General Project Finance Analytical Considerations

Introduction

Scope's 'General Project Finance: Analytical Considerations' sets out the key principles that Scope applies for analysing all types of infrastructure and project finance vehicles and instruments.

Scope expands the analytical coverage of project finance beyond the traditional emphasis on probability of default, with a focus on the expected loss of a project or a debt instrument issued in a project finance transaction. Scope believes this approach adds value to investors, as it improves credit differentiation across this low-default asset class, generally characterised by on average high, but widely dispersed, recovery rates (i.e. bi-modal recovery rates).

The fundamental analysis of the project's key credit risk drivers is vital to identifying credit impairment events that could result in a loss to investors. The same analysis also reveals the probability that credit impairment events will occur linked to risk factors which cannot be analysed quantitatively. The probability-weighted average loss – at the instrument level – of all possible events represents the expected loss for the investor. Counterparty and legal analysis overarch the analysis of credit impairment events and their severity.

These analytical considerations apply equally to different sectors and projects across many jurisdictions. Sector-specific considerations may still be required when analysing instruments in certain sectors. Sensitivity analysis and conditional stress testing are important for analysing the credit risk of a project finance transaction. Again, this is driven by the low-default characteristics of the asset class as well as the potentially extreme loss which certain credit impairment events would entail. In this context, the benchmarking against comparable projects (i.e. similar sectors, regions, and structures) only provides partial comfort because of potential systemic risks.

These analytical considerations are structured around five main areas of risk that exist in all project finance sectors as well as sponsor risk factors. Sponsors influence the credit risk of the overall project and consequently all five areas of risk. Each area includes considerations relevant to assessing the key credit risk drivers of a transaction. The risk areas are listed in Figure 1.

Figure 1. Focus on expected loss

Source: Scope Ratings

Scope has updated these analytical considerations on 25 September 2017 to align its contents to Scope's 'General Project Finance Methodology'. Originally published in May 2017.

Analysts

Aaron Konrad
+49 30 27891 132
a.konrad@scoperatings.com

Carlos Terré
+49 30 27891 242
c.terre@scoperatings.com

Related Research

General Project Finance Methodology, November 2017

Q&A on Scope's Project Finance Ratings – How We Are Different, September 2017

Scope Ratings AG

Lennéstraße 5
10785 Berlin

Phone +49 30 27891 0
Fax +49 30 27891 100

info@scoperatings.com
www.scoperatings.com

Bloomberg: SCOP

Expert analysis of qualitative and quantitative factors is essential

Scope believes that expert analysis, supported by dedicated scorecards to ensure consistency, is essential to capturing the key risk drivers which form the basis for the analysis of the possible project credit impairment events. This analysis should yield the probability of occurrence and the severity of the different credit impairment events. Scorecards incorporate both qualitative and quantitative elements and consequently benefit from the analyst's judgment around non-quantitative risk factors.

For example, counterparty risk exposures often require the analysis of roles and responsibilities in a very specific context, which considers the possibility of counterparty replacement or the materiality of counterparty failure. This would be in addition to the standard implications of financial and operating exposures as covered in our Methodology for Counterparty Risk in Structured Finance.

Areas of application

Considerations apply to all types of project finance vehicles and instruments

These analytical considerations apply to all types of project finance instruments, which are typically issued by a special-purpose vehicle (SPV) to finance the construction, purchase, or exploitation of a specific real asset. Scope focuses primarily on European project finance, but these considerations may also apply to other non-European or global transactions.

The asset class is very heterogeneous and usually covers long-term financings (15-25 years) of large, complex, and capital-intensive installations such as power plants, chemical processing plants and mines, as well as social, transportation, or telecommunications infrastructure (collectively 'infrastructure'), and oil and gas projects.

Non-/limited-recourse, single-asset

Debt is often issued on a non- or limited-recourse basis, and creditors rely on cash flows generated by a single asset or a portfolio of assets as the sole source of repayment. The cash flows generated by the asset should be enough to repay all debts before the end of the project's useful life.

Risk-sharing and various financial and legal structuring techniques are used to transfer or mitigate risks, improve the stability and predictability of the project's cash flows, and support its debt repayment capacity.

Contractual framework allocates risks and obligations

An SPV typically relies on a central contract or a right providing the basis to build and/or operate the project over a finite period. Complementarily, an SPV enters into several other contracts with third parties, which provide the necessary products and services to fulfil the central contract. The resulting contractual framework aims to allocate the project's risks and obligations to the parties best suited to managing them.

Single-purpose, ring-fenced SPV

Projects are typically carried out by SPVs whose only business is the project. The project is usually ring-fenced to shield its assets from third-party claims or insolvencies, including from sponsors. We expect creditors to exercise substantial control and oversight over the issuer's activities and the project's performance because they often solely depend on the project's cash flows to service debt. Creditors' security and collateral typically include the project's key contracts, direct agreements with the key agents involved, and all assets, rights, and accounts that are necessary to run the project.

Transactions that exhibit characteristics falling between project and corporate finance would need to include considerations applicable to the analysis of corporate credit risk. Hence, it is important to highlight the distinctions between project and corporate finance, even when these are not always clear-cut:

1. **Ring-fencing.** Debt in project finance is typically issued by an SPV against a defined, cash-producing, physical asset that is ring-fenced from its shareholders with no or limited recourse; corporate debt is backed by a company's balance sheet.

Table of Contents

2. **Strong covenants.** Project financings are often characterised by a strong set of covenants and structural protections, which are unusual among corporate financings.
3. **High leverage.** Project finance issuers generally have leverage ratios of 70-90%, higher than for typical corporate issuers.
4. **Single asset.** Creditors' claims are collateralised by cash flows generated by a specific project; corporate creditors have access to cash flows of a diverse mix of businesses and projects.
5. **Finite risk horizon.** Project finance debt is usually fully repaid over a finite period (before the end of the asset's economic life); corporate debt is often extended on the assumption that the company will remain in business and that it will be rolled over indefinitely, allowing for shorter tenors.
6. **Step-in rights.** Corporate debt may also be secured on a company's physical assets (unsecured debt is nevertheless more common), which can be sold if the debt is not repaid. In project finance, creditors usually prefer to take control to maximise recovery by exercising their step-in rights to keep the project in operation.

See Scope's Corporate Rating Methodology for insight around corporate finance analytical considerations.

Analytical framework

Five risk areas with 23 risk factors drive project credit impairment events

Scope's analytical framework considers five areas of risk and several factors within each area (23 risk factors in total). The analytical evaluation of these risk factors is based on quantitative and qualitative information. In addition, the fundamental understanding of the project and its economic fundamentals provide the basis for Scope's analysis while legal and counterparty risks overarch the framework across all risk areas.

The combination and evaluation of risk factors define the probability of all possible credit impairment events for an investor in a liability instrument. The probability of a certain outcome is driven by the strength or weakness of the project with respect to the risk factors within a given area.

Material credit impairment events contribute most to expected loss

Scope believes that the analysis of the potential credit impairment events can be made under the assumption that such events are independent from each other. This is a significant simplification in the analysis, but is justified, in Scope's opinion, as many projects have one or more weaknesses which expose them to the risk of a particular outcome. This becomes evident when one outcome is either very likely or would result in a high loss if it were to occur. Scope focuses on credit impairment events that contribute a material share of the debt instrument's total expected loss – compared to other events that represent a marginal contribution because they are either very unlikely or would not result in a significant loss.

Severe credit impairment events can be material despite low likelihood

For example, a public-private partnership (PPP) project may face the termination of its project agreement and default on its debts if it is not completed by the agreed longstop date. In evaluating construction risk, the analyst would examine the following risk factors, among others: construction contracts, liquidity packages, complexity, design, technology, and counterparties. If these risk factors are evaluated as strong, the probability of issues during the construction stage (e.g. delays and cost overruns) that may result in a loss would be assessed as low; while the probability of completing the project on time and on budget would be considered high. However, since failure to complete could result in the project's concession being terminated with a low level of debt recovery, the outcome's contribution to expected loss could be material despite a low probability of occurrence.

Analytical focus is on most material credit impairment events

Although the number of project credit impairment events is infinite, they can be categorised and assessed in terms of their contribution to expected loss, i.e. the likelihood of occurrence and severity if they occur. As a rule, Scope believes its analysis should focus on the likelihood and severity of the most material credit impairment events

(i.e. those which contribute the most to total expected loss), considering the project's sector and jurisdiction.

