January 2026

Project finance basics for International Arbitration practitioners

Executive summary

Project finance relies on non-recourse lending to a special-purpose vehicle (SPV) whose only assets and cashflows are generally derived from a single project. Project finance structures are typically highly leveraged and governed by strict contractual controls and a prioritized cashflow waterfall that pays operating costs, taxes, reserves, and debt service before equity distributions. Because lenders look solely to project revenues for repayment, even modest operational or regulatory disruptions can trigger covenant breaches, cash traps, or lender step-in, often eliminating equity value even when the project remains operable. Sector-specific risks, such as dependence on long-term PPAs in renewables or concession regimes and export conditions in mining, directly influence revenue stability and financing outcomes.

Disputes in project-financed projects frequently stem from the sector's structural features: high leverage, strict contractual frameworks, and dependence on stable operating conditions and counterparty performance. Governmental actions, delays in permits or concessions, counterparty failures, and operational disruptions can quickly erode revenues, undermine bankability, and trigger defaults. Because project financing requires numerous commitments to align at specific points in time, many disputes center on whether a project was realistically financeable, whether risks were allocated as intended, and how disruptions affected the project's ability to meet its obligations. Once distress emerges, lender protections such as step-in rights, cure periods, waivers, and restructuring options strongly influence both the evolution of the dispute and the assessment of losses.

This paper first outlines the core mechanics of project finance, including the SPV structure, contractual framework, and cashflow waterfall. It then illustrates how these features operate in renewable energy and mining projects, where PPAs, concession regimes, and offtake arrangements shape risk and bankability. The paper next reviews common dispute scenarios and the financial and contractual drivers behind them and concludes with an explanation of how project finance structures affect damages analysis, including the role of lender rights, covenant triggers, and cashflow-level modeling.

Based on the analysis in this paper, we note the following key takeaways:

- Non-recourse lending makes lender protection central and places sponsors last in payment priority.
- Cashflow waterfalls and covenants shape financial outcomes and could wipe out equity when disruptions occur.
- Sector-specific structures (PPAs, concessions, offtakes) heavily influence risk and bankability.
- Common disputes stem from financeability failures, government actions, counterparty issues, and operational disruptions.
- Lender enforcement tools (step-in, waivers, restructuring) materially affect both project outcomes and damages.
- Damage quantification must incorporate waterfall constraints and realistic mitigation options.

What is project finance and why is it important in arbitration?

Project finance is a method of financing large-scale projects off the balance sheet of the developer/owner (typically referred to as the Sponsor). Two key aspects of project finance are: (i) the use of a special purpose vehicle (SPV) company which owns the project and borrows money to help finance its construction and operations and (ii) that the liabilities of the SPV (e.g. project loans or bonds) are non-recourse to the Sponsor and other equity owners.

In a project finance structure, banks, or other debt investors, are lending to an SPV which typically has no other assets and only generates value from the future cashflows of the project. In a fully non-recourse structure, if the project SPV cannot pay back loans or meet other liabilities, lenders, or other creditors have no ability to access the assets of the Sponsor or any other entity to secure payment.

