STANDARD & POOR'S RATINGS SERVICES
McGRAW HILL FINANCIAL

RatingsDirect®

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.dolier-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

Table Of Contents (cont.)

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 Along with the fully and partially superseded criteria articles listed in paragraph 3, this article partially supersedes the section referencing construction in the article titled, "Mining Projects,"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. On Dec. 16, 2014 we updated paragraph 66 to reference "Single-Sponsor Pension Plan Risk Assessments For Project Finance Funding Commitments.")*

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:

   - Criteria articles superseded in full: "Residential Construction Project Financing: The Singapore And Australian Experience," Aug. 18, 2003, "Residential Construction Project Financing: The Singapore Experience," Aug. 13, 2002, and "Behind The Ratings: Power Projects--What Makes A Construction Project Investment Grade?," Sept. 4, 1996
   - Criteria articles partly superseded (the part 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, and "Project Finance: Construction And Technical Risk Criteria," Aug. 27, 1999

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:

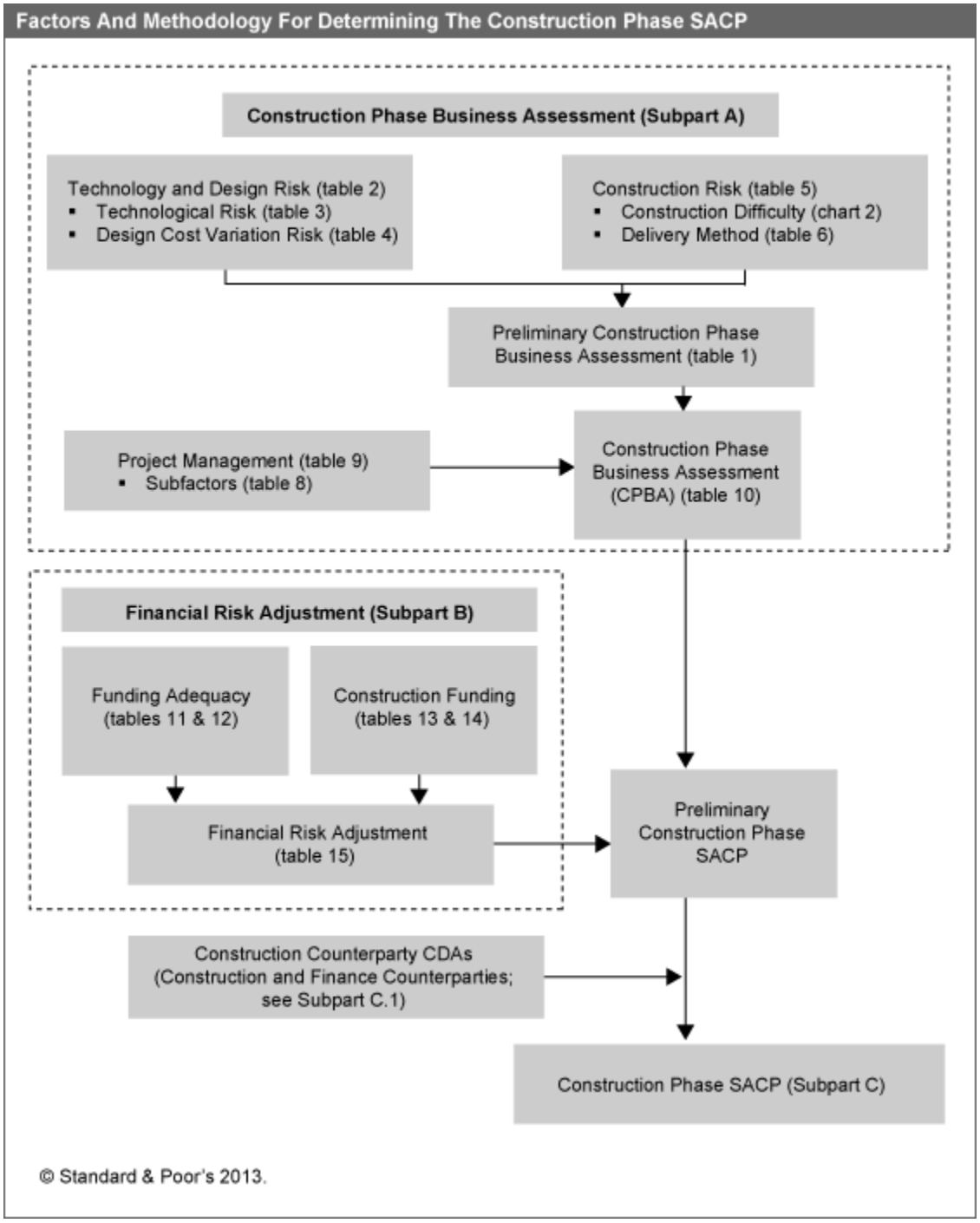
   - Assessing the construction phase business assessment. This involves assessing "technology and design risk" (table 2) and "construction risk" (table 5). We combine the resultant "technology and design risk" and "construction risk" assessments to derive a preliminary construction phase business assessment (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.
   - Adjusting the preliminary construction phase SACP for construction and finance counterparties risk. (For details, see "Project Finance Construction And Operations Counterparty Methodology," published Dec. 20, 2011, and "Counterparty Risk Framework Methodology And Assumptions," published June 25, 2013.)

