

Rating Criteria for Infrastructure and Project Finance

Master Criteria

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Scope

Project and Infrastructure Debt Ratings: The “Rating Criteria for Infrastructure and Project Finance” (Master Criteria) is used when rating debt instruments where repayment is dependent upon cash flows from the construction, and operation of a standalone project or infrastructure facility, including those that may encompass several project assets in different locations.

Additionally, the assets and operation of the project should be within a project vehicle or achieve an equivalent segregation of project cash flows such as a separate enterprise fund within a governmental entity □ in either case referred to as a single-purpose project (SPP) in this report. Such projects typically arise in the power, transportation, telecommunications, oil and gas, industrial, mining, and social infrastructure sectors.

Instrument Ratings: India Ratings and Research’s (Ind-Ra) infrastructure and project finance ratings under these criteria are assigned to individual debt instruments and are therefore issue ratings. They do not incorporate recovery prospects given a default.

Key Rating Drivers

Completion Risk: Where material to the rating, Ind-Ra evaluates risks that may cause the project not to be completed on time, on budget, and/or up to the performance standards assumed for the operating period credit profile. Ind-Ra considers the following factors: the contractors, cost structure, delay risk, technology risk, internal and external liquidity support or credit enhancement and other terms of the construction phase contracts.

Operation and Revenue Risks: Ind-Ra’s analysis addresses the SPP’s ability to generate a stable cash flow based on its legal framework and fundamental economics. India Ratings analysts will evaluate the operating, cost, demand, revenue and infrastructure renewal risks at the SPP.

Debt Structure: Financial analysis considers each of the SPP’s rated debt instruments separately, taking into account the debt structure, including priorities, amortization, maturity, interest risk and associated hedging, liquidity, reserves, financial covenants, and triggers in the context of the project’s operating environment.

Debt Service and Counterparty Risk: Cases are developed to assess the level of financial flexibility a project demonstrates as it encounters stress reasonably expected to occur over the relevant forecast period. Metrics are used to evaluate the SPP liquidity profile and overall leverage. Counterparty risk (off-takers, concession grantors, warranty providers, etc.) is assessed for its impact on the rated debt.

Structure and Information: Any additional risk or risk mitigation flowing from the quality and experience of sponsors, strength of legal structure and/or the quality of information is considered.

Framework

Evaluate Cash Flow Stability

Ind-Ra's analysis addresses the project's ability to generate a stable cash flow. This requires an evaluation of the fundamental characteristics of the underlying asset, considering its legal framework and fundamental economics, together with any industry specific, political or macroeconomic risks. An Ind-Ra analyst will evaluate the sponsor and legal structure, completion risk, operating risk, revenue risk, industry risk and macro risks.

Evaluate Financial Structure

The agency next considers the financial structure to form an opinion on the capacity of those cash flows to service the rated debt instruments in accordance with their terms. The financial analysis evaluates the debt structure, including priorities, amortization, maturity, interest risk and associated hedging, liquidity, reserves, financial covenants, and triggers in the context of the project's operating environment. Counterparty risk (off-takers, concession grantors, warranty providers, etc.) is assessed for its impact on the rated debt.

Evaluate Stress Scenarios

Stress scenarios are used to test the cash flow sensitivity in a range of possible outcomes for key rating drivers. Ultimately, rating cases are established to assess the level of financial flexibility a project can sustain as it encounters stress that can be reasonably expected to occur over the relevant forecast period. The ability of the SPP to make timely payments takes into account its full resources and capacity as captured in metrics measuring its liquidity profile, such as a debt service coverage ratio, as well as metrics measuring its overall financial and operational flexibility, such as a project life coverage ratio or other measures of overall leverage. Important characteristics and metrics of the project financial profile are compared, where possible, with peer transactions to ensure consistency across transactions.

Typical Attributes and Peer Comparison

Investment-grade ratings are typically associated with projects, structures, and instruments displaying predominantly stronger or midrange attributes described in this report combined with metrics consistent with ratings at that level. Where information on appropriate peer projects for which a rating has been assigned is available to Ind-Ra (usually for the same sector, and structure), this will be used for comparative analysis of individual risk factors (both qualitative and quantitative) or in establishing the rating, with respect to the peer group. Relevant sector criteria suggest indicative metrics for investment grade debt. Where no specific sector criteria apply completely, appropriate metrics will be determined on a basis that seeks consistency and comparability with assets having similar risk profiles. For example, an LNG facility would be evaluated under the Master Criteria and closely follow the analytical approach adopted in criteria for thermal power projects.

Even if a project meets the financial metrics requirements for investment grade, other factors may constrain it to a lower rating category. Factors such as weak sponsors, excessive technical risk, partial merchant exposure, sub-investment-grade counterparties or other key risk factor assessments may support a lower rating. Conversely, factors may be present that support a higher rating, such as exceptionally strong contractual protections, a benign industry environment, or market dynamics that reduce potential price or cost volatility. Projects otherwise meeting investment-grade requirements, but exhibiting DSCR coverage profiles lower than indicated for investment grade, are assessed based on the facts and circumstances particular to the project.

Limitations

This Master Criteria report is used by Ind-Ra's analysts in conjunction with any relevant sector-specific criteria. Sector-specific criteria may provide indicative metrics and stress levels, additional factors, attribute expectations or specific methodologies. The ranking of attributes in this report represent Ind-Ra's analytical views from a wide range of project types. The lists are not exhaustive and some attributes may simply not be relevant in a specific project. The attribute tables are not checklists but qualitative guidance in assessing the attributes present in a project and are only part of the rating process.

Not all rating factors in these criteria may apply to each individual rating or rating action. Each specific rating action commentary or rating report will discuss those factors most relevant to the individual rating action.

Ratings consider the risks that a project or infrastructure facility are generally expected to face, including stresses to revenues due to the effects of macroeconomic cycles, short-term external shocks, certain force majeure events, operating and cost stresses, and individual project bankruptcy. Ratings under the Master Criteria and related sector criteria do not cover fundamental change of law or change of regulations; fundamental changes in demand due to the application of revolutionary technology or otherwise; or extreme events, such as terrorism, the long-term effects of global warming, or the collateral consequences of extreme events.

The analytical process often includes reviews of third-party reports, including studies prepared to assess design, technology, and demand risks or forecast availability of important resources. Though they may form a basis for reaching reasonable conclusions about the relevant risks, such studies have inherent limitations in methodology and actual outcomes can vary significantly from forecast. The ratings do not:

- predict a specific percentage of default likelihood over any given time;
- give a view on the liquidity of the issuer's securities;
- give a view on the possible loss severity on an obligation should an issuer default;
- give a view on the suitability of an issuer as a counterparty to trade credit; and
- give a view on any quality related to an issuer's business, operational, or financial profile other than the agency's opinion on its relative vulnerability to default.

Use With Other Ind-Ra's Criteria

This Master Criteria and related sector criteria can also be used in combination with other Ind-Ra rating criteria when rating entities or debt instruments that operate infrastructure assets but do not use a project finance structural framework.

Structure and Information

Ownership and Sponsors

The quality of owners or sponsors is an important consideration when assessing the potential success of a project. Ind-Ra considers this attribute to be asymmetric. Weak sponsors may cause the rating to be lower, all other things being equal. In contrast, while the presence of strong sponsors will be considered when evaluating the impact of stress scenarios and the ability of an SPP to manage through them, strong sponsors cannot substantially elevate the rating unless providing binding performance or financial guarantees.

Strong sponsors have significant positive experience within their own markets and internationally. Ind-Ra will inquire about previous involvement with similar projects that have been developed and operated successfully and will look to the project sponsors to demonstrate past experience with the technology and market.

The involvement of local parties is considered to be advantageous, as they may be more knowledgeable of and responsive to the business and political environments within the country. The project will typically serve a commercial or social need and have reasonable economic fundamentals.

The agency also considers the ownership structure and its complexity, relationships with contractors, whether there are multiple owners, the potential for change of ownership, and the flexibility to resolve project issues. The alignment of interests between owners, contractors, and lenders is reviewed for obvious conflicts in adverse circumstances and contract negotiation.

Ind-Ra looks for evidence of the sponsors' commitment to the project. Sponsors with significant resources, time, and reputation invested in the project, including higher levels of direct equity investment or guarantees combined with covenants to retain adequate capitalization or public service focus are considered a stabilizing factor. The strategic importance of the project to the sponsor is considered. For example, the sponsor's performance on a high-profile project may heavily influence the chances for subsequent business and their reputation in general. In this regard, governments and trade owners or sponsors may be better incentivized than financial parties.

Figure 1

Ownership and Sponsors

Stronger attributes	Market leading "trade" owner/sponsor; deep experience of similar projects; history of support for investments; essential public service sponsored by central government; minimum ownership and change of control covenants through debt life; "long-term" business model; strong financial capacity.
Midrange attributes	Experienced financial and trade owner/sponsors; midrange financial strength; ownership via intermediate holding company; active municipal or government sponsor; minimum ownership and change of control covenants in key risk phases; government commitment in national strategic projects.
Weaker attributes	Three or more owner sponsors without previous successful cooperation; weak financial strength; no "majority/controlling" owner/sponsor; inexperienced or minor trade or financial sponsors; borrowed/leveraged equity; no contract tendering; multilayer ownership structure; non-essential public service with minority small municipal sponsor; weak or no minimum ownership and change of control covenants; speculative or "short-term" business model.

Source: Ind-Ra

Sponsors without operational resources or capacity for technical support are unlikely to be ascribed any rating benefit regardless of financial strength. Ind-Ra assesses the financial strength of sponsors or external support to meet financial obligations as part of its financial analysis (see Debt Service and Counterparty Risks section). In any case, unless there are contractual guarantees, Ind-Ra will not assume that sponsors will systematically provide financial support in a timely manner to honour the SPP's financial obligations.

Project Vehicle Status and Project Structure

This part of the analysis is undertaken to establish the degree to which factors other than the economic success of the project might affect the project cash flows.