To evaluate the materiality of various credit impairment events, Scope's analytical framework groups the key credit risk drivers into five distinct areas (see Figure 2).

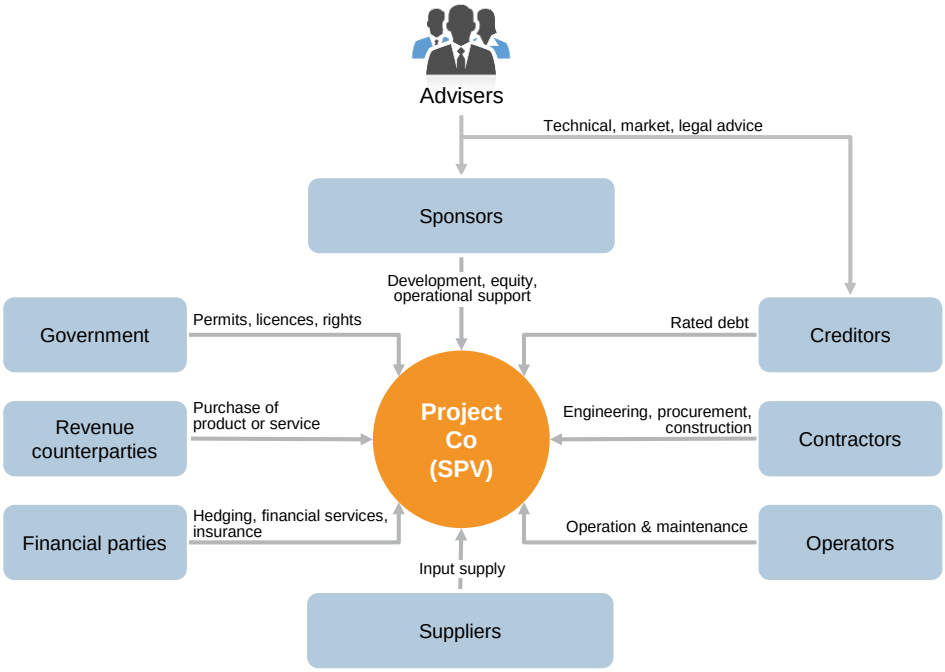
Figure 2. Risk areas in project finance analysis

Risk areas	Risk factors
(All areas)	Sponsors
Construction risk	Construction complexity, permits, design and technology Construction contracts, budget and schedule Construction funding and liquidity package Counterparty risk Equity contribution risk
Operational risk	Operational complexity, technology and standing O&M contracts, budget and planning Lifecycle risk Counterparty risk
Revenue risk	Revenue contract Economic fundamentals Supply/reserve risk Supplier risk Offtaker risk
Financial strength	Debt repayment Sensitivity to cash flow stress scenarios Inflation, interest rate and forex risk Refinancing risk Counterparty risk
Project structure and other risks	Financing and legal framework, compliance Country risk Events and force majeure risk

Contractual framework and key counterparties

The analysis of these risk areas requires careful consideration of the two pillars that influence a project finance transaction's credit quality: the contractual framework and key counterparties. SPVs enter into several contractual arrangements with creditors, sponsors, offtakers and other parties that provide products and services needed to build and operate the project. Flaws in the contractual framework, or counterparty weaknesses, would inevitably increase the credit risk of a given project. Figure 3 shows an idealised project finance contractual framework.

Figure 3. Idealised contractual framework



Source: Scope Ratings

Project agreement

A project's contractual framework is typically centred on a project agreement. This agreement determines the long-term economics of the project and typically covers the payment mechanism as well as output or service-level specifications to be met by the project. Alternatively, the project may operate in a competitive environment or sell its output directly to the market.

SPV at the centre

The SPV or project company lies at the centre of the transaction. It enters into the project agreement and various contracts with other parties to build and operate the asset.

Projects are often funded directly on the SPV's balance sheet via sponsors' equity and the issuance of debt instruments. Many project finance transactions issue a single class of debt, and sponsors usually provide capital in a combination of subordinated loans and equity. Some transactions use more complex capital structures, including projects that benefit from public-investment subsidies. For example, a public body or development bank may contribute the first loss-absorbing capital in the form of mezzanine debt, guarantees, or standby facilities (i.e. the EIB Project Bond Initiative). Mezzanine-type financings may also be provided by third parties unconnected with the sponsors or other investors. When multiple classes of debt are present, Scope assesses creditors' priorities and claims, the clarity of the agreement, the incentives attached to the instruments, and how conflicts are addressed in the intercreditor agreements.

Legal and structural integrity

Scope examines legal due-diligence reports and legal opinions to ascertain the

transaction's legal integrity and structural features, particularly the effectiveness of creditors' rights and remedies. This includes rights to step into the project and its contracts, replace contractual parties, and enforce creditors' security under the structure.

Structural subordination

In some cases, debt is issued by a holding company, which passes on the proceeds to the SPV. Scope analyses the transaction on a consolidated basis if the holding company's assets are part of creditors' security package and creditors can enforce directly against the project and its cash flows. If the holding company's debt is serviced by residual cash flows of one or more project, Scope treats the holding company's debt as subordinated.

Risk areas

Economic fundamentals

Analysis of the economic fundamentals of the project

The economic fundamentals of a project over its entire life are a critical element in Scope's analysis. Weak underlying economic fundamentals are a sign of higher credit risk. Strategic competitive analysis techniques therefore provide a solid foundation for credit risk analysis. Strong economic fundamentals can provide significant incentives to sponsors and other project participants to keeping the project in good operational and financial condition and preserving its value.

Construction risk

Risk factors during construction

In this area, Scope captures the key risks related to the project's design and type, the complexity of the technology used, the construction programme, construction contract and funding sources including equity contribution risk. Problems during the construction phase of a project may result in increased construction costs, delayed completion, or even default.

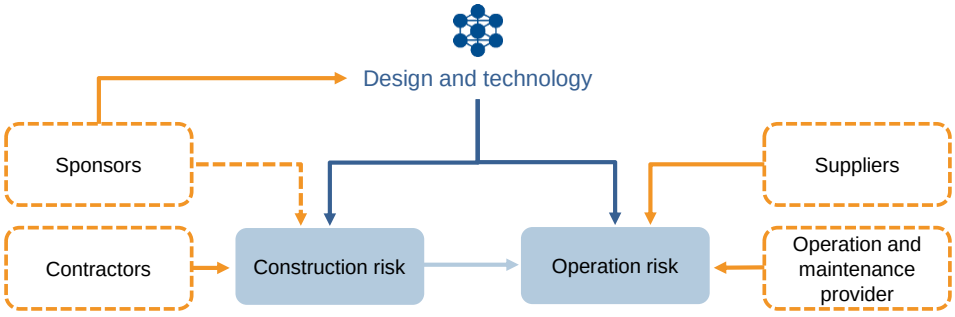
While some of the risks are only present during the construction stage, others can be found across a project's life. For example, a project's choice of technology and design may create challenges during construction and could also result in persistent underperformance during operation (e.g. nuclear power plants).

Independent engineer

Creditors often benefit from the appointment of an independent engineer, who can provide an unbiased assessment of the project's technical risks in addition to the opinion of the engineering firm engaged by the sponsors. Reputable engineering firms that are experienced in the project's particular technology and environment typically perform this role. The independent engineer usually produces periodic reports on construction's progress and provides notice of diversions from budget and schedule. Debt drawdowns may be subject to the independent engineer's certification of milestones, passed inspections, and performance and completion tests. Creditors' interests are also better protected if an independent engineer is involved in contract variations, renegotiations, and disputes.

An independent engineer's opinion and the reliability of its conclusions are critical elements in Scope's analysis of a project's technical characteristics. A strong opinion would be comprehensive, covering all relevant areas to assess the risks related to the construction budget and schedule, the areas of complexity, potential downside events, adequacy of funding and liquidity, and the likelihood of timely completion in line with cost projections, among others. Scope highlights important areas on which the independent engineer is unwilling or unable to provide a satisfactory opinion. The agency may ask for further information, or adjust its assumptions.

Figure 4. Technology, construction, operation



Source: Scope Ratings

Construction complexity, permits, design and technology

Construction and technological complexity

Construction complexity. Highly complex projects are generally more likely to experience issues during construction that result in delays or cost overruns. In addition, finding a replacement for the construction counterparty, if the need arises, is typically more difficult and costly.

