots.</td>
<td>Low strategic value in the infrastructure network, or subject to significant competition for customers.</td>
</tr>
<tr>
<td>Scale, scope, and diversity</td>
<td>There is exposure to multiple markets with extensive connectivity to transportation networks (pipelines, shipping, rail, etc.) and/or proximity to end users.</td>
<td>Small-scale assets subject to localized market risk and competition.</td>
</tr>
<tr>
<td>Demand outlook</td>
<td>There is a demonstrated track record of demand. For example, a waitlist in excess of 20% of capacity or a track record of renewals.</td>
<td>High churn rate, material unleased space, or significant contract maturity walls within the tenor without supportive recontracting demand.</td>
</tr>
</tbody>
</table>

**Table 9**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Typical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>At least three factors in table 8 are assessed as positive. None are negative.</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>One or two factors are assessed as positive under table 8. None are negative.</td>
</tr>
<tr>
<td>Fair</td>
<td>Does not meet the requirements of strong, satisfactory, or weak.</td>
</tr>
<tr>
<td>Weak</td>
<td>Two or more factors are assessed as negative under table 8.</td>
</tr>
</tbody>
</table>

The competitive position of vessel projects generally depends, in our view, on the project’s customer mix, operating efficiency, and demand outlook, as described and assessed in tables 10 and 11.

**Table 10**

<table>
<thead>
<tr>
<th>Vessels</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer mix</td>
<td>There are highly rated customers with long-term underlying needs and the project has a successful track record of being chartered, e.g., large oil and gas companies with long-term logistics or development needs.</td>
<td>Largely contracted with traders or other parties unlikely to recontract if economic opportunities contract.</td>
</tr>
<tr>
<td>Operating efficiency. Generally, technology is well-established and is not a differentiating factor unless similarly capable production shipyards are limited and unlikely to be built within the project’s lifetime.</td>
<td>The project has top quartile operating costs and high barriers to entry. These can be a function of a unique design or specialization that is difficult and/or expensive to duplicate, or by virtue of being a newer, more modern vessel.</td>
<td>Assets with fourth quartile operating costs. Typically older vessels (10+ years) that also face obsolescence risk as standards evolve.</td>
</tr>
<tr>
<td>Demand outlook</td>
<td>An aging fleet with a thin order book and demand expected to outstrip delivery of new vessels. Examples of demand includes a growing reliance on LNG to relieve global natural gas imbalances.</td>
<td>Strong order book with delivery schedule expected to grow supply faster than demand.</td>
</tr>
</tbody>
</table>
### Table 11

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Typical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>All three factors in table 10 are assessed as positive.</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>One or two factors in table 10 are assessed as positive. None are negative.</td>
</tr>
<tr>
<td>Fair</td>
<td>Does not meet the requirements of strong, satisfactory, or weak.</td>
</tr>
<tr>
<td>Weak</td>
<td>Two or three factors are assessed as negative in table 10.</td>
</tr>
</tbody>
</table>

### C. Preliminary Operations Phase SACP (Including Base-Case Guidance)

50. The minimum DSCRs used in Table 15 of the operations criteria are forecast using our base-case assumptions. The following guidance generally applies for refining, processing, and LNG projects:

**Base-case assumptions:**

- Our base case typically incorporates oil and gas futures pricing in relevant markets over the next one to two years, and mid-cycle spreads thereafter, taking into account unique circumstances and input from the market consultant. We generally assume 90% availability rates for refiners and 95% for LNG and processing facilities, and do not assume greater operational efficiency than peers, but may vary our assumptions based on asset-specific merits, such as track record or atypical process specifications, and will usually consider any availability assumptions from the independent engineer.

- Our economic starting point for refiners is a mid-cycle crack spread on our long-term crude oil price deck, mid-cycle differentials between heavy and light crude oil grades, and operating expenses reflective of peers. For natural gas processors, we assume an average NGL/crude ratio reflecting our long-term NGL crude price deck assumptions. And for LNG projects with market pricing, we use our long-term crude and Henry Hub price deck for indexation. These assumptions are a guideline and can vary, particularly for projects outside of the U.S. that face markedly different commodity pricing.

51. The following guidance generally applies for pipeline, storage, and vessel projects:

**Base-case assumptions:**

- Our base case assumes recontracting at market rates, although we may assume lower rates based on our view of market conditions and the relative competitiveness of a particular project. For example, for assets with particularly high rate volatility like U.S. natural gas storage or very large crude carrier assets, we generally assume rates revert to the historical average, which could be significantly lower than the existing rate at any given time. For some vessels, we may also assume a decline in rates due to a vessel’s age, increased competition from new builds, or new regulations.

### D. Adjusted Preliminary Operations Phase SACP

1. **Downside analysis**

52. Our downside case combines our market downside case with our operational downside assumptions and financial stresses linked to any refinancing, where relevant. Our market downside case assumptions are described in the Market Exposure section above. We apply the stresses for the remaining life of the project to determine its resilience.
53. We generally assume operating and capital expenditure increases by 10% from our base case for the first two-thirds of a project's asset life; and 20% thereafter to reflect the increasing costs of maintaining an aging asset (although this can be mitigated by O&M contracts). These increases reflect higher material prices and assumed lower efficiency rates.

54. For refining, processing, and LNG projects, we typically assume at least a 5% reduction in availability rates from our base case (generally 85% for refiners and 90% for LNG and processors).

2. Refinance risk

55. For purposes of calculating post-refinancing DSCRs over the remaining life of the project, we assume the following asset lives, subject to discussions with an independent engineer. Note that these life spans may be adjusted depending on the project's operating phase business assessment as outlined under our “Project Finance Operations Methodology,” published Sept. 16, 2014 (see table 12).

Table 12

<table>
<thead>
<tr>
<th>Asset type</th>
<th>Typical asset life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refinery</td>
<td>22 years, although significant major maintenance can extend asset life.</td>
</tr>
<tr>
<td>Ethanol plant</td>
<td>30 years</td>
</tr>
<tr>
<td>Gas processor</td>
<td>30 years</td>
</tr>
<tr>
<td>LNG facility</td>
<td>30 years. Equipment useful life generally ranges from 10 to 50 years.</td>
</tr>
<tr>
<td>Pipelines</td>
<td>30 years</td>
</tr>
<tr>
<td>Storage</td>
<td>30 years</td>
</tr>
<tr>
<td>Crude tankers</td>
<td>20 years</td>
</tr>
<tr>
<td>LNG tankers</td>
<td>25 years</td>
</tr>
<tr>
<td>Drill ships</td>
<td>30 years</td>
</tr>
</tbody>
</table>

APPENDIX A

56. Independent experts should be experienced (see “Credit FAQ: Provision Of Information For Assessing Project Finance Transactions,” Dec. 16, 2013). We focus on the author's relationship with the project sponsors, as well as the experience and expertise of the author. Key attributes would include:

- Independence: The expert is typically engaged for the benefit of the debt providers, rather than the project sponsors, and in any case his or her compensation should not be directly linked to the successful financing of the project.
- Experience: The expert should have appropriate prior experience in the sector covered by the project as well as the country where the project is located. For example, being a mining expert covering Scandinavia may not be sufficient to assess a mining project in Africa given different operational, weather, and market conditions.
- Track record: An expert's track record may also support his or her experience in a particular area.

57. Typically, we would expect independent expert reports to include (see "Credit FAQ: Provision Of Information For Assessing Project Finance Transactions," Dec. 16, 2013):

- Factual presentation of the project: This summarizes what the expert has specifically reviewed and analyzed and ensures that all aspects of the project have been considered.
• Risk assessment of the project: This covers all the risks pertinent to the expert's area of focus that could result in cash flow disruptions. For example, if the expert is assessing the construction of an oil and gas plant, this would usually include the risk that the plant may not be built on budget or on time and may not ultimately perform as designed. Risks would then typically be grouped according to their likelihood of occurrence (low to high probability) and impact (low to high impact) to ensure that the key risks (high probability and high impact) are thoroughly reviewed.

• Other sections: This includes views and analyses of the project parties' ability and experience in similar projects, as well as views and analysis of assumptions of the sponsors in certain key areas. For example, for public-private partnership projects, the expert would typically review the payment mechanism and determine the level of financial abatements that could occur. For oil and gas projects, the expert would typically opine on assumed availability levels over the life of the project, including any potential deterioration as the plant ages.

APPENDIX B

This article follows our Request for Comment, where Standard & Poor's solicited public feedback to the proposed criteria: “Request for Comment: Key Credit Factors For Oil And Gas Project Financings”, published on Dec. 16, 2013. The comments we received contributed to changes that we included in these criteria, and are outlined in the article “RFC Process Summary: Standard & Poor’s Summarizes Request For Comment Process For New Project Finance Methodology,” published Sept. 16, 2014.

RELATED CRITERIA AND RESEARCH

Related Criteria
• Project Finance Framework Methodology, Sept. 16, 2014
• Project Finance Transaction Structure Methodology, Sept. 16, 2014
• Project Finance Operations Methodology, Sept. 16, 2014
• Project Finance: Project Finance Construction Methodology, Nov. 15, 2013
• Principles Of Credit Ratings, Feb. 16, 2011

Related Research
• FAQ: An Overview of Standard & Poor’s Criteria For Assessing Project Finance Operating Risk, Sept. 16, 2014
• Market Assumptions Used For Oil And Gas Project Financings, Sept. 16, 2014
• Credit FAQ: Provision Of Information For Assessing Project Finance Transactions, Dec. 16, 2013

These criteria represent the specific application of fundamental principles that define credit risk and project issue credit rating opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or project issue credit rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.
Market Assumptions Used For Oil And Gas Project Financings

Primary Credit Analysts:
Karim Nassif, Dubai (971) 4-372-7152; karim.nassif@standardandpoors.com
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Terry A Pratt, New York (1) 212-438-2080; terry.pratt@standardandpoors.com

Table Of Contents
Related Criteria
Market Assumptions Used For Oil And Gas Project Financings

The following table provides specific guidance for common assumptions used in our "Key Credit Factors For Oil And Gas Project Financings," published Sept. 16, 2014. We will periodically update this guidance, as market conditions change or there is need to establish different assumptions for new project financings.

**Table 1**

<table>
<thead>
<tr>
<th>Guidance For Common Assumptions</th>
<th>Base case</th>
<th>Market downside case</th>
<th>Downside case</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Refining</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude oil price (Brent)</td>
<td>S&amp;P assumptions**</td>
<td>$50</td>
<td>$50</td>
<td>per bbl</td>
</tr>
<tr>
<td>Crude differentials (Light-Heavy quality differential)</td>
<td>futures</td>
<td>$5</td>
<td>$5</td>
<td>per bbl</td>
</tr>
<tr>
<td>Crack spread (U.S. Gulf Coast NYMEX 2:1:1)</td>
<td>15%</td>
<td>12%</td>
<td>12%</td>
<td>% of crude</td>
</tr>
<tr>
<td>Refining availability</td>
<td>90%</td>
<td>N/A</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>Operating expense (U.S.)*</td>
<td>$4 - $5</td>
<td>N/A</td>
<td>+10% to 20%</td>
<td></td>
</tr>
<tr>
<td><strong>LNG/gas processor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude oil price (Brent)</td>
<td>S&amp;P assumptions**</td>
<td>$50</td>
<td>$50</td>
<td>per bbl</td>
</tr>
<tr>
<td>Natural gas price (U.S. Henry Hub)</td>
<td>S&amp;P assumptions**</td>
<td>$2.50</td>
<td>$2.50</td>
<td>per mmBtu</td>
</tr>
<tr>
<td>NGL/crude oil price ratio</td>
<td>60%</td>
<td>40%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>LNG/gas processor availability</td>
<td>95%</td>
<td>N/A</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Operating expense</td>
<td>N/A</td>
<td>+10% to 20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Storage assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural gas storage recontracting rates (U.S.)</td>
<td>$0.15</td>
<td>$0.06</td>
<td>$0.06</td>
<td>per mmBtu/mo</td>
</tr>
<tr>
<td>Operating expense</td>
<td>N/A</td>
<td>+10% to 20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vessels</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VLCC time charter rates</td>
<td>current market rates</td>
<td>&lt;$15,000</td>
<td>&lt;$15,000</td>
<td>per day</td>
</tr>
<tr>
<td>LNG time charter rate</td>
<td>current market rates</td>
<td>$50,000</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>Ultra deep water drill ship</td>
<td>current market rates</td>
<td>$450,000</td>
<td>$450,000</td>
<td></td>
</tr>
<tr>
<td>Operating expense</td>
<td>N/A</td>
<td>+10% to 20%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Related Criteria

