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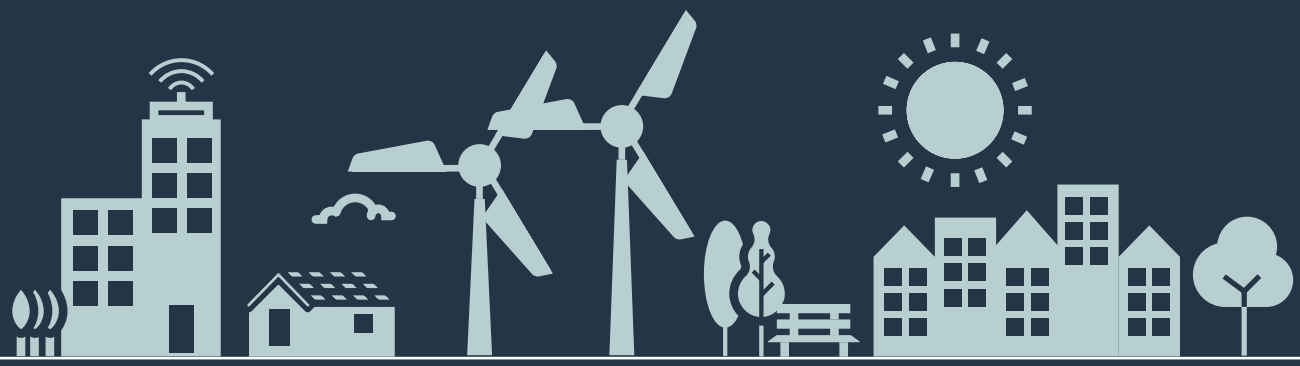
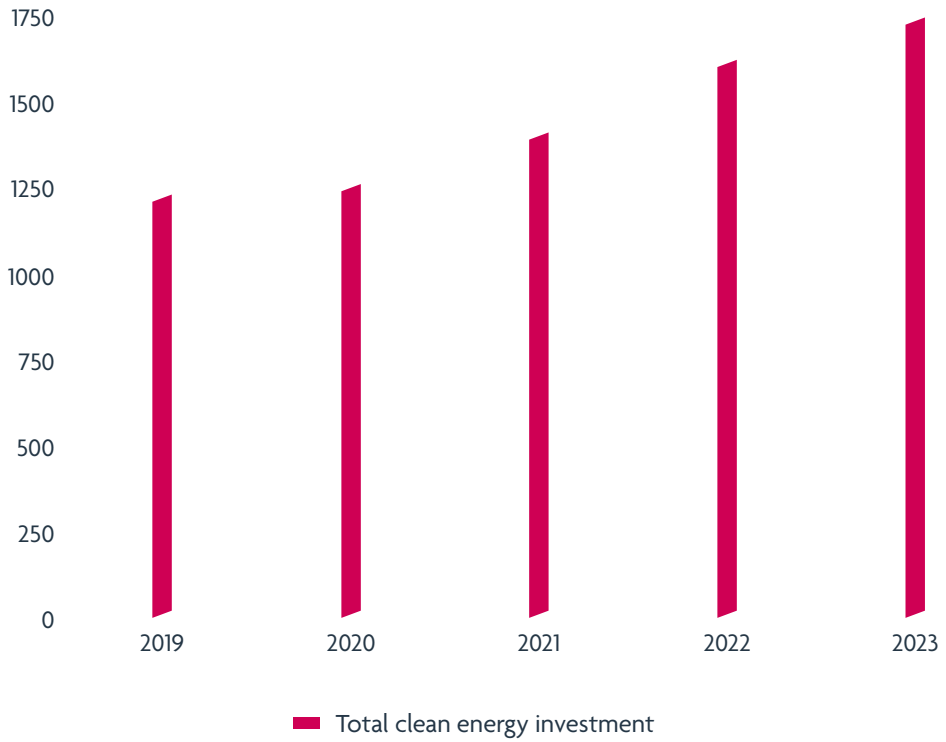


Securing Bankable Construction Delivery Terms for Energy Transition Projects

Rapid deployment of new technology is required to achieve ambitious greenhouse gas emissions reduction targets. The scope and diversity of deployment required will see participation by new market entrants and a likely reliance on project finance funding solutions.

Projects deploying these technologies in areas such as green hydrogen, carbon capture, utilization and storage (CCUS), sustainable aviation fuel and the battery value chain[1] are likely to be complex in nature. To manage this complexity and to position the project for success, meticulous planning will be required on all aspects of project execution. A lack of appropriate and informed planning early in the project development cycle (and generally) may have unexpected consequences that later constrain decision making or even lead to an expensive project failure.