Examples of less complex projects include simple buildings (such as schools, courthouses, and government-related buildings), solar projects, and oil and gas pipelines. Projects typically classified in the medium range of complexity include those that require civil or heavy-engineering expertise (such as coal-fired and natural-gas power plants) or the construction of complex buildings (such as hospitals), as well as onshore wind, road and rail projects. Lastly, heavy engineering or complex industrial projects lie at the high end of the complexity range. Examples include chemical and petrochemical plants, refineries, nuclear power plants, offshore wind, and complex tunnelling works.

Other important indicators of complexity include a project's relative size, significant interfaces with existing infrastructure, and challenging site conditions.

Scope also analyses external risks that could prevent the project from keeping to schedule, such as dependencies on another project's construction, or connections and utilities that need to be delivered.

Permitting status

Permitting risk. The risks that may prevent a project's completion and smooth operation are lower if all necessary permits, licences, permissions and rights have been obtained, and if no regulatory obstacles or public opposition are expected. This includes secure title and access to the project's site over its life, or land acquisitions e.g. for rail projects. If certain permits or rights cannot be obtained in the development stage, the risks may either stay with the granting authority or be transferred to the contractor. A clear and credible permit-management plan may partially mitigate the risk of additional costs or delays to the construction process.

Site suitability and environmental compliance

Site preparation. Detailed site investigations by independent experts typically underpin a project site's geological suitability. This assessment generally includes an impact study on environmental effects that evidences compliance with all applicable standards and laws. Certain prior uses of a site (e.g. heavy industrial use, mining operations) may necessitate the removal of environmental contamination. In certain geographical areas, there is also a risk of discovering archaeological artefacts or warfare material. Unexpected discoveries are likely to interrupt construction activities, increase costs, and may affect a project's debt servicing ability if inadequately covered by liquidated damages, contingency funds, and schedule buffers.

Operating history of technology

Technology. Well-established, currently-in-use technologies that demonstrate a proven operating history in similar environments and can be benchmarked against existing

references typically provide greater certainty for project completion as well as on performance levels during the operational stage. By contrast, weaker attributes include the use of new or unproven technology with limited operating history or important design elements either at a preliminary stage or that is developed in parallel to construction ('fast track' construction schedule).

Project design

Design. Proven and completed design that includes appropriate redundancies, safety margins, and additional supplies better protects the project from component failure resulting in prolonged operating problems or unavailability. Unusually complex designs increase the risk of problems during construction. Projects where important design elements are finalised after construction has already commenced are generally more exposed to necessary design changes, leading to higher costs or delays.

Construction contract, budget and schedule

Pass-through of construction tasks

Contract. Construction works generally form the largest component of a project's capex and often amount to 50-80% of total funds needed to build the asset. To transfer construction risks, an SPV typically enters into a construction contract with one or more construction contractors.

'Turnkey' and EPC contracts

There are several types of contracts in the market; the strongest from a risk perspective is either a fully wrapped 'turnkey' contract or an engineering, procurement, and construction (EPC) contract that enables the comprehensive pass-through of construction obligations. These contracts require construction counterparties to complete the project on time and on budget, and within certain specifications. Additionally, the contractors must bear cost overruns and will typically pay liquidated damages or penalties if the project is delayed (usually up to a certain specified liability cap). Turnkey contracts usually also include performance testing with the involvement of the independent engineer to prove that the project is ready for operation.

'Cost plus price' contracts and unfixed key terms

Weaker contract types, from a credit risk perspective, are 'cost plus price' contracts that pay the contractor for completed work, with the SPV bearing all other construction risks, as well as contracts with an unfixed price or completion date (sometimes used in construction programmes with multiple contractors).

As a part of its contract analysis, Scope examines the defects liability period and level of warranties available to protect the project during the operating period.

Contract pricing and terms

Budget. Even though construction contract prices are often fixed, Scope examines the contract's terms, crosschecking with market data to ensure it is adequately priced. Contracts priced below market could indicate an aggressive bidding strategy, which may result in cost overruns or even price renegotiations at a later stage of the project. On the other hand, very high prices could make the project's product or output less competitive in the market.

Scope also examines buffers in cost contingencies and the contactor's profit margin to accommodate potential cost variations and overruns. Budgeted costs and cost contingencies are compared to historical benchmarks on similar projects to assess its adequacy as appropriate.

Schedule buffers and contingency

Schedule. The longstop date in the construction contract is the date by which construction works must be completed, or on which an SPV can terminate the construction agreement. There are typically also longstop dates in the financing and concession agreements, and delaying construction works beyond these dates will trigger the rights of creditors and ultimately the offtaker/concession provider to terminate the project agreement. Scope examines time contingencies built in the contract such as

schedule float as well as time distance between target date, completion date, and various longstop dates.

It should be noted that the longstop date under the construction agreement is typically shorter (by 3-9 months) compared to the longstop dates under finance or concession agreements. This allows creditors to step into the project, replace the contractor, and complete the works before breaching the longstop date under the concession agreement (and thus averting concession termination). Scope also examines the time buffer between the longstop dates and the first debt repayment date.

Construction funding and liquidity package

Construction funding risks and mitigants

Construction funding. Ready access to funding is critical to a project's timely completion. Scope's assessment of construction funding typically includes the analysis of equity contribution risk (i.e. contributed upfront or pro rata), the debt drawdown profile (i.e. aligned with project milestones or frontloaded), the conditions precedent and their impact on timing and potential delays, and the availability and quality of other means of funding such as government contributions.

In some instances, a project may start to generate revenues even before it is fully completed. Examples include the addition of another lane to an existing road, or an offshore wind park that uses already-operational turbines to start producing energy while remaining turbines are built. Scope assesses the risk of revenue shortfalls leading to construction delays or project underfunding, including the extent and predictability of pre-completion revenue projections, considering other sources of funding such as contingent capital if available.

Construction liability and security

Liquidity package. Liquidated damages agreed with the contractor are typically sized to cover debt-related obligations (i.e. interest and fees) and foregone revenues in the event of delays or underperformance attributable to the contractor. Scope recognises that liquidated damages are usually capped (8-30% of the contract price depending on the sector and the complexity of construction works), and any amount exceeding this cap is borne by the SPV. Scope evaluates the strength of the construction counterparty's total liability cap, including liquidated damages, termination compensation in case of a default, and security available to cover this default.

Liquidated damage payments expose the SPV to a construction company's willingness and ability to pay. Even though liquidated damages are designed to clarify responsibilities and reduce ambiguity, in rare circumstances such payments become subject to dispute or escalate into arbitration proceedings, which could delay or block payment. Scope analyses the available security package covering such liabilities, including letters of credit, performance or adjudication bonds, and parent company guarantees. Key components defining Scope's conclusion on the security package's strength include the timeliness of payment (e.g. a letter of credit is stronger than an adjudication bond[1]), level of coverage, and exposure to the counterparty providing the instrument.

Counterparty risk

Single construction counterparty

Types of counterparties. To build the project, an SPV typically enters into agreements with several parties including one or more construction contractors and equipment suppliers. While the contractor often delegates specific work to sub-contractors, it usually remains fully liable to deliver the project. Hence, the contractor effectively guarantees the performance of its sub-contractors.

[1] Letter of credit is unconditional and typically drawn on time, while bonds require submission of the claim and thus may result in delayed or lower payments.

'Joint and several' and 'several' liability

In projects where several construction companies are responsible for completing the project, it is important to assess whether their liabilities are 'joint and several' or 'several'. In the first instance, each construction company is fully liable to deliver the project, even if another party fails to perform (i.e. effectively cross-guaranteeing each other's liabilities). 'Several' liability limits each construction company's responsibility to their respective part only (and thus higher analytical focus must be placed on the weaker counterparties).

Multiple construction counterparties

In certain sectors (e.g. port projects, offshore wind), it is industry practice for SPVs to enter into multiple 'several'-liability agreements with several contractors. This type of arrangement may signal limited capacity or willingness of contractors to bear the full risk of completing the project. In addition, the presence of multiple contractors exposes the project to interface risks. For example, a default or delay in the delivery of one contractor could result in knock-on delays and increased costs for the others. Since the other contractors are usually not liable for risks beyond their predefined scope of works, and penalties do not always fully cover increased costs, the additional costs and other adverse effects fall back on the SPV.

Sponsors' role in construction

In many transactions, sponsors take an active role in providing construction-related services or supporting third parties in performing these. In some projects, sponsors cover counterparty risks through risk substitution, e.g. the issuance of a completion guarantee. Scope evaluates the alignment of incentives between creditors and sponsors, and assess the adequacy of the various channels available to sponsors to extract value from the project (e.g. margin in a construction or service contract, equity interests, and fee income).