- Key Credit Factors For Oil And Gas Project Financings, Sept. 16, 2014
KEY CREDIT FACTORS AND ASSUMPTIONS FOR SOCIAL AND TRANSPORTATION PROJECTS

Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings

Key Credit Factors For Road, Bridge, And Tunnel Project Financings

Common Assumptions For U.S. Stadiums And Arena Projects
Criteria | Corporates | Project Finance:

Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings

Primary Credit Analysts:
James Hoskins, London (44) 20-7176-3393; james.hoskins@standardandpoors.com
Jodi E Hecht, New York (1) 212-438-2019; jodi.hecht@standardandpoors.com
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
Mario Angastiniotis, Toronto (1) 416-507-2520; mario.angastiniotis@standardandpoors.com
Trevor J D’Olier-Lees, New York (1) 212-438-7985; trevor.dolier-lees@standardandpoors.com

Secondary Contacts:
Anne C Selting, San Francisco (1) 415-371-5009; anne.selting@standardandpoors.com
Michela Bariletti, London (44) 20-7176-3804; michela.bariletti@standardandpoors.com
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com
Pablo F Lutereau, Buenos Aires (54) 114-891-2125; pablo.lutereau@standardandpoors.com

Criteria Officers:
Mark Puccia, New York (1) 212-438-7233; mark.puccia@standardandpoors.com
Andrew D Palmer, Melbourne (61) 3-9631-2052; andrew.palmer@standardandpoors.com
Peter Kernan, London (44) 20-7176-3618; peter.kernan@standardandpoors.com

Table Of Contents

SCOPE OF THE CRITERIA
SUMMARY OF THE CRITERIA
IMPACT ON OUTSTANDING RATINGS
EFFECTIVE DATE AND TRANSITION
METHODOLOGY
Part I: Construction Phase SACP
Table Of Contents (cont.)

A. Technology And Design Risk
B. Design Cost Variation Risk
C. Financial Risk Adjustment

Part II: Operations Phase SACP
A. Asset Class Operational Stability
B. Market Risk
C. Preliminary Operations Phase SACP (Including Base-Case Guidance)
D. Adjusted Preliminary Operations Phase SACP

APPENDIX

RELATED CRITERIA AND RESEARCH
Criteria | Corporates | Project Finance:
Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings

1. Standard & Poor’s Rating Services is refining and adapting its methodologies and assumptions for its Key Credit Factors (KCF) for rating social infrastructure, accommodation, and entertainment project finance transactions. We are publishing this article to help market participants better understand the key credit factors in this industry.

2. This article is related to our global project finance criteria (see "Project Finance Framework Methodology," published Sept. 16, 2014) and to our criteria article "Principles Of Credit Ratings," published Feb. 16, 2011.

SCOPE OF THE CRITERIA

3. These criteria apply to social infrastructure, accommodation, and entertainment project financings structured as availability-based projects, volume-based projects, or a combination of both.

4. Social infrastructure, accommodation, and entertainment project financings cover:
   - Education projects, such as primary and secondary schools and tertiary teaching facilities;
   - Health projects ranging from large, relatively complex regional hospitals to smaller local primary care facilities and psychiatric facilities;
   - Social housing, military barracks, and student accommodations;
   - Detention centers (i.e., prisons) and judicial facilities;
   - Convention centers;
   - Office accommodations;
   - Data centers and archiving facilities;
   - Hotels;
   - Sports stadiums and arenas; and
   - Student housing and university accommodations.

SUMMARY OF THE CRITERIA

5. These criteria specify the key credit factors relevant to analyzing the construction phase stand-alone credit profile (SACP) and the operations phase SACP for social infrastructure, accommodation, and entertainment projects, which we rate in accordance with "Project Finance Construction Methodology," published Nov. 15, 2013, and "Project Finance Operations Methodology, published Sept. 16, 2014.

6. As indicated in tables 1 and 2 below, factors marked with an 'X' in the "Key credit factor" column provide additional guidance on the sections of the construction phase criteria and the operations phase criteria. For factors not marked with an 'X' in that column, only the information provided in the construction phase criteria and the operations phase.
criteria apply. This KCF also provides assumptions for determining our base and downside cases specific to social infrastructure, accommodation, and entertainment projects.

### Table 1

**Social Infrastructure, Accommodation, And Entertainment: Areas Of Additional Guidance**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Construction phase criteria</th>
<th>Key credit factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Construction phase business assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Technology and design risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Technology risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Technology track record in this application</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ii) Technology performance match to contract requirements and expectations</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b) Design cost variation risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Degree of design completion and costing</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ii) Design complexity</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Construction risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Construction difficulty</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>b) Delivery method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Contractor experience</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ii) Degree of contract risk transfer</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3. Project management</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4. Adjusting the preliminary construction phase business assessment</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>B. Financial risk adjustment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Funding adequacy (uses of funds)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Construction funding (sources of funds)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>C. Construction phase SACP</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>1. Construction counterparty adjustment</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>D. Other factors</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2

**Social Infrastructure, Accommodation, And Entertainment: Areas Of Additional Guidance**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Operations phase criteria</th>
<th>Key credit factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Operations phase business assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Performance risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Asset class operations stability</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b) Project-specific contractual terms and risk attributes</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- Performance redundancy</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- Operating leverage</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- O&amp;M management</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- Technological performance</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- Other operational risk factors</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>c) Performance standards</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Table 2

| Social Infrastructure, Accommodation, And Entertainment: Areas Of Additional Guidance (cont.) |
| d) Resource and raw material risk | X |
| 2. Market risk |
| a) Market exposure (including market case guidance) | X | X |
| b) Competitive position | X | X |
| 3. Country risk | X |
| B. Determining the operations phase SACP |
| 1. Preliminary operations phase SACP (including base-case guidance) | X | X |
| a) Debt service coverage ratios | X |
| 2. Adjusted preliminary operations phase SACP |
| a) Downside analysis | X | X |
| b) Debt structure (and forecast average debt-service coverage ratio) | X |
| c) Liquidity | X | X |
| d) Refinance risk | X | X |
| e) Projects without fixed contractual maturity dates | X |
| f) SACPs in the 'ccc' or 'cc' categories | X |
| 3. Final adjustments to arrive at the operations phase SACP | X |
| a) Comparable ratings analysis | X |
| b) Counterparty rating adjustments | X |
| O&M--Operations and maintenance. |

**IMPACT ON OUTSTANDING RATINGS**

7. These criteria, in and of themselves, do not result in any rating changes. (See "Project Finance Framework Methodology," Sept. 16, 2014, for the rating changes related to the project finance criteria as a whole.)

**EFFECTIVE DATE AND TRANSITION**

8. These criteria are effective immediately. We intend to complete our review of all project finance issue credit ratings within the next six months.

**METHODOLOGY**

**Part I: Construction Phase SACP**

**A. Technology And Design Risk**

9. Social infrastructure, accommodation, and entertainment projects typically have limited exposure to technology. In
assessing the technology and design risk, one key credit factor is the track record of the technology, equipment, material, or technical solution in similar ground and weather conditions and scale as well as how the technology solution and design address the site-specific challenges.

10. For the majority of assets in the sector, the main technology exposures include:

- Heating and cooling systems;
- Building management and temperature control;
- Security systems;
- Water and waste water treatment systems;
- Building ventilation;
- Energy efficiency and environmental standards;
- Lifts and escalators; and
- Information technology, including voice and data systems.

11. Some assets, such as stadiums, may have additional technology exposure. For example, stadiums may have retractable roofs and video and scoreboard displays.

1. Technology track record in this application

12. In most cases, when assessing the technology track record, we assign an assessment of "commercially proven" because most of the technology that is used in social infrastructure, accommodation, and entertainment projects is off-the-shelf technology that building owners have used in many similar projects over a substantial time period and that has a proven track record for comparable operating conditions. For example, most projects will use off-the-shelf building management, heating, and ventilation systems, which we consider to be commercially proven under specified operating conditions.

13. We generally assign a "proven" assessment when the proposed technology is a minor change from a commercially proven technology. For example, a project could propose a more fuel-efficient or cleaner burning boiler system to heat the building, which, despite having some operating history, might have less-certain whole life costs. Similarly, many building management systems face ongoing obsolescence risk, which may impair the project company's ability to maintain the building and lead to an earlier-than-planned lifecycle replacement. If the costs associated with this are likely to have a material impact on predicting the overall lifecycle budget, then we may assign a "proven" assessment.

14. We are rarely likely to use an assessment of "proven but not in this application or arrangement" for these projects. In most cases, contractual mechanisms will likely limit the risk that the project company faces if there is material technology risk. For example, medical imaging equipment risk is often mitigated by protecting the project from default risk in the event that the technology fails to perform. If these mechanisms are absent or are regarded as ineffective and less-well-proven technology--such as a new medical imaging system--then we might consider the "proven but not in this application or arrangement" assessment to be appropriate.

15. New or unproven technology is rarely used in social infrastructure, accommodation, and entertainment projects. However, we assess an application to be "new or unproven technology" if a critical system has not been previously used in an operating environment similar to that of the project.
2. Technology performance match to contract requirements and expectations

16. In most cases, an assessment of "matches all" will apply if a sponsor's project bid sets out how its technical proposals meet the contracted output requirements. The contracting authority evaluates each bid to confirm whether it fully meets the contract requirements; any deviation would generally be a condition for the contracting authority to accept the offer. However, in limited circumstances, an assessment of "exceeds" or "falls short of minor" may apply under these criteria, as outlined in paragraphs 17 and 19 below. It is unlikely that we will assign an assessment of "falls short of material" in this sector, given the limited exposure to technology risk and the contracting authority's significant oversight prior to contract execution.

17. Importantly, many project agreements mitigate elements of technology risk by transferring the risk to a counterparty. We subsequently assess counterparty risks in accordance with "Project Finance: Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011. For example, projects are typically protected from performance risks associated with information technology systems in hospitals, such as medical imaging, although the initial supply and installation of such medical equipment may remain with the project. While maintenance of these systems may be one of the project's subcontractors' responsibilities, the contracts are typically structured to ensure that such medical equipment's failure does not weaken the project's credit quality. If these measures are absent or are regarded as ineffective, then we may assign a lower technology performance assessment to reflect the higher technology risk under these criteria.

18. To receive an assessment of "exceeds," under these criteria, a project must demonstrate that all of its components can achieve the relevant performance standards in extreme on-site conditions. The project may achieve this in various ways depending on the detailed project requirements. For example, heating systems may be significantly more energy-efficient than specified, or they may be installed with higher levels of redundancy than specified. Alternately, retractable roofs or playing fields in a stadium could be designed to operate across a much wider range of temperature and wind speeds than the contractual requirements specify.

19. Where systems are likely to affect operations across the whole building, we adopt a weak-link methodology in assessing technological performance risk. For example, if heating systems provide significant head room above the contract performance thresholds but the security systems match the performance requirements, then we assign an assessment of "matches all" under these criteria.

20. Using a weak-link approach, an assessment of "falls short of minor" will apply when there is a risk that a specified technology may fall short of the contract requirements, leading to an increased risk of financial deductions. For example, when a building is likely to fall short of contracted energy use targets or installed elevators are inadequate for the expected traffic levels. If these risks remain with the project company, then we assign an assessment of "falls short of minor" under these criteria.

21. While we consider it unlikely, an assessment of "falls short of material" will apply if we believe that the project will not reach contracted requirements based on the technology employed. This would typically require a significant error by the contracting authority that evaluated the bid and considered it acceptable prior to financial close.
B. Design Cost Variation Risk

1. Design complexity

22. Each new project is often uniquely designed to meet bespoke output requirements based on its location and user needs. However, given the extensive range of cost and building performance data that are available generically in the building industry for developed markets, an appropriate degree of certainty exists regarding how buildings are likely to perform once properly constructed. Many standard form contracts provide relief to a project that limits potential risk. We assign the design complexity assessment after factoring in the impact of contractual mitigation. For example, if ground condition risk remains with the contracting authority, then—everything else being equal—this would reduce design complexity risk. Planning and permitting risk are considered part of the project management assessment.