Investment in the Energy Transition From 2019-2023 ($ Billion)



Source: IEA

In this article, we outline the challenges in delivering new technologies at scale under a conventional project finance construction delivery solution. We go on to explain how, with appropriate planning early in the project development cycle, the conventional project finance construction delivery solution can be adapted to secure debt funding and to enhance deliverability and the overall prospects of project success.

The issues outlined in this article are high level in nature and are presented to summarize key aspects of a wider initiative that we have been working on with our clients and various stakeholders in the energy transition sectors.

Technology Licensing

We refer generically to license terms in this article but note that these terms will typically incorporate equipment supply terms, installation, commissioning and operational support services and a range of technology specific product, performance and availability warranties.

License terms for mature technologies are not typically open to negotiation. There is, however, a need for flexibility in the context of new technologies that are unproven at scale. This is required to recognize that (i) debt funding for these technologies is being required at an earlier stage in their maturity than is typical (and this requires some concessions); and (ii) if the licensor wants its technology to be commercialized, projects employing it need to be successfully delivered and technology providers need to play their part.

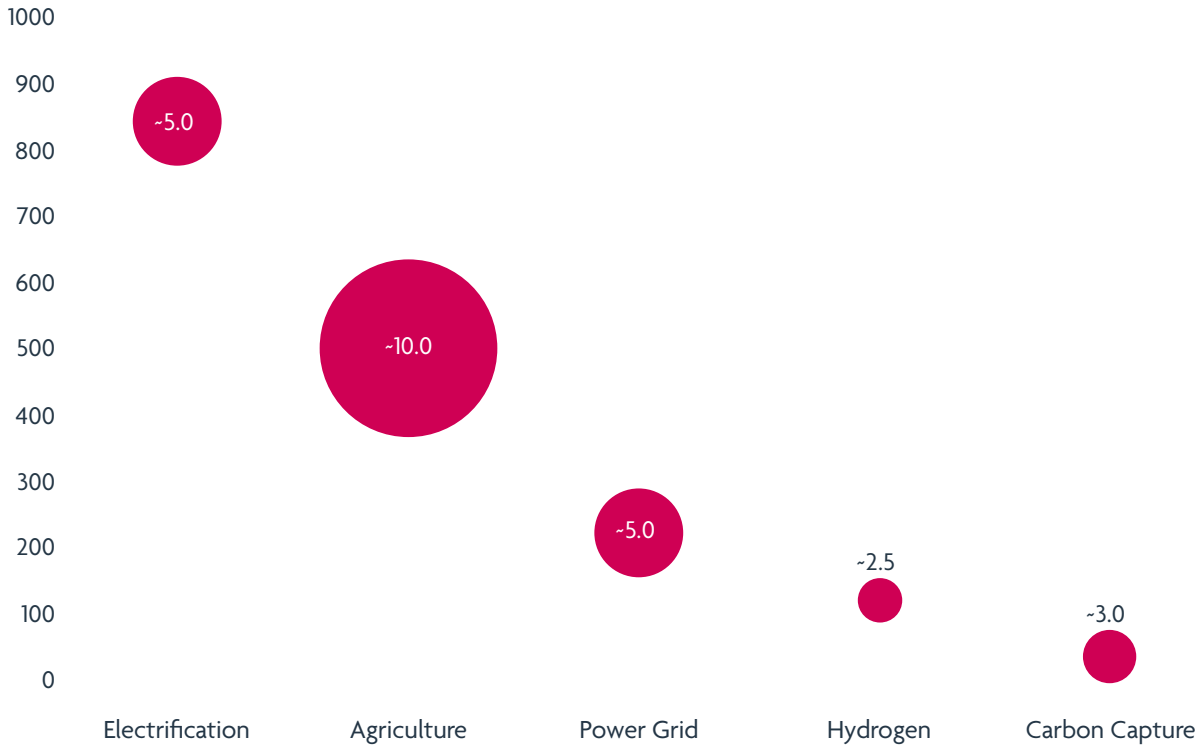
The focus of the negotiation should be on matters that will enhance the deliverability of the technology and address likely requirements of debt funders. It will be important for developers to ensure that technology license terms reflect likely future requirements to avoid the need for renegotiation later, when the developer's bargaining position may be less strong.