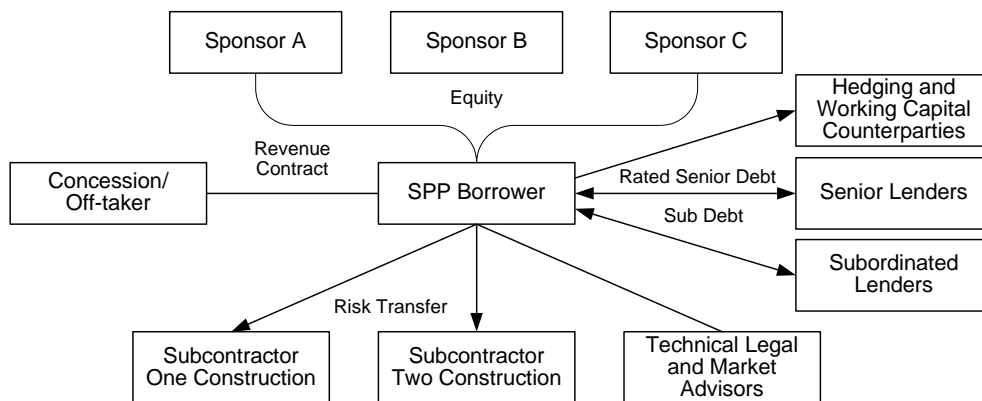
Ind-Ra's infrastructure and project finance criteria assume the existence of a project vehicle or equivalent means of segregation, the SPP, to ring-fence the assets and operation of the project and the cash flows, which are the repayment source of the rated debt instruments. Similar ratings may be achieved through specific legal frameworks without the existence of a project vehicle or by contractual structural features. Below is a diagram for a typical project financing.

Ind-Ra would expect key contracts to be in the name of the project vehicle or for the sole benefit of the segregated project. However, the operational role of the SPP is reviewed to consider what liabilities it might incur through employees, trade debt, taxation, environmental, and operational risks, etc., and to what extent these are subcontracted or mitigated. The SPP would also be expected to have corporate or statutory objects limited to supporting the single

purpose of the project and other provisions delinking its operations and finance and financial reporting from that of any owner or sponsor or public entity. Where the SPP has more than one class of debt, including working capital or liquidity facilities, a comprehensive inter-creditor agreement is anticipated possibly in association with nonrecourse and non-petition language.

Figure 2

Structure Example



Source: Fitch

In some instances, the SPP may not be the issuer (or borrower) of the rated debt but financed via a so-called “bankruptcy remote” special-purpose vehicle (SPV) that issues rated debt and lends to the project (SPP).

In some cases, the SPP could, if not properly separated from the sponsor/parent, be subject to a claim that its assets and liabilities should be consolidated with those of the parent/sponsor in a bankruptcy proceeding. In cases where there is a risk of such consolidation, Ind-Ra expects to receive an opinion of counsel that the SPP will not be substantively consolidated with its ultimate parent in the event of the parent’s bankruptcy. Where Ind-Ra concludes that the separation of the SPP from its sponsor is insufficient, other Ind-Ra’s criteria may be considered, such as criteria evaluating parent and subsidiary rating links or criteria used to evaluate rating linkages between government and government-owned enterprises. This may lead to a constraint on the rating of the SPP debt.

Figure 3

Project Vehicle Status and Project Structure

Stronger attributes	Borrower/issuer secured loan structure; bankruptcy-remote issuer with own liquidity/hedging; comprehensive inter-creditor arrangements at borrower level; de-linked from parent or group; clear single-purpose objects; limited or no operational activities; “nonrecourse”/“non-petition” debt; legal opinions confirm separateness/non-consolidation.
Midrange attributes	Rated debt at project level but to SPP; comprehensive restrictive covenants; inter-creditor agreement; financially and operationally de-linked from parent; contracts in the name of the SPP; “nonrecourse” debt; separate financial statements; some structural complexity, e.g. intermediate holding/joint venture; legal opinions confirm separateness/non consolidation.
Weaker attributes	Weak restrictive covenants and inter-creditor arrangements; rated debt at project level and borrower is not an effective SPP; financial and operational links to parent; project vehicle is not primary contracting party; complex borrowing structure; complex structure, e.g. intermediate holding companies.

Source: Ind-Ra

Legal and Regulatory

Forming an opinion of the quality of the legal framework upon which many project assumptions rest is a prerequisite to the credit analysis. For instance, this may be purely contractual or rely on statute or codified law, or a particular statutory instrument, or the powers of a constitutional or statutory authority. The project contract suite (and if appropriate, any legislation it may depend on) or detailed summary documents (such as a prospectus) are reviewed for key commercial elements and conformity to general market standards. Ind-Ra analysts will look for contract clarity, especially regarding allocation or transfer of risk within the project structure.

Unless otherwise stated in its issue report, where the project requires that the contracting parties hold licenses, permits or regulated status, Ind-Ra will seek confirmation that all relevant licenses, permits, or regulated status have been obtained and are valid under all relevant laws. The agency will also analyse the risk of loss of or renewal of such licenses, permits, or regulated status within the particular jurisdiction. More importantly, analysts will form a view on the clarity of the legislation and/or regulation, the stability of the regulatory environment, and any affect this may have on project performance or dispute resolution.

Other matters, such as independence of an SPV issuer, collateral rights, or statutory ownership restrictions, will be reviewed on a project by project basis. Ind-Ra will rely in its credit analysis on legal opinions to the extent that they are provided to it by transaction counsel, legal precedent that the agency is aware of, and/or statements by regulators or governments.

Figure 4

Legal and Regulatory

Stronger attributes	Structure based on standard contracts or specific legislation supported by legal opinions; allocation of project and financial risk unambiguously evidenced by contracts; all relevant licenses, permits, or regulated status have been obtained and are valid to debt maturity; low structural complexity; legal framework includes financial rebalancing mechanisms in case of unforeseen events; strong track record of quick and fair resolution of litigation.
Midrange attributes	Legal opinions or strong precedent for key contracts; all relevant licenses, permits or regulated status have been obtained and are valid and are likely to be retained and remain valid; allocation of project and financial risk clear but may have performance conditions.
Weaker attributes	Project contracts, regulatory or statutory framework is dependent upon untested legislation or regulation; weak or no legal opinions; contracts not available for inspection; all relevant licenses, permits, or regulated status have not yet been fully obtained.

Source: Ind-Ra

Use of Expert Reports

The information provided to Ind-Ra may contain reports, forecasts, or opinions provided to the issuer or their agents by various experts. These include legal advisors, third-party engineers, traffic, market, fuel/resource or environmental consultants, insurance advisors, and others. Sector criteria will describe the reports, forecasts, or opinions that are most relevant to risk analysis in the related sector. Where these reports contain matters of fact, Ind-Ra will question the source and reliability. Where the information is a forecast or opinion, Ind-Ra expects these to be based on well-reasoned analysis supported by the facts.

The status of the expert will also be considered in determining what reliance may be placed on their forecasts or opinions. Factors such as experience in the jurisdiction, location, or terrain, experience with the technology or transaction type, and formal qualification or licensing are often relevant. The importance placed on these factors is directly related to the materiality of the expert's forecast or opinion for Ind-Ra's rating opinion.

When forming its rating opinion, Ind-Ra may place less reliance on expert reports that lack clarity or contain extensive caveats or were conducted under less relevant circumstances. If possible, reports are compared with similar reports to highlight unusual or optimistic features. Without good rationale, such features may lead to adjustments in Ind-Ra's financial or

operational analysis. The agency expects experts to conduct their reports to professional standards.

The degree to which Ind-Ra uses expert information will depend partly upon the above issues and on the relevance of the information to the identified key risks. Where available, if expert information does not address a material issue, but might be expected to, Ind-Ra may make a further information request or an appropriate assumption. Where Ind-Ra determines that the reports are not sufficiently supported, complete or reliable, Ind-Ra may choose not to provide a rating.

Figure 5

Expert Reports

Stronger attributes	Major, specialized third-party advisor; specific experience with technology or sector, and location; projections and estimates based on tested or proven operation or precedent; no material unsupported assumptions; report demonstrates analytical rigor.
Midrange attributes	Third-party major advisor experienced with similar technology or sector; advisor may not have experience of location; advisor may be regional specialist familiar with the technology; estimates based on short operating history and/or rich industry data; some dependence on reasonable assumptions; formally qualified or licensed where required (e.g. under the local law).
Weaker attributes	Smaller or less experienced advisor; innovative technology or new sector; estimate data sourced from manufacturer or highly model dependent; high dependence on assumptions or sponsor estimates; report contains incomplete or limited reasoned analysis.

Source: Ind-Ra

Information Quality

The quality of information received by Ind-Ra, both quantitative and qualitative, can be a constraining factor for ratings. Information quality may constrain the rating category to some maximum level or in extreme cases preclude the assignment of a rating opinion. Information quality for the initial rating and for surveillance purposes is considered when a project finance rating is first assigned. Ind-Ra must be confident that adequate ongoing data will be available to monitor and maintain a rating once assigned. Information quality encompasses such factors as timeliness and frequency, reliability, level of detail, and scope. See also the Models and Surveillance sections.

Figure 6

Information Quality

Stronger attributes	Data from actual operation; high frequency data; independently validated; forecast supported by significance or error range statistic; no history of material data errors; detailed cash flows — receipts and disbursements; audited financial data; significant amount of public information available.
Midrange attributes	Combination of empirical and forecast; use of pilot studies, analogous projects in operation, tested equipment performance; timely receipt of data; periodic cash flows; timely notification of material events; actual counterparty exposures; regularly updated financial model; publicly available financial and regulatory data.
Weaker attributes	Substantially based on assumptions; extrapolated; subject to material caveats; data often subject to delay; history of revisions or errors; limited scope.

Source: Ind-Ra

Data Sources

Ind-Ra's analysis and rating decisions are based on relevant information available to its analysts. The sources of this information are the issuer, the arranger, third-party engineers or consultants, and the public domain. This includes relevant publicly available information on the issuer, such as audited and unaudited (e.g. interim) financial statements and regulatory filings. The rating process also can incorporate information provided by other third-party sources. If this information is material to the rating, the specific rating action will disclose the relevant source.

Completion Risk

Ind-Ra routinely rates “greenfield” projects before they are fully developed. Additionally, enterprises operating large infrastructure assets, such as airports, toll networks or LNG projects, engage in large capital projects as part of ongoing infrastructure renewal and extension even while continuing operations. Completion risk covers the risks in the construction, commissioning, and ramp-up phases of a project that may cause the project not to be completed on time, on budget, and/or up to the performance standards assumed for the operating period credit profile. The likelihood of these events occurring and their potential consequences are assessed.