23. A number of factors could influence a building design's complexity, which, in turn, would affect the building's operational performance as follows:

- Ground and site conditions: First, soil with limited ability to support building loads may require more complex foundation designs to maintain building stability. Second, underground structures, such as railway tunnels, may require more complex foundation designs to ensure that the building works do not damage any existing assets.
- Site surveys: Inadequate surveys create uncertainty, which may limit flexibility, cause unexpected delays, and increase construction costs. Brownfield sites are at particular risk of having inadequate survey data if existing buildings requiring demolition prior to construction prevent survey access.
- Utilities: Sites that have a large number of utilities services, such as power lines or water pipes, or highly important mains supplies may limit working time and increase the risk of cable strikes, which lead to delays. Brownfield sites with limited records of utilities services are particularly exposed to this risk.
- Environmental conditions: Contamination, endangered species, and unexpected archaeological finds may delay construction and increase construction costs.
- Site access: Confined building sites without room for onsite material storage, poor road access, or complex decanting requirements and construction phasing will limit the contractor's ability to recover from unexpected delays. Construction adjacent to sensitive buildings, such as operating theaters, may also limit working times and practices.
- Refurbishment works and building conversions: These works can create uncertainty about both construction time and cost because the existing building's condition may be uncertain, particularly when structural works are undertaken. The refurbished building's long-term performance may also be less certain than for new build works. Key considerations in determining the level of risks involved in refurbishment works include the degree of risks retained by the contracting authority and detailed knowledge of the building to be refurbished (e.g., structural drawings).

24. Under these criteria, we assess the following factors to determine the design complexity assessment:

- "Proven design." The design and construction sequence has not required material modification to account for site conditions, limited refurbishment works exist, and solid ground survey information is available, all of which are confirmed by an independent expert and adequate construction site access. Examples include simple schools and hotels, domestic accommodation and military barracks, hospitals on greenfield sites with good construction access, refurbishment works (which are limited to redecoration), and adequate survey data.
- "Modified proven design." An otherwise straightforward design and construction sequence has been tailored to meet specific site conditions, such as environmental conditions, utilities, or site access. This is likely to include
medium-sized building projects, such as hotels, hospitals, or stadiums, with some exposure to poor ground conditions, somewhat restricted site access, or moderate levels of structural refurbishment works.

- "Established design modified for site conditions." Large building construction that has required substantial tailoring to meet site requirements. This may include large hospitals on restricted building sites, hospitals with complex phasing requirements, and projects with substantial structural refurbishment works, poor ground conditions, or complex foundation requirements.

- "Simple first of kind." We will likely not assign this assessment to social infrastructure, accommodation, and entertainment projects because, in our view, it is unlikely that new technology will be used in this sector. A project would receive this assessment when employing a new design with a simple configuration.

- "Complex first of kind." We will likely not assign this assessment to social infrastructure, accommodation, and entertainment projects because, in our view, it is unlikely that new technology will be used in this sector. A project would receive this assessment when employing a new design with a complex configuration.

C. Financial Risk Adjustment

1. Construction base case

25. Most projects constructed in this sector use engineering and procurement and construction (EPC) contracts to mitigate construction cost and delay risk. Furthermore, some risks, such as force majeure risk or delays in achieving planning permission, are retained by the offtaker. Projects may also be exposed to delay due to variations that are agreed to during the construction process. If the concession agreement does not adequately mitigate the risk of cost increases or delays, we may make provisions for these risks within our base case under these criteria.

26. In some circumstances, stadiums and arenas may use an engineering, procurement, construction, and management contract to mitigate construction cost and delay risk, allowing the project to retain management of specific tasks, including procuring and installing specialized equipment, such as large-scale scoreboards or furnishings in the suite and club seat premium areas or restaurants. For this reason, Standard & Poor's may adjust its base case for those areas that are retained by the project, subject to our experience with project performance in the sector and any available reports from independent experts.

27. In rare circumstances when a project does not use fixed-price contracts, we will utilize information based on our previous experience with the sector and the contractors employed to determine the likely construction costs and schedules to define our construction base case. We will also use input from an independent expert as required.

2. Construction downside case

28. A risk exposure for a project in this sector is likely to be the failure and subsequent timely replacement of the project's building contractor. Where relevant, we calculate the forecast costs associated with replacing the construction contractor in accordance with "Project Finance: Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011. The downside case includes an allowance for the impact of a replaceable builder not already included in the counterparty replacement analysis (see paragraph 76 of "Project Finance Construction Methodology," Nov. 15, 2013).

29. Factors that could increase the EPC contract price, which we include in the construction downside case, may include the residual risk to a project after any contract risk allocation as a result of delays or cost increases due to variations,
planning consents, construction works that are required to be completed near sensitive operational facilities, or refurbishment works. For example, this could cover operating theaters in a hospital, poor ground conditions, unexpected archaeology, or delays associated with refurbishment works. In most cases, social infrastructure, accommodation, and entertainment projects seek to transfer all such risks to the building contractor or the offtaker or institute a sharing mechanism that caps the project exposure. To the extent that risks that remain with the creditworthy offtaker are mitigated by timely additional payments (e.g., upfront payments of capital costs for agreed variations), we do not typically make provisions for these possible costs in our construction downside analysis. If such contractual mechanisms are not present or are regarded as ineffective, then the downside analysis will include provisions for such additional costs. Due to the way these transactions are typically designed and structured together with independent oversight of construction payments, we typically expect such additional costs to be limited under a building contractor replacement scenario. If the project does not have sufficient liquidity to meet these additional costs, then the construction phase SACP will be weak-linked to the building contractor's credit quality.

30. The construction downside cost scenario will include our assessment of likely cost and revenue increases in the following allowances:

- Project operating costs: project salary allowances, office availability, insurances, etc.
- Facilities maintenance costs incurred during the construction period. Many projects may fully contract such costs on a fixed price basis. However, a project may be more exposed to maintenance cost increases during construction if the project delivers those maintenance services directly by using its own employees.
- Some projects may have a long construction period, during which initial lifecycle costs are included within the construction uses of funds. Typically, this will include lifecycle costs of buildings that were transferred to the project without capital works requirements. The construction downside case would include our assessment of likely cost increases.
- To the extent that the project relies on revenues earned during the construction period, the construction downside will consider the impact of a reduction in revenues. Such revenues will typically be backed either by third-party support or retentions from the construction contract sum.
- Any construction delay risks that are accepted by the project owner. This may include, for example, risks accepted by a hotel owner if the construction delay is not covered by timely and on-demand liquidity or a revised construction schedule.
- The construction schedule for a project's completion and the related impact on the budget based on onerous or lenient completion standards. For example, a hotel may be open and collecting room revenues even if, for example, the rooms on the top floor are not finished by the substantial completion date.

Part II: Operations Phase SACP

A. Asset Class Operational Stability

31. Schools, offices, and small primary care facilities, such as general practitioner doctors' offices, will typically receive an assessment of 1 under these criteria. Small- and medium-sized hospitals—including district and general hospitals, and small prisons—will typically receive an assessment of 2 due to their more intensive use and the more demanding standards, such as cleanliness, that these facilities are required to meet. Larger, more complex hospitals, such as large
or regional specialist acute care hospitals, and large prisons with complex service requirements, such as security, will typically receive an assessment of 3 due to their greater size, more intense use, and the facilities’ complexity.

32. Some more recent availability-based projects have limited service requirements (e.g., soft facilities maintenance services may be retained by the contracting authority). While reduced service requirements may marginally reduce risk to the project, we will not differentiate the asset class operational stability assessment. However, we may consider reduced service requirements in the comparable ratings analysis.

33. Open-air stadiums and smaller hotels will typically receive an operational stability assessment of 1 due to their limited operating complexity. Complex and large-scale convention center hotels and arenas would typically receive an operations stability assessment of 2 given their relatively higher operating complexity.

B. Market Risk

1. Market exposure (including base-case guidance)

34. Under these criteria, we will not generally assess market exposure for availability-based projects because we anticipate minimal variation in the cash flow available for debt service from our base case to the market downside case.

35. Some volume projects with market risk, such as university accommodation projects in the U.K. or hotels in the U.S., will only be paid for rooms that are occupied. In these situations, the market downside will be determined by examining the contractual features, such as minimum revenue guarantees, the market dynamics of local accommodations, and trends in occupancy over the previous seven to 10 years.

36. The market downside case for hotels will reflect the market conditions expected during a severe recession. For example, in the U.S., this case will generally be informed by the experience from 2008-2010, the low point of the recent economic cycle. We will use the following key assumptions for the market downside case:

- For operating and greenfield hotels, we will typically assume a seven- to 10-year downturn commensurate with conditions expected in an economic recession, followed by a two- to five-year period of normal conditions, and then another seven- to 10-year downturn. In the last 10 years of the hotels' estimated useful life, we will also assume deterioration in the hotels' ability to compete in the market as the facilities age or a new competing hotel opens, which will typically decrease annual revenue per available room (RevPAR) growth by at least 50 basis points relative to our base case.

37. The market downside case for stadiums and arenas will reflect the market conditions expected during a severe recession combined with a period of poor team performance. We will use the following key assumptions for the market downside case:

- Ticket revenues and attendance will be lower than the stabilized base case average and the decline will vary based on the sports league modified by the facility's competitive position as determined in Table 8. In the U.S., the typical attendance decline for the National Football League (NFL) is 5%, with the facility with the strongest competitive position declining by 4% and, in unusual circumstances, a facility with the weakest competitive position declining by 25%. The typical declines for the National Hockey League (NHL) and National Basketball Association (NBA) are 5%, declining to 4% for facilities with the strongest competitive position and a 20% decline for the unusual circumstance of a facility with a weak competitive position. For Major League Baseball (MLB), the typical decline is
12%, with the strongest facilities at 8% and the unusual circumstances of the weakest facilities declining by 20%. In sports outside the U.S., where poor team performance can lead to demotion to a lower league, we will typically apply a reduction of 20%–50% to reflect likely ticket revenues in the lower league.

- Contractually obligated income (COI), such as premium products of suites, clubs seats, and naming rights, typically declines by 2.5%–5% at each contract renewal point (generally assumed to be every 15 years) for facilities with an established operating track record. In sports outside the U.S., where poor team performance can lead to relegation to a lower league, a downside of 30%–60% will typically be applied to reflect the likely COI associated with the lower league with the amount of stress tied to the competitive position. We may assume a more modest decline if we believe the facility is highly competitive, allowing it to retain greater pricing power. For projects without an operating history, we will typically assume revenue from COI is 5%-15% lower at the contract renewal points.
- Turnstile/game-day revenue (i.e., food and beverage, parking, etc.) is tied to attendance levels and is based on the downside attendance levels. Minimum contractually guaranteed revenues provide a floor.
- If there is a material risk of a work stoppage, such as with many sports in the U.S., then we will apply a one-year work stoppage during the debt term. During the work stoppage, the facility will receive only contracted revenues whose contracts require payment during a loss of games. The pace of the recovery following the work stoppage will vary by league, with the NBA and NHL generally returning to pre stoppage levels in one year, and the NFL and MLB recovery over a longer period of time up to three years. The multi-purpose arenas have shorter recovery periods because historically it attracts additional arena programming during the work stoppages and attendance tends to recover faster due to team initiatives, such as discounting, to encourage fans to return. Similar to the attendance decline, this will vary based on the facilities competitive position score, with those facilities with strong competitive positions recovering faster and weak positions recovering over a longer period.

38. Stadium and arena projects may include financial structures to mitigate known sector risks. For example, a project may have a dedicated reserve account to fund facility operations and obligations during a work stoppage. Where we consider that the financial structure adequately mitigates the cash flow disruption, the market exposure assessment will exclude the impact of the work stoppage on cash flow available for debt service. We would then use the next weakest period of cash flow available for debt service for the market exposure assessment. When a reserve is used for a work stoppage, we will exclude that reserve from our remaining liquidity analysis (see paragraph 79 of "Project Finance Operations Methodology," Sept. 16, 2014).

39. Certain stadium and arena projects have long leases and debt tenor (up to 45 years). In these cases we often have limited confidence in market and operating assumptions in the outer years. As a result, we generally assume shorter asset life, typically 30 years for a new stadium, unless we have specific information that would point to a longer or shorter life. In our forecasts, we assume all debt amortizes within this timeframe.

2. Competitive position

40. The competitive position is typically not material for availability projects with revenues that are covered fully contracted and, therefore, no market risk exists. We outline the driving factors for our assessment of competitive position for student accommodation, hotels, and stadium projects below.

(a) Student accommodations

41. Where university/student accommodations are exposed to market risk, we will consider the following factors when determining the competitive position assessment:

- Whether the facility is collocated with the offtakers' facilities;
• Whether marketing processes for the facility are closely linked to the offtakers' core business and strategy for growth;
• The strength of other commercial incentives, such as revenue guarantees, which may require the offtaker to pay for unoccupied rooms below a specified threshold;
• The degree of competing facilities in the region;
• Occupancy history; and
• Price sensitivity.