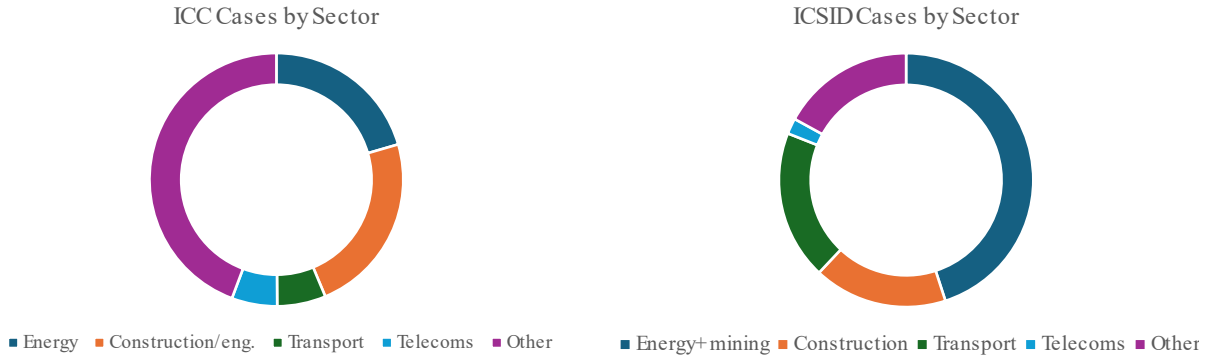
Project finance is used globally to finance a wide range of projects, particularly within infrastructure sectors such as energy, telecommunications, port facilities, and transportation. It is also widely used in the mining industry. A rapidly growing application for project finance, especially in North America, has been in the construction of new data centres and related digital infrastructure facilities. According to IJGlobal, global project finance transactions reached almost $800 billion in 2024, with energy, natural resources, transportation, and other infrastructure sectors dominating.

The sectors where project finance is frequently used closely correspond with those most frequently involved in international arbitration disputes, as shown in Figure 1 below. The largest sectors for commercial arbitration under ICC rules are in energy, construction, engineering, and transportation.[1] All of these sectors often rely on project and related off-balance sheet financing

[1] Data from International Chamber of Commerce, *ICC Dispute Resolution Statistics: 2024*, 24 June 2025. Available from https://iccwbo.org/news-publications/news/icc-dispute-resolution-statistics-2024/

structures. Similarly, in 2024 energy and mining-related matters made up almost half of ICSID cases, with construction and transportation making up much of the remainder.[2]

Figure 1: ICC and ICSID cases by sector (2024)



Furthermore, because project financing is typically highly leveraged and rigorously controlled distributions, even a modest operational impairment can trigger contractual provisions that divert cash to reserves and debt service. This can turn what could be a manageable underperformance at the project level into a wipe out of the project's equity, even if the asset continues operating. The strict contractual restrictions on project cashflows (discussed in more detail below) and high degrees of leverage tend to create a "binary" outcome for the project Sponsor, in which any adverse impact on project operations has an amplified impact on equity returns.

The sheer complexity of project finance contracts can also be a source of disputes among the many parties participating in a large project. Risk allocations are complex and may not have been fully anticipated by each of the parties. This, too, can lead to disputes if projects face unanticipated circumstances.