Performance risk and mitigants

Counterparty performance risk (track record and credit strength). The assessment of a counterparty's performance risk forms a critical component in Scope's analysis, particularly if a counterparty's failure to perform may materially impact the project's timely completion.

Scope's assessment considers a counterparty's technical capabilities to be an important factor. For example, in evaluating a contractor's technical capability, Scope analyses the company's (and its key personnel's) qualifications, industry experience and track record with similar projects, its reputation, the project's strategic fit in the contractor's business model, and the construction contract's size compared to its overall revenue base.

Scope considers financial capacity a critical component because wider financial difficulty is likely to also impact the counterparty's performance towards the project. To assess a counterparty's financial capacity, Scope analyses its credit quality.

Impact of a contractor default

Counterparty importance assessment. Scope considers the relative ease and cost of replacing a non-performing counterparty a key element for assessing the counterparty's importance in the project. If a counterparty provides low-complexity, non-specialised products or services that can also readily be sourced from an alternative provider at a comparable cost, Scope assesses the exposure to this counterparty as less material. If the counterparty's products or services are highly specific or complex, and timely replacement is considered difficult or unclear, Scope may judge this risk as excessive. Scope also considers any termination compensation that the project may benefit from and assess whether this can cover replacement costs (which are often charged at a premium).

Incentive alignment between contractor and creditors

Incentive alignment. The clear alignment of incentives between counterparties and creditors is critical to Scope's analysis, as diverging interests or flawed incentive structures often result in costly delays, provoke renegotiation attempts, and may ultimately lead to project failure. This risk can be mitigated by early completion bonuses,

milestone-related compensation, subordinated payments, equity participations, a project's strategic importance, and strong business relationships.

Equity contribution risk

Equity drawdown and funding schedule

The capital structure of the project typically includes an equity contribution ranging from 7% to 50% of total funding. Equity is typically contributed upfront at financial close and is available to absorb first losses (e.g. in a termination event). Alternatively, sponsors may contribute equity pro rata to debt drawdowns during the construction period. In some cases, equity may not be contributed in cash, and the commitment is supported by a parent guarantee or an unconditional, irrevocable letter of credit provided by a highly rated financial institution.

Scope evaluates sponsors' financial strength with respect to the support required over the relevant timeframe, particularly if equity is provided pro rata or if sponsors commit to providing additional financial support (e.g. contingent equity).

Structural mitigations. Guarantees, letters of credit, performance and adjudication bonds, and other credit enhancements can mitigate counterparty exposures.

Operational risk

Risk factors during operation

Once a project is commissioned, it typically relies on ongoing operation and maintenance (O&M) services to ensure its smooth operating condition, optimise downtimes, and protect the issuer from cost increases or revenue interruptions resulting from either underperformance or the project's unavailability.

The analysis of operational risk considers the strength of the O&M contract, the counterparties involved, the project's major maintenance programme, obligatory operational-performance standards, as well as the potential impact on performance resulting from technological issues.

Operational complexity, technology and standing

Operational activities often include the routine operation of the asset (e.g. cleaning, security), maintenance and parts replacement, as well as heavy maintenance or major upgrades.

Type of project drives operational complexity

The type of project and the technology used are important credit risk drivers for a project in operation. Projects that use commercially proven and widely used technology generally exhibit more predictable O&M and cost structures underpinning cash flow projections. Projects that use newer, 'state of the art' technology with a less proven operating history are generally more likely to suffer from unanticipated cost deviations, revenue interruptions, or lower-than-projected efficiency. Other examples of higher-risk operating activities are projects during their ramp-up period (when operations may require some adjustments), specialist operating requirements of a highly skilled operator, significant interface risks, and environmental and weather-related challenges.

Projects in operation may suffer from higher-than-expected costs, unexpected outages or unavailability, lower production efficiency, performance penalties, or technical failures potentially affecting the project's cash flows.

O&M contract, budget and schedule

Pass-through of O&M tasks

O&M contract. It is common for an SPV to enter into O&M agreements with third-party providers, thus passing down most O&M tasks (such as sourcing products and services to run the project) and related risks to the O&M provider. This covers performance-related penalties and provides remedies such as termination rights in the event of non-performance.

Contract pricing and term

The pricing of O&M activities could be either fixed or subject to periodic benchmarking (typically seen in PPP projects) to align it with the market. Scope deems it important to analyse how the price compares with the market and what effect benchmarking could have on the project's cash flows.

The length of an O&M contract varies by sector – some could be shorter than the loan maturity (e.g. five years) while others may cover the entire project's life (e.g. 25 years). Scope typically examines the cost implications of contract extensions or the search for an alternative O&M provider, particularly if the O&M contract is shorter than the debt tenor.

Performance standards

An SPV often specifies detailed performance standards in the O&M contract. These typically mirror the SPV's own operating requirements, including the pass-down of penalties if standards are not met. The penalty mechanism (i.e. performance targets and penalty size) can vary significantly among different projects, from benign to severe, and is therefore an important element in Scope's analysis of an O&M contract.

Performance deductions

Deductions for underperformance or asset unavailability passed down to the O&M provider are often (but not always) subject to a liability cap, typically a percentage of the annual O&M fee. Complex operations often signal higher deduction risk, which may be buffered by higher liability caps.

Severe underperformance of an operator typically triggers the right for an SPV to terminate the contract. The liability cap may include a termination payment to cover contract substitution costs and lost revenue. Scope evaluates whether such a payment can be expected to cover replacement costs, including an adequate premium and debt service until a replacement is found, considering any mitigating factors such as collateral.

Buffers to cover performance issues

Budget and planning. Scope analyses the project's budget and schedule assumptions (including staffing, operation, maintenance, outage, spare parts, and environmental plans) and will perform sensitivity tests in relation to cost increases and other sector-specific operating assumptions. Scope also assesses whether contingencies can adequately cover unforeseen events, such as rising costs and weaker performance as the plant becomes older. In rare instances, the SPV may perform O&M services itself or parts of it (e.g. heavy maintenance tasks). Such arrangements often pose higher risks because unmitigated and unidentified risks will remain with the SPV.

Lifecycle risk

Project expansion, additional capex programmes (e.g. expansion of an airport terminal), or significant concentrations of heavy maintenance/refurbishment activities within short periods of time (e.g. heavy maintenance of a road) typically represent major sources of operational risk in a project.

Capex/heavy-maintenance budget and schedule

Scope supplements its analysis of the lifecycle arrangements and the O&M provider's capabilities with a detailed evaluation of the project's capex/heavy-maintenance budget and schedule. This is performed in the context of available maintenance reserve accounts and other sources of funds (such as dedicated capex or decommissioning reserve accounts).

Lifecycle reserves

The analysis includes an assessment of the reserve-account build-up mechanism, the reserve's level at various project stages, its cost structure, the flexibility in timing and the extent of additional capex or heavy maintenance, as well as sources of liquidity to cover higher-than-expected costs. For example, in addition to dedicated reserves a project may benefit from the ability to reschedule or postpone works and expenditures, which can minimise the impact of operational interruptions on revenue generation and debt servicing capacity.

Counterparty risk

O&M provider strength and importance

O&M services are often provided by one or more specialist service providers. In some projects, these services may be provided by an affiliate of a sponsor, or an equipment supplier. The O&M provider's incentives, experience and track record, technical capabilities, and financial capacity to perform the services within budget and on schedule are key considerations in Scope's counterparty risk assessment. A high degree of specialisation, high costs, or the lack of available replacements for a defaulting O&M provider generally increase the reliance on the O&M provider's performance. Examples include industrial facility licensing equipment that is operated and maintained by a specialist equipment supplier. Providers can be incentivised to maximise performance and reduce downtimes to a minimum. Strong incentives include significant damages for underperformance, bonuses for outperformance, subordination of fees, and the project's strategic importance in the provider's business model.

As a rule, early involvement of an O&M provider during a project's construction stage (often it is the same/sister company) decreases the risk of a contract being mispriced as well as various undetected problems resulting in operational issues.

O&M tasks at SPV-level

In some projects, a portion or all the services may instead be performed by the SPV itself (such as heavy maintenance), necessitating the SPV to employ staff (or transfer them from an existing O&M provider) with the necessary skills and expertise. Scope considers management's industry experience and track record to be important, particularly with existing or past projects exhibiting similar characteristics. Other key elements include the project's staff recruitment and retention strategy, O&M plans including spare-part stocking strategies, and arrangements with third-party service providers.