42. We list the factors we use to assess the competitive position for university and student accommodation projects in table 3 below. We will assess these attributes as positive, neutral, or negative. We describe the characteristics of positive and negative assessments below. If a factor does not meet these characteristics, then we will assess it as neutral. Table 4 specifies how we combine the results from table 3 to determine the competitive position assessment. In limited circumstances, one factor may be assessed as unusually negative. In this case, we will lower the competitive position assessment by at least one category below that defined by table 4 (e.g., "weak" instead of "fair"). For example, if an offtaker was actively building material competing supply adjacent to the rated project, then we will assess "competing supply" as highly negative and lower the competitive assessment by at least one category compared to the outcome from table 4.

### Table 3

<table>
<thead>
<tr>
<th>Competitive Position Factors - University And Student Accommodations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive factor</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td>Collocation</td>
</tr>
<tr>
<td>Marketing process</td>
</tr>
<tr>
<td>Offtaker incentive</td>
</tr>
<tr>
<td>Competing supply</td>
</tr>
<tr>
<td>Price sensitivity</td>
</tr>
</tbody>
</table>

### Table 4

<table>
<thead>
<tr>
<th>Competitive Position Assessments - University And Student Accommodations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive assessment</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Strong</td>
</tr>
<tr>
<td>Satisfactory</td>
</tr>
<tr>
<td>Fair</td>
</tr>
<tr>
<td>Weak</td>
</tr>
</tbody>
</table>
(b) Hotels and stadiums

43. The key factors we will consider in determining the competitive position for stadium and arena projects are:

- Pricing;
- Demand;
- Market strength; and
- Market share.

44. The key factors we will consider in determining the competitive position for hotel projects are:

- Market position;
- Market strength;
- The asset’s condition; and
- Pricing elasticity.

45. In assessing the competitive position for hotels, stadiums, and arenas, we will consider the attributes described in tables 5 and 7 below. We will assess these attributes as positive, neutral, or negative. We describe the characteristics of positive and negative assessments below. If the project does not meet these characteristics, then we will assess it as neutral. In limited circumstances, one factor may be assessed as unusually negative. In this case, we will lower the competitive position assessment by at least one category below that defined in tables 6 and 8 (e.g., “weak” instead of “fair”). Two examples are (1) a hotel that’s old, not well maintained, and has insufficient cash flow to undertake adequate maintenance and (2) a stadium that has been forced to lower prices despite strong team performance in order to maintain attendance. In such cases, we will lower the competitive assessment by generally one category compared to the outcome in tables 6 and 8.

Table 5

<table>
<thead>
<tr>
<th>Competitive Position Factors – Hotels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Competitive factor</strong></td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Market position</td>
</tr>
<tr>
<td>Market strength</td>
</tr>
<tr>
<td>The asset’s condition</td>
</tr>
<tr>
<td>Pricing elasticity</td>
</tr>
</tbody>
</table>
Table 6

<table>
<thead>
<tr>
<th>Competitive Position Assessment – Hotels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Competitive assessment</strong></td>
</tr>
<tr>
<td>Strong</td>
</tr>
<tr>
<td>Satisfactory</td>
</tr>
<tr>
<td>Fair</td>
</tr>
<tr>
<td>Weak</td>
</tr>
</tbody>
</table>

Table 7

<table>
<thead>
<tr>
<th>Competitive Position Factors – Stadiums And Arenas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Competitive factor</strong></td>
</tr>
<tr>
<td>Demand</td>
</tr>
<tr>
<td>Market share</td>
</tr>
<tr>
<td>Market strength</td>
</tr>
<tr>
<td>Pricing</td>
</tr>
</tbody>
</table>

Table 8

<table>
<thead>
<tr>
<th>Competitive Position Assessment – Stadiums And Arenas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Competitive assessment</strong></td>
</tr>
<tr>
<td>Strong</td>
</tr>
<tr>
<td>Satisfactory</td>
</tr>
<tr>
<td>Fair</td>
</tr>
<tr>
<td>Weak</td>
</tr>
</tbody>
</table>

C. Preliminary Operations Phase SACP (Including Base-Case Guidance)

1. Availability projects

   Standard & Poor's base case for availability projects will generally be in line with the sponsor's base case because costs and revenues are predominately fully contracted. However, we may adjust the sponsor's base case if necessary based on independent information and our analytical experience. While most project revenues are contracted, projects can
be exposed to deductions for failing to provide services to specification. In most cases, any deductions will be passed through in full to the project's service providers. Accordingly, Standard & Poor's base case will not generally include deductions. However, we will assess the impact of the service provider's failure to meet its contracted service obligations and the consequences this could have under its contractual agreements. If an availability project is self-performing the services, then Standard & Poor's base case will include expected deductions depending on the nature of the services being delivered and the payment mechanism's terms.

47. In most cases, if we determine that a subcontract price is not consistent with current market prices, then we will most likely reflect this by increasing the downside cost margin rather than by adjusting the base case.

48. Where costs are self-performed or uncontracted (e.g., lifecycle costs), Standard & Poor's base case will be based on our assessment of likely costs, the independent expert's report (if available), and our experience with the sector and the region in which the project is operating.

2. Volume-based projects

49. Standard & Poor's typically develops its base case for volume-based projects using the sponsor's base case as a starting point. We will make adjustments to our base case based on our sector experience and input from a market study conducted by an independent expert. Standard & Poor's base case will consider the project's location, the local market, and the pledged revenues. For example, each project may have a different mix of pledged revenue, which may include:

- All stadium operating revenues available after payment of operating expenses, which may include lease payments from long-term tenants, such as the team;
- Only ticket revenue generated at the stadium or arena;
- Local hotel occupancy tax, sales tax, or other nonproject revenue, such as government appropriation revenues;
- All hotel operating revenues available after payment of hotel operating expenses; or
- Contracted payments based on room occupancy for university accommodation projects.

50. We will include in our base case the impact of any revenue contracts that may mitigate volume and pricing risk. Hotels may have short-term group bookings for room blocks contracted on a rolling basis, and stadiums/arenas may have medium- to long-term advertising, naming rights contracts, and suite contracts. Such contracts only partially mitigate risk. For example, contracts for hotel groups guarantee a daily room rate and a minimum number of room nights. However, during a recession, room nights under room block agreements tend to be lower than contractual levels because they are often postponed or cancelled.

51. Projects with volume exposure, such as hotels and stadiums, often have an annual requirement to fund the replacement of furniture, fixtures, and equipment (FF&E) and major maintenance projects. FF&E replacement schedules are a function of hotel occupancy and we will adjust them in accordance with our occupancy assumptions (see RevPAR in table 9 below).

52. For stadium and arena projects, we believe these projects face market competition and over time, will be less competitive relative to potential new facilities and other entrants. As a result, we generally forecast profitability will worsen. We typically do this by assuming revenues grow at a slower pace relative to operating expenses. Specifically, we assume that the annual revenue growth rate is 50 bps lower than the initial growth rate, which often results in a
margin compression of roughly 10 percentage points from year 20 to year 30.

53. We will generally base room occupancy assumptions for student accommodation projects on the following assumptions:

- Trends in historical room occupancy rates, including average occupancy over the last five years (if available), with adjustments if these rates diverge significantly from the average;
- The strength of university marketing processes and any room guarantees offered to new students; and
- Incentives in place for the university to fully occupy project rooms (e.g., any revenue guarantees which may commence if room occupancy falls below a specified threshold).

54. We will use the assumptions in table 9 to develop our base case for hotels.

55. We will use the assumptions in table 10 to develop our base case for stadiums and arenas.

### Table 9

<table>
<thead>
<tr>
<th>Factor</th>
<th>Assumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue per available room (RevPAR)</td>
<td>We base our assessment on the market's current and historical average RevPAR growth rate, while considering the impact on the additional capacity added to the market. For new projects, we may apply a premium over similar competitive hotels if substantiated by our assessment of local demand conditions. For all operating projects, growth in RevPAR will slow as occupancy reaches a stabilized level and room rates move in line with Standard &amp; Poor's consumer price index (CPI) forecast.</td>
</tr>
<tr>
<td>Ramp-up</td>
<td>For new hotels, our ramp-up period is generally three to five years based on historical supply and demand trends. We may adjust this period based on the effectiveness of management's marketing strategy and short-term group bookings. Other factors that we consider include the strategy employed by competing facilities, such as discounting the average daily rate, or renovation projects to compete with the new hotel.</td>
</tr>
<tr>
<td>Operating margin</td>
<td>Our operating margin assumptions generally range between 40%-60% and are influenced primarily by the hotel's pricing power and regional labor costs and fixed obligations, such as property taxes and utilities.</td>
</tr>
</tbody>
</table>

### Table 10

<table>
<thead>
<tr>
<th>Variable</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ticket revenues and attendance</td>
<td>We typically base ticket revenues and attendance on the historical averages over the past seven stabilized years, adjusted for new capacity, seating configuration, market factors, and pricing premium. Typically, opening year attendance would be higher compared to historical trends, followed by a decline to a stabilized level within three to five years. Long term growth rates will generally be lower than CPI, especially for those teams with ticket prices in the top quartile, as market factors limit pricing flexibility. For facilities without an established operating history we rely on our experience which may be informed by reports from independent consultants.</td>
</tr>
<tr>
<td>Contractually obligated income (COI), such as premium products of suites, club seats, and naming rights</td>
<td>At the expiration of the current contracts, COI revenues increase with inflation and we adjust them for historical performance and market competitiveness in line with the facility's competitive position score. For projects without an operating history or in a competitive market, we would generally assume a price decline of generally 5% at the major renewal point, which typically occurs every 15 years. For uncontracted inventory, we would generally assume a portion is sold, either under short-term or individual game-day contracts, based on our experience with historical market demand. For new stadiums under construction without executed contracts, we would generally not assume that the sales of remaining uncontracted products contribute to occupancy of higher than 70% unless this can be substantiated by successful premarketing programs or strong expression of interest from existing patrons.</td>
</tr>
<tr>
<td>Turnstile/game-day revenue (i.e., food and beverage, parking, etc.)</td>
<td>Turnstile revenue is tied to annual attendance and follows our base case assumptions. If the contract includes guaranteed minimum revenue, then we would include the minimum revenue in our base-case forecast. Revenues would grow in line with our view of the CPI or decrease based on historical performance and market demand. Similar to ticket revenues, the growth rate may be lower than CPI as market factors, such as demand indicated by the competitive market assessment, may limit annual pricing flexibility.</td>
</tr>
</tbody>
</table>
Table 10

<table>
<thead>
<tr>
<th>Standard &amp; Poor's Base-Case Assumptions For Stadium and Arena Projects (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-sporting-event revenue (i.e., concert and family shows in an NFL stadium)</td>
</tr>
<tr>
<td>Operating costs</td>
</tr>
<tr>
<td>Major maintenance</td>
</tr>
</tbody>
</table>

D. Adjusted Preliminary Operations Phase SACP

1. Downside analysis
   (a) Availability projects

56. Because revenues are generally fully contracted, the main variables for Standard & Poor's downside case in this sector are operating costs, lifecycle and/or capital costs, and the timing of these variables. In contrast to most sectors, we assume that the transition from our base case to the downside case would happen rapidly. The downside stresses are generally run as a combined scenario. Table 11 below specifies the cost increase assumptions that we will typically apply in this sector. We may apply higher downside cost assumptions in limited circumstances. For example, if we consider that a facility's maintenance contract does not reflect current market prices, the downside will include the increases specified in table 11 plus an amount to correct for the original contract's lower-than-market pricing.

57. We expect that the most likely cause of underperformance in this sector is the failure and subsequent replacement of a project's contractors. We will calculate replacement costs in line with "Project Finance: Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011, and, therefore, exclude them from the downside case. Following replacement, the downside scenario assumes a subsequent cost increase where relevant, as specified in table 11 below. Structural changes in the market for the contracted services, economic conditions, contractor- or issue-specific factors, and projects located in less-well-developed markets may result in higher replacement cost scenarios in the downside than specified in table 11.

58. Where facilities management services are provided by a contractor that is rated at the same level as the project or higher, and the services are backed by an appropriate guarantee from the parent company, Standard & Poor's downside case will generally exclude services cost increases. In this case, we would deem the service contractor irreplaceable in accordance with "Project Finance: Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011. To confirm the possible rating transition in the event of a counterparty downgrade, we will run the downside including the additional costs following contractor replacement.