A key requirement for the developer should be an enhanced information sharing regime. In order for the primary construction delivery contractor to engage proactively in the management of technology integration risk, it must be able to interrogate underlying data and source code information, to enhance the opportunity for design optimization and innovation. Without access to this information, there is unlikely to be any meaningful bridging of the technology interface described below. Appropriate controls can be included with regard to any such information sharing to protect the licensor, and in return for this enhanced disclosure, the technology provider may be entitled to exclusivity for future developments or an equity share in the project.

It will be important for developers to ensure that technology license terms reflect likely future requirements to avoid the need for renegotiation later.

In the context of a project finance transaction, it is unlikely that the original license will be held in the name of the eventual project company, as this will only usually be incorporated closer to financial close. The license must therefore be readily transferable to the project company in order for debt funders to take security over the license terms—which will be a requirement. In all cases, the license terms must set out the basis on which the licensor will be required to coordinate and cooperate with other project stakeholders at the various stages of the project development cycle. This will need to be carefully plotted out to contemplate the various likely project delivery solutions being considered by the developer.

Annual Investment in Energy Transition Technology by 2025 ($ Billions) and Impact on CO^2 Emissions



Source: McKinsey & Co

Debt funders will seek confirmation that the terms afford all rights likely to be required for the project. This will also include rights to technology improvements, design development, commissioning support and certain specified technical support services. Debt funders will also require assurances that the technology provider owns the rights it is purporting to grant under the license terms. This is typically achieved through diligence and/or the provision of legal opinions. To the extent that any source code data is not shared under the terms of the license, debt funders may require this to be held in escrow such that it can be accessed by the project parties, should the technology provider become insolvent. These requirements should be articulated and agreed early in the project development cycle to avoid surprises later.

Debt funders will expect to see very narrow termination rights (often limited to insolvency and material and persistent non-payment above agreed thresholds). In any event, debt funders will require a direct agreement with the licensor limiting licensor 'walk-away' rights. It is important to recognize that debt funders will require the license terms to be ring fenced from the risk of cross default under other projects—so it is likely that a standalone license for each project may be required.

The royalty/payment structure should be less controversial, provided it is aligned with the equity base case financial model assumptions and there is protection against any material downside risk (e.g. avoiding unmanageable minimum annual royalty payments, particularly during any project optimization period).

The terms of any specification or performance warranty will need to be aligned with the key project design assumptions, the equity base case model assumptions, the feedstock and offtake strategy, and the terms of any regulatory controls and permitting requirements. The license terms will need to be drafted on the basis that these requirements may not be fully understood at the date of license execution, but likely requirements should be capable of articulation at this stage with the assistance of adviser support and diligence. The extent to which these obligations can be managed under the wider primary construction delivery contractor liability regime will be important given that the technology licensor is unlikely to be offering performance security and will not typically have the balance sheet strength or the appetite to offer a liability regime to stand behind any such specification or performance shortfall. What is required is a mindset change, under which all parties engage with technology integration risk from project inception and establish ways in which it can be managed in a manner that is likely to be acceptable to all project stakeholders and which supports project economics.

Antitrust advice should be obtained to the extent that the license terms could be seen to prevent, distort or restrict competition or trade. This advice will need to be provided beyond the domestic context if the offtake product from the project is likely to be exported.

Construction Delivery

Project finance lenders will expect to see one financially robust and highly experienced contractor assuming full risk in delivery of all aspects of project design, construction and commissioning, on time, on budget and to a required performance and technical specification. They will also expect to see the satisfaction of these key requirements being underwritten with a market standard security package.

Whilst we have seen disaggregated delivery models in areas such as offshore wind, it is fair to say that the drivers for this are linked to the size of the projects and the range of different disciplines involved, not technology risk. In any event, these projects typically operate with large levels of contingent funding and therefore a perception from debt funders that the disaggregation risk (and any new turbine technology risk) is manageable. This can be contrasted with projects of the type we are considering here where technology integration risk is a central concern and the project models are unlikely to support large levels of contingency.

Candidates for the primary construction delivery contractor role on projects of the nature considered here are unlikely to be willing to underwrite the delivery of new technology that has not been proven at scale. This will therefore create a technology interface and a disaggregated construction delivery structure, contrary to the position expected by debt funders.

Project finance lenders will expect to see one financially robust and highly experienced contractor assuming full risk in project delivery.

The divergence of positions here needs to be understood and the issue resolved if project finance funding solutions are to be deployed for the rollout of new technologies at scale.