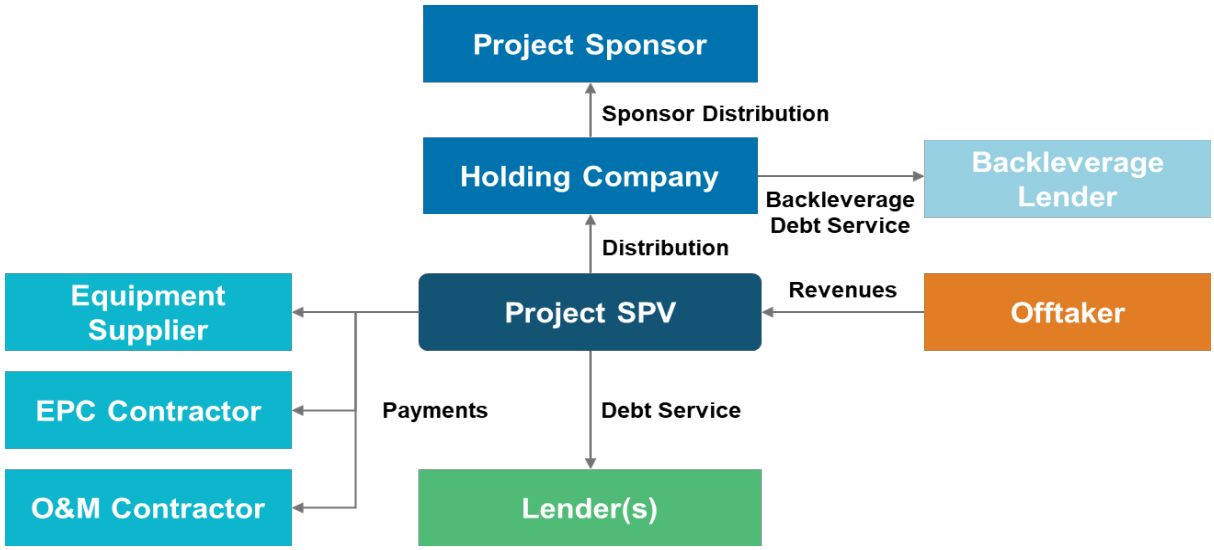
Basic project finance structure

At the heart of a project finance structure sits the SPV, which, in many countries, is created as a limited liability company (LLC). The SPV owns and operates the project and borrows funds from the Lenders necessary to build and operate the project, in conjunction with equity investments made by the Sponsor (often the project developer and owner) and other investors (if any).[3] The basic structure for a project financing is shown in Figure 2 below.

[2] Data from ICSID Annual Report 2024, available from https://icsid.worldbank.org/sites/default/files/publications/ICSID-AR2024-WEB.pdf

[3] For more information on basic project finance structures, see E.R. Yescombe, *Principles of Project Finance,* Academic Press, 2nd ed. 2013; S. Raikar and S. Adamson, *Renewable Energy Finance: Theory and Practice,* Academic Press, 2nd ed. 2024; B. Esty, *Modern Project Finance: Casebook*, Wiley 2003.

Figure 2: Simplified illustration of a project finance structure and key cashflows



Unlike a typical company, the SPV is very tightly controlled, and provisions in the governing contracts control what it can and cannot do. The SPV is limited to owning and operating the project and often has no employees of its own. Its fundamental role is to operate the project to produce cashflows which can then be distributed to the lenders and Sponsor/equity owners in specific and defined ways. The financing parties, such as the Sponsor and the Lenders, typically have defined quite clearly what the SPV can and cannot do, and what happens to any cash and assets controlled by the SPV.

As illustrated in Figure 2, the SPV and the Sponsor are not the only actors on the project finance stage. Other key participants include:

- **Lenders:** The project finance structure often underlies projects with a high level of debt. This is often arranged by the bank (the lead arranger) but with much of the risk often transferred to other debt investors through syndication in a project finance loan. Alternatively, in some financings debt will be obtained through the sale of project finance bonds, which may or may not be rated by credit rating agencies. In either case, as lenders collectively put up much of the money to build the project, much of the project finance structure is designed to protect lender interests. Key rights associated with the project (operating licenses, offtake agreements, leases, etc.) will generally be held at the SPV level so that lenders can easily step-in if needed in case of a default.

- **Offtaker or other counterparty:** When lending to the SPV without its own assets or other collateral, lenders generally want assurance that cashflows will be steady enough to ensure debt service payments (interest and scheduled repayment of loan principal). This requires a customer for the project's output or services with enough resources to be creditworthy. For a power generation project, for example, the offtaker could be a utility purchasing the power under a long-term power purchase agreement (PPA) at a fixed or indexed price. For a mining project, the offtaker could be a purchaser for the ore produced by a project-financed mine complex. In any case, it is generally critical that the resulting prices and revenues be stable enough to ensure debt service requirements can be met.

- **Contractors:** The SPV owns and operates the project legally but typically does not have the staff and resources to operate a facility itself. Instead, the SPV contracts outside firms such as engineering, procurement and construction (EPC) contractors to build the project, equipment vendors (e.g. solar panel manufacturers for a solar PV project), and an operations and maintenance (O&M) contractor to run and maintain it. The O&M contractor may be an independent firm or sometimes is an affiliate of the project Sponsor. Given the reliance on project revenues to repay debts, the experience (and oftentimes warranties) of equipment suppliers, EPC, and O&M contractors may be scrutinized.