59. Standard & Poor's downside case will also incorporate any other risks to which the project is exposed and that are not hedged or transferred to a suitable counterparty. For example, if a project is exposed to energy price or consumption...
risk, Standard & Poor's downside case will include increases in these unhedged exposures as specified in table 11 below.

60. Standard & Poor's downside case will generally include deductions that reflect poor performance as determined by the project's independent expert (if available) and our experience with the sector. Standard & Poor's downside case will also consider how such deductions will be funded. If such funding is timely and provided on demand from a creditworthy source, then the financial impact of such deductions would be mitigated.

61. Projects often remain exposed to lifecycle risk (i.e., the risk that major maintenance costs exceed expectations or a change in timing) through the concession's life. We will impose a stress on lifecycle costs and timing, as set out in table 11 below, because our analysis assumes that the project would be exposed to lifecycle cost and timing risk if a lower-rated lifecycle counterparty defaults and is not replaceable. If, in accordance with "Project Finance: Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011, we consider that the lower-rated counterparty is replaceable on similar terms, then Standard & Poor's downside case would be based on our assessment of the replacement lifecycle contract's terms. As a result, Standard & Poor's downside case may incorporate an inflated lifecycle contract cost but no exposure to lifecycle timing risk.

62. Where lifecycle costs and timing risk are subcontracted to a counterparty that is rated at the same level or higher than the project debt, we will generally not impose the lifecycle stress, and we will deem the counterparty irreplaceable in accordance with "Project Finance Construction And Operations Counterparty Methodology," Dec. 20, 2011. To confirm the possible rating transition in the event of a counterparty's downgrade, we will run the downside case including lifecycle risk.

63. Lifecycle timing risk will typically be assessed by moving 35% of the two-highest forecast semiannual lifecycle expenditures two years earlier than specified in Standard & Poor's base case. If, in our opinion, it is difficult to forecast lifecycle costs and timings, then under the criteria we may make larger adjustments to the lifecycle timing in our downside case. If lifecycle expenditures are required to meet hand-back requirements and occur in the last few years of the concession, then we will ignore these periods when determining the highest periods of expenditure. In our opinion, expenditures planned purely to meet hand-back requirements are unlikely to occur earlier than scheduled unless, in our opinion, the costs are scheduled so late in the concession that there is likely to be insufficient time to complete the works prior to the end of the concession.

64. Table 11 below shows the stresses that we will typically simultaneously apply to an availability project.

<table>
<thead>
<tr>
<th>Table 11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard &amp; Poor's Downside Case Assumptions For Availability Projects</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Downside case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard facilities maintenance costs</td>
<td>The hard contractor is terminated. We will apply a replacement premium of typically 10% higher costs.</td>
</tr>
<tr>
<td>Soft facilities maintenance costs</td>
<td>The soft facilities maintenance contractor is terminated two years after the hard facilities maintenance contractor. We will apply a replacement premium of typically 10% until the next benchmark period.</td>
</tr>
<tr>
<td>Project company management costs</td>
<td>Base-case costs typically increase by 5%.</td>
</tr>
<tr>
<td>Lifecycle costs</td>
<td>Typically a 10% increase on all real costs.</td>
</tr>
<tr>
<td>Lifecycle timing</td>
<td>We will move typically 35% of the two-largest semiannual payments two years earlier relative to Standard &amp; Poor's base case.</td>
</tr>
</tbody>
</table>
Table 11

| Standard & Poor's Downside Case Assumptions For Availability Projects (cont.) |
|-----------------------------|--------------------------------------------------------------------------------|
| Third-party income          | Only guaranteed levels, if applicable.                                        |
| Energy costs                | We will base the price assumptions on the maximum contracted exposure or the worst-case prices typically over the last 10 years. |
| Energy volumes              | Typically increase by 5%.                                                      |
| Abatements/deductions       | In the absence of operational history, we will typically base deductions on the independent experts' view of likely poor performance and our opinion of the operators' experience and capability in the sector and region in which the project is located. Where a project has substantial operating history and no recent independent expert report, we will typically apply financial deductions of at least twice the average level experienced during the operational period, capped where relevant by the facilities management contract termination threshold. In the absence of an independent expert report or operating history, we will apply deductions typically equivalent to 50% of the facilities management contract termination threshold. If the project is completing services directly, then the downside case will be based on our expectation of deductions associated with likely poor performance. |

(b) Volume-based projects

65. Standard & Poor's downside case will combine our market downside case with our operational downside assumptions and financial stresses linked to any refinancing, where relevant. Our market downside case assumptions are described in paragraphs 35-37. Similar to availability projects, we will assume that the transition from Standard & Poor's base case to Standard & Poor's downside case will happen quickly. The main driver for Standard & Poor's downside case is:

- For stadiums and arenas, an economic downturn or recession combined with poor team performance.
- For hotels, a new hotel entering the market.

66. Tables 12 and 13 show the stresses that we will typically apply simultaneously to volume-sensitive hotels or stadiums in our downside case. Operating costs include both variable costs tied to usage and fixed costs. Therefore, during an economic downturn, we would assume that operating expenses would be flat or decline slightly as management adjusts the variable costs, such as maid service or lost games, to match the occupancy. In addition, if a hotel has consistently low occupancy, then the major maintenance cycles may be less frequent. For example, major furnishings—such as carpeting and bedding—will require less frequent replacement because of lower usage.

67. We may apply higher downside assumptions in limited circumstances. For example, if the hotel has not reached stabilization or there are strong competing hotels in the market, we may assume a greater decline in operating margin.

Table 12

| Standard & Poor's Downside Case Assumptions For Hotel Projects |
|-----------------------------|------------------------------------------------------------------|
| Variable                    | Assumption                                                        |
| Operating margin            | Operating margins will gradually decline by generally 10 percentage points from year 10 until the estimated end of life. |
| Operating and maintenance and major maintenance costs | The costs of running an aging facility increase at a slightly higher rate than in the base case. Typically, annual percentage cost increases would be 50 basis points higher relative to our base case. Furthermore, operating and major maintenance costs accelerate during the last 10 years of a project's useful life. Typically, we assume major maintenance costs grow by an incremental 2-5 percentage points per year. |

Table 13

| Standard & Poor's Downside Case Assumptions For Stadiums and Arenas |
|-----------------------------|-------------------------------------------------------------------|
| Variable                    | Assumption                                                        |
| Operating and maintenance and major maintenance costs | If the project has not stabilized by year five, then we will typically increase operating and maintenance costs by up to 5%, or the five-year average, to reflect our view of the steady state. |
Lower downside assumptions may apply in limited circumstances. For example, if we believe the project has regularly followed major maintenance replacement, we may limit the growth in major maintenance costs to inflationary increases.

2. Liquidity

In most social infrastructure, accommodation, and entertainment projects, we will typically assess liquidity as "neutral." Debt service reserve accounts are generally sized to meet at least six months of debt service, while major maintenance accounts and other accounts are generally sized to meet any forecasted lumpy capital expenditures, tax, and transaction-specific structural features.

Some market-exposed projects, such as U.S. hotels and stadiums, may require greater levels of liquidity to achieve a "neutral" assessment. For example, convention center hotel projects are typically exposed to downturns in demand and occupancy, which move in line with regional and national economic trends, and do not have the ability to adjust operating expenses to offset the decline in RevPAR.

For liquidity to be assessed as "neutral" under the "Project Finance Operations Methodology," Sept. 16, 2014, we would expect U.S. hotels to have the following liquidity provisions:

- A debt service reserve account that is typically sized to meet 12 months of senior debt service; and
- FF&E reserves for the periodic replacement of hard and soft FF&E typically funded from 4% of gross room revenues ahead of periodic replacement.

For liquidity to be assessed as "neutral" under the "Project Finance Operations Methodology," Sept. 16, 2014, we would expect U.S. stadiums and arenas to have the following liquidity provisions:

- A debt service reserve account that is typically sized to meet 12 months of senior debt service. However, under certain circumstances—for example, when a stadium's revenues are predominately contracted and supported by a period of stable operation—a senior debt service reserve sized to support six months of senior debt service may achieve a "neutral" liquidity assessment; and
- Cash flow for an arena or stadium project may be interrupted during a prolonged work stoppage because a portion of the short-term or uncontracted revenues may not be collected. For a stadium or arena to have "neutral" liquidity, the project must be able to meet operating and debt service costs for 12 months without access to uncontracted revenues. This may be achieved by having sufficient contracted revenues to meet cash flow requirements in the event of a stoppage, dedicated prefunded reserves, or covenanted reserves, which build liquidity prior to the expiration of the league's collective bargaining agreement.

3. Refinance risk

When refinance risk is present, we will generally use the asset lives as indicated in table 14. Where applicable, we will adjust a specific project's expected life based on its particular circumstances. Long-term concession agreements may cap a useful economic life.

<table>
<thead>
<tr>
<th>Standard &amp; Poor's Typical Asset Life</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset type</strong></td>
</tr>
<tr>
<td>Availability projects</td>
</tr>
<tr>
<td>University student accommodations</td>
</tr>
</tbody>
</table>
### Table 14

<table>
<thead>
<tr>
<th>Standard &amp; Poor's Typical Asset Life (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotels</td>
</tr>
<tr>
<td>Typically 20 years for limited-purpose hotels and 30 years for large-scale convention center hotels</td>
</tr>
<tr>
<td>Stadiums and arenas</td>
</tr>
<tr>
<td>Typically 30 years</td>
</tr>
</tbody>
</table>

### APPENDIX

This article follows our Request for Comment, where Standard & Poor's solicited public feedback to the proposed criteria: "Request for Comment: Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings," published on Dec. 16, 2013, on Ratings Direct. The comments we received contributed to changes that we included in these criteria, and are outlined in the article "RFC Process Summary: Standard & Poor’s Summarizes Request For Comment Process For New Project Finance Methodology," published Sept. 16, 2014.

### RELATED CRITERIA AND RESEARCH

**Related criteria**

- Project Finance Framework Methodology, Sept. 16, 2014
- Project Finance Transaction Structure Methodology, Sept. 16, 2014
- Project Finance Operations Methodology, Sept. 16, 2014
- Project Finance Construction Methodology, Nov. 15, 2013
- Project Finance: Project Finance Construction And Operations Counterparty Methodology, Dec. 20, 2011
- Principles Of Credit Ratings, Feb. 16, 2011

**Related research**

- Common Assumptions For U.S. Stadium And Arena Projects, Sept. 16, 2014
- Credit FAQ: Provision Of Information For Assessing Project Finance Transactions, Dec. 16, 2013

These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or issue credit rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.
Criteria | Corporates | Project Finance:

Key Credit Factors For Road, Bridge, And Tunnel Project Financings

**Primary Credit Analysts:**
Thomas Jacquot, Sydney (61) 2-9255-9872; thomas.jacquot@standardandpoors.com
David C Lundberg, CFA, New York (1) 212-438-7551; david.lundberg@standardandpoors.com
James Hoskins, London (44) 20-7176-3393; james.hoskins@standardandpoors.com
Jodi E Hecht, New York (1) 212-438-2019; jodi.hecht@standardandpoors.com
Candela Macchi, Buenos Aires 0054-114891-2110; candela.macchi@standardandpoors.com

**Secondary Contacts:**
Paul Judson, CFA, Toronto 416-507-2523; paul.judson@standardandpoors.com
Anne C Selting, San Francisco (1) 415-371-5009; anne.selting@standardandpoors.com
Trevor J D'Olier-Lees, New York (1) 212-438-7985; trevor.dolier-lees@standardandpoors.com

**Criteria Officers:**
Mark Puccia, New York (1) 212-438-7233; mark.puccia@standardandpoors.com
Andrew D Palmer, Melbourne (61) 3-9631-2052; andrew.palmer@standardandpoors.com
Peter Kernan, London (44) 20-7176-3618; peter.kernan@standardandpoors.com

**Table Of Contents**

- SCOPE OF THE CRITERIA
- SUMMARY OF THE CRITERIA
- IMPACT ON OUTSTANDING RATINGS
- EFFECTIVE DATE AND TRANSITION
- METHODOLOGY

Part I: Construction Phase SACP

A. Technology And Design Risk
Table Of Contents (cont.)

B. Construction Risk
C. Financial Risk Adjustment

Part II: Operations Phase SACP

A. Asset Class Operations Stability
B. Market Risk
C. Preliminary Operations Phase SACP (Including Base-Case Guidance)
D. Adjusted Preliminary Operations Phase SACP

APPENDIX A

RELATED CRITERIA AND RESEARCH
Criteria | Corporates | Project Finance:

Key Credit Factors For Road, Bridge, And Tunnel Project Financings

1. Standard & Poor's Ratings Services is refining and adapting its methodology and assumptions for its Key Credit Factors (KCF) for rating road, bridge, and tunnel project financings. We are publishing this article to help market participants better understand the key credit factors in this sector.