In reviewing these risks, Ind-Ra considers the following factors: the contractors, cost structure, delay risk, technology risk, and other terms of the construction phase contracts. Importantly, many of these risks can be partially offset if the SPP has existing operating components that generate sufficient cash flow to deal with such risks.

Contractors

The experience and credit quality of the main contractors in the construction is reviewed. A record of completing projects on time, on budget, and up to required standards helps mitigate risk. Multinational scale operating capacity (for large projects), previous experience with the technology and type of project plus experience in the country where the project is located are considered stronger attributes.

Generally, Ind-Ra considers the involvement of local partners, subcontractors, and/or suppliers to be advantageous based on their local business and political experience. Contractors with a history of stable labour relations able to draw on a strong base of skilled and unskilled labour, local or expatriate, are considered stronger. The contractor’s relationship with other transaction parties is reviewed for potential conflicts or incentives.

The availability of suitable replacement contractors and contractual provisions to effect a replacement are considered. Where relevant to the rating, the financial health of the contractors is assessed (*see the Counterparty Risks section*). This is done to assess whether construction contractors have the necessary resources to overcome cost overruns, delays, and performance challenges and bring the project into operation and meet all financial obligations to the project, such as payment of performance or delay liquidated damages. Where necessary to assure financial capacity sufficient for the project debt rating, contractors may be required by the SPP to post performance bonds or completion guarantees (*see the Debt Service and Counterparty Risk section*), usually in favour of the SPP and assigned as security for the benefit of the debt holders (*see the Debt Structure Security Package section*).

Where required to support the rating, a performance bond will be sized as a percentage of the fixed-price contract. The adequacy of the performance bond coverage will typically be reviewed by the third-party engineer and confirmed to be sufficient to cover additional costs and works that may be expected to result from a failure of the contractor at a critical stage in the works.

Operators of existing facilities may effectively take on the role of general construction manager for improvement projects. Improvement projects at operating facilities require managers to handle myriad challenges. Less emphasis will be placed on evaluation of the contractor and more on the infrastructure management’s track record with such construction projects and its capacity to manage these risks and any resulting costs within the SPP’s existing credit profile. The presence of a facility management team with a history of delivering capital projects on schedule and within budget is a substantial mitigating factor to contractor exposures and is considered a stronger attribute, as is a well-phased capital program that can be modified to reflect changes in need or demand.

Figure 7

Contractor

Stronger attributes	International engineering, procurement, and construction (EPC) contractor; direct experience of similar projects; involvement of major local contractor; midrange to strong financial strength; substantial performance bonding; comprehensive performance guarantees; renegotiation period adequate to replace contractor; facility management team with a history of delivering projects on time.
Midrange attributes	Experienced contractor; part of larger group, midrange financial strength; performance bonding commensurate with the rating; involvement of local contractors; material performance guarantees; facility management team has adequate project management record but has experienced some cost or timing issues.
Weaker attributes	Smaller or less experienced contractor; multiple subcontractors; weak financial strength; no external financial support; inexperienced facility operator; weak contractual framework.

Source: Ind-Ra

Cost Structure

The risk that the construction costs will be greater than budgeted and the effect this could have on the ability of the SPP to make debt service payments are analysed. Ind-Ra looks at the allocation and determination of costs within the contracts; in particular, under what circumstances the contract price can be increased. The agency expects risks within a project to be allocated to the parties best able to control them.

Contractors are typically best able to manage direct construction costs, therefore fixed-price turnkey contracts provide significant motivation for the contractors to be on or under budget. However, this benefit of fixed-price turnkey contracts depends on the strengths of the contractors and their willingness to deliver on their obligations. The construction budget is also reviewed. Even with fixed-price turnkey contracts, it is important that the budgeted cost of the project is reasonable and achievable.

To determine the reasonableness of the budget, the cost of the project is compared with similar projects when possible, as well as available information on other contractors' pricing for the same project. Unique features of the project, such as difficult terrain, are considered in this analysis.

The adequacy of budgeted contingencies for which there is committed funding is also reviewed. Such contingency funds are available to address unexpected events or potentially provide credit or liquidity support if contractor replacement occurs. Ind-Ra will also consider the level of development of the design and specifications for the project. The potential for increased costs as well as disputes is likely to be greater where the design for the project is less advanced.

Given the technical and specific nature of all the points mentioned above, Ind-Ra prefers that a third-party engineer or technical adviser has reviewed the status of designs and specifications and noted the additional risks associated with that level of design. The report will also review the sources and uses of funds, and the cost budget, and provide conclusions as to its reasonableness and achievability.

Operators of large existing infrastructure facilities, such as airports, seaports, and toll networks, tend to use turnkey fixed-price contracts less frequently, preferring to manage timing, completion, and cost risks themselves. In these cases, Ind-Ra will review the capital improvement and construction planning with management to assess the risk that cost overruns and delay may pose to the credit profile of the facility debt. The SPP's ability to continue to earn revenue and its ability to absorb costs over budget and costs resulting from delayed completion will be a focal point.

Figure 8

Cost Structure

Stronger attributes	Fixed-price contract; cost risk appropriately allocated; cost risk hedged without material basis risk; substantial contingencies in cost budget; committed funding incorporates contingencies; cost estimates based on detailed upfront designs; well-conceived project management approach at existing facility substantially mitigating cost and delay risks.
Midrange attributes	Fixed-price contracts with more than one main contractor (e.g., a manufacturer and balance of plant contractor); design detail not fully developed, though risk is transferred under the fixed-price contract; adequate contingencies in cost budget; committed funding incorporates contingencies; adequate project management approach at existing facility limiting the potential effects of costs and delay risk.
Weaker attributes	Target price or similar contract leaving project vehicle materially exposed to cost risk; facilities management experience is limited relative to scope of project and weak contractual mitigating factors; no or adverse history of project management approach at existing facility.

Source: Ind-Ra

Delay Risk

Ind-Ra reviews factors that could delay scheduled completion of the project, the length of the projected construction period, the availability of building materials and supplies, the terrain over which the project is being constructed, the risk of not receiving permits as and when required, the exposure to labour problems, connecting infrastructure, dispute resolution, and political risks.

Delay risk will vary with the stage of the project and the length of the projected construction period. Longer construction periods are generally considered more risky and key agreements typically provide for a larger cushion between expected completion and the long-stop or mandatory completion date. Significant construction already completed can act as a mitigating factor.

Projects may be delayed because of the inability to receive materials and supplies on time, particularly when they have to be imported. An assessment of this risk includes the capacity of the suppliers, transport infrastructure, terrain, and climate. Difficult terrain and unpredictable climate may also increase delay risk on actual construction absent adequate contingencies. Political instability can affect project schedules through issues such as physical security and receipt of permits.

The potential for schedule delays due to problems with supply and reliability of labour are considered. Dependence upon foreign workers, prevalence of disputes, and the working environment can be factors here. Ind-Ra will consider the capacity of the project schedule to accommodate reasonably foreseeable delays and the SPP's right to obtain compensation from responsible parties.

Ind-Ra typically reviews the analysis and conclusions of the third-party engineer when assessing delay risks. The third-party engineer typically has reviewed the construction schedule and commented on its attainability, considering both the scheduled completion date and the final or longstop completion date.

Contracts will typically include payment of liquidated damages to cover costs incurred by the SPP arising from a delay. These costs may include additional interest, lost revenues, and financial penalties, if any, that the SPP may owe to an off taker. Third-party support may be required to support the financial obligations of a contractor, parent guarantor, or sponsors to pay such damages at a level commensurate with the rating of the project debt.

The form of third-party supports will be considered. On demand guarantees, including letters of credit and, in some jurisdictions, performance bonds will be considered as liquidity sources in addition to budgeted contingencies and retainage. Support that does not provide by its terms for on demand payment, or that is typically not paid on demand under standard market terms,

will not be considered to be available as liquidity to cover delay risks. Financial mitigating factors for delay risk (such as liquidity and reserves) are discussed in the Debt Structure section.

Figure 9

Delay Risk

Stronger attributes	Extensive completion guarantees and liquidated damage provisions; step-in rights; all permits, etc., in place; “long stop” adequate to replace contractor; generous project schedule; contingencies for unexpected delays; little ground for public opposition; major parties have history of on-time completion.
Midrange attributes	Adequate completion guarantees and liquidated damage provisions; material permits granted — some minor conditions may exist but their costs have been properly accounted for; reasonable project schedule.
Weaker attributes	Weak completion guarantees and liquidated damage provisions; clear potential for delay; permits outstanding; dependence on political will; ambitious project schedule; key party has history of delays.

Source: Ind-Ra

With respect to projects undertaken by operators of existing facilities, Ind-Ra will review the management’s overall approach to completion risk, including delay risk, within the context of its available resources.

Contract Terms

As well as the aspects of the contracts discussed above, where available Ind-Ra reviews material construction phase contracts for factors that may affect the service of rated debt. The agency’s expectation is for contracts that are standard for the practice in that sector, reflecting the particular risks of that sector and the stated aims and scope of the project. Specific sector issues are discussed in sector-specific criteria reports or in issue reports. Some generic factors are discussed below. The agency may not have access to certain contracts or may rely on summary information or responses to questions from issuers and their third-party advisors. Issues raised in this section that extend to the operating phase will also be considered in that context.

Where a contract transfers risk away from the SPP to another party, the rating will only benefit when that party has capacity to absorb the risk at a level commensurate with the rating of the debt (*see the Debt Service and Counterparty Risk section*).

Operators of existing infrastructure facilities will incorporate such protections as prudent in the context of their overall operation, financial resources, cost recovery framework, and management capabilities when undertaking renewal and expansion projects.

A typical, best practices construction contract suite for a standalone project financing includes most of the following elements.

Contractual Risk Allocations

Retentions, penalty payments, long-stop dates, and liquidated damages if the project is not completed on time, on budget, or to the required performance standards, would usually be a feature of projects supporting investment-grade debt.

Penalty clauses will be reviewed to assess the extent to which they ensure that any such costs or payments incurred by the SPP under the project agreements are passed on to the responsible party. Penalty payments are analysed to determine whether they compensate for lost revenue or increased costs sufficient to maintain debt service under stress scenarios commensurate with the rating. Ind-Ra may assume delays in receipt and less than full payment in its analysis, subject to assessment of the terms of any on-demand payment facilities. Penalty payments subject to complex conditions or deferred payment are unlikely to benefit a rating. Similarly, bonus payments would not necessarily benefit the rating but would be considered a budgeted cost.