Revenue risk

The key factors affecting the stability and predictability of a project's revenue stream must be evaluated to assess their impact on the level and volatility of cash flow available for debt service.

Revenue contract

Many projects rely on a project agreement, which includes long-term purchase and/or supply obligations of the project's product or service by one or more revenue counterparties. Key areas of analysis include price risk, volume risk, and contract length.

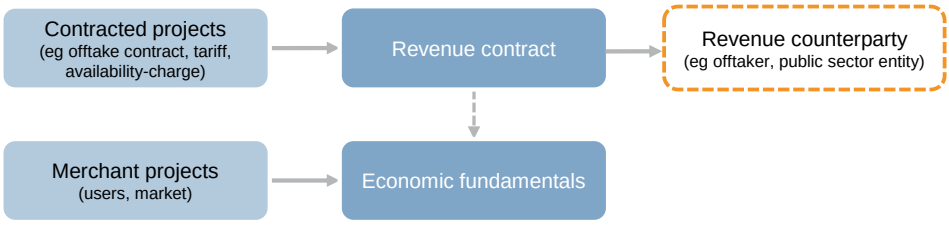
Merchant risk

Projects without a purchase contract (i.e. 'merchant risk' projects) or supply agreement (if relevant) exhibit the highest degree of market risk exposure. These risks may be partially mitigated by long-term, superior project economics, growing long-term demand/supply projections supported by a rigorous market study, strong historical evidence of demand/supply, and limited reliance on market forecasts.

Economic fundamentals

Scope considers projects' underlying economic fundamentals a critical element in its analysis. This is particularly true for merchant projects that rely exclusively on the competitiveness of their output. Examples include toll roads that overly rely on cyclical trucking traffic or compete against alternative infrastructure or transportation modes. Economic fundamentals are also important in projects that benefit from a long-term revenue contract –if a project's output is uncompetitive, its revenue counterparty may be incentivised to look for 'contract outs' and alternatives, increasing contract abrogation and default risk. The risk increases if a project's underlying economic fundamentals are weak.

Figure 5. Revenue risk



Source: Scope Ratings

Revenue contract

The revenue contract is fundamental to many project finance transactions, since it often represents an SPV's single source of cash flow to repay debt.

A revenue agreement's structure is often determined by a project's industry and sub-sector. Scope classifies different types of agreements into four categories, ranked by the degree of a project's market risk exposure: availability (none to low), contracted (low to medium), concession/demand-based (medium to high), and merchant projects (high). For a list of common types of revenue agreements, see Figure 6.

Figure 6. Revenue agreement categories and types

Category	Revenue type	Description
Availability	**Service fee**	Revenue counterparty pays availability charge that may reduce in the event of unavailability or underperformance.
	Capacity payment	Revenue counterparty pays a capacity charge even if the plant is not dispatched, along with an energy charge covering variable costs.
Contracted	**Take or pay**	Revenue counterparty must purchase project's output or make a payment in lieu of purchase at an agreed price. Project must make available output.
	Long-term sales contract	Revenue counterparty purchases an agreed quantity of a project's output, but pays market price.
	Long-term sales contract with floor	Like long-term sales contract, but includes a minimum price.
	Take and pay	Revenue counterparty pays for output taken at an agreed price, but no minimum agreed purchase quantity.
Mixed	**Partially contracted (x%)**	A percentage of projected output is contracted, with the remaining portion is sold to the market, e.g. take or pay (60%).
Concession or demand-based	**User charge**	Users of the infrastructure pay a usage-based tariff to the project, which is usually subject to regulation.
	Shadow toll	Like user charges but the tariff is paid by revenue counterparty, typically a public authority or government agency.
	Competition	Like user charges but the tariff is determined by competitive forces.

Scope assesses the revenue contract's quality, agreed price and volume, as well as output specifications, the degree of risk transfer from the SPV to the revenue counterparty, and alignment of incentives. Scope also analyses the contract's integrity with the transaction's overall contractual framework, including operating and supply agreements, and the SPV's financing contracts.

A good-quality revenue contract can clearly delineate each counterparty's rights and responsibilities, provide transparent output specifications in line with the project's operating plans and technology, and clearly define allocation of risks. Dispute-resolution procedures and termination provisions can protect the project from the risk of contract renegotiation and cover debt service under adverse events or force majeure scenarios.

The scope and extent of risk transfer to the revenue counterparty is often determined by a project's industry and economic fundamentals.

Lowest exposure to market risks

Availability-based revenues. Availability-based revenues generally retain the lowest exposure to market risks. This type of revenue agreement is present in many private-finance initiative (PFI) and PPP transactions and usually requires the project to keep certain infrastructure for public use. This is performed in return for a service fee, paid by a public authority or government agency. While the agreement usually requires the project to meet certain performance standards, payments are often fixed to allow for full cost recovery and capital returns, independent of actual usage or demand. Payments are sometimes indexed for inflation or fluctuations of foreign exchange rates. The agreement often includes certain performance parameters that, if not fully met, will result in deductions from the agreed service charge and reduce the project's revenue. Hence, the risk of the asset becoming unavailable or not fully meeting the required standards is a critical factor in Scope's analysis of such projects, involving a detailed examination of availability and performance criteria as set out in the project agreement.

Different exposures to market risks

Contracted revenues. Other types of revenue contracts expose projects to different degrees of market risk. In the example of a substantial risk transfer, a power plant may sell its output to an offtaker based on a 'take or pay' agreement. Under this type of contract, the revenue counterparty is typically obliged to either purchase the project's output or make a payment in lieu of purchase at an agreed price. Purchase prices may be indexed for inflation; in emerging markets, the purchase currency may be matched with that of the issuer's debts.

Some contracts only transfer a portion of market risks to the revenue counterparty. For example, 'take and pay' involves a purchaser's agreement to buy a project's output for a set price. However, in this case it has no obligation to purchase the project's output, exposing the project to demand risk. The risk may be partially transferred by including certain minimum purchase quantities. Some transactions use mixed models, contracting a portion of output while selling the surplus to the market.

Regulatory, tariff, and volume risks

Concession/demand-based revenues. Another common revenue agreement involves a public authority awarding a concession/licence or a right to operate certain public infrastructure. Examples include toll roads, bridges, airports, and port facilities. In return for making available the infrastructure, the concessionaire typically has the right to levy tariffs or charges from the infrastructure's users.

While the default risk of a single counterparty is often diversified across many users, projects often rely on sufficient levels of user demand for the infrastructure. This may expose the project to sources of demand fluctuation, including the economic cycle and commodity prices, increasing cash flow volatility.

In addition, tariff setting is often subject to regulation, potentially constraining the project's flexibility in adjusting prices to demand patterns to maximise revenue. Scope considers the tariff-setting procedure, including the clarity of regulations, the scope for regulatory discretion, the administrative mechanism, as well as the regulator's independence, predictability, and track record. Whether the regulatory framework allows for cost recovery and adequate capital returns is also a consideration.

Highest exposure to market risks

Merchant revenues. Some projects do not enter into a long-term revenue agreement but instead sell their output to the market. Market risks that could materially affect a project's revenue stream include changes in prices of its output, competing products, lower user demand within its scope of delivery, and in some cases fluctuations in inflation and foreign exchange rates. The SPV bears all market risks that are not transferred to a revenue counterparty or that are not mitigated. Examples include gas-fired 'peaker' plants

that sell electricity in the wholesale market during peak times at the prevailing market price, or toll-road concessionaires that collect tariffs from users. In the latter example, a project may also be exposed to regulatory risks related to tariff setting, which could hamper its ability to manage or mitigate demand risk by adjusting prices.

Changes in output prices can be a much greater source of revenue risk in certain industries. For example, due to the roll-out of renewables and broader changes in the global energy landscape over the last decade, many conventional power producers have suffered from continued electricity price declines in European wholesale markets combined with significant short-term volatility. Conversely, user charges for public infrastructure such as major airports increased moderately and were significantly less volatile.

Economic fundamentals

Scope considers a project's economic fundamentals and the competitiveness of its output as key drivers of revenue risk and the issuer's overall credit profile. Even if a project benefits from a long-term revenue contract, factors such as long-term changes in the industry, technological shifts, the emergence of substitutes, or infrastructure alternatives may render the project's output uncompetitive and create an incentive for the revenue counterparty to renegotiate, look for contract-outs, or default.