2. This article relates to our global project finance criteria (see "Project Finance Framework Methodology", published on Sept. 16, 2014) and to our criteria article "Principles Of Credit Ratings," published Feb. 16, 2011.

**SCOPE OF THE CRITERIA**

3. These criteria apply to road, bridge, and tunnel project financings whose revenues come from real toll, "shadow" toll, or availability payments. Roads, bridges, and tunnels set up as non-profit public authorities continue to be rated under "Governments: Toll Road And Bridge Revenue Bonds In The U.S. And Canada," published Feb. 25, 2014.

**SUMMARY OF THE CRITERIA**

4. These criteria specify the key credit factors relevant to analyzing the construction phase stand-alone credit profile (SACP) and the operations phase SACP for road, bridge, and tunnel projects, which we rate in accordance with "Project Finance Construction Methodology," published Nov. 15, 2013, and "Project Finance Operations Methodology" published Sept. 16, 2014. For simplicity, this article uses the word "road" instead of "road, bridge, or tunnel." Where relevant, any references to "road" should be construed as also applying to bridges and tunnels.

5. As indicated in tables 1 and 2, factors marked with an "X" in the "key credit factor" column provide additional guidance on the sections of the construction phase criteria and the operations phase criteria. For factors not marked with an "X" in the "key credit factor" column, only the information provided in the construction phase criteria and the operations phase criteria apply. This KCF also provides assumptions for determining our base and downside cases specific to road projects.

**Table 1**

<table>
<thead>
<tr>
<th>Road Construction Phase: Areas Of Additional Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factors</strong></td>
</tr>
<tr>
<td><strong>Where assessed</strong></td>
</tr>
<tr>
<td>A. Construction phase business assessment</td>
</tr>
<tr>
<td>1. Technology and design risk</td>
</tr>
<tr>
<td>a) Technological risk</td>
</tr>
<tr>
<td>i) Technology track record in this application</td>
</tr>
<tr>
<td>X</td>
</tr>
<tr>
<td>ii) Technology performance match to contract</td>
</tr>
<tr>
<td>requirements and expectations</td>
</tr>
<tr>
<td>X</td>
</tr>
</tbody>
</table>
Table 1  
**Road Construction Phase: Areas Of Additional Guidance (cont.)**

b) Design cost variation risk
   - i) Degree of design completion and costing X
   - ii) Design complexity X X

2. Construction risk
   - a) Construction difficulty X X
   - b) Delivery method
     - i) Contractor experience X
     - ii) Degree of contract risk transfer X

3. Project management
   - X

4. Adjusting the preliminary construction phase business assessment X

B. Financial risk adjustment
   - 1. Funding adequacy (uses of funds) X X
   - 2. Construction funding (sources of funds) X X

C. Construction phase SACP
   - X

D. Other factors
   - X

SACP—Stand-alone credit profile.

Table 2  
**Road Operations Phase: Areas Of Additional Guidance**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Operations phase criteria</th>
<th>Key credit factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Operations phase business assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Performance risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Asset class operations stability</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b) Project-specific contractual terms and risk attributes</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- Performance redundancy</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- Operating leverage</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- O&amp;M management</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- Technological performance</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- Other operational risk factors</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>c) Performance standards</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>d) Resource and raw material risk</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2. Market risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Market exposure (including base-case guidance)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b) Competitive position</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. Country risk</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

B. Determining the operations phase SACP
   - 1. Preliminary operations phase SACP (including base-case guidance) X X
   - 2. Adjusted preliminary operations phase SACP
     - a) Downside analysis X X
     - b) Debt structure (and forecast avg. DSCRs) X |
### IMPACT ON OUTSTANDING RATINGS

6. These criteria, in and of themselves, do not result in rating changes. (See "Project Finance Framework Methodology," published Sept. 16, 2014.)

### EFFECTIVE DATE AND TRANSITION

7. These criteria are effective immediately. We intend to complete our review of all project finance issue credit ratings within the next six months.

### METHODOLOGY

#### Part I: Construction Phase SACP

**A. Technology And Design Risk**

8. The key challenges in building a road project mainly relate to design considerations and construction techniques. Technologies that are used for the asset itself (rather than its construction) have not materially changed over the years and, as such, we believe that road projects typically have limited exposure to technology. For most assets in the sector, the main technology risks include:

- Road surface (e.g., asphalt);
- Structural integrity;
- Drainage;
- Traffic-management systems;
- Ventilation and other mechanical systems (mainly for tunnels);
- Tolling systems; and
- Noise control.
1) Technology track record in this application

9. Regarding construction of road projects, advances in technology are mainly linked to construction techniques. For example, the introduction of boring machines revolutionized tunnel building, but the result—the tunnel—has not changed significantly in the past 30 years. The only significant change concerns tolling and traffic-management systems, with the introduction of free-flow tolling systems (using electronic tags rather than manned toll booths) and satellite tracking systems.

10. In most road-building cases, we typically assign a "commercially proven" assessment because construction contractors have used many of the technologies for road infrastructure in their current form for at least 15 years and significant data are available regarding their expected performance. This type of technology typically includes simple tolling equipment that relies on electronic tags that predetermine the price that users pay.

11. We assign an assessment of "proven" or "proven but not in this application or arrangement" if the project uses certain technologies that do not have a long track record of performance under a wide range of operating conditions. The election of either of these two assessments largely stems from the technology's expected life and how frequently that technology is replaced. For example, we are likely to assess latest-generation pavements with high drainage performance but limited operating data as "proven" if the project assumes that the road will be resurfaced every five years. In this case, a faster-than-expected deterioration will likely result in only a marginally compressed replacement frequency compared with our base case. However, we assign an assessment of "proven but not in this application or arrangement" if the project assumes no or limited replacement.

12. Complex electronic tolling systems that rely solely on license plate recognition or dynamic toll rates (where the toll that users pay is a function of traffic conditions) are likely to receive an assessment of "proven" or, in cases of significant project-specific requirements, "proven but not in this application or arrangement." The assessment of a tolling system is ultimately driven by the extent to which "off-the-shelf" systems are being used and assembled and to what degree the system needs to be tailored to the project.

13. New or unproven technology is rarely seen in road projects. However, because we adopt a weak-link approach to assessing technology risk, we assess an application to be "new or unproven" if a critical system has not been tested in an operational environment similar to one in which the project operates.

2) Technology performance match to contract requirements and expectations

14. In most cases, we assign an assessment of "matches all" if a sponsor's project bid sets out how its technical proposals meet the contracted output requirements. The contracting authority evaluates each bid to confirm whether it fully meets the contract requirements; any deviation is generally a condition for the contracting authority to accept the offer. However, in limited circumstances, an assessment of "falls short of minor" or "exceeds" may apply under these criteria, as outlined in paragraphs 15 and 18 below, respectively. It is unlikely that we will assess a technology as "falls short of material" in this asset class, given the limited exposure to technology risk and the contracting authority's significant oversight before contract execution.

15. We assess the technology performance match to contract requirements as "falls short of minor" in cases when the project will not fully meet the contractual requirements in abnormal conditions. This could include speed restrictions during inclement weather (e.g., high wind or heavy snow) or on certain types of vehicles with heavy loads, unless
allowed under the concession agreement.

16. Where a contract requires a road to consistently operate at a level below its design capacity, we assign an assessment of "matches all" even if the contract requires that additional lanes be built in the future, provided that adequate provisions are made (in terms of time and costs) in our base-case forecast and these additional lanes can be built (i.e., the land corridor set aside for the project can accommodate these lanes).

17. We believe that an assessment of "falls short of material" is unlikely under these criteria unless the technology falls short of some material contract or performance expectation. This could include building a project in an area with high seismic activity that would likely sustain significant damage—and face extended closures—if an earthquake occurs of a magnitude previously seen in the area, unless the project does not bear that risk. This could also be the case if the traffic forecast is such that the road could not operate at the flow rates (i.e., the number of cars travelling in each lane over an hour) required under the contract. In cases where the road may not meet the contractually required flow rates in materially higher-than-forecast traffic and for a limited time period, we are likely to assess the project as "falls short of minor."

18. An assessment of "exceeds" requires that the contractor design the project with technologies exceeding each contractual requirement. Although this could be the case in certain circumstances (e.g., when a project elects to run a section of the road undercover to avoid noise pollution when keeping the road section in open air and using walls could achieve the same result), we expect this to remain the exception under these criteria given the likely significantly higher capital cost of implementing solutions that exceed the contract requirements.

19. We assess the technology performance match to contract requirements and expectations using a weak-link approach, whereby we assess each technology separately and the assessment of the project will be equal to that of the weakest technology.

3) Design complexity

20. Road designs are unique by nature in that they are typically tailored to and cannot be dissociated from the landscape, as well as the ground and soil conditions, on which the road is built. However, given the extensive range of cost and building performance data that are often available globally, an appropriate degree of certainty exists regarding how the roads are likely to perform once they are properly built and operational.

21. Many project grantors retain certain risks where it is difficult to quantify the likelihood of such risks materializing and their potential impact. For example, this could cover risks such as archaeological findings or native title claims. In these cases, we assign the "design complexity" assessment after excluding those risks that such contractual mitigants cover.

22. The main drivers that we believe can affect a road's design complexity are:

- Quality-of-site surveys: Inadequate site surveys can create uncertainty. Also, our experience shows that one of the key drivers of construction delays and cost overruns are unforeseen ground and subsurface conditions. Typically, a high correlation exists between cost overruns and insufficient/poor subsurface investigations. Site surveys, including extensive drilling exploration holes and seismic mapping, are also critical in building tunnels.
- Soil and ground conditions: Soil and ground with a limited ability to support structural loads or that suffer from poor
drainage, in our experience, are typically more prone to significant design variations.

- Environmental conditions: This includes contamination and archaeological findings, which may also delay construction and increase costs.
- Utilities: Sites that have a large number of utility services, such as power, gas, or water lines, may restrict working conditions and increase the risk of cable strikes, which can delay construction. Sites with limited records of utilities services are particularly exposed to this risk.
- Site congestion: Roads in congested areas can be more susceptible to utility relocation and latent conditions. Furthermore, site access can become a problem in that obtaining construction approval from local authorities can be more challenging and social opposition more likely, both of which can delay construction and increase costs. To avoid doubt, we include in this section the effect of site congestion on the design complexity. If material, we will factor the execution difficulty associated with construction in congested sites into the "construction difficulty" assessment.
- Upgrade work: This can create uncertainty in terms of any effect on the upgraded road's construction time and cost schedule because the existing road's or structure's condition may also be uncertain. The upgraded pavement's or structure's long-term performance may also be less certain than for new construction work. Key considerations in determining the level of risks involved in such work include the degree of risks retained by the contracting authority and detailed knowledge of the pavement and structures to be upgraded (e.g., structural drawings).

23. We assess these factors to determine the design complexity as follows:

- "Proven design." This applies when the design and construction sequencing does not require any material modification from that of similar roads. In addition, only minor modifications are required to account for site conditions and limited upgrade works. The road also displays no particular interfaces, with all of them being carried out in parallel, and have good soil and ground conditions. An example includes greenfield roads with no complex structures on relatively flat terrain.
- "Modified proven design." This is generally a road with a straightforward design that the construction contractor has tailored to meet specific site conditions. Most roads typically receive this assessment because they are tailored to and cannot be dissociated from the ground and soil conditions on which they are built.
- "Established design modified for site conditions." We assign this assessment to complex road designs that require significant tailoring to meet site requirements and ground conditions or roads with extensive structural upgrades. An example is a complex tunnel in an urban area, which needs to address the presence of existing utility services and building foundations.
- "Simple first of a kind" and "complex first of a kind." We are unlikely to assign these assessments to road projects because the facility's linearity normally allows for construction tasks running in parallel, rather than sequentially. This assessment potentially applies to long tunnels or bridges that require a design that specifically addresses the challenges of that particular project. The assessment of "simple first of a kind" or "complex first of a kind" is then typically driven by site conditions (e.g., we are likely to assess the construction of a long tunnel in an area of high seismic activity as "complex first of a kind").