The developer may see full equity funding as an alternative option for an initial project on the basis that subsequent projects can then be rolled out under a project finance solution once there is proof of concept. Unfortunately, our experience is that a single successful project using the technology without long-term operating data will be insufficient to convince project finance lenders that their standard project structuring requirements will not be needed. Where any equity financing is provided on the assumption of a subsequent project finance rollout of multiple projects, it will be necessary to understand how this issue will be addressed at the very outset.

We have set out below in very high-level terms how we would adapt the conventional turnkey engineering, procurement and construction (EPC) approach to project finance contracting to achieve a bankable solution that is likely to be acceptable to the contracting community.

The approach will facilitate optimization and innovation in design development and implementation by the primary construction delivery contractor over an extended pre-construction phase and outside of the constraints of a fixed price and program. The approach will help to bridge the technology interface and limit disaggregation risk and, on the assumption that the contractor is highly experienced in delivering projects of this nature,[2] the approach will enhance deliverability and the overall prospects of project success.

1

Front End Engineering Design (FEED)

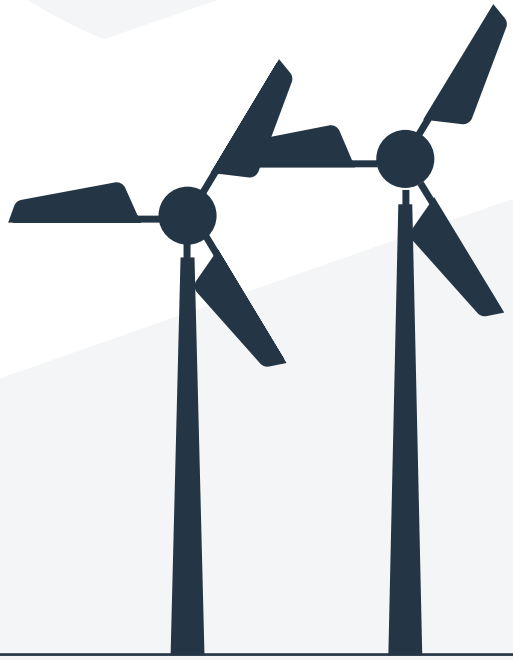
The technology license terms and the FEED terms will need to articulate how the FEED contractor and the technology licensor will cooperate and share information and data. We would typically expect this interface (at this stage of the project) to be managed through the developer, as counterparty to each agreement.

Design development at this stage should be aligned with the key project conceptual design assumptions established at the feasibility stage, the equity base case model assumptions, the feedstock and offtake strategy, and the terms of any regulatory controls, zoning and permitting requirements. It will also need to be aligned with the wider power procurement strategy and any overarching project configuration requirements that must be satisfied for regulatory compliance and in order for the project to satisfy requirements to secure any public subsidy support.

In particular, the feedstock strategy and offtake requirements will need to be interrogated as part of this process. For instance, if a secure and robust feedstock supply is available from a single supplier source, the need for in-built design flexibility may be more limited. Where such supply is not available or there is a perceived need for contingent supply (which funders are likely to want to see), the level of in-built design flexibility may need to be greater.

It would be usual for the FEED to include or to enable the development of contracting options for delivery of detailed design, construction and commissioning. In theory, the FEED should be capable of being taken on by a third party to deliver on the contracting solution selected by the developer, so it will be for the developer to ensure that steps are taken to limit the extent of design development at this stage to avoid any 'over-design' limiting procurement options later.

It will be important for the developer to police FEED development to ensure the work product contemplates a procurement plan and contracting structure that will be bankable and is aligned with the wider project strategy. Oversight and monitoring by an experienced developer team, with the implementation of agreed design control points will be very important.



2

Extended FEED

The constraints of a project finance model—and in particular, the fixed price and program imperative under a turnkey EPC contract solution—don't sit comfortably with the need to innovate and optimize design development and implementation in the context of delivering new technological applications.

A relevant example of this comes from the deployment of scale-up advanced gasification technologies in the waste-to-energy sector. Whilst the technology is potentially superior to conventional incineration from the perspective of emissions and energy recovery efficiency, there have been a number of high value project failures arising from the project financing of this technology. This has occurred even where turnkey EPC contracts have been adopted and, crucially, the existence of those turnkey EPC contracts has not served to confine losses exclusively to the contractors offering them.