Long-stop dates permitting delay mitigation, typically in the range of six to 24 months after scheduled completion, would be expected.

Construction and similar contracts often will include caps on the liability the contractor may incur for failing to complete, or for not completing per specifications, including performance specifications. Ind-Ra would expect the third-party engineer to comment on the reasonableness of the caps in light of the risks involved in the construction process and the potential costs that could be incurred by the project to rectify deficiencies or replace the contractor. Caps typically do not apply in the case of abandonment, wilful neglect, or negligence in a material degree. Unless otherwise mitigated, caps that apply more broadly than customary would be considered a weakness.

Retainage is a contractual feature that defers full payment to the contractor for work progress until final project completion. It provides a source for recovery of losses upon replacement of the contractor as well as some liquidity for payment of delay costs by the contractor. Retainage varies by sector but is typically not more than 10% of works completed and may be much less on simpler construction or for financially stronger contractors.

The contract framework will be reviewed to assess the degree to which it provides a clear procedure to determine how additional costs incurred for modified or further works will be recovered by the SPP.

Disputes

Dispute resolution mechanisms in contracts, regulatory approvals or statutes are evaluated to ascertain the extents to which they provide a reliable forum and a clear mechanism should a dispute arise. This will be met if dispute resolution is to be governed by internationally recognized standards. Of particular concern is the potential impact on the cash flows of a dispute that is not resolved quickly, resulting in delays and cost overruns. The documentation typically provides protection against subcontractor disputes and claims either through a requirement of delivery of subcontractor lien waivers or payment bonds provided by a bank or insurance company. The financial strength of the contractor can vary the requirement for such additional protections if it is commensurate with the rating of the debt.

Insurance and Force Majeure

A typical construction package will require that the contractor have insurance in place (benefitting the SPP and its lenders) to cover a range of insurable project risks, ideally consistent with the report of an independent insurance advisor; liability, casualty, and business continuity insurance are typically included and cover hurricane, flood, or seismic risk where appropriate. The expectation is that casualty insurance will be a "total loss," which is maintained on a continuing basis. The involvement of the insurer's loss engineers from the outset helps determine appropriate cover and potentially speeds up claims. In some cases, insurance proceeds may have no impact on default ratings but only influence recovery prospects. The rights to insurance proceeds and the party responsible for insuring would normally be established.

Force majeure risks or "acts of nature" that are uninsurable in the market and outside the control of the project parties will be evaluated to assess relevance to the rating. Operators of an existing infrastructure asset may have self-insurance to some degree, or other mitigating factors to risks that cannot be fully insured. The approach to mitigation of event risk will be considered in context. *See the Macro Risks section*).

A force majeure clause typically relieves or suspends the obligation of a party when they are unable to perform the obligation due to a force majeure event. It is important that the "force majeure" clauses excusing a party's performance are aligned in the documentation so that the SPP has an equal protection on its own performance. To the extent force majeure clauses deviate from industry standards, Ind-Ra considers whether its analysis should incorporate additional risk factors.

Construction Quality Assessment

Typical documentation includes a regime for onsite inspection ensuring that construction and major maintenance are well-managed, and independently monitored. Cost, quality, and time schedule targets are required by the documentation to be reported, enabling the risks to be tracked. Ind-Ra expects to receive copies of such reports on a periodic basis. Progress payments released from a trust against the certificate of a third-party engineer is seen as a benchmark protection for debt holders. However, other mechanisms, perhaps involving external financial support, and associated counterparty risk may provide a similar level of reassurance. Equally, overcomplicated or rigid mechanisms may have unintended adverse effects.

Related Infrastructure

Connecting infrastructure is expected to be contracted such that delay, cost, or performance risks to the project are minimized. Connecting infrastructure may be built by the project or by third parties or provided by connection to existing networks. Where non-availability is a risk to project cash flows, Ind-Ra will consider key connecting infrastructure using the same factors and approach as for the main project. Ind-Ra expects that the contracts for the connecting infrastructure are generally well-aligned with the main project.

Figure 10

Contract Terms

Stronger attributes	Comprehensive, best practice contract suite; extensive completion guarantees and liquidated damage provisions; clear, binding and standard dispute resolution process; insurance consistent with independent report; regular onsite inspection and detailed reporting; no connecting infrastructure risk.
Midrange attributes	Clear and comprehensive contracts to industry standards; adequate completion guarantees and liquidated damage provisions; dispute resolution process in place; industry standard insurance package; connecting infrastructure contracted; onsite inspection and exception reporting.
Weaker attributes	Complex or incomplete contract suite; multiple subcontractors without liability of the EPC provider; weak completion guarantees and liquidated damage provisions; high penalties for the SPP; no dispute resolution process; self-insured or underinsured risks; reliance on local or minor insurers; connecting infrastructure not contracted; no provision for onsite inspection and reporting.

Source: Ind-Ra

Technology Risk

Technology risk in the construction phase may contribute to delays (*see Delay Risks section on page 9*) or lower performance leading to lower operational cash flows, higher maintenance costs, or more frequent life-cycle capital expenditure. The completion risk for projects that make use of conventional proven technology is considered lower, particularly if proven in similar terrain, climate, and scale. Technical complexity is considered a risk factor, including connecting infrastructure, whether proven or not.

Where technical performance relies on assumptions or manufacturers' claims, Ind-Ra typically places more reliance on the opinions of the third-party engineer. Manufacturer involvement, either operationally or through warranties, can be a positive, particularly if supported by appropriate financial capacity.

Contractors' experience and ability to source skilled labour (*discussed above*) may be more important where technology risk is higher. Where contractors provide warranties for the performance of the project, the most value is derived where the length of the warranty period is commensurate with the technical risks and the warranty period begins after the project has met satisfactory completion testing.

The transaction documentation may include an obligation of a contractor or a manufacturer to pay performance liquidated damages in the event that the project or a component does not perform at a level sufficient to generate anticipated revenues. Payments of such liquidated damages may be considered in the financial analysis to the extent that the obligor or a third-

party guarantor has financial strength commensurate with the rating of the debt. The SPP will typically benefit from contractual and statutory protection against latent defects in construction works. The third-party engineer's report may note the period over which defects might emerge. Retainage, budgeted contingencies, or performance bonding may provide support on warranty and latent defects obligations.

Prior to commissioning and ramp-up (period required to reach long-term average production, availability, or usage), Ind-Ra would expect the third-party engineer to confirm that the project was completed to the required standards (typically recognized international standards or standards that project company must meet under any off-take agreements) on the basis of a reasonable completion test established or referenced in the documentation. Where possible, Ind-Ra compares modelled performance, contractor guarantees, and manufacturer's specifications with the engineer's reports. Adequate commissioning and ramp-up time consistent with the technical risk is expected.

Figure 11

Technology Risk During Construction

Stronger attributes	Well-tested equipment installed in similar terrain/climate; contractor experienced with technology; continuous support by manufacturer; manufacturer-supervised commissioning and ramp-up; major manufacturer; low technical complexity (e.g. social infrastructure, wind farms).
Midrange attributes	Manufacturer support; adequate testing period based on similar projects; modified technology; established manufacturer; possibility of delay but within stresses; medium technical complexity (e.g. roads, traditional power plant).
Weaker attributes	Innovative technology or in new terrain; smaller or newer manufacturer; technical report with caveats; history of problems; less experienced contractor; onerous handover terms with clear potential for delay; minimal or no manufacturer support; high technical or logistical complexity (e.g. refineries, major rail).

Source: Ind-Ra

Operation Risk

Operation risk is the risk that the project will suffer a reduction in availability, productivity or output or, alternatively, the project will incur operating, maintenance or life-cycle costs that are greater than projected. Any of these may result in a reduction in projected cash flows or a breach of contractual performance requirements, reduce the project's financial flexibility, and potentially impair the ability of the project to service its debt. These risks are reviewed to assess the likelihood of the events occurring and the consequences if they do.

The extent and nature of the risks vary by project sector but maintenance is a key factor for output, availability, and cost. The analysis of operation risk focuses on the ability and financial health of the operator, the cost structure, and the supply risk. Analogous contract risks, discussed in the *Completion Risk* section above, are considered again for the operation phase.

Operator

Operating profiles vary across the spectrum of project and infrastructure finance. Large infrastructure facilities are frequently self-operated with some contracting to third parties. In those cases, Ind-Ra evaluates the experience of the management team, their record of revenue and cost management, facility maintenance, and capital renewal and their effectiveness relative to peers.

Project financings typically adopt an approach relying heavily on contractual relationships to transfer risks and operate on a smaller scale. The contractual operator's ability to operate the project efficiently and effectively is usually evidenced by past experience with the same type of project and technology, ideally in the same country or region, together with adequate resources, including relevant qualified staff. Although these are similar factors to those for construction contractors, contract periods are typically much longer with a wide range of complexity between projects from smaller, basic availability schemes to technically advanced, market-exposed large-scale projects.

Ind-Ra will assess whether the operator's compensation reflects the risks and performance standards of the contract, allowing a reasonable prospect of absorbing the risks and achieving the standards. Ind-Ra will expect the report of the third-party engineer to discuss the reasonableness of the proposed operating costs for a project. Contracts that appear under-priced may be considered credit negative if, for example, this might lead to delay or reduced expenditure on repairs and maintenance. Achievable performance-based measures (either penalties or bonuses) may be considered credit positive if they provide an incentive to achieve or surpass projected performance.

Penalties for underperformance will be evaluated for reasonableness based on an assessment of whether they are proportionate and cover lost revenues that result from substandard performance by the operator. Bonuses will be considered incurred costs in scenarios where they are likely to be incurred. An operating and maintenance contract that provides a clear mechanism for dispute resolution, thus avoiding interruption of cash flow for rated debt service, is considered typical in project finance.

Ind-Ra assesses the performance risk based on the operator's track record, third-party engineering reports, peer analysis, operating complexity, and contractual/structural flexibility. Grace periods, flexible maintenance schedules, and other such features may act as mitigating factors. However, onerous terms such as challenging deadlines or concession termination rather than financial penalties are considered weaker attributes and may constrain the rating.