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



1375431 | 300000625

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

Preliminary Construction Phase Business Assessment*

	--Construction risk (table 5)--				
Technology and design risk (table 2)	**1**	**2**	**3**	**4**	**5**
1	a+	a	a-	bbb+	bbb-
2	a	a-	bbb+	bbb	bb+
3	a-	bbb+	bbb	bbb-	bb
4	bbb+	bbb	bbb-	bb+	bb-
5	bbb-	bb+	bb	bb-	b+

*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

Technology And Design Risk

	--Technological risk (table 3)--				
Design cost variation risk (table 4)	**Very strong**	**Strong**	**Adequate**	**Weak**	**Very weak**
Very low	1	2	3	4	5
Low	2	2	3	4	5
Modest	2	3	4	5	5
Moderate	3	4	5	*	*

Table 2

Technology And Design Risk (cont.)					
High	4	5	*	*	*

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

Technological Risk				
	--Technology performance match to contract requirements and expectations (see paragraph 24)--			
Technology track record in this application (see paragraph 22)	**Exceeds**	**Matches all**	**Falls short of minor**	**Falls short of material§**
Commercially proven	Very strong	Strong	Weak	Very weak§
Proven	Strong	Adequate	Weak	Very weak§
Proven but not in this application or arrangement	Adequate	Weak	Very weak	*
New or unproven technology	Weak	Very weak§	Very weak§	*

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

	--Design complexity (see paragraph 28)--				
Degree of design completion and costing (see paragraph 27)	**Proven design**	**Modified proven design**	**Established design modified for site conditions**	**Simple first of a kind**	**Complex first of a kind**
Very advanced	Very low	Low	Modest	Moderate	High
Advanced	Very low	Modest	Moderate	High	High
Moderate	Low	Moderate	High	High	*
Preliminary	Moderate	High	*	*	*

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

Construction Risk

	--Construction difficulty (chart 2)--				
Delivery method (table 6)	**Simple building task**	**Moderately complex building or simple civil engineering task**	**Civil or heavy engineering task**	**Heavy engineering-to-industrial task**	**Industrial task complex building task**
Very strong	1	1	1	2	3
Strong	1	2	3	4	4
Adequate	2	3	4	5	*
Weak	4	4	5	*	*
Very weak	5	5	*	*	*

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 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) Construction difficulty

31. "Construction difficulty" (see chart 2) assesses the difficulty in building a project. The assessment recognizes that