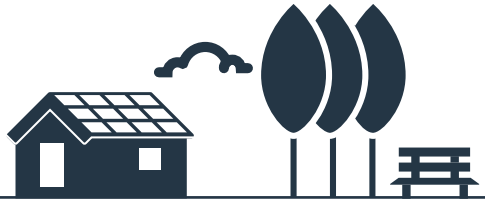
Our suggested approach would be to extend the pre-construction contract design phase to include detailed design development under separate and distinct detailed design terms. This will enable design innovation and optimization outside of the constraints of the turnkey EPC contract terms.

Importantly, this further design development will take place in the context of what should, at that stage, be known planning terms, permit terms, fuel supply terms and offtake terms.[3]

Our suggested approach would be to extend the pre-construction contract design phase to include detailed design development under separate and distinct detailed design terms.

There will be additional cost exposure for the project prior to the point at which financing for the project is confirmed. This risk exposure must, however, be weighed against the significant benefits for the project in following the approach outlined here.

A concern for the developer will be that the contractor will be in a very strong negotiating position at the end of the design period, as the developer will have sunk costs in the project and the design, for practical reasons, will not be readily transferrable to an alternative contractor. To overcome this concern, the parties may enter into a convertible detailed design contract that will seek to lock the contractor into an agreed time and cost envelope, risk allocation principles and key construction terms at the start of the extended design phase. Whilst these arrangements do not offer absolute protection for the developer, any rejection of agreed terms by the primary construction delivery contractor can be policed through incentive regimes, and the steps outlined below which seek to enhance the role and engagement of the primary construction delivery contractor in the wider project structure will provide the developer with an enhanced level of comfort.



3

EPC (Technology Integration Management+/TIM+)

We recognize that it may not always be possible to secure full transfer of technology integration risk on what may be considered a fixed-price EPC basis. Any residual technology interface and/or disaggregation in the construction delivery solution will give rise to bankability challenges.

The extended design phase and opportunity to innovate and optimize design development outside of the constraints of turnkey EPC contract terms will facilitate the following:

- The primary construction delivery contractor assuming responsibility for technology integration management (TIM). By this, we mean the management and coordination of the technology provider(s) from a design, procurement and installation perspective.

- The primary construction delivery contractor assuming liability (either completely or in part) for technology integration, hence the reference above to '+' in our abbreviation EPC (TIM+). The extent to which this will be possible will depend on the success the parties have in implementing the approach outlined above. We would expect this to include an underwrite of project wide performance and availability warranties.

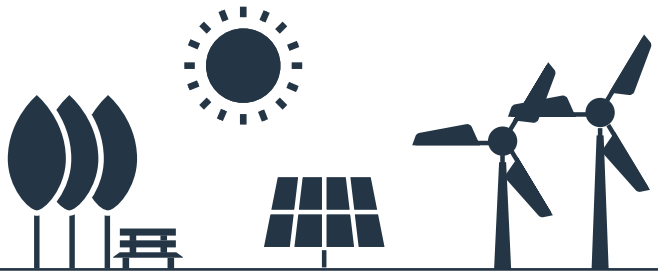
Each of these elements will operate to reduce the technology interface and the level of disaggregation in the construction delivery solution.

The EPC (TIM+) terms will define the extent of any excluded liability, the relief available to the primary construction delivery contractor and the general management obligations in relation to the same and technology integration more generally. Ideally, the terms should incorporate an early warning regime which triggers a process of engagement by key stakeholders, including third-party independent engineering experts. There are a number of ways this can be structured, but the focus initially must always be on problem solving, transparency and collaboration—not blame and liability. The structure needs to encourage engagement and the project program and budget needs to be sized to accommodate.

The focus initially must always be on problem solving, transparency and collaboration—not blame and liability.

It will be important for the primary construction delivery contractor to retain a degree of risk in overall delivery of the technical solution, as this will drive the correct behavior and will help to limit the extent of the technology risk flowing back to the developer.

We outline below options for how the developer may manage residual risks excluded from the primary construction delivery contractor's liability regime.



4

Enhanced Role for Primary Construction Delivery Contractor

Outside of the contractual steps outlined above, the developer should consider how to more fully benefit from the expertise of the primary construction delivery contractor by securing deeper engagement by it in project delivery and success. We see wide-ranging benefits obtained through securing engagement by the primary construction delivery contractor in aspects of the project that transcend the confines of the construction terms.

From a first principles perspective, the primary construction delivery contractor being encouraged to invest equity in the project with a required hold period post-construction completion will help to foster a deeper engagement by it in the success of the project. The shareholder arrangements could also be structured to offer exclusivity for the primary construction delivery contractor for future projects. This will further encourage a longer term view and interest by the contractor on the investment in the project.