Costs drive competitiveness of output

Cost competitiveness. The competitiveness of a project's output is driven by its cost of production. Lower costs relative to substitute products or competing infrastructure will, all else being equal, protect the project from erosion of demand and discourage new entrants. Conversely, cheaper substitute products or cost-undercutting by competitors may result in lower-than-projected demand and may increase the default risk of a revenue counterparty. Exceptionally low marginal costs may help to protect a project from competition in the short term by maintaining output at lower prices. Scope assesses the sustainability of these benefits in the context of the typical technologies, business cycles and asset lives (and debt tenors) in certain sectors.

Isolation from competitive forces

Barriers to entry. Scope's assessment of a project's economic profile considers entry barriers to the project's market. Tight regulation, high capital intensity, extensive specialist requirements, or the characteristics of a natural monopoly all help to shield a project from competition by new entrants and mitigate demand risk. For example, a major energy transmission asset in a geo-strategically important area would exhibit very high barriers to entry.

Long-term supply and demand

Supply and demand. Another important consideration is the nature of a transaction's product or service, shaping Scope's view on future demand. This includes its essentiality, the extent to which it serves existing needs (as opposed to projections of future needs), and the product's or service's exposure to market cycles. Examples of non-cyclical, essential services that address existing needs (which Scope also expects to continue) include public facilities such as hospitals, schools and prisons.

Future technological disruption may render a project's technology obsolete, its output uncompetitive, or create substitute products. This can lead to an erosion or a shift of demand for the project's output. These risks are typically lower in sectors with relatively long technology cycles such as road and rail infrastructure, or social infrastructure.

In considering demand resilience for the project's output, Scope considers the degree of diversification of a project's user base. A global or inter-regional user base may allow the project to absorb demand shocks in a local market by shifting its sales elsewhere.

Supply/reserve risk

A project's output can rely on the transformation of a key input, such as fuel stock. This is typical in sectors that work with power plants, waste and water facilities, LNG facilities, and industrial processing plants. Projects usually source these inputs through a long-term supply contract with a third party, or in the open market.

Input supply of production factors

Supply contract. Strong supply contracts clearly stipulate the quality, quantity, price, and terms of delivery of the input. Scope analyses the risk of variations in those factors as well as unavailability of key supplies resulting in operating problems or the interruption of revenue streams.

Since a project's supply contract is an offtake contract for the supplier, the contract may be structured in similar ways, including take or pay, tolling, or reserve dedication. The contract's features may expose the issuer to certain risks, particularly the availability in quality and quantity, price, and in some cases fluctuations in inflation or foreign exchange rates. Scope evaluates to what extent the project's supply contract matches its offtake contract, including the contractual terms, and the degree of risk pass-through to the offtaker, including penalties payable to the offtaker if output interruptions occur due to supply unavailability.

Highest exposure to supply risks

Merchant supply risk. Some projects source their key input from the market without having to enter into a long-term supply contract. This is typically the case for widely available, homogenous inputs that exhibit commodity features. Scope considers it important for such projects that a market study confirms the market is liquid and deep, with multiple alternative suppliers and substitute products. Scope's analysis incorporates an assessment of the adequateness of a project's connecting infrastructure.

Reserve studies and supply projections

Reserve risk. In sectors such as renewable energy, the physical delivery of a project's key input (e.g. wind, solar irradiation) cannot be secured contractually. The project relies on availability projections, in which experts consider the history of operating performance if available. Scope considers the quality and reliability of these projections, along with the expert's independence, experience and reputation, as well as the analytical rigour of the study, the reliability of the primary data sources, and historical performance at similar sites.

Some projects transfer or mitigate their resource availability risk by entering into financial agreements such as resource variability swaps or derivative contracts. Scope analyses the effectiveness of the hedge and the credit quality of the hedging provider, among other factors.

Counterparty risk

Revenue and supply counterparties

In projects that rely on a single long-term revenue source or a critical supply contract for cash flow, the default risk of the revenue/supply counterparty is typically a major credit risk driver. In evaluating this risk, Scope assesses the counterparty's financial strength and incentives, track record as well as alternative sources of demand/supply for the project's output.

Financial strength

Scope's assessment of a project's financial strength incorporates ongoing debt servicing ability, financial leverage and repayment profiles, financial flexibility, and exposure to financial counterparties.

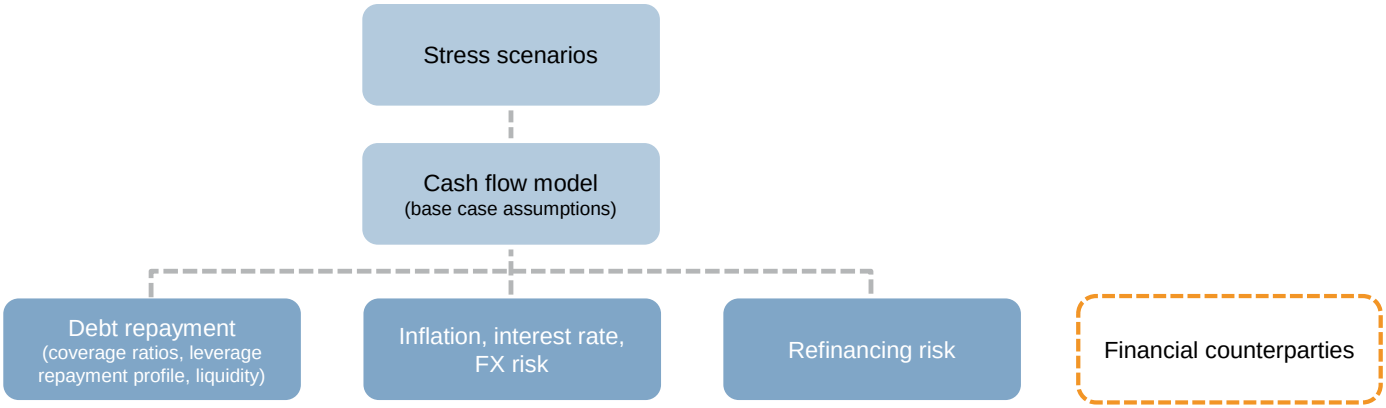
Debt service coverage, leverage, and financial flexibility

Appropriate levels of debt service coverage, leverage, and financial flexibility incorporate the fundamental project characteristics, and the stability and predictability of cash flows.

As a rule, relatively weak fundamental attributes indicate lower debt capacity, and require comparatively stronger financial strength characteristics to protect the SPV's credit quality.

Scope also aims to benchmark projects' key ratios with comparable, rated peers.

Figure 7. Financial strength



Source: Scope Ratings

Debt repayment (coverage ratios and leverage, repayment profile, liquidity)

Key debt service coverage metrics

Debt service coverage ratios. Scope calculates certain key credit metrics to evaluate a project's ability to cover debt service obligations as they come due. These include:

- Debt service coverage ratio (DSCR): cash flow available for debt service divided by interest and principal repayments due
- Interest coverage ratio (ICR): cash flow available for debt service divided by payable interest

Certain coverage metrics may be more relevant in some transactions. For example, the ICR may be useful for analysing an interest-only instrument with a bullet maturity. For amortising instruments, Scope typically relies on the DSCR as it includes debt repayments and therefore better captures the ability to service debt in full and when due.

Key leverage metrics

Leverage. Scope typically calculates leverage metrics using the outstanding balance of the rated instrument plus all debts ranking senior or pari passu to it. These key metrics typically include:

- Loan life coverage ratio (LLCR): the net present value of projected cash flow available for debt service until maturity (discounted at the promised rate) divided by its outstanding balance (considering any debt service reserve account);
- Project life coverage ratio (PLCR): the net present value of projected cash flow available for debt service during the asset's useful life (discounted at the adjusted promised rate) divided by its outstanding balance (considering any debt service reserve account);
- Debt/equity: the outstanding balance against the net present value of projected cash flows during the asset's useful life (discounted at the cost of equity) less the outstanding balance.

Like coverage metrics, Scope may calculate some, all, or none of the above ratios to evaluate a given project's financial leverage. For example, if an amortising instrument provides equal periodical debt service payments, Scope typically focuses on DSCR since LLCR equals average DSCR in this instance.

Amortisation and cash dedication

Debt repayment profile. Scope evaluates a project's repayment profile, including any available cash dedication mechanisms. For example, transactions in some sectors are

sometimes structured as partially amortising with a balloon repayment at maturity. Such structures may include a performance-based cash sweep mechanism that triggers additional repayments if the project underperforms and breaches certain thresholds.