- **Other actors:** There are generally a host of other parties directly or indirectly involved in a project financing not illustrated in the figure above. These may include financial institutions which act as agents and control the cash assets and collateral of the SPV under a specific agency agreement. Government agencies and government-owned entities may also play a role in many financings in some fashion, through the granting of licenses to build and operate a project, royalty agreements in mining and oil and gas projects, or as direct counterparties such as offtakers. On the Lender side, some form of credit enhancement or sovereign guarantees (often through multilateral agencies or government export agencies) may also exist.

In some situations, the SPV will not be owned directly by the Sponsor or other equity investors but may be owned by an intermediate holding company (HoldCo). In this case, there may also be debt at the HoldCo level (known as “backleverage”) with its own financing documents and restrictions.

Project cashflows – follow the money

One way to gain insight into how a project finance structure works is to follow the cashflows, which are illustrated by the arrows in Figure 2. When the project closes, the Sponsor and other equity investors will invest equity capital, typically according to the provisions of a pre-negotiated equity contribution agreement. The lenders will invest debt capital, subject to the terms of the financing agreements. During the construction phase of a project, construction loans may be employed, whether from the same set of lenders or others. These will then be replaced or rolled over into longer-term loans for the operational phase of the project.

During the construction phase, payments must be made to the EPC contractor(s) and equipment suppliers (e.g., to turbine manufacturers for a wind farm project). Payments to the O&M contractor are also required.

Once commercial operations have started, cashflows from the project flow to the SPV which uses these in predefined and agreed ways. Operating revenues minus operating expenses and cash taxes are often designated as Cash Flow Available for Debt Service (CFADS). In project finance, it is common to consider a “waterfall” of cashflows, in which cash is distributed in order of priority.

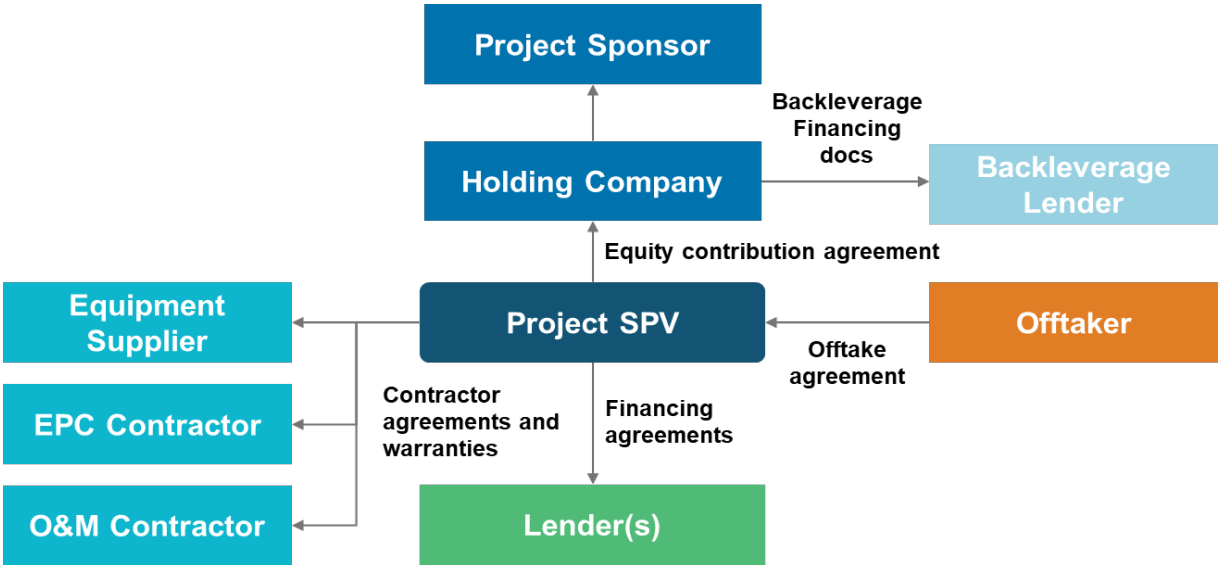
In simplified terms, the waterfall may consist of payments to Agents (Administrative, Collateral, and Depositary Agents, for example), debt service (interest and amortization), funding of reserve accounts (such as debt service reserves), and any mandatory prepayments for cash traps or sweeps. Sponsors are typically at the bottom of the waterfall of distributions from the SPV. Significant variation can occur in the details, but the basic concepts are generally the same across project financings.