We also believe that the conventional approach of the primary construction delivery contractor exiting the project (subject to defects liability obligations) upon construction and commissioning completion requires further consideration.

It would be sensible to encourage the contractor to retain an operational role in the project, particularly during the early period of operations, during which operational performance will be optimized. The primary construction delivery contractor should be encouraged to continue optimization into the operating period which could be underpinned by an incentive bonus-malus regime, including the right to claw back performance and availability damages previously paid and/or a right to share in any longer term operational over-performance, over and above the base case equity return levels. Importantly, this will also mitigate the risk of construction/operational interface issues during the early operational period which so often lead to performance problems and disputes in the early operational period.

We see wide-ranging benefits obtained through securing engagement by the primary construction delivery contractor in aspects of the project that transcend the confines of the construction terms.

Residual Technology Risk

All stakeholders will need to consider the downside scenario where technology chronically under-performs or does not perform at all and the relevant cause does not fall within the primary construction delivery contractor's liability regime and it has otherwise discharged its technology interface management responsibilities. The aim of the structure outlined in this paper is to significantly reduce the prospect of such a scenario materializing. Nevertheless, it will need to be discussed in an open and considered manner and it appears to us that there are a few parties who could conceivably be asked to take the ultimate downside risk (even in part) with a view to giving funders (but not equity) some manner of protection.

The extent to which any such party will manage this downside risk will need to be carefully balanced to maintain a position whereby the primary construction delivery contractor retains an appropriate level of risk to incentivize management of technology integration and, importantly, so as to retain sufficient risk in the project structure to ensure that returns remain attractive for investors and funders. We have worked closely with a range of government entities and export credit agencies (ECAs) to articulate how coverage of this risk may be structured to recognize these important features but also to achieve a bankable solution. Our assessment is that there are a range of options available and we would expect to see these come to market in 2024 and be banked.

Timing of Engagement With Key Stakeholders

The developer will need to plan a detailed schedule for stakeholder engagement. It will be important for the developer to ensure that it has the right information collated at the relevant time for any such engagement and that the information is presented in a manner that achieves its wider commercial strategy. We have highlighted some of the key engagement touch points below.

Governments and ECAs

In terms of risk coverage from governments and ECAs, we would suggest that early engagement is sensible to understand the nature of protection on offer and options for structuring the product. We would recommend that this engagement occurs during the FEED phase or before. This is important as the developer will want to engage with likely funders having bottomed-out key aspects of risk allocation in order to offer solutions that can be considered bankable. Furthermore, the ECA coverage on offer may dictate procurement options, which will need to be factored into detailed design development.

Advice should be sought from practitioners with experience in structuring products of this nature on large complex projects.

Revenue Support

Eligibility for any government revenue support or credit needs to be understood early in the project development cycle, as it will drive the equity base case model assumptions, influence bankability considerations and the conditions to the securing of the relevant support will need to be reflected in all relevant project contracts.

Practitioners will be able to assist the developer in obtaining clarity on eligibility requirements, conditions for support and answers to requisitions relating to the same. The developer will typically need to run downside scenarios within the equity base case financial model to understand the impact of not securing the relevant support, and any liability flowing from this will need to be articulated and understood by all relevant project stakeholders.

Eligibility for any government revenue support or credit needs to be understood early in the project development cycle.

Funder Engagement

The developer's financial adviser will manage the formation of a funding group for the project. It will be important for funders to be approached only when the developer is able to articulate how each key bankability issue will be addressed. Based on the proposed structure outlined in this paper, our view is that this should occur post-FEED but pre-commencement of the detailed design phase. There are a number of reasons for this but principally, the developer will want assurances that the structure is bankable and importantly, will want to factor in any further funder requirements (to the extent acceptable) into detailed design development where relevant. It may also want to get these assurances whilst there remains competitive tension between various funders and funding options. It may also be sensible at this stage for the developer to require the funder to run the project past its credit team and to secure a non-binding term sheet from each funder.