The reputational importance for the operator of a high profile project either in respect of technology, scale or national prestige may add an incentive but is unlikely to benefit the rating in isolation. An operator may also be a sponsor or constructor of the project or have some other interest. In this case, both incentives and possible conflicts are considered. However, the key rating issue is an alignment of interest with the rated debt holders.

Figure 12

Operator

Stronger attributes	Management team with strong record of successfully managing asset; extensive experience with similar projects; international reach with local experience; multiple alternative operators available; ease of replacement; project is a "landmark" for the operator.
Midrange attributes	Management team with adequate record of managing revenues and costs Experienced operator; part of larger group; alternative operators available; local experience; market-based compensation.
Weaker attributes	Management team with subpar record of managing revenues and costs; project requires specialty operator with few or no alternative operators available and no effective mitigation; limited to no experience in sector; unclear replacement provisions; uneconomic contract; poor reputation; limited "in-house" resources.

Source: Ind-Ra

The operator's financial position is considered to the extent that it might constrain its ability to operate the facility throughout the life of the debt (performance risk). Where this is judged to be a material factor, it is likely to constrain the rating. The materiality of this risk will also depend on the availability of a replacement operator or other contract party; factors such as specialist skills, size of project, and location, as well as contractual remuneration, can determine this. Projects are typically exposed to their operators for a long period, raising risk and the importance of an available replacement. Replacement of an operation and maintenance contract that was under-priced may result in additional cost or negotiation, particularly if the operator is affiliated to other project parties. Ind-Ra also evaluates the extent to which the SPP or noteholders have rights to replace an operator and the related timing to do this is also considered.

Costs

Ind-Ra reviews the makeup, timing, and potential volatility of operating costs. Operating costs vary by project but generally will include some combination of the following: commodities and utilities, labour, taxes, insurance, maintenance, and capital expenditure or “life-cycle” costs. In contrast to the construction phase, the operating phase may have a high component of cost that is variable (passed through to revenues), thus reducing operating leverage, which is seen as positive. The exposure of the project to unanticipated operating costs is reviewed and reflected in the stresses in the cash flow analysis.

Cost mitigation through risk transfer to strong subcontractors or suppliers inflation-based contracts, cost-plus contracts, and the like are considered in the rating to the extent the financial strength of the counterparty is commensurate with the rating of the debt (*see the Debt Service and Counterparty Risk section on page 27*). For new projects, Ind-Ra expects to have third-party engineering reports available when assessing future capital expenditure or life-cycle costs, both for timing and amount. For an existing infrastructure facility, Ind-Ra would expect to receive any third-party reports prepared for management in the development of the capital improvement and maintenance plans for the asset.

Figure 13

Operating Costs

Stronger attributes	Well-identified cost drivers; flexibility in timing for major costs (life-cycle); generous provisions for cost variations; costs well spread over time; highly predictable/contracted cost profile; strong ability to vary cost with demand; not capex-intensive; low maintenance cost profile; costs substantially recoverable under concession or framework contract; reserves cover contingent costs; pass through of costs to entities with strong financial capacity.
Midrange attributes	Predictable cost profile; ability to vary marginal cost with demand; material capex; cost increases reflected in regular revenue adjustments (tariff adjustment, benchmarking, or market testing) with transparent methodology; well-identified cost structure dynamics; pass through of costs to entities with midrange financial strength.
Weaker attributes	High sensitivity of project cash flows to the timing of costs; lumpy cost structure; volatile cost profile (labor/energy/technology); history or risk of labor disputes; highly capex-intensive; high maintenance cost profile; no cost pass through; weak or no operating reserves; pass through of costs to entities with weaker financial strength.

Source: Ind-Ra

Supply Risk

Some projects require that a resource or product exist or be available in order for the project to operate. Examples are projects designed to convert or use an input to produce a specific output and generate revenues based on the volume of such output, such as LNG, thermal power, and water treatment facilities. This resource or product can take many different forms. Ind-Ra evaluates the risk that these resources or products are not available in sufficient quantities and/or at prices that allow the project to operate as projected. In projects that involve the extraction of a resource or commodity, an assessment of the supply risk will involve a determination of the sufficiency of reserves and the cost of extracting them. Ind-Ra expects a study by a third-party expert when addressing these issues.

If a resource or product is being supplied to run the project, the agency considers the availability of the resource or product. If liquid markets exist for required commodities, Ind-Ra considers the potential for temporary supply constraints rather than long-term availability deficits. Where relevant, this includes an analysis of the price at which a substitute resource or product is available. In projects where supply risk is high, and markets are characterized by illiquidity, Ind-Ra may stress the cost of a volatile commodity. Supply risk may be mitigated by long-term supply contracts with suppliers having a credit quality commensurate with the rating of the debt. These contracts may fix the volume and/or price at which the resource or product is supplied. *See the Debt Service and Counterparty Risk section on page 27.*

Figure 14
Supply Risk

Stronger attributes	No supply constraints for labor or materials; excellent transportation/utility infrastructure; connecting infrastructure in place — alternatives exist; commoditized nature of key supplies; low or no exposure to input costs; sufficient independently verified reserves; pass through of supply risks on long term contract to a financially strong counterparty.
Midrange attributes	Adequate supply of materials and labor with limited volatility (amount and timing); good transportation/utility infrastructure; connecting infrastructure in place — limited alternatives; pass through of supply risks to an entity with midrange financial strength.
Weaker attributes	Potential for supply constraints; monopolistic supply; poor transportation/utility infrastructure; weakness in connecting infrastructure; reliance on development of reserves; pass through of supply risks to an entity with weaker financial strength.

Source: Ind-Ra

The importance of fixing the price at which the resource or product is supplied depends on the volatility of the price of the product and how the off-take price is determined. Where input cost increases could make the project's output uneconomical, fixing supply costs through a contract with a supplier having a credit quality commensurate with the rating of the debt can be an effective mitigating factor. However, if the resource or product represents a pass-through cost in determining the revenue of the project, then generally fixing the price of the input is not as important except when reduced off-take volume may result.

Ind-Ra also examines how the product or resource is supplied to the project, especially in terms of connecting infrastructure or availability of reliable alternative supply routes. The credit quality of any party involved in supplying the resource or product is assessed. If credit quality would not be commensurate with the rating of the debt, and price volatility is low, the availability of back-up suppliers may be an effective mitigating factor.

Technology Risk

Technology risk during the operating phase centres on maintenance and performance within projected cost. This risk varies significantly by project type. Generally, when the technology is conventional and proven, the risk is not as great or it is easier to quantify based on past experience. Even technologies with proven reliability depend upon maintenance standards being met. Evidence of qualified staff, adequate budgets, and availability of parts and consumables and, in some cases, manufacturer support is evaluated. Alternative sources for goods and services are seen as positive in mitigating cost and delays.

Figure 15
Technology Risk During Operation

Stronger attributes	Many years of successful operating history and proven performance; low technical maintenance component; parts/labor widely available; diversified technology risk; minimal third-party supporting technology; warranty or service contracts; adequate redundancy inbuilt.
Midrange attributes	Actual operating data but limited operating history at the scale required by the project; adequate, but limited sources of spare parts supply; adequate but limited number of experienced third parties; safety or environmental norms finalized.
Weaker attributes	Proprietary or innovative technology; untested over long term; revenues dependent upon high performance or availability; non-diversified operating assets; material dependence on external supporting technology; safety or environmental norms not finalized.

Source: Ind-Ra

Flexible opportunities for maintenance, an experienced operator, and technology risk diversified over several units can all be positives. Technology risk increases significantly with new and unproven technology. In any case, Ind-Ra will expect the third-party engineer's report to address issues such as: capacity, availability, expected outages, repair and maintenance levels, future required capital investments, spare part requirements, expected efficiency levels, and environmental issues (see the *Use of Expert Reports* section on page 6). Similar issues apply to connecting technology. See the *Infrastructure Development and Renewal/Obsolescence/Economic Life* section on page 20.

Tail Risk

Significant and unique financial risks may occur in the final years of a project arising from the project coming to the end of its life (such as reduced productivity or decommissioning), contractual obligations (such as handover), or renewal of licenses, leases, or concessions. Decreased revenue or increased capital expenditure may occur with an associated rise in default risk.

Structural features such as grace periods, reserves, and forward-looking cash sweep tests are often included in the structure in such cases. Ind-Ra considers the tail period in the context of the impact and predictability of large capital renewal or decommissioning costs on cash flow available for timely debt service. The analyst will include stresses for affected revenues and costs in the financial analysis (see the Debt Service and Counterparty Party Risk section). Unquantifiable costs associated with decommissioning a facility would limit Ind-Ra's ability to rate a transaction if such costs could be incurred while the rated debt is outstanding, or where refinance debt is anticipated, during the term of such refinance debt.

Revenue Risk

Gross Revenue

Gross revenue of a project is typically driven by a combination of availability, price, and volume. Risk arises if output or service cannot be adequately provided or if demand for the output or service does not exist at a price at which the project is able to meet its operating expenses and service its debt. The sources of gross revenue are typically either one or a few payers such as a concession grantor or a contractually obligated power purchaser; one or more major off-takers, such as a utility, airlines or shipping companies; or a significant number of users such as cars and trucks on toll roads. Ind-Ra will evaluate the relative stability and predictability of cash flow to the project when considering its ability to service its debt. Specifically, the analyst will review the revenue framework, performance requirements, and exposure to demand for its services, which together shape the overall revenue profile.

Revenue Framework

Exposure to demand risk varies widely across projects. Some projects have fully contracted revenue streams that provide cash flow provided the facility is simply available. Because projects with fully contracted revenues, such as availability-based concessions and energy facilities with tolling agreements, are less exposed to demand risk, analysis of other risks becomes more important. These include risks relating to performance against contract terms (availability, throughput, and efficiency) and counterparty risks associated with the off-taker or concession grantor. However, there are variations that require further assessment of volume or price risk, such as energy facilities with partially contracted and partially merchant-based revenues or shadow toll arrangements, which combine usage risk with a single concession payer. Ind-Ra also considers whether mechanisms for determining revenues are clear and objective, reducing potential for dispute.