B. Construction Risk

1) Construction difficulty

24. Our assessment of "construction difficulty" focuses not only on the relative difficulty of construction tasks, but also on construction techniques. As such, two identical bridge projects could receive a different assessment if one uses well-known and understood techniques and the other uses state-of-the-art processes that could significantly reduce the
construction phase's length, but that are inherently more risky given their lack of a track record. In this example, we are likely to assess the first project as a "civil or heavy engineering task" and the second as a "heavy engineering to industrial task." Our approach adopts a weak-link methodology. As such, the assessment reflects the most difficult component of the works—even in situations where the most complex part of the works reflects only a small component of the overall capital cost.

25. For most roads with few bridges or underpasses, we assess the construction difficulty as either a "moderately complex building or simple civil engineering task" or a "civil or heavy engineering task." We differentiate between these assessments based on several factors, such as topography (the flatter the ground, the easier to build), location (rural locations are easier to build on than urban ones), and site congestion (the presence of existing traffic).

26. We start our assessment for tunnels and bridges at a "heavy engineering to industrial task" and we move up or down one category based on similar factors, as listed in paragraph 25. Examples of projects that we assess as a "civil or heavy engineering task" include tunnels that are being duplicated (the site/ground condition will be known due to the presence of an existing tunnel) and short-span/low-height bridges in sheltered locations. At the other end of the scale, we are likely to assess long tunnels under residential areas/deep water (and the associated risks of collapse) or long-spanning bridges built in demanding weather or site conditions as an "industrial task complex building task."

27. Assessments of "simple building task" are rare in road projects unless the project includes the construction of a road on relatively flat terrain with simple bridges and underpasses, such as simply supported structures over a single or dual carriageway, and ground condition risks are considerably lower than other projects (either because the project does not bear the risk or available data are comprehensive).

C. Financial Risk Adjustment

1) Construction base case

28. Most road projects typically use engineering, procurement, and construction (EPC) contracts to mitigate construction costs and delay risk. Furthermore, risks that are not typically transferred to the project, such as force majeure risk or delays in achieving planning permission, are in many cases retained by the public sector concession grantor. Projects may also be exposed to delay due to variations that are agreed to during the construction process. If the concession agreement does not adequately mitigate the risk of cost increases or delays, then we may make provisions for these risks in our base case.

29. In rare circumstances where a project does not use fixed-price contracts and it undertakes construction on a "cost-plus" basis or uses a schedule of rates, we use, for determining our base case, information that the project and its contractors provide and supplement it with data gathered from similar projects in the sector.

2) Construction downside case

30. A primary risk exposure for a road project is the failure and subsequent timely replacement of the project’s building contractor. We calculate the forecast costs for replacing the contractor according to our "Project Finance Construction and Operations Counterparty Methodology," published Dec. 20, 2011 although our downside scenario may also include additional allowances to replace a replaceable builder not already covered under that analysis (see paragraph
Factors that could increase the EPC contract price, which we include in the construction downside case, may include the residual risks to a project—where the project retains the risks—after any contractual mitigants due to delays or cost increases due to variations, planning consents, ground contamination, or delays and cost increases linked to land acquisition. We also assess potential delays related to inclement weather against provisions that have been incorporated into the construction program. Our downside scenario may incorporate further weather-related delays if the weather-related time contingency allowance is sized based on mild to normal weather conditions with no additional buffer.

The construction downside cost scenario includes our assessment of likely cost increases or a revenue shortfall as follows:

- Project operating costs, including project salary allowances, office availability, insurances, and additional lender-related costs (e.g., increased monitoring fees, higher margins, etc.);
- Operations and maintenance costs incurred during construction, when the project takes over an existing road when the project starts;
- Toll revenues that the project collects during construction; and
- Additional costs that the project directly incurs in relation to risks that the construction contractor does not bear. This could include land-acquisition costs.

Part II: Operations Phase SACP

A. Asset Class Operations Stability

Operations stability varies across different road projects. In assessing the asset class operations stability for a road project, the following guidance applies under these criteria:

- We typically assess roads on relatively flat terrain with no bridges or tunnels as a ‘1’ under the criteria. In those cases where it’s difficult to forecast operating costs—for example, due to extreme weather conditions—or more complex operations, such as a managed lanes project, we typically assess such road projects as a ‘2’.
- Large-span bridges or tunnels typically receive a ‘3’ or ‘4’ if these same roads have above-average complexity or have associated lifecycle costs that prove difficult to forecast.

We assess a project’s asset class operations stability using the weakest-link approach. For example, we typically assess a large-span bridge at the end of a long and flat road as a ‘3’ or ‘4’ despite the fact that we assess most of the project (by length) as a ‘1’.
B. Market Risk

1) Market exposure (including base-case guidance)

35. Under these criteria, when we assess market exposure, we base the projected decline in the cash flow available for debt service on our market downside case using the following key assumptions, which are correlated to the road’s operating history:

- For roads with established traffic (defined as a road where recent traffic growth closely correlates with GDP, population growth, and employment), we generally assume an annualized traffic growth rate of 3% below our base case assumptions for two consecutive years, followed by a reduction of 1.5% below our base case growth assumptions for a subsequent three years. We then assume that traffic growth resumes in line with our base case thereafter.
- Table 3 shows the annualized traffic growth rate in the base case and market downside case, assuming the market downside starts in Year 1.

Table 3

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base case</td>
<td>2.5</td>
<td>2.5</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Market downside case</td>
<td>(0.5)</td>
<td>(0.5)</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>2</td>
</tr>
</tbody>
</table>

- With roads that mostly rely on commuter traffic (more correlated with population and employment), we adjust the magnitude of the stress applied to the initial two years in line with these factors (in particular, we consider a likely rise in unemployment and the effect on the related demographic during the period of our market downside). For managed lanes, we focus on total revenue and typically assume a longer period of no growth given their reliance on high levels of congestion on alternative free roads. As the rate of traffic growth along the corridor the project covers recovers to levels in line with growth before the downturn, the toll-free alternative road—rather than the managed lanes—will initially benefit. The reduction would generally be five years in duration and typically include a reduction of 5% to 15% for the initial two years, with a revenue drop being then halved for the subsequent three years (e.g., if an 8% drop was selected for the initial two years, revenue would go down by 4% against the base case in the next three years). The selection of the revenue decrease in the suggested range will take into account the characteristics of the road and its users, such as local wealth, employment, and prevalence of free alternatives in the corridor. For example, a managed lane project in an area of relative high wealth and low unemployment will likely perform more robustly in an economic downturn. For managed lane projects already in operation where we have more accurate data on traffic behavior, we may apply a lower stress in the project’s early years to take into account some of the project’s current strengths (e.g., such as a relatively low toll rate), we will revert to the above range in subsequent downside cycles (as described in paragraph 53) as reliance on historical data becomes less relevant.
- For greenfield roads and roads still in ramp-up, we generally assume an extension of the ramp-up phase by three to five years (except for managed lanes or congestion relievers that have extensive operating history) and a traffic level following the ramp-up phase of 10% to 20% lower than our base case. We also remove any induced traffic (defined as traffic that will not otherwise exist but for the new road, which typically comes from assumed residential, commercial, or industrial properties being developed on the back of the road’s construction).

36. The extent of the traffic reduction for roads without established traffic is driven by the nature of the traffic (a higher level of commercial vehicles generally results in higher traffic volatility in an economic downturn, whereas a high level
of commuter traffic shows better resilience) and the roads. Managed lanes and congestion relievers (which, by their nature, rely heavily on commuter traffic) are somewhat potentially more exposed to an economic downturn during their ramp-up because they are competing against free alternatives (generally co-located with the project) and they rely on heavy congestion during peak hours to gain pricing power. When unemployment is high and commuter traffic decreases, traffic on the competing free alternative will likely drop, creating capacity on that road that will be filled by commuters that will otherwise have used the project. This reduction in traffic will then remove that pricing power and lower tolls, compounding the effect on revenue. Therefore, we expect this type of project to have a more severe revenue drop than roads with limited competition when unemployment is high.

37. When assessing our market downside case, we reduce the level of stress applied to a "shadow" toll road, reflecting the lower exposure in an economic downturn (compared with a real toll road) because road users do not pay to use the road.

38. We assume that toll rates increase by the maximum allowed under contract except for countries or regions where the toll culture is not established or is uncertain, in which case we generally assume no toll increase for the initial two years of our downside case.

2) Competitive position

39. Road projects' capacity to attract vehicles from other roads and achieve expected traffic growth, in our view, generally depends on the road's rationale (i.e., the reason it was built), its competitiveness, and its user characteristics. We make an assessment of the project's "competitive position" (see tables 4 and 5). We assess a factor that does not match most of the descriptors for either "positive" or "negative" as "neutral."

<table>
<thead>
<tr>
<th>Competitive Position Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive factor</td>
</tr>
<tr>
<td>Road rationale</td>
</tr>
<tr>
<td>Interurban radial facilities (e.g., a river crossing) with defined single-purpose traffic</td>
</tr>
<tr>
<td>The road represents a significant proportion of the total end-to-end average journey and time saving is significant compared to alternative routes</td>
</tr>
<tr>
<td>The facility is part of a national or regional network</td>
</tr>
<tr>
<td>Competitiveness (value proposition compared to competing facilities)</td>
</tr>
<tr>
<td>Time and operating cost savings are clear and significant</td>
</tr>
<tr>
<td>No multimodal competition</td>
</tr>
<tr>
<td>Roads have short and intuitive access from other road facilities</td>
</tr>
</tbody>
</table>
Table 4

<table>
<thead>
<tr>
<th>Competitive Position Factors (cont.)</th>
<th>Track record and strong contracts ensuring passive protection (competing facilities will not be built or upgraded) and active protection involving government action (traffic-calming)</th>
<th>Track record of a lack of passive or active protection. Several layers of autonomous governments that may take conflicting actions, such as granting competing routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic growth drivers</td>
<td>Developed, stable, and diversified local economy; high income per capita (more than $30,000); low unemployment; observed low, but stable, close correlation to GDP</td>
<td>Developing, volatile, and/or undiversified local economy; high unemployment; observed divergence between GDP and traffic growth</td>
</tr>
<tr>
<td>User characteristics</td>
<td>High reliance on commuters (more than 80%-90%) or single-journey purpose; low reliance on commercial vehicles (maximum 10%-15% of revenues); high-income, time-sensitive market; steady traffic profile through day and week</td>
<td>High recreational traffic and/or high reliance on commercial vehicles (more than 60% of revenues)</td>
</tr>
<tr>
<td></td>
<td>Few clear dominant market segments constituting the bulk (more than 70%) of all trips</td>
<td>Multiple, atomized user segments (no group accounting for more than 50% of all trips)</td>
</tr>
<tr>
<td></td>
<td>Key origins and destinations (more than 70% of all trips)</td>
<td>No clear market or a multitude of less-dominant origins and destinations</td>
</tr>
<tr>
<td></td>
<td>Flat-demand profile (time of day, day of week)</td>
<td>High seasonal or peak demand profile, except for managed lanes</td>
</tr>
<tr>
<td></td>
<td>Simple route-choice decision making and strong compliance with weight restrictions</td>
<td>Complicated route choice decision making and/or frequent overload of trucks</td>
</tr>
</tbody>
</table>

Table 5

<table>
<thead>
<tr>
<th>Competitive Position Assessment</th>
<th>Typical characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>All four factors in table 4 are assessed as positive.</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>Two or more factors in table 4 are assessed as positive (with at least one of these positive assessments relating to road rationale or competitiveness) and the remaining factors are neutral.</td>
</tr>
<tr>
<td>Fair</td>
<td>Does not meet the requirements for strong, satisfactory, or weak.</td>
</tr>
<tr>
<td>Weak</td>
<td>At least two factors in table 4 are assessed as negative.</td>
</tr>
</tbody>
</table>

C. Preliminary Operations Phase SACP (Including Base-Case Guidance)

1) Traffic growth assumptions

40. Standard & Poor's base case for a road project varies depending on the road's maturity. Roads with established traffic have a good level of historical traffic data that we can reliably use to determine our base-case assumption. However, a greenfield road has no data and, in that case, we rely on a traffic forecast that an independent, reliable third-party expert prepares.

41. For roads with established traffic, we assume that the historical correlation among traffic growth and GDP, population, and employment continues. However, as traffic increases to the road's full capacity, we temper and eventually flatten our growth assumption. At that stage, revenue growth is solely driven by increases in the toll rate. In cases where we believe toll rates are high relative to the area's socio-economic levels, we may reduce the rate of revenue growth when we expect congestion increases as the road's economic value for the users diminishes.