Private Credit Funds Charging The Energy Transition

Investor name	Fund name	Impact category preferences	Close date	Fund size	Location
Blackstone	Blackstone Green Private Credit Fund III	Climate	10/08/23	$7.1B	New York
Macquarie Asset Management	Macquarie Global Infrastructure Debt Fund II	Infrastructure	24/06/20	$3.4B	Sydney
Brookfield Capital Partners	Brookfield Infrastructure Debt Fund II	Infrastructure	10/12/20	$2.7B	New York
Global Infrastructure Partners	GIP Capital Solutions Fund II	Infrastructure	31/12/20	$1.6B	New York
Edmond de Rothschild Asset Management	Benjamin de Rothschild Infrastructure Debt Generation IV	Infrastructure	28/01/20	$1.4B	Geneva
ILX Management	ILX Fund I	Climate	20/06/22	$1.1B	Amsterdam
Eiffel Investment Group	Eiffel Impact Debt	Energy	08/07/21	$0.7B	Paris
PROW Capital	Green Shipping Fund	Climate, pollution	24/11/21	$0.5B	Amsterdam
Tikehau Capital	Tikehau Capital Private Debt Impact Fund	Agriculture, climate, employment	31/12/21	$0.3B	Paris
SUSI Partners	SUSI Energy Efficiency Fund II	Climate, energy	15/05/20	$0.3B	Zug, Switzerland

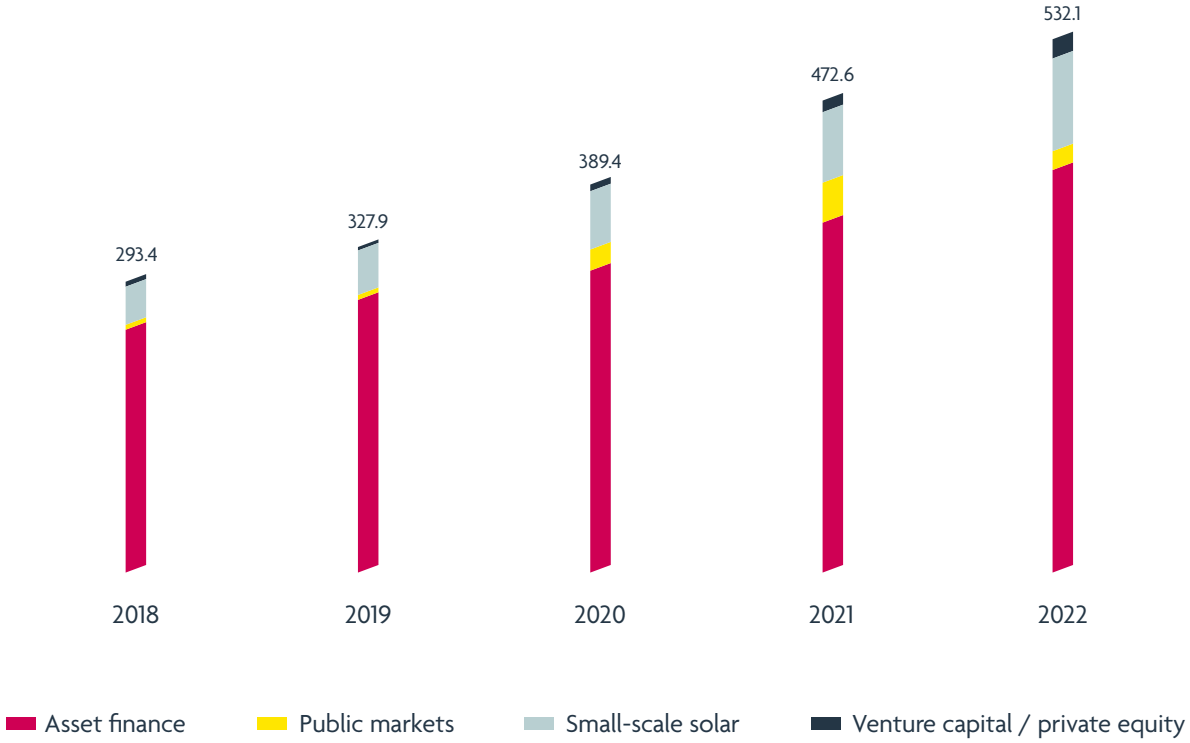
Source: PitchBook data

Geography: Global

As of Oct. 11, 2023

Whilst the financial adviser will have relationships within the funding community, it will be important for the developer to ensure that all options are being explored. For instance, we see a significant role being played on this type of project by private credit funds. Whilst there may be a higher cost of debt, these funds have a greater appetite for risk. It may be that private credit funds are used for initial projects or are refinanced out with traditional lending institutions post-construction.

Private Investment in Renewable Energy Projects ($ Billion)



Source: Alliance Bernstein

We see a significant role being played on this type of project by private credit funds. Whilst there may be a higher cost of debt, these funds have a greater appetite for risk.