Project finance agreements

Another way to look at a project financing is as a nexus of contractual relationships, which are carefully negotiated between the various parties so that the allocation of risks is acceptable to the required parties at the table. Drawing on the previous figure,

Figure 3 provides a simplified overview of some of the essential contractual relationships between the key parties involved in a project financing.

Figure 3: Examples of project finance agreements



As Lenders can only be repaid from project revenues in a full-recourse structure, the project agreements are typically designed to give them the ability to step in for the project owners in case of a project default. In standard practice, all important rights necessary for the future operation of the project (land leases, concession agreements, O&M agreements etc.) must be held at the SPV level and be available to the lenders (and/or other secured parties) so that project operations (and future revenues) can continue for debt service.

Project finance contracts, while containing common elements, are highly complex and heavily negotiated. It is not uncommon for the full set of project finance documents in a large deal to run thousands of pages, between numerous parties. In the arbitration context, it is often critical to understand how all of these complex arrangements work together to allocate risks and make financings work, which may require a holistic view of the entire deal structure.

Example project finance agreements by project type

In this section we provide a couple examples of project finance arrangements (and associated agreements) by type of project. Specifically, we detail a renewable power project underpinned by a PPA and a mining project with a concession agreement and long-term offtake agreement in place.

Wind or solar project with long-term PPA

A typical wind or solar project is owned by an SPV whose primary revenue source is a long-term power purchase agreement (PPA) with a utility or other creditworthy offtaker. The PPA provides a contracted price (often fixed or indexed) and an availability or delivery framework that lenders underwrite as the project's core cashflow engine.

Broadly speaking, much of the construction risk is allocated to an EPC contractor and operating risks are managed through an O&M agreement. The lenders take security over the SPV's shares and project accounts and require an agreement that routes all project revenues into controlled accounts and distributes them through a waterfall (operating costs, taxes, reserves, debt service, and only then equity). This structure typically allows lenders to cure defaults or step in if the SPV defaults through issues with the PPA or other agreements.

Mining project with concession agreement

A mining project SPV usually combines (i) a concession or license granted by the State, (ii) a long-term offtake agreement (or streaming/royalty financing) that underpins revenue certainty, and (iii) a construction and commissioning program with material completion and performance risk. Lenders will carefully scrutinize the title, permitting, the project's environmental and social compliance, and the durability of the concession regime (as regulatory interference can directly affect operations and the ability to export).

The offtake arrangement can function almost like a revenue floor but also introduces potential for disputes over pricing formulas, quality specifications, and delivery shortfalls. The bankability of the package frequently depends on stabilization protections, on credible contingency planning for operational disruptions, on commodity price volatility, political risk events, and others.

Common types of project finance disputes

A significant portion of project finance investments are cross-border transactions, many of which are subject to arbitration provisions. Project finance-related issues are common in both commercial arbitration and investor-state disputes. In this section, we highlight several disputes where project finance issues played a critical role.

Ability to finance

A fairly common dispute arises when a project developer proposes and develops a project in a country only to have the project stymied by governmental action or inaction. This may include failure or delays in issuing permits or concessions, suspension of operating licenses, or imposition of new environmental regulations. Similar issues may arise in commercial arbitration, related to the actions (or lack thereof) of offtakers or other counterparties to a deal.

Frequently the project developer, especially in developing countries, lacks the investment capital to build the project itself, and relies on external project finance or other forms of related non-recourse finance (such as vendor financing). In evaluating such claims, a key issue in assessing quantum may be "How likely was it that the project could have been financed and gone ahead anyway?"

To assess these types of claims, and associated quantum of damages, requires a careful understanding of the project economics and project finance practice. For example:

- Was there a secure offtake agreement with a counterparty that lenders would find creditworthy and credible?
- Were equipment and other key inputs (such as land, fuel, mineral resources) available, contracted or contractable and well-documented?
- Did the sponsor or other investors have access to equity needed under a contribution agreement?