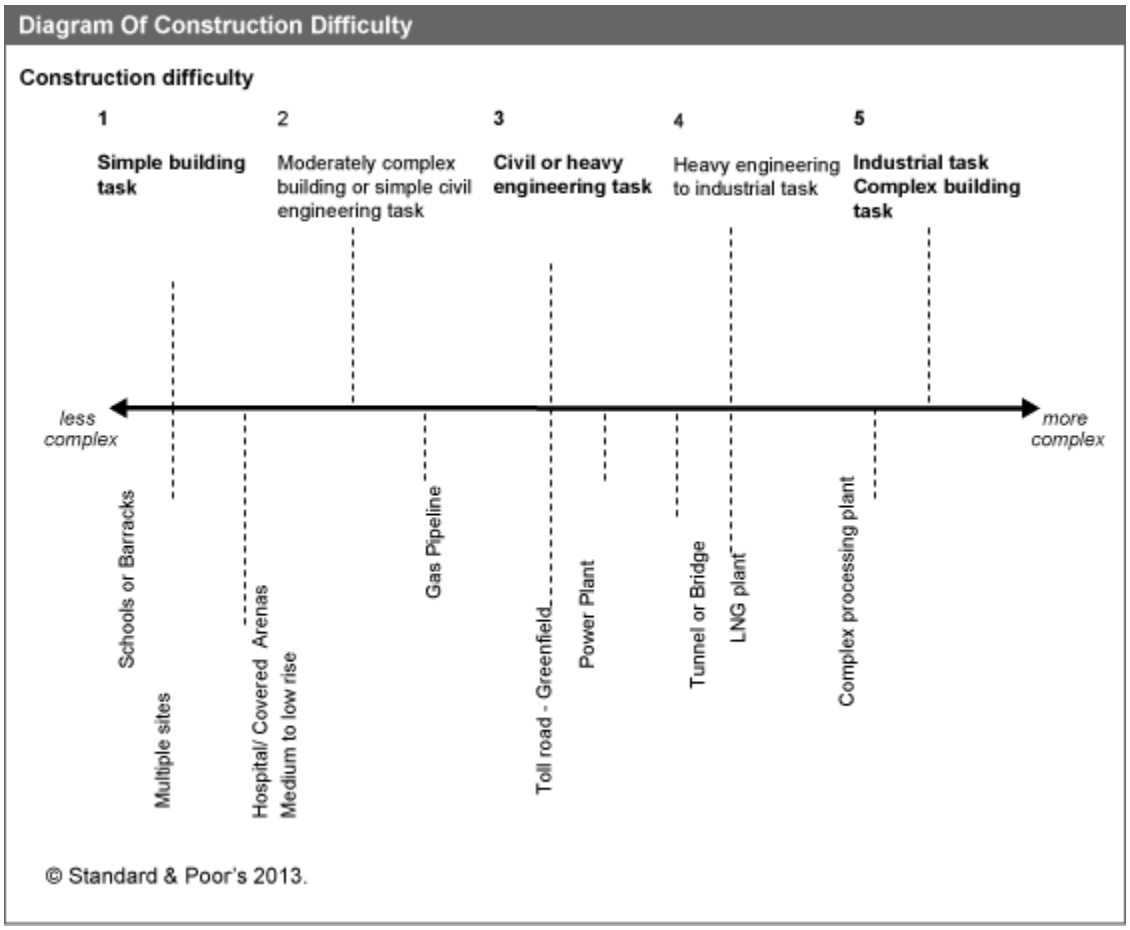
construction difficulty, even for a specific type of project, is a continuum with the assessment determined by rounding to the nearest assessment, or, in borderline cases, to the next-weakest assessment. For example, a simple civil project such as a flat-surface, greenfield (see Glossary) toll road is 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).

Chart 2



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

Delivery Method

	--Degree of contract risk transfer (table 7)--				
Contractor experience (see paragraphs 35-37)	**High**	**High to moderate**	**Moderate**	**Moderate to low**	**Low**
Very experienced	Very strong	Strong	Adequate	Weak	Very weak
Experienced	Strong	Adequate	Weak	Very weak	Very weak
Experienced but not in local conditions or project type	Adequate	Weak	Very weak	*	*
Inexperienced	§	Very weak	*	*	*

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

Degree Of Contract Risk Transfer		
Typical contract name	**Guidance**	**Assessment**
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 contactor 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

Summary Of Assessment Rules For Project Management Subfactors

	Positive	**Negative**	**Very negative**
Construction cash management	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.	Cash management is basic and lacks an independent, forward-looking review.	Cash management lacks adequate controls on payments/disbursement of funds or permits payments ahead of completion of work package.
Design approval	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.	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.	Operator and user or offtaker have not been involved in design or approval. No review of the design relative to contract requirements has occurred.
Permits and acquisition of right of way	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.	Permits are not issued or potential site conditions have material consent conditions or have not been quantified (such as contamination or archeology), 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.	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.
Project management expertise	Sponsor has strong project management skills and a previous track record of delivering similar projects on time and budget.	Sponsor's project management track record is limited and risk of contractor-introduced change is higher.	Not applicable*
Planning and budgeting execution risk	Critical-path items present limited risk to achieving schedule and budget.	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.).	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.
Sunset date	Sunset date and date of first debt service allow adequate time, in addition to the expected construction schedule, to cover the period required to replace a contractor and to complete works following an unexpected delay.	Sunset date and date of first debt service allow adequate time to replace a contractor, but the time buffer to accommodate additional delays is limited.	No time buffer to allow for delays during construction ahead of first debt service from operations threatens the viability of the project if underlying contracts terminate.

Table 8

Summary Of Assessment Rules For Project Management Subfactors (cont.)

Dispute resolution	The method resolves disputes quickly through strong working relationships between project, constructor, and off-taker, and the project documents are easy to navigate and readily facilitate the ability to solve problems.	Complex process or poor working relationships that may prolong dispute resolution.	The process is reliant on prolonged legal processes.

*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

Determining The Overall Assessment For Project Management

Overall assessment of project management	Subfactor (see table 8)
Strong	All of the subfactors are positive.
Satisfactory	The majority of subfactors are positive, with some negative assessments.
Fair	The majority of subfactors are negative, or we view key aspects of project management as potentially harmful to the company's risk profile.
Weak	Any assessment is very negative.