Liquidity. Scope's analyses a transaction's cash reserves, liquidity support facilities, financial covenants, and capex and maintenance flexibility. Liquidity available to absorb potential revenue shortfalls, repairs, unscheduled maintenance, and other contingencies supports a transaction's ability to service its debts in a timely manner.

Reserve accounts and other liquidity sources

Liquidity typically includes a debt service reserve account, letter of credit, or readily available debt service reserve facility. Scope assesses whether the reserve is sized to cover the project's needs, and determines if there is a risk that the liquidity may be unavailable when called upon. Examples include a debt service reserve facility provided by a weak financial institution, or a plan to fund the reserve from cash flow projections that may not materialise.

Financial covenants

Scope considers the transaction's financial covenants, including its headroom over performance thresholds that, if breached, could result in distribution lock-up, early repayment, or impairment of the project's financial flexibility.

Sensitivity to cash flow stress scenarios

When analysing a transaction's cash flow model, as a first step Scope evaluates the reasonableness of the key underlying assumptions. Scope then applies adjustments or assumptions driven by the project's key characteristics.

Modelling assumptions

Scope's modelling assumptions consider key risk areas including the project's contracts, economic fundamentals, legal and financial structure, and key counterparties. Scope typically focuses on weak areas identified in its analysis and apply stress assumptions. Examples include capex increases, delays in project completion, plant unavailability, swings in output prices and volumes, additional O&M requirements, and changes macro variables. Scope may use sector-specific assumptions disclosed in additional documents or may detail its assumptions in its analysis.

Sensitivities and scenario analysis

To supplement Scope's scorecard and cash flow modelling, Scope performs sensitivity tests and scenario analysis. This may involve selecting and stressing the most critical assumptions and modelling the impact on the project's key credit metrics.

Inflation, interest, and foreign exchange risks

Macroeconomic risk factors

Interest rate risk. In many transactions, particularly the private market for project finance loans, debt pays variable interest, exposing the project to fluctuations in the underlying index if unhedged. Scope evaluates the project's hedging programme and assesses the potential impact that changes in benchmark rates may have on coverage ratios. Scope analyses the financial risk exposure to hedging counterparties if applicable.

Inflation risk. Projects may suffer from changes in inflation rates through various channels. For instance, a wind farm may benefit from a fixed, feed-in tariff for each unit of power produced. Because the feed-in tariff is fixed, an inflationary increase in labour and maintenance costs would squeeze cash flows available for debt service. Another example could be a mismatch between indexation clauses in a concessionaire's building contract and the escalation factors on tariffs it may charge its users.

Foreign exchange risk. Swings in foreign exchange rates can affect a project's credit profile, particularly if its revenues and debts are denominated in different currencies. Projects that may be exposed to this risk include emerging-market exporters of a commodity that is traded in a hard currency (e.g. oil and gas) while its debt is denominated in local currency. Foreign exchange risk can be hedged by matching the

currency of a project's debt with that of its revenues, or by entering into derivative contracts.

Refinancing risk

Asset illiquidity

Due to the generally location-bound and illiquid nature of project finance assets, Scope typically views material refinancing needs as a significant credit risk driver. To assess this risk, Scope evaluates the likelihood of failure to refinance by assessing the transaction's debt servicing capacity at the point of refinancing, usually assuming a risk premium on top of the instrument's promised rate, which captures the risk of downturns in the credit cycle.

Cash flow and leverage at the point of refinancing

The project's underlying strength depends on its future cash flows and leverage at the point of refinancing. Additional considerations include the project's remaining useful life, the instrument's payback period if it fails to refinance, its structural features (e.g. cash-sweep mechanisms, headroom under covenants), its security package, and the current/forecasted state of financial markets.

Counterparty risk

Financial counterparties. Project finance transactions normally rely on several financial arrangements in addition to its funding arrangements. These include hedging agreements, payment and custody services, liquidity facilities, letters of credit, performance bonds, guarantees, and insurance products.

Hedging providers

Issuers often seek to hedge macroeconomic risks, particularly for changes in interest rates, foreign exchange rates, inflation, and commodity prices. To transfer the risks, transactions usually enter into derivative contracts with one or more financial institutions.

Financial services providers

Project finance transactions also require calculation, payment, and custody services from financial institutions. Projects also routinely purchase insurance policies to mitigate various political, investment, force majeure, and event risks. While these instruments help to mitigate risks, transactions become exposed to the credit risk of the financial counterparties involved.

Debt providers

Creditors. Many project financing structures, particularly for greenfield projects, provide for staggered drawdowns of capital that is linked to the progress of construction. This may expose creditors to the risk of other investors defaulting on their drawdown commitments. This may include sponsor commitments in projects where equity is contributed pro rata with debt drawdowns, which exposes the transaction to equity contribution risk. Counterparty risks may be mitigated by the sound credit quality of existing capital providers, minimum rating provisions, replacement triggers, or credit enhancement.

Creditors in project finance transactions include bank lenders, institutional investors, export credit agencies, equipment suppliers, and mezzanine lenders, among others.

Sponsors

Experience, track record and importance of the project

Role of the sponsors

Sponsors initiate, develop, and provide equity capital to projects. In many transactions, sponsors also have a key strategic role throughout a project's life by providing construction, operation, or input supply services, or by acting as the primary purchaser of output. Financial sponsors (institutional investors), on the other hand, may provide financial expertise and management skills. Hence, sponsors' quality, technical and financial capabilities, as well as their incentive alignment with creditors are key considerations in Scope's assessment.

Sponsor strength

A sponsor is considered strong if it demonstrates experience in the sector with similar

types and sizes of projects, jurisdictions, technologies, and PPP frameworks (if applicable). Scope also looks for a proven ability to provide technical or operating support if required by the project, as well as relationships with the granting authority and other key counterparties. If sponsors enter into additional agreements with the SPV (e.g. an EPC contract to construct a plant), Scope assesses the arrangements and checks if the terms are set on an arm's length basis.

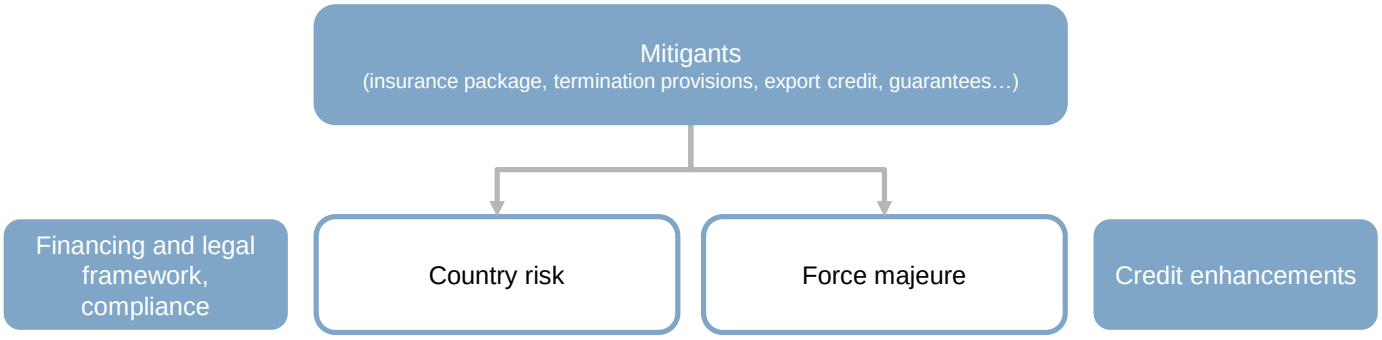
Sponsor incentive alignment with creditors

Scope also considers sponsors' incentives to complete and operate the project at the required standard, including a significant investment of capital and time, the strategic importance for the sponsors' business model and reputation, and a reasonable return on equity. Even though many project financings are structured on a non-recourse basis, strong incentives can increase a sponsor's willingness to protect their investment if needed.

In transactions with multiple sponsors, Scope analyses the SPV's ownership structure, as well as the alignment of incentives between sponsors and creditors. Scope also looks for adequate ownership and change-of-control provisions, particularly when the sponsors' continued active involvement is necessary to build and run the project. Scope views it as credit-positive if consortium members have a proven record of collaboration.

Project structure and other risks

Figure 8. Project structure and other risks



Source: Scope Ratings

Financing and legal framework, compliance

Scope's analysis incorporates an assessment of the transaction's legal and financial structure, including the legal integrity of the contracts, structural features, and security package benefiting creditors.