Performance Requirements

Contracted gross revenue may vary with the quality of the project's output, availability of the facility, timeliness, or quantity/efficiency of output. Failure of the operator to achieve required standards typically results in a reduced price or penalties deducted from a fixed-concession payment (see the *Operation Risk* section on page 14). Where penalties may be incurred by the project vehicle due to subcontractors, connecting infrastructure, or suppliers, Ind-Ra will evaluate the SPP's ability to pass through such penalties under the subcontract. As with other compensation payments, including any from an off-taker, counterparty risk may be material.

Broader Demand Risk

Some projects will be more exposed to demand risks, such as merchant facilities producing power without any contractual support in place, or with support for a term less than the debt maturity. Moreover, for many infrastructure facilities and projects, a contractual or regulatory framework will establish the basis upon which revenues are generated, but expose the facility

to demand risk to some degree. Ind-Ra will evaluate the mitigating factors of volume and price risks present in any such contractual or regulatory framework, taking into account the facility's competitive position. Some infrastructure facilities have a monopoly on the provision of the essential public service and face limited competition. Others may face competition from nearby facilities even though a local monopoly has been granted.

When evaluating debt for facilities fully or partially exposed to price and/or volume risk, volume and price projections established by the project's sponsors supporting the project economics are reviewed. As part of this analysis, Ind-Ra will request and review any reports or studies conducted by a third-party expert on behalf of the SPP. Such a study, together with historical price and volume trends, market, and macroeconomic forecasts and peer analysis, where available and appropriate, are used to assess the likelihood of price and volume combining to achieve expected revenues.

Ind-Ra may also use its own forecasts and assumptions (e.g. oil and gas price forecasts). The use of historical information will depend on its quality and evidence of its predictive value. Historical information is likely to be more relevant for established projects and markets where specific performance data are available. Ind-Ra views assumptions or estimates based on such performance information as more reliable. Volume and price risk factors identified as drivers of gross revenue are stressed as part of the financial analysis (see *the Debt Service and Counterparty Risks section on page 27*). Like for like, Ind-Ra would expect projects exposed to price or volume risk to have the capacity to survive higher sensitivities than those shielded from such risks by contract.

Other Considerations

When gross revenues are determined under a contractual or regulatory framework, Ind-Ra will consider the relative dependability of any legal and regulatory incentives necessary to sustain the revenues.

Figure 16

Revenue Risk Characteristics

Stronger attributes	Availability-based revenue from counterparty with strong financial capacity; limited deduction risk; limited delivery risk; fixed tariff "take-or-pay" contracts exceeding rated debt life; currency hedging; minimal reliance on demand or resource forecasts; matched costs and revenues; low-cost producer; demand at market prices; strong historical evidence of revenue patterns; lower volatility user-based revenues; diverse customer base; proven ability to pass on inflationary price increases.
Midrange attributes	Availability-based revenue from counterparty with midrange financial strength; off-take agreements (with price risk); moderate deduction risk; market convention delivery risk; partial currency hedging; reliance on low volatility or proven resource forecasts; established long-term subsidy regime; competitive market position; moderate ability to pass on inflationary price increases.
Weaker attributes	Availability-based revenue from counterparty with weaker financial strength; full exposure to market risks (price and volume); existing or expected competing facilities; significant deduction risk; special delivery risks; currency exposure; potential for increased royalties, windfall taxes or production limits; reliance on demand forecasts or resource forecasts of higher variability; politically sensitive subsidy regime; complex definition of output; limited ability to pass on inflationary price increases.

Source: Ind-Ra

The attributes below present the approach to assess revenue risk on a qualitative basis under the Master Criteria. Where useful to sharpen the focus of the analytical approach, individual sector criteria may treat attributes relating to resiliency of demand and the pricing framework separately.

Infrastructure Development and Renewal/Obsolescence and Economic Life *Infrastructure Development and Renewal*

For project debt to be rated, its maturity should be within the reasonably expected economic life of the project. Essential public infrastructure assets typically have longer or indefinite useful lives, subject to proper asset development and renewal efforts being made.

To the extent the expected economic life of a facility is achievable only through significant capital expenditure, the regulatory or contractual framework will typically require that the necessary works be carried out. In some cases, this may be accomplished indirectly by a requirement that facility availability and output be maintained at a level attainable only through periodic capital expenditure. Ind-Ra will evaluate the extent to which the costs of infrastructure renewal can be recovered from revenues on a pay-go basis or through borrowing. In this regard, Ind-Ra will seek to understand the management's/sponsor's approach to the capital program, including planning, funding, management, and the process for developing any relevant stakeholder consensus.

Obsolescence and Economic Life

Obsolescence risk due to more efficient variants, competing innovation, or demand shift is considered against mitigating factors available to the SPP. Obsolescence risk is higher for merchant projects that compete in the market place for revenues and are fully exposed to cost and supply risk. Ind-Ra will evaluate the capacity of the project to invest in upgrades to maintain competitiveness and generate revenues in base case and stress scenarios. Fully contracted frameworks (e.g., power purchase agreements) and large public infrastructure assets are less exposed to obsolescence risks as contractual mitigating factors may exist via concession grantors, off-takers, or suppliers. Obsolescence risk without mitigating factors may result in Ind-Ra assuming a shorter economic life and lower revenues in its financial analysis (see the *Debt Service and Counterparty Risk* section).

Figure 17

Infrastructure Renewal and Obsolescence

Stronger attributes	Strong mechanisms for capital planning and funding; demonstrated history of effective management; debt maturity significantly within proven economic life; established but current technology; capex evaluated by third-party engineer as reasonable.
Midrange attributes	Adequate mechanisms for capital planning and funding; successful history of managing capital program with some inconsistency or shortfall; one- to two-year economic tail after debt maturity; no evidence of emerging competing technology or potential demand shift.
Weaker attributes	Weak planning mechanisms, history of deferred maintenance/cost overruns; economic life nearly co-terminus with debt maturity; emerging competing technology, e.g. lower cost or substitute.

Source: Ind-Ra

Early Termination Risk

A risk of a termination event under any of the key contracts during the operating phase could have a material effect on ratings, particularly if compensation or lender structural protections (such as step-in rights and direct agreements) are not present. Examples of such events are termination of a concession, break clauses in off-take agreements, or loss or failure to renew a license, all of which may threaten project revenues. Acceleration of a financial agreement may have direct implications for the operation of the project or consequences indirectly via suppliers or other third parties. Appropriate grace periods in contracts, reserves, or liquidity to give time for remedy without interruption of rated debt service payments are key features. Of equal importance are contractual provisions for termination payments by the counterparty if it terminates the agreement other than for project company contractual performance or financial default.

Figure 18

Early Termination Risk

Stronger attributes	No contractual termination events; termination events without any SPP default (force majeure or grantor option) compensated to repay rated debt on a timely basis; direct agreements (concession grantor/lender); robust grace periods.
Midrange attributes	Low risk of termination based on history of successful management of similar contracts or ease of compliance or ease of finding substitute service providers/suppliers; adequate grace periods; lender step-in rights.
Weaker attributes	Foreseeable termination events; compensation following termination other than for SPP default (force majeure or grantor option) may be less than debt or unclear; renewal risks; tax clauses.

Source: Ind-Ra

Macro Risks

A stable and predictable environment for a project is evidenced by the government's commitment, public support, and a consistent application of law and regulation.

The likelihood of the government interfering with the project during the life of the rated debt is reviewed. Government interference with the project could result in reduced revenues, increased costs, or impaired operation affecting debt service. Interference may take the form of unilateral contract variation, specific regulatory actions, exceptional taxes or royalties, forced changes in ownership or control, or outright expropriation. Ind-Ra places emphasis on the incentives that exist for a government not to interfere negatively with the project.

Where appropriate, Ind-Ra will form a view on factors such as the political and economic importance of the project to the relevant government (including regional or central government planners), future reliance on external investment, and government assurances regarding exchange controls, consents, approvals, stable environment, and non-interference.

Public support for the project is assessed as opposition to the project can result in delays or increased costs or, in more extreme cases, abandonment of the project. Factors such as national interest and projected impacts and benefits for local communities in terms of project output, employment, or environmental damage may influence public support. Even where government and public support for a project appears strong, Ind-Ra is cautious as this may not extend to support for debt investors in times of crisis. Absence of a well-developed legal system that respects the validity of contracts and the rights of property owners and in which there exists well-settled corporate and commercial law may constrain the debt ratings. Macro and microeconomic factors affecting the project's industry sector are discussed in the *Industry Risks* section.

Industry Risks

The agency considers the project in the context of its immediate industry sector in terms of relative competitive position, overall supply, and demand and the general outlook for the industry. This includes not only similar projects but other industry participants such as corporations, state-owned enterprises, and not-for-profit organizations. In this regard and for general industry outlooks, infrastructure and project finance analysts rely on Ind-Ra corporate or public finance analysts from the relevant sectors. Barriers to entry or the essential nature of the sector are considered both at a global and local level, including industry-specific regulatory regimes or rules. Closely related industries encompassing suppliers, users, or potential competitors are also examined. An assessment of the industry may not be relevant for all sectors (e.g. toll roads and bridges).

Figure 19

Industry Risk

Stronger attributes	Regulated industry; provides essential services; significant barriers to entry; positive industry outlook.
Midrange attributes	Established industry may be supported by discretionary spending; some barriers to entry; stable industry outlook.
Weaker attributes	New industry; industry supported primarily by discretionary spending with many competing alternatives; few barriers to entry; negative industry outlook.

Source: Ind-Ra

Event Risks

When evaluating project finance and infrastructure transactions Ind-Ra explicitly considers the potential event risks that may adversely affect the issuer's ability to repay the debt. Event risks arising from natural hazards – floods, earthquakes, hurricanes, tornadoes – as well as human error or mechanical malfunctions – industrial accident, explosions, forced outage – are identified and the management of the relevant risks evaluated.

Comprehensive insurance, including business interruption insurance, is a typical tool used by issuers. Insurance for many of these risks is commonly available, subject to some repricing risk and the rating considers that the issuer will be able to meet a covenant to have in place required insurance coverage consistent with market standards from qualified insurance providers.

In some instances, events will be determined to be “uninsurable,” meaning insurance of the related risk is unavailable, unavailable in sufficient amounts, or completely uneconomic. Terrorism is one such risk. Earthquake is another risk. Where a project or infrastructure asset is exposed to uninsurable risks, a second level of analysis is required to determine whether mitigation is required for the rating and, if so, whether there is an alternative to insurance that mitigates the risk of default to a degree commensurate with the rating of the debt.