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

Construction Phase Business Assessment

Overall assessment of project management (see table 9)	Impact on preliminary construction phase business assessment
Strong	Plus 1 notch
Satisfactory	No change
Fair	Minus 2 notches
Weak	Generally not assessed higher than 'b-' and at least minus two notches

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)

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

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)

The impact of funding adequacy	Subfactor assessment
Neutral	Funding is available for all costs under the downside scenario.
Marginally negative	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.
Negative	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.
Insufficient	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.

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)

Highly certain	Certain	Uncertain*
	--Debt funding certainty--	
Risk of debt being unavailable when required is remote.	Risk of debt being unavailable when required is low.	Potential for delayed debt drawdown when required to make a payment, or, would create an insolvency of the project.
The debt is either contributed in full or unconditionally and irrevocably underwritten from a financial institution (counterparty risk would apply) at financial close.	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'.	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.

Table 13

Construction Funding (Sources Of Funds) (cont.)		
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.		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.
--Equity certainty--		
		Some risk that equity will not be contributed when required.
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.	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.	
	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 & Poor's guarantee criteria listed in the "Related Criteria And Research" section below) for projects with a construction phase business assessment above 'bb+'.	
--Interest income during construction--		
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.	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%.	Interest income not resulting from deposit with a highly rated bank.
--Revenues from operations during construction--		
Excess proceeds from operations are highly certain under all reasonable conditions.	Excess proceeds from operations are slightly vulnerable to underperformance.	Operating cash inflow income from untested or uncontracted operations that are vulnerable to interruption or delay.
Excess proceeds 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.	Operating surplus income from operations that have at least five years of operations history, but limited to a downside scenario.	
	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†--		
Third-party support is available on demand when required.	Risk of third-party support not being available when required is low.	Third-party support is highly conditional or may not be contributed in time to prevent a default.

Table 13

Construction Funding (Sources Of Funds) (cont.)		
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)--		
Contractor's funds are either cash deposits, retentions, or unconditional and irrevocable instruments.	Contractor's support 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).	Liquidated damages are not backed by an unconditional and irrevocable instrument (such as an LOC).
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 Methodology," published Dec. 20, 2011.)

Table 14

Use Of Subfactor Assessments For Determining The Impact Of Construction Funding (Sources Of Funds) (See Table 13)		
The impact of construction funding	**Country risk assessment 1-3**	**Country risk assessment 4**
Neutral	Highly certain sources are sufficient to meet the minimum funding requirement of all the downside scenario (see Appendix) needs.	Highly certain sources are sufficient to meet 101% of the minimum funding requirement of all the downside scenario (see Appendix) needs.

Table 14

Use Of Subfactor Assessments For Determining The Impact Of Construction Funding (Sources Of Funds) (See Table 13) (cont.)		
Marginally negative	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.	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.
Negative	Exceeds the conditions necessary for uncertain but does not meet the conditions necessary for marginally negative.	Exceeds the conditions necessary for uncertain but does not meet the conditions necessary for marginally negative.
Uncertain	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-'.	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-'.

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	
How we express our analytical opinion (rankings and qualifiers)	**Impact on the construction phase business assessment by a maximum***
Financial risk adjustment: Funding adequacy (use of funds) (see table 12)	
Neutral	No change
Marginally negative	-1 notch
Negative	-2 to -3 notches§
Insufficient	Generally not assessed higher than 'b-' and at least minus 2-3 notches
Financial risk adjustment: Construction funding (source of funds) (see table 14)	
Neutral	No change
Marginally negative	-1 notch
Negative	-2 to -3 notches§

Table 15

Financial Risk Adjustment (cont.)	
Uncertain	Generally not assessed higher than 'b-' and at least minus 2-3 notches

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.

65. 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.

66. 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 and refer to "Single-Sponsor Pension Plan Risk Assessments For Project Finance Funding Commitments", published Dec. 16, 2014 for pension plan risk assessments. We will treat pension plan risk assessments for the purposes of these criteria as being equivalent to counterparty ratings in the "Counterparty Risk Framework Methodology and Assumptions" criteria.

D. Other Factors

1. Third-Party Construction Guarantee

67. 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

68. 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.

69. 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

70. 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
- Guarantee Default: Assessing The Impact On The Guarantor's Issuer Credit Rating, May 11, 2012

Other criteria articles

- Single-Sponsor Pension Plan Risk Assessments For Project Finance Funding Commitments, Dec. 16, 2014
- RFC Process Summary: Standard & Poor's Summarizes Changes From The Project Finance Construction Methodology Request For Comment, Nov. 15, 2013
- Standard & Poor's Ratings Definitions, Oct. 24, 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
- Advance Notice Of Proposed Criteria Change–Project Finance Rating Methodology And Assumptions, Aug. 16, 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
- Residential Construction Project Financing: The Singapore Experience, Aug. 13, 2002
- Behind The Ratings: Power Projects--What Makes A Construction Project Investment Grade?, Sept. 4, 1996

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

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.)