By considering each of the required elements of a project finance structure, the expert can evaluate the likelihood of success and develop a quantum model consistent with project expenditures and/or future cashflows.

Separately, the concept of bankability, or financeability, is often fundamental to a project financing and generally underpins liability and quantum. Bankability is not limited to whether a loan could have been obtained. Instead, it is an analysis of an ecosystem of commitments, approvals, and conditions that must align at a particular moment in time. For example, for a renewable energy project, bankability may depend on an executed offtake agreement, site permits, transmission interconnection rights, and other agreements all being available within a limited window of time.

Tribunals may be asked to decide whether, absent the alleged breach, the project realistically would have achieved financial close on market terms. That inquiry typically relies on contemporaneous evidence such as term sheets, lender credit approvals, independent engineer reports, model audits, permit status, and satisfaction of conditions precedent.

Bankability can therefore operate as a threshold: if the record shows that debt would not have closed (or would have closed only on materially different terms), causation and damages analyses often collapse or must be reframed around a smaller, more realistic “but-for” case for the project.

Solar PV project financing termination

In an ICC matter in Asia, a PPA for a new solar PV generation facility could be terminated if the financing for the project had not closed by a specific date defined in the PPA. The Claimant argued that development of the PV project had been slowed by a force majeure (FM) event outside of its control. The Respondent, a state-controlled utility demonstrated that the purported FM event occurred only a short period before the required closing date for the project financing, and that the Claimant was not close to having a financeable project at that time, as the Claimant did not have complete site control, secure equipment supplies, and firm commitments from banks. Therefore, even had this FM event existed, it was not realistic that the Claimant could have advanced the project to the necessary stage by the required closing date. Based on the prevailing fact set, the tribunal was asked to rule whether the Respondent was within its rights to terminate the PPA.

Risk allocation

Given the basic need for projects to cover operating costs and repay debts over long periods, the negotiation of the documents and the resulting allocation of risks between the Sponsor, Lenders, and other parties is typically lengthy and complex. The financing and other documentation will need to specify, to the extent possible, how risks will be allocated and managed, as for most capital-intensive projects many costs are sunk upfront. In some situations, parties will have step-in and/or cure rights to prevent projects from defaulting if it is in their interest to do so.

Consider, as an example, an extended outage in a mining project due to technical reasons, resulting in lost operating revenues and increased maintenance costs. In this situation, the SPV's cash flows may be impacted, potentially constituting an event of default under the project documents. In some cases, offtake agreements may also be terminable by the offtake counterparty after a sufficient period of non-performance, which may bankrupt a project.

This situation can give way to disputes over the performance of equipment and contractors, and whether guarantees or warranties are sufficient to protect the project SPV from the loss of revenues and/or increased operating costs.

If technical performance is not adequately protected by warranties the project could default, potentially leading to a loss of all Sponsor equity in the project. In this case, lenders would likely step in to maximize debt recovery. If possible in this situation, it may be advantageous for a Sponsor to exercise cure rights and make additional equity injections into the SPV to preserve debt service and avoid a default and loss of control.

Mining project revenue shortfalls from export restrictions

Due to export restrictions affecting a mining project, the project's revenues fell below the levels required by the financing, which triggered a lock-up of cash and mandatory payments to lenders before any distributions could be made to equity. When the problem was not resolved within the time allowed under the loan documents, lenders declared a default and exercised step-in rights, preserving the concession/offtake and operating contracts but effectively wiping out equity. The arbitration was triggered shortly thereafter, when the sponsor commenced proceedings after the enforcement process crystallized the loss and the parties failed to resolve responsibility for the default and its consequences. The tribunal was then asked to decide causation (what drove the default) and mitigation (whether a waiver, restructuring, or controlled transfer was realistically available, and on what terms).