Offtakers and Feedstock Suppliers

Funders will need to understand (i) the feedstock strategy and terms and (ii) the proposed route to market for the offtake product and terms. These will need to be in place and binding on or before financial close. There is often reluctance by suppliers and offtakers to fix terms possibly two to three years before they become effective following the commencement of commissioning and operations. This will be required (or a very high degree of certainty provided) as feedstock supply and offtaker requirements will need to be factored into the relevant project contracts (including construction and operating and maintence (O&M) terms) and, importantly, funders are unlikely to see a project as bankable without certainty of terms in this regard. Drafting solutions will be required to address concerns around shifting prices, but the potential for upside for the developer needs to balance against certainty of terms and bankability.

Both feedstock supply and offtake terms are likely to influence design development, so we would suggest that detailed heads of terms are agreed prior to the commencement of the detailed design phase. This should be accompanied by detailed market analysis (on which funders will eventually seek reliance) which should underpin the feedstock and offtake strategy and which should outline contingent arrangements. A clear picture needs to be presented to potential funders prior to commencement of the extended design phase and as part of the funder engagement outlined above.

Landowners

Early diligence should be performed to ensure that all necessary land rights are available to the project to build and operate the facility—including necessary rights of access and egress. To the extent that the developer acquires a leasehold interest, the terms will need to be reviewed from a bankability perspective. For instance, funders will look very carefully at proposed rights of forfeiture, the risk of the lease being terminated early being a fundamental concern. Again, they will expect the lease to be held by an entity, which can grant security over its terms to the funders.

Early diligence should be performed to ensure that all necessary land rights are available to the project to build and operate the facility.

The developer will be required to certify title to lenders and the terms of any such certificate will need to be bankable. Should any restriction or encumbrances on title be identified, the developer will need to either secure removal or present a strategy for their management that is likely to be acceptable to lenders. We would recommend that this work be carried out at the earliest possible opportunity, as any issues need to be understood before the outlay by the developer of material expenditure.

Site Risk

We would expect the primary construction delivery partner to undertake verification surveys as part of the detailed design phase.

Detailed geotechnical surveys should be carried out prior to the commencement of the detailed design phase. Issues such as any requirement to remediate pre-existing contamination need to be understood early and a strategy developed for their management. Funders will expect ground conditions risk to be managed generally by the primary construction delivery contractor, so any surveys performed by the developer must be comprehensive and shared with the primary construction delivery partner on a non-reliance basis. We would expect the primary construction delivery partner to undertake verification surveys as part of the detailed design phase to inform design and the final price build-up.

Permitting Authorities

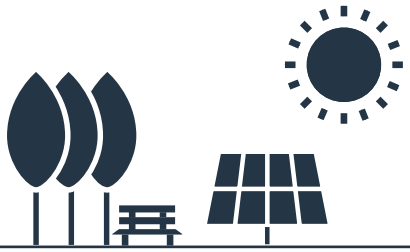
It is unlikely that the project will be able to secure an operating permit prior to financial close. This creates uncertainty with regard to whether the project, as designed, constructed and commissioned will be able to obtain an operating permit. Furthermore, the terms of the permit may give rise to unexpected requirements which could have time and cost impacts or undermine the assumptions on which the project has been developed.

Through liaison with the relevant permitting authority and the provision of professional advice, the core likely terms of the relevant permit may be capable of being understood. There will remain issues that cannot be understood until the near final permit is issued and it will be necessary for the parties to work with the permitting authority and funders to establish an acceptable solution that gives the project the highest level of time and cost certainty possible.

1. Lithium hydroxide conversion facilities, giga factories, CAM manufacturing etc.
2. Often, contractors operating in this field will have a track record of delivery and often are developers of technologies that themselves have been through a similar development process.
3. Note: Project finance lenders are unlikely to accept financial close without these aspects of the project being finalised and agreed. The extended pre-construction design phase will be undertaken at the point at which projects would usually achieve financial close.

Our Practice and Experience

We act for energy companies, industrials, investors, funders, ECAs and governments on the financing, design, construction and operation of energy projects. We advise on the largest and most complex energy projects and have advised on genuine pathfinder first-in-kind projects across the energy and infrastructure sectors. We have a full service global offering from project inception and feasibility, FEED and financial investment decision (FID) achievement, to detailed design, construction, commissioning and operations. Our areas of experience include construction, licensing regulations, supply and power purchase agreement (PPA) terms, offtake arrangements, joint ventures, mergers & acquisitions (M&A), project financing and debt finance, as well as disputes, restructuring and investigations.



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