42. When considering correlation among traffic growth and GDP, population, and employment, we do not seek to
determine a specific formula linking all of these parameters. Instead, we rely on historical trends and compare variations of each variable. For example, if a road’s historical annual traffic growth over 10 years has been consistently one to two percentage points less than GDP, we retain the same difference in our forecast. Similarly, if historical growth appears to be a function of population growth and GDP, we reflect those characteristics in our forecast.

43. For greenfield roads, we initially establish our base case using a third-party traffic forecast. To validate this forecast, we typically complete the following assessments of the traffic model and make the appropriate adjustments where required:

- Validation of the network model, assuming the road is not built. This process allows us to validate the traffic growth on existing roads with known traffic. Any significant growth on existing roads at rates significantly higher than historical traffic growth generally indicates issues with the base network model.
- Validation of historical induced traffic. This means looking at the network model from a past date to determine if the model’s assumed induced traffic between that date and today correlates with actual induced traffic.
- Validation of the multipliers used to derive annual traffic. Traffic models that focus solely on morning peak usage, for example, will vary significantly because total traffic will be derived by applying multipliers to that morning peak level.
- Validation of the assumptions used that could result in material and sudden changes in traffic growth (i.e., when traffic grows a certain percentage every year but then suddenly jumps significantly in one year). This could include assumptions about new large property developments adjacent to the road or the development of the road network in the project’s vicinity. We typically discount these assumptions (or at least revise the timing for when those projects are completed) unless we have an appropriate degree of comfort about the validity of those assumptions. For example, we may include a new road that will feed additional traffic onto the project if there are clear government policies and public support, whereas we are likely to discount it if the project is highly uncertain.
- Review of the ramp-up assumptions: the traffic forecast typically seeks to establish the base traffic level from the point when traffic growth is driven primarily by GDP, demographics, and employment. To reflect the time it will take for users to become familiar with the new road, we factor in a time period (or ramp-up) when traffic will gradually increase to this consistent level. This transition period varies depending on the project’s location and nature. For example, we expect a longer ramp-up for a project established in an area with few other toll roads (because users are not accustomed to paying for using roads) compared with a project that is expanding an existing toll road (because user knowledge and acceptance is already high). We use our experience on similar roads to ensure that the assumptions are appropriate given the project’s characteristics.
- Validation of the extent to which another independent expert has reviewed the traffic forecast.
- Use of key macroeconomic assumptions (including inflation, GDP, employment, and population growth) and, where relevant, our assessment of the project’s share of the corridor traffic.
- Review of the forecast outputs to ensure that the project can accommodate traffic growth. It is not uncommon to see forecasts assuming traffic levels that are beyond the road’s capacity or peak commuting hours extending well beyond reasonable hours. This also includes a review of forecast traffic growth against actual growth on similar roads.

44. Once we establish our initial base-case traffic forecast, we adjust our traffic growth assumptions based on actual traffic data and revised macroeconomic assumptions.

45. Although a detailed traffic forecast is not critical for availability-based roads (because revenue paid to the project is not a function of the total number of users), we still seek to establish likely traffic levels given the implications on
operations and maintenance costs, as well as lifecycle replacement.

2) Other assumptions

46. In addition to traffic forecasts, our base case reflects the other key assumptions that affect cash flows. They include: toll rates, operations and maintenance costs, lifecycle replacement costs, general administration costs, and, where relevant, revenue abatements for failure to comply with contract requirements (typical for availability-based road projects).

47. To establish forecast revenue, we assume that toll rates vary as permitted or imposed (if a toll rate reduction is required) under the concession agreement. To the extent toll rate increases are subject to a third party's approval, we may assume they will increase at intervals greater than allowed for countries or regions with no established toll culture or where we have concerns about timeliness of approval. We also assume a level of toll evasion in line with similar toll road facilities in the region.

48. We typically assume operations and maintenance costs, and lifecycle replacement costs in line with the sponsor's base case. We may, however, adjust the timing of lifecycle replacement so that it is in line with our traffic forecast (e.g., the traffic level significantly influences the resurfacing of a road).

49. Projects that are exposed to revenue abatement/financial penalties for failure to comply with contractual requirements typically pass on this risk to the project's operations and maintenance operator. Accordingly, Standard & Poor's base case generally does not include deductions. However, we assess the impact of the operator's failure to meet its contracted service obligations and the consequences this could have under its contractual agreements. If an availability-based project is performing road operations itself, then Standard & Poor's base case includes expected deductions depending on the payment mechanism's terms.

50. Because some projects in this sector have long concessions (up to 99 years), we may have limited confidence in certain operating and traffic assumptions beyond a reasonable timeframe that will not be adequately mitigated through appropriate contractual protections. In this case, we limit the actual assumed project life even if it is shorter than the actual concession period. Typically, this means that we do not look beyond 40 years and assume that the project will not carry any debt beyond this date. As time passes, we maintain this 40-year window until such time it becomes constrained by the actual concession expiry date.

D. Adjusted Preliminary Operations Phase SACP

1) Downside analysis

51. Standard & Poor's downside case combines our market downside case with our operational downside assumptions and financial stresses linked to any refinancing, where relevant. We describe our market downside case assumptions in paragraphs 35-38.

52. Although we traditionally start the market downside case from the first year of our forecast, we may delay it by up to five years if our base-case forecast shows a release of cash reserves to equity during that period and the project's ramp-up is completed. In this circumstance, we start our market downside case in the year immediately following the cash release.
53. When establishing our downside case, we apply the operational downside assumptions for the project’s life. We also apply the market downside case at regular intervals of typically 15 years, taking into account the timing of major asset replacement works and the concession's actual expiry (see paragraph 52 for the timing of the first market downside).

54. Unlike real estate projects, it is not uncommon for road projects to operate and maintain the road without recourse to long-term operations and maintenance contracts that do not transfer price and operational risks to a third party. This partly reflects the lower operating costs as a percentage of revenue compared with real estate projects--mature roads generally demonstrate high profitability, with an EBITDA margin often higher than 80%.

55. In our downside case, we assume moderate cost increases (typically 10% for operations and maintenance and lifecycle costs). We also increase the frequency of road resurfacing by reducing the length of time between two scheduled resurfacing dates by 12 months compared with our base-case forecast (although the timing also takes into account the lower traffic volumes our market downside case establishes). For example, if our base case assumes the first resurfacing at Year 10 and then every 10 years thereafter, our downside will assume the first resurfacing will occur at Year 9 and then every nine years after that. Structural changes in the market for the contracted services, economic conditions, contractor- or issue-specific factors, and projects in less-well-developed markets may prompt us to impose higher downside cost scenarios in the downside than specified above.

56. We also assume higher energy usage and prices (mainly relevant for tunnels) of typically 10% (applied to both usage and price). Finally, we usually assume increases in project management costs of 5%.

57. For projects exposed to abatements (which typically is the case for availability-based roads), Standard & Poor's downside case generally includes deductions that reflect poor performance, as determined by the project's independent expert (if available) and our experience with the sector. We also rely, where relevant, on historical abatement levels and generally double those levels in our downside case.

58. The key operational downside assumptions highlighted above under these criteria represent the typical level of stress we apply to a project’s cash flows. In certain cases, we increase the level of stress to reflect that our base-case assumptions may be subject to greater variability (e.g., a project required to maintain aging infrastructure that has been subject to a superficial condition survey warrants a higher lifecycle stress). Similarly, we adjust our energy usage and price stress for projects with larger-than-average mechanical and electrical systems given that the aging of those systems will reduce energy efficiency (e.g., this applies to long tunnels that typically have high energy requirements from ventilation systems compared with open-air roads).

2) Liquidity

59. Under these criteria, we expect road projects to have adequate fungible liquidity to fund debt service if traffic is temporarily disrupted. Some projects may be exposed to longer periods of cash flow disruptions caused by economic cycles and have little ability to adjust fixed costs. Such risks may be mitigated by higher-than-average liquidity. For example, greenfield toll roads, particularly managed lanes, have additional reserves available during the critical ramp-up period. These reserves are available to cushion a longer ramp-up, while the users become accustomed to using the facility until the project becomes stable. The additional reserves outside of the debt service reserve fund are available during the critical ramp-up period and throughout the debt's term to withstand the expected downturns in economic cycles and provide more resilience to the downside conditions. Although the absence of these reserves does
not typically translate into a "less-than-adequate" liquidity assessment, they can lead to less-favorable results under our downside case.

60. Typically, we expect the aggregate of all fungible reserves available to support debt service to represent more than 12 months of debt service during ramp-up and until traffic growth becomes more stable and predictable. At this stage, a project can generally accommodate a reduction of the reserves to a level equivalent to at least six months of debt service, provided the project otherwise incorporates appropriate lock-up and release mechanisms to ensure that cash is trapped as required as traffic starts to deteriorate.

61. When considering the reserves available for debt service, we generally exclude any cash reserve or cash-trapping mechanism included in the project's structure that ensures sufficient cash resources are available to undertake large asset-replacement work. For example, we do not rely on gradual cash trapping to cover the cost of resurfacing, together with lost revenue while the work is being completed, as a debt service-dedicated reserve.

APPENDIX A

This article follows our Request for Comment, where Standard & Poor's solicited public feedback to the proposed criteria: "Request for Comment: Key Credit Factors For Road, Bridge, And Tunnel Project Financings," published Dec. 16, 2013. The comments we received contributed to changes that we included in these criteria, and are outlined in the article "RFC Process Summary: Standard & Poor's Summarizes Request For Comment Process For New Project Finance Methodology," published Sept. 16, 2014.

RELATED CRITERIA AND RESEARCH

Related Criteria
- Project Finance: Project Finance Framework Methodology, Sept. 16, 2014
- Project Finance: Project Finance Transaction Structure Methodology, Sept. 16, 2014
- Project Finance: Project Finance Operations Methodology, Sept. 16, 2014
- Project Finance: Project Finance Construction Methodology, Nov. 15, 2013
- Principles Of Credit Ratings, Feb. 16, 2011

Related Research
- Credit FAQ: Provision Of Information For Assessing Project Finance Transactions, Dec. 16, 2013

These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions.
Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor’s Ratings Services’ assessment of the credit and, if applicable, structural risks for a given issuer or issue credit rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.
Common Assumptions For U.S. Stadium And Arena Projects

Primary Credit Analyst:
Jodi E Hecht, New York (1) 212-438-2019; jodi.hecht@standardandpoors.com

Secondary Contacts:
James Hoskins, London (44) 20-7176-3393; james.hoskins@standardandpoors.com
Jayne M Ross, New York (1) 212-438-7857; jayne.ross@standardandpoors.com

Table Of Contents

Additional Guidance
Common Assumptions For U.S. Stadium And Arena Projects

The following table provides the most common assumptions--by sports league--used in Standard & Poor’s Ratings Services’ "Key Credit Factors For Social Infrastructure, Accommodation, And Entertainment Project Financings," published Sept. 16, 2014. We will update these assumptions periodically as market conditions and our criteria warrant.

### Historical Attendance Trends

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFL</td>
<td>66,625</td>
<td>65,043</td>
<td>64,978</td>
<td>64,698</td>
<td>nfl.com</td>
</tr>
<tr>
<td>% change</td>
<td>(2.0)</td>
<td>(2.0)</td>
<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>MLB</td>
<td>32,333</td>
<td>30,191</td>
<td>30,064</td>
<td>30,212</td>
<td>mlb.com</td>
</tr>
<tr>
<td>% change</td>
<td>(1.0)</td>
<td>(7.0)</td>
<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>NBA</td>
<td>17,394</td>
<td>17,497</td>
<td>17,149</td>
<td>17,319</td>
<td>espn.com</td>
</tr>
<tr>
<td>% change</td>
<td>(2.0)</td>
<td>0.6</td>
<td>(2.0)</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>NHL</td>
<td>17,307</td>
<td>17,476</td>
<td>17,070</td>
<td>17,164</td>
<td>nhl.com</td>
</tr>
<tr>
<td>% change</td>
<td>1.0</td>
<td>(2.3)</td>
<td>0.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Additional Guidance

**Ticket and COI adjustment**
- The table provides the historical basis for our attendance adjustment applied in downside case.

Under Standard & Poor's policies, only a Rating Committee can determine a Credit Rating Action (including a Credit Rating change, affirmation or withdrawal, Rating Outlook change, or CreditWatch action). This commentary and its subject matter have not been the subject of Rating Committee action and should not be interpreted as a change to, or affirmation of, a Credit Rating or Rating Outlook.