Whether mitigation is required depends on a qualitative assessment of the project’s vulnerability to the identified risk. As an example, flood insurance is not needed for a project on a hill and the absence of such insurance would not be a rating constraint. Ind-Ra considers terrorist activity to lie outside the scope of ratings in infrastructure and project finance as a general rule.

Where it is determined that the project has vulnerability to a risk, mitigating factors other than insurance will be evaluated. Some issuers have multiple assets and analysis may consider a single event unlikely to affect all assets to an extent that would negatively affect timely payment of debt.

In some cases, risk mitigation may be accomplished by transferring the risk to a third party. For example, a public authority may grant a concession in a public private partnership transaction, yet retain the risk of uninsurable force majeure risks, including limited insurability that results from uneconomic pricing of such risks.

In other cases, the nature of the infrastructure asset is such that the asset function might be impaired, but it could continue to operate at a substantial level and recover costs of rebuilding through the applicable tariff mechanisms. The debt will not be affected so long as it has sufficient liquidity to get through the immediate impacts of the event. Finally, in some cases, risk mitigation will not be sufficient and the rating may be capped below an investment-grade threshold depending on vulnerability to the uninsured risk.

Debt Structure

In contrast to the foregoing project analysis, which considers the capacity of the project to generate cash flow and the stability of those cash flows, the following financial analysis considers each rated debt instrument separately, taking into account the quality of its individual debt characteristics, structural features, security rights, and any external support. Ind-Ra rates infrastructure and project finance debt instruments in accordance with their terms and conditions.

Debt Characteristics and Terms

The characteristics of a debt instrument, including its maturity, amount, and currency, are usually sourced from the loan agreement or bond documentation. In some instances, a term sheet, prospectus, or representations from issuers may be relied on. The obligation to pay interest, including rate basis, margin, payment dates, grace periods, and whether interest may be deferred and the obligation to pay principal according to an amortization schedule, are established together with the priority of these payments. This analysis is undertaken for each debt level in the financing.

Figure 20

Debt Characteristics and Terms

Stronger attributes	Senior-ranking debt — interest and principal; fully amortizing debt; no de facto subordination; scheduled amortizing principal commencing after completion; interest deferral on junior debt; no cross-default or acceleration; fixed interest rates.
Midrange attributes	Senior-ranking debt — interest and principal; within senior-ranking class but other debt within that class may mature earlier; amortization may have limited interest-only period or some flexibility; some refinancing risk with mitigating factors; some floating-rate debt.
Weaker attributes	Non-senior debt; highly sculpted amortization; bullet maturity; “loan-level” refinancing risk not mitigated; junior interest in priority to senior principal or reserves; cross-default and acceleration; significant floating-rate exposure.

Source: Ind-Ra

Other terms of the instrument are reviewed keeping in mind the balance between protecting the investor and maintaining the SPP’s operational and financial flexibility. Ind-Ra also considers whether the terms of the issuer’s other debt instruments affect the rated instrument. Rights and control may only be of value when the rated instrument is in the controlling creditor class.

Structural Features

A debt instrument may benefit from various structural features that can underpin the cash flows supporting debt service. These may include covenants and triggers to trap or divert cash based on financial ratios, which may be to the benefit or detriment of the instrument, usually depending upon its priority. General covenants are expected to restrict additional debt, restrict payments to sponsors or equity holders, and typically retain cash for future periods, when financial indicators are deteriorating, to benefit creditors.

Cash diverted or retained is typically allocated to reserves or principal reduction of the most senior debt. Contractual arrangements often exist between creditors to determine the priority of payments for costs, fees, swap payments, interest, and principal (payment waterfall). Ind-Ra analysts will review payment waterfalls to see if they are consistent with other assumptions, if they are reflected in the model, and under what circumstances they may change. Access to debt service reserves, events of default, or covenants transferring control are assessed. See *the Debt Service and Counterparty Risk section on page 27*.

Figure 21

Structural Features

Stronger attributes	Forward-looking covenants and triggers; early dividend lock-up and cash sweep; access to debt service reserves; sinking funds or capex reserves; immediate reserve replenishment consistent with rated instrument priority.
Midrange attributes	Dividend lock-up and cash sweep triggers; access to debt service reserves; reserve replenishment.
Weaker attributes	Weak dividend lock-up; no cash sweep; junior or no access to reserves; no reserve replenishment.

Source: Ind-Ra

Derivatives and Contingent Obligations

Ind-Ra will evaluate the debt structure to identify liabilities from other sources, including derivatives, working capital lines, and off-take or supply agreements. Swaps are most commonly used to hedge interest costs but are also used to mitigate foreign exchange, inflation, or other risks. Where the notional amount to be hedged is variable or a direct hedge is not available, mismatching of basis, maturity, or notional may leave open or over-hedged positions.

Liquidity lines typically provide independent issuer-level protection direct to rated debt against interruptions in operational cash flows. SPP level working capital and reserve facilities are typically independent of short-term project performance and drawable with minimal conditionality. These may be evaluated as drawn facilities when considering overall leverage where advances occur in the stress or rating case.

Figure 22

Derivatives and Contingent Obligations

Stronger attributes	Revenues fully hedged to debt service for currency, and interest rates for the relevant tenor.
Midrange attributes	Partial hedging; some imbalanced hedging of interest rates, inflation or foreign exchange.
Weaker attributes	Significantly imbalanced hedging or unhedged financial risks.

Source: Ind-Ra

The SPP may be required to post collateral under supply or off-take contracts to cover replacement revenues to the counterparty if the SPP experiences outages. The source of collateral posting or replacement letters of credit will be evaluated to determine the SPP's ability to perform this obligation under the relevant contract. (See *the Debt Service and Counterparty Risk* section).

Security Package and Creditor Rights

The benefits of security or creditor rights to the rated bondholders can be manifested in reducing either the likelihood of default or the loss severity given a default. However, it is only the former benefit that is considered when assigning an infrastructure and project finance rating. Where a jurisdiction permits, the granting of available security (over key economic, financial and intellectual assets) in favour of debt holders is viewed as conventional.

Post enforcement, security interests in key project assets and contracts would be expected to attach in the same rank order as debtholder priority and ideally confer controlling rights prior to enforcement. Pre-enforcement controlling rights potentially reduce the likelihood of default and are typically the more significant rating aspect of the security package. Step-in and other rights providing senior investors with the ability to protect key contracts and assets or to initiate replacement of failing transaction parties would be expected together with security interests granted by project owners over their ownership interests in the SPP.

Comprehensive inter-creditor agreements limiting the scope for individual pre-emptive action and defining the pre-enforcement controlling class of creditor may reduce uncertainty regarding project assets in adverse circumstances. Much of this also relies on a reliable and creditor-friendly jurisdiction. Control of material insurance proceeds, either to ensure project reinstatement or debt repayment, is also desirable. Differences in rights between classes to control remedies following default are noted in the context of rating each class of debt.

Figure 23

Security Package and Creditor Rights

Stronger attributes	Senior-ranking security interests overall operating and intellectual assets, contract rights, and cash balances; first payee of material insurance proceeds; contract step-in rights; creditor-friendly jurisdiction; first security interest in shares of project company; controlling class; early transfer of cash control from operator to trustee.
Midrange attributes	Senior-ranking or controlling security interests over key operating and intellectual assets, contract rights, and cash balances; "equitable" interests in some assets; senior position if collateral held via security trustee; control of material insurance proceeds; minor super-senior statutory creditors; controlling class absent protection test.
Weaker attributes	Non-senior-ranking security interests or subordinate position via security trustee; significant or unquantifiable statutory super-senior creditors; untested or cross-jurisdiction collateral structure; no post-enforcement control; transfer of cash control post default.

Source: Ind-Ra

Refinance Risk

Projects exposed to refinance risk (debt not fully amortized at maturity) are typically viewed as structurally weaker from a credit perspective as they present more uncertainty as regards both market access and the cost of debt at a future date. However, for debt instruments benefiting from substantial amortization, significant residual project value or structural mechanisms that ensure an alternative repayment mechanism to facilitate refinance, rating impact may be limited. All other factors being equal, such circumstances would typically not achieve the ratings of a fully amortized equivalent instrument.

Figure 24

Refinance Risk Characteristics

Stronger attributes	Marginal or no bullet debt in the financing structure; nominally some bullets, but rating case cash flows show no or limited balance at nominal bullet maturity.
Midrange attributes	Moderate use of bullets (less than 25%) with substantially fully amortizing debt.
Weaker attributes	Substantial use of bullets and dependence on refinance analysis.

Source: Ind-Ra

Ind-Ra will explicitly analyse refinance risk, using stress assumptions for refinance costs and liquidity derived from historical patterns observed in the relevant debt market. *See the Debt Service and Counterparty Risk section below.*

Debt Service and Counterparty Risk

Having reviewed the debt structure of each rated instrument, these features are combined with a more quantitative approach to determine the capacity of each instrument to maintain debt service through a range of stresses. The creditworthiness of both project and financial counterparties, in the context of their obligations, is also incorporated into the rating. Peer analysis may be used wherever appropriate.

Models

Models used in project finance are generally cash flow models projecting operational cash flows and debt service based on assumptions input as variables. These models are not stochastic, and only allow single or combined factor sensitivities to assess the impact on debt service. It is important to reiterate that model outputs are only one factor in an Ind-Ra analysis. A project for which credible projections show strong ability to repay rated debt may still be assigned a speculative-grade rating, or even no rating at all, if some more qualitative risks (for instance, , sponsor insolvency, or industry risk) are deemed very material.

Due to the idiosyncratic and complex nature of most projects, Ind-Ra does not have its own standard model. The agency judges that adapting a standard model to reliably incorporate the many individual features of a project is not justified when compared with focusing on analytic drivers such as choice of stress (below) and using an arranger's project-specific cash flow spreadsheet model to evaluate these. When using results from an external cash flow model, Ind-Ra prefers that it has been independently checked, ideally by a reputable third party.

The agency's analysts also consider the plausibility of results from external cash flow models by examining trends and sensitivities, making estimates and adjusting individual parameters. Despite these precautions, as with all types of information provided by issuers, Ind-Ra is incumbent on sponsors or issuers to ensure that the information provided to Ind-Ra is timely, accurate, and complete. Failure to do so may result in the withdrawal of ratings.