Project finance structure and its effect on the quantum of damages

The structured nature of a project financing may alter the likelihood of a dispute materializing and influences the quantum of damages should a dispute arise. This section analyses the impact of the project finance structure on the quantification of damages.

The waterfall as a constraint on damages

The waterfall of cash flows must be considered when assessing damages in a dispute concerning a project financed asset. Even if an equity claimant demonstrates that a particular measure diminished project value or reduced cash generation, the project finance cashflow waterfall may still limit the amount that equity could have received in the relevant "but-for" or counterfactual case in a damages analysis. Project finance is designed to prioritize debt service, reserves, and mandatory payments ahead of shareholder distributions. As a result, a damages claim framed as "lost profits" must incorporate the fact that cash may not be freely distributable, and that various cashflow and reserve triggers would happen before a project becomes insolvent.

Therefore, the damages model may need to consider items beyond lost project revenues, taking account of when, if ever, equity would have received incremental distributions under the governing waterfall and covenant regime. Therefore, experts and tribunals may need to model cash at the account level to distinguish project-level impairment from sponsor-level foregone distributions, and to avoid overcompensating for value that the waterfall retained for lenders.

Lender rights and step-in: Effects on loss

Because lenders are remunerated from project cashflows, project finance documents often include events of default, cure periods, and step-in rights that give options to lenders in case of project distress. These contractual options can create different outcomes for equity holders, impact equity valuation, and potentially affect the quantum of damages in a dispute. A disruption or breach that begins as a technical or regulatory issue may cascade into covenant breaches, acceleration risk, or enforcement that wipe out the Sponsor's equity value even if the asset remains operable.

Lender enforcement and step-in: Effects on mitigation

Lenders may have contractual tools in some circumstances to preserve operations, restructure terms, waive breaches, or transfer the project to a new owner/operator. Parties may therefore dispute not only what caused distress but also what was realistically achievable through other paths (e.g., waivers, cures, step-in, restructuring, controlled sale). Each of these factors can materially affect the timing, magnitude, and valuation of loss.

About the Authors

Seabron Adamson is a vice president in CRA's Energy Practice, based in London. He has extensive experience as a liability and quantum expert in international arbitration, having acted as an expert in ICC, ICDR, UNCITRAL, CRCICA, NAFTA, LCIA and *ad hoc* arbitrations in the energy and related infrastructure sectors. He has extensive commercial experience in project finance, having worked extensively with project sponsors, investors and lenders, especially in the power and natural gas industries. He is the co-author of the textbook *Renewable Energy Finance: Theory and Practice* (2nd edition, 2024) published by the Academic Press, which describes the application of project finance structures to renewable energy projects around the world. He formerly taught at Tulane University and Boston College and is currently a Visiting Research Fellow at the Judge Business School at the University of Cambridge

Dr. Tiago Duarte-Silva is a vice president in CRA's Finance Practice, based in Boston and London. He is an experienced testifying expert that combines economics, finance, and accounting expertise with market experience in M&A, public equity offerings, and other corporate transactions. He has been retained in 175 disputes across more than 50 countries and has been cross-examined live over 25 times across depositions, hearings, and trials. His written and oral opinions have been provided in litigation in the US (federal and state courts including Delaware Court of Chancery), Australia, Brazil, and Portugal, in domestic and international arbitrations (e.g., ICSID, PCA, ICC, LCIA, SIAC, HKIAC, SCC, JAMS, AAA, UNCITRAL), and before the US Department of Commerce.

About CRA's International Arbitration Group

Our International Arbitration Group combines finance and quantum expertise with industry expertise from energy, oil and gas, metals and materials, pharmaceuticals and life sciences, banking, financial services, and various other industries to offer a one-stop solution for clients in disputes that might otherwise require several firms. We have been engaged in some of the most complex and high-profile disputes of recent years. To learn more, visit **www.crai.com/ia**.

Contacts

Seabron Adamson
Vice President
London
+44-(0)20-7959-1506
sadamson@crai.com

Tiago Duarte-Silva
Vice President
Boston, London
+1-617-425-3128
+44-20-7664-3655
tduarte@crai.com