Bankruptcy remoteness

Bankruptcy remoteness is a key structural feature in project finance and typically involves certain contractual restrictions and obligations, as well as limitations on the number of potential claimants against the SPV. Scope assesses the risk of third parties initiating bankruptcy proceedings against the SPV and the strength of protective elements implemented in the structure. This includes limited-recourse provisions, non-petition language, M&A and corporate activity restrictions, debt limitations, and asset pledges.

Legal integrity of the structure

Scope's analysis also covers the legal integrity of the structure and aims to identify legal weaknesses that could affect the transaction's ability to service debt, or complicate/prevent enforcement action. Important elements include the enforceability and validity of the financing documents, implications of the transaction's governing law, arbitration provisions, and legal framework.

Enforceability of creditors' collateral

Scope evaluates whether the transaction documents provide comfort on the adequacy and enforceability of creditors' collateral, considering legal opinions provided by independent third-party experts. For example, Scope ascertains whether all material

rights, permits, or licenses are pledged and whether such pledges can be enforced without any material impediments (e.g. protracted process, taxes).

Intercreditor agreement

For transactions with multiple classes of debt, Scope assesses the effectiveness of the intercreditor agreement and identify potential ambiguities including governance over voting, security, and enforcement actions.

Scope generally assesses the risks related to unclear or broad language in the transaction documents, including key elements such as creditors' rights against the issuer, the SPV and management, as well as the priority of claims, performance triggers, and events of default.

Country risk

Due to their single-asset, location-bound nature, project finance transactions are often vulnerable to unpredictable shocks and adverse events that could affect operations and result in the project's failure. Hence, country risks form an important part of Scope's analysis, and material risks may affect the credit view even if a project is otherwise solid.

Country risk factors

Scope performs a forward-looking evaluation of trends affecting the transaction's country and industry sector. Important factors that could expose the project to risks associated with its country include:

- clarity and stability of its business environment and legal regime;
- political climate and reliability;
- sovereign default;
- institutional meltdown;
- creditor orientation of its legal system; and
- transfer and convertibility risks.

Unforeseen events related to these factors may prevent a project from operating as intended; interrupt debt service or hamper effective enforcement actions; or destroy, tax, or expropriate creditors' collateral.

Scope believes a sovereign's credit quality is not a good anchor for judging the credit quality of a project. Nevertheless, all projects are affected by sovereign risks around the rule of law, the robustness of the institutional framework, or the free transfer of capital and currency convertibility. In some instances, the financial distress of the sovereign may incentivise it to intervene in the project's affairs, which would have to be covered in the analysis when appropriate.

Force majeure risk

Because projects are often physical assets fixed in a certain location, they are exposed to specific, local conditions and events beyond its control that could disrupt operations and cash flows, and lead to default.

Force majeure and termination provisions

While inherently difficult to predict, project contracts often include force majeure provisions, which seek to define and allocate risks related to extreme events. Typical force majeure events include a major disruption from natural disasters such as earthquakes and floods, collective action, civil unrest, war, terrorism, and changes in law.

Scope assesses the clarity and comprehensiveness of the project's force majeure definitions, with a focus on its obligations, and the termination events of key contracts. In some projects, material risks may be absorbed by sponsors' guarantees. While these guarantees are credit-positive, Scope assesses whether the capacity and incentives of sponsors provide sufficient protection in such an event.

Geographical location and complexity

A project's geographical location and overall complexity are typical indicators for force majeure risk, in Scope's view. The risk is higher in geographically sensitive areas prone to events such as natural disasters, political instability, and regional conflict. The severity of force majeure events is likely to be higher for projects that exhibit tightly linked operations, complex processes, and a high degree of specialisation. Examples include nuclear power plants, chemical plants, and LNG facilities. Force majeure risks are usually lower in simpler projects with less spatial concentration such as onshore wind farms, toll roads, and simple public buildings.

Insurance

Some of the risks are usually covered by insurance. Scope ascertains whether insurance policies protect debt service for the entire period if an insured event were to occur. Widely insurable events include political risk, business interruption, delay in start-up, and property casualty insurance.

Credit enhancements

Third-party credit support

Third parties can provide various forms of credit support to mitigate project-level risks (such as construction risk, ramp-up risk or volume risk), or institutional, currency, sovereign, force majeure and other types of risk. This can take the form of comprehensive risk insurance, sponsor or government guarantees, among others.

Scope evaluates the terms and conditions of available credit enhancements, counterparty risks, and the history of claims/guarantee payments to decide whether to give credit to these instruments in its analysis.

Counterparty risk

Financial and operational exposures to counterparties

Scope analyses counterparty risk at the same time as it analyses the fundamental characteristics of the project. Scope's analysis reflects the credit implications of financial and operational exposure to the different counterparties. The different risk factors' contributions to total loss embed how we expect counterparty risk to affect the credit performance of the project in each of the risk areas considered in our analytical framework.

Legal analysis

Credit implications of legal aspects

Like the treatment of counterparty risk, Scope analyses the credit implications of legal aspects affecting a project at the same time as it analyses the fundamental characteristics of a project and assesses the contributions to total loss of the different risk factors. Scope's analysis generally considers three categories of possible legal risks: i) in relation to the security; ii) in relation to the issuer of the rated debt; and iii) in relation to the transactional parties and documents. Scope reviews legal opinions to gain comfort on the assumptions made regarding relevant legal issues.

A final note on the estimation of losses

Focus on material events

The risk assessment of the project requires the formation of an opinion on the probability of various credit impairment events for the investor along with their severity. Scope believes a detailed estimation of losses is only necessary for three credit impairment events with a high probability of occurrence or expected severity, given the fact that it is very difficult in practice to calculate precise levels of recovery for every scenario. The recovery for all other credit impairment events is less critical and can be estimated based on sector, jurisdiction, project stage and structure, incorporating the analysis of the instrument's seniority and characteristics (including amortisation profile and the time value of money at the rate promised to the investor) and recovery strength as described below.

Going concern assumption

Generally, Scope believes the soundest approach for evaluating the severity of a given project outcome is to assume lenders would rather hold distressed assets (i.e. the project becomes a going concern) than immediately dispose of them. The approach should

instead consider liquidation recovery calculation in the rare cases where this assumption does not hold.

Discounted cash flow valuation

The use of discounted cash flow valuation is the adequate method to calculate losses where the assumption of going concern applies. This method considers future cash flows available to the investor until either the maturity of the exposure being analysed or the end of the project's economic life. From the point of view of credit analysis, these cash flows should be stressed based on the conditions implied by the outcome under analysis (e.g. a default scenario following a counterparty failure) and discounted at the rate promised to the investor.

Liquidation assumption

Under a liquidation assumption, by contrast, the analyst would need to establish the market value under stressed conditions, which may deviate greatly from the value implicit in an independent valuation report or other available information.

As a particular case, the assessment of losses for projects such as PPP or PFI should consider the termination provisions embedded in the project agreement.

Recovery risk factors

Project value, the market value of the assets, or termination payments result in different degrees of severity for the investor. This depends on important elements such as the instrument's seniority and sector, project security, collateral enforceability including recovery costs and administration fees, and any other project-specific considerations (e.g. the presence of multilateral lenders, certain types of insurance provisions or the fundamental economic value of the project). Depending on the event under consideration, it may be appropriate to consider haircuts or enhancements to recovery values.

These analytical considerations show where Scope can make a difference in infrastructure and project finance credit analysis. Scope is a new player in Europe which brings significant market expertise in capital markets since 2002, notably in asset-based finance.

Scope Ratings AG

Headquarters Berlin
Lennéstraße 5
D-10785 Berlin

Phone +49 30 27891 0

Frankfurt am Main
Neue Mainzer Straße 66-68
D-60311 Frankfurt am Main

Phone +49 69 66 77 389-0

Paris
33 rue La Fayette
F-75009 Paris

Phone +33 1 82885557

London
Suite 301
2 Angel Square
London EC1V 1NY

Phone +44 203-457 0 4444

Madrid
Paseo de la Castellana 95
Edificio Torre Europa
E-28046 Madrid

Phone +34 914 186 973

Milan
Via Paleocapa 7
IT-20121 Milan

Phone +39 02 30315 814

Oslo
Haakon VII's gate 6
N-0161 Oslo

Phone +47 21 62 31 42

info@scoperatings.com
www.scoperatings.com

Disclaimer