Base Case

For most projects, Ind-Ra will establish a cash flow base case, which serves as the agency's expected case for rating surveillance and as the common starting point for stress analysis. Sponsor forecasts typically are concerned with planning for resources necessary for performance in upside scenarios or to project equity returns and this can have an embedded optimism bias. Ind-Ra's base case is typically established by adjusting the issuer's central

forecast to make it consistent with Ind-Ra's criteria and forecasts, which are focused on measuring financial and operational flexibility in the economic environment reasonably anticipated to exist in the relevant forecast period. Additionally, the agency's analytical assumptions specific to the project will be incorporated.

Project Stresses

Having established a base case, Ind-Ra applies a series of stresses to parameters identified as key in the project analysis. Parameters such as delays, input and output prices, demand or utilization levels, performance, life-cycle, and other costs may be stressed, either in value or in timing. Additionally, the cash flow impact of structural or legal changes may be estimated and remodelled. The purpose is to test the sensitivity of cash flows available to each rated debt instrument to changes in these parameters. Certain key project variables may be hedged, either contractually or through natural positions. Ind-Ra considers the effectiveness of such arrangements and any remaining risk from imperfect hedges (basis risk) or residual unhedged positions may be the subject of stress tests.

Financial Stresses

Financial stresses are considered in a similar manner to project stresses; some may only apply to individual rated debt instruments. Common financial stresses such as inflation, interest rates, and foreign exchange rates may be hedged or partially hedged. In such cases, the result of a stress may be a material increase in counterparty risk against the protection seller. Financial stresses may include the potential default and replacement of any counterparty with a material financial obligation to the SPP or issuer SPV. The amount of financial stress applied is typically by reference to forecasts from an appropriate analytical group within Ind-Ra. Interest rate stresses, for example, may be considered under the report, *Criteria for Interest Rate Stresses in Structured Finance Transactions* dated March 21, 2011 in the base and rating cases where appropriate and on historical patterns observed in the relevant debt market where appropriate. The stress will be applied in the direction adversely affecting cash flows for the rated instrument.

Rating Cases, Combined Downside, and Break-Even Stresses

A combination of project and financial stresses or a series of individual stresses (typically referred to as a "rating case" in the sector criteria) are identified, typically by reference to historical events, peer analysis (see page 30), forecasts, and Ind-Ra's expectations for the future. These may reflect a particular "scenario" of events. They are used either by selecting base case metrics providing relevant cover or by modelling the stresses to test that the rated instrument does not default. The method employed for a particular sector is usually determined by the type of information available and the importance of peer analysis, which often relies on metrics.

When selecting stresses, the sensitivity of cash flows to changes in the stress is considered to achieve a degree of rating stability through the economic cycle, including a typical downturn. The rating case may vary the commencement of the downturn to assess the effects on the credit if a downturn commences at a more vulnerable time for the related project or infrastructure asset. The choice of the rating case is a key quantitative and qualitative determinant of the rating and is typically a central point of discussion in rating committees.

Metrics

The results of these stresses are typically summarized by using various metrics, often in the form of ratios and are used in combination. Metrics are used selectively as appropriate to the sector or transaction structure. Metrics associated with a given rating category can vary widely depending on the nature of the project and the potential volatility of cash flows. Any sector-specific criteria will include medians and ranges typical for the relevant sector. It is important to note that such metrics are an input in determining a rating to the extent that they summarize in a single number Ind-Ra's views on certain risks and, in particular, their impact on a project's cash flows. As noted above, a rating includes both qualitative and quantitative analysis.

Stronger or weaker financial metrics will be viewed in the context of the qualitative analysis of risk attributes described in this Master Criteria.

Common among metrics are the following listed below.

Debt Service Coverage Ratio (DSCR)

This is the measure of cushion between debt service and cash flow available for debt service (CFADS) in any given period (typically annual, but may be intra-annual especially for projects exposed to seasonality). It is calculated as the ratio of CFADS (generally excluding cash reserves) divided by the total amount of equal-ranking and senior debt service due (principal and interest) in that period. Both minimum and average periodic DSCRs are taken into account in the analysis as they both give indication on volatility of cash flows. The profile or evolution of the DSCR is also considered in the context of the relative increase in uncertainty for many variables overtime.

Gearing/Leverage Ratio

This is the ratio of net debt to CFADS or net debt to EBITDA used most often when evaluating infrastructure entities having an effectively unlimited franchise to provide an essential public service.

Project Life Coverage Ratio (PLCR)

This is the net present value (NPV) of CFADS over the remaining project life, divided by the principal outstanding on the rated debt instrument (plus all equal-ranking and senior debt) at the calculation date. Typically, "project life" will refer to the remaining economic life of the asset. Where a concession is granted that runs for a term less than the expected economic life of the asset (e.g., in certain social infrastructure PPP financings) the remaining project life can be the remaining life of the concession term, etc. In cases where the remaining life of the concession is very long, Ind-Ra substitutes an economic project life depending on the nature of the asset, since it becomes impractical to evaluate project cash flows for a longer period.

The PLCR is also a useful alternate metric to the LLCR in situations where long-term debt is not available, and where cash-flow coverage is too narrow to retire debt over the shorter available debt life. The PLCR looks at the economic capacity to retire debt over the economic life of the project. The discount rate used to calculate the NPV of CFADS will typically be the coupon on the debt, but where refinance risk is analysed, can incorporate varying assumptions about the cost of capital. See *Refinance Risk* on page 27.

Loan Life Cover Ratio (LLCR)

This is the NPV of the cash flow available for debt service after operations and covenanted or mandatory capex (CFADS), from the calculation date to the maturity of the rated debt instrument (including initial debt service reserve account (DSRA) and other available cash), divided by the principal outstanding on the rated debt instrument (plus all equal-ranking and senior debt) at the calculation date. Cash flows are discounted at the weighted-average cost of debt to maturity. Residual values at maturity are excluded unless assets are specifically structured to be liquidated. This metric is indicative of total capacity for debt service over the life of the rated instrument.

Counterparty Risks

Risk transfer to counterparties is a central theme of most project and infrastructure finance transactions. As noted in various sections, the value of a risk transfer to the rating will depend on the counterparty's financial capacity to absorb that risk. As a general principle, where the financial resources or cash flows of the SPP are dependent on the financial performance of a counterparty to whom warranty, completion, revenue, cost, supply, liquidity, interest rate, or other risks has been transferred, this will be given credit to the extent the counterparty has a rating commensurate or superior to the rating of the SPP debt. Unless otherwise enhanced, a counterparty upon whom the SPP has a dependency may constrain the rating of the SPP debt. The ratings for any counterparty where financial performance is key to SPP performance is

based upon a Ind-Ra rating assigned by the relevant analytical group. Where an Ind-Ra public rating is not available, an internal private rating or third-party information can be used in the case of counterparty risk material to the project finance rating. Rating dependencies (where a change in counterparty rating may affect the project finance rating) will be highlighted and any rating linkage (where the project finance rating will move with the counterparty rating) will be made explicit. Structural features to mitigate deteriorating counterparty risk, such as rating triggers or financial ratio tests, are examined.

Throughout this criteria report, where a qualitative assessment of risk incorporates, among other elements, the qualification and strength of a counterparty, the following attributes are used when considering financial resources of such counterparty in the context of that overall risk assessment.

Figure 25

Counterparty Characteristics

Stronger attributes	A stronger counterparty will have a rating in the 'A' category or higher.
Midrange attributes	A mid-range counterparty will have a rating of 'BB+' or in the 'BBB' category.
Weaker attributes	A weaker counterparty will have a rating of 'BB' or below.

Source: Ind-Ra

Peer Analysis

Where information on appropriate peer projects for which a rating has been assigned is available to Ind-Ra (usually for the same sector, region, and structure), this will be used for comparative analysis of individual risk factors (both qualitative and quantitative) or in establishing the rating, with respect to the peer group. Projects in different sectors or with different structures may present quite different qualitative features and credit metrics at a similar rating level due to factors such as legal framework, stability of cash flows, or structural features, making such comparisons of less value. Peer analysis is likely to play a more important role in sectors where the portfolio of ratings is more developed. Ind-Ra may use normalizing assumptions (such as a common annuity-based amortization schedule) to better compare rated debt with peer projects.

Surveillance

Existing ratings are monitored and reviewed in accordance with Ind-Ra's established criteria and methodologies for the type of rating. The likely adequacy and frequency of ongoing information will be considered at the time of the initial rating to provide a good prospect that the appropriate standard of surveillance can be maintained. Periodic information relating to a project such as financial statements/management accounts, performance data, technical reports, construction progress reports, budgets, and forecasts are expected to be received by Ind-Ra at least once a year until maturity of all rated debt.

Once received, this information is screened by an analyst for materiality and consistency with the expected case. Material new information or exceptions are referred to a senior analyst and a decision taken whether to initiate a full review of the rating. Significant market events, changes in counterparty ratings, or changes in law or regulation may also trigger a full review. Full reviews are undertaken periodically in any event as required by Ind-Ra policy. Information received as part of the surveillance process may lead to requests for further information and revisions in Ind-Ra's base and stress cases (either quantum or factors).

Treatment of Junior Debt

Junior debt and/or mezzanine debt is generally rated lower than the senior debt. The notching difference in ratings between a senior and junior debt depends upon a number of factors including the lender protection features in the financing documents, mainly the coverage metrics of consolidated debt vis-à-vis in relation to senior debt. In cases where a cross-default clause exists, the agency will analyse the combined (senior +junior) debt and its impact on the coverage ratios to arrive at the rating of the project debt. The presence of a cross-default

clause in the financing documents relating to junior or mezzanine debt, would automatically trigger a technical default (not necessarily, a payment default) on the senior debt, which will result in the junior debt and senior debt being rated at the same level.

In certain situations, it may so happen that the mezzanine debt in a project is guaranteed or backstopped by the sponsor whose rating is higher than the project's senior debt. In such a situation, the agency would analyse the terms of the guarantee/undertaking and should it turn out to be a guarantee or an undertaking that would effectively avoid a default, the agency would equate the rating of mezzanine debt to that of the sponsor's rating.

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